Electrical Systems Service Manual Body Builder Book

October 2012 Edition
S08323

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In this manual, Navistar® Inc. provides information about its different products to assist those who wish to modify these products for individual applications. Navistar does not recommend or approve any firm nor make any judgments on the quality of the work performed by a particular firm. Individuals who use the services of a Body Builder must satisfy themselves as to the quality of the work.

The party installing a body, a fifth wheel, any other equipment, or making any modifications to complete the vehicle for delivery and make it road-ready is responsible to see that the completed vehicle complies with all applicable certification procedures and safety standards, as may be set forth in Federal, State, and local statutes, rules and regulations.

Specifications, descriptions and illustrative material in this literature are as accurate as known at time of publication but are subject to change without notice. Illustrations are not always to scale and may include optional equipment and accessories but may not include all standard equipment.

In addition to this Body Builder Electrical Data Book, publication CT-471, Body Builder Data, may be required. The CT-471 - Body Builder Data is a set of booklets which includes a General Information Body Builder Data booklet for information about the Navistar, Inc. product line; model series Body Builder Data booklets which contain information related to the features and specifications for each of their respective models; Component Body Builder Data booklet containing information for components which have common application in two or more truck series, Body Builder Engine Programming information and any supplemental Body Builder Data booklets containing information for components which have common application in two or more truck series.

SAFETY INFORMATION

IMPORTANT - Read the following before starting the service procedure.

You must follow your company safety procedures when you service or repair equipment. Be sure to understand all of the procedures and instructions before you begin work on the unit.

Navistar uses the following types of notations to give warning of possible safety problems and to give information that will prevent damage to the equipment being serviced or repaired.

WARNING - A warning indicates procedures that must be followed exactly. Personal injury or possible death, along with damage to the vehicle, can occur if the procedure is not followed.

CAUTION - A caution indicates procedures that must be followed exactly. If the procedure is not followed, damage to equipment or components can occur.

NOTE - A note indicates an operation, procedure or instruction that is important for correct service.

Some procedures require the use of special tools for safe and correct service. Failure to use these special tools when required can cause injury to service personnel or damage to vehicle components.

FORWARD

INTRODUCTION

DISCLAIMER: NAVISTAR DOES NOT TAKE ANY RESPONSIBILITY FOR CUSTOMER OR BODY BUILDER WIRING.

NOTE: After-market installed wiring for engine speed control must comply with the following guidelines:

1. Sealed switches and connectors must be used for switches and connections that are exposed to the weather or to salt spray emanating from the vehicle's tires.
2. Route and clip wiring to minimize chafing and exposure to weather. Use conduit, loom, and/or tape to achieve this.
3. Fuse all power leads as close to the power source as possible. Remember fuses protect the wiring - size fuses accordingly.
4. All ground connections that will be made to the frame or body must be connected to clean bare metal. Remove all dirt, paint, grease and rust that would insulate the terminal from ground. After connecting the ground, seal the connection with a good quality grease or surface sealant to protect the connection from corrosion.
5. Spliced wires should be twisted together and soldered. Use a heat shrink tube with a meltable inner wall to seal the connection. Do not expose splices to the weather.

WARNING: To avoid serious personal injury, possible death, or damage to the vehicle, make sure the transmission is in neutral, parking brake is set, and the wheels are blocked before undertaking service procedures. In addition, turn off the engine when you leave the vehicle. Never leave the vehicle unattended with the engine running.

WARNING: To avoid personal injury, possible death, or damage to the vehicle when adding electrical features, disconnect batteries. Reconnect batteries when installation is complete.

- Whenever disconnecting battery terminals always disconnect the ground terminal first. When reconnecting, always connect the ground terminal last.
- To prevent injury to the eyes, face, limbs and body, it is imperative that lighted materials, flames or sparks be kept away from the vent openings of the battery. The gas mixture in the battery cells, which escapes through the vents, could ignite and/or cause an explosion. This is particularly true when jumper cables are being used.
- In addition, inhaling of gas produced by the normal operation of the battery could result in partial or permanent damage to the respiratory system.
- Always wear eye protection when working around batteries. Do not attempt to jump-start a vehicle having a frozen battery because the battery may explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen, do not attempt to start with jumper cables as long as the battery remains frozen. Thaw out the battery and recharge.
- Do not check battery condition by shorting (flashing) across terminals.
- Failure to observe these instructions could result in personal injury and/or damage to the vehicle.

Battery cable terminals must be clean and tight. Use hot water and common baking soda for removing terminal corrosion and for cleaning the top of the battery. Brighten the contact surface with steel wool, apply a light coat of lubricant sealing grease such as Fleetrite® 472141-C1 or equivalent and reassemble. Be sure the terminals are clamped tightly and that the battery is clamped securely in place.

When working around the terminals and battery, use extra care to avoid shorting. A good practice is to insulate pliers and screwdrivers.

INTRODUCTION

ELECTRICAL SYSTEM OVERVIEW

INTERNATIONAL® DIAMOND LOGIC® ELECTRICAL SYSTEM OVERVIEW

Multiplexing Architecture

Unlike the electrical systems on previous models, which utilized point-to-point wiring for all input signals and output loads, this system uses multiplex technology to provide control and communication between major functional areas of the vehicle. Multiplexing simply means: communicating multiple pieces of information via a single twisted pair of wires (called the data link) without requiring a wire for each piece of information. This information could be gauge information such as engine oil pressure, or switch information that controls vehicle functions such as headlamps.

The electrical system relies on a collection of electronic circuit modules and software to perform vehicle functions instead of implementing similar features using complex wire harness designs with electromechanical relays and switches. These electronic module components are connected together by data links. The data links can be thought of as computer networks that allow the electronic components on the vehicle to communicate with one another.

The concept of multiplexing is not new since data links for communicating between engine controllers, the instrument cluster and the diagnostic connector have been used for several years.

The goal of multiplexing is to reduce cab harness wiring and to simplify circuits. This is accomplished by using a low current data link for communicating between cab switches, the Body Controller and the Instrument Cluster. Other data links in the vehicle allow other electrical controllers, the BC and the Instrument Cluster to communicate with each other.

Data Links

Navistar's multiplexing uses two types of data-links, J1708 and J1939. The J1708 data link is often referred to as ATA and J1939 is often referred to as CAN. These two types are utilized in four separate data links on the vehicle.

- Power Train data-link – J1939

This data-link provides a path for communication between the engine controller, transmission controller, antilock brake system (ABS) controller, pyrometer ammeter module (PAM), Body Controller (BC), auxiliary gauge switch pack (AGSP) and the electronic gauge cluster (EGC). It also provides the capability for programming and diagnostic functions via the 9-pin diagnostic connector through the use of the appropriate service tool and diagnostic cable interface.

- Body Builder data-link – J1939

This data-link provides a path for communication between the remote power module(s), remote engine speed control module and the BC.

- Switch data-link – J1708

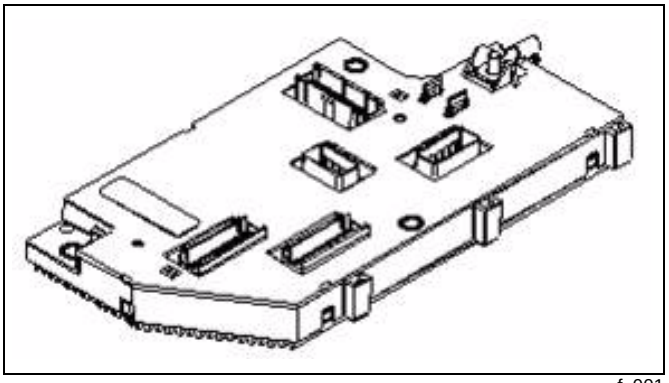
This J1708 data-link provides a path for communication between the center panel switch packs, door pods and BC.

- ATA data-link – J1708

This is the same J1708 data-link (sometimes referred to as ATA) that has been used in the past. The J1708 data-link is available, but is no longer the primary data link for communicating with the engine diagnostic and programming tool. The J1708 data-link has historically been used to provide programming capability and diagnostic information for various control modules including the ABS and the engine.

BODY CONTROLLER (BC)

The heart of the multiplex system is the BC.



f_001

Body Controller (BC)

The BC communicates with the switch packs on the switch datalink, controllers from other features on the power train datalink, and RPMs (remote power modules) and the RESCM (remote engine speed control module) on the Body Builder datalink. It also receives input from various sensors and hard wire inputs throughout the truck. The BC converts these inputs, in accordance with the programmed “rules,” into data to be transmitted on the datalinks.

It is also the power source for circuits that feed some of the components, controlled by the multiplexed switches, inside and outside of the cab. The primary vehicle software programming resides in the BC.

REMOTE POWER MODULE (RPM)

RPMs provide a method of distributing and controlling power to various device loads on the vehicle, outside the cab, without running high current wires from in-cab switches to the loads or splicing into existing wiring.

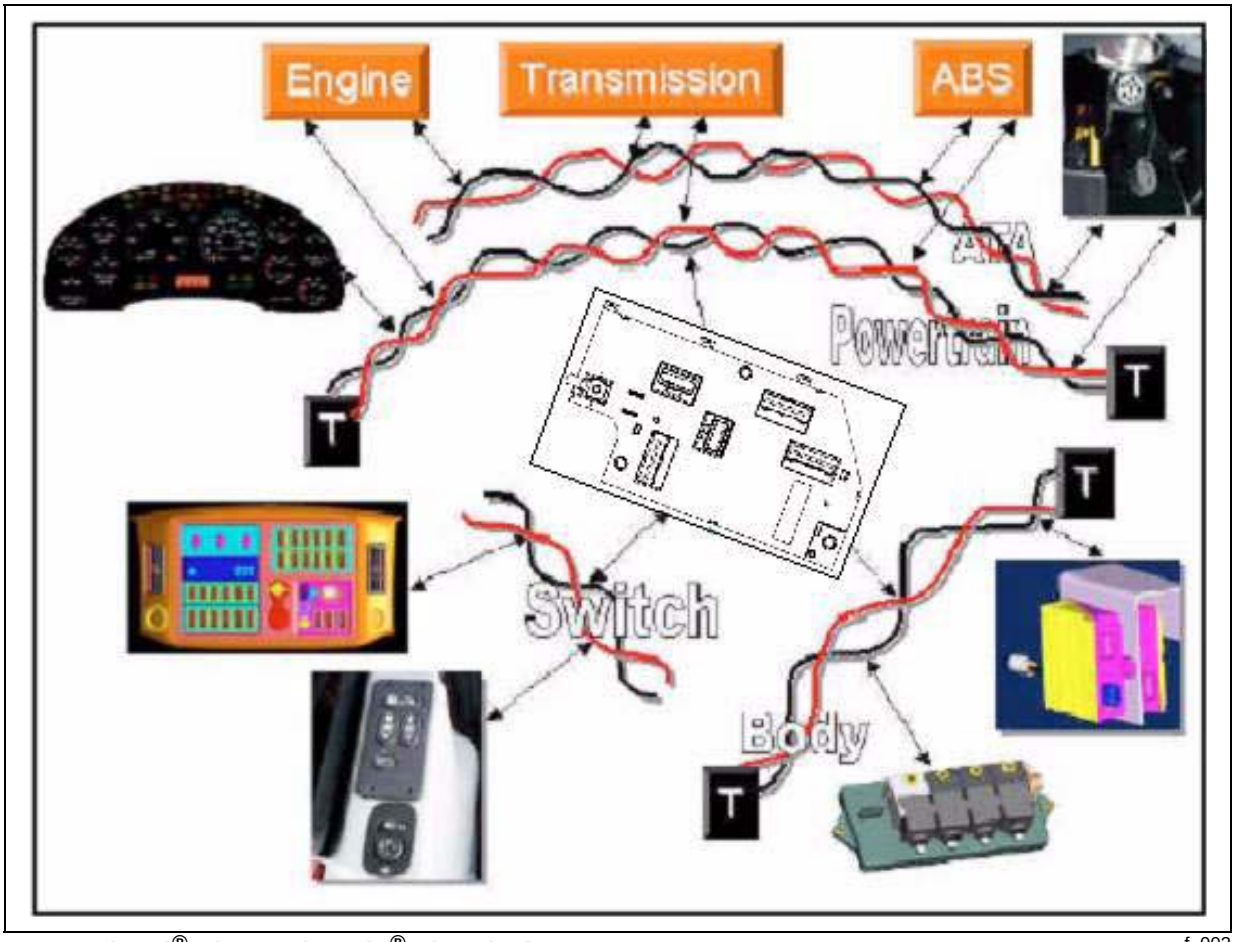
Remote Power Module (RPM) f_002

The RPM is connected to the BC via the Body Builder J1939 datalink (the BC is capable of controlling up to seven RPMs on the vehicle). The only factory-installed wires connected to the RPM are battery power for driving the loads and the datalink cable. Connectors for Body Builder-installed inputs and outputs are also provided. Power is fed to the RPM through a fusible link to the battery source. Each RPM has six independently controllable, 20 Ampere (AMP) outputs (80A maximum per RPM) with virtual (software programmable) fusing similar to the BC. If higher current capacity is needed, two outputs can be paralleled or the RPM can control a high current relay while still maintaining logic and diagnostic capability without having to wire to the inside of the cab.

Because the RPM is connected to the BC via the datalink, it also serves as an “integration gateway” to the BC and the vehicle electrical system. Six digital inputs on each RPM allow information from body accessories to be communicated to the BC and processed for interlocks, operator information/warning, etc. These inputs also allow the Body Builder to add body-mounted switches to turn on or off the same electrical devices controlled by in-cab switches.

Additional information concerning the use and installation of RPMs is contained in the applicable Feature sections that follow (see 60AAA/60AAB in particular for detailed data on RPM connectors/pin functions, wiring, and mounting).

The following is an example of how a vehicle electrical system might be configured.



International® Diamond Logic® Electrical System f_003

The International® Diamond Logic® electrical system, in conjunction with the Diamond Logic® Builder software, provides the Body Builder with unprecedented flexibility in adding and customizing the electrical features on a vehicle.

GENERAL ELECTRICAL

Navistar vehicle electrical systems are becoming increasingly complex with the addition of a BC, electronic engine and transmission controls, electronically driven instrument gauges, and Antilock Brake Systems (ABS) to name a few. While most systems still operate on battery voltage (12 volts), some systems operate at as high as 107 volts (electronic fuel injection) and as low as five (5) volts (electronic engine controls).

Navistar publishes Electrical Circuit Diagram Manuals for all its models. Body builders and installers should refer to these manuals before connecting body lights and accessories to the vehicle electrical system to assure that circuits chosen are both appropriate and not overloaded. Modifications not defined in the circuit diagram book are not to be made to the vehicle electrical/electronic control systems without first contacting Navistar for assistance at its Tech Central Department, telephone 1-800-336-4500.

J1939 HIGH SPEED DATA LINK CABLE (SAE J1939/15)

The information in this section applies to all 3200, DuraStar, WorkStar, and 8000 models.

Performing the proper repairs or modifications of the cable is critical to the integrity and performance of the vehicle systems. (For repair procedure see Electrical Troubleshooting Guide - S08250 or Data Link Repair in this manual.) This information based on SAE J1939/15.

COLOR CODE SYSTEM FOR INTERNATIONAL® TRUCK

Table 1

Color	Description
Red	Alternator/Battery Feeds
Pink	Ignition Feeds
Light Blue	Accessory Feeds
Yellow	Headlight System (Daytime Running Lights, Fog, Hi-Beam,etc.); Data Link J1939(+)
Dark Blue	Interior Lights (Dome, Panel, etc.); Data Link J1708(+)
Brown	Exterior Lights (Tail, Market, Clearance, etc.)
Orange	Exterior Lights (Turn, back-up, etc.)
Gray	Engine/Chassis Systems (Fuel Solenoid, Horn, etc.); Data Link J1708(-)
Tan	Engine/Chassis Monitoring Systems (Gauges)
Green	Data Link J1939(-)
Light Green	Driver Aid Systems (Windshield Washer, Heater, etc.)
Violet	Engine Controls - Electronic
White	GND
Black	Battery GND Cables or Computer Data Link Systems

NOTE: The wiring in multiple conductor jacketed cable does not follow the above color code system. See the electrical circuit diagram manual for specific colors and circuit numbers used with each system. Use only “GXL", “SXL" or “TXL" insulated wire. Crimp and solder all connections.

RECOMMENDED CIRCUIT PROTECTION

Table 2

Wire Gauge	Protective Device Size	Maximum Current (Amps)
18 Ga	10 AMP Fuse/Circuit Breaker	8 A
16 Ga	15 AMP Fuse/Circuit Breaker	12 A
14 Ga	20 AMP Fuse/Circuit Breaker	16 A
12 Ga	25 AMP Fuse/Circuit Breaker	20 A
10 Ga	30 AMP Fuse/Circuit Breaker	24 A
8 Ga	12 Gauge Fusible Link	80 A
6 Ga	10 Gauge Fusible Link	108 A
4 Ga	2-12 Gauge Fusible Link	160 A

CAUTION: Wire gauge is designed to match fuse/circuit breaker rating. Do not increase the size of a circuit breaker or fuse. To do so could cause wiring to overheat and burn.

CIRCUIT PROTECTION DEVICES

Table 3

Size	Circuit Breakers	Part Number	Color
7.5 A	Type III - Manual Reset	3536177C1	Brown
10 A	Type III - Manual Reset	3536178C1	Red
15 A	Type III - Manual Reset	3536179C1	Blue
20 A	Type III - Manual Reset	3536180C1	Yellow
25 A	Type III - Manual Reset	3536181C1	White
30 A	Type III - Manual Reset	3536182C1	Green
Size	**Fuses**	**Part Number**	**Color**
5 A	Mini - SAE J2077	3534208C1	Tan
7.5 A	Mini - SAE J2077	3546109C1	Brown
10 A	Mini - SAE J2077	3534209C1	Red
15 A	Mini - SAE J2077	3534210C1	Blue
20 A	Mini - SAE J2077	3534211C1	Yellow
25 A	Mini - SAE J2077	3534212C1	Natural
30 A	Mini - SAE J2077	3534213C1	Green

Circuit breakers and fuses can be installed in the chassis wiring using the following in-line connectors:

- 1676841C91 - Inline socket and cable for circuit breaker/fuse (20 A Maximum)
- 1682115C91 - Inline socket and cable for circuit breaker/fuse (30 A Maximum)

Table 4

Size	Devices	Part Number	Color
20 A	Autofuse	131224C1	Yellow
20 A	Circuit Breaker - Type III	3529688C1	
30 A	Autofuse	571691C1	Green
30 A	Circuit Breaker - Type III	3529690C1	

ELECTRICAL COMPONENTS COMMONLY USED BY EQUIPMENT INSTALLERS

Table 5

3200, DuraStar, WorkStar	Type
At Fuse Block	
3534164C1	Terminal Fuse Block (18/20 Gauge)
3573312C1	Terminal Fuse Block (14/16 Gauge)
3573311C1	Terminal Fuse Block (10/12 Gauge)
At Tail Lights	
589390C1	Seal, Wire - (Blue) .165-.138 O.D. Cable (12-14 Gauge)
589391C1	Seal, Wire - (Gray) .137-.111 O.D. Cable (14-16 Gauge)
1652325C1	Seal, Wire - (LtGn) .110-.080 O.D. Cable (16-20 Gauge)
1661375C2	Body Connector, 5-Way Male
1661377C1	Terminal, Female - 14/16 Gauge
1661376C1	Lock, 5-Way Male Connector
1677851C1	Body Connector, 5-Way Female
1671609C1	Terminal, Male - 14-16 Gauge
1677914C1	Lock, 5-Way Female Connector
587579C1	Sealing Plug (for Empty Connector Cavities)

NOTE: Any unused circuit cavities must be plugged with sealing plugs provided with chassis harness.

CONNECTORS 4450 AND 4460

Connectors 4450 and 4460 have their mating connectors attached filled with cavity plugs. To use connectors, remove cavity plugs and use the following:

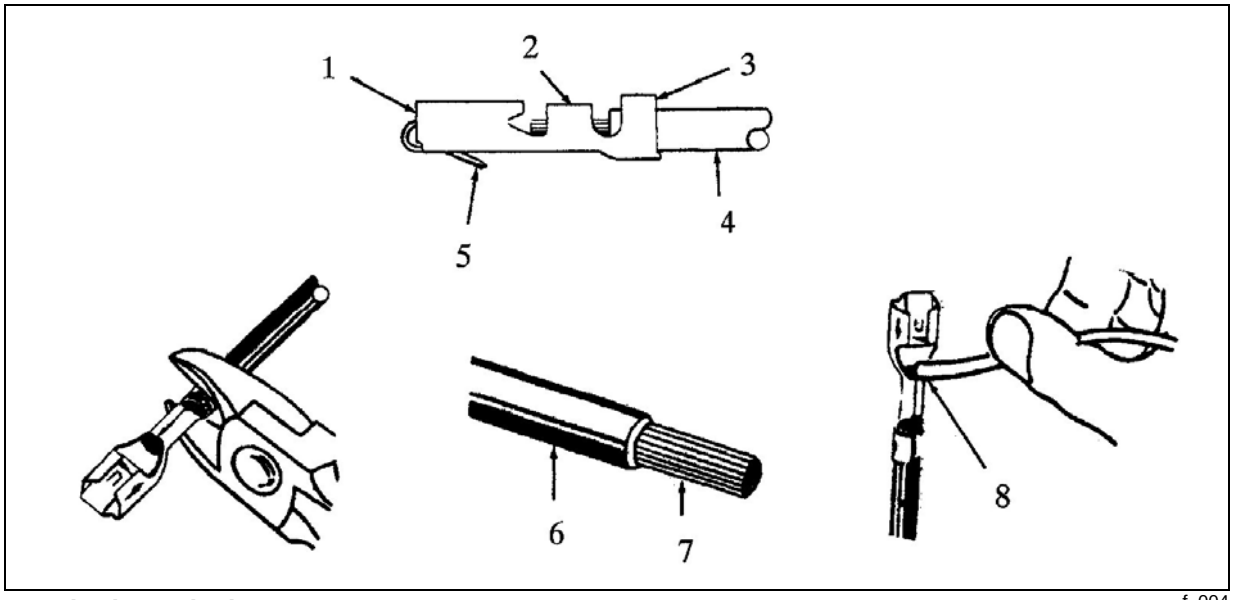
Table 6

Terminals	Wire Gauge
2033912C1	12, 14
2033911C1	16, 18, 20
Cavity Seals	**Wire Gauge**
0589390C1	12
0589391C1	14
1652325C1	16, 18, 20
Mating Connector Part Numbers	
4450 Connector	2039312C91
4450 Lock	2039342C1
4460 Connector	3553961C1
4460 Lock	3554019C1

STANDARD TERMINALS AND SPLICES

1. Cut the cable just before the insulation wings on the terminal.
2. Remove the insulation being careful not to cut any of the wire strands (¼ inch exposed copper stranding is typical).
3. Position cable in the new terminal.
4. Hand crimp the core wings first, then the insulation wings.
5. Check to ensure copper stranding is not cut as this can cause “hot spots”.
6. Ensure no copper is exposed beyond the insulation crimp as this will allow a pivot point and the copper stranding will break.
7. Solder all hand crimped terminals and electrically check for continuity.

NOTE: Always use the recommended crimp tool for each terminal. A detailed crimp chart is included in the repair kit.



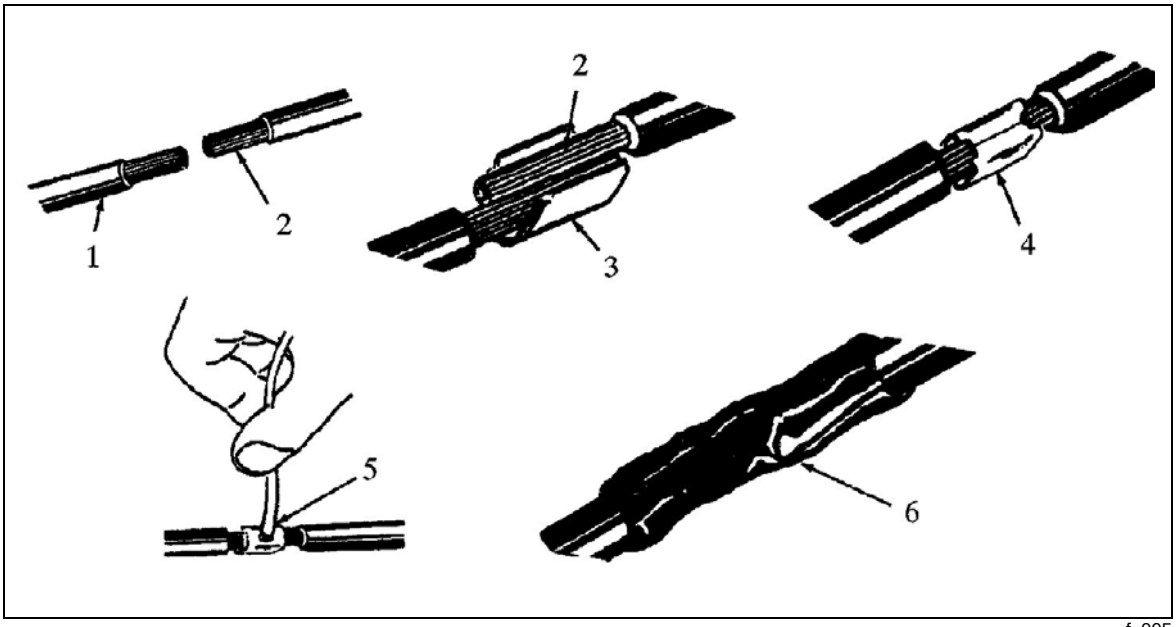
Standard Terminal f_004

1. Mating End
2. Core Wings
3. Insulation Wings
4. Cable
5. Lock Tang
6. Insulation
7. Wire Strands
8. Solder

SPLICE CLIP INSTALLATION

NOTE: A new clip must be located a minimum of 1.5 inches (40 mm) from a connector, sleeve or another clip

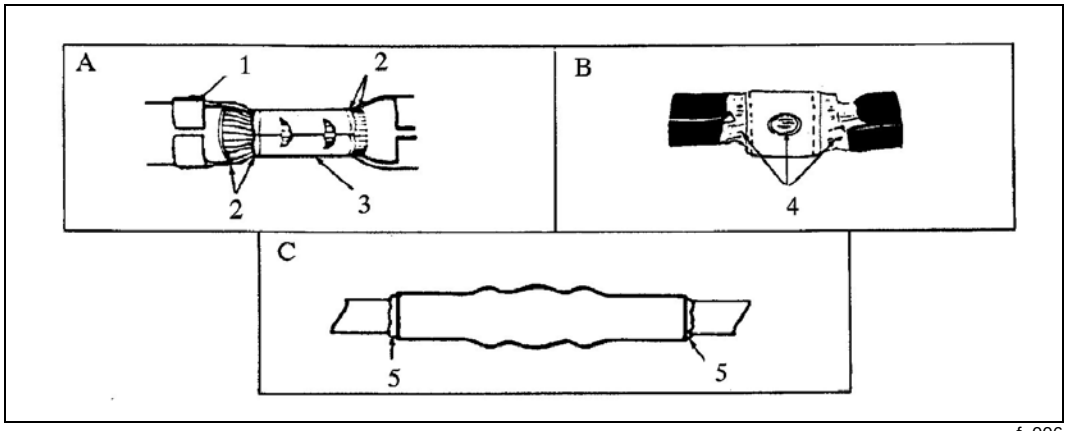
1. Cut off the old clip or bad section of wire.
2. Remove the insulation being careful not to cut any of the wire strands.
3. Install the proper clip on the wire strands.
4. Hand crimp the clip until securely fastened.
5. Solder the clip and electrically check for continuity.
6. Cover the entire splice with splice tape. Extend the tape onto the insulation on both sides of the splice(s).



Splice Clip Installation f_005

1. Insulation
2. Wire Strands
3. Clip (Positioned Correctly)
4. Crimped Correctly
5. Solder
6. Tape

SPLICE INSPECTION



Splice Inspection f_006

1. Terminal Application
2. Insulation Crimp
3. Wire Strands Visible in this Area
4. Core Crimp
5. Solder Application
6. Good Solder Application
7. Crimp and Seal Heat Application
8. Evidence of Glue

CRIMP AND SEAL SPLICE SLEEVE INSTALLATION

Part Number	Description	Quantity
3517501C1	12-10 AWG Splice	2
3517502C1	16-14 AWG Splice	7
3517503C1	22-18 AWG Splice	2
2644000R1	Dual Wall Heat Shrink, 50mm	50

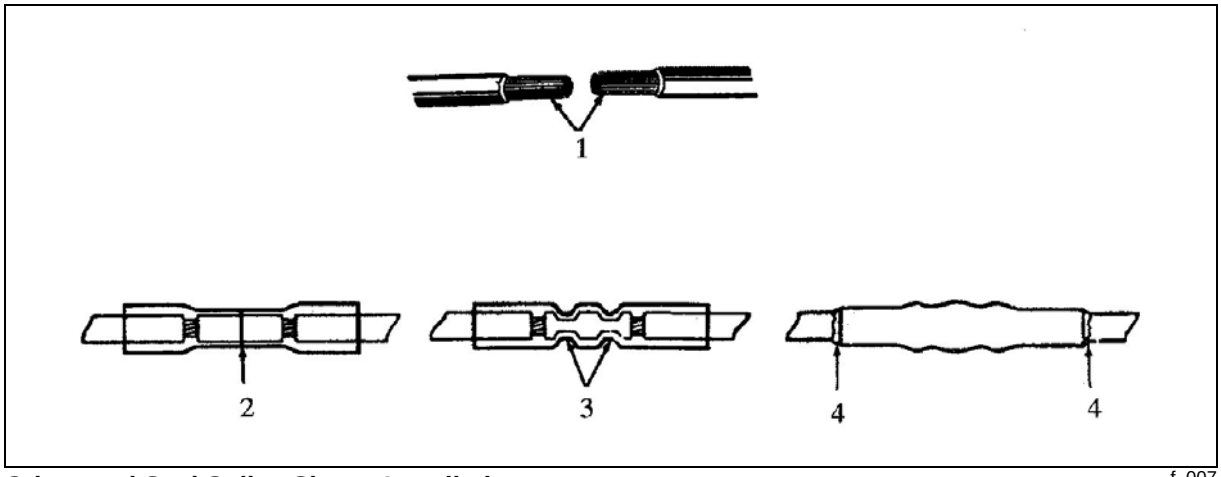
NOTE: A new sleeve must be located a minimum of 1.5 inches (40 mm) from a connector, clip or another sleeve.

1. Cut off the old sleeve or bad section of the wire.
2. Remove insulation being careful not to cut any of the wire strands.
3. Install the proper sleeve on the wire strands, making sure the ends of the wire hit the stop.
4. Hand crimp to the sleeve. Gently tug on the wire to make sure that they are secure.

NOTE: Always use the recommended crimp tool for each sleeve. A detailed crimp chart is included in the Repair Kit.

CAUTION: Use appropriate heat gun. Do not use a match or open flame to heat the sleeve seal.

5. Electrically check the sleeve and wire cable for continuity.



Crimp and Seal Splice Sleeve Installation

f_007

1. Wire Strands
2. Wire Stop
3. Crimp Connector
4. Evidence of Glue

DATA LINK REPAIR

J1708

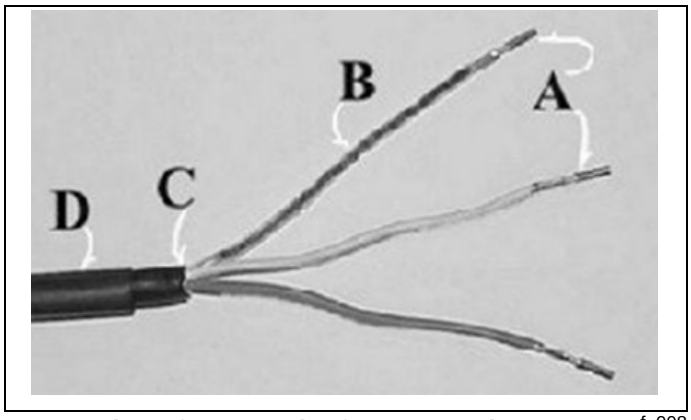
Repairs to damaged J1708 circuits should be accomplished using similar types of wiring. Splices should be crimped and soldered. Insure the twist in the wire pair (one twist per inch) is maintained and individual wires are covered with heat shrink.

J1939/11 Shielded Only

Repairs to damaged J1939 circuits should be accomplished using identical types of wiring. Splices should be crimped, soldered and covered with heat shrink. Insure the twist in the wire pair (one twist per inch) is maintained and that any wire bundles in the engine compartment are shielded and covered with heat shrink.

Wire Repair

This instruction addresses termination and splicing of J1939 wire.

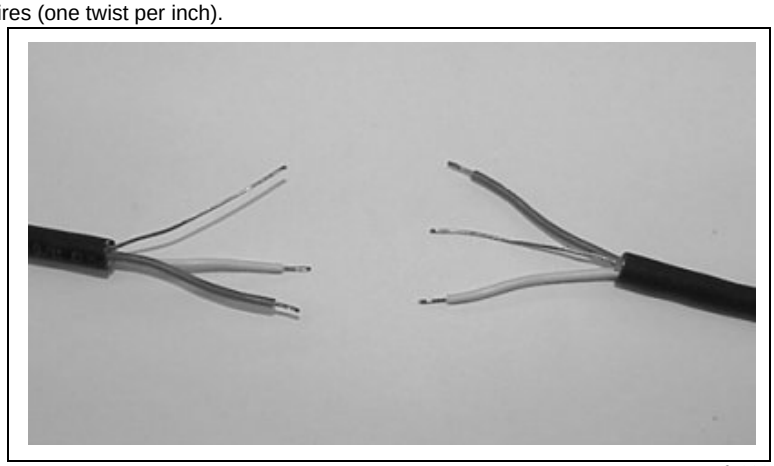


Preparation of J1939 Wire for Connection f_008

1. Strip back (view C) outer shield 3 1/8 in. (76 mm).
2. Strip (view A) green wire and yellow wire 1/4 in. (6.35 mm) being careful not to cut individual strands.
3. Re-twist all three wires (one twist per inch) if they have separated.
4. Sleeve drain wire (view B) may be soldered to aid in sleeving.
5. Install terminals on green and yellow wire ends, and crimp.
6. The 1/4" heat shrink tube (view D) will be shrunk later after the wires have been inserted into the crimp connector.

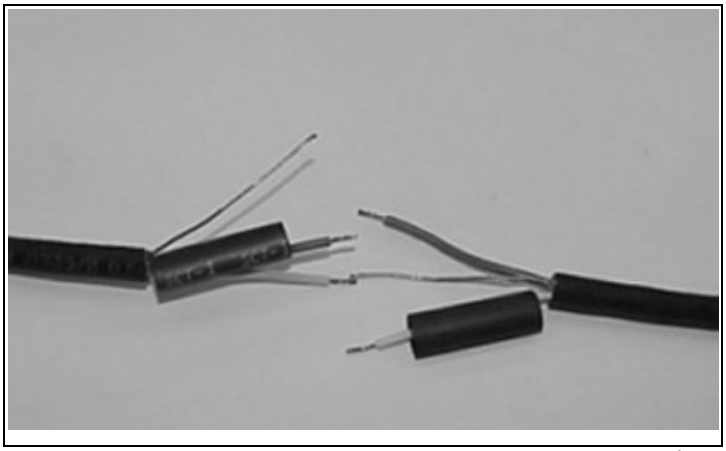
WIRE SPLICING

1. Strip wire ends 1/4 inch.
2. Re-twist any loose wires (one twist per inch).



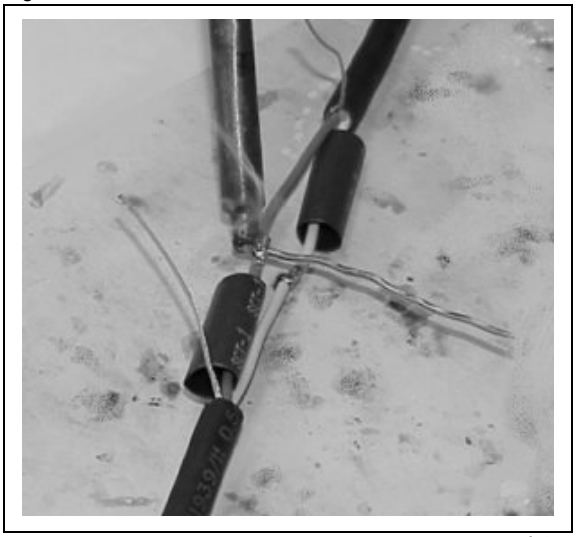
Re-Twist Any Loose Wires f_009

3. Slide 2-inch pieces of insulated heat shrink tube over wire for later use.



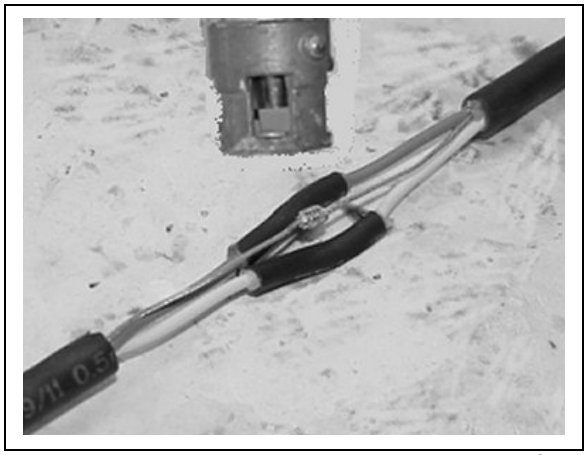
Put Heat Shrink Tube Over Each Wire f_010

4. Put heat shrink tube over each wire.
5. Insert ends of wires into splice joint and crimp.
6. Solder the wires and crimp joint together.



Solder Wires Together f_011

7. Center heat shrink tube over splice and shrink.

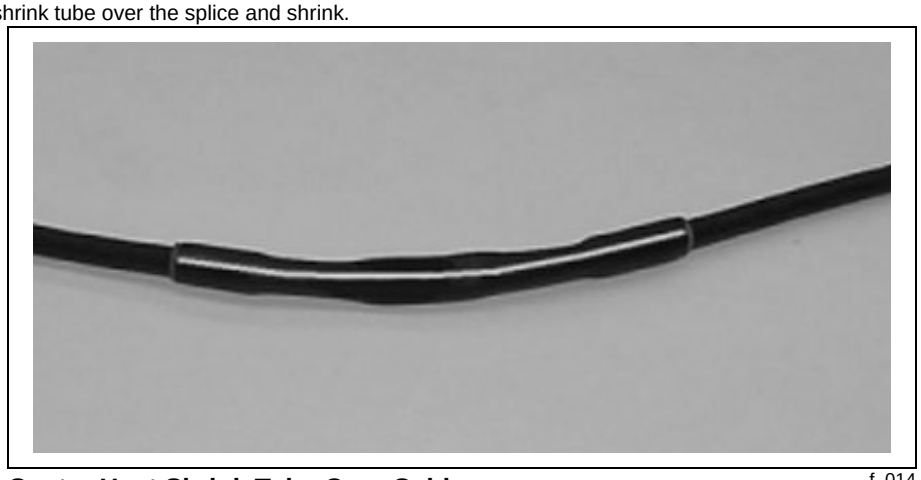


Center Heat Shrink Tube Over Splice f_012

8. Wrap wires with foil tape. Maintain at least 1/2 wrap overlap.

Center Heat Shrink Tube Over Cable f_013

9. Center heat shrink tube over the splice and shrink.



Center Heat Shrink Tube Over Cable f_014

J1939 HIGH SPEED DATA LINK CABLE (SAE J1939/15)

Performing the proper repairs or modifications of the cable is critical to the integrity and performance of the vehicle systems. (For repair procedure see Electrical Troubleshooting Guide - S08250 or Data Link Repair in this manual.) This information is based on SAE J1939/15 and TMC RP 142.

These instructions are intended for modifications that meet the SAE spec; i.e., no internal resistor. When extending the backbone the proper materials must be used. The data link cable consists of a twisted pair of insulated wires and is covered by an insulating jacket. The data link cable must meet the SAE - specified characteristic impedance of 120 ohms. Never splice regular automotive type wire such as GXL, SXL or TXL into the data link cable. Use data link cable furnished by Raychem, part number 2021D0309.

The backbone is the main part of the cable. This is terminated at each end with a 120 ohm resistor. When adding a device the backbone must be extended. This is done by removing the resistor, inserting the backbone extension, then plugging the resistor and the device into the extension.

The International® high performance vehicle will always have a power train J1939 system. This is for key operations that come from the factory direct. A second J1939 system is put in place for body builders and will be referred to as body builder J1939. Circuit diagrams are shown in Chapter 9 of the Circuit Diagram Book (S08322) under Remote Power Units, Solenoid Packs, Remote Engine Speed Controller.

J1939

J1939 is a high speed serial communications data link. The system requires two resistor caps. The first resistor cap for Body Builder J1939 currently starts in the engine compartment. The second resistor cap ends where the last module is placed. The wire between these two resistors is called the backbone. The backbone cannot be longer than 131.2 feet (40m). A module can tap into the backbone. This point is called the Node. The distance between two nodes cannot be less than 3.9 inches (0.1m). The cable length from the node to the module cannot be longer than 9.8 feet (3m).

With the research of the robustness of the J1939-15 lite (unshielded) International® removed the shield from their high performance vehicle in January 2002. Mixing of the shielded (J1939-11) and unshielded (J1939-15) is not recommended.

Adding Body Builder J1939, Power and Grounds

Without any Body Builder J1939: Ask Service Parts for “the components needed to add the Body Builder J1939 datalink to the vehicle. Service part kits are available to add the datalink, RPMs and switch packs."

Most of the software information is processed in the BC. Therefore, the J1939 wires must be connected to the BC. Refer to Circuit Diagram Manual S08322, Chapter 10, Remote Power Units, Solenoid Packs, Remote Engine Speed Controller for proper circuit installation.

HIGH VOLTAGE CIRCUITS (GREATER THAN 50 VOLTS) ON INTERNATIONAL® TRUCKS AND BUSES

Only a trained technician may perform service inside high voltage components. When working around or maintaining high voltage circuits, please seek high voltage training.

WARNING: To avoid property damage, personal injury, or death; refer to the manufacturer's service information before working on any high voltage equipment. By definition, high voltage circuits and components contain voltage levels that may cause equipment damage, electrical shock, and/or electrocution if handled incorrectly.

NOTE: The intent of this section IS to provide some basic guidelines when working on or around International® vehicles that are equipped with high voltage electrical equipment and circuits. For specific instructions, maintenance, or service information on specific equipment or options, refer to the service manuals for the specified truck models and component(s). It IS NOT the intent of this section to provide detailed service instructions for high voltage equipment and circuits.

High voltage systems require the maintainer to be familiar with two types of electrical systems.

- DC (Direct Current)

Most DC systems on today's trucks use 12 volt negative GND. Some systems can store DC electricity in batteries with operating voltages as high as 600 DC volts.

- AC (Alternating Current)

The main difference between AC and DC systems is that the voltage levels in DC systems remain constant while the voltage levels in AC systems are constantly changing. When measuring an AC system, it is important to know that the average voltage is zero, and that is why ***A VOLTMETER SET TO DC WILL NOT INDICATE THE PRESENCE OF AN AC VOLTAGE WHEN CONNECTED TO AN AC CIRCUIT!***

High voltage can be lethal. Always refer to the manufacturer of the high voltage component when maintenance or repairs are needed. In most cases, diagnostics and repair are performed after the high voltage circuits are disabled. If working around or maintaining high voltage circuits, please seek high voltage training.

WARNING: To avoid property damage, personal injury, or death, circuits must be checked using a voltmeter for the presence of both DC and AC voltages. A voltmeter set to DC will not indicate the presence of an AC voltage when connected to an AC circuit! Contacting an unknown AC or DC voltage may cause equipment damage, electrical shock, and/or electrocution.

Only a trained technician may perform service inside high voltage components. If working around or maintaining high voltage circuits, please seek high voltage training.

UNDERSTANDING HIGH VOLTAGE EQUIPMENT AND CIRCUITS ON INTERNATIONAL® PRODUCTS

Some examples of high voltage equipment that can be encountered on products are as follows:

Auxiliary Power Units (APUs)

APUs are basically small diesel powered generator units that are integrated into the vehicle electrical system. APUs are utilized in combination with inverters and battery chargers. APUs are often set up to automatically start when the electrical management system deems it necessary to maintain battery charge or electrical demand requires it.

NOTE: APU high voltage wiring may NOT be marked for easy identification as high voltage.

Shore Power

Shore power is a connection from a vehicle to an external 120 volt AC power source. The vehicle is equipped with an exterior receptacle that allows connection to an external “shore” power source.

NOTE: High voltage shore power wiring may NOT be marked for easy identification as high voltage.

Inverters

Inverters are electronic devices used to change DC (Direct Current) into AC (Alternating Current). Some inverters contain converters that also convert AC to DC for battery charging or running 12V equipment.

NOTE: High voltage wiring for inverters may NOT be marked for easy identification as high voltage.

Hybrid Electric Vehicles (HEVs)

HEVs combine internal combustion engines with high voltage batteries, electric motors, and inverters to offer higher fuel efficiency and lower emissions without compromising power, range, and convenient fueling of conventional vehicles. Regardless of the HEV design, high electrical voltages and currents are present.

NOTE: The industry standard for high voltage cables is for the cables to be covered in ORANGE CONDUIT.

If orange conduit is observed on a vehicle, please review the safety precautions for that system.

HOW TO IDENTIFY HIGH VOLTAGE CIRCUITS

High voltage circuits are not always connected with large wires. The best way to identify high voltage equipment or circuits is to be familiar with the equipment and circuit diagrams as well as to look for high voltage warning labels and orange conduit. Inspect the vehicle for any equipment or circuits added after the truck was built (owner/operators may add high voltage components such as inverters or APUs).

All electrical circuits associated with APUs, shore power, inverters, and HEVs should be considered high voltage. The standard for high voltage cabling on HEVs is orange. APUs, inverters, shore power, and cabin 110/120V outlet wiring may not indicate high voltage by visual inspection (they may not be marked and are NOT orange in color).

SERVICING NAVISTAR PRODUCTS

The following steps outline the appropriate method to follow to identify and address any maintenance or service on Navistar products with factory-installed high voltage equipment.

1. Complete related training prior to attempting to identify and service any high voltage system.
2. Review the line-set ticket provided with the vehicle or from ISIS, and identify all high voltage components. Inspect the vehicle for any equipment or circuits added after the truck was built (owner/operators may add high voltage components such as inverters or APUs that could be live and powering circuits in the vehicle EVEN WITH THE IGN OFF AND THE BATTERIES DISCONNECTED).
3. Refer to manufacturer's service publications for identified high voltage components.
4. Physically locate high voltage components on the vehicle and disable them according to manufacturer's instructions (some components may require a waiting period or special procedures to discharge the voltage completely).
5. Use Best Work Practices (see below) when performing work on electrical systems.

Best Work Practices

WARNING: To avoid personal injury or death, permit only trained responsible and capable persons to operate or maintain the equipment. Carelessly operating or neglecting maintenance despite the safe design of any vehicle and its high voltage equipment may result in personal injury or death.

The danger of injury through electrical shock is possible whenever electrical power is present. Most fatal injuries result from high-voltage exposure; however, people can sustain severe injuries from low voltage power if it has a high current flow.

- Be aware of ALL high voltage equipment on the vehicle; review line-set/build ticket and the owner and service manuals of high voltage equipment BEFORE starting any work.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued, and never work alone near high voltage equipment.
- Always stand on an insulated, dry surface when working on any electrical circuit. Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet.
- Always work in an adequately illuminated area.
- Always use appropriate protective equipment: insulated gloves, rubber gloves, goggles/face shield, safety shoes, protective clothing, and insulated tools when working on electrical components/circuits of the vehicle.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock or burns and may get caught in moving components causing injury.
- When working on vehicles that have high voltage devices or equipment, use appropriate alerting techniques in plain view to warn people that may be in the general area and to prevent inadvertent activation of any disabled high voltage circuit(s) during service: safety signs, safety symbols, tags, barricades, cones, etc.
- Keep a fire extinguisher close by at all times. Extinguishers rated "ABC" by the National Fire Protection Association are appropriate for use on the electrical system. Make sure the extinguisher is properly charged

and be familiar with its use. Consult the local fire department with any question pertaining to fire extinguishers.

- Ensure that the high voltage power, high voltage power generating equipment and high voltage storage devices are disconnected, locked out, or otherwise disabled BEFORE working on or around the vehicle, its electrical circuits, or components. Unless disabled, Auxiliary Power Units (APUs) may start at any time without warning; when this occurs, the circuits associated with the APU become energized with potentially lethal high voltage. Some components may require a waiting period or special procedures to discharge the voltage completely.
- Use an appropriate electrical tester and procedures to confirm that the power is disconnected BEFORE performing any work on or near any high voltage components/circuits.
- Exercise caution around output circuits even when the input power is off. Parallel power sources and energy storage devices can still be dangerous. Be familiar with the high voltage equipment installed on the vehicle. Some systems contain high voltage condensers that may require time to discharge after power is removed.
- After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulation tape.
- After completion of any electrical work, BEFORE restoring the power, verify that parts and/or tools are removed from the work area and that the fasteners are firmly tightened to the specified torque and the connectors are correctly connected.
- Voltage can be fatal at levels greater than 60 volts. High voltage can jump a larger air gap than low voltage. If contact is made with high voltage, it may not be possible to simply “let go”.
- Towing a HEV with its drive wheels on the ground may cause the motor to generate electricity. Consult the operator’s/owner’s manual for proper towing procedures.
- If a high voltage fuse or circuit protection device trips, do not re-energize the circuit until it has been determined that the circuit is safe. See manufacturer’s troubleshooting procedures before servicing a high voltage system.
- Reference OSHA Regulations as necessary and applicable.

SUPPRESSION

International® strongly recommends these electromagnetic devices be electrically suppressed, when adding electromagnetic devices such as relays, magnetic switches, and solenoids.

Unsuppressed electromagnetic devices can generate large voltage spikes which are conducted into the vehicle electrical system. These voltage spikes may adversely affect customer added electronic devices and in some instances may affect International® installed electronic components.

When installing electromagnetic devices, specify suppressed units. If suppressed units are not available, diode suppression may be added as shown below:

The following suppressed relays and magnetic switches are available from International®.

Table 8

Suppressed Relays and Magnetic Switches	
Part Number	**Description**
1691520C91	Magnetic Switch - Continuous Duty (Suppressed) 100 AMP
1693479C91	Magnetic Switch - Intermittent Duty (Suppressed) 100 AMP
3519350C1	Micro Relay – SPDT (Suppressed), NO – 20 AMP, NC – 10 AMP

WELDING INFORMATION

Whenever electric welding is done on any part of the vehicle, it is not necessary to disconnect the International® electronic modules in the cab such as the BC, ESC or RPM, and the instrument cluster. The welder's GND must be connected as close to the weld as possible. If the vehicle is equipped with an International® engine, disconnect both the positive (+) and the negative (-) battery cables including the electronic power feeds prior to electric welding. If it is necessary to weld close to an electronic component, it is

recommended that the component be temporarily removed.

Consult manufacturer's instructions for all other electronic modules such as Allison Transmission, Eaton Auto Shift Transmission, Bendix ABS, Wabco ABS, Cummins Engine, Caterpillar Engine, and Detroit Diesel Engine.

ROUTING GUIDELINES

Any hosing, tubing, battery cable, wiring or electrical harness must not rub on a sharp edge. However, due to the high abrasion resistance of synflex tubing, it is permissible for synflex tubing to make contact with the lower edge of the frame rail flange when the tubing is making the transition from the outside to down and under the rail. This does not mean that proper clearance or the need for protective wrap is not needed when synflex line contacts sharp edges or threaded fasteners.

Any hosing, tubing, battery cable, wiring or electrical harness must not rub or make contact with a hot surface. There should be 5" minimum clearance from the exhaust depending on the situation. The further back from the turbo, the less clearance required.

Nothing should rub or make contact with the copper compressor discharge tubing other than the clamp(s) that support it.

All hosing, tubing, battery cables or electrical harnesses should be supported at least every 18" to 20".

Straplocks used to directly clamp or support battery cables or main engine wiring harnesses must be no less than 7/16" in width.

Straplocks are not to be used on any bulk hose materials (heater hoses, make-up lines, etc.).

Route and Clip Recommendations

Table 9

Heat Source	Distance From
Exhaust Manifold to Muffler Inlet	6”
Aftertreatment	8”
Muffler Inlet to Tail Pipe Out	3”
Other (EGR Discharge Pipe/Hose)	1/2”

Electrical Harness

Table 10

Problem	Requirement
Sharp or Abrading Surface	No Contact
Tension Along Harness/Wires/Hoses	None
Distance From Moving Parts	1”
Connector Clipped to Avoid Damage	Yes
Connectors Are Sealed	Yes
Max Eyelets Per Stud	3
Harness Protected From Damage	Yes
Drip Point For Harness	Yes
Distance of Harness to Flammable Fluids	1/2”
Harness Location to Flammable Fluids	Not Directly Under
Battery Cables to Flammable Fluids	1” Minimum
Battery Cable to Conductive Surface	1/2” Minimum
Battery Cable Tie Strap	1/2” (250 Pound) Wide
Harness Contact with Metal Surface	No Relative Motion
P-Clamps — Electrical	Cushioned Only
P-Clamps Fastening Support	No Cantilever
High Pressure Pipe/Hose (>200 PSI)	Don’t Clip Anything to Them
Harness Through Metal Holes	Use Grommet
Full Articulated Position	Operates Without Damage
Clipping Fixed MAX Distance — Harness	14”
Splices	Use Shrink Wrap

ELECTRICAL DO’S AND DON'TS

The information in this section applies to all DuraStar 3200, 4200, 4300, 4400, and WorkStar models.

Table 11

Item	Do	Don’t
Accessory (power taps with key in “Accessory” mode)	Connect to accessory relay output in the inside cab fuse block; circuit A12B.	Connect to key switch accessory output.
Battery - Clean (unfused) power and maxi-fused power feeds and GND connection points	Use inline Maxi-holder from Mega-fuse unfused side.	Exceed additional 45 AMPS Exceed 3 ring terminals total on Maxi-fuse stud.
GND	GND additional electrical loads (customer supplied devices) to chassis or GND studs located on the dash panel.	GND to vehicle batteries for additional loads.
GND — with ammeter	GND to frame or dash GND stud to allow for ammeter to register current.	GND directly to batteries for meter signal.
IGN (power taps with key in “IGN”)	Connect to the IGN relay output in the inside cab fuse block; circuit A13FC	Connect circuits directly to key switch IGN circuits.
Start (power taps with key in “Start”)	Connect to the starter relay input circuit A17 at the outside fuse block.	Connect circuits directly to the key switch start circuits.
BC (access to pinouts of discrete circuits)	Connect to BC outputs only.	a) Exceed BC outputs amperage refer to BC section b) Connect to signal inputs of the BC
Electric City Horn	a) Connect to circuit A85E (Dash), M85E, M85N, or M85L (Forward chassis) and M85H (Horn jumper) or b) Only use suppressed type horn assembly.	Connect to Electric City Horn circuit without a diode for protection.
Air Horn (or Air Horn Accommodation)	Connect air line to output side of the solenoid pack controlled through BC.	Connect to input side of air switch electrical circuit.
CB Radio (or CB Accommodation)	Use power connector 2303 and CB antenna connector 2306 at CB opening in overhead console with optional code 08RCB	Exceed 10 AMPS.
Radio installation for customer aftermarket radio accommodation	a) Connect to pigtail (A13B) owner/operator IGN feed b) Use a relay if load exceeds 5 AMPS.	Exceed 5 AMPS.

Item	Do	Don't
Cruise/Stationary Throttle via Remote Throttle module and via hardwire for remote hook-up	For I6 or V8 engines without optional code 12VZA - Add circuit to Pins 16, 49, 60, and 68 of Engine ECM connector 6020 depending on desired function, or add a Remote Engine Speed Control Module (RESCM). Refer to 12VZA Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with these optional codes or the RESCM.	Connect to the BC Cruise Control Input circuits.
Engine Warning for remote panel display	For I6 or V8 engines without optional code 12VZA - Add circuit to Pin 22 of Engine ECM connector 6020 depending on desired function; or add a RESCM. Refer to 12VZA Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with these optional codes. Install discrete oil pressure sensor or tap signal off the ATA or public J1939 Datalink.	Connect directly to oil pressure sensor circuit.
Vehicle Speed output with Manual Transmission for optional feature control; i.e., sand spreader	For I6 or V8 engines without optional code 12VZA - Add circuit to Pin 72 of Engine ECM connector 6020 depending on desired function; or add a RESCM. This provides 30,000 pulse/mile output for speed. Use an isolated Dual wound sensor with manual transmission. Refer to Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with 12VZA optional code.	a) Connect into the speedometer sensor circuit on the engine. b) Wire into Speed sensor circuit on transmission. Use sensors in parallel with existing output speed sensor. It will cause VSS Diagnostic Trouble Code DTC to set.
Vehicle Speed output with Automatic Transmission for optional feature control; i.e., sand spreader	For I6 or V8 engines without optional code 12VZA - Add circuit to Pin 72 of Engine ECM connector 6020 depending on desired function; or add a RESCM. This provides 30,000 pulse/mile output for speed. Use an isolated Dual wound sensor with manual transmission. Refer to Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with 12VZA optional code. This provides 30,000 pulse/mile output for speed. Refer to Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with 12VZA optional code. Allison Transmission utilizes a variable frequency pulse generated by Transmission ECU. For vehicle speed information, refer to Allison service information, Connector 7205, cavity F (provides this signal connection point)	Connect into the speedometer sensor circuit on the engine.
Tachometer Signal Output for remote panel display	For I6 or V8 engines without optional code 12VZA - Add circuit to Pin 71 of Engine ECM connector 6020 depending on desired function; or add a RESCM. This provides a 12/pulse/eng RPM. Refer to Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters for vehicles equipped with 12VZA optional code.	Connect into the tachometer sensor circuits on the engine.

GENERAL ELECTRICAL

Item	Do	Don't
Engine Coolant Temperature Gauge Output Signal for remote panel display	Install discrete Engine Coolant Temperature sensor. Refer to Component Information Diamond Logic® Controller Engine Control Features and Programmable Parameters. Refer to ATA Datalink or public J1939 support information.	Connect into Engine Coolant Temperature sensor circuits.
Alternator warning light output circuit for remote panel display	Connect wire to alternator warning light output terminal and connect the other side of the warning light circuit to IGN feed. NOTE: Available on Remy alternator only.	Connect warning light circuit to GND circuit.
Low Air warning signal for remote panel display	a) Tap into air line with additional sensor or b) Refer to public J1939 Data Link information to extract Air PSI signal..	Connect into electrical Low Air sensor circuits
Park Brake Warning Output Signal for circuit interlock features installed	a) Tap into air line with additional switch for vehicles with air brakes or b) Connect into BC connector 1601 pin F1 with a 12 volt active signal Air or Hydraulic brake vehicle	Connect into existing air park brake switch electrical circuit b) Exceed 200 ma total.
Trans Warning Output signal for remote panel display	Connect wire to ECU circuit 115 for WTC III and circuit 125 for LCT 2000/24000 transmission models. Circuit goes open to GND to actuate a remote mounted light. An external relay is required if current is .05 AMPS or greater.	a) Splice into the transmission harness for signal uses b) Utilize this signal for vehicle shutdown system.
Transmission Interface (Body Builder Connections	See the Transmission section in this manual S08323 for Body Builder connection information.	Splice into the transmission harness for signal uses.
Back Up Lights	Connect into Body Builder connectors 4450; Cavity E circuit 71, or connect into tail light harness Connector 9303. Refer to Body Builder Connections and circuit diagrams.	Exceed 6 AMPS total circuit
Clearance/Marker Lights	Connect into Body Builder connector 4450; Cavity D circuit 58, or connect into tail light harness Connector 9303. Refer to Body Builder Connections and circuit diagrams.	Exceed 20 AMPS total circuit.
Dome Light	a) Connect into BC connector 1604; Pin J for output circuit. b) Theater Dimming must be turned off in the BC.Connect into any door switch circuit.	Exceed 10 AMPS total circuit.
Fog Light	a) Connect into BC connector 1603; Pin F for the left Fog Lamp and Pin K for the right Fog Lamp output circuit. b) Fog Light accommodation must be added to the BC. c) Add Fog Light Switch.	Connect into fog light switch circuit. Exceed 10 AMPS.
Headlights (including Plow Lights without Plow Light option	Connect into Plow Light 7-way Harness connector provided with optional code 08THJ	Connect into headlight switch circuit. Exceed 20 AMPS total circuit.
Panel Lights	Connect into panel lamp Bus connector 1002 located behind the Instrument Panel (IP) left of the interior fuse panel.	Connect into panel dimmer switch circuit or Panel light adapter circuit A62N. Exceed 5 AMPS.
Stop Lights	Connect into Body Builder connector (4450 cavity B and C; circuits 56 left/57 right combined) (4460 cavity A and B; circuits 56 left /57 right separate), or connect into tail light harness connector 9303. Refer to Body Builder Connections and circuit diagrams.	Connect into the stop light switch circuit at the brake pedal. Exceed 8 AMPS total.
Tail Lights	Connect into Body Builder connector 4450; Cavity A circuits 68 or connect into tail light harness Connector 9303. Refer to Body Builder Connections and circuit diagrams.	Exceed 20 AMPS Total Circuit.

Item	Do	Don't
Turn Signals	Connect to Body Builder connector (4450 cavity B and C; circuits 56 left/57 right combined) (4460 cavity A and B; circuits 56 left/57 right separate)	Connect to the input side of the turn signal switch or the BC circuit inputs. Exceed 8 AMPS total circuit.
Work Light	a) Connect into BC connector 1603 Pin G Work Light Output circuit. b) Work lamp accommodation (595ABR) must be programmed into the BC. c) Add Work Light push button switch to instrument cluster.Exceed 10 AMPS.	Exceed 10 AMPS.
RPM Connection	Connect to Body Builder connectors at the RPM (J3-output circuits and J4- remote inputs). Refer to RPM Section.	Exceed 20 AMPS per channel output with a maximum 80 AMPS total draw per module
Remote mounted Fuel Level (Low Fuel Warning)	Install additional fuel sender. Extract fuel gauge data from the Public J1939 data link.	Connect to fuel level gauge sender circuit or short existing fuel sending unit to chassis GND.
HVAC Interrupt (A/C compressor clutch and Blower fan interrupts)	Add a secondary A/C Evaporator to cool remote areas by tapping into the refrigerant lines with the authorized hoses. Use only the standard HVAC Control for controlling the A/C system.	Connect into HVAC A/C clutch circuit between the BC and the A/C compressor clutch for purposes of controlling the A/C system. Connect to the high side of the pressure transducer or either of the A/C system thermistors.
Clutch switch	Install additional switch.	Connect into the clutch switch or circuit.
Brake Switch	Install additional switch.	Connect into the brake switch or circuit.

HOW DO I - GENERAL INFORMATION

The International® parts system is set up to give part information that is specific to a particular vehicle that has been built. This includes all optional features that were ordered. If a feature is to be added after the vehicle was built, the dealer must be provided with the vehicle VIN number, the last 8 characters, and the feature code to be added. The dealer will contact "Parts Spec" to obtain a listing of parts required for that feature.

The circuits provided for the feature will be what are referred to as "overlay circuits" and are to be layered on and taped to existing harnesses. In some cases, a total harness may be provided. The harness may include standard wiring circuits.

The body builder will have to refer to the circuit diagram book for connector cavity information. If the decision is made to build the overlay locally, part numbers of the terminals can be found in the "Connector Body Composites" section at the rear of the circuit diagram manual S08322.

All hardware associated with a specific feature code, switches, brackets, etc. will be provided. The body builder must decide which parts are to be ordered – it is not required that all parts for a code be ordered. Generally, except for a few features, there are no "kits" available, hence, detailed instructions are not provided, and this section will cover some basic direction.

If a feature is not available on a specific model, a parts list will not be provided.

Some features will require reprogramming of the Body Controller (BC). If reprogramming is required, the vehicle must be returned to the dealer.

If the body builder adds a feature, they must assume full responsibility for proper operation of that feature.

International® parts purchased from any International® Truck Dealer carry a one-year, unlimited mileage warranty. Other than the one year parts warranty, International® assumes no warranty for Body Builder installed components or the labor to repair the Body Builder added feature if it is determined that the failure is not OEM related.

GENERAL

The following section provides basic information of how to integrate TEM's electrical systems with the vehicle electrical system. This section includes feature descriptions, programming information and sales codes where applicable. Also included is a description of how the feature works and in some cases, how the feature can be used.

If the vehicle was not ordered with the desired feature, this section covers basic information on how to add a feature to the vehicle.

An index of feature codes covered in this section is included in the table below.

Before proceeding, review the Introduction information.

Table 12

Feature Code Index			
Feature Code	Description	Section Name	Section & Page #
04SBL	Optional Aux. Air Pressure Gauge - Hydraulic Chassis	Gauges	Section 17-Page 3
08518	Cigar Lighter	In Cab Battery Feed Power Source	Section 10-Page 1
08585	Auxiliary Toggle Switch for Fog or Driving Lights	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 1
08718	Power Source, Cigar Type Receptacle	In Cab Battery Feed Power Source	Section 10-Page 1
08HAA	Body Builder Wiring, End of Frame Without Connector — Separate Stop/Turn/Tail Only	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 3
08HAB	Body Builder Wiring, Back of Cab With Connector — Combined and Separate Stop/Turn/Tail	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 5
08HAE	Body Builder Wiring, End of Frame With Connector — Combined and Separate Stop/Turn/Tail	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 5
08HAG	Electric Brake Accommodation Package for Separate Stop/Turn, End of Frame	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 15
08HAH	Electric Brake Accommodation Package for Combined Stop/Turn, End of Frame	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 15
08HAT	Body Builder Wiring for ease of connecting accessory equipment	Body Builder Wiring, Through Dash, Inside Cab	Section 22-Page 2
08HAU	Body Builder Wiring for Tail/Amber, Turn/Marker/Backup/Accessory, Power/Ground and Stop/Turn	Body Builder Wiring for Stop/Tail/Turn Lights	Section 13-Page 5
08NAA	Extending Frame and Tail Light Harnesses — 8 ft.	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 11
08RBK	Dual CB Radio Antennas	CB and 2-Way Radio Accommodation Packages	Section 08-Page 1
08RCB	Header — Mounted CB Radio Accommodation Package	CB and 2-Way Radio Accommodation Packages	Section 08-Page 1
08REA	2-Way Radio Accommodation Wiring Package — 10 ft.	CB and 2-Way Radio Accommodation Packages	Section 08-Page 2
08RGA	2-Way Radio Accommodation Package — Routed to Header Console	B and 2-Way Radio Accommodation Packages	Section 08-Page 2
08SAJ	In Cab Switch Controls for Body Accessories, 2 RPM's (BOC)/12 Momentary Switches	Remote power Modules	Section 18-Page 1
08THG	Auxiliary 7–Way Trailer Socket	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 10
08THH	Auxiliary 7–Way Trailer Socket	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 10
08THJ	Auxiliary Harness for Front Plow Lights and Turn Signals — 3 ft.	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 9
08THN	Hazard Lights Override Stop Lights	Productivity Features	Section 11-Page 5
08THU	7-Way Trailer Socket with Battery Fed Circuit to Center Pin with 30 Amp Fuse and Relay Controlled by Switch	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 10
08THV	Front Harness for Guidepost Lights	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 13
08TKK	Trailer Auxiliary Feed Circuit, 30 amp Accessory feed	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 11
08TME	7–Way Trailer Socket at End of Frame — Independent of Stop Lights	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 18
08TMG	7–Way Trailer Socket at End of Frame — Combined with Stop Lights	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 18
08TMH	Switched Power to Cab Roof	Worklight and Outside Cab Power Features	Section 14-Page 6

Feature Code Index			
Feature Code	Description	Section Name	Section & Page #
08TMN	Trailer Connection Socket	Bodybuilder Wiring for Stop/Tail/Turn Lights	Section 13-Page 10
08TNP	Auxiliary Harness for Front Snow Plow Application	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 9
08VZR	In Cab Switch Controls for Body Accessories, 1 RPM (BOC)/6 Momentary Switches	Remote Power Modules	Section 18-Page 1
08VZS	In Cab Switch Controls for Body Accessories, 2 RPM's (BOC)/12 Momentary Switches	Remote Power Modules	Section 18-Page 1
08WAA	Pedestal Mounted Work Light (Truck Lite 81 Series)	Worklight and Outside Cab Power Features	Section 14-Page 1
08WAD	Battery Disconnect Switch — Battery Box-Mounted	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WCK	Power Source, 2–Post Terminal Type	In Cab Battery Feed Power Source	Section 10-Page 1
08WCM	Power Source for Power Lift Gate Feed	Liftgate Accommodation Package	Section 27-Page 1
08WCS	Battery Disconnect Switch — Cab Floor-Mounted Positive Disconnect	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WEB	Extending Frame and Tail Light Harnesses — for Drop Frame Beverage Body	Bodybuilder Wiring for Stop/Turn/Tail Lights	Section 13-Page 13
08WEE	Passenger- Controlled Air Horn — Instrument Panel-Mounted Switch	Remote Air Solenoid Module	Section 25-Page 5
08WEX	Auxiliary Harness for Auxiliary Power Source	Bodybuilder Wiring for Stop/Turn/Tail Lights	Section 13-Page 13
08WGA	One Universal Air Solenoid, N/C	Remote Air Solenoid Module	Section 25-Page 1
08WGB	Two Universal Air Solenoids, N/C	Remote Air Solenoid Module	Section 25-Page 1
08WGC	Three Universal Air Solenoids, N/C	Remote Air Solenoid Module	Section 25-Page 1
08WGD	Four Universal Air Solenoids, N/C	Remote Air Solenoid Module	Section 25-Page 1
08WGL	Windshield Wiper Speed Control Forced to Slowest Speed	Productivity Features	Section 11-Page 4
08WGP	Five Universal Air Solenoids, N/O	Remote Air Solenoid Module	Section 25-Page 1
08WGR	Six Universal Air Solenoids, N/O	Remote Air Solenoid Module	Section 25-Page 1
08WHX	Battery Disconnect Switch — Battery Box-Mounted Positive Disconnect	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WHY	Battery Disconnect Switch — Cab Floor-Mounted Positive Disconnect	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WKM	6 Universal Air Solenoids. N/C	Remote Air Solenoid Module	Section 25-Page 1
08WJA	Special 200 AMP Max. Lift Gate Power Source — 2 Gauge Power Cable	Liftgate Accommodation Package	Section 27-Page 1
08WJB	Power Source For Customer Lift Gate — 0 Gauge Power Cable	Liftgate Accommodation Package	Section 27-Page 1
08WJH	Power Source, Dual Pole Terminal for Power Lift Gate Feed	Liftgate Accommodation Package	Section 27-Page 1
08WJT	Battery Disconnect Switch (Power to PDC) {Joseph Pollak} – Lever Operated, Mounted on Battery Box	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WJU	Battery Disconnect Switch (Power to PDC) – Locking, Key Operated, Mounted on Battery Box	Battery, Ignition & Accessory Taps	Section 07-Page 5
08WJV	Battery Disconnect Switch (Power to PDC) {Joseph Pollak} – Lever Operated, Cab Mounted	Battery, Ignition & Accessory Taps	Section 07-Page 6
08WJW	Battery Disconnect Switch (Power to PDC) {Joseph Pollak} – Key Operated, Cab Mounted	Battery, Ignition & Accessory Taps	Section 07-Page 6
08WLL	Pedestal-Mounted Work Light	Worklight and Outside Cab Power Features	Section 14-Page 1
08WLM	Fog Lights (Peterson) – Amber, Rectangular – WorkStar Series	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 1
08WLN	Fog Lights (Peterson) – Clear, Rectangular – WorkStar Series	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 1
08WMA	Work Light Accommodation Package – Customer-Supplied Light or Aux. Application	Worklight and Outside Cab Power Features	Section 14-Page 1
08WPL	Fog Lights – Amber, Oval – DuraStar Series	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 1
08WPM	Fog Lights – Clear, Oval – DuraStar Series	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 1
08WPZ	Test Exterior Lamps Except Back-Ups	Productivity Features	Section 11-Page 1
08WRB	Headlights on with Wipers	Battery, Ignition & Accessory Taps	Section 07-Page 4
08WSK	In Cab Switch Controls for Body Accessories, 1 RPM (EOF)/6 Momentary Switches	Remote Power Modules	Section 18-Page 1

Feature Code Index			
Feature Code	Description	Section Name	Section & Page #
08WSM	In-Cab Switch Controls for Body Accessories, 1 RPM (BOC)/6 Momentary Switches	Remote Power Modules	Section 18-Page 1
08WTJ	In-Cab Switch Controls for Body Accessories, 1 RPM (EOF)/6 Latched Switches	Remote Power Modules	Section 18-Page 2
08WXB	Headlight Warning System	Productivity Features	Section 11-Page 6
08WXN	Worklights (2) (Grote) 60 series	Work Light and Outside Cab Power Features	Section 14-Page 1
08WZG	In-Cab Junction Stud-100A Battery Feed for Body Builders	Body Builder Integration Harness	Section 22-Page 3
08WZP	Battery Warning Indicator Light	Battery, Ignition & Accessory Taps	Section 07-Page 8
08XBK	Auxiliary 40 Amp Circuit, Switch-Controlled	Work Light and Outside Cab Power Features	Section 14-Page 5
08WXD	Park Brake Alarm	Productivity Features	Section 11-Page 3
12VXT	Remote Engine Speed Control: Stationary, Variable Speed Control	Remote Engine Speed Control Features	Section 24-Page 12
12VXU	Remote Engine Speed Control: Stationary, Pre-Set Speed Control	Remote Engine Speed Control Features	Section 24-Page 12
12VXV	Remote Engine Speed Control: Mobile, Variable Speed Control	Remote Engine Speed Control Features	Section 24-Page 13
12VXY	Remote-Mounted Engine Speed Control	Remote Engine Speed Control Features	Section 24-Page 1
12VYL	Accessory Wiring for Road Speed Wire Coiled Under Instrument Panel	Remote Engine Speed Control Features	Section 24-Page 39
12VZA	Remote-Mounted Engine Speed Control, Direct Wire — for Post 2007 International® Engines	Remote Engine Speed Control Features	Section 24-Page 1
12VZB	Engine Control, Remote Mounted for PTO with MaxxForce 11 & 13 Engines	Remote Engine Speed Control Features	Section 24-Page 1
13GSB	Eaton 6-Spd Hybrid without ePTO Capability	Hybrid Electric Vehicle	Section 30-Page 19
13GSS	6-Spd Auto Manual with Electronic Shift Controls not with ePTO capability – Beverage Tractor only	Hybrid Electric Vehicle	Section 30-Page 19
13WDH	Wiring for Transmission/PTO Controls for Allison 2000, 2100, 2200, 2400, 2500 Series	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 54
13GUE	Transmission, Manual {Eaton Fuller Eaton Hybrid EH-8E406A-UP} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, ePTO Capability, Less APG Capability	Hybrid Electric Vehicle	Section 30-Page 1
13GUG	Transmission, Manual {Eaton Fuller Eaton Hybrid EH-8E406A-UPG} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, ePTO Capability, APG Capability	Hybrid Electric Vehicle	Section 30-Page 1
13WDN	PTO Control, Dash Mounted	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 54
13WUA	Automatic Neutral Allison WT Transmission Shifts to Neutral When Park Brake is Engaged	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUB	Allison Spare Input/Output for Highway Series (HS); General Purpose Trucks	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUC	Allison Spare Input/Output for Rugged Duty Series (RDS); General Purpose Trucks, Construction	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUD	Allison Spare Input/Output for Emergency Vehicle Series (EVS); Rescue, Ambulance	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUE	Allison Spare Input/Output for Emergency Vehicle Series (EVS); Fire/Pumper, Tank, Aerial/Ladder	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUG	Allison Spare Input/Output for Truck Recreational Vehicle (TRV)	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUH	Allison Spare Input/Output for Rugged Duty Series (RDS); Airport Refueler, Sewer Evac	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUJ	Allison Spare Input/Output for Rugged Duty Series (RDS); Front Loaders, Rear Loaders, Recycling/ Packer Trucks	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUK	Allison Spare Input/Output for Rugged Duty Series (RDS); Side Loaders	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUL	Allison Spare Input/Output for Rugged Duty Series (RDS); Street Sweeper	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6
13WUM	Allison Spare Input/Output for Pupil Transportation Series (PTS)	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 6

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Feature Code	Description	Section Name	Section & Page #
13WUP	Allison Spare Input/Output for Bus Series (B)	Transmission Spare Input/Outputs and Transmission Code	Section 16-Page 6
13WUR	Allison Spare Input/Output for Dump/Construction with Two- Speed Axle or Auxiliary Transmission (RDS)	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13WUS	Allison Spare Input/Output for Rugged Duty Series (RDS); General Purpose Trucks Modified for Single Input Auto Neutral	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13WUT	Allison Spare Input/Output for Emergency Vehicle Series (EVS); without Split Shaft PTO	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13WUU	Allison Spare Input/Output for Specialty Transmission Series (SP)	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13WUV	Allison Spare Input/Output for Highway Series (HP); General Purpose Trucks Modified for Single Input Auto Neutral	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13WUZ	Allison Spare Input/Output for Emergency Vehicle Series (EVS), 127/198 includes J1939 Based Auto Neutral; Fire/Pumper, Tank, Aerial/Ladder	Transmission Spare Input/Outputs and Transmission Codes	Section 16-Page 7
13XAA	Dash-Mounted PTO Control for Customer- Provided Clutched, Air-Shifted PTO	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 54
13ZYV	HEV, Power Electronics Carrier, Back of Fuel Tank	Hybrid Electric Vehicle	Section 30-Page 1
13ZYW	HEV, Power Electronics Carrier, Back of Battery Box	Hybrid Electric Vehicle	Section 30-Page 1
13ZYX	HEV, Power Electronics Carrier, Behind PEC	Hybrid Electric Vehicle	Section 30-Page 1
16HCK	Seatbelt Warning Prewire – 1 to 3 Belts	Productivity Features	Section 11-Page 6
16HCL	Seatbelt Warning Prewire – 4 to 6 Belts	Productivity Features	Section 11-Page 6
16HGG	Optional Engine Oil Temperature Gauge	Gauges	Section 17-Page 3
16HGH	Optional Allison Transmission Oil Temperature Gauge	Gauges	Section 17-Page 4
16HGJ	Optional Manual Transmission Oil Temperature Gauge	Gauges	Section 17-Page 5
16HGL	Optional Rear Axle Oil Temperature Gauge	Gauges	Section 17-Page 6
16HGN	Optional Air Application Gauge	Gauges	Section 17-Page 8
16HHT	Optional Ammeter Gauge	Gauges	Section 17-Page 9
16HKA	Optional IP Cluster display — Omit fault codes	Gauges	Section 17-Page 11
16HKT	IP Cluster Display Diagnostics	Gauges	Section 17-Page 11
16VCN	Remote Keyless Entry w/Aux. Work Light Feature	Power Windows, Locks, Remote Keyless Entry	Section 09-Page 1
16WJU	Power Windows/Locks (2)	Power Windows, Locks, Remote Keyless Entry	Section 09-Page 1
16VCP	Keyless Entry Remote w/ Trailer Function	Power Windows, Locks, Remote Keyless Entry	Section 09-Page 1
16WJV	Power Windows/Locks (4)	Power Windows, Locks, Remote Keyless Entry	Section 09-Page 1
16WKB	Air Conditioning	Air Conditioning	Section 15-Page 1
16WKZ	Remote Keyless Entry and Use of Aux Feature	Power Windows, Locks, Remote Keyless Entry	Section 09-Page 1
16WLM	PTO Hourmeter for Customer-Supplied PTO	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 83
60AAA	Remote Power Module (1) With 6 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAB	Remote Power Modules (2) With 12 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAC	International® Diamond Logic® PowerPack 3, Battery Box Mount	PowerPack 3 Primary and Temporary Mount Features	Section 28-Page 1
60AAD	Remote Power Modules (2) With 6 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAE	International® Diamond Logic® PowerPack 3, Temp Mount	PowerPack 3 Primary and Temporary Mount Features	Section 28-Page 1
60AAG	Remote Power Module (1) With 6 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAH	Remote Power Modules (2) With 12 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAJ	Remote Power Modules (3) With 18 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAK	Remote Power Modules (2) Special With 6 Latched Switches	Remote Power Modules	Section 18-Page 2
60AAL	Remote Power Module Special	Remote Power Modules	Section 18-Page 2
60AAM	Remote Power Module (1) With No Switches	Remote Power Modules	Section 18-Page 1

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Feature Code	Description	Section Name	Section & Page #
60AAN	Remote Power Module (1) With No Switches	Remote Power Modules	Section 18-Page 2
60ABA	Cable Shift PTO Accommodation Package	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 1
60ABB	Muncie Lectra-Shift PTO Accommodation Package	PTO (Power Take OFF) and PTO Hourmeter	Section 23-Page 6
60ABC	Remote Start/Stop	Remote Start/Stop Feature	Section 26-Page 1
60ABD	Remote Start/Stop With Emergency Pump Accommodation	Remote Start/Stop Feature	Section 26-Page 3
60ABE	Electric Over Hydraulic PTO Accommodation Package	PTO (Power Take OFF)	Section 23-Page 17
60ABK	Electric Over Air (Non-Clutched) PTO Accommodation Package	PTO (Power Take OFF)	Section 23-Page 26
60ABL	Electric Over Air (Clutched) PTO Accommodation Package	PTO (Power Take OFF)	Section 23-Page 35
60ABM	I/O Expansion Harness	Body Builder Integration Harness	Section 22-Page 1
60ABN	I/O Expansion Harness	Body Builder Integration Harness	Section 22-Page 1
60ACA	Unadvertised Code for Remote Power Module with One Latched Switch	Remote Power Modules	Section 18-Page 13
60ACB	Unadvertised Code for Remote Power Module with Two Latched Switches	Remote Power Modules	Section 18-Page 13
60ACC	Unadvertised Code for Remote Power Module with Three Latched Switches	Remote Power Modules	Section 18-Page 13
60ACD	Unadvertised Code for Remote Power Module with Four Latched Switches	Remote Power Modules	Section 18-Page 13
60ACE	In Cab Switch Controls for High Current (40AMP) Body Accessories	Power Features Using Remote Power Modules	Section 20-Page 1
60ACG	In Cab Switch Control (1) With Vehicle Speed Interlock for Body Accessories	Power Features Using Remote Power Modules	Section 20-Page 2
60ACH	In Cab Switch Controls (2) With Vehicle Speed Interlock for Body Accessories	Power Features Using Remote Power Modules	Section 20-Page 7
60ACJ	Unadvertised Code for Remote Power Module with Five Latched Switches	Remote Power Modules	Section 18-Page 13
60ACK	Unadvertised Code for Remote Power Module with Six Latched Switches	Remote Power Modules	Section 18-Page 13
60ACS	In Cab/External Switch for Body Accessories (3–Way Momentary), Two Switches	Power Features using Remote Power Modules	Section 20-Page 14
60ACT	In Cab/External Switch for Body Accessories (3–Way Momentary), Two Switches	Power Features using Remote Power Modules	Section 20-Page 16
60ACU	In Cab/External Switch for Body Accessories (3–Way Momentary), Three Switches	Power Features using Remote Power Modules	Section 20-Page 19
60ACV	Unadvertised Code for Remote Power Module with an Additional Six Latched Switches	Remote Power Modules	Section 18-Page 13
60ACW	Body Integration Input/Output Expansion Harness (DLB Controlled	Body Builder Integration Harness	Section 22-Page 1
60ACX	Theft Deterrent Feature	Theft Deterrent	Section 29-Page 1
60AJA	Throttle Control Accommodation for Single Customer- Mounted External Engine Speed Control Switch – Recovery Applications	Remote Engine Speed Control Features	Section 24-Page 21
60AJC	Special Gauge Cluster Indicators and Alarms (Gate Open and Rear Alert) for Refuse Applications	Indicator Lights and Alarms	Section 21-Page 1
60AJD	Special Gauge Cluster Indicators and Alarms (Boom Not Stowed and Outriggers Not Stowed) for Utility Applications	Indicator Lights and Alarms	Section 21-Page 5
60AJE	Throttle Control Accommodation for Single Customer- Mounted External Engine Speed Control Switch – General Purpose	Remote Engine Speed Control Features	Section 24-Page 25
60AJG	Throttle Control Accommodation for Single Customer- Mounted External Engine Speed Control Switch – Utility Applications	Remote Engine Speed Control Features	Section 24-Page 29
60AJH	Remote Throttle Control for Dual Function Engine Running/Emergency Power Engine Off	Remote Engine Speed Control Features	Section 24-Page 32
60AJJ	Remote Throttle Control for Customer- mounted Momentary Switch – Refuse Applications	Remote Engine Speed Control Features	Section 24-Page 36

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Feature Code	Description	Section Name	Section & Page #
60AJK	Body Integration, Indicator Lights (Body Up and Gate Open) Plow/Dump Applications	Indicator Lights and Alarms	Section 21-Page 9
60AJL	Remote Power Module (1) With 6 Latched Switches	Remote Power Modules	Section 18-Page 2
60AJM	Remote Power Module (2) With 12 Latched Switches	Remote Power Modules	Section 18-Page 3
60AJN	International® Diamond Logic® PowerPack 3, Battery Box Mount	PowerPack 3 Primary and Temporary Mount Features	Section 28-Page 16
60AJR	Dash Indicator Light – Red (1)	Indicator Lights and Alarms	Section 21-Page 12
60AJS	Dash Indicator Light – Red (2)	Indicator Lights and Alarms	Section 21-Page 12
60AJT	Dash Indicator Light – Red (3)	Indicator Lights and Alarms	Section 21-Page 12
60AJU	Dash Indicator Light – Red (6)	Indicator Lights and Alarms	Section 21-Page 12
60AJV	Dash Indicator Light – Green (1)	Indicator Lights and Alarms	Section 21-Page 12
60AJW	Dash Indicator Light – Green (2)	Indicator Lights and Alarms	Section 21-Page 12
60AJX	Dash Indicator Light – Green (3)	Indicator Lights and Alarms	Section 21-Page 12
60AJY	Dash Indicator Light – Green (6)	Indicator Lights and Alarms	Section 21-Page 13
60AJZ	Dash Indicator Light – Yellow (1)	Indicator Lights and Alarms	Section 21-Page 12
60AKA	Dash Indicator Light – Yellow (2)	Indicator Lights and Alarms	Section 21-Page 12
60AKB	Dash Indicator Light – Yellow (3)	Indicator Lights and Alarms	Section 21-Page 12
60AKC	Dash Indicator Light – Yellow (6)	Indicator Lights and Alarms	Section 21-Page 12
60AKD	Auxiliary Power Generator – Hybrid Mounted Inside Rail, Back of Cab	PowerPack 3 Primary and Temporary Mount Features	Section 28-Page 15
60AKE	Auxiliary Power Generator – Hybrid Mounted Left Side Outside Rail, Back of Cab	PowerPack 3 Primary and Temporary Mount Features	Section 28-Page 15
60AKG	PTO Control, Engine Compartment (LS)	PTO (Power Take Off) and PTO Hourmeter	Section 23-Page 44
60AKK	Bdy INTG, Headlight Wig Wag, Park Brake Disables Wig Wag	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 14
60AKL	Bdy INTG, Headlight Wig Wag, Park Brake Disables High Beam, Enables Low Beam	Fog, Plow and Guide Post Accommodation Packages	Section 12-Page 14
595AKY	Dome Light Features	Electrical Functionality without associated feature codes	Section 31-Page 1
595ANR	Park Brake Applied Connection	Electrical Functionality without associated feature codes	Section 31-Page 2
595ABC	Brake Applied Connection	Electrical Functionality without associated feature codes	Section 13-Page 3

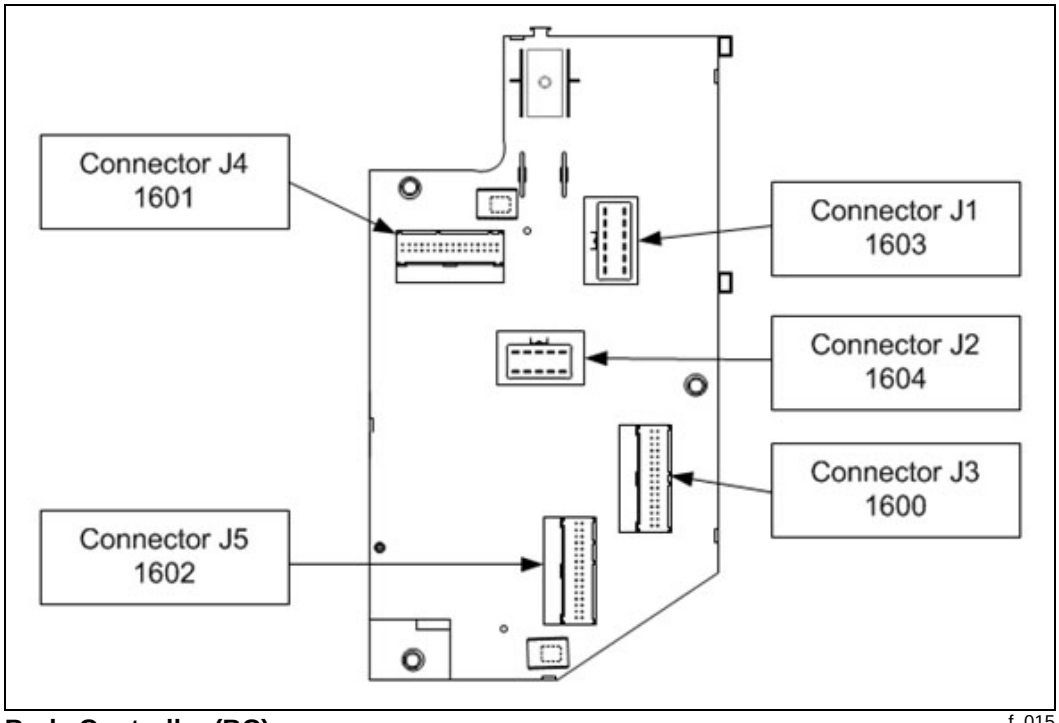
BODY CONTROLLER

3200, DURASTAR, WORKSTAR MODELS

At the center of the Diamond Logic® Electrical System is the Body Controller (BC). The BC is an electronic module that provides multiple analog and switched input/output interfaces to monitor vehicle sensors and control vehicle functions through solid state switches, relay driver outputs, and serial data communications. Serial datalinks connected to the BC include the following:

- A drivetrain J1939 datalink to communicate information between the engine, transmission, Antilock Brake System (ABS), the BC, and the Instrument Panel (IP)
- A switch datalink for communicating switch status between the rocker switch assemblies (in the IP and the switches in the door pods) and the BC
- A Body Builder datalink to interface optional input/output modules with the BC

The BC is located under the IP behind a kick plate to the left of the driver's left foot. All connections are now located inside the cab with the exception of the power connection that passes through the dash panel to the engine compartment. The BC provides a standard interface signals for the park brake set signal. This interface signal is described at the end of this section. The BC receives battery power from the maxi-fuse block and Ignition (IGN) power from the IP harness.

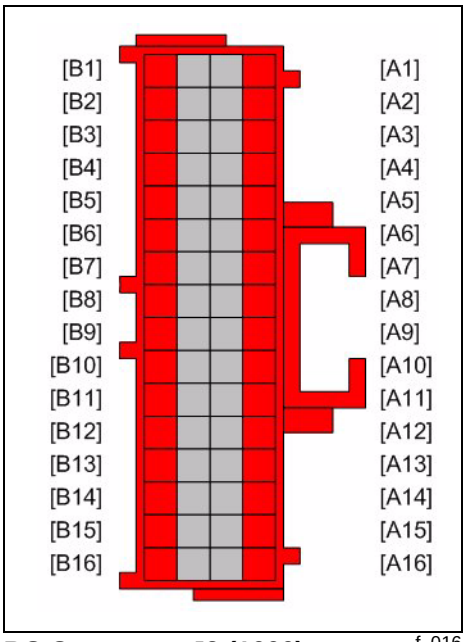


Body Controller (BC) f_015

NOTE: Pins E3, E5, and E7 of the BC 32-way connector (1602) are the Zero Volt References (ZVR) for various sensors on the vehicle and should NEVER have battery voltage applied to them. Doing so will permanently damage the BC. Do not connect other Ground (GND) signals to the ZVR.

NOTE: All connectors are viewed as looking at the terminal side of the connector.

BC CONNECTOR J3 (1600)



f_016

BC Connector J3 (1600)

Table 13

#1600 In-Cab		Air Chassis		Hydraulic Full Power Chassis	
32-Way Connector		Pin Description		Pin Description	
Pin	Type	Automatic Transmission	Manual Transmission	Automatic Transmission	Manual Transmission
A1	*Input (Gnd Active)*	*Accessory Switch Input*	*Accessory Switch Input*	*Accessory Switch Input*	*Accessory Switch Input*
A2	*Input (Gnd Active)*	*AC Request*	*AC Request*	*AC Request*	*AC Request*
A3	*Input (Gnd Active)*	*AC Diagnostics*	*AC Diagnostics*	*AC Diagnostics*	*AC Diagnostics*
A4	*Input (Gnd Active)*	*Headlight Dimmer Switch (Highbeam Switch)*	*Headlight Dimmer Switch (Highbeam Switch)*	*Headlight Dimmer Switch (Highbeam Switch)*	*Headlight Dimmer Switch (Highbeam Switch)*
A5	*Input (Gnd Active)*	*Electric Horn Switch Input*	*Electric Horn Switch Input*	*Electric Horn Switch Input*	*Electric Horn Switch Input*
A6	*Input (Gnd Active)*	*Right Turn Signal Switch Input*	*Right Turn Signal Switch Input*	*Right Turn Signal Switch Input*	*Right Turn Signal Switch Input*
A7	*Input (Gnd Active)*	*Left Turn Signal Switch Input*	*Left Turn Signal Switch Input*	*Left Turn Signal Switch Input*	*Left Turn Signal Switch Input*
A8	*Input (Gnd Active)*	*Washer Fluid Low Switch*	*Washer Fluid Low Switch*	*Washer Fluid Low Switch*	*Washer Fluid Low Switch*
A9	*Input (Gnd Active)*	*Wiper Switch 0*	*Wiper Switch 0*	*Wiper Switch 0*	*Wiper Switch 0*
A10	*Input (Gnd Active)*	*Wiper Switch 1*	*Wiper Switch 1*	*Wiper Switch 1*	*Wiper Switch 1*
A11	*Input (Gnd Active)*	*Wiper Switch 2*	*Wiper Switch 2*	*Wiper Switch 2*	*Wiper Switch 2*
A12	*Input (Gnd Active)*	*Air Park Brake Switch*	*Air Park Brake Switch*	*Manual Park Brake Switch*	*Manual Park Brake Switch*
A13	*Input (Gnd Active)*	*Door Switch Input*	*Door Switch Input*	*Door Switch Input*	*Door Switch Input*
A14	*Input (Gnd Active)*	*Flash-to- Pass Switch Input*	*Flash-to- Pass Switch Input*	*Flash-to- Pass Switch Input*	*Flash-to- Pass Switch Input*
A15	*Input (Gnd Active)*	*Washer Pump*	*Washer Pump*	*Washer Pump*	*Washer Pump*
A16	*Input (Gnd Active)*	*IGN Switch InputI*	*IGN Switch InputI*	*IGN Switch InputI*	*IGN Switch InputI*
B1	Input (Gnd Active)	Open	Open	Open	Open
B2	*Input (Gnd Active)*	*Primary Air Pressure*	*Primary Air Pressure*	*Auxiliary Air Pressure*	*Auxiliary Air Pressure*
*B3**	*Input (Gnd Active)*	*Secondary Air Pressure*	*Secondary Air Pressure*	*Open*	*Open*
B4	*Input (Gnd Active)*	*Open*	*Clutch Switch*	*Open*	*Clutch Switch*

BODY CONTROLLER

#1600 In-Cab		Air Chassis		Hydraulic Full Power Chassis	
32-Way Connector		Pin Description		Pin Description	
Pin	Type	Automatic Transmission	Manual Transmission	Automatic Transmission	Manual Transmission
B5	***Input (Gnd Active)***	***AC Accumulator Inlet Sensor***	***AC Accumulator Inlet Sensor***	***AC Accumulator Inlet Sensor***	***AC Accumulator Inlet Sensor***
B6	Input (Gnd Active	MD: Open SS: Engine Oil Temp (Cat engine only)	MD: Open SS: Engine Oil Temp (Cat engine only)	Open	Open
B7	***Input (Gnd Active)***	***PTO State Input***	***Transmission Oil Temperature Sensor (Manual) OR PTO State Input***	***PTO State Input***	***Transmission Oil Temperature Sensor (Manual) OR PTO State Input***
B8	***Input (Gnd Active)***	***Fuel Level Sensor Input — Right Side***	***Fuel Level Sensor Input — Right Side***	***Fuel Level Sensor Input — Right Side***	***Fuel Level Sensor Input — Right Side***
B9	***Input (Gnd Active)***	***Fuel Level Sensor Input — Left Side***	***Fuel Level Sensor Input — Left Side***	***Fuel Level Sensor Input — Left Side***	***Fuel Level Sensor Input — Left Side***
B10	***Input (Gnd Active)***	***FR(Front) Axle Oil Temp***	***FR(Front) Axle Oil Temp***	***FR(Front) Axle Oil Temp***	***FR(Front) Axle Oil Temp***
B11	***Input (Gnd Active)***	***RR(Rear) Axle Oil Temp***	***RR(Rear) Axle Oil Temp***	***RR(Rear) Axle Oil Temp***	***RR(Rear) Axle Oil Temp***
B12	***Input (Gnd Active)***	***AC Pressure Transducer Signal***	***AC Pressure Transducer Signal***	***AC Pressure Transducer Signal***	***AC Pressure Transducer Signal***
B13	***Input (Gnd Active)***	***AC Accumulator Outlet Sensor***	***AC Accumulator Outlet Sensor***	***AC Accumulator Outlet Sensor***	***AC Accumulator Outlet Sensor***
B14	***Input (Gnd Active)***	***Brake Application Pressure***	***Brake Application Pressure***	***Open***	***Open***
B15	Input (Gnd Active)	Open	Open	Open	Open
B16	***Input (Gnd Active)***	***Steering Wheel Cruise Switches Input***	***Steering Wheel Cruise Switches Input***	***Steering Wheel Cruise Switches Input***	***Steering Wheel Cruise Switches Input***

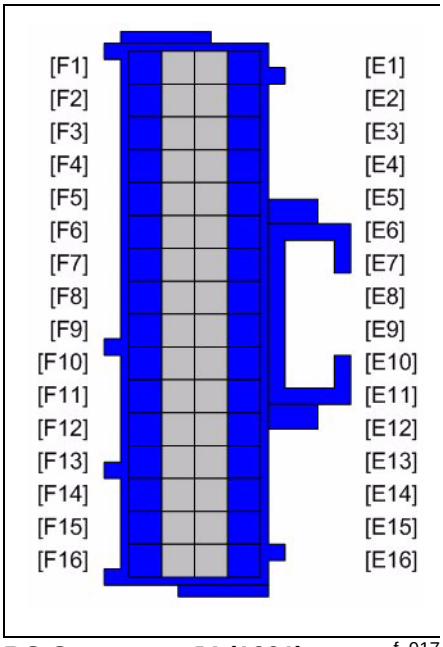
The circuit attached to pin B3 should NOT have additional connections or splices added on an air chassis.

NOTE: All outputs will handle up to a 500 milliAmpere load unless stated otherwise.

NOTE: Circuits labeled “Gnd Active", “12v Active", or “5v Active” are open circuit until active.

No connections or splices are allowable on any signals that are highlighted in bold italic.

BC CONNECTOR J4 (1601)



BC Connector J4 (1601) f_017

Table 14

#1601 In-Cab 32-Way Connector		Air Chassis Pin Description		Hydraulic Full Power Chassis Pin Description	
Pin	**Type**	**Automatic Transmission**	**Manual Transmission**	**Automatic Transmission**	**Manual Transmission**
E1	Output (Low Side Driver)	TEM Pump Inhibit Relay OR TEM Aux Relay Driver 2	TEM Pump Inhibit Relay OR TEM Aux Relay Driver 2	TEM Pump Inhibit Relay OR TEM Aux Relay Driver 2	TEM Pump Inhibit Relay OR TEM Aux Relay Driver 2
E2	Output (Low Side Driver)	TEM Engine Stop Relay OR TEM Aux Relay Driver 1	TEM Engine Stop Relay OR TEM Aux Relay Driver 1	TEM Engine Stop Relay OR TEM Aux Relay Driver 1	TEM Engine Stop Relay OR TEM Aux Relay Driver 1
E3	Output (Low Side Driver)	Auto Neutral Relay OR LCT Column Shifter IGN Relay OR Advanced Logic Relay Driver #3	Open OR Advanced Logic Relay Driver #3	Auto Neutral Relay OR LCT Column Shifter IGN Relay OR Advanced Logic Relay Driver #3	Open OR Advanced Logic Relay Driver #3
E4	Output (Low Side Driver)	MD: Theft Deterrent OR Advanced Logic Relay Driver #4 SS: Theft Deterrent OR Advanced Logic Relay Driver #4	MD: Theft Deterrent OR Advanced Logic Relay Driver #4 SS: Theft Deterrent OR Advanced Logic Relay Driver #4	Theft Deterrent OR Advanced Logic Relay Driver #4	Theft Deterrent OR Advanced Logic Relay Driver #4
E5	Output (Low Side Driver)	40 Amp Aux Circuit OR Stop Relay (Brake Pedal)	40 Amp Aux Circuit OR Stop Relay (Brake Pedal)	40 Amp Aux Circuit OR Stop Relay (Brake Pedal)	40 Amp Aux Circuit OR Stop Relay (Brake Pedal)
E6	***Output (Low Side Driver)***	***Windshield Wiper High/Low Speed***	***Windshield Wiper High/Low Speed***	***Windshield Wiper High/Low Speed***	***Windshield Wiper High/Low Speed***
E7	***Output (Low Side Driver)***	***Windshield Wiper Power (On/Off)***	***Windshield Wiper Power (On/Off)***	***Windshield Wiper Power (On/Off)***	***Windshield Wiper Power (On/Off)***
E8	Output (Low Side Driver)	MD: LCT Shifter — PB position unlock solenoid SS: LCT Shifter— PB position unlock solenoid OR Odometer Shut-off Relay	MD: Open SS: Odometer Shut-off Relay	MD: LCT Shifter — PB position unlock solenoid SS: LCT Shifter— PB position unlock solenoid OR Odometer Shut-off Relay	Open
E9	Output (High Side Driver)	Air Solenoid #7/Relay Driver #7	Air Solenoid #7/Relay Driver #7	Air Solenoid #7/Relay Driver #7	Air Solenoid #7/Relay Driver #7

BODY CONTROLLER

#1601 In-Cab		Air Chassis		Hydraulic Full Power Chassis	
32-Way Connector		Pin Description		Pin Description	
Pin	Type	Automatic Transmission	Manual Transmission	Automatic Transmission	Manual Transmission
E10	Output (High Side Driver)	Trailer Tail Lights (Tractor or Body Builder Lighting)/ Air Solenoid #13/Relay Driver #13	Trailer Tail Lights (Tractor or Body Builder Lighting)/ Air Solenoid #13/Relay Driver #13	Body Builder Tail Lights/ Air Solenoid #13/Relay Driver #13	Body Builder Tail Lights/ Air Solenoid #13/Relay Driver #13
E11	Output (High Side Driver)	Trailer Auxiliary Circuit OR TEM PTO Engagement Relay (Lectra-Shift)	Trailer Auxiliary Circuit OR TEM PTO Engagement Relay (Lectra-Shift)	TEM PTO Engagement Relay (Lectra-Shift)	TEM PTO Engagement Relay (Lectra-Shift)
E12	Output (High Side Driver)	Air Solenoid #3/Relay Driver #3	Air Solenoid #3/Relay Driver #3	Air Solenoid #3/Relay Driver #3	Air Solenoid #3/Relay Driver #3
E13	Output (High Side Driver)	Air Solenoid #5/Relay Driver #5	Air Solenoid #5/Relay Driver #5	Air Solenoid #5/Relay Driver #5	Air Solenoid #5/Relay Driver #5
E14	Output (High Side Driver)	Right Plow Lights Relay	Right Plow Lights Relay	Right Plow Lights Relay	Right Plow Lights Relay
E15	Output (High Side Driver)	Trailer Right Turn Signal (Tractor or Body Builder Lighting)/Air Solenoid #14 (Truck)/Relay Driver #14	Trailer Right Turn Signal (Tractor or Body Builder Lighting)/Air Solenoid #14 (Truck)/Relay Driver #14	Body Builder Right Turn Signal/Air Solenoid #14/ Relay Driver #14	Body Builder Right Turn Signal/Air Solenoid #14/ Relay Driver #14
F1	Output (High Side Driver)	Park Brake Relay	Park Brake Relay	Park Brake Relay	Park Brake Relay
F2	Output (High Side Driver)	Air Solenoid #11/Relay Driver #11	Air Solenoid #11/Relay Driver #11	Air Solenoid #11/Relay Driver #11	Air Solenoid #11/Relay Driver #11
F3	Output (High Side Driver)	Air Solenoid #12/Relay Driver #12	Air Solenoid #12/Relay Driver #12	Air Solenoid #12/Relay Driver #12	Air Solenoid #12/Relay Driver #12
F4	Output (High Side Driver)	Air Solenoid #6/Relay Driver #6	Air Solenoid #6/Relay Driver #6	Air Solenoid #6/Relay Driver #6	Air Solenoid #6/Relay Driver #6
F5	Output (High Side Driver)	Air Solenoid #8/Relay Driver #8	Air Solenoid #8/Relay Driver #8	Air Solenoid #8/Relay Driver #8	Air Solenoid #8/Relay Driver #8
F6	Output (High Side Driver)	Air Solenoid #9/Relay Driver #9	Air Solenoid #9/Relay Driver #9	Air Solenoid #9/Relay Driver #9	Air Solenoid #9/Relay Driver #9
F7	Output (High Side Driver)	Air Solenoid #10/Relay Driver #10	Air Solenoid #10/Relay Driver #10	Air Solenoid #10/Relay Driver #10	Air Solenoid #10/Relay Driver #10
F8	Output (High Side Driver)	Air Solenoid #4/Relay Driver #4	Air Solenoid #4/Relay Driver #4	Air Solenoid #4/Relay Driver #4	Air Solenoid #4/Relay Driver #4
F9	Output (High Side Driver)	Left Plow Lights Relay	Left Plow Lights Relay	Left Plow Lights Relay	Left Plow Lights Relay
F10	Output (High Side Driver)	Air Solenoid #2/Relay Driver #2	Air Solenoid #2/Relay Driver #2	Air Solenoid #2/Relay Driver #2	Air Solenoid #2/Relay Driver #2
F11	Output (High Side Driver)	Fuel Pump Transfer	Fuel Pump Transfer	Fuel Pump Transfer	Fuel Pump Transfer
F12	Output (High Side Driver)	Particulate Trap Indicator	Particulate Trap Indicator	Particulate Trap Indicator	Particulate Trap Indicator
F13	Output (High Side Driver)	Trailer Left Turn Signal (Tractor or Body Builder Lighting)/Air Solenoid #16 (Truck)/Relay Driver #16	Trailer Left Turn Signal (Tractor or Body Builder Lighting)/Air Solenoid #16 (Truck)/Relay Driver #16	Body Builder Left Turn Signal/Air Solenoid #16/ Relay Driver #16	Body Builder Left Turn Signal/Air Solenoid #16/ Relay Driver #16
F14	Output (High Side Driver)	Trailer Marker Lights (Tractor or Body Builder Lighting)/Air Solenoid #15 (Truck)/Relay Driver #15	Trailer Marker Lights (Tractor or Body Builder Lighting)/Air Solenoid #15 (Truck)/Relay Driver #15	Body Builder Marker Lights/Air Solenoid #15/ Relay Driver #15	Body Builder Marker Lights/Air Solenoid #15/ Relay Driver #15
F15	Output (High Side Driver)	Trailer or Body Builder Stop Lights	Trailer or Body Builder Stop Lights	Trailer or Body Builder Stop Lights	Trailer or Body Builder Stop Lights
F16	Output (High Side Driver)	Exhaust System High Temperature Indicator	Exhaust System High Temperature Indicator	Exhaust System High Temperature Indicator	Exhaust System High Temperature Indicator

NOTE: All outputs will handle up to a 500 mAmp load unless stated otherwise.

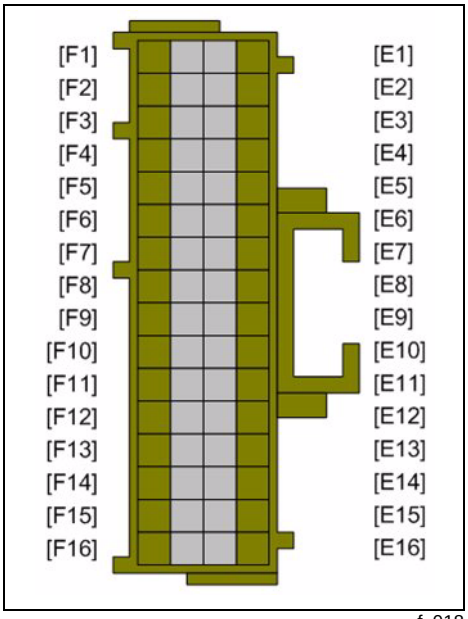
NOTE: Circuits labeled “Gnd Active", “12v Active", or “5v Active” are open circuit until active.

NOTE: For Air Solenoid/Relay Driver wiring see the Air Solenoid section of this manual or consult the applicable circuit diagram manual.

No connections or splices are allowable on any signals that are highlighted in bold italic.

*Ampere

BC CONNECTOR J5 (1602)



BC Connector J5 (1602) f_018

Table 15

#1602 In-Cab 32-Way Connector		Air Chassis Pin Description		Hydraulic Full Power Chassis Pin Description	
Pin	**Type**	**Automatic Transmission**	**Manual Transmission**	**Automatic Transmission**	**Manual Transmission**
Pin	**Type**	**Automatic Transmission**	**Manual Transmission**	**Automatic Transmission**	**Manual Transmission**
E1	Input/Output	Switch Datalink –	Switch Datalink –	Switch Datalink –	Switch Datalink –
E2	Input/Output	Switch Datalink +	Switch Datalink +	Switch Datalink +	Switch Datalink +
E3	***Reference***	***ZVR (1)***	***ZVR (1)***	***ZVR (1)***	***ZVR (1)***
E4	***Output***	***+5V Output (A)***	***+5V Output (A)***	***+5V Output (A)***	***+5V Output (A)***
E5	***Reference***	***ZVR (2)***	***ZVR (2)***	***ZVR (2)***	***ZVR (2)***
E6	***Output***	***+5V Output (B)***	***+5V Output (B)***	***+5V Output (B)***	***+5V Output (B)***
E7	***Reference***	***ZVR (3)***	***ZVR (3)***	***ZVR (3)***	***ZVR (3)***
E8	***Output***	***+5V Output (C)***	***+5V Output (C)***	***+5V Output (C)***	***+5V Output (C)***
E9	Input (Gnd Active)	N/A	N/A	N/A	N/A
E10	Input (Gnd Active)	Open	Open	Open	Open
E11	***Input (Gnd Active)***	***Headlight Enable***	***Headlight Enable***	***Headlight Enable***	***Headlight Enable***
E12	Input/Output	Air Horn Solenoid/Air Solenoid #1/Relay Driver #1	Air Horn Solenoid/Air Solenoid #1/Relay Driver #1	Air Horn Solenoid/Air Solenoid #1/Relay Driver #1	Air Horn Solenoid/Air Solenoid #1/Relay Driver #1
E13	Input/Output	N/A	N/A	N/A	N/A
E14	***Input (Gnd Active)***	***Brake Switch Input***	***Brake Switch Input***	***Brake Switch Input***	***Brake Switch Input***
E15	***Input (Gnd Active)***	***Brake Switch Input***	***Brake Switch Input***	***Brake Switch Input***	***Brake Switch Input***
E16*	***GND***	***AC Coupled GND***	***AC Coupled GND***	***AC Coupled GND***	***AC Coupled GND***
F1	Input (Gnd Active)	J1939 Shield Datalink	J1939 Shield Datalink	J1939 Shield Datalink	J1939 Shield Datalink
F2	Input/Output	J1939– Datalink	J1939– Datalink	J1939– Datalink	J1939– Datalink
F3	Input/Output	J1939+ Datalink	J1939+ Datalink	J1939+ Datalink	J1939+ Datalink
F4	Input (Gnd Active)	J1939 Shield Datalink	J1939 Shield Datalink	J1939 Shield Datalink	J1939 Shield Datalink
F5	Input/Output	J1939– Datalink	J1939– Datalink	J1939– Datalink	J1939– Datalink
F6	Input/Output	J1939+ Datalink	J1939+ Datalink	J1939+ Datalink	J1939+ Datalink

BODY CONTROLLER

#1602 In-Cab 32-Way Connector		Air Chassis Pin Description		Hydraulic Full Power Chassis Pin Description	
Pin	**Type**	**Automatic Transmission**	**Manual Transmission**	**Automatic Transmission**	**Manual Transmission**
F7		N/A	N/A	N/A	N/A
F8	Input (Gnd Active)	Air Horn Switch Input	Air Horn Switch Input	Air Horn Switch Input	Air Horn Switch Input
F9	***Input (Gnd Active)***	***Seat Belt Alarm Input***	***Seat Belt Alarm Input***	***Seat Belt Alarm Input***	***Seat Belt Alarm Input***
F10	Input (Gnd Active)	Backup Light State OR Electric Trailer Brake Controller Input	Backup Light State OR Electric Trailer Brake Controller Input	Backup Light State OR Electric Trailer Brake Controller Input	Backup Light State OR Electric Trailer Brake Controller Input
F11	Input (Gnd Active)	MD: Hood Switch Input for HEV	Two Speed Axle Switch Input	Open	Two Speed Axle Switch Input
F12	Input (Gnd Active)	TEM Aux Input 2	TEM Aux Input 2	TEM Aux Input 2	TEM Aux Input 2
F13	***Input (Gnd Active)***	***MD: N/A SS: Variable Speed Engine Fan***	***MD: N/A SS: Variable Speed Engine Fan***	***MD: N/A SS: Variable Speed Engine Fan***	***MD: N/A SS: Variable Speed Engine Fan***
F14	Input (Gnd Active)	TEM Aux Input 1	TEM Aux Input 1	TEM Aux Input 1	TEM Aux Input 1
F15	Input (Gnd Active)	TEM Remote Start/Stop Switch Input	TEM Remote Start/Stop Switch Input	TEM Remote Start/Stop Switch Input	TEM Remote Start/Stop Switch Input
F16	Input (Gnd Active)	MD: SAAR Input SS: Single Speed T-Case Motion Sensor	SS: Single Speed T-Case Motion Sensor	MD: SAAR Input	MD: SAAR Input

The circuit attached to pin E16 should NOT have additional connections or splices added on a hydraulic chassis.

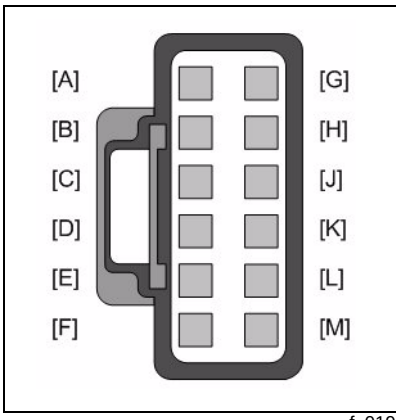
NOTE: All outputs will handle up to a 500 mAmp load unless stated otherwise.

NOTE: Circuits labeled “Gnd Active", “12v Active", or “5v Active” are open circuit until active.

NOTE: For Air Solenoid/Relay Driver wiring see the Air Solenoid section of this manual or consult the applicable circuit diagram manual.

No connections or splices are allowable on any signals that are highlighted in bold italic.

BC CONNECTOR J1 (1603)



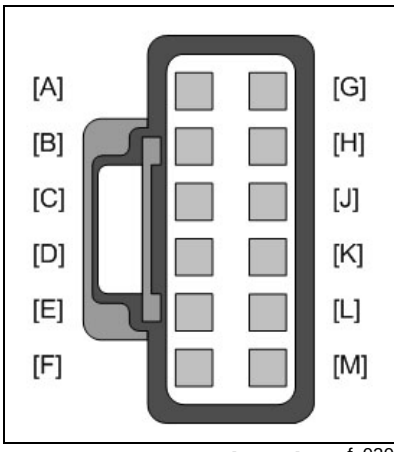
BC Connector J1 (1603) f_019

Table 16

#1603 In-Cab 12-Way Connector		
Pin	**Type**	**Signal Description**
A	10 AMP FET*	Right Front Turn Signal
B	10 AMP FET	Left Front Turn Signal
C	10 AMP FET	AC Compressor
D	10 AMP FET	Left Rear Turn Signal
E	12 AMP FET	Electric Horn
F	10 AMP FET	Left Fog Lamp
G	10 AMP FET	Work Light
H	10 AMP FET	Left Heated Mirror
J	10 AMP FET	Lift Gate
K	10 AMP FET	Right Fog Lamp
L	10 AMP FET	Right Heated Mirror
M	10 AMP FET	Right Rear Turn Signal

*Field Effect Transistor

BC CONNECTOR J2 (1604)



BC Connector J1 (1603) f_020

Table 17

#1604 In-Cab 10-Way Connector		
Pin	**Type**	**Signal Description**
A	20 AMP FET	Windshield Wiper Power
B	10 AMP FET	Headlamp, Low Beam — Left
C	10 AMP FET	Headlamp, High Beam — Left
D		N/A
E	10 AMP FET	Cab GND
F	10 AMP FET	Park, Marker, Clearance, ID Lamp #2
G	10 AMP FET	Park, Marker, Clearance, ID Lamp #1
H	10 AMP FET	Headlamp, Low Beam — Right
J	10 AMP FET	Cab Dome Lamp Circuit
K	10 AMP FET	Headlamp, High Beam — Right

*Field Effect Transistor

BODY CONTROLLER

BATTERY, IGNITION & ACCESSORY TAPS

STANDARD BATTERY AND IGNITION TAPS

FEATURE CODE DESCRIPTION

None

See radio and power source connections and fused battery connection sections for additional information.

Battery, Ignition (IGN) and accessory taps allow the customer to obtain battery IGN and accessory power from various locations on the vehicle to operate various Body Builder or after-market accessories such as lights, motors, heaters, cell phones, computers, etc.

NOTE: When adding any circuit, be sure to protect the circuit being added. See the General Electric section for circuit protection information.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

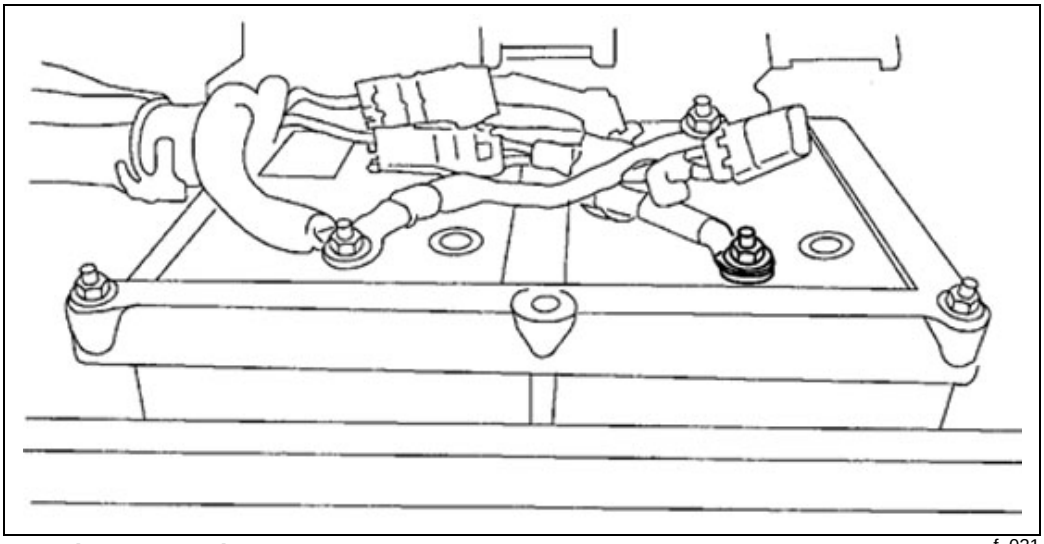
WIRING INFORMATION

Battery Connections

Location 1: Exterior battery tap in battery box.

Attach to battery post using ring terminals. Circuits should not be connected to the battery if vehicle is equipped with sealed battery terminals.

NOTE: Do not use starter stud for battery power, as extra terminals may cause nut to loosen.



f_021

Location 1: Exterior Battery Tap In Battery Box

Location 2: Exterior battery tap driver's side engine compartment mega-fuse assembly

Location 2: Exterior Battery tap Driver's side Engine Compartment f_022

Table 18 – Battery Feed Connection Points

Circuit Number	Max. Current (Amperes)	Terminal Size	Nut Torque	Special Instructions	Description	Location
—	20	5/16	12 Nm/9 lbf-ft	—	Mega-Fuse Stud, Fused Side*	Outside Dash Panel, Driver's Side
—	—	3/8	15 Nm/11 lbf-ft	**	Positive Battery Terminal*	Battery Box

* Additional "in-line" fuse of appropriate size must be added for circuit being added. Fuse should be located close to power source.

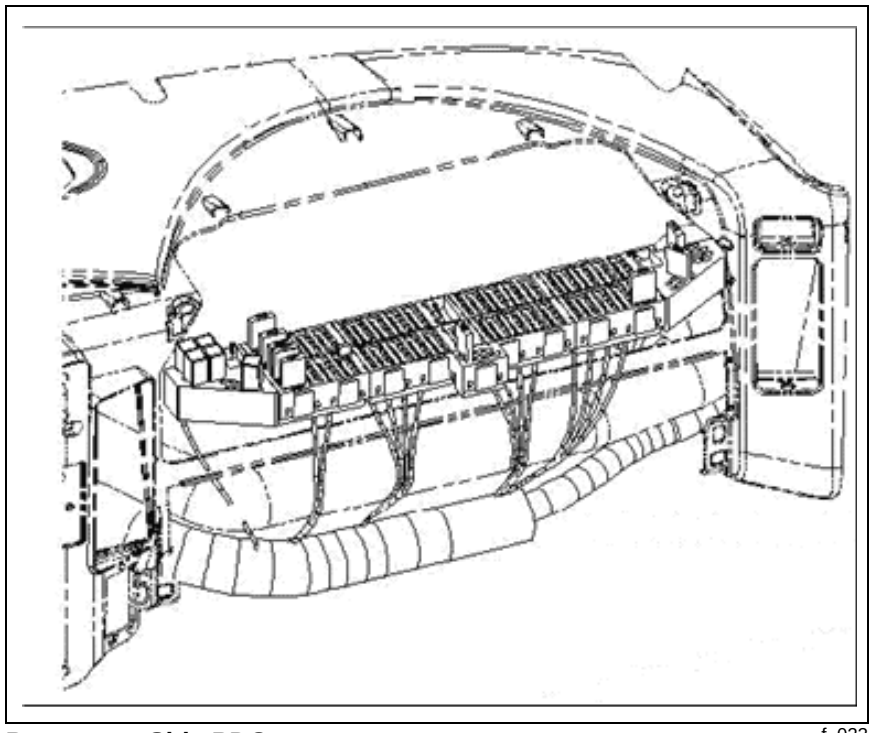
Special Instructions

**Circuits should not be connected to the battery if vehicle is equipped with sealed battery terminals.

NOTE: Do not use starter stud for battery power, as extra terminals may cause nut to loosen.

CONNECTING TO IGN SYSTEM

Location 1: Located by inside fuse panel.



Passenger Side PDC f_023

Table 19

Circuit Number	Color	Max. Current (Amps)	Special Instructions	Description	Location
A14G	Red	15	A	Pigtail at fuse block	Inside Cab, Passenger Side
A13B	Pink	5	B	Pigtail protected by 5 AMP fuse	Inside Cab, Passenger Side

Special Instructions

a. Circuit A14G circuit protected by a 15 AMP fuse in fuse block. A relay is required if the battery load exceeds 15 AMPS.

b. Circuit A13B circuit protected by a 5 AMP fuse in fuse block. A relay is required if the battery load exceeds 5 AMPS.

On most vehicles, there are unused IGN bussed fuse locations in the PDC. These can be used for low current IGN loads provided that the total IGN load in the PDC does not exceed the 40A rating for the ISO cube IGN relay. For relay and fuse descriptions, see the product graphic located on the inside of the PDC cover.

Fuse terminal part numbers

18 gauge – 3515517C1

16 gauge – 3573312C1

14 gauge – 3573312C1

12 gauge – 3573311C1

TESTING

- For Battery taps, test to see that battery voltage is present at all times.
- For Accessory taps, test to see that battery voltage is present when the IGN key is in “Accessory” or “IGN” key states
- For IGN taps, test to see that battery voltage is present when the IGN key is in “IGN” key state.

HEADLIGHTS ON W/WIPERS

08WRB

HEADLIGHTS ON W/WIPERS Headlights Will Automatically Turn on if Windshield Wipers are turned on. There are two functions, Lights On With Wipers (LOWW) and Day Time Running Lights (DTRL), available with this sales code.

Function (LOWW): The Lights On With Wipers (LOWW) function turns on the low beam headlights (tail, marker & clearance lights are also turned on with low beam headlights) whenever the windshield wipers are ON steady or intermittent. The headlights will not be enabled in washer mode. When the wipers are turned OFF, headlights will remain ON until the key is turned OFF or the headlight switch is cycled from OFF to ON to OFF.

Function (DTRL): The Day Time Running Lights (DTRL) function will turn on low beam headlights at 75% of normal brightness whenever the key is in the RUN position and the Park Brake is OFF.

Both features may be enabled or disabled by using Diamond Logic® Builder programming software.

NOTE: DTRL is required by law for Canadian registered vehicles and the feature must not be disabled.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature codes: 595ALB

- Software feature codes that must be removed: NONE
- The Lights_on_with_Wipers parameters activates the Lights On With Wipers function when the On/Off box is checked. If it is not checked the function is deactivated.
- The DTRL_Enabled parameter activates the daytime running lights function when the On/Off box is checked. If it is not checked the function is deactivated.

Table 20

Parameter	ID	Description	Default	Units	Min	Max	Step
Lights_on_with_Wipers	317	Activate/Deactivate headlights on with wipers. A value of 1 enables and a value of 0 disables this feature.	Off	On/Off	N/A	N/A	N/A
DTRL_Enabled	188	Activate/deactivate daytime running lights. A value of 1 enables and a value of 0 disables this feature.	On	On/Off	N/A	N/A	N/A

NOTE: The DTRL_Enable parameter is accessible only to Dealers.

WIRING INFORMATION

None

TESTING

1. If LOWW is wanted to be activated on the vehicle, check the parameter box for Lights_on_with_Wipers and program the Body Controller.
2. Turn on the wipers (Steady or Intermittent) and verify that the low beam headlights, tail, marker and/or clearance lights are turned on.
3. Turn off the wipers and verify that the above lights are OFF.

HOW TO ADD THIS FEATURE

- For 08WRB, the software feature code 595ALB must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see local dealer if software is not owned).

BATTERY DISCONNECT SWITCH

08WAD

BATTERY DISCONNECT SWITCH {Joseph Pollak} Lever Operated

08WCS

BATTERY DISCONNECT SWITCH {Joseph Pollak 51-315} Positive Type, Lever Operated, Mounted on Cab Floor

08WHX

BATTERY DISCONNECT SWITCH {Joseph Pollak 51-316} Locking, Key Operated, Positive Type, Mounted on Battery Box

08WHY

BATTERY DISCONNECT SWITCH {Joseph Pollak 51-316} Positive Type, Locking, Key Operated, Mounted on Cab Floor

08WJT

BATTERY DISCONNECT SWITCH {Joseph Pollak} Lever Operated, Disconnect Power to PDC, Does Not Disconnect Charging Circuits, Mounted on Battery Box

08WJU

BATTERY DISCONNECT SWITCH {Joseph Pollak} Locking, Key Operated, Disconnects Power to PDC, Does Not Disconnect Charging Circuits, Mounted on Battery Box

08WJV

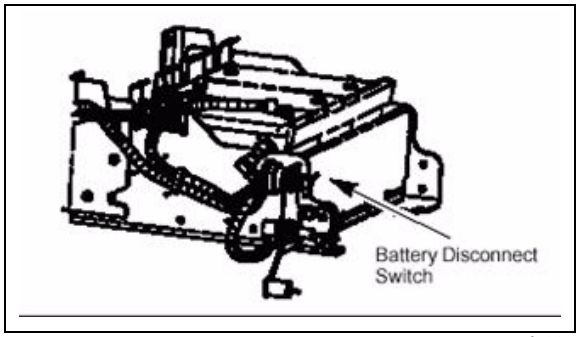
BATTERY DISCONNECT SWITCH (Joseph Pollak) for Cab Power Disconnect Switch; Cab Mounted, Lever Operated, Disconnects Power to PDC, Does Not Disconnect Charging Circuits

08WJW

BATTERY DISCONNECT SWITCH {Joseph Pollak} Key Operated, Disconnects Power to PDC, Does Not Disconnect Charging Circuits, Cab Mounted

The disconnect switch is used to shut down the entire battery-fed electrical system. When a vehicle is not going to be used for several days or longer, this switch will shut off the system so that the electrical components on the vehicle, if left on, do not drain the batteries of their charge. Customers have the choice between a key or lever operated battery disconnect switch.

NOTE: The disconnect switch should never be used to shut off the engine as there is a possibility of the alternator generating a high positive voltage spike which may result in electrical damage.



Battery Disconnect Switch (08WAD) f_024

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

No additional wiring is necessary if the vehicle is ordered from International® with the sales feature codes listed above.

TESTING

1. Close switch.
2. Verify that the vehicle is providing 12-14 Volts to the starter motor.
3. Verify vehicle will start.
4. Turn engine off.
5. Open disconnect switch.
6. Verify vehicle systems do not have any electrical power.

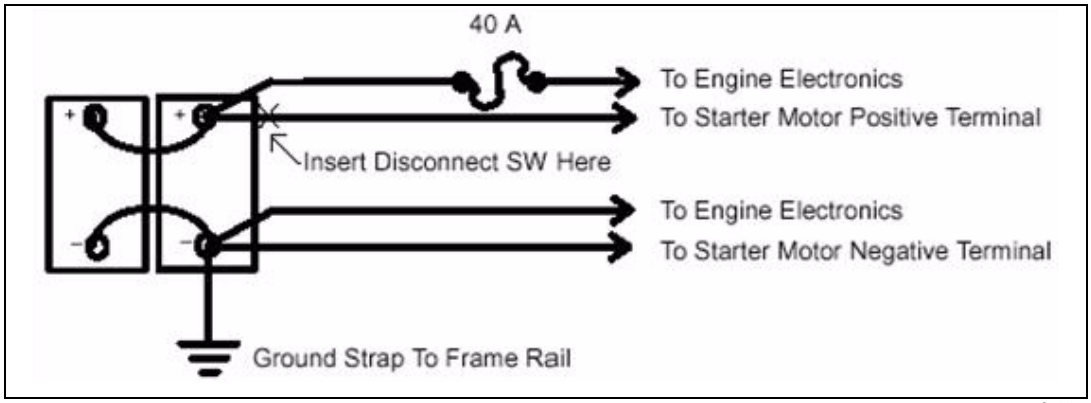
HOW TO ADD THIS FEATURE

The disconnect switch cannot be put into the battery Ground (GND) cable as was previously done. The electronic modules will provide a GND path around the master disconnect switch if this is tried. The engine and transmission modules must always be connected to the batteries, even when the master disconnect switch is open. Separate power and GND circuits are provided on each vehicle to the engine and transmission electronics. To install a master disconnect switch, splice into the positive battery cable, or use OEM cables, going from the batteries to the cranking motor and insert disconnect switch into that circuit (NOT 08WJT, 08WJU, 08WJV or 08WJW), as shown in Figure f_025. For 08WJT, 08WJU, 08WJV and 08WJW, the battery disconnect switch must be inserted in the positive cable after the starter motor and all battery power leads from

the starter motor positive terminal must be re-routed to the load side of the master disconnect switch. Ensure that adequate electrical insulation is used between the positive battery cable, the switch mounting, and the surrounding area. Place boots or covers over the disconnect switch studs to protect the batteries and cables from accidental shorting. Do not disturb the direct connections from the battery to the engine or transmission electronics. To reduce corrosion, dielectric grease should cover eyelets and studs.

CAUTION: Make sure that batteries are disconnected prior to performing any electrical work.

If a non-OEM switch is to be used, make sure it is designed to handle at least 1,000 AMPS (intermittent duty)



f_025

Installation Circuit for Battery Disconnect Switch (not 08WJT, 08WJU, 08WJV or 08WJW)

NOTE: If there is more than one positive cable, eyelet terminals will have to be stacked on the switch stud. Some installations may not have GND strap to rail – if none exists, there is no need to add one.

BATTERY WARNING INDICATOR

08WZP

BATTERY WARNING Green Indicator Mounted on Left Side of Instrument Panel above left side switch panel.

May be used with factory code 08WAD, 08WCS, 08WHX, 08WHY, 08WJT, 08WJU, 08WJV or 08WJW (battery disconnect switch for cab power) or with a customer supplied disconnect.

The indicator will illuminate any time the battery disconnect switch is turned on regardless of key position.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

HOW TO ADD THIS FEATURE

Green “Battery On” indicator light and associated wiring to the battery disconnect switch.

f_026

Green “Battery On” Indicator Light

CB & 2-WAY RADIO ACCOMMODATION

CB & 2-WAY RADIO ACCOMMODATION PACKAGES

CB RADIOS

Refer to the Circuit Diagram Manual S08322, Chapter 4, Cab Accessories, CB Power Radio.

08RCB

CB RADIO Accommodation Package; Header Mounted; Feeds From Accessory Side of Ignition (IGN) Switch; Includes Power Source and Two Antenna Bases with Wiring

- When installing a CB radio, this feature provides the power circuits required for hook-up. This accommodation package includes a two-way connector with 10 Ampere (AMP) accessory power feed and cab Ground (GND), dual CB antenna cables routed from the mirrors to the cab overhead console panel opening, and two CB antenna mounts located at the top of each mirror. A strap is also provided in the header to mount the customer-supplied CB radio. The CB antennas are not provided with this code. If the two antennas are desired, an additional feature code 08RBK must be ordered.

08RBK

CB ANTENNA (2) {Pana-Pacific} Full Wave; 4.0' Length Includes "International®" Name on Top

- Provides two 4' long CB antennas.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

Locations for connecting to the vehicle IGN and cab GND have been provided. The table below lists the connection point along with information about that point. For a complete diagram of the IGN system and for connector and terminal part numbers, see vehicle circuit diagram manual.

Table 20

Feature Codes	Max. Current (Amps)	Power Feed	Description
08RCB	10	Accessory	CB Radio Accommodation Package (Includes 2 Antenna Bases and Cable)

The mating connector for the CB connector is 1661196C1 and terminal 1661209C1 (16 gauge).

TESTING

To test these circuits, refer to the above chart and verify that battery voltage is present in the correct key-state for each respective feature.

HOW DO I ADD THESE FEATURES?

If the vehicle was ordered without one of the desired features, they can be installed in the field. Refer to the section "How Do I" General Information section of this electrical guide for information on obtaining required parts. The same parts that are used in the OEM installation are available (cables, components, etc.). Also, refer to the circuit diagram that applies to the vehicle to aid in the installation.

CB & 2-WAY RADIO ACCOMMODATION

2-WAY RADIOS

Refer to the Circuit Diagram Manual S08322, Chapter 4, Cab Accessories, 2-Way Radio.

08REA

2-WAY RADIO Wiring Effects; Wiring With 20 AMP Fuse Protection, Includes IGN Wire With 5 AMP Fuse, Wire Ends Heat Shrink and 10’ Coil Taped to Base Harness

- Feature code 08REA provides a fused 20 AMP battery feed power wire, GND wire and fused 5 AMP IGN feed for applications requiring two–way radio communications such as local municipal government units or state DOT highway maintenance vehicles. The three wires are taped to the main cab harness.

08RGA

2-WAY RADIO Wiring Effects; Wiring With 20 AMP Fuse Protection, Includes IGN Wire with 5 AMP Fuse, Wire Ends Heat Shrink and Routed to Center of Header Console in Cab

- Feature code 08RGA provides a fused 20 AMP battery feed power wire, GND wire and fused 5 AMP IGN feed for applications requiring two–way radio communications such as local municipal government units or state DOT highway maintenance vehicles. The three wires are located in the center of the header console in the cab.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

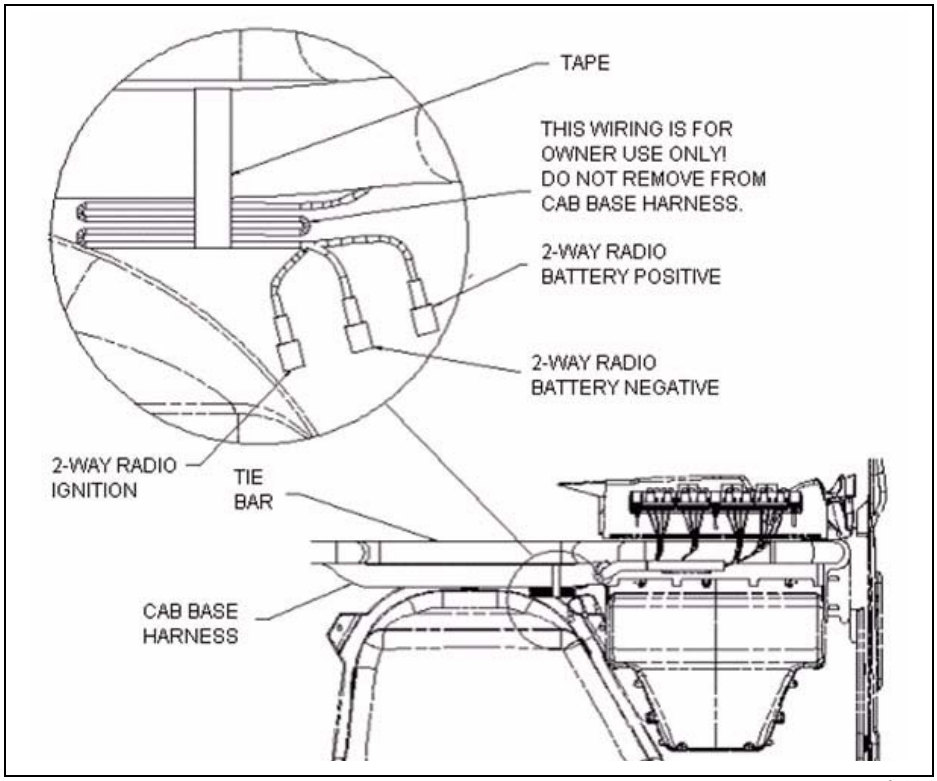
WIRING INFORMATION

Locations for connecting to the vehicle IGN have been provided. The table below lists the connection point along with information about that point. For a complete diagram of the IGN system and for connector and terminal part numbers, see vehicle circuit diagram manual.

Table 21

Feature Code	Max. Current (AMPS)	Power Feed	Description
08REA	20	Battery	Power feed to two-way radio
	5	IGN	IGN feed to two-way radio
08RGA	20	Battery	Power feed to two-way radio
	5	IGN	Ignition feed to two-way radio

CB & 2-WAY RADIO ACCOMMODATION



f_027

08REA and 08RGA provide radio power and GND directly from the battery to minimize electrical noise on the line.

The cable is coiled up under the Instrument Panel (IP) as shown above in 08REA, and is of sufficient length to route to the back of the Travelcrew cab.

The wiring is located in the center of the header console in the cab for 08RGA.

TESTING

To test these circuits, refer to the applicable circuit diagram for the feature and verify that battery voltage is present in the correct key-state for each respective feature.

HOW TO ADD THESE FEATURES

If the vehicle was ordered without one of the desired features, it can be installed in the field. Refer to the “How Do I” General Information section of this electrical guide for information on obtaining required parts. The same parts that are used in the OEM installation are available (cables, components, etc.). Also, refer to the circuit diagram that applies to the vehicle to aid in the installation.

CB & 2-WAY RADIO ACCOMMODATION

POWER WINDOWS, LOCKS, REMOTE KEYLESS ENTRY

POWER WINDOWS, LOCKS, REMOTE KEYLESS ENTRY

KEYLESS ENTRY SYSTEM REMOTE/WINDOW, POWER

Refer to the Circuit Diagram Manual S08322, Chapter 4, (Page 4 & 5) Cab Accessories, Front Door Windows and Locks (Power), or For Crew for crew cab vehicles.

16WKZ

KEYLESS ENTRY SYSTEM REMOTE With Panic and Auxiliary Buttons, Includes One Key Fob (Transmitter)

16VCN

KEYLESS ENTRY SYSTEM REMOTE With Panic and Auxiliary Work Light Function, Includes One Key Fob (Transmitter)

16VCP

KEYLESS ENTRY REMOTE W/ TRAILER FUNCTION

16WJU

WINDOW, POWER (2) and Power Locks, Left and Right Doors

16WJV

WINDOW, POWER (4) and Power Door Locks, Front and Rear Doors, Left and Right

16WSS

WINDOW, POWER and Power Lock, Left Side Only

Driver and passenger power windows and door locks are available. The driver switches are located on the driver door trim and can control all door windows and locks. The passenger switches are located on the passenger door trim and can control the passenger door window and all locks. Window express down is available for all window switches by momentarily depressing the window down switch. The driver can “lockout” all non-driver controllable window switches by momentarily depressing the lower left switch on the driver door control.

REQUIRED SOFTWARE FEATURE CODE FOR SALES CODE:

16VCN: 595ABZ & 595ABT

16WJU: 595ABY

16WJV: 595AEJ

16WKZ, 16VCP: 595ABZ

16WSS: 595ALE

POWER WINDOWS, LOCKS, REMOTE KEYLESS ENTRY

Driver's Side Door Pod f_028

Passenger's Side Door Pod f_029

The International® Keyless Entry System uses electronic door pods in the driver and passenger side doors which also operate the power door locks and the power windows. If equipped with Remote Keyless Entry (optional code), the memory in the receiver (front passenger door pod) learns the transmitter codes from the key fobs (transmitters) and only recognizes those which it has learned in the programming process. Each vehicle's passenger side door pod has the ability to learn up to six transmitter codes allowing the vehicle to be accessed by six different key fobs. Each key fob has a unique code which can be learned by any number of RKE equipped vehicles.

The key fob controls the following functions:

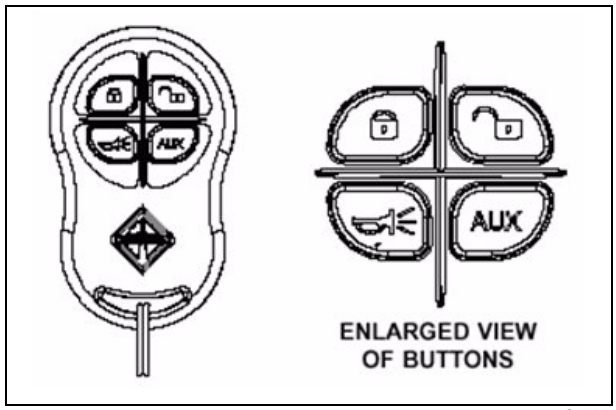
- Chirp of the horn and doors lock if the lock button is pressed on the key fob.
- Autolock function, which automatically locks the doors at a vehicle speed of 15 MPH see details below.
- Panic function, button with horn symbol, which chirps the horn on/off in unison with the headlights and park lights for three minutes when the panic button on the key fob is pressed and the ignition (IGN) switch is off. If the button is pressed prior to the time out period, the lights, etc. will go off

- Pressing the “AUX” button will toggle the work light circuit on. Pressing the button will turn the work light off. Vehicle must be ordered with work light or work light accommodation package.

With the IGN on, if wheel-based vehicle speed is above the auto lock speed, the park brake was released below the auto lock speed and is still released, and the doors were closed below the auto lock speed and are still closed, all doors will lock.

The auto lock feature will only lock the doors once regardless of the number of times the truck stops and starts. Cycling the key and/or opening the door, while below the auto lock speed, will allow the auto lock feature to lock the doors again when the speed conditions are met.

NOTE: Horn chirp, auto lock are programmable parameters.



Keyless Entry Controller f_030

Transmitter Learning and Erasing

Before the transmitter can be used for the first time, it has to be "learned" by the receiver. Up to 6 transmitters with different identification codes can be learned by a single RKE Pod.

These procedures are designed for manual learning/erasing operations on a complete vehicle. They can be used for learning replacement transmitters, for using up to six transmitters for accessing the same vehicle, or for accessing any number of vehicles using the same transmitter. If RKE is being added to the vehicle, additional programming of the Body Controller (BC) is required to operate the horn, panic, and dome light functions with RKE.

Procedure for Erasing All Learned Transmitters

1. Cycle the IGN from Off to On.

NOTE: Step 2 must be initiated (all four buttons pressed) within 10 seconds of this IGN event.

2. On the driver door pod, do the following:

While holding down the driver window-up, driver window-down, and unlock switches, depress and hold the lock switch. All four switches must be held for at least 5 seconds. Six or seven seconds is recommended. After the 5 seconds, the door pod RKE unit will erase all learned transmitters and the RKE will be disabled. At this point, the erase procedure is finished and a new IGN cycle must be initiated to perform any transmitter learning.

Procedure for Learning a Transmitter

NOTE: This learning procedure cannot be performed during the same IGN cycle as the "erase all learned transmitters" procedure. If necessary, the erase procedure should be completed before this procedure is started.

1. Cycle the IGN from Off to On (leaving the IGN on will not work, it must be cycled). Step 2 must be initiated (all four buttons pressed) within 10 seconds of this IGN event.
2. On the passenger door pod, do the following:

   While holding down the window-up, window-down, and unlock switches, depress and hold the lock switch. All four switches must be held for at least 5 seconds. Six or seven seconds is recommended.
3. After the 5 seconds, the Door Pod RKE unit will enter "Learn Mode" and stay there for 10 seconds (or until a transmitter is learned). Once the RKE enters the "Learn Mode", the four buttons can be released. During the ten second "Learn Mode" any function on the new fob/transmitter must be keyed at least twice (See NOTE 1).

NOTE: After the transmitter is learned, the next keying of the new transmitter will perform the indicated function. It is recommended that the transmitter be successively keyed until the selected key's function is actually performed; i.e., pressing the lock button on the transmitter two times should learn its code; on the third push, it should lock the door and momentarily beep the city horn. This is a good way to quickly confirm the success of the learning.

NOTE: Steps 1 through 5 of the learning process must be repeated for each transmitter to be learned.

PARTS INFORMATION

Replacement key fobs/transmitters can be obtained from Service Parts by ordering part number 3544938C2.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code for sales code 16VCN or 16WKZ: 595ABZ

Turning the Panic_Enable parameter ON enables the Panic Mode feature of the keyless remote. The panic function chirps the horn on/off in unison with the headlights and park lights for three minutes when the panic button on the key fob is pressed and the IGN switch is off. If the button is pressed prior to the time out period, the lights and horn will go off.

Turning the Chirp_Enable parameter ON enables the Chirp feature for the keyless remote. The chirp feature results in a “chirping” sound when the truck is locked and unlocked.

Table 22

Parameter	ID	Description	Default	Units	Min	Max	Step
Panic_ Enable	644	Enable/disable the Panic Mode for the Keyless Remote. A value of 1 enables and a value of 0 disables the feature.	On	No_Units	N/A	N/A	N/A
Chirp_ Enable	647	Enable/disable the remote lock "chirp" for Keyless Remote. A value of 1 enables and a value of 0 disables the feature.	On	No_Units	N/A	N/A	N/A

The AutoLock_Speed parameter sets the vehicle speed at which the vehicle doors will lock automatically.

Table 23

Parameter	ID	Description	Default	Units	Min	Max	Step
AutoLock_ Speed	652	uto lock speed. The speed at which the vehicle doors will lock automatically (requires power locks); Setting this parameter to zero will disable auto door locks.	15	mph	0	155	1

WIRING INFORMATION

When using the “Aux” feature, the work light circuit can be used for other features other than a work light - see “Work Light Feature for additional information.

If truck was built with power locks but not the keyless entry, see “How Do I Add Work Light Feature.”

With the Diamond Logic® Builder software, one other system can be activated. For example, the Aux button could turn on headlights or hazard lamps, not both.

HOW TO ADD THIS FEATURE

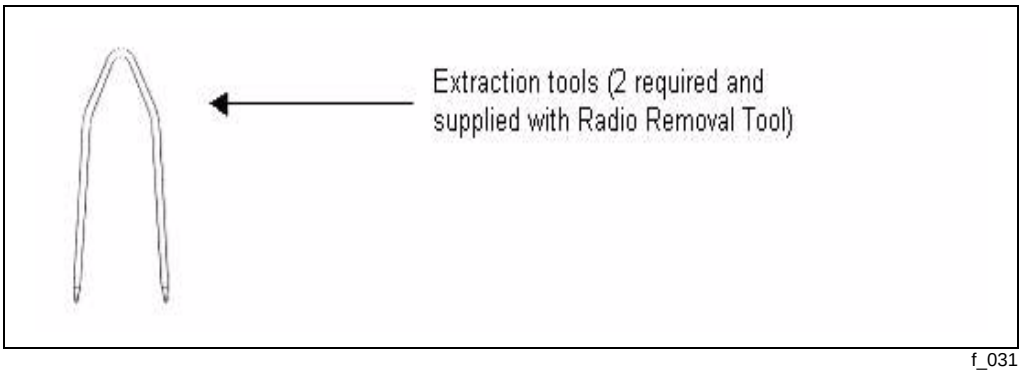
The Remote Keyless Entry (RKE) feature can be added if power windows/power locks (16WJU/16WJV/16WSS) are already installed on the vehicle by replacing the standard front passenger side door pod with an RKE compatible door pod.

- Software feature code 595ABZ must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).

- Remove the existing passenger side door pod and replace it with the RKE compatible pod, part number 3544937C6 as described below. The desired quantity of remote key fobs, part number 3544938C2, must also be ordered.
- Set the applicable programmable parameters, chirp enable, panic enable - see above, using the Diamond Logic® Builder software (see local dealer if not owned). The auto lock with vehicle speed option should already be set since power locks are installed.
- As noted above, additional wiring may be required if the Aux button on the key fob will be utilized for turning on a work light or other functions.
- Program the RKE receiver to recognize the desired key fobs as described above.

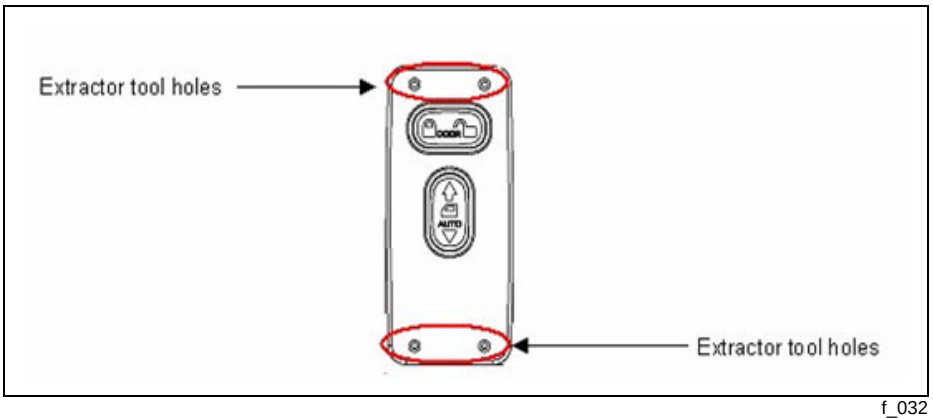
REMOVAL/REPLACEMENT OF PASSENGER SIDE DOOR POD

To remove the door pod use the DIN Radio Removal Tool part number 2504954C1.



f_031

Insert the extraction tools (2) into the two holes on either side of the pod housing until the locking tabs are fully depressed. The pod can then be removed from the door panel and the extraction tools removed.



f_032

To install the new replacement pod, connect the appropriate connectors and push the pod in until the locking tabs are fully engaged.

FUSED BATTERY CONNECTIONS INSIDE CAB

FUSED BATTERY CONNECTIONS INSIDE CAB

FUSED BATTERY CONNECTIONS INSIDE CAB

08518

CIGAR LIGHTER

- Provides cigar lighter.

08718

POWER SOURCE Cigar Type Receptacle without Plug and Cord

- This option provides a power source for customers who wish to use CB radios, hand held spotlights or trouble lights, or other accessories that plug into the power socket receptacle for 12-Volt power.

08WCK

POWER SOURCE, TERMINAL TYPE 2-Post

- Customers often desire the ability to power 12-volt accessories with the truck's electrical system. This option provides a power source for items equipped to receive power from post-type terminals.

Refer to the Circuit Diagram Manual S08322, Chapter 4, Cab Accessories, Cigar Lighter and Power Feeds.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

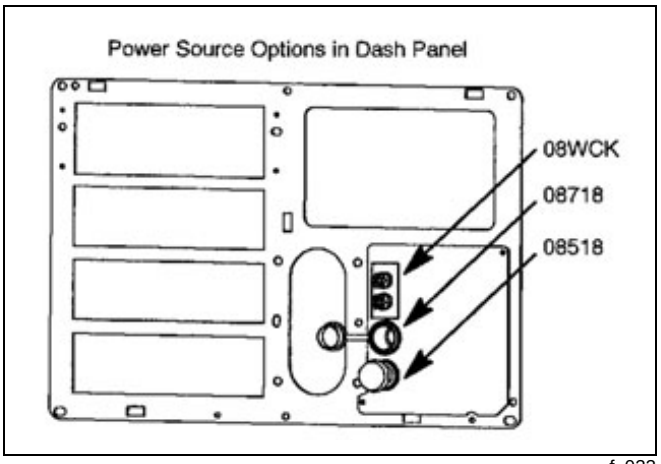
None

Locations for connecting to the vehicle Ignition (IGN) have been provided. The table below lists the connection point along with information about that point. For a complete diagram of the IGN system and for connector and terminal part numbers, see vehicle circuit diagram manual.

Table 24 – Vehicle Ignition Connections.

Feature Code	Max. Current (Amperes)	Power Feed	Description
08WCK	20	Battery	Power Source, Two Post-Type
08718	20	Battery	Power Source (Cigar-Type Receptacle)
08518	15	Battery	Cigar Lighter (provides customer with a 15 AMP battery supply)

FUSED BATTERY CONNECTIONS INSIDE CAB



Power Source Connections f_033

TESTING

To test these circuits, refer to the applicable circuit diagram for the feature and verify that battery voltage is present in the correct key-state for each respective feature.

HOW TO ADD THESE FEATURES

If the vehicle was ordered without one of the desired features, it can be installed in the field. Refer to the “How Do I” General Information section of this electrical guide for information on obtaining required parts. The same parts that are used in the OEM installation are available (cables, components, etc.). Also, refer to the circuit diagram that applies

PRODUCTIVITY FEATURES

TEST EXTERIOR LAMPS EXCEPT BACK UPS

08WPZ

Test Exterior Lights Pre-Trip Inspection will cycle all exterior lamps except back-up lights.

Exterior light test feature allows easier verification of light illumination during walk-around checks. Exterior lights shall illuminate in a fashion that allows the operator to verify the illumination of exterior lights. Feature 595AZY comes with push button “LMPv” (Lamp Check) to activate the lamp test. If this sales code is not ordered, the feature 595AES may be added for functionality without the push button.

For feature 595AZY, to enable the external lamp check sequence:

- Turn the key to IGN or ACCESSORY
- All exterior lights are off
- All of the external lights inputs, park light switch, service brake switch, cruise switch and key state have a good status
- Set the park brake
- Push the ELC button in the cluster

To disable the external lamp check sequence, the operator must:

- Press the service brake OR
- Manually turn on any of the external lights OR
- Turn the key to the off or crank position OR
- Release the park brake.

NOTE: A bad status on any of the external light inputs, park light switch, service brake switch or key state will also terminate the lamp check sequence.

For feature 595AES, to enable the external lamp check sequence:

- Turn the key to IGN or ACCESSORY
- All exterior lights are off
- All of the external lights inputs, park light switch, service brake switch, cruise switch and key state have a good status
- Set the park brake
- Simultaneously press the cruise on and cruise resume switches

THEN

- Press and release the brake pedal.

To disable the external lamp check sequence, the operator must:

- Press the service brake OR
- Manually turn on any of the external lights OR
- Turn the key to the off or crank position OR
- Release the park brake.

NOTE: (Note: A bad status on any of the external light inputs, park light switch, service brake switch or key state will also terminate the lamp check sequence)

The backup lamp cannot be included within this test since the ESC does not control this lamp's functionality.

The lamp test repeatedly flashes all the lights on in the following sequence. This allows the operator to get outside the vehicle and verify that all the lights are working properly.

The following sequence is repeated with no delay between the steps; the programmable time parameter (PP) shall have a default value of two seconds, a minimum of one second, and a maximum of 10 seconds, with increments of one second. This parameter is set at FLEET access.

Table 25

Sequence Number	Lights Requested On	Time In This Sequence
0	High Beam on Plow (if plow is installed)	PP
1	High Beams and Park Lights on	PP
2	Fog Lamps (if installed) and Park Lights on	PP
	If fog lamps not installed, skip sequence one	PP
3	Low Beam on Plow (if plow installed)	PP
4	Low Beam and Park Lights on	PP
5	Right Front and Rear Turn Light and Park Lights on	PP
6	Left Front and rear Turn Light and park Brake Lights on	PP
7	All Lights Off	PP
8	Brake Lights	PP
9	All Lights Off	PP

Push Button Switch Located Below the Instrument Cluster (595AZY) f_034

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code: 595AZY or 595AES

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

Table 26

Parameter Name	Parameter ID#	Parameter Description	Default Settings	Units	Minimum Value	Maximum Value	STEP
Ext_Lamp_ Test_ Seq_Time	2230	The time between each step of the exterior lamp check	2	5	1	10	1

WIRING INFORMATION

None required.

TESTING

Refer to the FEATURES/BODY FUNCTION section.

HOW TO ADD THIS FEATURE

1. Enable the software feature code using the Diamond Logic® Builder software (see local dealer).
2. Set the desired programmable features from the table above.

ALARM, PARKING BRAKE

08WXD

ALARM, PARKING BRAKE Electric Horn Sounds in Repetitive Manner when Vehicle Park Brake is “NOT” Set, With Ignition (IGN) “OFF” and any Door Open.

The purpose of the parking brake alarm is to alert drivers if they fail to set the park brake before exiting the vehicle. For this feature to be activated, ALL of the following conditions MUST occur:

- The IGN switch is in the off position.
- The parking brake is not set.
- A cab door is open.

Once activated, the electric horn will sound for 60 seconds, which is the factory default setting for this programmable parameter. To deactivate the parking brake alarm, press on the brake pedal to immediately quiet the horn, and then make sure the IGN switch is in the run or accessory position and set the park brake.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

- Required software feature code: 595AZV
- 595AJD activates this feature; however, the parameters below can be found under 595AYC.

SOFTWARE FEATURE CODE THAT MUST BE REMOVED

None

Park_Brake_Alarm_Duration parameter determines the maximum amount of time the horn will sound when the alarm is triggered. The default time is set at 60 seconds, but the range is from 0 to 180 seconds.

Park_Brake_Alarm_Suspend parameter determines the amount of time the alarm will suspend after the brake pedal is depressed in order to allow the driver to complete the steps to deactivate the park brake alarm. The default time is set at 10 seconds, but the range is from 0 to 60 seconds.

Park_Brake_Alarm_KeyOff_Enable parameter allows for the selection of the park brake alarm to work in either key off or key on/off.

Table 27

Parameter	ID	Description	Default	Units	Min	Max	Step
Park_Brake_ Alarm_ Duration	1951	The amount of time the horn will sound when alarm activated	60	S	0	180	1
Park_Brake_ Alarm_ Suspend	1952	Amount of time the alarm will suspend before brake is depressed	10	S	0	60	10
Park_Brake_ Alarm_ KeyOff_ Enable	2457	Park brake alarm depends on Key=Off, or not	1	On/Off	0	1	1

WIRING INFORMATION

No additional wiring is required for this feature.

How To Add These Features

This feature is software only and can be added by activating software feature code 595AZV with Diamond Logic® Builder.

WINDSHIELD WIPER SPEED CONTROL

08WGL

Windshield Wiper Speed Control forces wipers to slowest Intermittent Speed when the park brake is set and left on for a predetermined time.

Feature 08WGL is a software feature that forces the windshield wipers to their slowest intermittent speed when the park brake is set and the wipers are left on for a programmable period of time (Wipers_To_Low_Int_Timeout).

The user may override this feature by manually moving the wiper switch to another position. The wipers will remain at this speed for the same programmable period of time and then return to their slowest intermittent speed after that time has passed.

If the IGN switch is turned off, this feature will be overridden.

There are two programmable parameters associated with this feature: Wipers_To_Low_Int_Enabled and Wipers_To_Low_Int_Timeout. These parameters can be modified by anyone with the appropriate interface tool and Fleet access or higher.

Software Feature Codes/Programmable Parameters

Software Feature Codes that must be installed: 08WGL — 595AJD

595AJD activates this feature; however, the parameters below can be found under 595AYC.

The Wipers_To_Low_Int_Enabled parameter shall enable or disable this feature. The default setting shall be ON when this feature is ordered.

The Wipers_To_Low_Int_Timeout parameter shall determine the amount of time the park brake has to be set before the wipers are forced to their slowest intermittent speed. The default value for this parameter is 60 seconds. The minimum time allowed is 10 seconds and the maximum time allowed is 300 seconds with 10 second intervals.

Table 28

Parameter	ID	Description	Default	Units	Min	Max	Step
Wipers_To_Low_Int_Enabled	2171	Enables or disables the wiper speed override, if it is present.	1	None	0	1	1
Wipers_To_Low_Int_Timeout	2228	Defines the amount of time the parking brake has to be set before the wiper speed is overridden.	60	S	10	300	10

Wiring Information

This feature is software driven.

Testing

1. Start vehicle and make sure the parking brake is engaged.
2. Turn the windshield wipers on any setting except for the slowest intermittent speed.
3. Leave the wipers on this setting for 60 seconds without adjusting the wiper speed.
4. After 60 seconds, the wipers should slow to the lowest speed.
5. Adjust the wiper speed control.
6. The wiper setting should match the user set speed.

How To Add These Features

Use the Diamond Logic® Builder software to install the appropriate software and determine correct settings for programmable parameters.

HAZARD LIGHT OVERRIDE STOP LIGHTS

08THN

TURN SIGNAL SWITCH With Hazard Flasher Overrides Brake, to be done With Programming System Controller.

This feature is for vehicles with combination stop and turn lamps. This feature allows hazard flashers to continue flashing when service brakes are applied. This feature is used on bulk fuel transport where some states require hazard lamps to remain flashing when stopped at R/R crossings. When the Stop Override Hazard programmable parameter below is turned on, this feature allows hazard flashers on the rear of the vehicle to stop flashing and stay illuminated as long as the brake pedal is depressed.

This feature can be enabled or disabled by using the Diamond Logic® Builder software.

Software Feature Codes/Programmable Parameters

Required Software Feature Codes: 0595AAL

Software Feature Codes That Must Be Removed

None

Activating the Stop_Override_Hazard_Enabled parameter means that the brake lights will override the hazard lights if both are activated at the same time.

Table 29

Parameter	ID	Description	Default	Units	Min	Max	Step
Stop_ Override_ Hazard_ Enabled	562	Activate/deactivate stop light override of flashing hazards on rear of vehicle. A value of 1 enables and a value of 0 disables this feature.	On	On/Off	N/A	N/A	N/A

Wiring Information

None required.

Testing

Stop Override Hazard Disabled:

1. Turn on the Hazard lights and verify normal operation (flashing), front and rear.
2. Depress the brake pedal and verify that both front and rear hazard lights remain flashing.

Stop Override Hazard Enabled:

1. Turn on the Hazard lights and verify normal operation, front and rear.
2. Depress the brake pedal and verify that both rear stoplights are on (not flashing) and that the front hazard lights remain flashing.
3. Release the brake pedal and verify that normal operation of the flashing hazards resumes at the rear of the vehicle.

How To Add This Feature

If it is desired to have the HAZARD lights override the STOP lights, then the Stop_Override_Hazard_Enabled parameter must be turned OFF.

HEADLIGHT WARNING BUZZER

08WXB

HEADLIGHT WARNING BUZZER Sounds When Head Light Switch is on and Ignition Switch is in “Off” Position.

The purpose of the Headlight Warning Buzzer is to alert drivers if their headlights are still in when the vehicle is turned off.

This feature can be enabled or disabled by using the Diamond Logic® Builder software.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required Software Feature Codes: 0595BHH

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

Table 30

Parameter	ID	Description	Default	Units	Min	Max	Step
Exterior_Lamp_Warn	2179	se this parameter to enable exterior lamp reminder. A value of 1 will result in an audible warning when the vehicle is off and the lights are on. A value of 0 is used to deactivate the audible warning	On	On/Off	0	1	N/A

WIRING INFORMATION

None required.

TESTING

Exterior_Lamp_Warn Disabled:

1. Turn the key off.
2. Turn headlights on. There should be no warning.

Exterior_Lamp_Warn Enabled:

1. Turn the key off.
2. Turn headlights on. The warning will beep five times (with the door closed).
3. Open door. The warning will buzz continuously.

HOW TO ADD THIS FEATURE

Use the Diamond Logic® Builder software to install the appropriate software and determine correct settings for programmable parameters.

SEATBELT WARNING PREWIRE

16HCK

SEATBELT WARNING PREWIRE for 1 to 3 Belts.

16HCL

SEATBELT WARNING PREWIRE for 4 to 6 Belts.

These features include Seat Belt Switches and Seat Sensors for belted positions in the cab and a harness routed to the center of the dash for the aftermarket installation of a Data Recorder and Seat Belt Indicator System.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

Refer to the circuit diagram manual chapter 4, pages 39-41 for wiring information.

ELECTRICAL LOAD CONTROL 11.8 VOLTS

595BMY

ELECTRICAL LOAD CONTL 11.8 Volts

595BMY is the Electrical Load Control/Shedding (ELCS) intended to protect the vehicle's batteries from excessive discharge. The goal is to save enough charge to deliver sufficient power to the starting system to start the engine. The feature is intended to provide a convenient means of automatically shutting down loads overnight in order to conserve energy. This feature is specifically designed to be used for a Celadon split battery system. The first shed point for this system shall be 11.8 Volts. The second shed point is at 10 V and the third is at 9 V.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code: 595BMY and (595AYE or 595AYS or 595BJM or 595BJH)

Conflicts with Software feature: 595ACL, 595BRM

Features disabled by the Electrical Load Control/Shedding (ELCS) with an available parameter to specify the level include the following: Work Lights, Fog Lights, Heated Mirrors, Air Shield Lights, Sleeper Dome Light, Floor Search Lights, Skirt Light, Fuel Heater and Aux Trailer Circuit.

595AMU – WORK LIGHT Rocker Switch

595ABR – WORK LIGHT Push Button B

595AAU – HEATED MIRRORS Rocker Switch, Aftermarket only

595AMP – HEATED MIRRORS in Push Button Location B, Aftermarket only

595AMR – HEATED MIRRORS in Push Button Location A

595ACE – FOG LIGHTS Rocker Switch

595AMS – FOG LIGHTS Push Button Location A

595AMT – FOG LIGHTS Push Button Location B

595BMJ – FOG LIGHTS REAR ECE R38 Compliant, Red LED

595ADK – AIR SHIELD LIGHTING

595AAS – INTERIOR DOME LIGHTS in Sleeper

595AAT – INTERIOR FLOOR LIGHTS in Sleeper

595ADU – INTERIOR FLOOR LIGHTS in Cab

595 AEG – SKIRT LIGHTS Customer Supplied

595ADG – FUEL HEATER Will be Activated by ESC

595ADB – TRAILER AUX CIRCUIT Accessory Powered

595ADC – TRAILER AUX CIRCUIT Battery Powered

The Load_Shed _Level_Work_Light parameter specifies at what level the work light may be shed or loaded.

The Load_Shed _Mirror_Heat_Level parameter specifies at what level the work heated mirrors may be shed or loaded.

The Load_Shed _Level_Fog_Light parameter specifies at what level the fog light may be shed or loaded.

The Load_Shed _Level_Air_Shield_Lights parameter specifies at what level the air shield lights may be shed or loaded.

The Load_Shed _Sleeper_Dome_Light parameter specifies at what level the sleeper dome light may be shed or loaded.

The Load_Shed _Floor_Search_Lights parameter specifies at what level the floor search lights may be shed or loaded.

The Load_Shed _Level_Skirt_Light parameter specifies at what level the skirt light may be shed or loaded.

The Load_Shed _Level_Fuel_Heater parameter specifies at what level the fuel heater may be shed or loaded.

The Load_Shed _Level_Aux_Trailer_Circuit parameter specifies at what level the auxiliary trailer circuit may be shed or loaded.

For features 595AMU or 595ABR: Table 78

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_ Work_Light	2327	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595AAU or 595AMP or 595AMR: Table 79

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Mirror _Heat_Level	2360	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595ACE or 595AMS or 595AMT or 595BMJ: Table 80

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_ Fog_Light	2369	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595ADK: Table 81

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_ Air_Shield_Lights	511	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595AAS:Table 82

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_ Sleeper_Dome-Light	2363	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595AAT or 595ADU: Table 83

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Floor_Search_Lights	2324	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595AEG:Table 84

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_Skirt_Light	2370	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595AMU or 595ABR:Table 85

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_Fuel_Heater	2054	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

For features 595ADB or 595ADC:Table 86

Parameter	ID	Description	Default	Units	Min	Max	Step
Load_Shed_Level_Aux_Trailer_Circuit	601	Level at which load or shed occurs (0 = Do not load shed, 1= Load shed at first level, 2 = Load shed at second level, 3 = Load shed at third level	1	List	N/A	N/A	N/A

WIRING INFORMATION

No additional wiring is needed.

TESTING

No physical testing is specified for this feature. If there is access to DLB, the signal for Battery Voltage could be set below 11.8 V to test those features that should be shed at level 1, but it is not recommended that the actual battery voltage be allowed to drain just to test the feature.

HOW TO ADD THIS FEATURE

Select software feature 595BMY using the Diamond Logic® Builder software (See Local Dealer). If any of the related features are installed on the vehicle, specify the desired load shed level for these features using the Diamond Logic® Builder software.

PRODUCTIVITY FEATURES

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

FOG/DRIVING LIGHTS

Codes 08585, 08WPL, 08WPM, 08WLM, and 08WLN

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Fog Light and Work Light.

DuraStar

08585

TOGGLE SWITCH, AUXILIARY and Wiring; For Driving Lights or Fog Lights Mounted by Customer

08WPL

FOG LIGHTS (2) Amber, Oval, With H355W Halogen Bulb

08WPM

FOG LIGHTS (2) Clear, Oval, With H355W Halogen Bulb

WorkStar

08585

TOGGLE SWITCH, AUXILIARY and Wiring; For Driving Lights or Fog Lights Mounted by Customer

08WLM

FOG LIGHTS {Peterson} Amber, Halogen, Rectangular

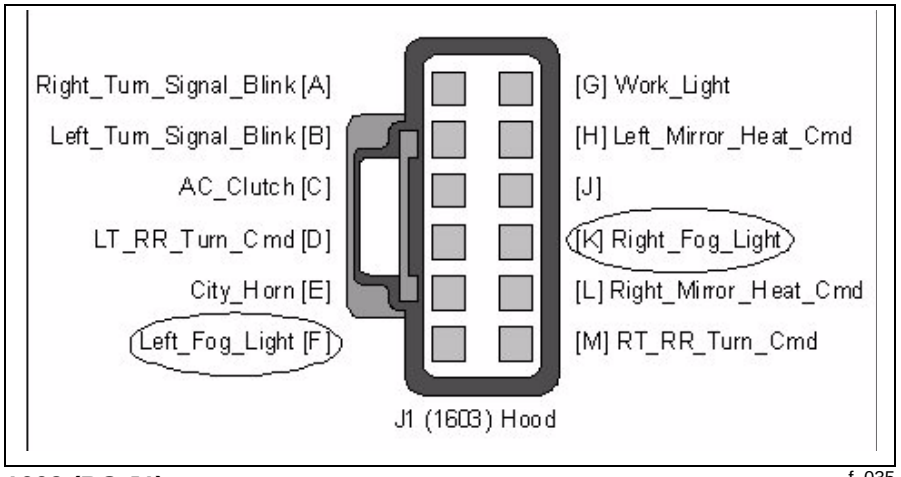
08WLN

FOG LIGHTS {Peterson} Clear, Halogen, Rectangular

Feature codes 08WPL, 08WPM, 08WLM, and 08WLN come with the fog light system (wiring and fog lamps) completely installed. Feature code 08585 is an accommodation package that comes with wiring and a fog light connector. Customer must supply the mating connector, terminals, and seals, and must install the fog lamps.

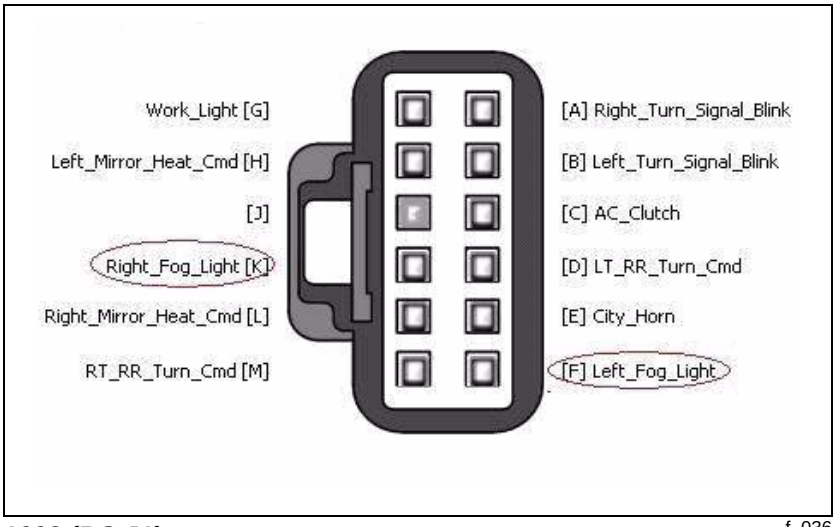
All above features operate as follows: to turn on the fog lamps; the headlamps must be on and in the low beam position. The lamps will go off if the headlamps are switched to high beam.

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES



f_035

1603 (BC J1)



f_036

1603 (BC J1)

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

f_037

Fog Light Switch in Switch Pack

Depending on the other features ordered on the vehicle, the fog light button switch could also be located on the left of the steering column under the instrument cluster.

f_038

Fog Light Switch Located Under the Instrument Cluster

For the customers who prefer to mount their own lamps, installation integrity is improved with the factory toggle switch and wiring feature.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS - REQUIRED SOFTWARE FEATURE CODES:

595ACE for Rocker Switch

595AMT for Push Button in Location B under the instrument cluster

595AMS for Push Button in Location A under the instrument cluster

595AHT for 08585

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

Table 31

Parameter	ID	Description	Default	Units	Min	Max	Step
Left_Fog_Light_Hi_Current	2309	Left Fog Light High Current Detection Level (AMPS)	10	A	0	10	0.1
Left_Fog_Light_Lo_Current	2310	Left Fog Light Low Current Detection Level (AMPS)	0.5	A	0	10	0.1
Left_Fog_Light_OC_Current	2311	Left Fog Light Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1
Load_Shed_Level_Fog_Lights	2369	Level for Load Shed for the Fog Lights	0	List	N/A	N/A	N/A
Right_Fog_Light_Hi_Current	2312	Right Fog Light High Current Detection Level (AMPS)	10	A	A	0	10
Right_Fog_Light_Lo_Current	2313	Right Fog Light Low Current Detection Level (AMPS)	0.5	A	A	0	10
Right_Fog_Light_OC_Current	2314	Right Fog Light Open Circuit Detection Level (AMPS)	0.5	A	A	0	10

WIRING INFORMATION

With feature 08585 and if the vehicle is a 3200, 4200, 4300 or 4400, a “thin” fog lamp must be used if mounted in the bumper opening.

The fog lamp connections are located at the front of the frame on each side. See view below.

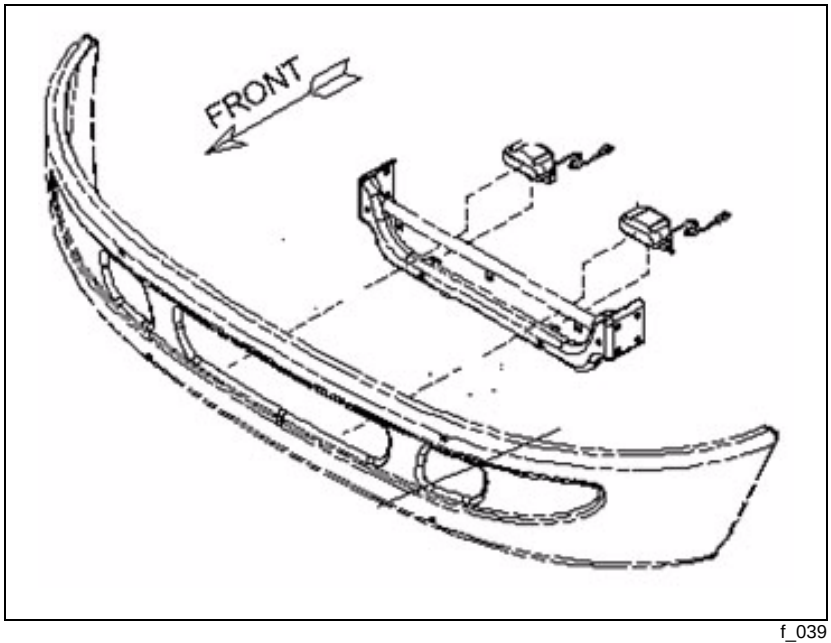
Care must be taken when adding fog lamps as lamps may have a GND wire and also have a grounded base. Be sure that the feed circuit, cavity A, the connector at front of frame, is not connected to GND.

Mating connector part number 587568C91

Terminal (16 gauge) part number 587575C1

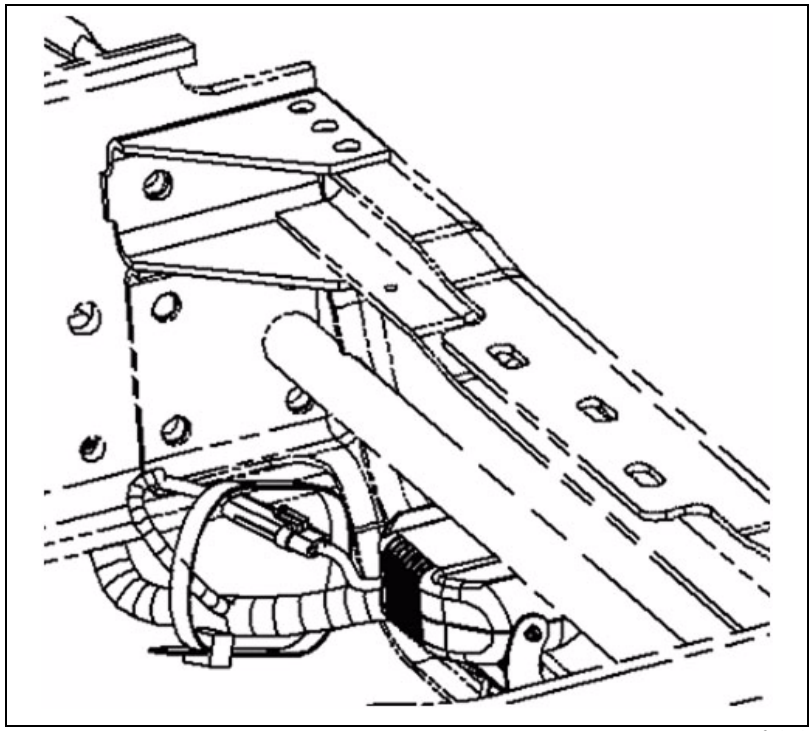
Seal part number 1652325C1

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES



f_039

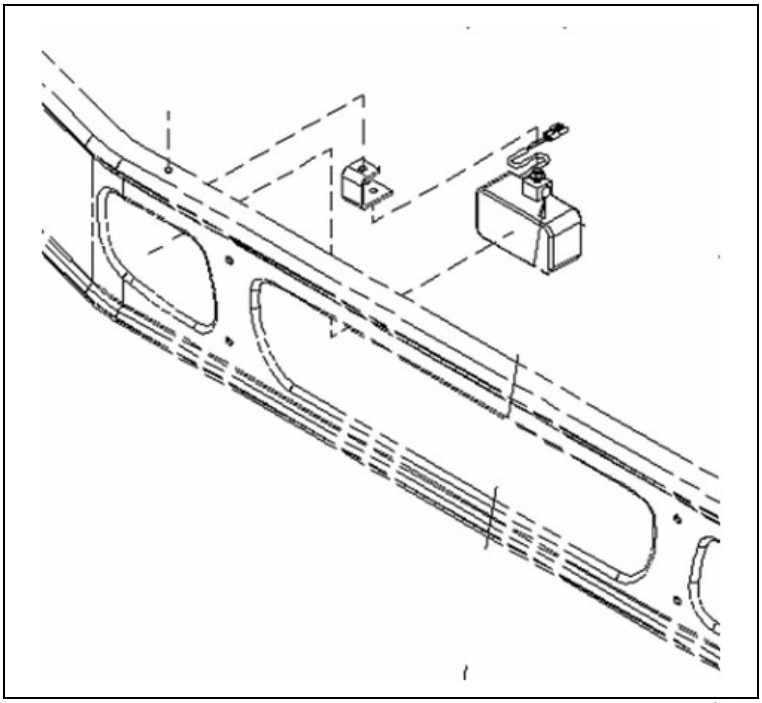
Thin fog lamps must be used if mounted in the bumper opening of the 3200, 4200, 4300 and 4400 models.



f_040

View of Fog Lamp Breakout

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES



View of Bumper Mounting - WorkStar Models f_041

TESTING

1. Activate fog light switch with the IGN key on and the headlamp switch on the low-beam mode.

2. Verify that pin F (labeled Left_Fog_Light) and pin K (labeled Right_Fog_Light) in DLB located in connector (#1603 J1) are providing battery voltage.

3. Verify that the fog lights are functioning correctly.

4. Turn the fog light switch OFF.

5. Verify that the fog light output goes OFF.

HOW TO ADD THIS FEATURE

- Software feature code 595ACE, 595AMY, or 595AMS (depending on switch location) must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer if not owned).
- Install fog light switch part number 3563064C1 in the designated switch pack location or part number 3610765C1 for the pushbutton switch located below the instrument cluster. Use Diamond Logic® Builder software to determine the fog light switch assignment after the software has been programmed into the BC.
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see local dealer if not owned).
- Customer must wire the desired load into pin F (labeled Left_Fog_Light) and pin K (labeled Right_Fog_Light) on the BC hood connector (#1603 J1).

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

FOG LIGHT INSTALLATION

MODELS: 4200, 4300, 4400, 8500

There are two fog light kits available from your International® dealer, 2507255C91, Fog Lights Clear and 2507254C91 Fog Lights Amber. These kits provide the parts for the slim line fog lights for the DuraStar models only. The installation instructions are shown below for reference.

WARNING: Turn off IGN switch before starting procedure to avoid injury.

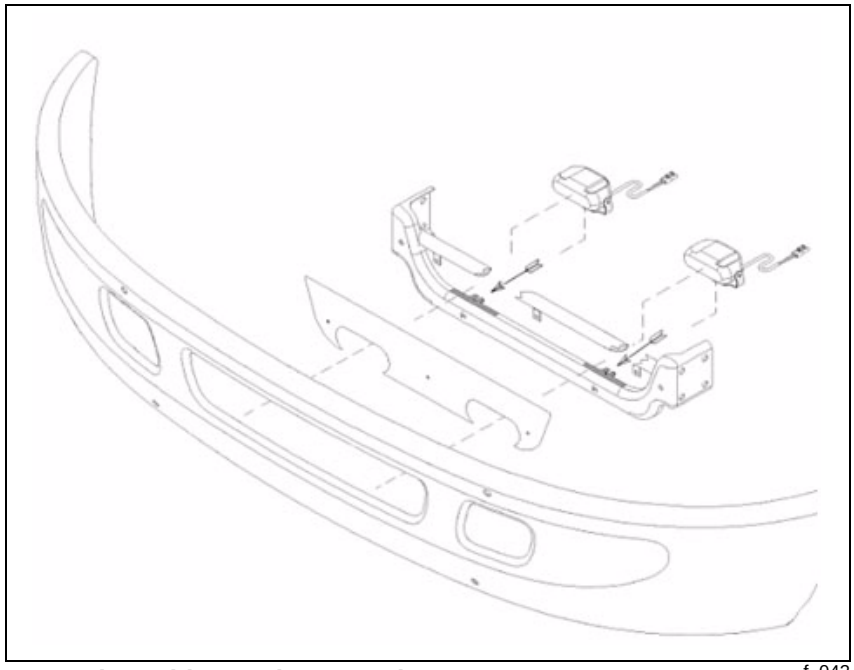
DESCRIPTION

This section addresses installation, switching, and programming of fog lights on International® 4200, 4300, 4400, and 8500 trucks.

Table 32 – Parts Information

Part Number	Description	Quantity
2507254C91	Amber Light Kit	1
2507255C91	Clear Light Kit	1

Install fog lights using hardware included in the kit. The Figure below shows installation.



f_042

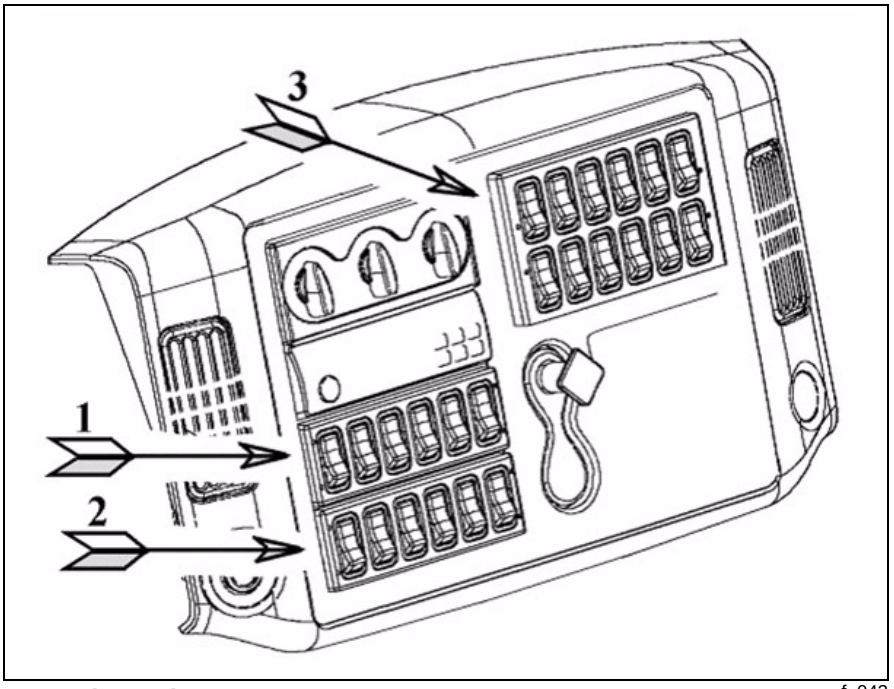
Front View with Attachment Points

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

SWITCH INSTALLATION

Refer to the Figure below.

If there is an available switch opening in location one, install the fog light control switch in this location. If, in location one, the switch pack module is fully populated, install a six pack (part number 3549776C4) in location two. Additional switch blanks (part number 3533950C1) may be needed to cover unused switch locations.



Control Panel f_043

Location 1: Six pack

Location 2: Six Pack

Location 3: Twelve Pack

WIRING FOG LIGHTS

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Fog Light and Work Light for circuit installations.

PROGRAMMING FOG LIGHTS

Adding fog lights will require reprogramming the system controller. See local dealer.

Table 33 – Fog Light Kit - Clear

Part Number	Description
2507255C91	Fog Light Kit Clear
3555568C91	Light, Fog w/Brkt (Clear) Slim
3535162C1	Nut, Hex Metr Prev Torq*M8X1.25
306132C1	Strap, Cable Lock
3560279C91	Harness, *Fog Lights
3560225C91	Harness, Electrical, Chassis Wi
3549438C91	Switch, Light *Assy — Fog Light
3554890C1	Screen, Air Intake Radiator Gau
3552493C1	Bolt, Sems M6X1.0–25 SST Blk Ox
3526712C1	Nut, Special *M6
3535292C1	Bolt, Sems All 6mm X15 Torx
30592R1	Nut, Speed Standard Part M6 X1
2507524R1	Manual, Inst Fog Light Instl

Table 34 – Fog Light Kit - Amber

Part Number	Description
2507254C91	Fog Light Kit Amber
3555569C91	Light, Fog w/Brkt (Amber) Slim
3535162C1	Nut, Hex Metr Prev Torq*M8X1.25
306132C1	Strap, Cable Lock
3560279C91	Harness, *Fog Lights
3560225C91	Harness, Electrical, Chassis Wi
3549438C91	Switch, Light *Assy — Fog Light
3554890C1	Screen, Air Intake Radiator Gau
3552493C1	Bolt, Sems M6X1.0–25 SST Blk Ox
3526712C1	Nut, Special *M6
3535292C1	Bolt, Sems All 6mm X15 Torx
30592R1	Nut, Speed Standard Part M6 X1
2507524R1	Manual, Inst Fog Light Instl

AUXILIARY FRONT LIGHTS

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Aux Headlights, Snow Plow Lights.

Feature Code Description

08THJ

AUXILIARY HARNESS 3.0’ for Auxiliary Front Headlights and Turn Signals for Front Plow Applications

08TNP

AUXILIARY HARNESS 5.0’ for Auxiliary Front Headlights and Turn Signals for Front Plow Applications

When front-mounted equipment blocks the vehicle headlamps and turn lamps, such as a snowplow, this feature code is available to connect additional lamps to be used in place of the normal headlamps. These features provide either a 3-foot or a 5-foot extension harness with a sealed 7-way connector cap for front-mounted auxiliary headlights, park or identification, right turn signal, left turn signal and ground. The connector is located behind the driver’s side headlight under the hood.

The harness and connector provide a 20 Amp high and low beam feed, a 10 Amp right and left turn signal feed and a 20 Amp park light feed. The connector comes with a mating connector and sealing plugs pre-installed. The auxiliary park or identification, right and left turn signals are directly tied to the respective front lighting circuits. When the headlight switch is turned to the PARK or ON position, both the vehicle park and auxiliary park lights will come on. If the turn signal switch is activated, both the vehicle turn and auxiliary turn signal lights will come on.

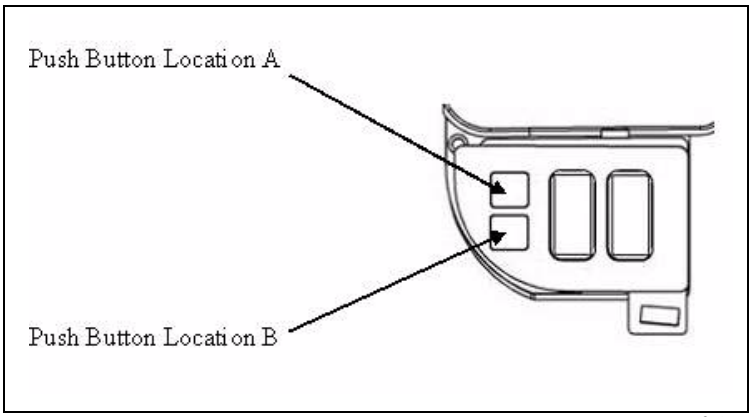
FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

An auxiliary lighting switch labeled PLOW LIGHTS is mounted in the dash panel. The switch controls whether the auxiliary or vehicle headlights are on. The headlamp switch must be ON for the auxiliary headlamps to operate. Note that both sets of headlamps cannot be turned on at the same time. The plow light switch will only function with the key in the ON or ACCESSORY position.

This option is not available with the fog light or customer-mounted fog light options and is not available factory-installed on DuraStar models.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS - REQUIRED SOFTWARE FEATURE CODE:

- 595AMV – Push button located in position A below instrument cluster
- 595AMW – Push button located in position B below instrument cluster
- 595AYY – Rocker switch



Plow Lights Push Button Locations f_044

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

Plow Light Rocker Switch f_045

Software Feature Codes That Must Be Removed

595AMS, 595AMT, 595ACE

Wiring Information

The circuit ratings are as follows: the headlamp hi beam 20 AMP, the headlamp low beam 20 AMP, the left turn 10 AMP, the right turn 10 AMP and the park 15 AMP. Since the auxiliary park and turn current is shared with vehicle lighting current, make sure the added lighting does not exceed the stated current rating for each circuit. All circuit protection is internal to the BC (Body Controller).

NOTE: If the plow lights are turned on without the lights being connected, the BC will log a headlamp fault code.

Table 35 – Aux. Connector Circuit Identification

Circuit Number	Cavity	Function
M64HI	A	Hi Beam
M11-GE	B	GMD
M64LO	C	Low Beam
M56D	D	T/S Left
M58F	E	Park
M57D	F	T/S Right
Plug	G	Plug

Connector on chassis harness viewed from mating end. This harness is located behind the driver's side headlight under the hood.

CONNECTOR – 2039311C91
PLUG – 0587579C1
LOCK – 2039342C1

f_046

To mate with the chassis harness use the following:

Table 36 – Part Information

Part	Quantity	Description
2039312C91	1	Body, Connector 7 Way Metri-Pack 280 Series, Sealed - FEM
587579C1	1	Plug, Filler, Sealing Weatherpack - GREEN
2033912C1	6	Terminal, Cable, Cable* Metri-Pack 280 Series Male Blade
589391C1	6	Seal, Cable Terminal Weatherpack - Gray
2039342C1	1	Lock, Connector Body

The terminals and seals in the above table are for 14-gauge cable.

NOTE: It is suggested that an extra connector (Part # 2039312C91), be completely filled with plugs, which can be saved and connected to the chassis harness connector when the plowing season is over – this procedure protects against corrosion.

TESTING

1. Activate the plow light switch in the dash using the Diamond Logic® Builder software for switch locations.
2. Turn on vehicle park lights.
3. Verify that auxiliary connector Cavity E has battery voltage levels present.
4. Turn ON vehicle headlights to the LOW BEAM position.
5. Verify that auxiliary connector Cavity C has battery voltage levels present.
6. Turn vehicle headlights to the HIGH BEAM position.

VERIFY THAT AUXILIARY CONNECTOR CAVITY A HAS BATTERY VOLTAGE LEVELS PRESENT.

1. Turn on vehicle left turn signal.
2. Verify that auxiliary connector Cavity D has intermittent voltage levels present.
3. Turn on vehicle right turn signal.
4. Verify that auxiliary connector Cavity F has intermittent voltage levels present.
5. Turn off the plow light switch.
6. Verify all vehicle lights are operating correctly.

HOW TO ADD THIS FEATURE

There is a plow light kit available 2585355C91 to facilitate installation. The instructions that come with the kit are shown below.

NOTE: If the vehicle has hydraulic brakes, the instructions for installing relay circuits do not apply as the cavities have factory-installed circuits in the cavities indicated DO NOT REMOVE THESE CIRCUITS, use alternate open cavities. Be sure to mark the function of the added relays on the decal located on the bottom of the PDC cover.

Kit, Auxiliary (Snowplow) Light Instructions

2585355C91

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Aux Headlights, Snow Plow Lights for circuit information on installing this feature.

FRONT GUIDE POST LIGHTS

08THV

DISCONNECT, FRONT HARNESS for Guide Post Lights; Connectors Located at Headlight Connection, for Customer Installation

This feature provides two additional connectors located in the front wiring harness for front parking or identification lights. This feature is commonly used for customer or Body Builder- added guidepost lights typically mounted at each end of the front bumper. These connectors come with mating connectors and sealing plugs pre-installed. The guide post light circuit is directly tied to the vehicle parking light system, so when the headlight switch is turned to the park or on position, these auxiliary lights will turn on with the standard vehicle lighting. This feature should be used in any application where operation in tight spaces requires constant identification of the vehicle's width.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software Feature Codes that must be added: NONE

Software Feature Codes that must be removed: NONE

WIRING INFORMATION

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Light System – Marker, Park, Tail, Turn, and Stop Lights.

Table 37 – Connector Cavity Information and Parts Required

Connector P/N	Cavity	Circuit #		Gauge	Term Part Number	Seal Part Number
		Left Side	Right Side			
1661778C1	A	M58H	M58J	16	1661875C1	1661872C1
	B	M58-GA	M58-GB	16	1661875C1	1661872C1

Plug part number: 2025431C1

Lock part number: 1661874C1

TESTING

1. Turn the Headlight switch to PARK position and verify that both right and left guide post lights are on.

2. Turn the Headlight switch to ON position and verify that both right and left guide post lights are on.

HOW TO ADD THIS FEATURE

If the vehicle was not ordered with the feature, it may be added. Refer to the part numbers identified in the Wiring section above for information on parts and components. See also "How Do I" - General Information section of this electrical guide.

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

HEADLIGHTS WIG WAG

60AKK

HEADLIGHTS WIG WAG With Highbeam Flash

60AKK is the Wig Wag feature for emergency vehicles. This feature provides 13 different flash patterns for vehicle high beams. High beams will only flash when the park brake is released. If high beams are requested from the headlight switch, the high beams will come on steady. The headlight switch has ultimate control.

60AKL

HEADLIGHTS WIG WAG With Lowbeam or Highbeam Flash

60AKL is the Wig Wag feature for non-emergency vehicles. This feature provides 13 different flash patterns for vehicle headlights. High beams will only flash when park brake is released. Low beams will flash whenever requested to. Headlight switch has ultimate control. When vehicle is moving, if high beams are selected, low beams will flash; if low beams are selected, high beams will flash.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Wig_Wag_Cad

This parameter specifies the Wig Wag pattern for the headlights. The following table indicates the pattern and timing for the headlights.

Table 38

Setting	Wig Wag Pattern
1	Standard Left, Right Pattern – 75 flashes per minute
2	Standard Left, Right pattern – 150 flashes per minute
3	2 Left then 2 Right flashes (repeat) – 75 flashes per minute
4	2 Left then 2 Right flashes (repeat) – 150 flashes per minute
5	3 Left then 3 Right flashes (repeat) – 75 flashes per minute
6	4 Left then 4 Right flashes (repeat) – 150 flashes per minute
7	Standard Left, Right pattern 3 flashes, then 3 flashes of both (repeat) – 75 flashes per minute
8	Standard Left, Right pattern 2 flashes, then 2 flashes of both (repeat) – 150 flashes per minute
9	Standard Left, Right pattern 3 flashes, then 3 flashes of both (repeat) – 150 flashes per minute
10	Standard Left, Right pattern 4 flashes, then 4 flashes of both (repeat) – 150 flashes per minute
11	Standard Left, Right pattern 2 flashes, then 2 flashes of both, Left 2 flashes, Right 2 flashes (repeat 2x), then 2 flashes of both, Left 3 flashes, Right 3 flashes (repeat 2x), then 2 flashes of both, Left 4 flashes, Right 4 flashes, then 2 flashes of both, then repeat entire pattern –150 flashes per minute
12	Standard and non-standard Left and Right patterns with flashes of both at varying lengths of time
13	Standard Left, Right pattern with flashes of both at varying lengths of time

Daytime_Running_Lights_Disable

This parameter (Daytime_Running_Lights_Disable), when set ON provides the capability to disable the daytime running lights when the Wig Wag is ON.

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

Emergency Vehicle

REQUIRED SOFTWARE FEATURE CODE FOR 60AKK

595BLN

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

595BLP

Table 39

Parameter	ID	Description	Default	Units	Min	Max	Step
Wig_Wag_Cad	2629	Determines method of flashing for the wig wag headlights	1	Number	1	13	1

Non-Emergency Vehicle

REQUIRED SOFTWARE FEATURE CODE FOR 60AKL

595BLP

SOFTWARE FEATURE CODE THAT MUST BE REMOVED

595BLN

Table 40

Parameter	ID	Description	Default	Units	Min	Max	Step
Daytime_Running_Lights_Disable	2630	Provides the ability to disable the daytime running light during wig wag	Off	On/Off	N/A	N/A	N/A
Wig_Wag_Cad	2629	Determines method of flashing for the wig wag headlights	1	Number	1	13	1

WIRING INFORMATION

Wig Wag switch is located in one of the multiplex switch housings.

WIG WAG INHIBIT INPUT

This input is located in the Body Controller on Connector 1600, pin B15. This input allows a customer to hook up an external input to access the wig wag feature and tie it into a customer-supplied master switch. The inhibit input wire is a blunt cur wire located inside the cab near the steering column under the dash.

Wig Wag Enable Switch f_047

FOG, PLOW, GUIDE POST & WIG WAG ACCOMMODATION PACKAGES

TESTING

60AKK (Emergency Vehicles)

1. Turn Wig Wag switch on with Park Brake released.
2. Verify that High Beams are flashing in the pattern selected by the Wig_Wag_Cad parameter.
3. Set Park Brake and verify that Wig Wag pattern stops.
4. Turn Wig Wag switch on with Park Brake released.
5. Verify the High Beams are flashing in the pattern selected by the Wig_Wag_Cad parameter.
6. Turn Wig Wag switch off and verify that Wig Wag stops.

60AKL (Non-Emergency Vehicles)

1. Turn Wig Wag switch on with Park Brake released.
2. Verify that High Beams are flashing in the pattern selected by the Wig_Wag_Cad parameter.
3. If Daytime_Running_Light_Disable parameter was set, verify that Daytime Running Lights are not on during the Wig Wag.
4. Set Park Brake and verify that Wig Wag pattern stops.
5. Turn Wig Wag switch on with Park Brake released.
6. Verify the High Beams are flashing in the pattern selected by the Wig_Wag_Cad parameter.
7. Turn Wig Wag switch off and verify that Wig Wag stops.

HOW TO ADD THIS FEATURE

Install Wig Wag Switch in the switch pack position shown in Diamond Logic® Builder after adding feature 595BLN or 595BLP.

60AKK (Wig Wag for Emergency Vehicles)

Set Wig_Wag_Cad parameter to desired pattern using the Diamond Logic® Builder software, or see a dealer.

60AKL (Wig Wag for Non-Emergency Vehicles)

Set Wig_Wag_Cad parameter to desired pattern using the Diamond Logic® Builder software, or see a dealer.

Turn on Daytime_Running_Light_Disable, if desired using the Diamond Logic® Builder software, or see a dealer.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

STOP/TURN/TAIL

International® provides standard rear stop and turn signal lights on every vehicle. If the Body Builder or TEM needs to add different rear light configurations, such as separate stop and rear turn signals, various methods are offered to tap into the tail light circuits. The first and most common way is to use the standard sealed tail light 5-way Packard connector to provide lighting circuits for body-mounted lights that need combined stop and rear turn signals. It is recommended that a sealed mating connector and terminals be used to attach body wiring to the vehicle wiring. If the existing rear lighting is used and a marker or identification light feed is needed, International® recommends using the 5-way connector on the driver side rear tail light. Other optional methods for adding various light configurations are available (feature codes 08HAA, 08HAB, and 08NAA).

A feed terminal for body marker lights is provided in "terminal D" position on the left tail lamp. To wire body lights, Body Builders are to attach a terminal (International® part number 2033816C1 or Packard Electric part number 12129493) and seal (International® part number 589391C1 or Packard Electric part number 12015193) to the body feed cable. The cable can then be snapped into the empty cavity of the existing 5-way connector (Note: if a splice is absolutely necessary, use heat shrink tubing with proper wire).

To connect to the tail light wiring harness, instead of using the OEM tail lights, use International® connector 1677851C1 or Packard Electric P12186400. Be sure to use a terminal plug in any unused cavities in the connector body. Alternately, order feature code 08NAA which includes separate wiring for standard left and right tail lights with 8' of extra cable for extending tail light wiring and separate wiring for left and right body-mounted tail lights.

The standard tail light connectors are located at the lights mounted to both the driver and passenger sides of the frame rail at the rear.

STANDARD TAIL, MARKER, AND CLEARANCE LAMP CONNECTION

This feature is standard with standard tail lamps.

International® provides a connection point at the left rear standard tail lamp. The connection point is made available so that power can be provided to additional tail, marker and clearance lamps.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

There is an unused cavity in the left rear tail lamp connector that can be used to provide tail, marker and clearance power. Remove the connector from the lamp and remove the cavity seal. Terminate added circuit with terminal and seal below, and insert into cavity D.

Table 41

Parts	Part Numbers
Terminal (12 gauge)	2033816C1
Seal	589390C1

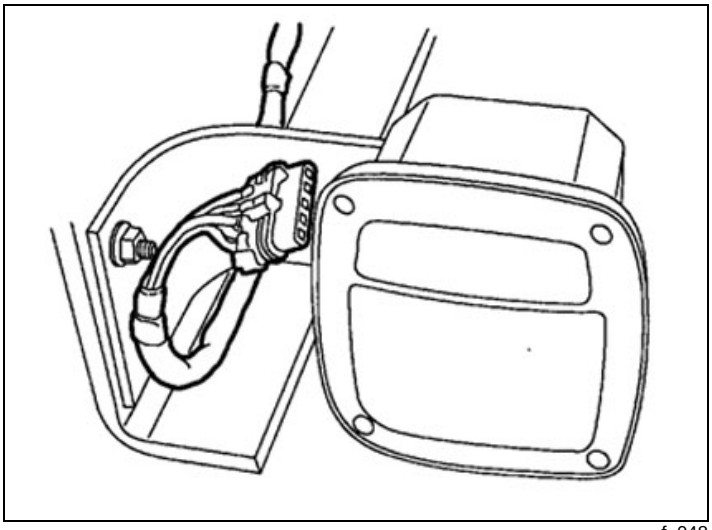
NOTE: Circuit is protected internally by the Body Controller (BC) at 15 Amperes (AMPS). If current is close to or exceeds 15 AMPS, a relay must be added.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

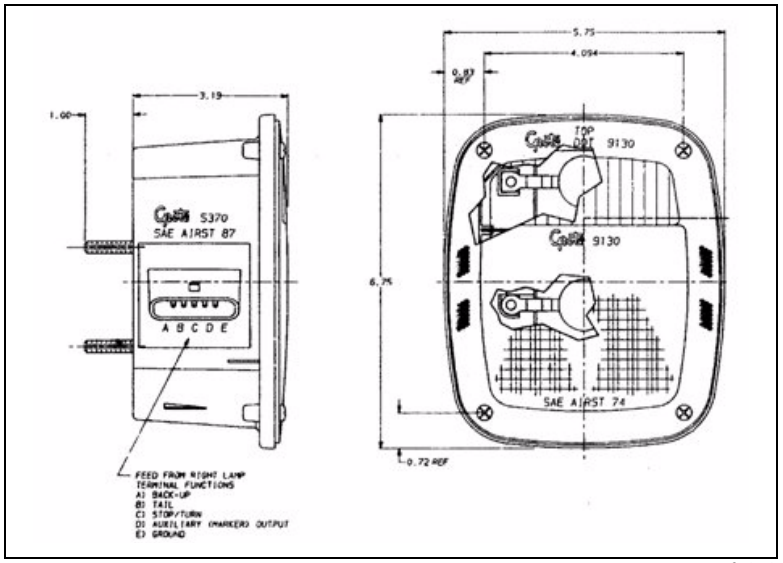
If the rear lighting is to be entirely body-mounted, and a connection to the rear harness tail lamp connector is needed, use connector, terminal and seal specified below.

Table 42

Parts	Part Numbers
Connector	1677851C1
Terminal	1687848C1 — 10 Gauge 2033912C1 — 12-14 Gauge
Lock	1677914C1
Seal	0589390C1 — 10-12 Gauge 0589391C1 — 14-16 Gauge



Feed Terminal Location on Left Tail Lamp f_048



Feed Terminal Location on Left Tail Lamp f_049

TESTING

When additional lights are added, test those lights for functionality and test the connection point for battery voltage.

BODY BUILDER WIRING AT END OF FRAME

Refer to the Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – Back of Cab (BOC) and EOF.

08HAA

BODY BUILDER WIRING To EOF, With Stop, Tail, Turn, and Marker Lights Circuits, Ignition (IGN)-Controlled Auxiliary Feed and Ground (GND), Less Trailer Socket

This feature is for vehicles that have heavy-duty lighting requirements. This feature has a 30 AMP IGN Feed. Right and left turn signals can support up to seven turn lamps per side. Code 08HAA is designed for separate stop and turn lamps only. The 7-wire breakout is located at the EOF, and there is no connector. The wires are blunt-cut with heat shrink covering.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software Feature Codes that must be added: 595ABC

Software Feature Codes that must be removed: NONE

These parameters should be left at their factory default values!

Table 43

Parameter	ID	Description	Default	Units	Min	Max	Step
LT_FT_Turn_ Lo_Current	1910	Park and ID Lights Low Current Detection Level (AMPS)	0.5	A	0	10	0.1
LT_FT_Turn_ Hi_Current	1911	Park and ID Lights High Current Detection Level (AMPS)	10	A	0	10	0.1
LT_FT_Turn_ OC_Current	1912	Park and ID Lights Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ Lo_Current	1913	Park and ID Lights Low Current Detection Level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ Hi_Current	1914	Park and ID Lights High Current Detection Level (AMPS)	10	A	0	10	0.1
RT_FT_Turn_ OC_Current	1915	Park and ID Lights Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1

WIRING INFORMATION

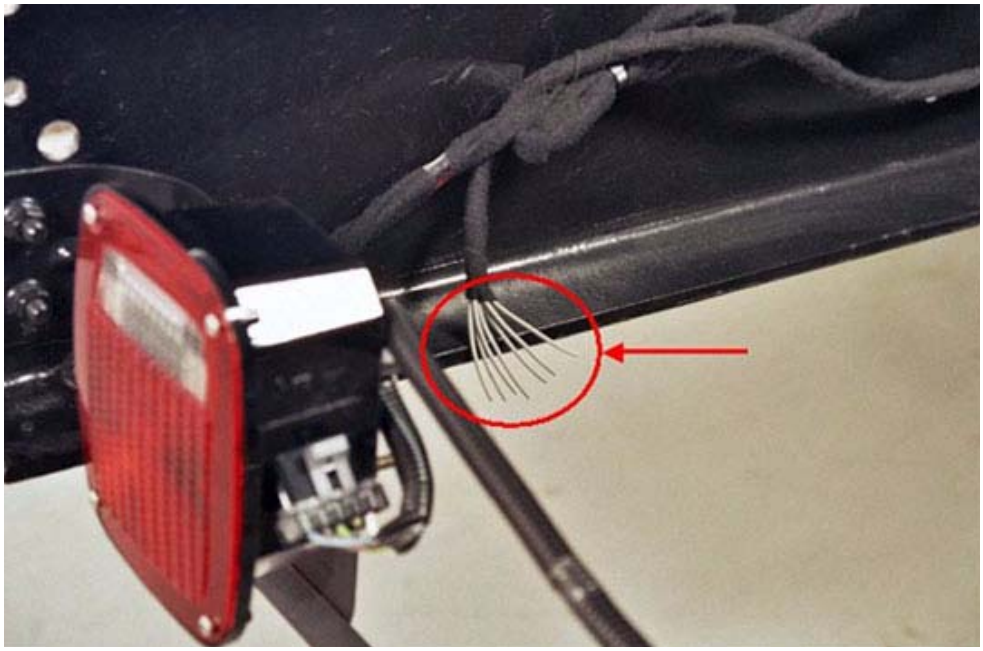
08HAA gives 7 wires located at EOF that are blunt-cut.

Table 44 – 08HAA

Cavity	Circuit Number	Maximum Current	Description	Fused by
N/A	R70	30 A	Stop Lights	F7-D F4-E4
N/A	R68	20 A	Park Lights	F3-B D2-C2
N/A	R94	30 A	IGN Feed	F8-D F4-E4
N/A	R58	20 A	Identification Lights	F3-D D4-C4
N/A	R56	15 A	Left Turn	F2-A F1-E1
N/A	R57	15 A	Right Turn	F2-C F3-E3
N/A	R10	N/A	GND	

Connector pinout is labeled as Trailer Socket (9734) connector in Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – BOC and EOF. The connector itself is not supplied, and wires are blunt-cut.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS



Location of 7-Wire Breakout at EOF f_050

TESTING

WARNING: To avoid property damage, personal injury or death, park the vehicle on a level surface, set the parking brake, chock the wheels and turn the engine off.

1. Turn on vehicle headlights.
2. Verify that the taillight circuit (# R68) has battery voltage levels present.
3. Verify that the marker light circuit (# R58) has battery voltage levels present.
4. Turn off vehicle headlights.
5. Turn on left turn signal in vehicle.
6. Verify that left turn circuit (# R56) is cycling between battery voltage and GND.
7. Turn off vehicle left turn signal.
8. Turn on right turn signal in vehicle.
9. Verify that right turn circuit (# R57) is cycling between battery voltage and GND.
10. Turn off vehicle left turn signal.
11. Put the vehicle in reverse.
12. Turn the key to the accessory or IGN position.
13. Verify that the IGN circuit (# R94) has battery voltage levels present.
14. Press the vehicle brake pedal.
15. Verify that the stop circuit (# R70) has battery voltage levels present.
16. Release brake pedal.

CIRCUIT DIAGRAM

See Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – BOC and EOF.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

How To Add This Feature

Feature 08HAA is not available with code 08HAG and 08HAH Electric Trailer Brake or codes 08TME and 08TMG Trailer Connection Socket and 08THH Aux Trailer Socket with Center Pin Circuit. If the vehicle has any of these codes, 08HAA cannot be installed in the vehicle.

This feature is not easy to install, and every effort should be made to order the vehicle with the desired code.

Refer to the “How Do I” General Information section of this electrical guide for obtaining information on obtaining required circuits.

Refer to the 7-way socket at EOF for information covering circuit connections and use of the circuit diagram manual to aid in assembly.

BODY BUILDER WIRING

Refer to the Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder Connections.

08HAB

BODY BUILDER WIRING, BOC AT LEFT OF FRAME, includes 7-way sealed connector for tail/amber/backup/accessory power/GND and sealed connectors for combination stop/turn and a 3-way for separate stop/turn lights.

08HAE

BODY BUILDER WIRING, BOC REAR OF FRAME, includes 7-way sealed connector for tail/amber/backup/accessory power/GND and sealed connectors for combination stop/turn and a 3-way for separate stop/turn lights.

08HAU

BODY BUILDER WIRING INSIDE CAB; Includes Sealed Connectors for Tail/Amber, Turn/Marker/Backup/Accessory, Power/Ground, and Stop/Turn.

These features provide power to operate various body loads or after-market accessories such as stop/tail/backup/marker/rear turn signal lights, motors, heaters, etc. There are two connectors that come with these options. A 7-way and a 3-way both have sealed mating connectors and sealing plugs pre-installed. The 7-way connector provides the combined stop and turn signal circuits while the 3-way provides the separate stop and turn signal circuits. It is always recommended that sealed mating connector terminals be used to attach body wiring to the vehicle wiring. Also, if this option is used in place of the standard rear lighting connector, it is recommended that a mating connector with sealing plugs be placed into the standard rear tail light connector.

Software Feature Codes/Programmable Parameters

Software Feature Codes that must be added: 595ABC

Software Feature Codes that must be removed: NONE

These parameters should be left at their factory default values!

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 45

Parameter	ID	Description	Default	Units	Min	Max	Step
LT_FT_Turn_ Lo_Current	1910	Park and ID Lights Low Current Detection Level (AMPS)	0.5	A	0	10	0.1
LT_FT_Turn_ Hi_Current	1911	Park and ID Lights High Current Detection Level (AMPS)	10	A	0	10	0.1
LT_FT_Turn_ OC_Current	1912	Park and ID Lights Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ Lo_Current	1913	Park and ID Lights Low Current Detection Level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ Hi_Current	1914	Park and ID Lights High Current Detection Level (AMPS)	10	A	0	10	0.1
RT_FT_Turn_ OC_Current	1915	Park and ID Lights Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1

WIRING INFORMATION

08HAB: Connectors are located inside the driver's side frame rail at the BOC.

08HAE: Connectors are located inside the driver's side frame rail at the EOF.

08HAU: Connectors are located inside the cab.

Table 46 – 7-Way Connector Information

Wire Number	Cavity	Gauge	Color	Description	Fuse Rating (Amps)	Available Current (Amps)
N68BB	A	14	Brown	Tail Light	20	20
N56BB	B	16	Yellow	Left Turn Light	10	8
N57BB	C	16	Light Green	Right Turn Light	10	8
N54BB	D	14	Brown	Marker Light	20	20
N71BB	E	16	Light Blue	Back-up Light	10	6
N12BB	F	14	Light Blue	Accessory Feed	20	20
N11-GD	G	12	White	GND	--	--

Table 47 – More 7-Way Connector Information

Description	Chassis Harness	Body Builder Harness
(4450) 7-Way Connector	2039311C91	2039312C91
Lock	2039342C1	
12 Gauge Seals	589390C1	
14 Gauge Seals	589391C1	
16 Gauge Seals	1652325C1	
12 Gauge Terminals	2039344C1	1687848C1
14 Gauge Terminals	3535486C1	2033912C1
16 Gauge Terminals	2039343C1	2033911C1

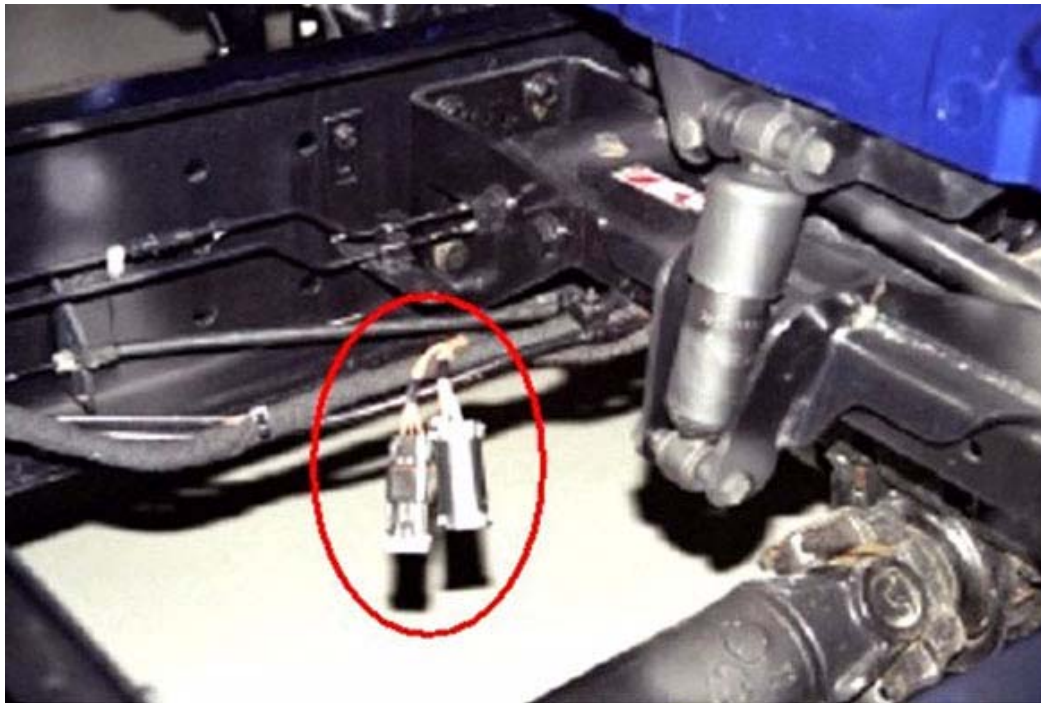
BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 48 – 3-Way Connector Information

Wire Number	Cavity	Gauge	Color	Description	Fuse Rating (Amps)	Available Current (Amps)
N56BC	A	16	Orange	Left Turn Light	10	6
N57BC	B	16	Orange	Right Turn Light	10	6
N70BB	C	14	Orange	Stop Light	15	15

Table 49 – More 3-Way Connector Information

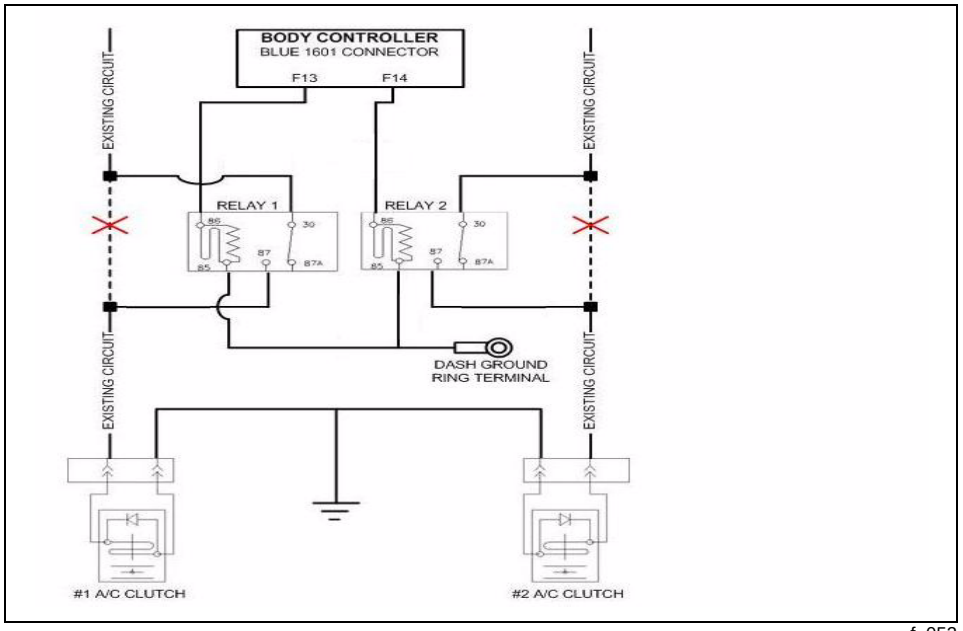
Description	Chassis Harness	Body Builder Harness
(4460) 7-Way Connector	1686834C1	3553961C1
Lock	1664408C1	
14 Gauge Seals	589391C1	
16 Gauge Seals	1652325C1	
14 Gauge Terminals	2033816C1	2033912C1
16 Gauge Terminals	2033819C1	2033911C1



7-Way and 3–Way Connectors for 08HAB (BOC) f_051

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

1



7-Way and 3–Way Connectors for 08HAE (EOF) f_052

7-Way and 3–Way Connectors for 08HAU (Inside Cab) f_053

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

TESTING

WARNING: To avoid property damage, personal injury or death, park the vehicle on a level surface, set the parking brake, chock the wheels and turn the engine off.

For Combined Stop and Turn:

1. Turn on vehicle headlights.
2. Verify that the tail light circuit, Cavity A of 7-way socket with brown 14 gauge wire, has battery voltage levels present.
3. Verify that the marker light circuit, Cavity D of 7-way socket with brown 14 gauge wire, has battery voltage levels present.
4. Turn OFF vehicle headlights.
5. Turn on left turn signal in vehicle.
6. Verify that left turn/stop circuit, Cavity B of 7-way socket with orange 16 gauge wire, is cycling between battery voltage and GND.
7. Turn off vehicle left turn signal.
8. Turn on right turn signal in vehicle.
9. Verify that right turn/stop circuit, Cavity C of 7-way socket with orange 16 gauge wire, is cycling between battery voltage and GND.
10. Turn off vehicle left turn signal.
11. Put the vehicle in reverse.
12. Verify that the body backup lights are working correctly.
13. Verify that the backup light circuit, Cavity E of 7-way socket with orange 16 gauge wire, has battery voltage levels present.
14. Take the vehicle out of reverse.
15. Turn key to accessory or IGN position.
16. Verify that the accessory circuit, Cavity F of 7-way socket with light blue 14 gauge wire, has battery voltage levels present.
17. Press the vehicle brake pedal.
18. Verify that the brake lights are functioning correctly.
19. Verify that the left turn/stop circuit, Cavity B of 7-way socket with orange 16 gauge wire, AND the right turn/stop circuit, Cavity C of 7-way socket with orange 16 gauge wire have battery voltage levels present.
20. Release brake pedal.

For Separate Stop and Turn:

1. Turn ON vehicle headlights.
2. Verify that the tail light circuit, Cavity A of 7-way socket with brown 14 gauge wire, has battery voltage levels present.
3. Verify that the marker light circuit, Cavity D of 7-way socket with brown 14 gauge wire, has battery voltage levels present.
4. Turn off vehicle headlights.
5. Turn on left turn signal in vehicle.
6. Verify that left turn circuit, Cavity A of 3-way socket with orange 16 gauge wire, is cycling between battery voltage and GND.
7. Turn off vehicle left turn signal.
8. Turn on right turn signal in vehicle.

9. Verify that right turn circuit, Cavity B of 3-way socket with orange 16 gauge wire, is cycling between battery voltage and GND.
10. Turn off vehicle left turn signal.
11. Put the vehicle in reverse.
12. Verify that the backup light circuit, Cavity E of 7-way socket with orange 16 gauge wire, has battery voltage levels present.
13. Take the vehicle out of reverse.
14. Turn key to accessory or IGN position.
15. Verify that the accessory circuit, Cavity F of 7-way socket with light blue 14 gauge wire, has battery voltage levels present.
16. Press the vehicle brake pedal.
17. Verify that the stop circuit, Cavity C of 3-way socket with orange 14 gauge wire, has battery voltage levels present.
18. Release brake pedal.

HOW TO ADD THIS FEATURE

This feature is not easy to install and every effort should be made to order the vehicle with the desired code.

Refer to the “How Do I” General Information section of this electrical guide for obtaining information on obtaining required circuits.

Refer to the 7-Way Socket at EOF for information covering circuit connections and use of the circuit diagram manual to aid in assembly.

AUXILIARY 7-WAY TRAILER SOCKET

Refer to Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – BOC and EOF.

08THG

AUX. TRAILER SOCKET 7-Way; With Battery Fed Circuit to Center Pin, With 25 AMP Fuse and Relay Controlled by Switch with Indicator Light on Instrument Panel (IP) Fed from Hot Battery Feed (Not Wired Thru Key Switch)

08THH

AUX. TRAILER SOCKET 7-Way; With Battery Fed Circuit to Center Pin, With 25 AMP Fuse and Relay Controlled by Switch with Indicator Light Controlled by Accessory Side of Key Switch, Switch Mounted on IP

08THU

TRAILER SOCKET 7-Way; With Battery Fed Circuit to Center Pin, With 30 Amp Fuse and Relay Controlled by Switch With Indicator Light on Instrument Panel Fed from Hot Battery Feed, When Parking Brake Is Applied, Not Wired Thru Key Switch

08TMN

TRAILER CONNECTION SOCKET {Phillips STA-DRY} 7-Way; Equipped With ABS Feed, Mounted at BOC and End of Frame Locations

These features allow a customer to connect two trailer lighting circuits to the vehicle. These options provide the same functionality as sales code 08HAB but provide a second 7-way socket next to the existing 7-way socket at the BOC.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

None

Refer to feature code 08HAB for wiring and installation information. The circuits from the first 7-way trailer socket are directly spliced to the circuits of the second 7-way trailer socket. Part numbers for the connector and terminals remain the same.

TRAILER AUXILIARY FEED CIRCUIT, 30 AMP ACCESSORY FEED

Refer to Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – BOC and EOF.

08TKK

TRAILER AUXILIARY FEED CIRCUIT for Electric Trailer Brake Accommodation/Air Trailer ABS; With 30 Amp Fuse and Relay, Controlled by Ignition Switch

These features enables a truck to be wired to accommodate multiple trailer sockets that will drive the electrical loads of either an air brake type trailer or a trailer with electric brakes.

The 30 amp feed may be used for air brake Trailer ABS Power or as a charging circuit for electric trailer brake batteries.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

None

Refer to feature code 08HAB for wiring and installation information. The circuits from the first 7-way trailer socket are directly spliced to the circuits of the second 7-way trailer socket. Part numbers for the connector and terminals remain the same. The circuit is routed to the end of the frame rail with blunt cut wires.

EXTENDING TAIL LIGHT HARNESSES

08NAA

TAIL LIGHT WIRING MODIFIED Includes: Separate Wiring for Standard Left and Right Tail Lights, With 8.0’ of Extra Cable; Separate Wiring for Left and Right Body-Mounted Tail Lights, With 8.0’ of Extra Cable

Feature code 08NAA provides eight additional feet of stop, turn, and tail light wiring to relocate the stop/turn lights provided with the vehicle.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

The extra harness length for code 08NAA is coiled at the EOF on both the right and left frame rail per view below. The loose harness connector is covered with a sealed connector. If standard tail lights are being removed, use sealing cap to protect open connector.

If a harness is to be connected to the OEM connector, see below for parts requirements. The part number for the 08NAA extension harness is 3547275C91.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 50 – Left Side Connector

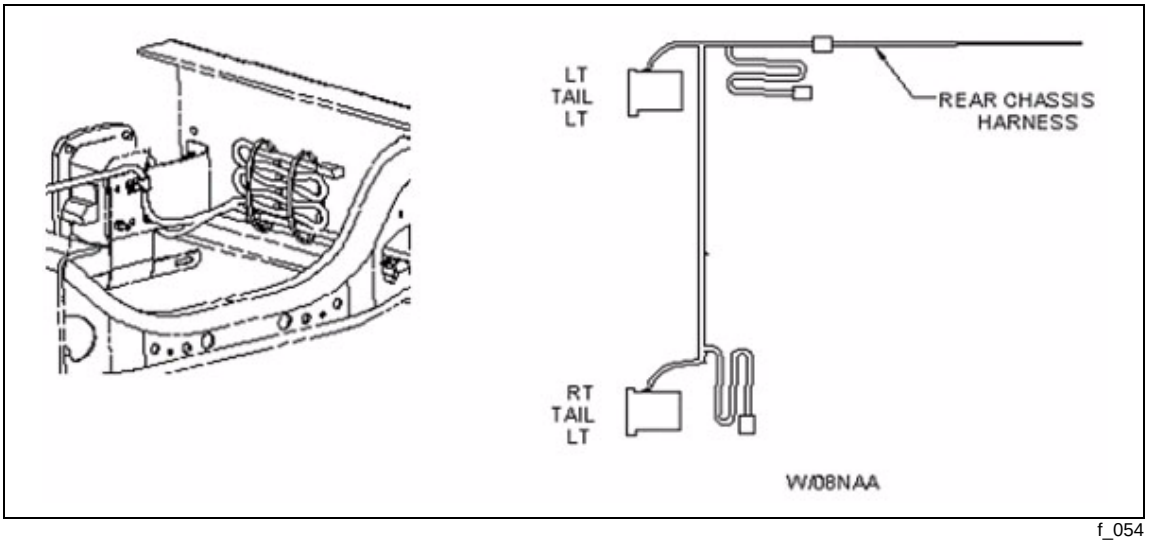
Connector Cavity Information and Parts Required to connect to OEM Connector					
Connector P/N	**Cavity**	**Circuit #**	**Description**	**Term P/N**	**Seal P/N**
1677851C1	A	S71H	Back up	2033911C1	589391C1
	B	S68F	Tail	2033911C1	589391C1
	C	S56E	Stop/Turn	2033911C1	589391C1
	D	Plug	--	2033911C1	589391C1
	E	S10-GF	GND	2033911C1	589391C1

Table 51 – Right Side Connector

Connector Cavity Information and Parts Required to connect to OEM Connector					
Connector P/N	**Cavity**	**Circuit #**	**Description**	**Term P/N**	**Seal P/N**
1677851C1	A	S71G	Back up	2033911C1	589391C1
	B	S68G	Tail	2033911C1	589391C1
	C	S57E	Stop/Turn	2033911C1	589391C1
	D	Plug	--	2033911C1	589391C1
	E	S10-GE	GND	2033911C1	589391C1

Plug P/N – 587579C1

Connector Lock P/N – 1677914C1



f_054

How To Add This Feature

See the part numbers identified in the “Wiring Information” section of this document.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

CENTER CHASSIS EXTENSION HARNESS

08WEB

SPECIAL WIRING HARNESS, BODY for Chassis, With 6' Additional Length to Accommodate Drop Frame Beverage Body Application

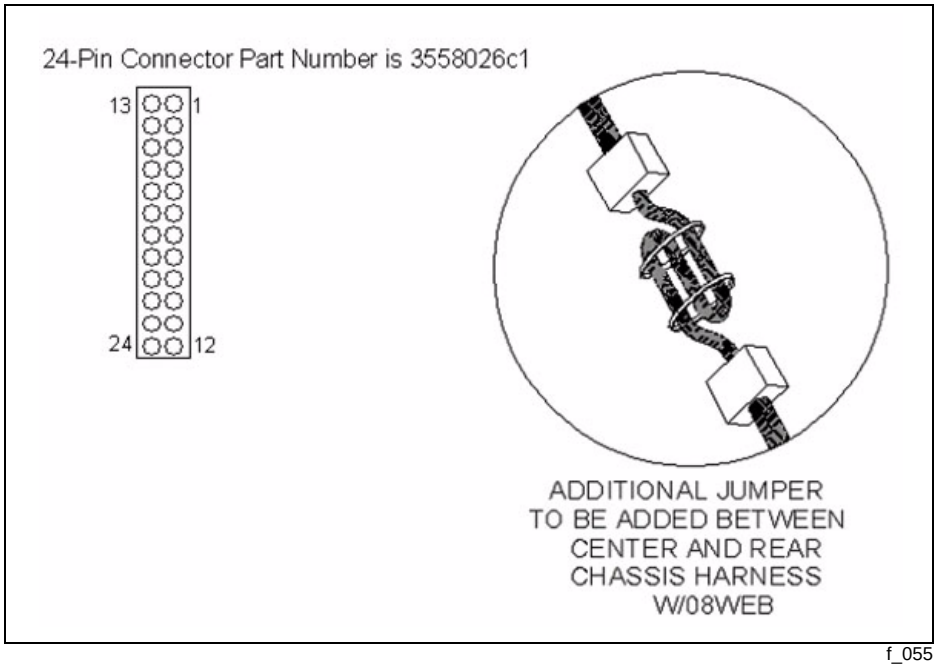
Feature code 08WEB provides an additional 6 feet to the center chassis harness. This feature is to accommodate drop frame applications but may be specified when additional chassis harness length is desired.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

A 6’ extension of the center chassis harness, part number 3560971C91, is provided for Beverage Body Applications. A 24-pin connector is provided at the end of the extension.



f_055

HOW TO ADD THIS FEATURE

See the part numbers identified in the “Wiring Information” section of this document.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

AUXILIARY HARNESS FOR AUXILIARY POWER SOURCE

08WEX

AUXILIARY HARNESS for Auxiliary Power Source; 30 Amp, Key Switched, 2-Pin Connector, Located on Floor Between Seats

This feature consists of an ignition key switched wiring that is routed up the right “A” pillar to the back of cab to a coil that when stretched out can reach between the seats. The circuit is protected with a 30 AMP fuse. This feature is only available on the 7000 models.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

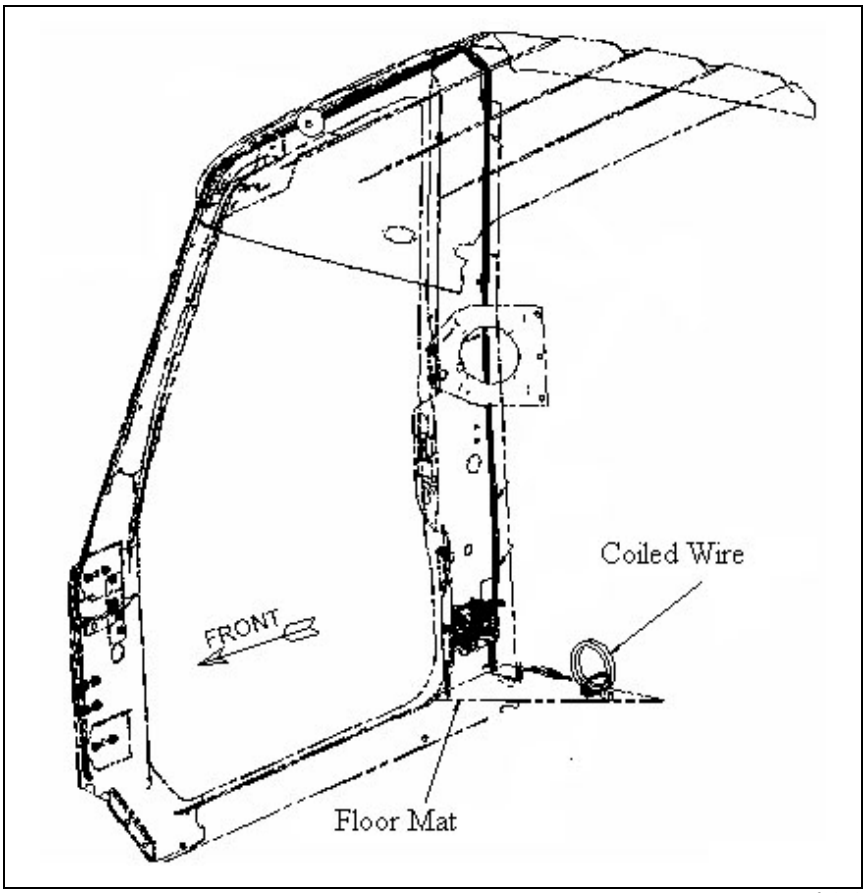
None

WIRING INFORMATION

The wiring inside back of cab includes both GND and feed circuits, and the circuits are terminated to a two pin connector. The GND circuit is white, and the Ign12V feed is orange.

Connector Part Number: 0587568C91

Connector ref # 1872F



View of Coiled Wire Location , Viewed From Inside Vehicle f_056

This switch is “hard wired” and there are no multiplex circuits associated with this feature. NOTE - This feature does depend on IGNITION key position, and can not be turned on with the key off.

If wire is to be routed out of cab the desired hole location for the harness to exit the cab and location may vary from customer to customer, circuits are left on the floor for customer to drill hole.

Note that there are floor or back of cab reinforcements that should not be drilled into. Remove interior components to locate harness and determine best hole location. Install grommet into the hole and seal around cables and grommet to prevent leakage of moisture into cab.

When connecting to load, be sure to use sealed connectors or a splice protected with heat shrink sleeve with an adhesive inner lining.

TESTING

1. Turn on ignition switch.

2. Verify that the added feature operates.

3. Verify that the feed wire is receiving battery voltage.

HOW TO ADD THIS FEATURE

If the vehicle was not ordered with the feature, it may be added. For information on parts and components, see "How Do I" General Information section of this electrical guide.

ELECTRIC TRAILER BRAKES

Refer to the Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Electric Trailer Brake.

08HAG

ELECTRIC TRAILER BRAKE/LIGHTS Accommodation Package to Rear of Frame (ROF); for Separate Trailer Stop, Tail, Turn, Marker Light Circuits; Includes Electric Trailer Brake Accommodation Package With Cab Connections for Mounting Customer- Installed Electric Brake Unit, Less Trailer Socket

08HAH

ELECTRIC TRAILER BRAKE/LIGHTS Accommodation Package to Rear of Frame; for Combined Trailer Stop, Tail, Turn, Marker Light Circuits; Includes Electric Trailer Brake Accommodation Package With Cab Connections for Mounting Customer-Installed Electric Brake Unit, Less Trailer Socket

These features provide a four-circuit breakout, blunt-cut with heat shrink covering located under the Instrument Panel (IP) on the left side of the steering column. The circuits include a Ground (GND) circuit, an electric brake feed to electric trailer brakes, a 30 Ampere (AMP) power circuit plus the stop lamp feed. The circuits are designed to work with all popular electric trailer brake controllers.

The two different features are designed to handle trailers with separate stop and turn and combination stop and turn circuits.

The seven circuits that connect to the trailer are located at the rear of frame and are blunt cut with heat shrink covering. The appropriate socket assembly needs to be added by the customer.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature codes: 595AHU, 595ABC

Software Feature Codes That Must Be Removed: 0595ABS

These parameters should be left at their factory default values!

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 52

Parameter	ID	Description	Default	Units	Min	Step	Max
LT_FT_Turn_ Hi_Current	1911	Left front turn signal high current detection level (AMPS)	10	A	0	10	0.1
LT_FT_Turn_ Lo_Current	1910	Left front turn signal low current detection level (AMPS)	0.5	A	0	10	0.1
LT_FT_Turn_ OC_Current	1912	Left front turn signal open circuit detection level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ Hi_Current	1914	Right front turn signal high current detection level (AMPS)	10	A	0	10	0.1
RT_FT_Turn_ Lo_Current	1913	Right front turn signal low current detection level (AMPS)	0.5	A	0	10	0.1
RT_FT_Turn_ OC_Current	1915	Right front turn signal open circuit detection level (AMPS)	0.5	A	0	10	0.1

WIRING INFORMATION

For circuit installation, see Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Electric Trailer Brake.

The circuit colors/function to the electric brake controller are as follows:

Table 53

Circuit	Wire Color	Wire Gauge
Power feed to the controller	Black	12
Stop lamp feed	Red	16
Feed to electric trailer brakes	Grey	10
GND	White	16

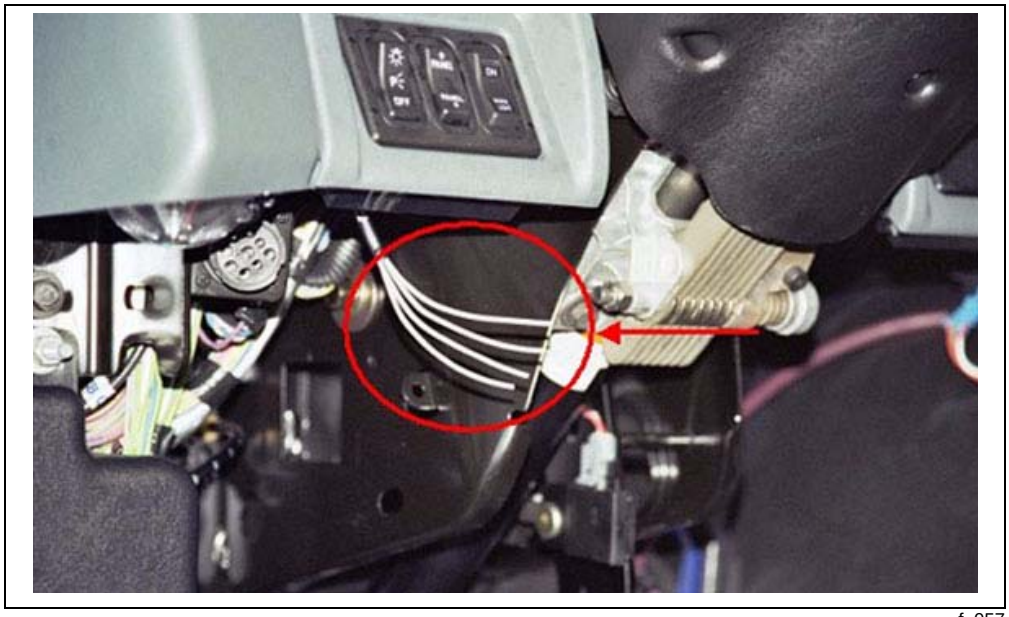
08HAG and 08HAH provides seven blunt-cut wires located at end of frame and four blunt-cut wires located under cab IP.

The following are the wires for the circuits found in the blunt-cut wires located at the end of the frame.

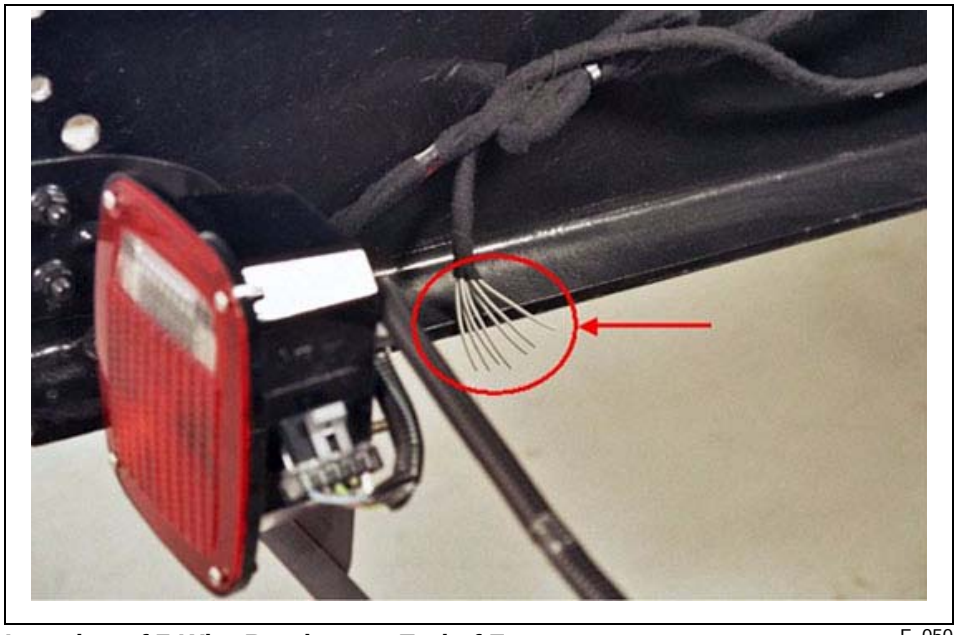
Table 54

Circuit Number	Maximum Current	Description/Labeled	Color
08HAG and 08HAH Label Number (Connector 9724)			
R70	30 A	Stop Lights	Red
R68	20 A	Park Lights	Brown
R94	30 A	Trailer Brake	Grey
R58	20 A	Identification Lights	Brown
R10	N/A	GND	White
08HAG Connector (Connector 9724)			
R56	15 A	Left Turn	Yellow
R57	15 A	Right Turn	Light Green
08HAH Connector (Connector 9724)			
R56	15 A	Left/Stop Turn	Yellow
$57	15 A	Right/Stop Turn	Light Green
08HAG and 08HAH Label ETB Controller (Connector 1923)			
AJ11-GNA	--	GND Signal	White
A14NS	30 A	Power Supply Signal	Black
A70NS	15 A	Stop Lights	Red
A94T	20 A	Elec Brake Signal	Dark Blue

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS



Location of 4-Wire Breakout under Dash f_057



Location of 7-Wire Breakout at End of Frame F_050

NOTE: Many trailers combine trailer marker lamps with the tail lamp. If this has been done, leave the black circuit covered with the heat shrink tube.

TESTING

1. Make proper trailer connections.
2. Turn on headlights.
3. Verify that the brown tail light wire and the black identification light wire have battery voltage levels present.
4. Turn off headlights.
5. Press the footbrake.
6. Verify that the red brake wire has battery voltage levels present.
7. Release the footbrake.
8. Turn on the left turn signal.
9. Verify that the yellow left turn signal wire is cycling between battery voltage and GND.
10. Turn off left turn signal.
11. Turn on the right turn signal.
12. Verify that the light green right turn signal wire is cycling between battery voltage and GND.
13. Turn off right turn signal.
14. Activate trailer brakes with the trailer brake controller.
15. Verify that the dark blue electric trailer brake wire has variable voltage levels present commensurate with the position of the brake controller lever.
16. Verify that trailer brakes are functioning correctly by calibrating the electric trailer brake controller according to the manufacturer's instructions.

TRAILER SOCKETS

Refer to Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Body Builder and Trailer Socket – BOC and EOF.

08TME

TRAILER CONNECTION SOCKET 7-Way; Mounted at EOF, Wired for Turn Signals Independent of Stop, Compatible with Trailers That Have Amber or Side Lamps

08TMG

TRAILER CONNECTION SOCKET 7-Way; Mounted at EOF, Wired for Turn Signals Combines With Stop, Compatible With Trailers That Use Combined Stop, Tail, Turn Lamps

These features are used to connect trailer lighting circuits to the vehicle. These options are for providing separate and combined stop and turn signals and are located at the EOF. These 7-way sockets provide IGN-controlled fused 30 AMP center pins for trailer Antilock Brake Systems (ABS). Feature 08TMG is designed for trailers with combined stop and turn lamps. With all trailer connection features, the socket is a standard SAE recommended socket used in the trucking industry. The circuit arrangement in the socket is also the same as SAE recommendation, except for 08TMG which has no separate stop circuit.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software Feature Codes that must be added: 595ABW, 595AAD, and 595ABC.

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

These parameters should be left at their factory default values!

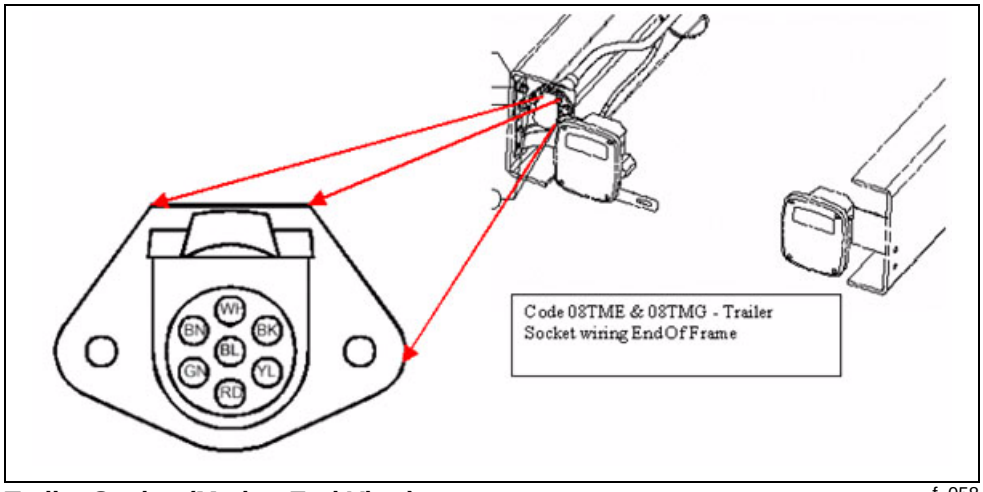
BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 55

Parameter	ID	Description	Default	Units	Min	Max	Step
LT_FT_Turn_ Lo_Current	1910	Park and ID Lights Low Current Detection Level (Amps)	0.5	A	0	10	0.1
LT_FT_Turn_ Hi_Current	1911	Park and ID Lights High Current Detection Level (Amps)	10	A	0	10	0.1
LT_FT_Turn_ OC_Current	1912	Park and ID Lights Open Circuit Detection Level (Amps)	0.5	A	0	10	0.1
RT_FT_Turn_ Lo_Current	1913	Park and ID Lights Low Current Detection Level (Amps)	0.5	A	0	10	0.1
RT_FT_Turn_ Hi_Current	1914	Park and ID Lights High Current Detection Level (Amps)	10	A	0	10	0.1
RT_FT_Turn_ OC_Current	1915	Park and ID Lights Open Circuit Detection Level (AMPS)	0.5	A	0	10	0.1

WIRING INFORMATION

A 7-Way Trailer socket is provided at the end of the driver's side frame rail.



Trailer Socket (Mating End View) f_058

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

Table 56 – Electrical Description of 08TME

Circuit Description	Fused	Available Current	Color
GND	--	--	White
Tail Lamp	20	20	Brown
Right Turn	15	15	Green
Left Turn	15	15	Yellow
Marker	20	20	Black
Stop	30	30	Red
Center Pin	30	30	Blue

Table 57 – Electrical Description of 08TMG

Circuit Description	Fused	Available Current	Color
GND	--	--	White
Tail Lamp	20	20	Brown
Right Turn	15	15	Green
Left Turn	15	15	Yellow
Marker	20	20	Black
Stop	--	Not Provided	--
Center Pin	30	30	Blue

TESTING

08TME

1. Turn on vehicle headlights.
2. Verify that the tail lights circuit (brown wire, top left cavity on trailer socket) has battery voltage levels present.
3. Verify that trailer marker circuit (black wire, top right cavity on trailer socket) has battery voltage levels present.
4. Turn off vehicle headlights.
5. Turn on vehicle right turn lamp.
6. Verify that the trailer right turn lamp circuit (green wire, bottom left cavity on trailer socket) is cycling between battery voltage and GND.
7. Turn off vehicle right turn lamp.
8. Turn on vehicle left turn lamp.
9. Verify that the trailer left turn lamp circuit (yellow wire, bottom right cavity on trailer socket) is cycling between battery voltage and GND.
10. Turn off vehicle left turn lamp.
11. Press the vehicle brake pedal.
12. Verify that the trailer brake light circuit (red wire, bottom center cavity on trailer socket) has battery voltage levels present when the IGN key is in the accessory position.
13. Verify that trailer brake circuit (Blue wire, center cavity on trailer socket) has battery voltage levels present.
14. Release brake pedal.

08TMG

1. Turn on vehicle headlights.
2. Verify that the tail lights circuit (brown wire, top left cavity on trailer socket) has battery voltage levels present.
3. Verify that trailer marker circuit (black wire, top right cavity on trailer socket) has battery voltage levels present.
4. Turn off vehicle headlights.
5. Turn on vehicle right turn lamp.

6. Verify that the trailer right turn/stop lamp circuit (green wire, bottom left cavity on trailer socket) is cycling between battery voltage and GND.
7. Turn off vehicle right turn lamp.
8. Turn on vehicle left turn lamp.
9. Verify that the trailer left turn/stop lamp circuit (yellow wire, bottom right cavity on trailer socket) is cycling between battery voltage and GND.
10. Turn off vehicle left turn lamp.
11. Press the vehicle brake pedal.
12. Verify that the right turn/stop circuit (green wire, bottom left cavity on trailer socket) and the left turn/stop circuit (yellow wire, bottom right cavity on trailer socket) have battery voltage levels present.
13. Verify that the trailer brake light circuit (red wire, bottom center cavity on trailer socket) has battery voltage levels present when the IGN key is in the accessory position.
14. Release brake pedal.

How To Add This Feature

Adding these features after the vehicle is built is not an easy task. It is encouraged that the vehicle be ordered with the desired feature.

Refer to the “How Do I” General Information section of this electrical guide to obtain information on circuits and components. It is necessary to have the circuit diagram manual that applies to the vehicle to complete the installation.

The installation requires additional fuses and relays be added to the Power Distribution Center (PDC) in the cab. Be sure to label the function of the added relays and fuses to the decal on the underside of the PDC cover.

The loose circuits will be numbered and correspond to the circuits outlined in the circuit diagram manual.

BODY BUILDER WIRING FOR STOP/TAIL/TURN LIGHTS

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

WORK LIGHT/AUXILIARY REAR LIGHT

Refer to the Circuit Diagram Manual S08322, Chapter 9, Lights, Fog Light and Work Light.

Tractor

08WLL

WORK LIGHT; Pedestal Mounted With Switch on Instrument Panel

08WAA

WORK LIGHT; Pedestal Mounted With Switch on Instrument Panel (Truck Lite 81 Series)

Straight Truck

08WMA

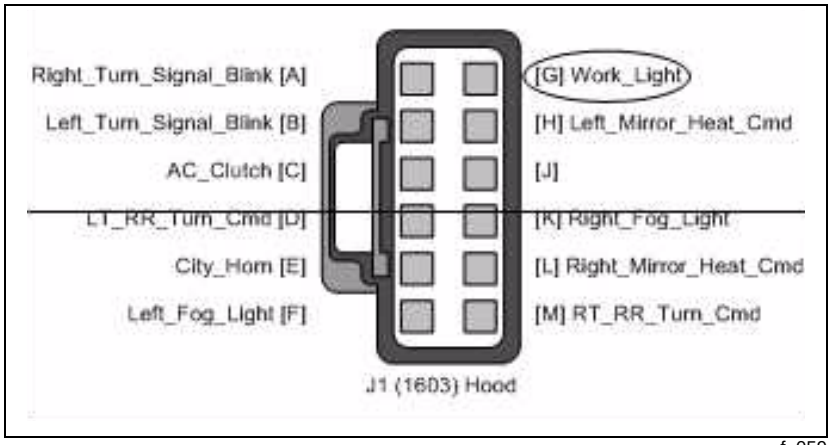
WORK LIGHT TOGGLE SWITCH, on Instrument Panel and Wiring Effects for Customer Furnished Back of Cab Light

08WXN

WORK LIGHT (2) (Grote) 60 Series, Mounted Under Hood One Each Side

With the International®-installed work light (08WLL, 08WAA), nighttime trailer hook-ups are made easier with a work light mounted at the Back of Cab (BOC) on tractors. This light illuminates the fifth wheel area of the vehicle. Both features include a switch in the Instrument Panel (IP), or 08WMA can also come with a push button switch located below the instrument cluster. Either switch will illuminate when the switch is on. These features provide an out-of-cab load on pin G of the Body Controller (BC) connector #1603. The feature without the light (08WMA) can be used to satisfy any number of electrical needs for vehicles with straight truck brakes (4091) such as lights inside dry van boxes, small pumps, and illumination to aid in various job functions.

If the engine is off, there is a time out feature, which is factory set at 120 minutes. The time out period can be changed through the Diamond Logic® Builder software (see local dealer if not owned). If the vehicle is running, the work light will not time out after 120 minutes. If the work light is left on when the vehicle is moving, the green indicator light in the work light switch will flash.



f_059

1603 (BC J1)

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

Work Light Located in Switch Pack f_060

Push Button Switch Located Below the Instrument Cluster f_061

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS-REQUIRED SOFTWARE FEATURE CODES

08WLL, 08WAA: 595ABR Switch located in the switch pack

08WMA:

- 595ABR or
- 595AMU Switch located below the instrument cluster in position B and
- 595AJE

08WXN:

- 595AMU Switch located below the instrument cluster on right side

The Work_Light_Timeout_Enable parameter is used to set the amount of time that the customer desires the work light to remain on after the IGN key is turned off. This parameter is for customers who desire to have their work light time out after a specified length of time so that the light does not drain the battery(s) in case the operator forgets to turn the work light off.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

If the current in the work light circuit falls below the level set by the Work_Light_Lo_Current parameter, the Body Controller (BC) will register a fault code.

If the current in the work light circuit exceeds the level set by the Work_Light_Hi_Current parameter, the Body Controller (BC) will shut off the circuit and register a fault code.

The Work_Light_OC_Current parameter should be left at its factory default of zero.

Table 58

Parameter	ID	Description	Default	Units	Min	Max	Step
Work_Light_ Timeout_ Enable	640	This signal is a parameter that can be adjusted to vary the amount of time that the work light will remain on after the IGN key is turned off. If this value is set to 6, the work light will remain on for 60 minutes after the IGN key is turned off.	120	Min	10	1440	10
Work_Light_ Lo_Current	1898	Work Light Low Current Detection Level (Amps)	0	A	0	10	0.1
Work_Light_ Hi_Current	1899	Work Light High Current Detection Level (Amps)	10	A	0	10	0.1
Work_Light_ OC_Current	1900	Work Light Open Circuit Detection Level (Amps)	0	A	0	10	0.1
Load_Shed_ Level _Work_ Light	2327	Level at which GEN2 work light is shed	1	List	0	3	1
Work_Light_Off_ Speed	2568	Speed at which the Work Light will be turned off	90	Mph	1	90	2

WIRING INFORMATION

The maximum current load for the work light/aux light is 10 AMPS. The circuit protection is internal to the Body Controller (BC).

Table 59 – Parts Required to Connect to Work Light Cable

Connector Part #	Lock Part #	Term Part #	Seal Part #
1661778C1	1661874C1	1661875C1	1661872C1

Table 60 – Terminals Designed for 16-Gauge Wire

Connector Cavity	Circuit Number	Circuit Description
A	N65	Work Light Feed
B	N65-G	Work Light GND

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

Arrow Indicates Location of Work Light Connector (Straight Truck) f_062

Arrow Indicates Location of Work Light (Tractor) f_063

TESTING

1. Activate work light switch.
2. Verify that pin G (labeled Work_Light) on the Body Controller (BC) connector (#1603) is providing battery voltage.
3. Verify that the work light (or alternate load) is functioning properly.
4. Turn work light switch OFF.
5. Verify that the work light output goes OFF.

HOW TO ADD THIS FEATURE

- For 08WLL, the software feature code 595ABR must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).
- For 08WMA, the software feature codes 595ABR or 595AMU (dependent on switch location) and 595AJE must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).
- For 08WXN, the software feature code 595AMU must be enabled on the vehicle using Diamond Logic® Builder software (see local dealer).
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see local dealer if software is not owned).
- The customer must then wire the desired load into the pin labeled Work_Light on the Body Controller (BC) output connector (#1603 – Work Light).
- The customer must install a 3-position momentary rocker switch (part number 3549804C91) in the switch pack or appropriate part number for switch located below the gauge cluster. The switches are backlit with an amber light for better viewing during night operations. The switch has a green indicator light in the top half of the switch to indicate when the work light is on.

AUXILIARY 40 AMP CIRCUIT, SWITCH CONTROLLED

Refer to the Circuit Diagram Manual S08322, Chapter 10, Aux and Power Source.

08XBK

SWITCH, AUXILIARY Switch 40 AMP Circuit for Customer Use; Includes Wiring Connection in the engine compartment near the megafuse

Feature code 08XBK provides a 40 AMP battery feed for customer use. An in-cab rocker switch controls the circuit. A blank window switch is provided with this feature along with a graphic overlay kit that allows custom labeling of the switch function.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software Feature Codes that must be added: 595AJH Body Controller (BC) Prog, SWITCH AUXILIARY In Center Panel, With 40 AMP Fuse Circuit, Accessory-Controlled

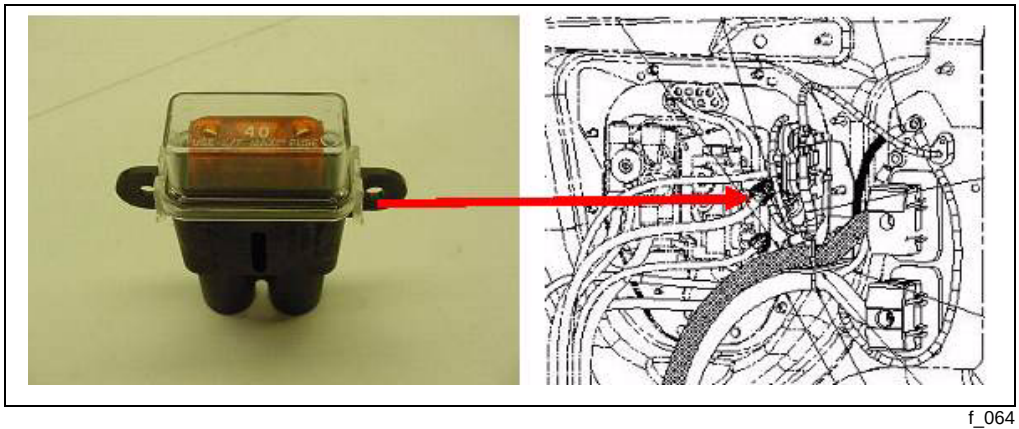
SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

WIRING INFORMATION

A blunt-cut wire (light green) taped back to the dash harness near the megafuse is provided for customer interface to this circuit. The battery feed to this wire is through a relay that is enabled by a 12V signal from the Body Controller (BC) connector 1601 pin E5 when the switch is activated.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES



f_064

TESTING

To test this circuit, verify that battery voltage is present at the wire provided when the in-cab switch is activated with the IGN key in the on or accessory position. The green indicator in the rocker switch shall be illuminated when the output is on.

HOW TO ADD THIS FEATURE

If the vehicle was not ordered with the feature, it may be added. For information on parts and components, see “How Do I” - General Information section of this electrical guide.

Use the Diamond Logic® Builder software to add the following software feature: 595AJH BC Prog, SWITCH AUXILIARY In Center Panel, With 40 AMP Fuse Circuit, Accessory-Controlled.

Also refer to the “Center Panel” tab in the Diamond Logic® Builder software to determine the assigned location of the rocker switch for this feature.

OTHER EXTERNAL LIGHTING

08TMH

SWITCH, AUXILIARY Accessory Control; for Wiring in Roof, With Maximum of 20 AMP Load with Switches in the Instrument Panel

This feature consists of a switch mounted in the center panel with wiring that is routed up the right “A” pillar. The circuit is protected with a 20 AMP fuse. This feature is only available on the WorkStar models.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

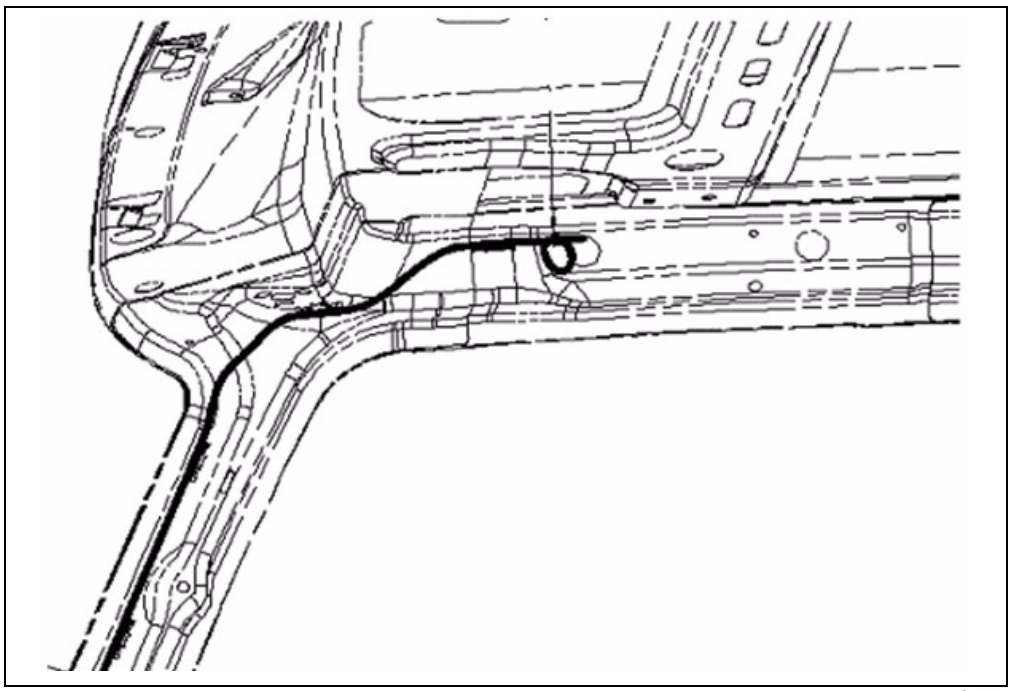
WIRING INFORMATION

The wiring in the roof includes both GND and feed circuits, and the circuits are blunt-cut covered with a heat shrink sleeve. The GND circuit is white, and the feed is brown.

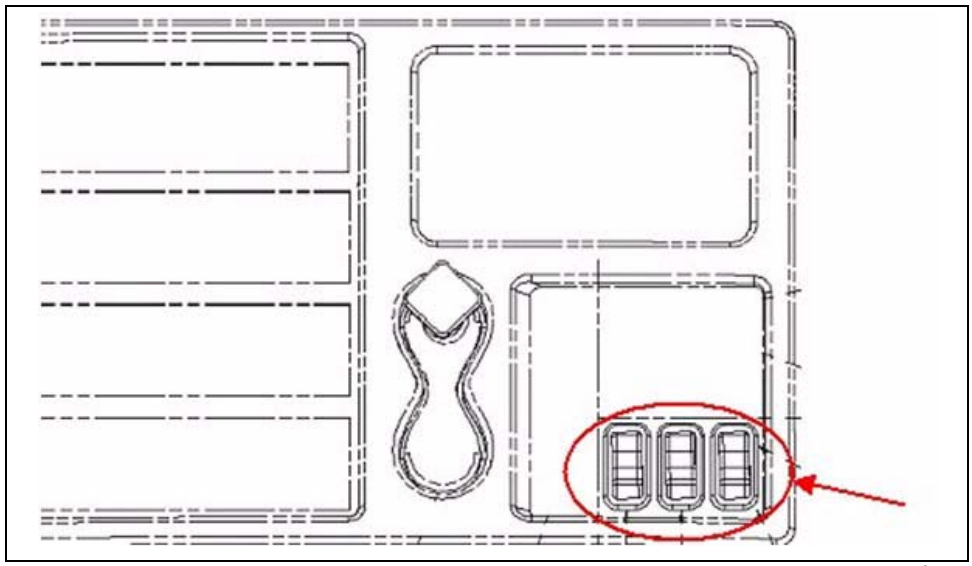
Switch Part Number: 3557932C1

Switch Label: "Roof Aux"

WORK LIGHT AND OUTSIDE CAB POWER FEATURES



View of the Right Pillar and Roof Area, Viewed From Inside Vehicle f_065



Switch Controlling the Aux Roof Circuit Will Be In One of Three Switch Positions Viewed Above f_066

This switch is “hard wired” and there are no multiplex circuits associated with this feature. The switch is lighted to give an “ON” indication.

NOTE: This feature does not depend on any IGN key position, and can be turned on with the key off. Care must be taken as leaving the switch on may discharge the batteries.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

Since the desired hole location for the harness to exit the cab and location may vary from customer to customer, circuits are left in roof for customer to drill a hole.

NOTE: There are roof reinforcements that should not be drilled into or through. Lower the headliner to locate the harness and determine the best location to drill a hole. Install a grommet into the drilled hole and seal around the cables and grommet to prevent leakage of moisture into cab.

When connecting to load, be sure to use sealed connectors or a splice protected with heat shrink sleeve with an adhesive inner lining.

TESTING

1. Turn on in-cab switch.

2. Verify that the added feature operates.

3. Verify that the feed wire is receiving battery voltage.

HOW TO ADD THIS FEATURE

If the vehicle was not ordered with the feature, it may be added. For information on parts and components, see “How Do I” General Information section of this electrical guide.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

IN-CAB LIGHTING

ELECTRICAL SYSTEM 12-Volt, Standard Equipment

This standard connection provides a fused connection point (5 AMPS maximum for all circuits connected to this point) to allow auxiliary lights to be dimmed as the panel lights are dimmed.

This circuit utilizes a Pulse Width Modulated (PWM) signal. Do not connect a relay coil to it.

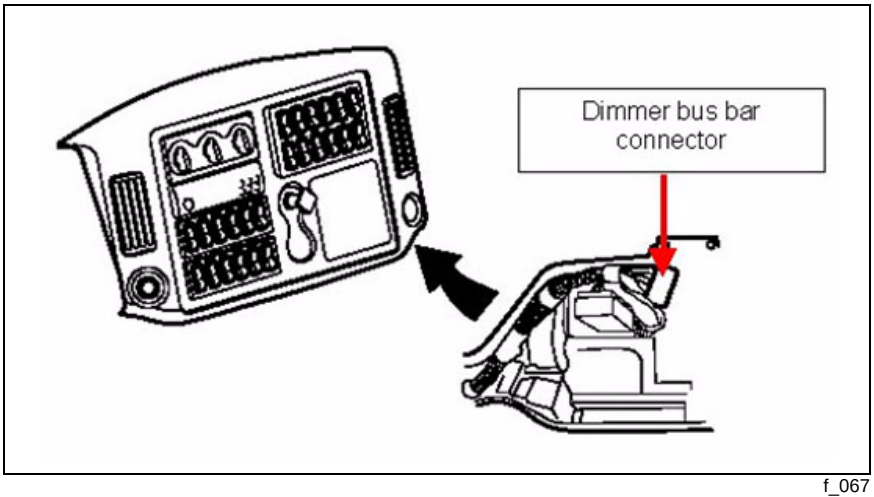
SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software Feature Codes that must be added: NONE

Software Feature Codes that must be removed: NONE

WIRING INFORMATION

The connection is located under the instrument panel left of the interior fuse panel.



f_067

To connect to this circuit, remove the lock from the wire side of the bus bar connector and insert the added wire with terminal (terminal part number 1661208C1) on an unused connection point.

NOTE: The cover opposite the wires should also be removed to verify that the new connection is properly seated.

Re-install the cover and lock.

TESTING

Check that the added circuit properly dims when the panel dimmer switch is activated with the headlamp switch in the PARK or ON position.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

LIGHTS ON WITH WIPERS (LOWW)/DAY TIME RUNNING LIGHTS (DTRL)

Parameter 317

Lights On With Wipers (LOWW) - None

The Lights On With Wipers (LOWW) function turns on low beam headlights (tail, marker and clearance lights are also turned on with low beam headlights) whenever the windshield wipers are ON steady or intermittent. The headlights will not be enabled in washer mode. When the wipers are turned OFF, headlights will remain ON until the key is turned OFF or the headlight switch is cycled from OFF to ON to OFF.

Parameter 188

Day Time Running Lights (DTRL) – None

The Day Time Running Lights (DTRL) function will turn on low beam headlights at 75% of normal brightness whenever the key is in the RUN position and the Park Brake is OFF.

Both features may be enabled or disabled by using the Diamond Logic® Builder software. Note: the DTRL is required by law for Canadian registered vehicles and the feature must not be turned off.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code: 595ALB

Software Feature Codes that must be removed: 595ALH

Table 61

Parameter	ID	Description	Default	Units	Min	Max	Step
LOWW_ Enabled	317	Activate/Deactivate headlights on with wipers. A value of 1 enables and a value of 0 disables this feature.	Off	On/Off	N/A	N/A	N/A
DTRL_ Enabled (See Note)	188	Activate/Deactivate day time running lights. A value of 1 enables and a value of 0 disables this feature.	On	On/Off	N/A	N/A	N/A

NOTE: The DTRL_Enable parameter is accessible only to Dealers.

WIRING INFORMATION

None required.

TESTING

LOWW

1. Turn on wipers (to the low speed) with IGN switch in run position.
2. Verify that the low beam headlights (and tail, marker and clearance lights) are on.
3. Turn on wipers (intermittent) with IGN in Run position.
4. Verify low beam headlights are on.
5. Turn off wipers and verify headlights remain on.
6. Cycle the Headlight switch and verify that headlights are off.

DTRL

1. Set the IGN switch to run with the park brake off.
2. Verify that low beam headlights are on.

3. Set the park brake to on and verify that the low beam headlights turn off.

4. Set the IGN switch to accessory with the park brake off and verify that the low beam headlights are off.

How To Add This Feature

LOWW

1. Activate the LOWW_Enabled parameter using the Diamond Logic® Builder software, or see a dealer.

DTRL

2. Go to your local dealer and have them enable the DTRL_Enabled parameter with their version of the Diamond Logic® Builder software.

WORK LIGHT AND OUTSIDE CAB POWER FEATURES

AIR CONDITIONING

AIR CONDITIONING

AIR CONDITIONING

Refer to the circuit diagram in S08322, Chapter 12, Air Conditioning.

16WKB

Air Conditioner (International® Blend Air) with integral heater, defroster and R134-A Refrigerant.

This is an electrical connection point for detecting when the air conditioner clutch is on. No direct electrical connection point is provided for tapping into the A/C clutch wire. However, if an A/C clutch connection is necessary, the Body Builder may use proper splice techniques to tap into wire AC77A. The added load required by the Body Builder should not exceed two Amperes (AMPS). This control wire shall be at battery volts when the A/C clutch is on and 0 volts when off. The software in the Body Controller (BC) determines when the A/C clutch should be on or off based upon the mode of the HVAC controls in the cab and condenser temperatures and high side pressures of the A/C system.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

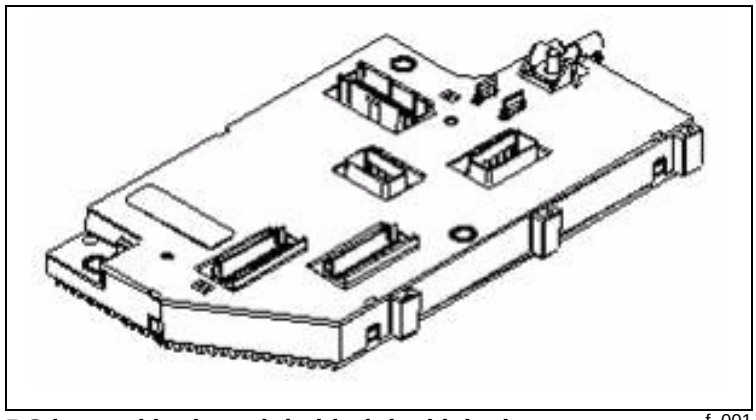
WIRE GAUGE: 16 Gauge

WIRE NUMBER/COLOR: AC77A-LTGN

BC connector (1603): Pin C

TERMINAL: 3534163C1

CIRCUIT DIAGRAM: See Electrical Circuit Diagram Manual S08322 Chapter 12, Air Conditioning.



f_001

BC located in the cab behind the kick plate next to the driver's left foot

TESTING

1. Start the vehicle. Turn on air conditioner.
2. Verify that the wire feeding the body load is at battery volts when the A/C Clutch is ON and 0 volts when OFF.
3. Ensure that no faults codes are present when the truck is on.

AIR CONDITIONING

Body Builder Important Information

In some applications it may be advantageous to add an additional A/C evaporator to cool remote areas of the vehicle. The following procedures and part numbers will accommodate this addition.

NOTE: Do not break into the A/C clutch circuit for the purpose of controlling the A/C system.

Do not connect to the high side of the pressure transducer.

Do not connect to either of the A/C system thermistors.

Parts Information

2007 MaxxForce DT and MaxxForce 9 Engines, Low Cab Mount

Hose, A/C assy accumulator to compressor – 3613035C92

Hose, A/C assy condenser to evaporator – 3613034C93

Hose, A/C assy compressor to condenser – 3613033C94

2007 MaxxForce DT, MaxxForce 9 and MaxxForce 10 Engines, Mid High Cab

Hose, A/C assy accumulator to compressor – 3613038C92

Hose, A/C assy condenser to evaporator – 3616067C93

Hose, A/C assy compressor to condenser – 3613036C92

2007 MaxxForce 7

Hose, A/C assy accumulator to compressor – 3612962C93

Hose, A/C assy condenser to evaporator – 3613034C93

Hose, A/C assy compressor to condenser – 3612960C94

Procedure

WARNING: To avoid property damage, personal injury or death, park the vehicle on a level surface, set the parking brake, chock the wheels and turn the engine off.

WARNING: Wear a face shield, or other adequate eye protection, and nonporous gloves when working with refrigerant. The temperature of liquid refrigerant may cause injury or blindness if the refrigerant contacts the eyes. Should liquid refrigerant come in contact with skin, remove contaminated clothing, including shoes and treat the injury as though the skin had been frostbitten. See a doctor immediately.

WARNING: Refrigerant must be recovered from the air conditioning system before any components of the system are replaced. Removing components while pressure is in the system will cause personal injury or death.

1. Recover the refrigerant from the A/C system.
2. Remove the A/C hose from the condenser to the evaporator and install the new hose.
3. Remove the A/C hose from the accumulator to the compressor and install the new hose.
4. Install the A/C hose from the new evaporator to the aux. fitting on the newly installed hose from the condenser to the evaporator.
5. Install the A/C hose from the new evaporator to the aux. fitting on the newly installed hose from the accumulator to the compressor.
6. Evacuate the system.
7. Recharge the system using R-134A refrigerant. The original truck system holds 30 oz. and the new evaporator should require an additional 16 oz. The additional requirement will vary from system to system depending on the length of hoses and the capacity of the new evaporator. The additional capacity will also require an additional 40 cc (1.2 fl. Oz.) of PAG oil in the system.

CAUTION: Failure to add additional PAG oil to the increased capacity A/C system will result in improper lubrication and lead to premature component failure.

8. Operate the vehicle to make sure the A/C is performing properly and is not leaking.

A/C COMPRESSOR ACCOM. DUAL; FOR LOW SPEED ACCELERATION DISABLE, FOR AFTERMARKET A/C SYSTEM

595AZR

This feature shall activate high side relay driver outputs A/C Compressor Clutch RD1 and A/C Compressor Clutch RD2. Output will be defaulted to turn off when vehicle is not accelerating from a stop. This feature is used to reduce engine load added by the AC compressors.

Normal Operation

The feature shall set AC_Clutch_RD_1 and AC_Clutch_RD_2 if the following conditions are true:

- (Ignition Signal is ON AND Current Gear is in Neutral AND Park Brake is Set)

OR

- (Ignition Signal is ON AND Current Gear is not in Neutral AND Park Brake is not Set AND Wheel Based Vehicle Speed is less than 1mph AND Accelerator Pedal Position is less than Accelerator 8%)

OR

- (Ignition Signal is ON AND Current Gear is not in Neutral AND Park Brake is not Set AND Wheel Based Vehicle Speed is greater than 4mph AND Engine Speed is greater than or equal to Engine Speed AC Compressor On Speed)

The feature shall reset AC_Clutch_RD_1 and AC_Clutch_RD_2 if the following conditions are true:

- Ignition Signal is Off

OR

- (Current Gear is not in Neutral AND Park Brake is not set AND Wheel Based Vehicle Speed is less than or equal to 4mph AND Accelerator Pedal Position is greater than or equal to Accelerator 8%)

NOTE: Please use the Diamond Logic® Builder software to determine pin locations on the Body Controller.

If pin locations F13 and F14 are being used by other features, contact Vehicle Programming Support for assistance.

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software.

Required Software Feature Code

595AZR

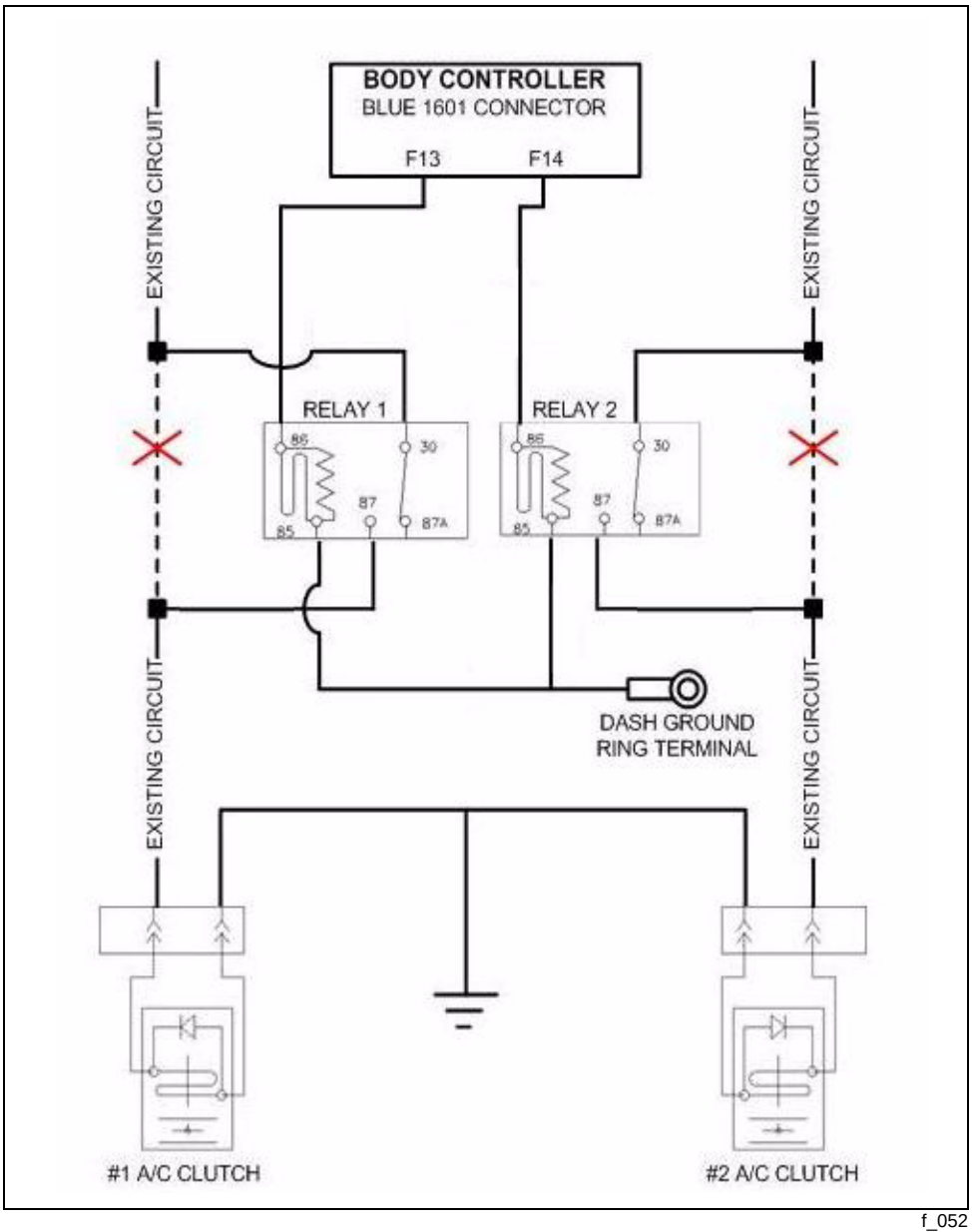
Conflicts With Software Feature

595ABC

There are no programmable parameters associated with this feature.

WIRING INFORMATION

See the graphic below. Install the circuits, as illustrated, if they were not factory installed.



f_052

TESTING

1. With Park Brake released, Air Conditioning Demand on and compressor running, accelerate from a stop. The Compressor (s) should be shut off, upon initial acceleration is completed.
2. The Compressor (s) should be shut off, upon initial acceleration is completed.

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

AUTOMATIC TRANSMISSION INTERFACES

13AHE

TRANSMISSION, AUTOMATIC {ALLISON 1000_HS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Less PTO Provision, Includes Park Pawl, Less Retarder, With 19,500-lb GVW & 26,000-lb GCW Max

13AHK

TRANSMISSION, AUTOMATIC {ALLISON 1000_PTS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Less PTO Provision, Includes Park Pawl, Less Retarder, With 19,500-lb GVW & 26,000-lb GCW Max

13AKX

TRANSMISSION, AUTOMATIC {ALLISON 1000_RDS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, With PTO Provision, Less Retarder, With 19,500-lb GVW & 26,000-lb GCW Max.

13AKY

TRANSMISSION, AUTOMATIC {ALLISON 1000_EVS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, With PTO Provision, Less Retarder, With 19,500-lb GVW & 26,000-lb GCW Max.

13AHG

TRANSMISSION, AUTOMATIC {ALLISON 2100_HS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Less PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHJ

TRANSMISSION, AUTOMATIC {ALLISON 2500_HS} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Less PTO Provision, Less Retarder, With 33,000-lb GVW & GCW Max.

13AHL

TRANSMISSION, AUTOMATIC {ALLISON 2100_PTS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Less PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHN

TRANSMISSION, AUTOMATIC {ALLISON 2500_PTS} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Less PTO Provision, Less Retarder, With 33,000-lb GVW & GCW Max.

13AHP

TRANSMISSION, AUTOMATIC {ALLISON 2100_RDS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; With PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHS

TRANSMISSION, AUTOMATIC {ALLISON 2500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; On/Off Hwy; 33,000 lb GVW & GCW Max., With PTO Provision, Less Retarder

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

13AHT

TRANSMISSION, AUTOMATIC {ALLISON 2500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Refuse; With PTO Provision, Less Retarder, With 24,200-lb GVW Max.

13AHU

TRANSMISSION, AUTOMATIC {ALLISON 2100_EVS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; With PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHW

TRANSMISSION, AUTOMATIC {ALLISON 2500_EVS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; With PTO Provision, Less Retarder, With 33,000-lb GVW & GCW Max.

13AHY

TRANSMISSION, AUTOMATIC {ALLISON 2500_MH} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive, Less PTO Provision, Less Retarder, With 33,000-lb GVW & GCW Max.

13ALN

TRANSMISSION, AUTOMATIC {ALLISON 2500_SP} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Less PTO Provision, Less Retarder, With 33,000-lb GVW & GCW Max.

13AHH

TRANSMISSION, AUTOMATIC {ALLISON 2200_HS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, Less PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHM

TRANSMISSION, AUTOMATIC {ALLISON 2200_PTS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, Less PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHR

TRANSMISSION, AUTOMATIC {ALLISON 2200_RDS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, With PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13AHV

TRANSMISSION, AUTOMATIC {ALLISON 2200_EVS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, With PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max.

13ALG

TRANSMISSION, AUTOMATIC {ALLISON 2200_SP} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Park Pawl, With PTO Provision, Less Retarder, With 26,000-lb GVW & GCW Max. Military use only.

13AHZ

TRANSMISSION, AUTOMATIC {ALLISON 3000_HS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, Less PTO Provision, Less Retarder, With 80,000-lb GVW & GCW Max.

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

13AJA

TRANSMISSION, AUTOMATIC {ALLISON 3000_HS} 4th Generation Controls; Close Ratio, 6-Speed, With Double Overdrive; Includes Oil Level Sensor, Less PTO Provision, Less Retarder, With 80,000-lb GVW & GCW Max.

13AJB

TRANSMISSION, AUTOMATIC {ALLISON 3000_PTS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive, Includes Oil Level Sensor, Less PTO Provision, Less Retarder, School Max. Bus GVW N/A SCHOOL BUS

13AJC

TRANSMISSION, AUTOMATIC {ALLISON 3000_PTS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, Less PTO Provision, Less Retarder, Shuttle Bus, With 33,000 lb GVW & GCW Max.

13AJE

TRANSMISSION, AUTOMATIC {ALLISON 3000_RDS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; On/Off Hwy; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 80,000-lb GVW & GCW Max.

13AJG

TRANSMISSION, AUTOMATIC {ALLISON 3000_RDS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Refuse/Mixer; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 62,000-lb GVW

13AJH

TRANSMISSION, AUTOMATIC {ALLISON 3000_RDS_P} 4th Generation Controls; Close Ratio, 6-Speed, With Double Overdrive; On/Off Hwy; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 80,000-lb GVW

13AJJ

TRANSMISSION, AUTOMATIC {ALLISON 3000_RDS_P} 4th Generation Controls; Close Ratio, 6-Speed, With Double Overdrive; Refuse/Mixer; Includes Oil Level Sensor With PTO Provision, Less Retarder, With 62,000-lb GVW Max.

13AJK

TRANSMISSION, AUTOMATIC {ALLISON 3500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; On/Off Hwy; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 80,000-lb GVW & GCW Max.

13AJL

TRANSMISSION, AUTOMATIC {ALLISON 3500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Refuse/Mixer; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 60,000-lb GVW

13AJM

TRANSMISSION, AUTOMATIC {ALLISON 3500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Specialty PTO; Includes Oil Level Sensor, With PTO Provision, Less Retarder, MAX. GVW N/A

13AJN

TRANSMISSION, AUTOMATIC {ALLISON 3500_RDS_P} 4th Generation Controls; Wide Ratio, 6-Speed, With Double Overdrive; On/Off Hwy; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 80,000-lb GVW & GCW Max.

13AJP

TRANSMISSION, AUTOMATIC {ALLISON 3500_RDS_P} 4th Generation Control; Wide Ratio, 6-Speed, With Double Overdrive; Refuse/Mixer; Includes Oil Level Sensor, With PTO Provision, Less Retarder, With 60,000-lb GVW Max.

13AJR

TRANSMISSION, AUTOMATIC {ALLISON B-300} 4th Generation Controls; 5-Speed; With Overdrive, Includes Oil Level Sensor, With Deep Sump, Less PTO Provision and Less Retarder, With 38,000-lb GVW Max.

13AJU

TRANSMISSION, AUTOMATIC {ALLISON 3000EVS_P} 4th Generation Controls; Close Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A

13AJV

TRANSMISSION, AUTOMATIC {ALLISON 3000EVS_P} 4th Generation Controls; Close Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A

13AJW

TRANSMISSION, AUTOMATIC {ALLISON 3500EVS_P} 4th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A

13AJX

TRANSMISSION, AUTOMATIC {ALLISON 3500EVS_P} 4th Generation Controls; Wide Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A

13AKA

TRANSMISSION, AUTOMATIC {ALLISON 3000TRV_P} 4th Generation Controls; Close Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO Gear, Less Retarder, Max. GVW N/A with 40,000-lb

13AKB

TRANSMISSION, AUTOMATIC {ALLISON 3000TRV_P} 4th Generation Controls; Close Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO Gear, Less Retarder, Max. GVW N/A with 40,000-lb GCW

13AKG

TRANSMISSION, AUTOMATIC {ALLISON 4000_HS} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive, Includes Oil Level Sensor, Less PTO Provision, Less Retarder

13AKH

TRANSMISSION, AUTOMATIC {ALLISON 4000_HS} 4th Generation Controls; Close Ratio, 6-Speed, With Double Overdrive, Includes Oil Level Sensor, Less PTO Provision, Less Retarder

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

13AKJ

TRANSMISSION, AUTOMATIC {ALLISON 4500_HS} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, Less PTO Provision, Less Retarder

13AKK

TRANSMISSION, AUTOMATIC {ALLISON 4500_HS} 4th Generation Controls; Wide Ratio, 6-Speed, With Double Overdrive; Includes Oil Level Sensor, Less PTO Provision, Less Retarder

13AKL

TRANSMISSION, AUTOMATIC {ALLISON 4000_RDS_P} 4th Generation Controls; Close Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarder

13AKM

TRANSMISSION, AUTOMATIC {ALLISON 4000_RDS_P} 4th Generation Controls; Close Ratio, 6-Speed, With Double Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarder

13AKN

TRANSMISSION, AUTOMATIC {ALLISON 4500_RDS_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarde

13AKP

TRANSMISSION, AUTOMATIC {ALLISON 4500_RDS_P} 4th Generation Controls; Wide Ratio, 6-Speed, With Double Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarder

13AKR

TRANSMISSION, AUTOMATIC {ALLISON 4000EVS_P} 4th Generation Controls, Close Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder

13AKS

TRANSMISSION, AUTOMATIC {ALLISON 4000EVS_P} 4th Generation Controls; Close Ratio, 6-Speed; With Double Overdrive; Includes Oil Level Sensor, With Provision for PTO, Less Retarder

13AKT

TRANSMISSION, AUTOMATIC {ALLISON 4500EVS_P} 4th Generation Controls; Wide Ratio, 5-Speed; With Overdrive; Includes Oil Level Sensor, With Provision for PTO, Less Retarder

13AKU

TRANSMISSION, AUTOMATIC {ALLISON 4500EVS_P} 4th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive; Includes Oil Level Sensor, With Provision for PTO, Less Retarder

13ALH

TRANSMISSION, AUTOMATIC {ALLISON 3000_SP_P} 4th Generation Controls; Close Ratio, 5-Speed, Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarder, Military Support/Tactical MILITARY ONLY

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

13ALJ

TRANSMISSION, AUTOMATIC {ALLISON 4500_SP_P} 4th Generation Controls; Wide Ratio, 5-Speed, With Overdrive; Includes Oil Level Sensor, With PTO Provision, Less Retarder, Military Support/Tactical

13WDH

WIRING, TRANS BODY BUILDER Installed Wiring for Transmission/PTO Controls, for Allison 2000, 2100, 2200, 2400, 2500 Series Transmission Only

13WUA

ALLISON NEUTRAL Allison WT Transmission Shifts to Neutral When Parking Brake is Engaged and Remains on Neutral When Park Brake is Disengaged

13WUB

ALLISON SPARE INPUT/OUTPUT for Highway Series (HS); General Purpose Trucks

13WUC

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); General Purpose Trucks, Construction

13WUD

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Rescue, Ambulance

13WUE

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Fire/Pumper, Tank, Aerial/Ladder

13WUG

ALLISON SPARE INPUT/OUTPUT for Truck Recreational Vehicle (TRV)

13WUH

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); Airport Refueler, Sewer Evac

13WUJ

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); Front Loaders, Rear Loaders, Recycling/Packer Trucks

13WUK

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); Side Loaders

13WUL

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); Street Sweeper

13WUM

ALLISON SPARE INPUT/OUTPUT for Pupil Transportation Series (PTS)

13WUP

ALLISON SPARE INPUT/OUTPUT for Bus Series (B)

13WUR

ALLISON SPARE INPUT/OUTPUT for Dump/Construction with Two-Speed Axle or Auxiliary Transmission (RDS)

13WUS

ALLISON SPARE INPUT/OUTPUT for Rugged Duty Series (RDS); General Purpose Trucks Modified for Single Input Auto Neutral

13WUT

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Without Split Shaft PTO

13WUU

ALLISON SPARE INPUT/OUTPUT for Specialty Transmission Series (SP)

13WUV

ALLISON SPARE INPUT/OUTPUT for Highway Series (HS); General Purpose Trucks Modified for Single Input Auto Neutral

13WUZ

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS), 127/198 includes J1939 Based Auto Neutral; Fire/Pumper, Tank, Aerial/Ladder

13WVB

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS), 108/174 Includes J1939 Based Auto Neutral; Rescue, Ambulance

The features listed above describe both Allison transmission sales features as well as Allison vocational electrical interface sales features. Review each entry carefully, and choose the transmission and optional electrical interface feature that is right for the particular equipment application. Allison electrical interface connections are optional equipment on International® vehicles. Choose one of the features described below to receive a cable harness interface connection on a vehicle factory-installed.

Allison provides electrical inputs and outputs for a variety of vehicle controls. The controls may be specific for fire truck, emergency vehicle, loader, etc. See Allison Controls and General Information for details.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

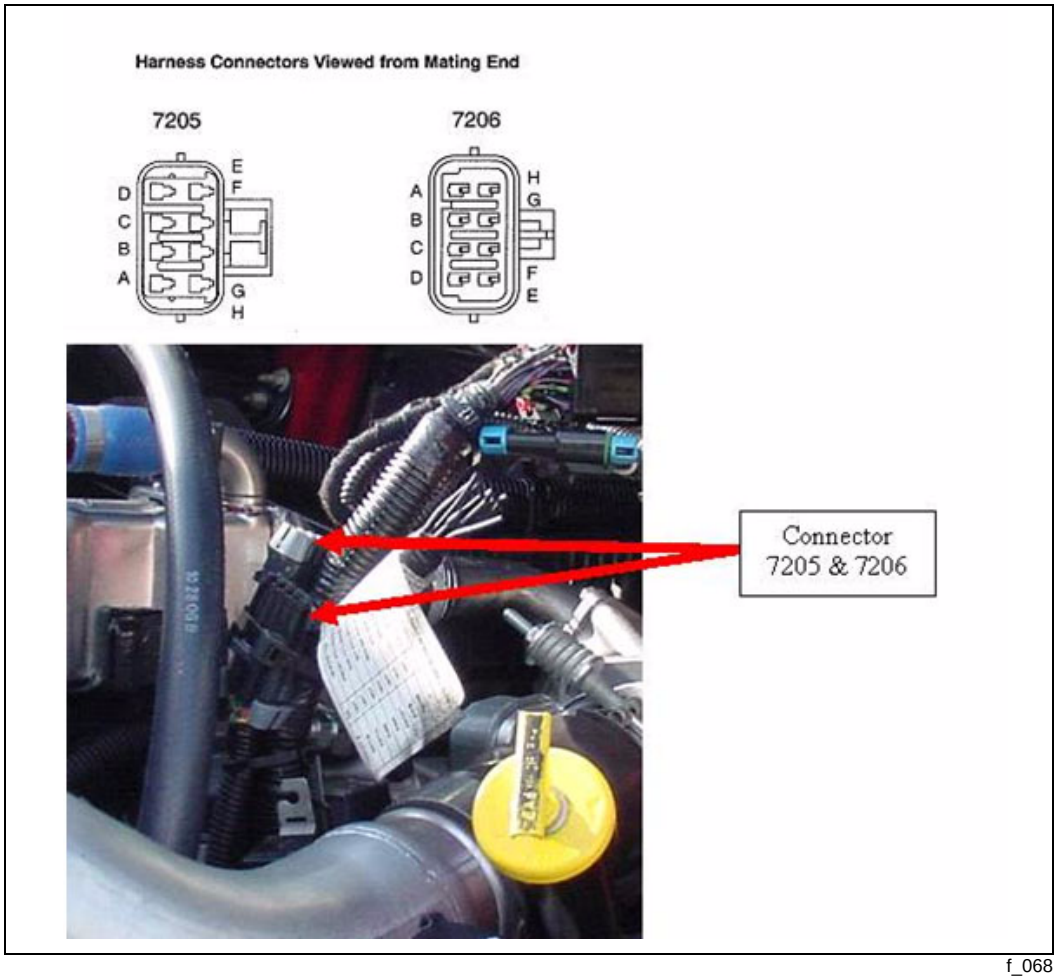
None

WIRING INFORMATION

See Allison Controls and General Information for technical details and circuit design.

With the Allison 3000/4000 Series, there are two connectors – 7205 and 7206. Connectors 7205 and 7206 have their mating connectors attached filled with cavity plugs. The interface connections are located in between the radiator pipe and the engine on the driver side of the engine.

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES



f_068

To use these connectors, remove cavity plugs and use the following:

Table 62

Mating Connector for 7205		
Connector	**Connector Lock**	**Cavity Plug**
3525874C1	3525875C1	2025431C1
Terminals	**Wire Gauge**	
1667742C1	16, 18, 20	
Cable Seals	**Wire Gauge**	
1661872C1	16, 18, 20	
Mating Connector for 7206		
Connector	**Connector Lock**	**Cavity Plug**
3525872C1	3525873C1	2025431C1
Terminals	**Wire Gauge**	
1661875C1	16, 18, 20	
Cable Seals	**Wire Gauge**	
1661872C1	16, 18, 20	

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

The circuit numbers on the harness correspond to the circuit numbers used by Allison. The table below gives the Allison 3000/4000 circuit number which corresponds to the circuit numbers in the International® harness connectors. For a complete circuit diagram of the transmission wiring and for connector and terminal part numbers, see Circuit Diagram Manual S08322, Chapter 11, Transmission.

Table 63

Cavity	Circuit Number	I/O	Maximum Current
Connector Number 7205			
A	K92B103	--	--
B	K92#161	Input	--
C	K92#157	Input	--
D	K92#124	Output	500 mAMP*
E	K92#122	Input	--
F	K92#105	Output	--
G	K92#164	Output	500 mAMP
H	K92#162	Input	--
Connector Number 7206			
A	K92#101	Input	--
B	K92#117	Input	--
C	K92C103	--	--
D	K92#143	Input	--
E	K92#142	Input	--
F	K92#145	Output	500 mAMP
G	K92#130	Output	500 mAMP
H	K92#123	Input	--

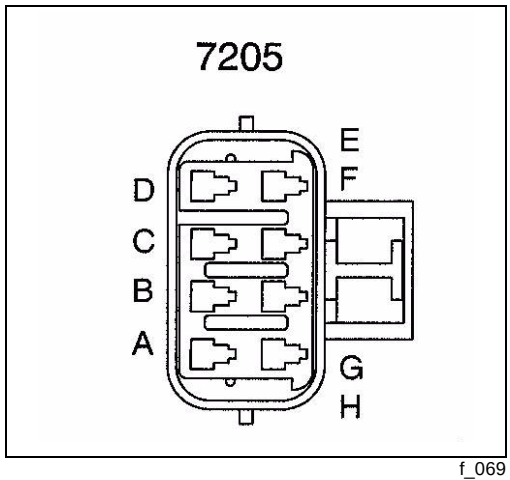
*milliAmpere

NOTE: See Allison technical manual for suggested circuit design.

NOTE: See special features table below for package content.

NOTE: MUST COMPLY WITH FMVSS STANDARD #102.

The Allison 1000/2000 series has a single connector – 7205. Connector 7205 has its mating connector attached and filled with cavity plugs. The interface connections are located in between the radiator pipe and the engine on the driver side of the engine.



f_069

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

To use connector, remove cavity plugs and use the following:

Table 64

Connector	Connector Lock	Cavity Plug
3525874C1	3525875C1	2025431C1
Terminals	**Wire Gauge**	
1667742C1	16, 18, 20	
Cable Seals	**Wire Gauge**	
1661872C1	16, 18, 20	

The circuit numbers on the harness correspond to the circuit numbers used by Allison. The table below gives the Allison 1000/2000 circuit number which corresponds to the circuit numbers in the International® harness connectors. For a complete circuit diagram of the transmission wiring and for connector and terminal part numbers, see Circuit Diagram Manual S08322, Chapter 11, Transmission.

Table 65

Cavity	Circuit Number	I/O	Maximum Current
Connector Number 7205			
A	L92C103	--	--
B	L92#143	Input	--
C	L92#150	Output	500 mAMP*
D	L47C125	Output	--
E	L92#101	Input	--
F	L92#123	Output	--
G	L92#145	Output	500 mAMP
H	L92#105	Input	--

*milliAmpere

NOTE: See Allison technical manual for suggested circuit design.

NOTE: See special features table below for package content.

NOTE: MUST COMPLY WITH FMVSS STANDARD #102.

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

The following tables show the various vocational feature codes that are available. Note the Group and Package number correspond to Allison Group and Package number.

NOTES for the tables below:
M = Mode Button Located on Shift Tower
# = Not Available with Code 13AAZ or 13WUA
@ = Requires Code 13AAZ, Automatic Neutral
% = Requires Code 13WUA, Automatic Neutral
* = Not Activate

Table 65

Spare Input/Output	Code	13WU#B	13WUC#	13WUD#	13WUE#	13WUG#	13WUH#
Package Content	Group	98	99	108	107	110	102
	Package	200	113	174	120	113	150
	Other	Highway Series (HS)	Rugged Duty Series (RDS)	Emergency Vehicle Series (EVS)	Emergency Vehicle Series (EVS)	Truck Recreational Vehicle (TRV)	Rugged Duty Series (RDS)
	Requirements	General Purpose Trucks	General Purpose Trucks, Construction	Rescue, Ambulance	Fire/Pumper, Tank, Aerial/Ladder		Airport, Refueler, Sewer Evac
Function #	**Function Name**						
I-A	Secondary Shift Schedule	M	M	M	M	M	M
I-C	PTO Enable		143	143	142	143	
I-D	Shift Selection Transition			101*			
I-E	Auxiliary Function Range Inhibit (STD)		101*			101*	101*
I-F	Auxiliary Function Range Inhibit (Special)						
I-G	Auxiliary Hold		142			142	
I-H	Engine Brake & Preselect Request	102/157	102/157	102/157	102/157	102/157	102/157
I-J	Fire Truck Pump Mode				122/123*		
I-L	Auto Neutral for PTO (STD)						
I-Q	Two-Speed Axle Enable						
I-W	Direction Change Enable		122*			122*	122*
I-Y	ABS Input	121	121	121	121	121	121
I-Z	Retarder Enable	161	161	161	161	161	161
I-AA	Service Brake Status	162	162	162	162	162	162
I-AG	Auto Neutral for Refuse Packer & PTO Enable						
I-AJ	4th Gear Lockup for Pump Mode						122/123*
O-A	Engine Brake Enable	104	104	104	104	104	104
O-B	Sump/Retarder Temperature Indicator	164	164	164	164	164	164
O-C	Range Indicator	145	145	113	145 (4th)	145	145 (4th)
O-D	Output Speed Indicator A	105	105	105	105	105	105
O-G	PTO Enable		130	130	130	130	
O-J	Two-Speed Axle Enable						
O-I	Engine Overspeed Indicator						130
O-O	Service Indicator						
O-Q	Retarder Indicator	124	124	124	124	124	124
O-S	Neutral Indicator for PTO			145			

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

Spare Input/Output	Code	13WUJ@	13WUK@	13WUL#	13WUM#	13WUP#
	Group	105	106	103	111	112
Package Content	Package	142	170	167	203	1484
	Other	Rugged Duty Series (RDS)	Rugged Duty Series (RDS)	Rugged Duty Series (RDS)	Pupil Transportation Series (PTS)	Bus Series (B)
	Requirements	Front Loaders, Rear Loaders, Recycling/Packer Trucks	Side Loaders	Street Sweeper	School/Shuttle	Transit and Intercity Bus
Function #	**Function Name**					
I-A	Secondary Shift Schedule	M		142	M	M
I-C	PTO Enable	143		M		143
I-D	Shift Selection Transition	101*				
I-E	Auxiliary Function Range Inhibit (STD)				101*	101*
I-F	Auxiliary Function Range Inhibit (Special)					
I-G	Auxiliary Hold				142	142
I-H	Engine Brake & Preselect Request	102/157		102/157	102/157	102/157
I-J	Fire Truck Pump Mode					
I-L	Auto Neutral for PTO (STD)			117*	117*	117*
I-Q	Two-Speed Axle Enable			101		
I-W	Direction Change Enable					
I-Y	ABS Input	121		121	121	121
I-Z	Retarder Enable	161		161	161	161
I-AA	Service Brake Status	162		162	162	162
I-AG	Auto Neutral for Refuse Packer & PTO Enable	142/117				
I-AJ	4th Gear Lockup for Pump Mode					
O-A	Engine Brake Enable	104		104	104	104
O-B	Sump/Retarder Temperature Indicator	164		164	164	164
O-C	Range Indicator			113	145	145
O-D	Output Speed Indicator A	105		105	105	105
O-G	PTO Enable	130		130		130
O-J	Two-Speed Axle Enable			145		
O-I	Engine Overspeed Indicator					
O-O	Service Indicator					
O-Q	Retarder Indicator	124		124	124	124
O-S	Neutral Indicator for PTO	145		145		

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

Spare Input/Output	Code	13WUR#	13WUS%	13WUT#	13WUU#	13WUV%
	Group	100	99	107	114	98
Package Content	Package	146	113 mod	119	163	200
	Other	Dump/Construction with Two-Speed Axle or Auxiliary Transmission (RDS)	Rugged Duty Series (RDS)	Emergency Vehicle Series (EVS)	Specialty Series (SP)	Highway Series (HS)
	Requirements		General Purpose Trucks Modified for Single Input Auto Neutral	Fire (not for Split-Shaft PTO)r	Specialty Vehicles	General Purpose Trucks Modified for Single Input Auto Neutral
Function #	**Function Name**					
I-A	Secondary Shift Schedule	M	M	M	M	M
I-C	PTO Enable	143	143	143	143	
I-D	Shift Selection Transition					
I-E	Auxiliary Function Range Inhibit (STD)	101*	101*			
I-F	Auxiliary Function Range Inhibit (Special)			101/142		
I-G	Auxiliary Hold		142		142	
I-H	Engine Brake & Preselect Request	102/157	102/157	102/157	102/157	102/157
I-J	Fire Truck Pump Mode					
I-L	Auto Neutral for PTO (STD)					117
I-Q	Two-Speed Axle Enable	142				
I-W	Direction Change Enable		122*			
I-Y	ABS Input	121	121	121	121	121
I-Z	Retarder Enable	161	161	161	161	161
I-AA	Service Brake Status	162	162	162	162	162
I-AG	Auto Neutral for Refuse Packer & PTO Enable					
I-AJ	4th Gear Lockup for Pump Mode					
O-A	Engine Brake Enable	104	104	104	104	104
O-B	Sump/Retarder Temperature Indicator	164	164	164	164	164
O-C	Range Indicator		145		145	145
O-D	Output Speed Indicator A	145	105	105	105	105
O-G	PTO Enable	130	130	130	130	
O-J	Two-Speed Axle Enable	145				
O-I	Engine Overspeed Indicator					
O-O	Service Indicator			164		
O-Q	Retarder Indicator	124	124	124	124	124
O-S	Neutral Indicator for PTO			145		

TRANSMISSION SPARE INPUTS/OUTPUTS AND TRANSMISSION CODES

Spare Input/Output	Code	13WUZ#	13WVB%
	Group	127	108
Package Content	Package	198	174
	Other	Emergency Vehicle Series (EVS)	Emergency Vehicle Series (EVS)
	Requirements	Fire/pumper, Tank, Aerial/Ladder	Ambulance, Rescue
Function #	**Function Name**		
I-A	Secondary Shift Schedule	M	M
I-C	PTO Enable	142	143
I-D	Shift Selection Transition		101
I-E	Auxiliary Function Range Inhibit (STD)		
I-F	Auxiliary Function Range Inhibit (Special)		
I-G	Auxiliary Hold		
I-H	Engine Brake & Preselect Request	102/157	102/157
I-J	Fire Truck Pump Mode	122/123	
I-L	Auto Neutral for PTO (STD)		
I-Q	Two-Speed Axle Enable		
I-W	Direction Change Enable		
I-Y	ABS Input	121	121
I-Z	Retarder Enable	161	161
I-AA	Service Brake Status	162	162
I-AG	Auto Neutral for Refuse Packer & PTO Enable		
I-AJ	4th Gear Lockup for Pump Mode		
O-A	Engine Brake Enable	104	104
O-B	Sump/Retarder Temperature Indicator	164	164
O-C	Range Indicator	145	113
O-D	Output Speed Indicator A	105	105
O-G	PTO Enable	130	130
O-J	Two-Speed Axle Enable		
O-I	Engine Overspeed Indicator		
O-O	Service Indicator		
O-Q	Retarder Indicator	124	124
O-S	Neutral Indicator for PTO		145

GAUGES

This chapter describes the optional gauges that are either installed or can be installed in the instrument cluster. If the vehicle was ordered without a desired gauge, one or more can be added in the field. Programming of the Body Controller (BC) and proper placement is critical. Certain gauges will only work in certain locations. Before adding the gauge to the vehicle, ensure that the vehicle can accept it. The outboard four gauges are the only ones that can be moved or added. They can be added by using the Diamond Logic® Builder software. Follow the steps below for adding a gauge to the cluster (those without Diamond Logic® Builder should see an International® dealer). The following instructions can be followed for any of the four auxiliary gauge positions.

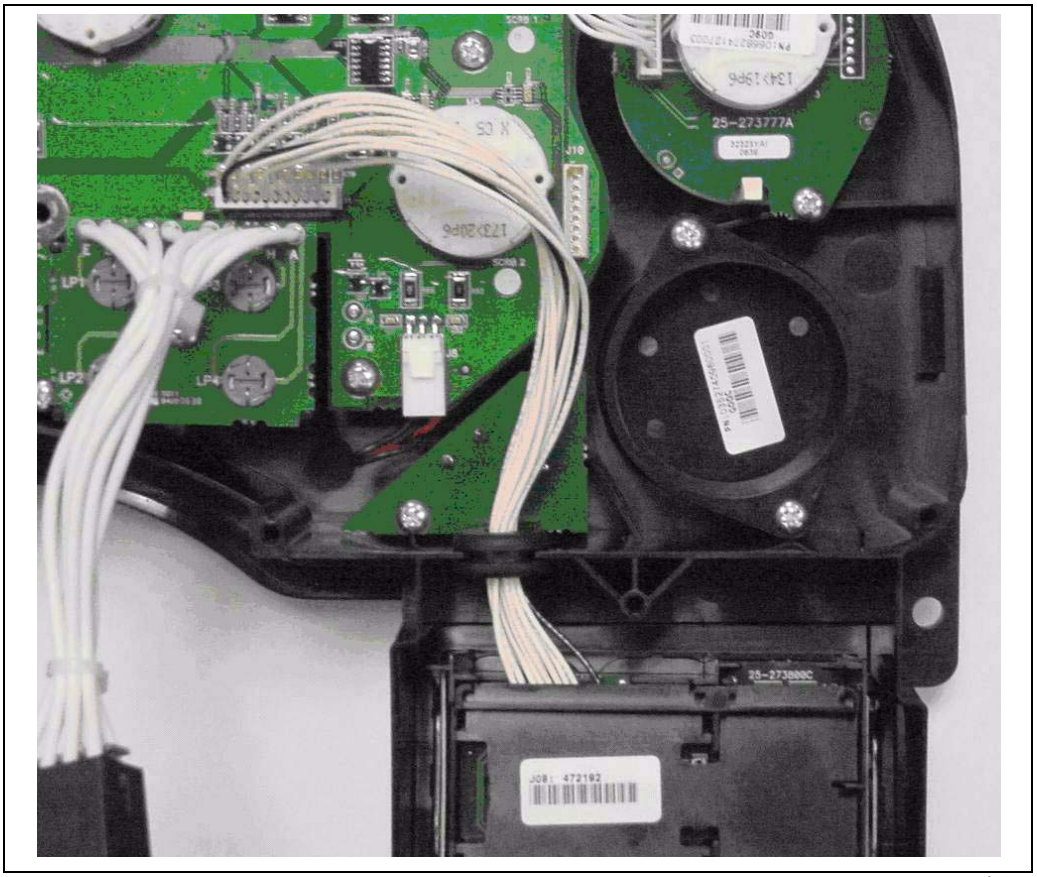
Adding And Programming The Vehicle

a. Using Diamond Logic® Builder, obtain a copy of the electronic vehicle file either by getting it from the vehicle or from history.
b. Select the proper software feature code for the gauge to be added, and add this code to the configuration.
d. Position the gauge in the desired location in the cluster by clicking and dragging it to an open location identified by a large blue circle. If the gauge will not move to a particular position, it is not designed to work in that location.
d. Once the location of the gauge is determined, save the configuration and program the vehicle.

Installing the Gauge

NOTE: Refer to the “How Do I – General Information” section of this electrical guide for information on how to obtain gauge, circuits, and sensor part numbers.

a. Remove the cluster shroud from the Instrument Panel (IP).
b. Remove the four screws which hold the cluster in place.
c. Tilt the cluster forward to gain access to the back of the cluster (use caution not to scratch the face of the cluster).
d. Remove all the connectors from the back of the cluster, and remove the cluster from the vehicle.
e. Remove the ten screws from the metal panel on the back of the cluster.
f. Remove the proper filler plug. See below.
g. Install the gauge using caution not to move the needle, damage the face, or get the face of the gauge dirty.
h. Connect the jumper wire in the socket directly next to the added gauge.
i. Replace the metal panel, and install in the vehicle in the reverse order of removing it.



f_070

WIRING INFORMATION

The standard cluster includes:

ODOMETER DISPLAY: Miles, Trip Miles, Engine Hours, Trip Hours, Fault Code Readout (Odometer, trip odometer, and fault code readout electronic-liquid crystal display)

WARNING SYSTEM: Low Fuel, Low Oil Pressure, High Engine Coolant Temp, and Low Battery Voltage (Visual and Audible)

GAUGE CLUSTER GAUGES (6): Engine Oil Pressure (Electronic), Water Temperature (Electronic), Fuel (Electronic), Tachometer (Electronic), Voltmeter, Speedometer

GAUGE, AIR PRESSURE: Air 1 and Air 2 Gauges; Located in Instrument Cluster (Air Chassis only)

TESTING

Use the Diamond Logic® Builder software to steer each gauge to test values.

INSTRUMENT CLUSTER – ADDING AIR GAUGES

This feature provides system air pressure when an air compressor is ordered with a hydraulic brake vehicle.

04SBL

AIR COMPRESSOR {Bendix Tu-Flo 550} 13.2 CFM Capacity; and Tank for Air Source on Hydraulic Chassis

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

04SBL (Auxiliary Air gauge): 595AEP

The Aux_Air_Press_Alrm_Type_Param parameter defines the number of beeps associated with the auxiliary air pressure gauge alarm.

The Aux_Air_Press_Filter_Param parameter sets the auxiliary air gauge update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Aux_Air_Press_Max_WL_Gen2 parameter sets the maximum point for auxiliary air in-gauge warning light. When the auxiliary air pressure rises above this set parameter, the warning light in the gauge will illuminate. A value of 76040 is the default gauge parameter and should normally not be changed.

The Aux_Air_Press_Min_WL parameter sets the minimum point for auxiliary air in-gauge warning light. When the auxiliary air pressure falls below this set parameter, the warning light in the gauge will illuminate.

Table 66

Parameter	ID	Description	Default	Units	Min	Max	Step
Aux_Air_ Press_Alrm_ Type_Param	2380	Auxiliary air pressure alarm types available	4	List	0	7	1
Aux_Air_ Press_Filter_ Param	108	Auxiliary air gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Aux_Air_ Press_Max_ WL _Gen2	2392	Maximum threshold for auxiliary air in-gauge warning light. The default of 76040 means no minimum warning light.					
Aux_Air_ Press_Min_WL	1964	Minimum threshold for auxiliary air in-gauge warning light					

Table 67

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Auxiliary Air Pressure Gauge	3615266C1	3615267C1

This feature provides engine oil temperature to the vehicle operator.

16HGG

GAUGE, OIL TEMP, ENGINE

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HGG (Engine Oil Temperature): 595ADW OR 595ADX (Customer cannot use both)

** Software Feature Code 595ADW is used to read engine oil temperature off the datalink.

** Software Feature Code 595ADX is used to read engine oil temperature from a hard-wired analog sensor.

The Eng_Oil_Temp_Alrm_Ty_Param parameter defines the number of beeps associated with the engine oil temperature alarm.

The Eng_Oil_Temp_Filter_Param parameter sets the engine oil temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Eng_Oil_Temp_Max_WL parameter sets the maximum point for engine oil temperature in-gauge warning light. When the oil temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Eng_Oil_Temp_Min_WL parameter sets the minimum point for engine oil temperature in-gauge warning light. When the oil temperature falls below this set parameter, the warning light in the gauge will illuminate.

Table 68

Parameter	ID	Description	Default	Units	Min	Max	Step
Eng_Oil_ Temp_Alrm_ Ty_Param	2354	Engine oil temperature gauge alarm type.	4	List	0	7	1
Eng_Oil_ Temp_Filter _Param	219	Engine oil temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Eng_Oil_ Temp_ Max_WL	2274	Maximum threshold for auxiliary air in-gauge warning light.	251	F	100	300	0.03125
Eng_Oil_ Temp_ Min_WL	2291	Minimum set point for engine oil temperature in-gauge warning light. The default of 3226 means no minimum warning light.	3226	F	100	300	0.03125

Table 69

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Engine Oil Temperature Gauge	3615258C1	3615259C1

16HGH

Provides Allison transmission fluid temperature information to the vehicle operator.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HGH (Allison Transmission Oil Temperature gauge): 595ADZ

The Trans_Oil_Temp_Alrm_Ty_Param parameter defines the number of beeps associated with the Transmission oil temperature alarm.

The Trans_Oil_Temp_Filter_Param parameter sets the transmission oil temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Trans_Oil_Temp_Max_WL parameter sets the maximum point for transmission oil temperature in-gauge warning light. When the oil temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Trans_Oil_Temp_Min_WL parameter sets the minimum point for transmission oil temperature in-gauge warning light. When the oil temperature falls below this set parameter, the warning light in the gauge will illuminate.

Table 70

Parameter	ID	Description	Default	Units	Min	Max	Step
Trans_Oil_ Temp_Alrm_ Ty_Param	2356	Transmission oil temperature gauge alarm type.	0	No_Units	0	7	1
Trans_Oil_ Temp_ Filter_Param	589	Transmission oil temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Trans_Oil_ Temp_ Max_WL	2272	Maximum set point for transmission oil temperature in-gauge warning light. The default of 3226 means no maximum warning light.	3226	F	100	300	0.03125
Trans_Oil_ Temp_ Min_WL	2273	Minimum set point for transmission oil temperature in-gauge warning light. The default of 3226 means no minimum warning light.	3226	F	100	300	0.03125

Table 71

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Transmission Oil Temperature Gauge	3615268C1	3615269C1

This feature provides manual transmission oil temperature to the vehicle operator. Manual transmissions should not be operated at temperatures above 250 °F (120 °C).

16HGJ

GAUGE, OIL TEMP, MANUAL TRAN

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HGJ (Oil Temperature gauge on a manual transmission): 595AEW

The Trans_Oil_Temp_Alrm_Ty_Param parameter defines the number of beeps associated with the Transmission oil temperature alarm.

The Trans_Oil_Temp_Filter_Param parameter sets the transmission oil temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Trans_Oil_Temp_Max_WL parameter sets the maximum point for transmission oil temperature in-gauge warning light. When the oil temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Trans_Oil_Temp_Min_WL parameter sets the minimum point for transmission oil temperature in-gauge warning light. When the oil temperature falls below this set parameter, the warning light in the gauge will illuminate.

Table 72

Parameter	ID	Description	Default	Units	Min	Max	Step
Trans_Oil_ Temp_Alrm_ Ty_Param	2356	Transmission oil temperature gauge alarm type.	4	No_Units	0	7	1
Trans_Oil_ Temp_ Filter_Param	589	Transmission oil temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Trans_Oil_ Temp_ Max_WL	2272	Maximum set point for transmission oil temperature in-gauge warning light. 3226 means no maximum warning light.	250	F	100	300	0.03125
Trans_Oil_ Temp_ Min_WL	2273	Minimum set point for transmission oil temperature in-gauge warning light. The default of 3226 means no minimum warning light.	3226	F	100	300	0.03125

Table 73

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Transmission Oil Temperature Gauge	3615268C1	3615269C1

INSTRUMENT CLUSTER – ADDING GAUGES

Provides rear axle operating information to the vehicle operator. Rear axle temperature should not exceed 240 °F (115 °C).FEATURE CODE DESCRIPTION:

16HGL

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HGL (Rear Axle Temperature): 595AYA OR 595AYB (Customer cannot use both)

** Software Feature Code 595AYA is used to read rear-rear axle temperature AND forward-rear axle temperature.

** Software Feature Code 595AYB is used to read just rear-rear axle temperature.

* 595AYA (rear-rear and forward-rear axle temperature)

The Fwd_RR_Axle_Temp_Filter_Param parameter sets the forward rear axle temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Rear_Axle_Temperature_Alarm_Gen2_Param parameter defines the number of beeps associated with the rear-rear axle temperature alarm.

The Rear_RR_Axle_Temp_Filter_Param parameter sets the rear-rear axle temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Rear_Axle_TempC_Max_Gen2_WL parameter sets the maximum point for rear-rear axle temperature in-gauge warning light. When the rear-rear axle temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Rear_Axle_TempC_Min_Gen2_WL parameter sets the minimum point for rear-rear axle temperature in-gauge warning light. When the rear-rear axle temperature falls below this set parameter, the warning light in the gauge will illuminate.

The Fwd_Axle_TempC_Max_Gen2_WL parameter sets the maximum point for forward-rear axle temperature in-gauge warning light. When the forward-rear axle temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Fwd_Axle_TempC_Min_Gen2_WL parameter sets the minimum point for forward-rear axle temperature in-gauge warning light. When the forward-rear axle temperature falls below this set parameter, the warning light in the gauge will illuminate.

The Fwd_Axle_Temperature_Alarm_Gen2_Param parameter defines the number of beeps associated with the forward-rear axle temperature alarm.

Table 74

Parameter	ID	Description	Default	Units	Min	Max	Step
Fwd_RR_ Axle_Temp_ Filter_Param	277	Forward-rear axle temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Rear_Axle_ Temperature_ Alarm_Gen2	2415	Rear-rear axle temperature gauge alarm type.	4	No_Units	0	7	1
Rear_RR_ Axle_Temp_ Filter_Param	519	Rear-rear axle temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	F	1	255	1
Rear_Axle_ TempC_ Max_Gen2_WL	2485	Maximum set point for rear-rear axle temperature in-gauge warning light	240	F	100	300	1
Rear_RR_ Axle_TempC_M in_Gen2_WL	2486	Minimum set point for rear-rear axle temperature in-gauge warning light. A value of 117923 means no minimum warning light.	100	F	100	300	1
Fwd_Axle_ TempC_ Max_Gen2_WL	2498	Maximum set point for forward-rear axle temperature in-gauge warning light	240	F	100	300	1
Fwd_RR_ Axle_TempC_M in_Gen2_WL	2499	Minimum set point for forward-rear axle temperature in-gauge warning light. A value of 117923 means no minimum warning light.	100	F	100	300	1
Fwd_Axle_ Temperature_ Alarm_Gen2	2500	Forward-rear axle temperature gauge alarm type.	4	No_Units	0	7	1

* 595AYB (just rear-rear axle temperature)

The Rear_Axle_Temperature_Alarm_Gen2_Param parameter defines the number of beeps associated with the rear-rear axle temperature alarm.

The Rear_RR_Axle_Temp_Filter_Param parameter sets the rear-rear axle temperature update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Rear_Axle_TempC_Max_Gen2_WL parameter sets the maximum point for rear-rear axle temperature in-gauge warning light. When the rear-rear axle temperature rises above this set parameter, the warning light in the gauge will illuminate.

The Rear_Axle_TempC_Min_Gen2_WL parameter sets the minimum point for rear-rear axle temperature in-gauge warning light. When the rear-rear axle temperature falls below this set parameter, the warning light in the gauge will illuminate.

Table 75

Parameter	ID	Description	Default	Units	Min	Max	Step
Rear_Axle_ Temperature_ Alarm_Gen2	2415	Rear-rear axle temperature gauge alarm type.	4	No_Units	0	7	1
Rear_RR_ Axle_Temp_ Filter_Param	519	Rear-rear axle temperature gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Rear_Axle_ TempC_ Max_Gen2_WL	2485	Maximum set point for rear-rear axle temperature in-gauge warning light.	240	F	100	300	1
Rear_RR_ Axle_TempC_M in_Gen2_WL	2486	Minimum set point for rear-rear axle temperature in-gauge warning light. A value of 117920 means no minimum warning light.	100	F	100	300	1

Table 76

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Rear-rear Axle Oil Temperature Gauge	3615272C1	3615273C1
Forward-rear Axle Oil Temperature Gauge	3615260C1	3615261C1

INSTRUMENT CLUSTER – ADDING GAUGES

This feature gives a visual read-out of the amount of pressure being applied to the brake pedal.

16HGN

GAUGE, AIR APPLICATION

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HGN (Air application gauge): 595ANP

The LH_Brake_App_Alrm_Ty_Param parameter defines the number of beeps associated with the brake application gauge alarm.

The Brake_App_Filter_Param parameter sets the brake application gauge update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Brake_App_Max_WL parameter sets the maximum point for the brake application in-gauge warning light. When the brake pressure rises above this set parameter, the warning light in the gauge will illuminate.

The Brake_App_Min_WL parameter sets the minimum point for brake application in-gauge warning light. When brake pressure falls below this set parameter, the warning light in the gauge will illuminate.

The Brake_App_Max_WL_Gen2_AGSP parameter sets the maximum point for the brake application AGSP warning light. When the brake pressure rises above this set parameter, the warning light in the gauge will illuminate.

The Brake_App_Min_WL_Gen2_AGSP parameter sets the minimum point for brake application AGSP warning light. When brake pressure falls below this set parameter, the warning light in the gauge will illuminate.

Table 77

Parameter	ID	Description	Default	Units	Min	Max	Step
LH_Brake_ App_ Alrm_Ty_ Param	2348	Brake application gauge alarm type.	0	No_Units	0	7	1
Brake_App_ Filter_Param	128	Brake application gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	No_Units	1	255	1
Brake_App_ Max_WL	2343	Maximum set point for brake application in-gauge warning light. A value of 38020 means no maximum warning light.	38020		0	150	0.5
Brake_App_ Min_WL	2337	Minimum set point for brake application in-gauge warning light. A value of 38020 means no minimum warning light.	38020	psi	0	150	0.5
Brake_App_ Max_WL_ Gen2_AGSP	2424	Maximum set point for brake application AGSP warning light. A value of 38020 means no maximum warning light.	150	psi	0	38020	1
Brake_App_ Min_WL_ Gen2_AGSP	2423	Minimum set point for brake application AGSP warning light. A value of 38020 means no minimum warning light.	0	psi	0	38020	1

Table 78

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Air Application Gauge	3616155C1	361656C1

INSTRUMENT CLUSTER – ADDING GAUGES

This feature gives a visual read-out of the amperage on the vehicle.

16HHT

GAUGE, Ammeter 150 Ampere (AMP)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HHT (Ammeter 150 AMP Gauge): 595AEZ

The Ammeter_Alrm_Ty_Param parameter defines the number of beeps associated with the ammeter gauge alarm.

The Ammeter_Filter_Param parameter sets the ammeter gauge update rate. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Ammeter_Max_WL parameter sets the maximum point for the ammeter in-gauge warning light. When the amperage rises above this set parameter, the warning light in the gauge will illuminate.

The Ammeter_Min_WL parameter sets the minimum point for ammeter in-gauge warning light. When amperage falls below this set parameter, the warning light in the gauge will illuminate.

The PAM_Acc_Pos_Offset_Param parameter estimates the electrical loads measured by the PAM when the key is in the accessory position.

The PAM_Run_Pos_Offset_Param parameter estimates the electrical loads measured by the PAM when the key is in the run position.

The PAM_Xfer_Function_Slope_Param parameter sets the slope of the transfer function used to calculate the electrical load on the vehicle displayed by the ammeter.

Table 79

Parameter	ID	Description	Default	Units	Min	Max	Step
Ammeter_ Alrm_Ty_ Param	71	Ammeter gauge alarm type. The number of “beeps” is the value of this parameter divided by 5. 255 is a continuous tone.	0	Number	0	255	25
Ammeter_ Filter_Param	72	Ammeter gauge update rate. A value of 1 is the slowest and 255 is the fastest update rate.	255	Number	1	255	1
Ammeter_ Max_WL	2394	Maximum set point for ammeter in-gauge warning light. The default of 1676 means no maximum warning light.	1676	A	-300	300	1
Ammeter_ Min_WL	2393	Minimum set point for ammeter in-gauge warning light. The default of 1676 means no minimum warning light.	1676	A	-300	300	1
PAM_Acc_ Pos_Offset_ Param	1941	Estimation of electrical load that is not measured by the PAM when the key is in the accessory position.	0	A	0	250	1
PAM_Run_ Pos_Offset_ Param	1940	Estimation of electrical load that is not measured by the PAM when the key is in the run position.	5	A	0	250	1
PAM_Xfer_ Function_ Slope_ Param	1939	Slope of the transfer function used to calculate the electrical load on the vehicle to be displayed by the ammeter	475	micro Ohm	0	64255	1
Ammeter_ Max_WL	2004	Maximum set point for ammeter in-gauge warning light.	150	A	-300	300	1
Ammeter_ Min_WL	2001	Minimum set point for ammeter in-gauge warning light.	-150	A	-300	300	1

Table 80

Optional Gauges	ENGLISH Part Number	METRIC Part Number
Ammeter	3615264C1	--

INSTRUMENT CLUSTER – OMIT FAULT CODES

This is an optional feature that removes the ability to read fault codes inside the vehicle, using the cluster's LCD display. No hardware change is needed. This is a software configurable feature.

16HKA

IP CLUSTER DISPLAY OMIT FAULT CODES — Omit display of fault codes in instrument cluster and disable blink codes (requires service tool to retrieve and view fault codes).

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HKA (IP Cluster Display Omit Fault Codes): 595ANV

WIRING INFORMATION

No additional wiring is needed.

TESTING

1. Set Park Brake
2. Press and hold "Cruise On" switch and "Cruise Resume" switch
3. Odometer should NOT display "NO FAULTS" or a number of FAULTS.

HOW TO ADD THESE FEATURES

Select software feature code 595ANV using the Diamond Logic® Builder software (See Local Dealer)

INSTRUMENT CLUSTER – FAULT CODES

This feature allows the retrieval of fault codes from the LCD display in the cluster. No hardware change is needed. This is a software configurable feature.

16HKT

IP CLUSTER DISPLAY DIAGNOSTICS — Display on board diagnostics of fault codes in gauge cluster

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

16HKT (IP Cluster Display Diagnostics): 595ANW

WIRING INFORMATION

No additional wiring is needed.

TESTING

1. Set Park Brake
2. Press and hold "Cruise On" switch and "Cruise Resume" switch
3. Odometer should display the number of active and past fault codes.
4. Pressing the selection button on the face of the cluster will cycle through the fault codes, or they will change to the next fault code every ten seconds.

HOW TO ADD THESE FEATURES

Select software feature code 595ANW using the Diamond Logic® Builder software (See Local Dealer)

GAUGES

REMOTE POWER MODULES

International® has developed a method of controlling loads on the vehicle, outside the cab, without running individual wires from each switch to the load. This is accomplished by an electronic device called a Remote Power Module (RPM). This module is used to distribute and control power to various devices on the vehicle from switches inside the cab. The RPM is connected to the Body Controller (BC) via the Body Builder J1939 datalink (not the powertrain or ATA datalink). The only wires connected to the RPM are battery power (for driving the loads), datalink cable (which includes power and Ground (GND) to operate the module), and a wire for each vehicle device operated by the RPM.

REMOTE POWER MODULES (RPMS)

Refer to the Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Remote Power Units, Solenoid Packs, Remote Engine Speed Controller.

There are several combinations of RPM and switch types available. Listed below are the current configurations and what types of switches are provided for them:

MOMENTARY SWITCH RPMS

08WSK

SWITCH, BODY CIRCUITS, REAR for Body Builder; With Six Momentary Switches in Instrument Panel (IP); One Power Module, With Six Channels, 20 Ampere (AMP) per Channel and 80 AMP Max. Output, Switches Control the Power Modules through Multiplex Wiring, Mounted at Rear on Frame

08WSM

SWITCH, BODY CIRCUITS, MID for Body Builder, With Six Momentary Switches in IP; One Power Module with Six Channel, 20 AMP Max. per Channel and 80 AMP Max. Output, Switches Control the Power Module through Multiplex Wiring, Mounted Battery Box, Back of Cab (BOC)

08SAJ

SWITCH, BODY CIRCUITS, MID for Body Builder; 12 Momentary Switches in IP, With Two Power Modules with Six Channels, 20 AMP Max. per Channel, 80 AMP Max. Output, Switch Control Power Modules through Multiplex Wiring, Mounted on Battery Box, BOC

08VZR

SWITCH, BODY CIRCUITS, MID for Bodybuilder, 6 Switches in Instrument Panel; One Power Module with 6 Channels, 20 Amp Max. Per Channel, 80 Amp Max Output, Switches Control Power Module Through Multiplex Wiring, Mounted in Cab Behind Driver Seat

08VZS

SWITCH, BODY CIRCUITS, MID for Bodybuilder, 12 Switches in Instrument Panel; Two Power Modules with 6 Channels, 20 Amp Max. Per Channel, 80 Amp Max Output, Switches Control Power Module Through Multiplex Wiring, Mounted in Cab Behind Driver Seat

NO SWITCHES PROVIDED RPMS

60AAM

BDY INTG, RPM AUX Mounted on the Driver's Side Frame Rail at Rear of Frame; Up to 6 Outputs and 6 Inputs, Max. 20 AMP per Channel, Max. 80 AMP Total

REMOTE POWER MODULES

60AAN

BDY INTG, RPM AUX Mounted Back of Cab; Up to 6 Outputs and Inputs, Max. 20 AMP per Channel, Max. 80 AMP Total, “(No switches included)”

60AAL

BDY INTG, RPM {SPECIAL} Mounted Inside Cab behind Driver Seat; Max. 20 AMP per Channel, Max. 80 AMP Total; Includes Three Modules with Hardware Only

LATCHED SWITCH RPMS

60AAA

BDY INTG, RPM Mounted Under Cab; Up to Six Outputs and Six Inputs, Max. 20 AMP per Channel, Max. 80 AMP Total (Includes One Switch Pack with Latched Switches) Mounted on Battery Box, BOC

60AAB

BDY INTG, RPM (2) Mounted Under Cab; Up to Six Outputs and Six Inputs Each, Max. 20 AMP per Channel, Max. 80 AMP Total per Power Module (Includes Switch Packs with Latched Switches) Mounted on Battery Box, BOC

08WTJ

SWITCH, BODY CIRCUITS, REAR for Body Builder with Six Switches in IP (2-position Latched Switches), One Power Module With Six Channels, 20 AMP per Channel and 80 AMP Maximum Output, Switches Control the Power Modules Through Multiplex Wiring, Mounted at the Rear of the Frame (ROF)

60AAD

BDY INTG, RPM (2) {SPECIAL} Mounted Under Cab or on Battery Box; Max. 20 AMP per Channel, Max. 80 AMP Total per Power Module; Includes One Module with Switch Pack Containing Six Latched Switches and One Module with Hardware Only

60AAG

BDY INTG, RPM Mounted Inside Cab behind Driver Seat; Max. 20 AMP per Channel, Max. 80 AMP Total; Includes One Module with Switch Pack Containing Latched Switches

60AAH

BDY INTG, RPM (2) Mounted Inside Cab behind Driver Seat; Max. 20 AMP per Channel, Max. 80 AMP Total; Includes Two Modules with 2 Switch Packs Containing Latched Switches

60AAJ

BDY INTG, RPM (3) Mounted Inside Cab behind Driver Seat; Max. 20 AMP per Channel, Max. 80 AMP Total; Includes Three Modules with 3 Switch Packs Containing Latched Switches

60AAK

BDY INTG, RPM (2) {SPECIAL} Mounted Inside Cab behind Driver Seat; Max. 20 AMP per Channel, Max. 80 AMP Total; Includes One Module with Switch Pack Containing Six Latched Switches and One Module with Hardware Only

60AJL

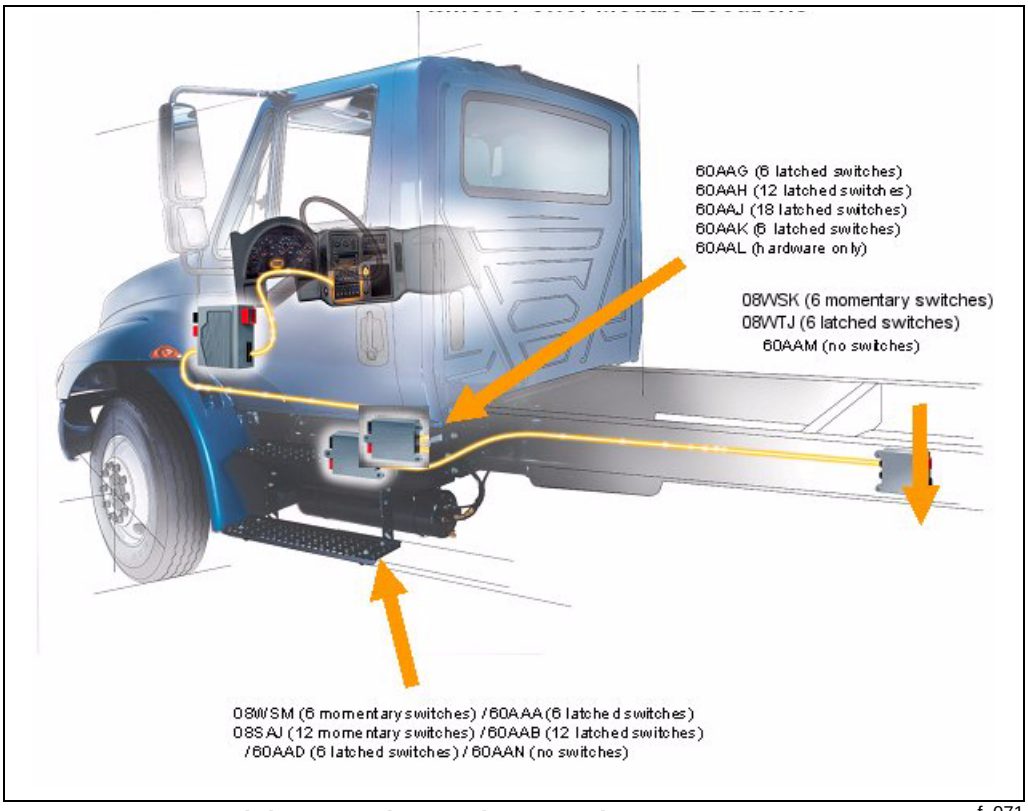
BDY INTG, REMOTE POWER MODULE Mounted Inside Cab; Up to 6 Outputs & 6 Inputs, Max. 20 AMP per Channel, Max. 80 AMP Total; (Includes 1 Switch Pack With Latched Switches)

60AJM

BDY INTG, REMOTE POWER MODULE (2) Mounted Inside Cab; Up to 6 Outputs & 6 Inputs each, Max. 20 AMP per Channel, Max. 80 AMP Total; (Includes Switch Packs With Latched Switches)

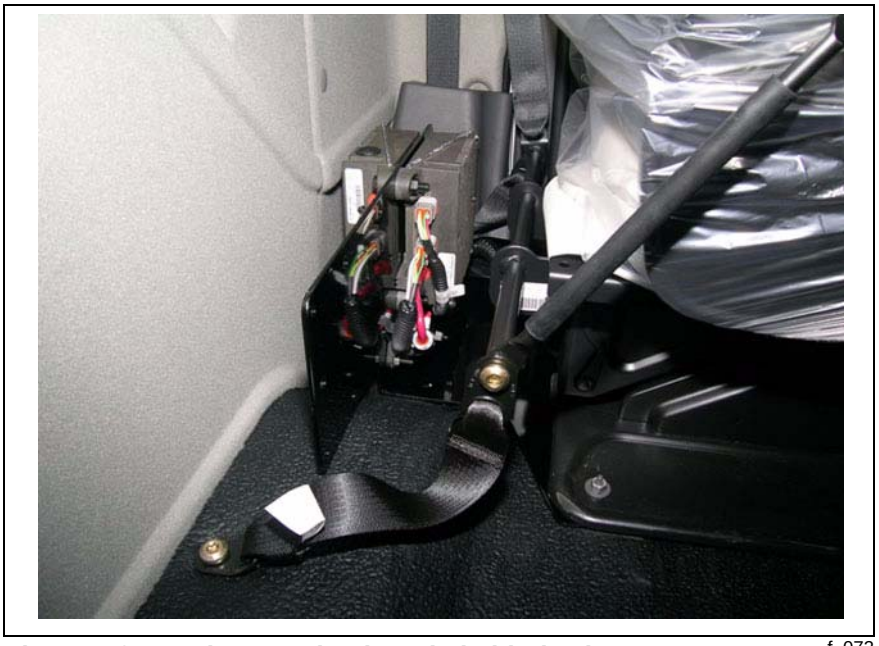
FEATURE/BODY FUNCTION

- On the DuraStar models, codes 08SAJ, 08WSM, 60AAA, AAD, AAN and 60AAB have the RPMs mounted at the back of the battery box.
- On the WorkStar models, codes 08SAJ, 08WSM, 60AAA, AAD, AAN and 60AAB have the RPMs mounted under the cab, left rear.
- On either the DuraStar or WorkStar models, codes 08WSK, 08WTJ or 60AAM have the RPMs mounted on the driver's side frame rail at the ROF.
- On the DuraStar or WorkStar models, codes 08VZR, 08VZS, 60AAG, 60AAH, 60AAJ, 60AAK, or 60AAL have the RPMs mounted inside the cab, behind the driver's seat.
- On the Workstar models, codes 60AJL and 60AJM have the PRMs mounted inside the cab, behind the passenger's seat. On the DuraStar, codes 60AJL and 60AJM are not available.
- On WorkStar models code 60AAN is not compatible with 60AAB



f_071

Remote Power Module Internal Mounting Locations



Picture of Sample Mounting in Cab, behind Driver's Seat f_072

Feature codes 08WSK, 08WSM, 08SAJ, 08VZR, 08VZS, and 08WTJ each add a 6-pack switch pack in a one-to- one relationship to the RPM feature code.

60AAA and 60AAB add switches by filling in the first empty switch location. Once the first switch pack is full, a second will be added filling in from the left to right of the switch pack.

REMOTE POWER MODULES

The table below summarizes the RPM locations and configurations by sales code and model:

Table 81

RPM Code	# of RPM's and Addresses Used	# of Switches	Type of Switches	Switch Configuration	Model	Location
08SAJ	2 (1, 2)	12	Momentary	Mounted in their own 6 Packs or 12 Pack Switchpack	DuraStar	Back of Battery Box
					WorkStar	Under Cab Left Rear
08WSK	1 (4)	6	Momentary	Mounted in their own 6 Pack Switchpack	DuraStar & WorkStar	Drivers side Rear of Frame
08WSM	1 (1)	6	Momentary	Mounted in their own 6 Pack Switchpack	DuraStar	Back of Battery Box
					WorkStar	Under Cab Left Rear
08VZR	1 (1)	6	Momentary	Mounted in their own 6 Pack Switchpack	DuraStar & WorkStar	Inside the cab behind the driver's seat
08VZS	2 (1, 2)	12	Momentary	Mounted in their own 6 Packs or 12 Pack Switchpack	DuraStar & WorkStar	Inside the cab behind the driver's seat
08WTJ	1 (4)	6	Latched	Fills in the next blank switch location after factory switches	DuraStar & WorkStar	Drivers side Rear of Frame
60AAA	1 (1)	6	Latched	Fills in the next blank switch location after factory switches	DuraStar	Back of Battery Box
					WorkStar	Under Cab Left Rear
60AAB	2 (1, 2)	12	Latched	Fills in the next blank switch location after factory switches	DuraStar	Back of Battery Box
					WorkStar	Under Cab Left Rear
60AAD	2 (1, 2	6	Latched	Fills in the next blank switch location after factory switches	DuraStar	Back of Battery Box
					WorkStar	Under Cab Left Rear
60AAG	1 (1)	6	Latched	Fills in the next blank switch location after factory switches	DuraStar & WorkStar	Inside the cab behind the driver's seat (Extended cab, mounted outside of cab
60AAH	2 (1,2)	12	Latched	Fills in the next blank switch location after factory switches	DuraStar & WorkStarI	Inside the cab behind the driver's seat (Extended cab, mounted outside of cab
60AAJ	3 (1, 2, 4)	18	Latched	Fills in the next blank switch location after factory switches	DuraStar & WorkStarI	Inside the cab behind the driver's seat (Extended cab, mounted outside of cab
60AAK	2 (1,2)	6	Latched	Fills in the next blank switch location after factory switches	DuraStar & WorkStarI	Inside the cab behind the driver's seat (Extended cab, mounted outside of cab
60AJL (Not recom-mended, use 60AAG)	1	6	Latched	Fills in the next blank switch location after factory switches	DuraStar	Not available
					WorkStar	Inside the cab behind the driver's seat
60AJM (Not recom-mended, use 60AAH)	2	12	Latched	Fills in the next blank switch location after factory switches	DuraStar	Not available
					WorkStar	Inside the cab behind the driver's seat
60AAL	3 (1, 2, 4)	0	None	N/A	DuraStar & WorkStar	Inside the cab behind the driver's seat (Extended cab, mounted outside of cab)
60AAM	1 (5)	0	None	N/A	DuraStar & WorkStar	Drivers side Rear of Frame
60AAN	1 (3)	0	None	N/A	WorkStar	Back of Cab (Not compatible with 60AAB on WorkStar)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

08WSK: 595AHB

The PwrMod4_Fuse_Level1_Param sets the limit (in AMPS) of the current flowing from Output #1 of RPM #4.

The PwrMod4_Fuse_Level2_Param sets the limit (in AMPS) of the current flowing from Output #2 of RPM #4.

The PwrMod4_Fuse_Level3_Param sets the limit (in AMPS) of the current flowing from Output #3 of RPM #4.

The PwrMod4_Fuse_Level4_Param sets the limit (in AMPS) of the current flowing from Output #4 of RPM #4.

The PwrMod4_Fuse_Level5_Param sets the limit (in AMPS) of the current flowing from Output #5 of RPM #4.

The PwrMod4_Fuse_Level6_Param sets the limit (in AMPS) of the current flowing from Output #6 of RPM #4.

The PwrMod4_Init_State1_Param parameter determines the initial state of RPM #4, output #1. If the parameter is set to 1, Output #1 of RPM #4 will be turned ON at ignition (IGN) key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod4_Init_State2_Param parameter determines the initial state of RPM #4, output #2. If the parameter is set to 1, Output #2 of RPM #4 will be turned ON at ignition (IGN) key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod4_Init_State3_Param parameter determines the initial state of RPM #4, output #3. If the parameter is set to 1, Output #3 of RPM #4 will be turned ON at ignition (IGN) key on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod4_Init_State4_Param parameter determines the initial state of RPM #4, output #4. If the parameter is set to 1, Output #4 of RPM #4 will be turned ON at ignition (IGN) key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod4_Init_State5_Param parameter determines the initial state of RPM #4, output #5. If the parameter is set to 1, Output #5 of RPM #4 will be turned ON at ignition (IGN) key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod4_Init_State6_Param parameter determines the initial state of RPM #4, output #6. If the parameter is set to 1, Output #6 of RPM #4 will be turned ON at ignition (IGN) key-on. If the parameter value is set to 0, the output will be OFF at key-on.

Table 82

Parameter	ID	Description	Default	Units	Min	Max	Step
PwrMod4_ Fuse_Level1_ Param	454	Current Limit in amps for Output #1 of RPM #4	20	A	0	20	0.1
PwrMod4_ Fuse_ Level2_ Param	455	Current Limit in amps for Output #2 of RPM #4	20	A	0	20	0.1
PwrMod4_ Fuse_ Level3_ Param	456	Current Limit in amps for Output #3 of RPM #4	20	A	0	20	0.1
PwrMod4_ Fuse_Level4_ Param	457	Current Limit in amps for Output #4 of RPM #4	20	A	0	20	0.1
PwrMod4_ Fuse_ Level5_ Param	458	Current Limit in amps for Output #5 of RPM #4	20	A	0	20	0.1
PwrMod4_ Fuse_ Level6_ Param	459	Current Limit in amps for Output #6 of RPM #4	20	A	0	20	0.1
PwrMod4_ Init_State1_ Param	460	If this parameter is set to 1, Output #1 of RPM #4 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod4_ Init_State2_ Param	461	If this parameter is set to 1, Output #2 of RPM #4 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod4_ Init_State3_ Param	462	If this parameter is set to 1, Output #3 of RPM #4 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod4_ Init_State4_ Param	463	If this parameter is set to 1, Output #4 of RPM #4 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod4_ Init_State5_ Param	464	If this parameter is set to 1, Output #5 of RPM #4 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod4_ Init_State6_ Param	465	If this parameter is set to 1, Output #6 of RPM #4 will be turned on at ignition key-on. If set to 0, output will be off at key-on	OFF	No_ Units	N/A	N/A	N/A

08WSM & 08VZR: 595AHE

The PwrMod1_Fuse_Level1_Param sets the limit (in AMPS) of the current flowing from Output #1 of RPM #1.

The PwrMod1_Fuse_Level2_Param sets the limit (in AMPS) of the current flowing from Output #2 of RPM #1.

The PwrMod1_Fuse_Level3_Param sets the limit (in AMPS) of the current flowing from Output #3 of RPM #1.

The PwrMod1_Fuse_Level4_Param sets the limit (in AMPS) of the current flowing from Output #4 of RPM #1.

The PwrMod1_Fuse_Level5_Param sets the limit (in AMPS) of the current flowing from Output #5 of RPM #1.

The PwrMod1_Fuse_Level6_Param sets the limit (in AMPS) of the current flowing from Output #6 of RPM #1.

The PwrMod1_Init_State1_Param parameter determines the initial state of RPM #1, output #1. If the parameter is set to 1, Output #1 of RPM #1 will be turned ON at ignition key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State2_Param parameter determines the initial state of RPM #1, output #2. If the parameter is set to 1, Output #2 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State3_Param parameter determines the initial state of RPM #1, output #3. If the parameter is set to 1, Output #3 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State4_Param parameter determines the initial state of RPM #1, output #4. If the parameter is set to 1, Output #4 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State5_Param parameter determines the initial state of RPM #1, output #5. If the parameter is set to 1, Output #5 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State6_Param parameter determines the initial state of RPM #1, output #6. If the parameter is set to 1, Output #6 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

Table 83

Parameter	ID	Description	Default	Units	Min	Max	Step
PwrMod1_ Fuse_Level1_ Param	392	Current Limit in amps for Output #1 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level2_ Param	393	Current Limit in amps for Output #2 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level3_ Param	394	Current Limit in amps for Output #3 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_Level4_ Param	395	Current Limit in amps for Output #4 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level5_ Param	396	Current Limit in amps for Output #5 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level6_ Param	397	Current Limit in amps for Output #6 of RPM #1	20	A	1	20	0.1
PwrMod1_ Init_State1_ Param	398	If this parameter is set to 1, Output #1 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State2_ Param	399	If this parameter is set to 1, Output #2 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State3_ Param	400	If this parameter is set to 1, Output #3 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State4_ Param	401	If this parameter is set to 1, Output #4 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State5_ Param	402	If this parameter is set to 1, Output #5 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State6_ Param	403	If this parameter is set to 1, Output #6 of RPM #1 will be turned on at ignition key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A

08SAJ & 08VZS: 595AHE and 595AHD

The PwrMod2_Fuse_Level1_Param sets the limit (in AMPS) of the current flowing from Output #1 of RPM #2.

The PwrMod2_Fuse_Level2_Param sets the limit (in AMPS) of the current flowing from Output #2 of RPM #2.

The PwrMod2_Fuse_Level3_Param sets the limit (in AMPS) of the current flowing from Output #3 of RPM #2.

The PwrMod2_Fuse_Level4_Param sets the limit (in AMPS) of the current flowing from Output #4 of RPM #2.

The PwrMod2_Fuse_Level5_Param sets the limit (in AMPS) of the current flowing from Output #5 of RPM #2.

The PwrMod2_Fuse_Level6_Param sets the limit (in AMPS) of the current flowing from Output #6 of RPM #2.

The PwrMod2_Init_State1_Param parameter determines the initial state of RPM #2, output #1. If the parameter is set to 1, Output #1 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod2_Init_State2_Param parameter determines the initial state of RPM #2, output #2. If the parameter is set to 1, Output #2 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod2_Init_State3_Param parameter determines the initial state of RPM #2, output #3. If the parameter is set to 1, Output #3 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod2_Init_State4_Param parameter determines the initial state of RPM #2, output #4. If the parameter is set to 1, Output #4 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod2_Init_State5_Param parameter determines the initial state of RPM #2, output #5. If the parameter is set to 1, Output #5 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod2_Init_State6_Param parameter determines the initial state of RPM #2, output #6. If the parameter is set to 1, Output #6 of RPM #2 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Fuse_Level1_Param sets the limit (in AMPS) of the current flowing from Output #1 of RPM #1.

The PwrMod1_Fuse_Level2_Param sets the limit (in AMPS) of the current flowing from Output #2 of RPM #1.

The PwrMod1_Fuse_Level3_Param sets the limit (in AMPS) of the current flowing from Output #3 of RPM #1.

The PwrMod1_Fuse_Level4_Param sets the limit (in AMPS) of the current flowing from Output #4 of RPM #1.

The PwrMod1_Fuse_Level5_Param sets the limit (in AMPS) of the current flowing from Output #5 of RPM #1.

The PwrMod1_Fuse_Level6_Param sets the limit (in AMPS) of the current flowing from Output #6 of RPM #1.

The PwrMod1_Init_State1_Param parameter determines the initial state of RPM #1, output #1. If the parameter is set to 1, Output #1 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State2_Param parameter determines the initial state of RPM #1, output #2. If the parameter is set to 1, Output #2 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State3_Param parameter determines the initial state of RPM #1, output #3. If the parameter is set to 1, Output #3 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State4_Param parameter determines the initial state of RPM #1, output #4. If the parameter is set to 1, Output #4 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State5_Param parameter determines the initial state of RPM #1, output #5. If the parameter is set to 1, Output #5 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

The PwrMod1_Init_State6_Param parameter determines the initial state of RPM #1, output #6. If the parameter is set to 1, Output #6 of RPM #1 will be turned ON at IGN key-on. If the parameter value is set to 0, the output will be OFF at key-on.

Table 84

Parameter	ID	Description	Default	Units	Min	Max	Step
PwrMod2_ Fuse_Level1_ Param	35	Current Limit in amps for Output #1 of RPM #2	20	A	1	20	0.1
PwrMod2_ Fuse_ Level2_ Param	36	Current Limit in amps for Output #2 of RPM #2	20	A	1	20	0.1
PwrMod2_ Fuse_ Level3_ Param	37	Current Limit in amps for Output #3 of RPM #2	20	A	1	20	0.1
PwrMod2_ Fuse_Level4_ Param	38	Current Limit in amps for Output #4 of RPM #2	20	A	1	20	0.1
PwrMod2_ Fuse_ Level5_ Param	39	Current Limit in amps for Output #5 of RPM #2	20	A	1	20	0.1
PwrMod2_ Fuse_ Level6_ Param	40	Current Limit in amps for Output #6 of RPM #2	20	A	1	20	0.1
PwrMod2_ Init_State1_ Param	41	If this parameter is set to 1, Output #1 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod2_ Init_State2_ Param	42	If this parameter is set to 1, Output #2 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod2_ Init_State3_ Param	43	If this parameter is set to 1, Output #3 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod2_ Init_State4_ Param	44	If this parameter is set to 1, Output #4 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod2_ Init_State5_ Param	45	If this parameter is set to 1, Output #5 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod2_ Init_State6_ Param	46	If this parameter is set to 1, Output #5 of RPM #2 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Fuse_Level1_ Param	392	Current Limit in amps for Output #1 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level2_ Param	393	Current Limit in amps for Output #2 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level3_ Param	394	Current Limit in amps for Output #3 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_Level4_ Param	395	Current Limit in amps for Output #4 of RPM #1	20	A	1	20	0.1

Parameter	ID	Description	Default	Units	Min	Max	Step
PwrMod1_ Fuse_ Level5_ Param	396	Current Limit in amps for Output #5 of RPM #1	20	A	1	20	0.1
PwrMod1_ Fuse_ Level6_ Param	397	Current Limit in amps for Output #6 of RPM #1	20	A	1	20	0.1
PwrMod1_ Init_State1_ Param	398	If this parameter is set to 1, Output #1 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State2_ Param	399	If this parameter is set to 1, Output #2 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State3_ Param	400	If this parameter is set to 1, Output #3 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State4_ Param	401	If this parameter is set to 1, Output #4 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State5_ Param	402	If this parameter is set to 1, Output #5 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A
PwrMod1_ Init_State6_ Param	403	If this parameter is set to 1, Output #6 of RPM #1 will be turned on at IGN key-on. If set to 0, output will be off at key-on.	OFF	No_ Units	N/A	N/A	N/A

FEATURE BODY FUNCTION

60AAA provides one RPM where 60AAB provides two RPMs. Each RPM provides six load outputs for a maximum of 20 AMPS per channel and a maximum of 80 total AMPS per module. Each RPM also provides six inputs that can be either a 12 volt input or a GND active input signal.

60AAD provides two RPMs with only one 6-pack switch pack. This feature is specifically for customers that wish to use advanced logic to control the outputs of these two RPMs through special customer-created software.

60AAG provides one RPM, 60AAH provides two RPMs and 60AAJ provides three RPMs. Each RPM provides six load outputs for a maximum of 20 AMPS per channel and a maximum of 80 total AMPS per module. Each RPM also provides six inputs that can be either a 12 volt input or a GND active input signal.

60AAK provides two RPMs with one switch a 6-pack switch pack. 60AAL provides three RPMs. These features are fir customers that wish to use advanced logic to control the outputs of the RPMs through special customer-created software.

60AJL and 60AJM provide the same functionality as 60AAG and 60AAH respectively. It is recommended that 60AAG or 60AAH be used instead of 60AJL or 60AJM.

* There are other software features that can be ordered such as PTO features that will also use RPM outputs and inputs. These features will take precedence over the RPM feature code switches and inputs/outputs. For example, an order for a PTO feature that uses switch location one and RPM input/output one comes with the PTO switch and five other switches that would control outputs two through six.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Feature code 60AAA, 60AAB, 60AAD, 60AAG, 60AAH, 60AAJ, 60AAK, 60AAL, 60AJL or 60AJM are configured by special unadvertised software feature codes. These codes are determined by the number of additional features that use the RPM resources. The following codes should be added after all other features are added to the vehicle.

60ACA = 595AJK – This feature should be added if there are features already using five RPM inputs/outputs.

60ACB = 595AJL – This feature should be added if there are features already using four RPM inputs/outputs.

60ACC = 595AJM – This feature should be added if there are features already using three RPM inputs/outputs.

60ACD = 595AJN – This feature should be added if there are features already using two RPM inputs/outputs.

60ACJ = 595AJP – This feature should be added if there are features already using one RPM input/output.

60ACK = 595AJR – This feature should be added if there no other features using any RPM inputs/outputs.

60ACV = 595AJS – This feature should be added to add the second RPM (60AAB).

The following parameters may or may not show up in certain combinations based on which of the above software feature codes are installed on the vehicle.

The TEM_Aux1_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_1_Output of RPM #1.

The TEM_Aux2_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_2_Output of RPM #1.

The TEM_Aux3_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_3_Output of RPM #1.

The TEM_Aux4_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_4_Output of RPM #1.

The TEM_Aux5_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_5_Output of RPM #1.

The TEM_Aux6_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_6_Output of RPM #1.

The TEM_Aux7_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_7_Output of RPM #1.

The TEM_Aux8_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_8_Output of RPM #1.

The TEM_Aux9_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_9_Output of RPM #1.

The TEM_Aux10_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_10_Output of RPM #1.

The TEM_Aux11_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_11_Output of RPM #1.

The TEM_Aux12_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled Aux_Switch_12_Output of RPM #1.

Table 85

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Aux1_ Output_Fuse_ Param	1990	This is the maximum current Aux 1 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux2_ Output_Fuse_ Param	1991	This is the maximum current Aux 2 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux3_ Output_Fuse_ Param	1992	This is the maximum current Aux 3 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux4_ Output_Fuse_ Param	1995	This is the maximum current Aux 4 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux5_ Output_Fuse_ Param	1999	This is the maximum current Aux 5 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux6_ Output_Fuse_ Param	2000	This is the maximum current Aux 6 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux7_ Output_Fuse_ Param	2100	This is the maximum current Aux 7 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux8_ Output_Fuse_ Param	2101	This is the maximum current Aux 8 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux9_ Output_Fuse_ Param	2102	This is the maximum current Aux 9 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux10_ Output_Fuse_ Param	2103	This is the maximum current Aux 10 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux11_ Output_Fuse_ Param	2104	This is the maximum current Aux 11output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux12_ Output_Fuse_ Param	2105	This is the maximum current Aux 12 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1

FEATURE/BODY FUNCTION

08WTJ: 595AJG

Feature 08WTJ adds one RPM to the end of the frame to be used by itself or in combination with 60AAA (one RPM BOC) or 60AAB (two RPMs BOC). The RPM will have six channels, 20 AMPS per channel, and 80 AMPS maximum output. There will be six, 2-position, latched switches located in the IP that will control the RPM through multiplex wiring.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code: 595AJG

Conflicts with Software features: 595AHB

The TEM_Aux13_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output1 of RPM #1.

The TEM_Aux14_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output2 of RPM #1.

The TEM_Aux15_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output3 of RPM #1.

The TEM_Aux16_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output4 of RPM #1.

The TEM_Aux17_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output5 of RPM #1.

The TEM_Aux18_Output_Fuse_Param sets the limit (in AMPS) of the current flowing from the output labeled RPM4_Output6 of RPM #1.

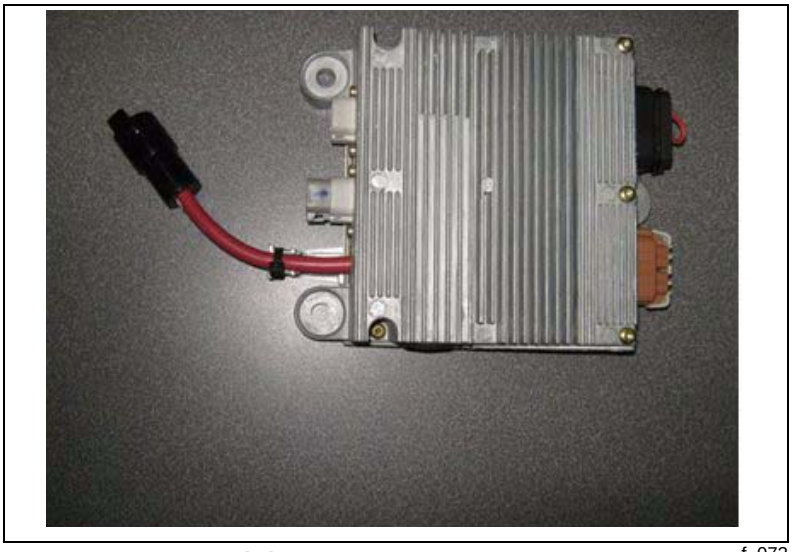
Table 86

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Aux13_Output_Fuse_Param	2215	This is the maximum current Aux 13 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux14_Output_Fuse_Param	2216	This is the maximum current Aux 14 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux15_Output_Fuse_Param	2217	This is the maximum current Aux 15 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux16_Output_Fuse_Param	2218	This is the maximum current Aux 16 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux17_Output_Fuse_Param	2219	This is the maximum current Aux 17 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1
TEM_Aux18_Output_Fuse_Param	2220	This is the maximum current Aux 18 output is allowed to source before the virtual fusing turns the output off.	20	Amps	0	20	0.1

WIRING INFORMATION

Each module receives power from a 4-gauge cable, protected by a fusible link, connected to the battery stud of the starter motor or the battery depending on the location of the RPM.

REMOTE POWER MODULES



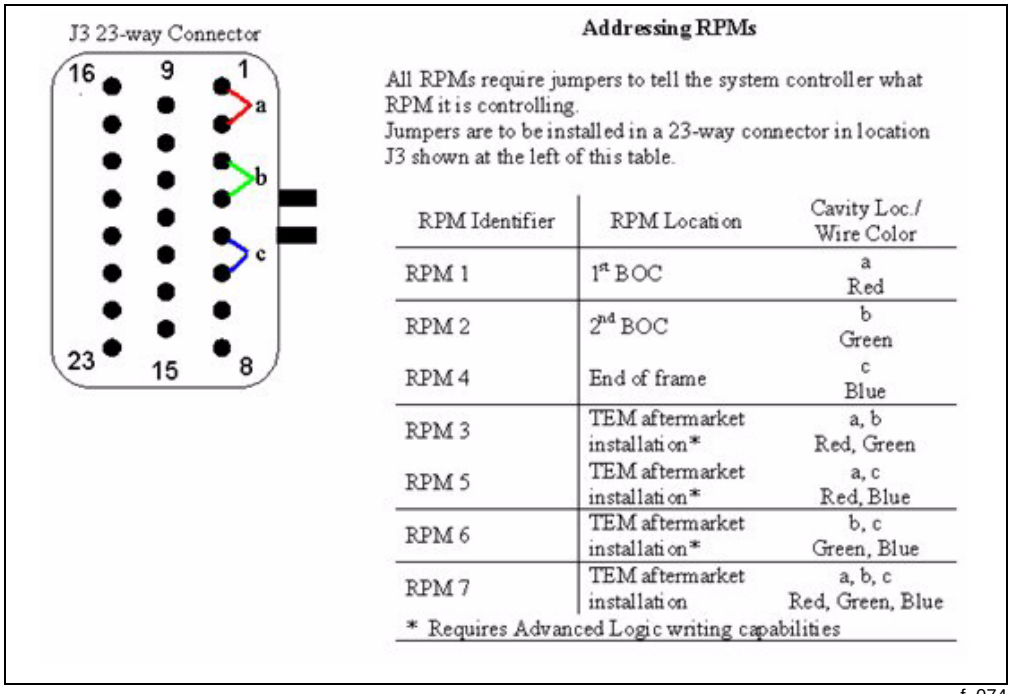
Remote Power Module f_073

Each generic RPM has the ability to operate up to six devices of 20 AMPS or less not to exceed 80 AMPS for the entire module. Each RPM comes with a 6-pack of switches that is inserted into the center section of the IP. Each generic switch controls one output of the RPM. The switch mapping is one-to-one with the RPM, i.e. switch one controls output channel one on the RPM. The switch pack is connected to the switch data bus that communicates switch operation to the BC, which communicates that operation to the RPM. The RPM also has inputs on the module itself that can be programmed to control the outputs. This means that the RPM functions like a 3-way lamp switch in a home. Each in-cab switch is a momentary rocker switch that is stable in the center position. The upper section of each switch has an indicator light to provide the status of each power output channel. Pressing the upper section of the switch will latch the respective power output channel on and illuminate the indicator. Pressing the lower section of the switch will latch the power output channel off and turn the indicator off. Likewise, the output channels may be controlled remotely by using a three-position momentary single pole, double throw switch on each remote switch input. Applying battery volts to the remote switch input will turn the output channel on. Applying GND to the remote switch input will turn the output channel off. The lamp indicator on the IP switch will always display the current status of the output channel as long as the IGN key is in the IGN or accessory position. Each RPM In-cab switch operates with the key in the IGN or accessory position. The RPM remote input switches operate at any time. If a conflict exists between the switches, the off state always wins.

A maximum of three RPMs may be connected to the vehicle from the factory which allows a total of 18 devices to be controlled as long as the 80 AMPS per module is not exceeded. The modules can be relocated from their mounting position as long as the datalink cable will reach its new mounting location without the datalink cable being modified.

ADDRESSING RPMS

All RPMs require jumpers to tell the system controller what RPM it is controlling. Jumpers are to be installed in a 23-way connector in location J3, shown in the figure below. No two RPMs can have the same address on a vehicle.



Addressing RPMs

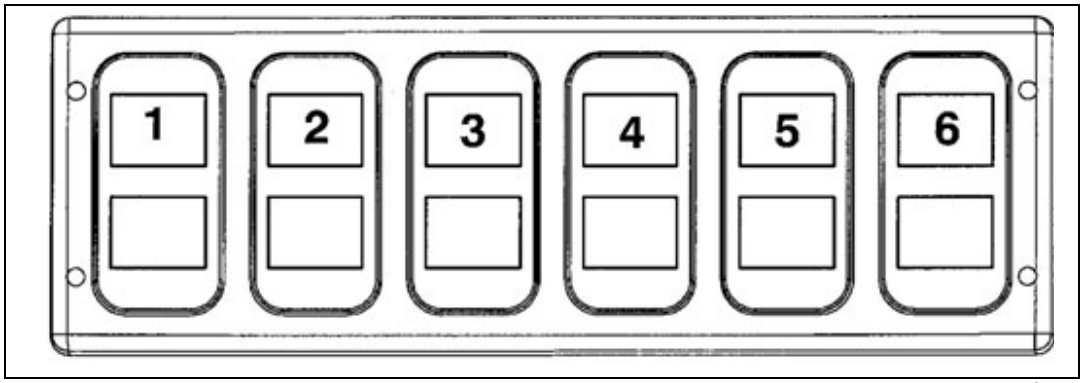
All RPMs require jumpers to tell the system controller what RPM it is controlling.
Jumpers are to be installed in a 23-way connector in location J3 shown at the left of this table.

RPM Identifier	RPM Location	Cavity Loc./ Wire Color
RPM 1	1st BOC	a Red
RPM 2	2nd BOC	b Green
RPM 4	End of frame	c Blue
RPM 3	TEM aftermarket installation*	a, b Red, Green
RPM 5	TEM aftermarket installation*	a, c Red, Blue
RPM 6	TEM aftermarket installation*	b, c Green, Blue
RPM 7	TEM aftermarket installation	a, b, c Red, Green, Blue

* Requires Advanced Logic writing capabilities

J3 23–Way Connector

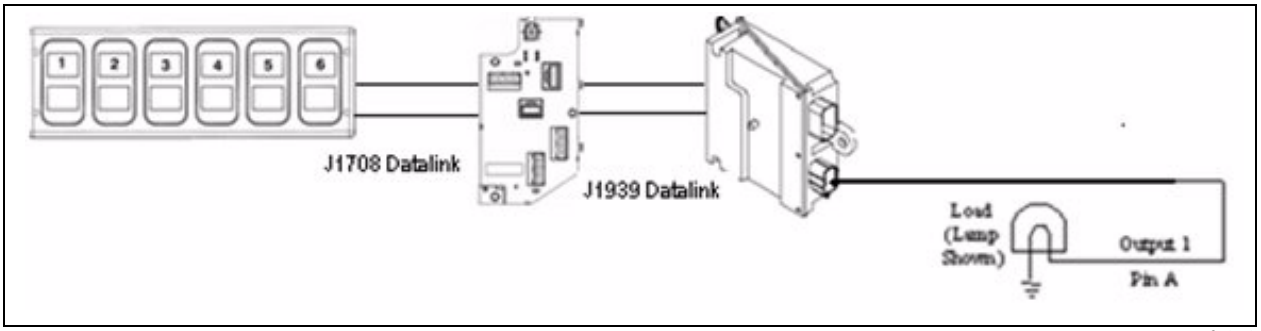
f_074



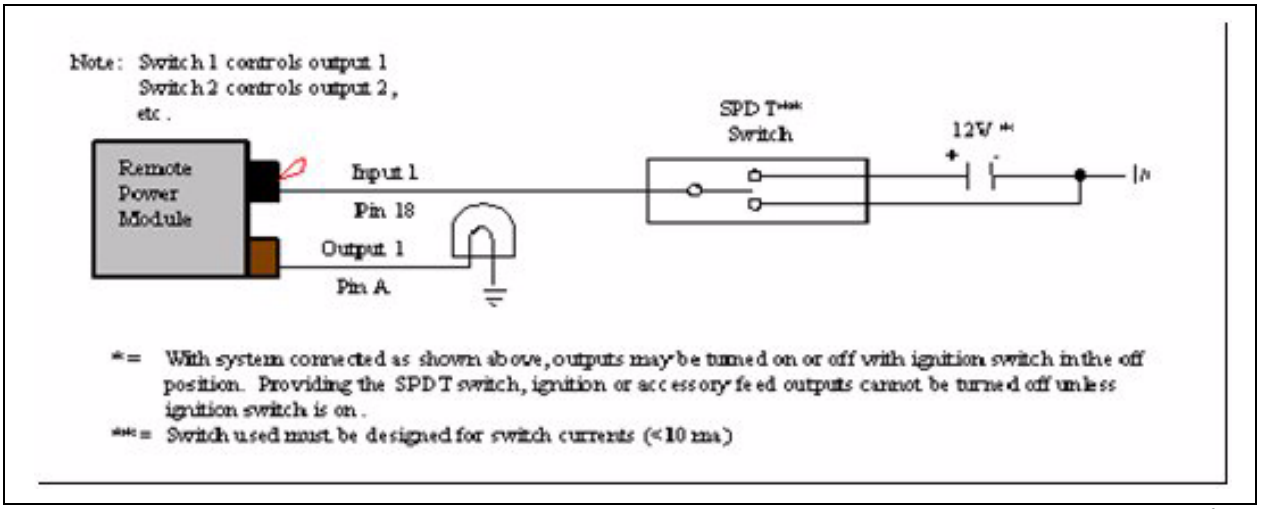
Instrument Panel Mounted Switch Pack

f_075

Switch Labeling: Switch packs provided with the RPM feature are general purpose “un-labeled” rocker switches. Since the functions of the rocker switches are unknown at the time of vehicle assembly, “un-labeled” rocker switches are provided so the Body Builder can customize the switches to any particular need. For switch graphic information, see the Switches chapter in this electrical guide.



Example with RPM Output Controlled by Switch Inside Cab f_076



Example with RPM Output Controlled by Switch Located on Chassis f_077

Table 87

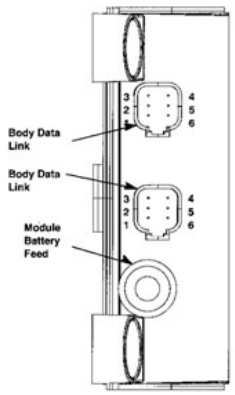


Fig_078

Pin	Signal Name	Signal Direction	Rating (Amps)
Body Data Link			
2	GND	GND/Pass-Thru	
3	Body Builder J1939+	Datalink	
4	Body Builder J1939–	Datalink	
6	Battery	Input/Pass-Thru	5
Body Datalink			
2	GND	GND/Pass-Thru	
3	Body Builder J1939+	Datalink	
4	Body Builder J1939–	Datalink	
6	Battery	Input/Pass-Thru	5
Module Battery Feed			
1	Supply Voltage	Input	80

NOTE: Body datalink output is supplied with the mate to this connector which is sealed and includes a 120 ohm terminating resistor.

NOTE: No additional circuits can be added.

Table 88

Pin	Signal Name	Signal Direction	Rating (Amps)
Signal Connector			
1	Module Select Common	GND	
2	Module Select #1	Digital Input	0.010
3	Module Select Common	GND	
4	Module Select #2	Digital Input	0.010
5	Module Select Common	GND	
6	Module Select #3		0.010
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18	Input #1	Switch Input	0.010
19	Input #2	Switch Input	0.010
20	Input #3	Switch Input	0.010
21	Input #4	Switch Input	0.010
22	Input #5	Switch Input	0.010
23	Input #6	Switch Input	0.010
Power Connector			
A	Output #1	Output	20
B	Output #2	Output	20
C	Output #3	Output	20
D	Output #4	Output	20
E	Output #5	Output	20
F			
G			
H	Output #6	Output	20

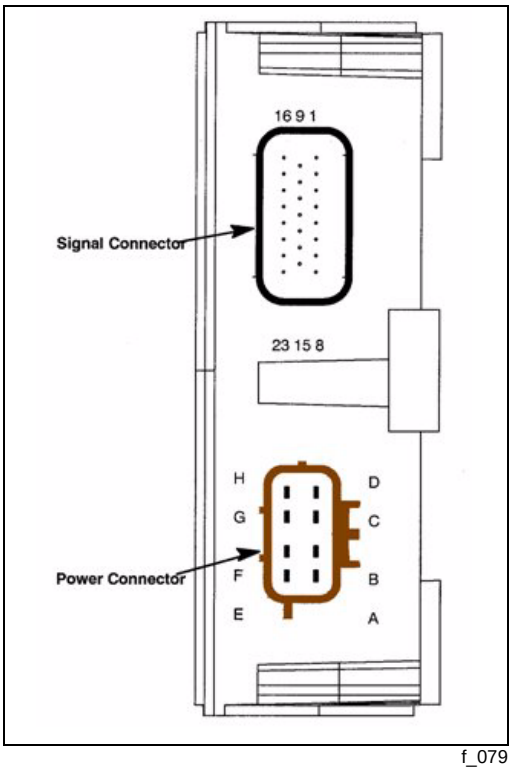
NOTE: Refer to the Recommended Circuit Protection in the General section when selecting wire gauge and fusing.

Table 89 – Mating Connector Information

Signal Connector — 23 Way	
Connector	**Plug**
2005482C1	1688285C1
Terminal	**Cable Gauge**
1698937C1	16, 18, 20

Table 90 – Mating Connector Information

Power Connector — 8 Way	
Connector	**Lock**
3548934C1	3548943C1
Terminal	**Cable Gauge**
3535930C1	16, 18
3534163C1	12
3535931C1	14
Cable Seal	**Cable Gauge**
3535936C1	
3535937C1	
3548945C1	
Plug	2025431C1



f_079

For Switch Product Graphic Label Kit part numbers, see the Switch chapter in this electrical guide.

REMOTE POWER MODULES

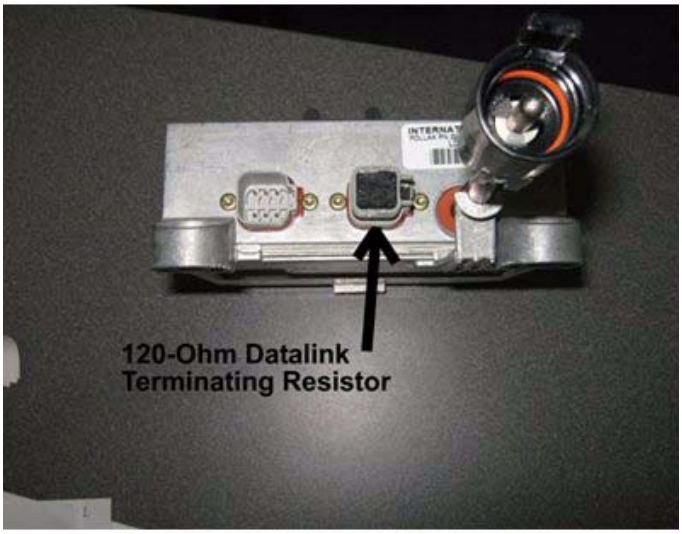
Here are some facts about the use of the RPM:

- Each RPM provides six outputs. The loads on each output are protected by virtual fuses and are programmable in 100mA (milliAmp) increments, 20 AMP max. per channel, 80 AMP max. per module.
- A maximum of three RPMs per vehicle may be factory-installed, and a total of seven can be added after the vehicle has been built.
- Power is fed to the RPM through a fused link from the battery or starter lug (depending on the vehicle model) that controls lights, mirrors, solenoids, fans, etc.
- If higher current capacity is needed, the RPM can control a high current relay and still maintain logic and diagnostic capability without having to wire to the inside of the cab.
- The RPM outputs may be programmed to be on or off with each key-on cycle (assumes a momentary switch is used in the cab).
- There is an input connector for the Body Builder switches.

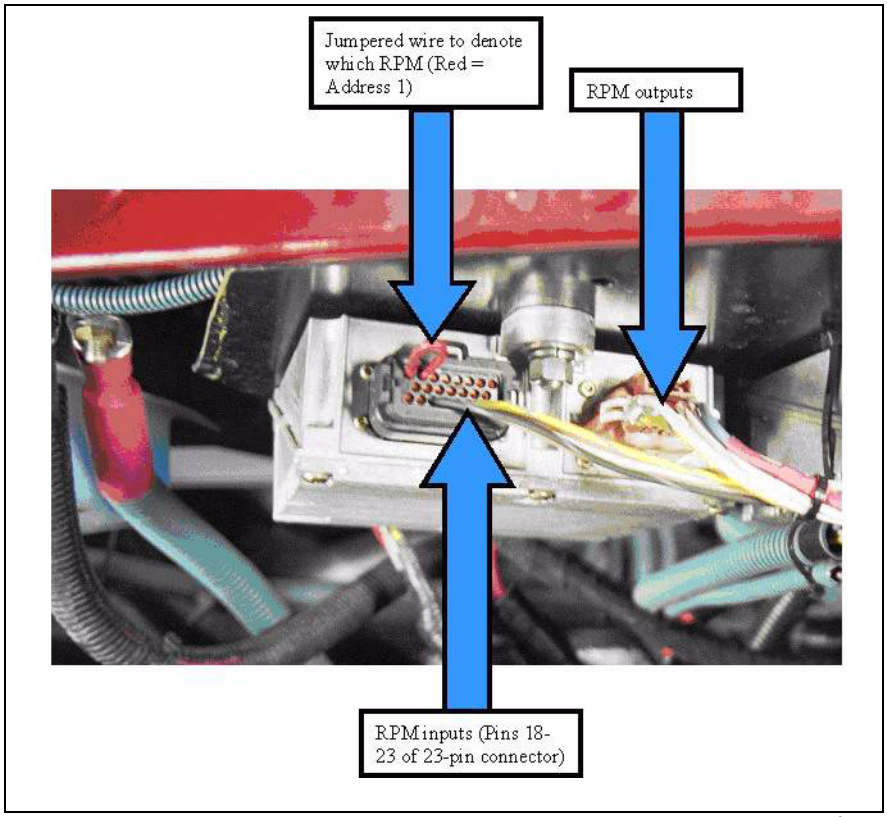
- A 3-way output control may be achieved by using a single pole double throw switch with the RPM inputs. The respective RPM output may be turned on by the in-cab switch and off by the remote switch, and vice versa. The in-cab switch indicator displays the status of the RPM output.
- The switch input actually goes to the BC so that the program rules can be checked. If all of the rules checkout, the controller will activate the channel. If the preprogrammed logic rules for this circuit are not met, the switch will flash until the desired condition is activated.
- A 12 volt input will turn a channel on, and a GND input will turn the channel off.
- If a latching switch is used by the TEM or Body Builder with the remote switch inputs, the channel cannot be controlled by the in-cab switch.

- RPMs have diagnostic capability.
- As mentioned, the fusing current can be programmed. If that current is exceeded, the circuit will be “fused” and the RPM will send that message to BC indicating which RPM and what output is over current.
- The RPM has two 6-pin connectors.

- The last module must have a 120–ohm terminating resistor in the datalink connector.
- All power, GND, and datalink signals are contained in these connectors.
- The two identical connectors located on the power input side of the module are the datalink connectors. They are pass-thru connectors that allow for the “daisy chaining” of modules. Only one connector plugs into the chassis harness.



120–ohm Datalink Termination Connector on RPM f_080



RPM Connectors f_081

How To Add This Feature

Three RPMs can be added to a vehicle. The RPM kit 2594132C91 contains the RPM, datalink cables, three foot power cable, 6-pack switch pack, LED indicators for the switches, and six latching switches. If momentary switches are needed, order part number 3564004C1 in the quantity needed.

Table 91 – RPM Kit Contents

Part	Description	Quantity
2588909C92	KIT, REMOTE POWER MODULE W/JMPR	1
3804529P93	MM, IP, WRG, J1939 PRIVATE RPM	1
3558934C92	HARNESS, CHASSIS WIRING* SINGLE	1
3611349P93	HARN, CTR CHSS. RPU/RPTO BOC DAT	1
MIN10	FUSE 10A (3534209C1)	1
3519178C91	RESISTOR, ELECT TERMINATING	1
3549776C4	HOUSING, SWITCH*6-PACK DIN MULT	1
3578910C1	SWITCH, BLANK RCKR-2 POS BISTAB	6
3578733C1	LIGHT, IND, LED ON-GREEN, BRIGHT	6
3533928C1	LIGHT, IND, LED AMBER BKLGT	6
3552005C4	KIT, LIGHT* PRODUCT GRAPHIC FOR	1
2585423C91	KIT, RPM TERMINAL/SEAL 14GA	1
2585651C91	KIT, RPM TERMINAL/SEAL 12GA	1
2594135R1	MANUAL, INST RMT PWR MOD/BOC	1

This kit is for left-mounted battery box for DuraStar models and under cab for WorkStar models and inside the cab, for both models. If truck has right-mounted battery box, add 3558936C91. If adding two RPMs, use jumper harness 3558937C91 from first to second RPM and add 3558934C92 cable for the battery feed.

If RPM brackets are needed, the following part numbers will need to be ordered.

DuraStar models (one or two RPMs)

RPM bracket for inside the cab – 3676154C4

- Mounted inside the cab behind driver's seat

RPM bracket for second BOC RPM – 3558794C1

- Mounted under battery box

WorkStar models (one or two RPMs)

RPM bracket for inside the cab – 3676154C4

- Mounted inside the cab behind driver's seat

Day Cab – 3582976C2, Crew/Extended Cab – 3582983C2

- Mounted under driver side of cab
- 3558794C1 – Mounting Bracket

Attach the mounting bracket to the underside of the vehicle cab on WorkStar models (driver's side) and the back of the battery box if a second RPM is mounted on a DuraStar series. See figures below.

Attach the RPM to the vehicle-mounting bracket, and securely tighten the fasteners.

Install dash harness and center chassis harness as per the following instructions. The schematic diagram is provided for assistance in the installation.

Wrap the add-on harnesses to respective dash and center chassis harnesses with electrical tape or other harness wrap after the installation. Ensure harnesses are routed away from sharp edges and properly clipped for good wire harness support.

INSTALLATION INSTRUCTIONS

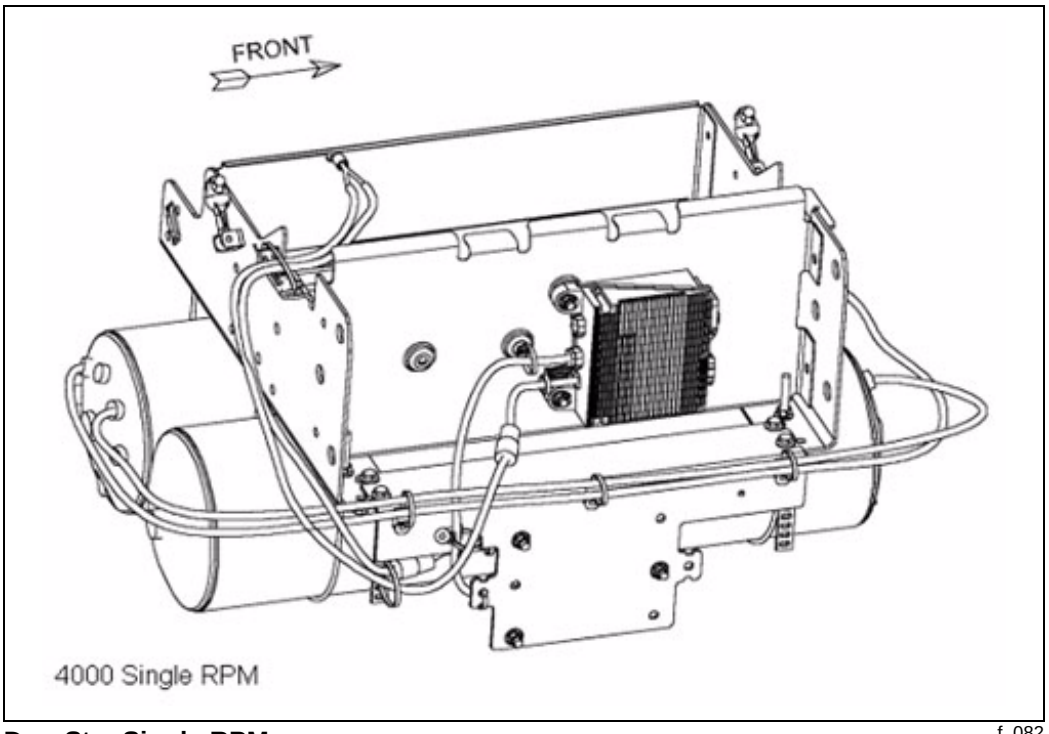
In-Cab

1. Install A5EB (1939 +) {yellow} into the BC (1602) cavity F6
2. Install A5EB (1939 -) {green} into the BC (1602) cavity F5
5. Insert A20 {lt green} into the fuse panel (1017) cavity E3.
6. Insert a 10 AMP fuse in cavity F3-E3 in the fuse panel (1017).

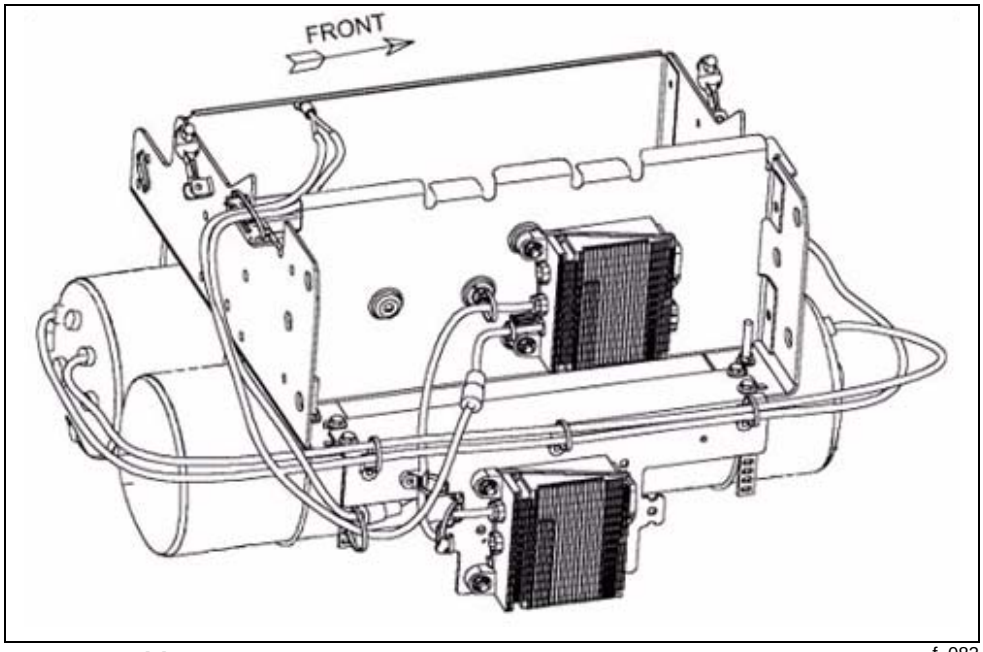
Engine Compartment

1. Install A5E (1939 +) {yellow} into the IP center chassis (1701) cavity 52
2. Install A5E (1939 -) {green} into the IP center chassis (1701) cavity 53
3. Insert A20 {lt green} into the IP center chassis (1701) cavity 51
4. Install N10-GR {white} into splice pack (8809) cavity C

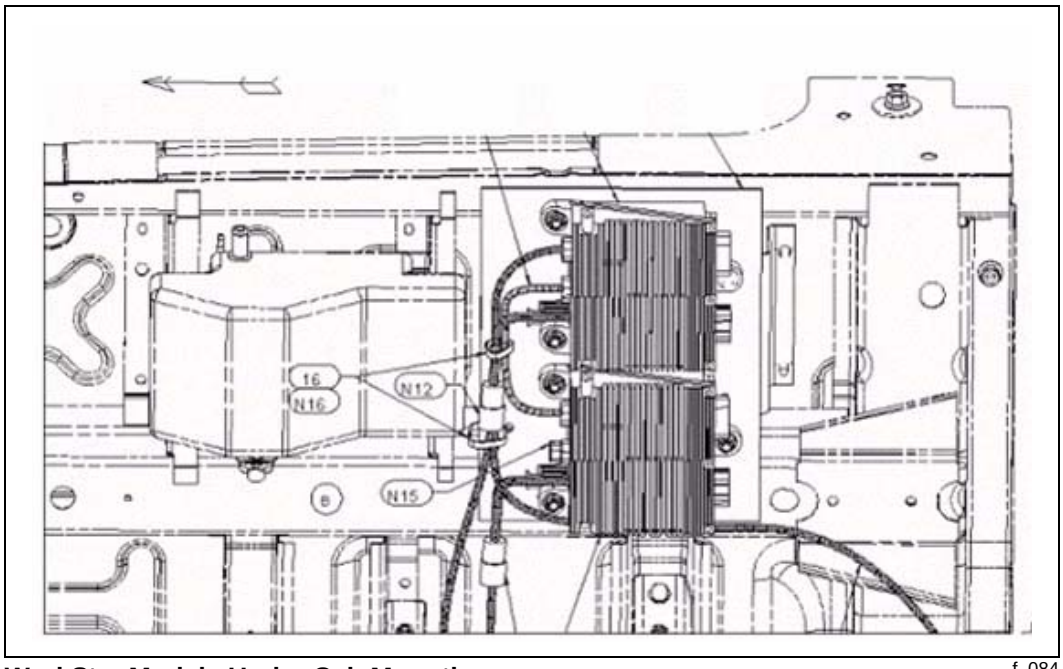
Install a terminating resistor in the open connector in the cab, and install a terminating resistor in the last module in the datalink.



DuraStar Single RPM f_082

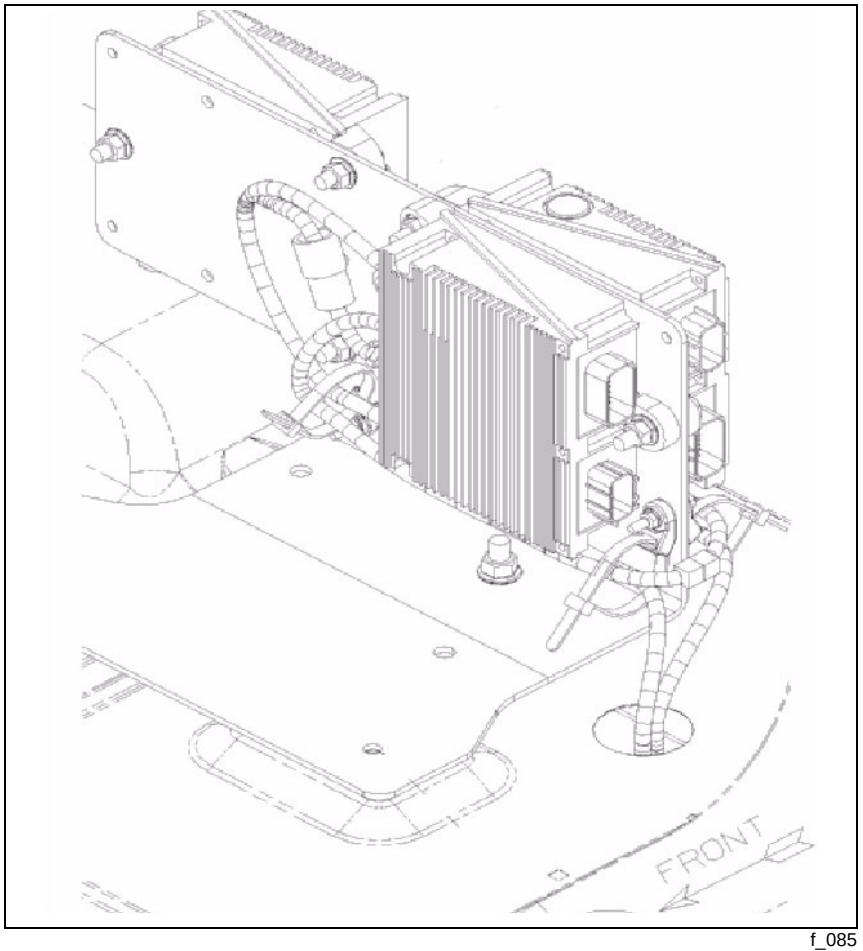


DuraStar with 2 RPMs f_083



WorkStar Models Under Cab Mounting f_084

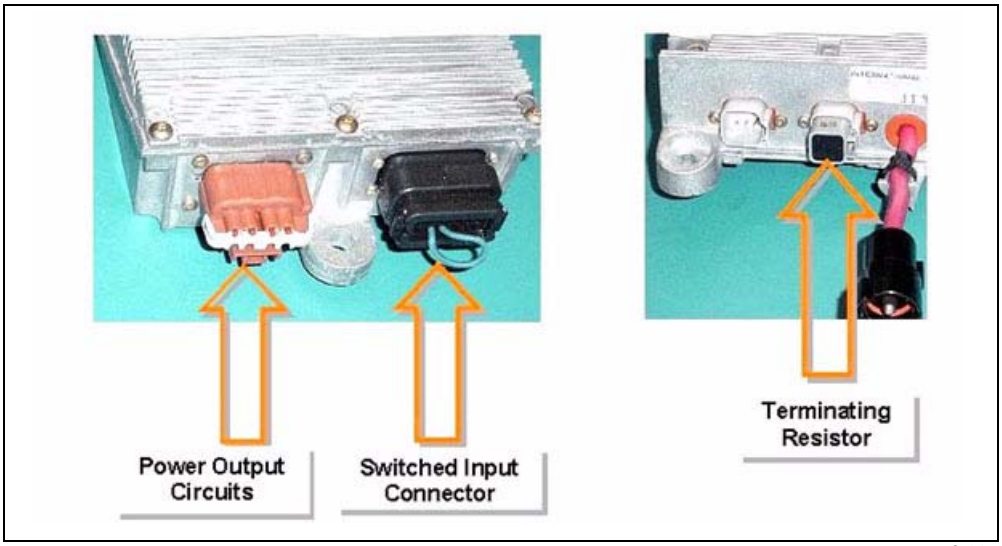
Inside Cab RPMs are located behind the driver's seat on 4000 models.



f_085

DuraStar Models In Cab Mounting

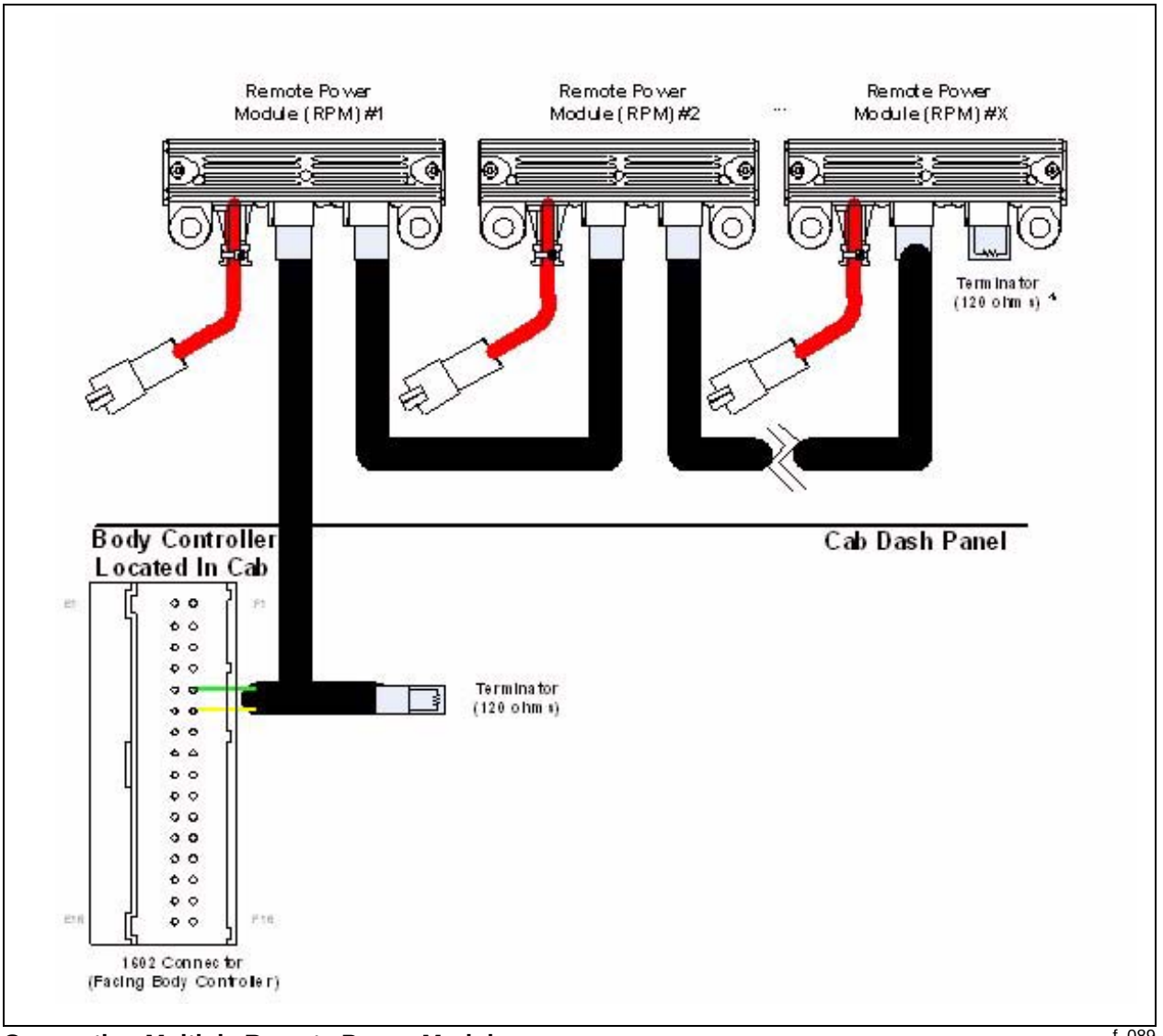
f_086



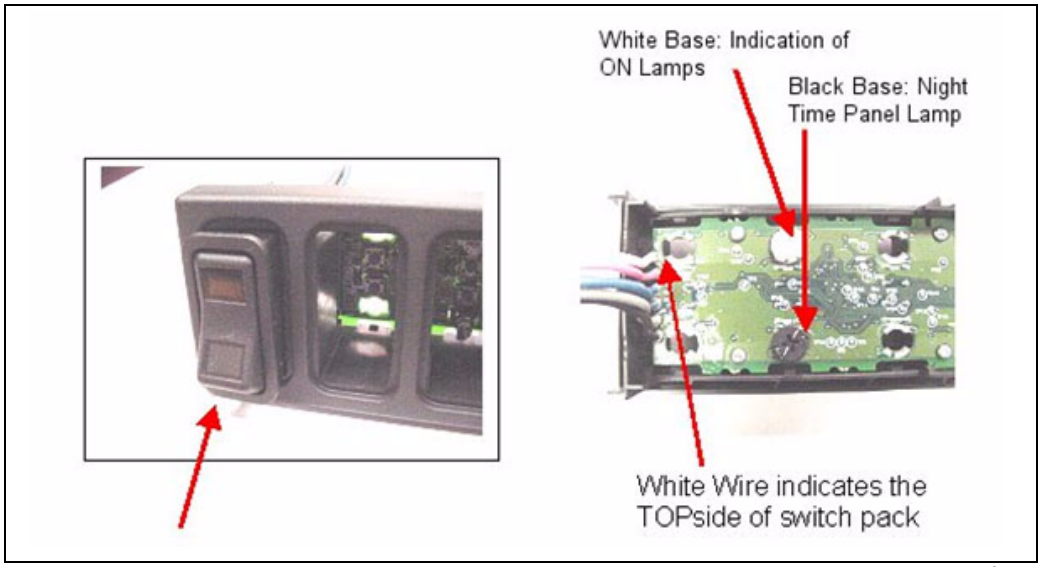
f_087

When more than one Remote Power Module (RPM) is installed, the Data Link wire harness must be daisy-chained using the scheme diagrammed in the figure below. Connect the 6 pin Data Link Harness (J1939) from the first RPM to either data link connector of the second. Continue connecting the data link jumper

harness of each RPM to the next until the final RPM is reached. The last RPM in the chain will have a Terminating Resistor inserted into the last remaining open 6 pin data link connector of the remote power module. Various lengths of data link jumper harnesses and extension harnesses are available from Navistar Service Parts through any Navistar Dealer.



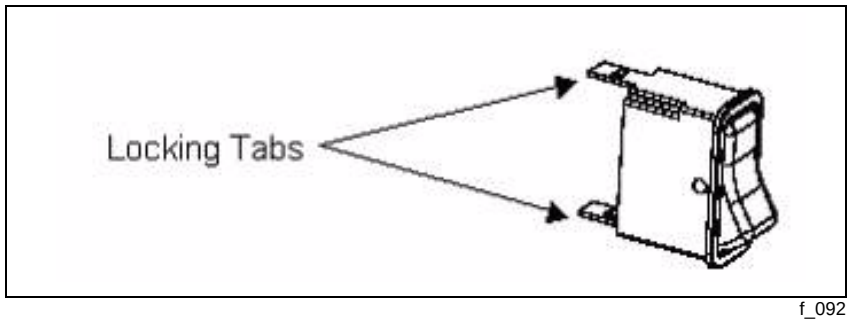
Connecting Multiple Remote Power Modules f_089



f_090

Installation of Switch Packs and LEDs

To install a switch in the switch pack housing, insert the switch in the proper slot and push in until the switch locking tabs are fully engaged (switches are keyed and cannot be installed upside down).



f_092

Remove the rear cover of the switch pack. It is attached with a snap fit. See the attached pictures to determine which end is up on the switch pack. Install the LED lamps with the white base (part number 3578733C1) in the upper section of each switch on the switch pack housing. These are the indication of on lamps and will glow green when activated. Note that the LED lamps have a keying feature as they are installed in the switch pack circuit board. If the lamps are forced in against the proper orientation, they will not illuminate.

Install the LED lamps with the black base (part number 3533928C1) in the lower section of each switch on the switch pack housing. These are the back light lamps and will glow amber when the panel lights are on. Reattach the rear cover and secure the wire harnesses under the cover hooks.

Locate a free switch pack opening in the central IP.

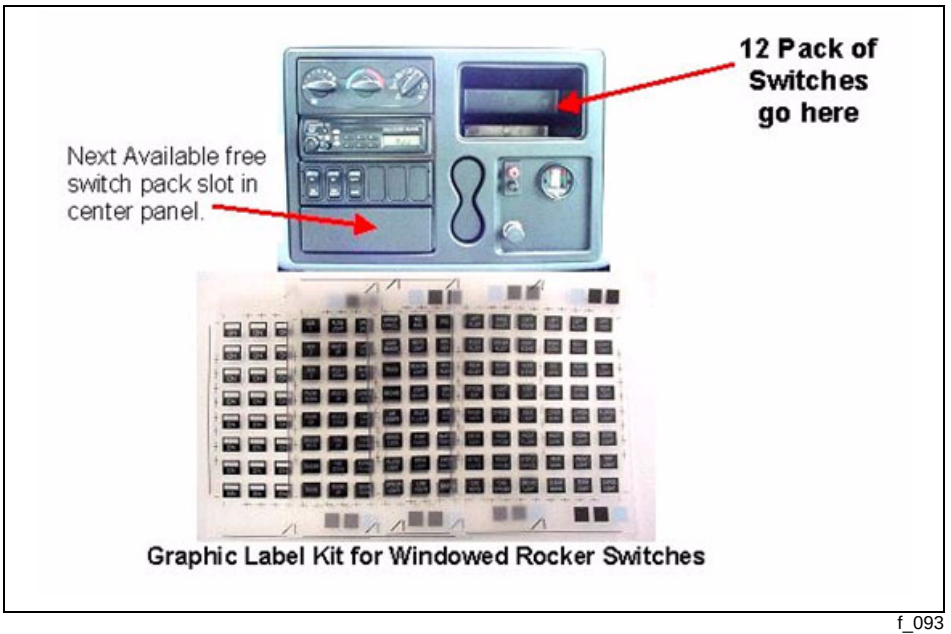
If no switch packs are present in the vehicle, remove the switch blank below the radio space and locate the 6-pin cab harness for the switch packs. Connect the cab switch harness to the left side switch pack harness (as viewed from the front). Connectors are keyed to ensure proper connection. Ensure that the switch pack is installed in the proper orientation. The green indication of on lamps must be on top when viewing the front of the switch pack.

If one 6-switch pack is already present, locate the new switch pack in the lower left switch pack area.

Connect the second harness of the first switch pack to the input cable harness of the second switch pack.

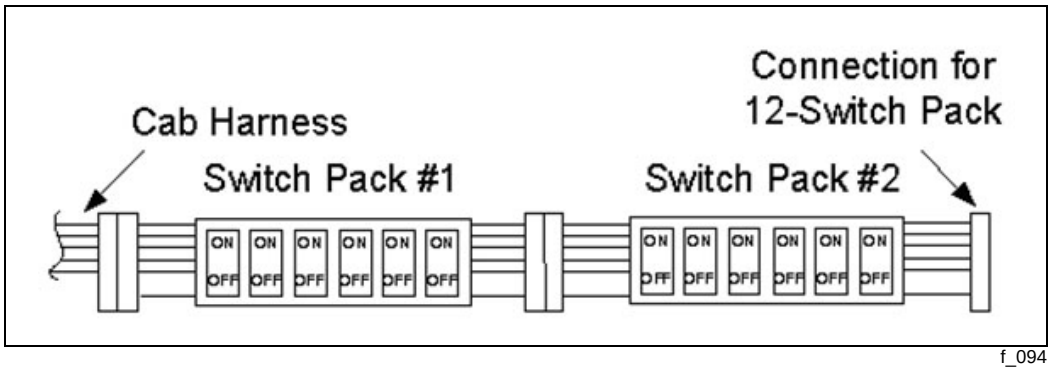
Install the second switch pack into center IP. It is secured with a snap action.

Determine the function of each of the newly added rocker switches. Locate the set of switch labels in the parts kit. Place the labels named “on” in the upper section of each windowed rocker switch. Place the switch name in the lower portion of the rocker switch.

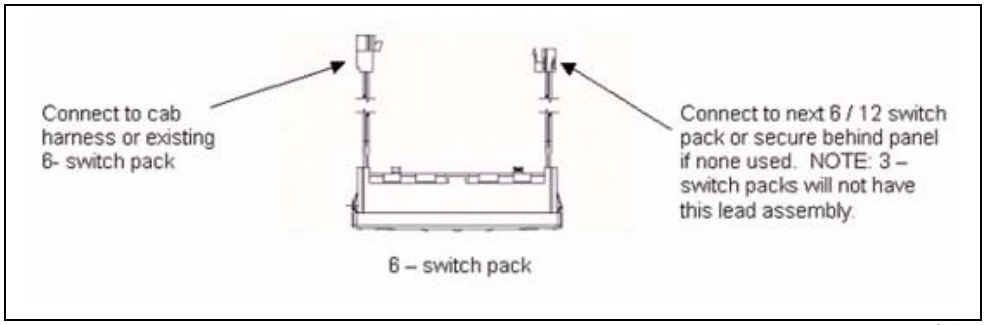


f_093

If an additional switch pack is being installed, it is connected to the multiplex system by “daisy chaining” its connectors to the existing switch pack (or to the cab harness if no switch pack is currently installed). It is important to connect the switch packs together and to the cab harness in the wrong order will cause switch pack addressing problems.



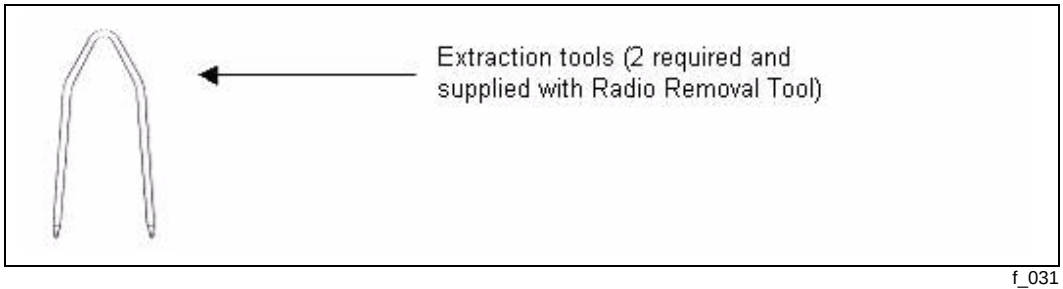
f_094



f_095

REMOVAL/REPLACEMENT OF SWITCHES AND SWITCH PACKS

To remove a switch pack from the panel use the DIN radio removal tool part number 2504954C1.



f_031

Insert the extraction tools (2) into the two holes on either side of a switch pack housing until the locking tabs are fully depressed. The switch pack can then be removed from the panel and the extraction tools removed.

f_096

To remove individual switches or blanks from a switch pack, squeeze the locking tabs on the rear of the switch or blank (top and bottom) and push it from the housing.

To install a switch pack in the panel, make the necessary connections then simply push the assembly into place until the locking tabs are fully engaged.

NOTE: The switch pack can be inadvertently installed upside down. To avoid this when no switches are present in the housing, make sure the white wire in the lead assemblies on the rear of the housing is towards the top.

PROGRAMMING THE SYSTEM

The RPM and switch pack system is now installed.

The electrical system must now be programmed to recognize these new components.

With the Diamond Logic® Builder software program, enable the appropriate 595xxx software feature codes from the beginning of this section.

The system may also be programmed at the nearest International® dealer. Contact the dealer for details on purchasing either of these programs.

When other body integration features are used, please refer to the body integration feature section for further directions on installing these features.

TESTING 08WSK, 08WSM, 08SAJ, OR 08WTJ (ONE-TO-ONE MAPPING):

1. Turn key to accessory or IGN key state.
2. Activate first in-cab switch.
3. Verify that RPM output #1 is providing battery voltage.
4. Deactivate first in-cab switch.
5. Apply 12V to RPM input #1.
6. Verify that RPM output #1 is providing battery voltage.
7. Apply GND to RPM input #1.
8. Verify that RPM output #1 shuts off.

Continue the above testing procedure for each RPM switch location.

If any RPM outputs have been programmed to turn on automatically when the key is turned on, (see programmable parameters) then turn the key to the on position and verify that those outputs are providing battery voltage.

TESTING 60AAA OR 60AAB:

1. Turn key to accessory or IGN key-state.
2. Activate first in-cab switch.
3. Verify that RPM output #1 is providing battery voltage.
4. Deactivate first in-cab switch.

Continue the above testing procedure for each RPM switch location.

SWITCH BODY CIRCUITS FRAME MTG REAR

Feature 08WTJ adds 1 RPM to the end of the frame to be used by itself or in combination with 60AAA (1 RPM BOC) or 60AAB (2 RPMs BOC). The Remote Power Module will have 6 channels, 20A per channel, and 80A maximum output. There will be 6, 2–position, switches located in the Instrument Panel, that will control the RPM through multiplex wiring.

08WTJ

SWITCH, BODY CIRCUITS, REAR for Bodybuilder with 6 switches in instrument panel (2–position switches), one power module with 6 channels, 20 amp per channel and 80 amp maximum output. Switches control the power modules through multiplex wiring, mounted at the rear of the frame.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature code: 595AJG

Conflicts with Software features: NONE

Table 92

Parameter Name	ID	Description	Default Settings	Units	Min Value	Max Value	Step
TEM_ Aux13_ Output_Fuse_ Param	PV-TEM-Aux-13	Default setting for TEM_Aux13_Output_Fuse Param	20	Amps	0	20	0.1
TEM_ Aux14_ Output_Fuse_ Param	PV-TEM-Aux-14	Default setting for TEM_Aux14_Output_Fuse Param	20	Amps	0	20	0.1
TEM_ Aux15_ Output_Fuse_ Param	PV-TEM-Aux-15	Default setting for TEM_Aux15_Output_Fuse Param	20	Amps	0	20	0.1
TEM_ Aux16_ Output_Fuse_ Param	PV-TEM-Aux-16	Default setting for TEM_Aux16_Output_Fuse Param	20	Amps	0	20	0.1
TEM_ Aux17_ Output_Fuse_ Param	PV-TEM-Aux-17	Default setting for TEM_Aux17_Output_Fuse Param	20	Amps	0	20	0.1
TEM_ Aux18_ Output_Fuse_ Param	PV-TEM-Aux-18	Default setting for TEM_Aux18_Output_Fuse Param	20	Amps	0	20	0.1

WIRING INFORMATION

Refer to current remote power module.

TESTING

Refer to current remote power module.

HOW TO ADD THIS FEATURE

- Select software feature code 595AJG using ICAP or the Diamond Logic® Builder software (See Local Dealer)
- Programmable Parameters must be set using ICAP or the Diamond Logic® Builder software (See Local Dealer)
- Refer to current remote power module for further installation instructions.

REMOTE POWER MODULES

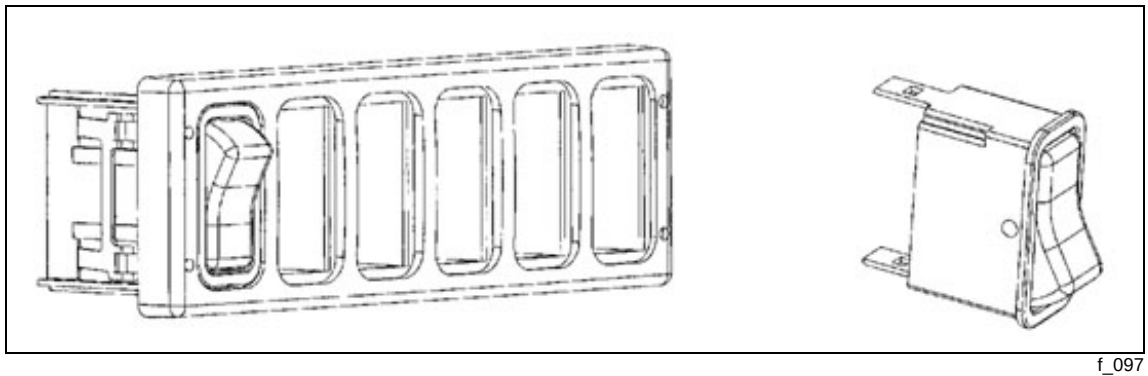
Listed below is a listing of parts that may be required depending on how the vehicle was equipped at the factory.

Table 93

Part Number	Description
3595804F91	**Consists of the following:**
6 of 3533928C1	Light, Indicator, LED backlight (Amber)
6 of 3578733C1	Light, Indicator, LED on (Green) 1.0 CAN
6 of 3578910C1	Switch, Electronic, Blank Rocker — 2 POS

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION



f_097

Most switches are rocker actuators that do not require hard wiring. See the Switch Actuators for Multiplex Systems Table below. The switches are used in switch pack modules (6 or 12 switches) that connect to the multiplex system through the switch housing cable harnesses. Push button switches for the cluster are also available. See Push Buttons Table below.

If the original vehicle has a three switch pack with only one or two switch locations full, adding another switch is acceptable. Once three switch locations are full, adding more would require the purchase of a six switch pack. To identify a 3 or 6-pack, remove the switch pack from the center console using the radio removal tool. A 3-pack has wires on the left side only; a 6-pack has wires on the left and right side.

In the Switch Actuator Table below, the first column references the part numbers of the new replacement switch, and columns 2 and 3 are the replacement LED's part numbers. Column 4 is the switch description. Columns 5, 6, and 7 describe the switch functions. Position Number reflects the number of positions where the switch can physically be placed. Position On denotes the position of the switch for activation. Switch Action indicates whether the switch is momentary (spring-loaded, switch returns to a specific state) or if the switch is latching (switch stays in the selected state).

NOTE: Switches are no longer packaged with LEDs (Light Emitting Diodes). LEDs must be ordered separately. Refer to the Table below to locate the proper LED part numbers. Each switch usually requires two LEDs that are installed from the rear side of the switch pack assembly (see the Switches section). If the switch has an on indicator, a green LED will be located in the upper portion. An amber LED is required in the lower portion providing for nighttime viewing. If a switch does not contain an on indicator, then an amber LED should be installed in the upper as well as the lower section.

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

SWITCH ACTUATORS FOR MULTIPLEX SYSTEM

LED part numbers: 3578733C1 (green) = 1 3533928C1 (amber) = 2

* = User may use any LED color they see fit.

Table 94 – Switch Actuators for Multiplex System

1	2	3	4	5	6	7
New Part #	**Indicator LED**	**Back Light LED**	**Description**	**Position #**	**Position On**	**Switch Action**
3563061C1	2	2	Head Light Switch	3	Mid/Up	Latching
3560046C1	1	2	Engine Compression Brake On/Off On/Off	2	Up	Latching
3560047C1	2	2	Engine Compression Brake Selector	3	All	Latching
3560048C1	1	2	Fan Override	2	Up	Latching
3560659C1	1	2	Transfer Case Hi/Neut/Low	3	All	Latching
3560961C1	1	2	Blower Road Switch	2	Up/Down	Latching
3561702C1	1	2	Auxiliary Transmission	3	All	Latching
3563062C1			Dimmer Switch	2	Up/Down	Momentary
3563063C1	1	2	Work Light Switch	2	Up/Down	Latching
3563064C1	1	2	Fog Light Switch	2	Up	Latching
3563065C1	1	2	Exhaust Brake Switch	2	Up	Latching
3563066C1	1	2	Plow Light Switch	2	Up	Latching
3563068C1		2	2 Speed Axle Hi/Low	2	Up/Hi	Latching
3563069C1	1	2	Front Axle Switch	2	Up	Latching
3563070C1		2	Marker Interrupt	2	Down	Momentary
3563072C1	1	2	Auto Neutral Switch	2	Up	Latching
3563073C1	1	2	Power Divider Lock	2	Up	Latching
3563074C1	1	2	Diff Lock	2	Up	Latching
3563075C1	1	2	Air Suspension Dump	2	Up	Latching
3563076C1	1	2	5th Wheel Slide	2	Up	Momentary
3563079C1	1	2	PTO On/Off	2	Up	Latching
3563080C1	1	2	Air Assist	2	Up	Momentary
3563111C1		2	Transfer Case Hi/Low	2	Up/Hi	Latching
3563113C1		2	Wet Tank Drain	2	Up	Momentary
3563114C1		2	Primary Tank Drain	2	Up	Momentary
3582129C1	1	2	Mirror Heat	3	Up	Momentary
3587551C1	1	2	PTO, Xfer Case	2	Up	Latching
3593177C1	1	2	Lift Gate	3	Up	Momentary
3597367C1	1	2	Forward Rear Differential Lock	2	Up	Latching
3597368C1	1	2	Rear-Rear Differential Lock	2	Up	Latching
3598282C1	1	2	Eng Spd	2	Up	Latching
3606678C1	1	2	120VAC	3	Up	Momentary
3621122C1	1	2	Traction Control Mud/Snow	2	Up	Latching
3622543C1	1	2	Traction Control Off Road	2	Up	Latching
3809914C1	1	2	Parked Regen	3	Up	Momentary
3813770C1	1	2	Engine Brake On/Variable/Off	3	Up/Mid	Latching
3564004C1	1	2	*Window Rocker Blank (3 Position)	3	Up	Momentary
3578910C1	1	2	*Window Rocker Blank (2 Position)	2	Up	Latching
3579027C1	1	2	*Window Rocker Blank (2 Position)	2	Up	Momentary
2589880C91	*	2	Blue Rocker Blank (2-Position)	2	Up	Latching
2589590C91	*	2	Red Rocker Blank (2-Position)	2	Up	Latching
2589883C91	*	2	Yellow Rocker Blank (2-Position)	2	Up	Latching
2589881C91	*	2	Orange Rocker Blank (2-Position)	2	Up	Latching
2589882C91	*	2	White Rocker Blank (2-Position)	2	Up	Latching
3533950C1			Plug, Filler Switch Blank for 6/12 packs			
2585638C1	1	2	Switch, Rocker Blank	3	ALL	Latching

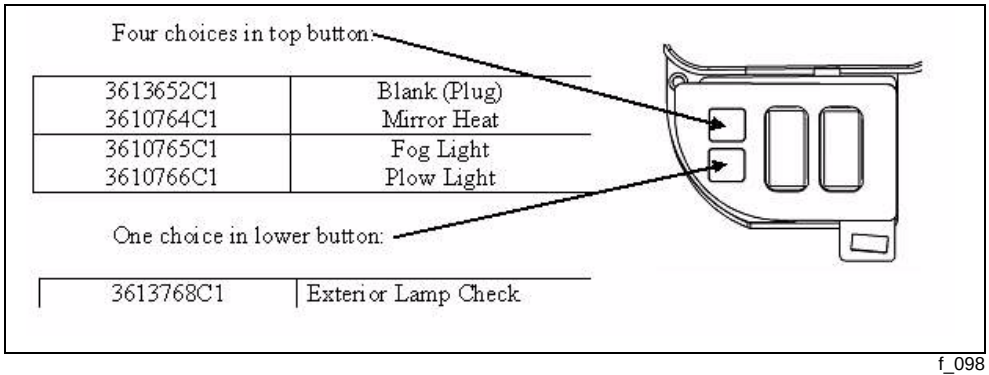
NOTE: Blank switches have two clear square windows on them and require a stick-on graphic to identify function and allow for custom switches. The graphic labels can be purchased under part numbers in the Switch Graphic Label Kits Table below.

*These blank switches are normally to be used with Remote Power Modules (RPMs) or advanced logic functions.

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

PUSH BUTTONS — LEFT SIDE OF CLUSTER TABLE

Table 96 – Warning Lights



f_098

Part Number	Description
3587032C1	Green Indicator Housing Less LED
3596344C1	Green 3 Candle Power LED
3587033C1	Amber Indicator Housing Less LED
3587034C1	Amber 3 Candle Power LED
3587024C1	Red Indicator Housing Less LED
3587031C1	Red 3 Candle Power LED

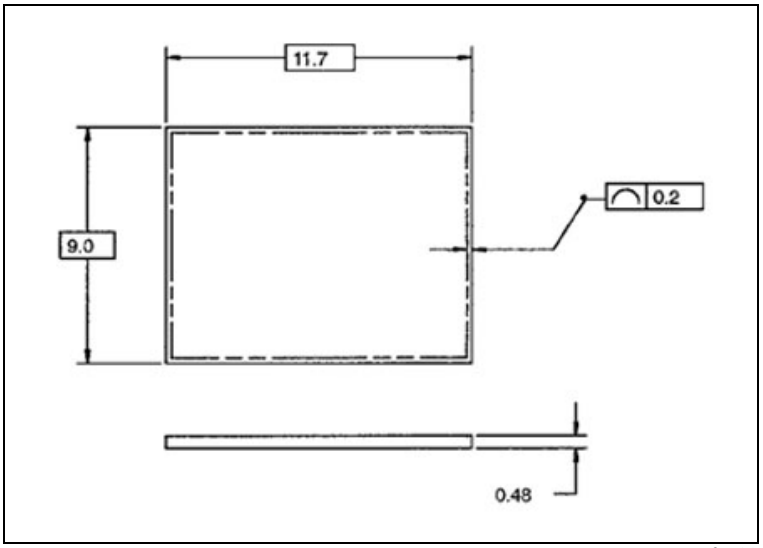
f_099

SWITCH PACK AND RPM SWITCH LABEL GRAPHICS

A package of the first five switch label sheets is provided for usage by the Body Builder to finish the labeling of the switches. There are also seven additional sheets at this time with more labels available from Navistar (see the Switch section of this manual for a list of all labels offered from Navistar). If the Body Builder requires a label name not already provided by International®, a custom label may be designed by following the specification of the switch label appliqué drawing below. Supply of custom labels is the responsibility of the Body Builder.

Switch Labeling: Switch packs provided with the RPM feature are general purpose “un-labeled” rocker switches. Since the functions of the rocker switches are unknown at the time of vehicle assembly, “un-labeled” rocker switches are provided so the Body Builder can customize the switches to any particular need.

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION



Switch Label Dimensions in Millimeters f_100

The supplier for the windowed rocker labels is:

ECI Screenprint
135 S. Main St.
P.O. Box 116
Thomaston, CT 06787
Telephone: 860-283-9849
Web site: eciscreenprint.com

When contacting ECI Screenprint, instruct them to create the labels in the same format and style as the Navistar sheets to ensure product consistency and the factory fit and finish that is achieved by using the Navistar graphics.

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

Table 97 – Legend

Sheet	Kit Part No.	First Label		Sheet	Kit Part No.	First Label
Sheet 1 – 5	3552005C4			Sheet 7	2589327C1	Left Cot
Sheet 1		Left Alley		Sheet 8	2590999C1	Night Strobe
Sheet 2		Mangr Cancel		Sheet 9	2591000C1	Hyd Filter
Sheet 3		Aux 1		Sheet 10	2593674C1	Tank1 Open
Sheet 4		On		Sheet 11	2593676C1	Door
Sheet 5		Raise Bed		Sheet 12	2593677C1	Estop
Sheet 6	2588422C1	Self Test		Sheet 13	2597868C1	Front

Table 98 – Labels – Page 1

(BLANK)	Sheet 4 Quantity of 8	AUX WARN	Sheet 2	BOOM N/STOW	Sheet 5
110 V INVT	Sheet 2	AXLE 1 DOWN	Sheet 3	BOOM RIGHT	Sheet 3
12 VOLT OUTLET	Sheet 4	AXLE 1 UP	Sheet 3	BOOM STOW	Sheet 3
120VAC POWER	Sheet 7	AXLE 2 DOWN	Sheet 3	BOOM UP	Sheet 3
A/C	Sheet 4	AXLE 2 UP	Sheet 3	BOOST DOWN	Sheet 9
A/C HEAT	Sheet 4	B LOAD GATE	Sheet 7	BOOST OPERATE	Sheet 9
AIR COMPR	Sheet 2	BACK ALARM	Sheet 3	BOOST UP	Sheet 9
AIR HORN	Sheet 2	BACKUP LIGHT	Sheet 2	BOTTOM LOAD	Sheet 7
ALLEY	Sheet 4	BAR LIGHTS	Sheet 5	BOX UP	Sheet 3
ALLEY LIGHTS	Sheet 9	BATH ASSIST	Sheet 13	BRAKE INTLCK	Sheet 7
ALT FLASH	Sheet 5	BATH CONFIRM	Sheet 13	BRAKE LOCK	Sheet 2
AMB POWER	Sheet 7	BATH LIGHT	Sheet 13	BRK INT OVRIDE	Sheet 7
ARROW BOARD	Sheet 9	BATT SAVE	Sheet 5	CAB BACKUP	Sheet 6
ARROW LEFT	Sheet 9	BATTERY ON	Sheet 7	CAB ROTO	Sheet 1
ARROW RIGHT	Sheet 9	BEACON LIGHT	Sheet 2	CAB STROBE	Sheet 1
ARROW SPLIT	Sheet 10	BED UP	Sheet 5	CABIN LIGHTS	Sheet 5
ATF PUMP	Sheet 11	BELLY VALVE	Sheet 7	CAMERA LIGHT	Sheet 3
AUTO	Sheet 11	BIN LIGHT	Sheet 1	CARGO LIGHT	Sheet 1
AUTO CHAINS	Sheet 6	BLOWER	Sheet 3	CEILING LIGHT	Sheet 13
AUTOMATIC	Sheet 13	BODY LOWER	Sheet 11	CENTER DOME	Sheet 11
AUX 1	Sheet 3	BODY N/STOW	Sheet 9	CHARGE PSI LOW	Sheet 9
AUX 2	Sheet 3	BODY OVRHT	Sheet 9	CHARGR POWER	Sheet 12
AUX 3	Sheet 3	BODY RAISE	Sheet 11	CHASER FLASH	Sheet 9
AUX ENGINE	Sheet 6	BODY UP	Sheet 11	CHECK ELEC	Sheet 3
AUX HEAT	Sheet 11	BOOM	Sheet 3	CHECK FAULTS	Sheet 12
AUX LIGHT	Sheet 11	BOOM DOWN	Sheet 3	CHECK HYBRID	Sheet 9
AUX PTO	Sheet 2	BOOM LEFT	Sheet 3	CHUTES	Sheet 8

Table 99 – Labels – Page 2

CHUTES DOWN	Sheet 8	DECK LIGHT	Sheet 1	EMERG SHTOFF	Sheet 11
CHUTES LOCK	Sheet 8	DEFROST FAN	Sheet 7	EMERG STOP	Sheet 6
CHUTES UNLOCK	Sheet 8	DEFUEL VALVE	Sheet 7	ESPAR HEAT	Sheet 4
CHUTES UP	Sheet 8	DFROST FAN 1	Sheet 13	ESTOP	Sheet 12
CITY HORN	Sheet 2	DFROST FAN 2	Sheet 13	EXHST FAN	Sheet 2
CLEAR LIGHTS	Sheet 7	DIESEL GEN	Sheet 13	EXT SPEAKR	Sheet 11
CLEAR WARN	Sheet 1	DIESEL HEATER	Sheet 13	EXTEND	Sheet 8
CLOSE	Sheet 9	DIESEL PUMP	Sheet 11	FAN	Sheet 4
CLOSE DOOR	Sheet 5	DIESEL REEL	Sheet 11	FAN 1	Sheet 11
CLOSE GATE	Sheet 7	DIGGER	Sheet 13	FAN 2	Sheet 11
CLOSE WINDOW	Sheet 9	DIVIDER DOWN	Sheet 5	FAN HIGH	Sheet 2
CODE AMBER	Sheet 2	DIVIDER UP	Sheet 5	FAN LOW	Sheet 2
CODE BLUE	Sheet 2	DO NOT MOVE	Sheet 2 &12	FAST IDLE	Sheet 10
CODE GREEN	Sheet 2	DOCK LIGHTS	Sheet 10	FILL VALVE	Sheet 3
CODE RED	Sheet 2	DOME LIGHT	Sheet 1	FILTER BYPASS	Sheet 6
COLOR LIGHTS	Sheet 5	DOOR	Sheet 11	FLOOD LIGHT	Sheet 2
COMPRS PTO	Sheet 13	DOOR DOWN	Sheet 12	FLOOR HEATER	Sheet 5

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

COMPT 1 CLOSE	Sheet 12	DOOR LIGHT	Sheet 12	FLOOR LIGHTS	Sheet 5
COMPT 1 OPEN	Sheet 12	DOOR OPEN	Sheet 2	FLOOR UNLOAD	Sheet 9
COMPT 2 CLOSE	Sheet 12	DOOR UP	Sheet 12	FLORES LIGHT	Sheet 1
COMPT 2 OPEN	Sheet 12	DOWN	Sheet 5	FLOW 1 CLOSE	Sheet 6
COMPT 3 CLOSE	Sheet 12	DRAIN VALVE	Sheet 3	FLOW 1 OPEN	Sheet 6
COMPT 3 OPEN	Sheet 12	DRIVE LIGHT	Sheet 2	FLOW 2 CLOSE	Sheet 6
COMPT LIGHT	Sheet 1	DRIVER ALLEY	Sheet 1	FLOW 2 OPEN	Sheet 6
CONVEYOR	Sheet 3	DRIVER DOME	Sheet 13	FOG LIGHTS	Sheet 11
COOL	Sheet 5	DRUM CHRGE	Sheet 8	FRONT	Sheet 13
COORDINATOR	Sheet 11	DRUM DISCHRG	Sheet 8	FRONT A/C	Sheet 5
CRANE	Sheet 4	DRUM START	Sheet 8	FRONT ALARM	Sheet 13
CRANE ACTIVE	Sheet 11	DRUM STOP	Sheet 8	FRONT CENTER	Sheet 5
CRANE DOWN	Sheet 8	DUMP CLOSE	Sheet 10	FRONT FLASH	Sheet 1
CRANE EXTEND	Sheet 8	DUMP OPEN	Sheet 10	FRONT LIGHT	Sheet 1
CRANE LEFT	Sheet 8	DUMP POWER	Sheet 7	FRONT SCENE	Sheet 7
CRANE LIGHT	Sheet 6	DUMP VALVE	Sheet 9	FRONT STROBE	Sheet 1
CRANE PTO	Sheet 13	ELECT HORN	Sheet 2	FRONT SWEEP	Sheet 12
CRANE RETRACT	Sheet 8	ELECT MAGNET	Sheet 12	FRONT UNITY	Sheet 13
CRANE RIGHT	Sheet 8	ELECT SUCTN	Sheet 3	FRONT WARN	Sheet 1
CRANE UP	Sheet 8	EMERG MASTER	Sheet 2	FRONT WORK	Sheet 13
CRUISE	Sheet 9	EMERG OVRIDE	Sheet 13	FRT OW NOZZLE	Sheet 7
DEAD MN SWITCH	Sheet 7	EMERG PANIC	Sheet 3	FT LF ARM DN	Sheet 6

Table 100 – Labels – Page 3

FT LF ARM UP	Sheet 6	HYD OIL HI TEMP	Sheet 6	LEFT WARN	Sheet 1
FT RT ARM DN	Sheet 6	HYD OIL LOW	Sheet 6	LEFT WING	Sheet 3
FT RT ARM UP	Sheet 6	HYD OVRIDE	Sheet 8	LF DUMP CLOSE	Sheet 6
GAS PUMP	Sheet 11	HYD PUMP	Sheet 11	LF DUMP OPEN	Sheet 6
GAS REEL	Sheet 11	HYD SHUTDN	Sheet 8	LF WEEDSEEKER	Sheet 6
GATE DOWN	Sheet 9	IN REVERSE	Sheet 9	LIFT	Sheet 5
GATE OPEN	Sheet 5	INJECT SYSTEM	Sheet 11	LIFT ENABLE	Sheet 13
GATE UP	Sheet 9	INTERNL VALVE	Sheet 11	LIFT EXTEND	Sheet 11
GEN RUN	Sheet 2	INTSEC LIGHTS	Sheet 1	LIFT GATE	Sheet 3 &5
GPM FLOW	Sheet 6	LADDER	Sheet 8	LIGHT BAR	Sheet 1
GROUND LIGHT	Sheet 1	LADDER DOWN	Sheet 10	LIGHT BOARD	Sheet 2
HAZARD LIGHT	Sheet 11	LADDER LIGHTS	Sheet 10	LIGHT TOWER	Sheet 7
HEAT	Sheet 5	LADDER N/STOW	Sheet 7	LO FLO HOSE	Sheet 11
HEAT 1	Sheet 11	LADDER PTO	Sheet 7	LOAD	Sheet 11
HEAT 2	Sheet 11	LADDER RACK	Sheet 7	LOAD MANGR	Sheet 2
HEATED MIRROR	Sheet 11	LADDER UP	Sheet 10	LOCK	Sheet 9
HEATER 1	Sheet 13	LAMP OUT	Sheet 9	LOCK DOOR	Sheet 4
HEATER 2	Sheet 13	LAMP TEST	Sheet 12	LOCK WINDOW	Sheet 9
HEATER 3	Sheet 13	LASER LIGHTS	Sheet 5	LOW	Sheet 4 &5
HEATER 4	Sheet 13	LCR 11 POWER	Sheet 10	LOW PRES	Sheet 9
HEV OFF	Sheet 9	LEFT ALLEY	Sheet 1	LOW THROTL	Sheet 7
HI FLO HOSE	Sheet 11	LEFT CEILING	Sheet 13	LOW VOLTS	Sheet 2
HI THROTL	Sheet 7	LEFT CENTER	Sheet 5	LOWER	Sheet 5
HIGH	Sheet 4 & 5	LEFT CHUTE	Sheet 7	LOWER BED	Sheet 5
HIGH IDLE	Sheet 3	LEFT COMPT	Sheet 6	LOWER BOX	Sheet 3
HIGH PRES	Sheet 9	LEFT COT	Sheet 7	LOWER IDLE	Sheet 7
HIGH RAIL	Sheet 4	LEFT DOME	Sheet 11	LOWER LIFT	Sheet 12
HIGH WATER	Sheet 7	LEFT DOOR	Sheet 8	LOWER PLW LTS	Sheet 13
HOOD OPEN	Sheet 9	LEFT EVAC	Sheet 6	LOWER WARN	Sheet 1
HOOK DOWN	Sheet 8	LEFT FLOOD	Sheet 1	LOWER WORK	Sheet 1
HOOK UP	Sheet 8	LEFT FRONT	Sheet 5	MACHINE	Sheet 2
HOPPER	Sheet 8	LEFT HOSE	Sheet 12	MANGR CANCEL	Sheet 2
HOPPER DOWN	Sheet 8	LEFT PTO	Sheet 12	MANUAL	Sheet 11
HOPPER LIGHT	Sheet 4	LEFT PTO ON	Sheet 12	MAP LIGHT	Sheet 1
HOPPER UP	Sheet 8	LEFT READ	Sheet 11	MASTER	Sheet 2
HOSE LIGHTS	Sheet 7	LEFT REAR	Sheet 5	MASTER HEATER	Sheet 13

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

HOSE REEL	Sheet 11	**LEFT SCENE**	Sheet 1	**MASTER POWER**	Sheet 12
HYD ENABLE	Sheet 8	**LEFT SPRAY**	Sheet 10	**MASTER THROTL**	Sheet 2
HYD FILTER	Sheet 9	**LEFT SWEEP**	Sheet 12	**MEDIUM IDLE**	Sheet 10

Table 101 – Labels – Page 4

MESSG WAIT	Sheet 8	**PACKER RIGHT**	Sheet 11	**PURGE**	Sheet 10
METEOR LIGHT	Sheet 4	**PANEL LIGHT**	Sheet 12	**PUSHER DOWN**	Sheet 8
METER POWER	Sheet 10	**PASS ALLEY**	Sheet 1	**PUSHER UP**	Sheet 8
MID START	Sheet 8	**PERM LIGHT**	Sheet 1	**QUICK RAISE**	Sheet 13
MID STOP	Sheet 8	**PLC POWER**	Sheet 12	**RADIO REMOTE**	Sheet 8
MIDDLE	Sheet 13	**PLOW DOWN**	Sheet 3	**RAISE BED**	Sheet 5
MIXER	Sheet 6	**PLOW LEFT**	Sheet 6	**RAISE BOX**	Sheet 3
MTROIL PUMP	Sheet 11	**PLOW LIGHT**	Sheet 3	**RAISE IDLE**	Sheet 7
NEED REGEN	Sheet 12	**PLOW RIGHT**	Sheet 6	**RAISE LIFT**	Sheet 12
NEON LIGHTS	Sheet 5	**PLOW UP**	Sheet 3	**RAMP ENABLE**	Sheet 13
NEUTRAL	Sheet 11	**POLE LIGHT**	Sheet 13	**REAR**	Sheet 13
NIGHT STROBE	Sheet 8	**POWER**	Sheet 5	**REAR A/C**	Sheet 5
NO DATA LOGGED	Sheet 8	**POWER WINDOW**	Sheet 9	**REAR ALERT**	Sheet 5
NO DATA LOGGING	Sheet 13	**PRESSURE**	Sheet 10	**REAR ALLEY**	Sheet 1
NOT LEVEL	Sheet 7	**PRIMRY WARN**	Sheet 1	**REAR CAMERA**	Sheet 5
NOZZLE N/STOW	Sheet 13	**PRINTR POWER**	Sheet 11	**REAR CENTER**	Sheet 5
OIL LEVEL	Sheet 4	**PTO**	Sheet 2	**REAR CHUTE**	Sheet 7
OK TO HI IDLE	Sheet 2	**PTO 1**	Sheet 12	**REAR CNTRL**	Sheet 9
OK TO PUMP	Sheet 2	**PTO 2**	Sheet 7 & 12	**REAR COMPT**	Sheet 7
OK TO THROTL	Sheet 6	**PTO 3**	Sheet 12	**REAR DELIVRY**	Sheet 10
ON	Sheet 4 Qty of 24	**PTO CURB**	Sheet 10	**REAR FLASHR**	Sheet 2
OPEN	Sheet 9	**PTO DIESEL**	Sheet 10	**REAR FLOOD**	Sheet 1
OPEN DOOR	Sheet 5	**PTO DRIVER**	Sheet 12	**REAR GATE**	Sheet 6
OPEN GATE	Sheet 3	**PTO GAS**	Sheet 10	**REAR LIGHT**	Sheet 1
OPEN WINDOW	Sheet 9	**PTO GEN**	Sheet 2	**REAR MOOD**	Sheet 11
OPTI COM	Sheet 1	**PTO OVRIDE**	Sheet 6	**REAR SCENE**	Sheet 1
OUTRIG DOWN	Sheet 3	**PTO PASNGR**	Sheet 12	**REAR STROBE**	Sheet 1
OUTRIG N/STOW	Sheet 5	**PTO PUMP**	Sheet 2	**REAR SWEEP**	Sheet 12
OUTRIG UP	Sheet 3	**PTO STREET**	Sheet 10	**REAR UNITY**	Sheet 13
OVER LOAD	Sheet 9	**PUMP**	Sheet 3	**REAR WARN**	Sheet 1
OVER RIDE	Sheet 9	**PUMP & ROLL**	Sheet 2	**REAR WORK**	Sheet 13
OVER TEMP	Sheet 9	**PUMP ENG'D**	Sheet 2	**REEL GATE**	Sheet 6
OXYGEN	Sheet 2	**PUMP HI**	Sheet 10	**REFER FUEL**	Sheet 9
OXYGEN LIGHT	Sheet 2	**PUMP LO**	Sheet 10	**REFER TEMP**	Sheet 9
PA POWER	Sheet 6 &13	**PUMP ONE**	Sheet 6	**REGEN ON**	Sheet 12
PACKER LEFT	Sheet 11	**PUMP PANEL**	Sheet 2	**REMOTE OVRIDE**	Sheet 8
Packer On	Sheet 11	**PUMP TWO**	Sheet 6	**RESET**	Sheet 11

Table 102 – Labels – Page 5

RETRACT	Sheet 8	**SECND WARN**	Sheet 1	**SWIVEL DOWN**	Sheet 9
RF POWER	Sheet 10	**SELF TEST**	Sheet 6	**SWIVEL UP**	Sheet 9
RIGHT ALLEY	Sheet 1	**SENSOR POWER**	Sheet 10	**TAG DOWN**	Sheet 3&12
RIGHT CEILING	Sheet 13	**SHAKER**	Sheet 3	**TAG UP**	Sheet 3&12
RIGHT CENTER	Sheet 5	**SHRED POWER**	Sheet 9	**TAIL GATE**	Sheet 8
RIGHT CHUTE	Sheet 7	**SHUT DOWN**	Sheet 9	**TANK 1 CLOSED**	Sheet 10
RIGHT COMPT	Sheet 6	**SIDE DELVRY**	Sheet 10	**TANK 1 OPEN**	Sheet 10
RIGHT COT	Sheet 7	**SIDE EVAC**	Sheet 7	**TANK 2 CLOSED**	Sheet 10
RIGHT DOME	Sheet 11	**SIDE GATE**	Sheet 6	**TANK 2 OPEN**	Sheet 10
RIGHT DOOR	Sheet 8	**SIDE WARN**	Sheet 1	**TANK 3 CLOSED**	Sheet 10
RIGHT FLOOD	Sheet 1	**SIREN**	Sheet 2	**TANK 3 OPEN**	Sheet 10
RIGHT FRONT	Sheet 5	**SIREN BRAKE**	Sheet 2	**TANK 4 CLOSED**	Sheet 10

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

RIGHT HOSE	Sheet 12	**SIREN HORN**	Sheet 2	**TANK 4 OPEN**	Sheet 10
RIGHT PTO	Sheet 12	**SLOW FLASH**	Sheet 9	**TANK 5 CLOSED**	Sheet 10
RIGHT PTO ON	Sheet 12	**SLOW IDLE**	Sheet 10	**TANK 5 OPEN**	Sheet 10
RIGHT READ	Sheet 11	**SPARE**	Sheet 3	**TANK 6 CLOSED**	Sheet 10
RIGHT REAR	Sheet 5	**SPOT LIGHT**	Sheet 4	**TANK 6 OPEN**	Sheet 10
RIGHT SCENE	Sheet 1	**SPRAY FILL**	Sheet 7	**TANK 7 CLOSED**	Sheet 10
RIGHT SPRAY	Sheet 10	**SPREDR**	Sheet 5	**TANK 7 OPEN**	Sheet 10
RIGHT SWEEP	Sheet 12	**SPREDR LIGHT**	Sheet 2	**TANK 8 CLOSED**	Sheet 10
RIGHT WARN	Sheet 1	**START**	Sheet 6	**TANK 8 OPEN**	Sheet 10
RIGHT WING	Sheet 3	**START GEN**	Sheet 7	**TANK EMPTY**	Sheet 5
ROAD MODE	Sheet 6	**START REGEN**	Sheet 12	**TANK HEAT**	Sheet 9
ROOF AC	Sheet 13	**STEP HEATER**	Sheet 7	**TANK VENTS**	Sheet 10
ROOF LIGHT	Sheet 1	**STEP LIGHT**	Sheet 1	**TARP UNWIND**	Sheet 3
ROTO LIGHT	Sheet 2	**STEP LT CANCEL**	Sheet 1	**TARP WIND**	Sheet 3
RR DUMP CLOSE	Sheet 6	**STOP**	Sheet 6	**T-GATE DOWN**	Sheet 8
RR DUMP OPEN	Sheet 6	**STOP CONFIRM**	Sheet 13	**T-GATE UP**	Sheet 8
RR LF ARM DN	Sheet 6	**STOP GEN**	Sheet 7	**THROTL**	Sheet 13
RR LF ARM UP	Sheet 6	**STOP HYBRID**	Sheet 9	**TIRE PRES**	Sheet 9
RR OW NOZZLE	Sheet 7	**STOP REGEN**	Sheet 12	**TOOL CIRCUIT**	Sheet 13
RR RT ARM DN	Sheet 6	**STOP REQST**	Sheet 13	**TOWER DOWN**	Sheet 10
RR RT ARM UP	Sheet 6	**STROBE BAR**	Sheet 1	**TOWER POWER**	Sheet 7
RT DUMP CLOSE	Sheet 6	**STROBE LIGHT**	Sheet 1	**TOWER UP**	Sheet 10
RT DUMP OPEN	Sheet 6	**SUMMER**	Sheet 8	**TRAFFC CNTRL**	Sheet 10
RT WEED SEEKER	Sheet 6	**SUSP DUMP**	Sheet 7	**TRAILER ACTIVE**	Sheet 8
SANDER	Sheet 3	**SUSP KNEEL**	Sheet 13	**TRANS HEAT**	Sheet 10
SANDER ROTO	Sheet 3	**SUSP RAISE**	Sheet 7 & 13	**TRAP LIGHT**	Sheet 3

Table 103 – Labels – Page 6

TRUCK	Sheet 2	**VAC ON**	Sheet 12	**WELDER LIGHT**	Sheet 13
TTP CLOSED	Sheet 12	**VACUUM**	Sheet 8	**WHEEL CHAIR**	Sheet 5
TTP OPEN	Sheet 12	**VAN DOWN**	Sheet 5	**WHEEL CHOCK**	Sheet 6
TV MONITOR	Sheet 5	**VAN UP**	Sheet 5	**WIG WAG**	Sheet 2
U WING NOZZLE	Sheet 7	**VAPOR PUMP**	Sheet 11	**WIGWAG FLASH**	Sheet 9
UNLOAD	Sheet 11	**VAPOR VALVE**	Sheet 7	**WINCH**	Sheet 3
UNLOCK	Sheet 9	**VOLUME**	Sheet 10	**WINCH IN**	Sheet 7
UNLOCK DOOR	Sheet 4	**WARN 1**	Sheet 12	**WINCH OUT**	Sheet 7
UNLOCK WINDOW	Sheet 9	**WARN 2**	Sheet 12	**WINDOW AJAR**	Sheet 11
UP	Sheet 5	**WARN 3**	Sheet 12	**WING LIGHTS**	Sheet 7
UPPER PLW LTS	Sheet 13	**WATER**	Sheet 8	**WINTER**	Sheet 8 Qty of 2
UPPER WARN	Sheet 1	**WATER CANNON**	Sheet 13	**WINTER SUMMER**	Sheet 8
UPPER WORK	Sheet 1	**WATER J-STICK**	Sheet 13	**WORK LIGHT**	Sheet 1
VAC OFF	Sheet 12	**WATER PUMP**	Sheet 5	**XFER CASE**	Sheet 3

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

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SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

f_102

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

f_103

SWITCHES AND SWITCH LABEL PART NUMBERS AND INFORMATION

f_104

POWER FEATURES USING REMOTE POWER MODULES

POWER FEATURES USING REMOTE POWER MODULES

DUAL OUTPUT LATCHED SWITCH 40 AMPS

This feature provides one two-positioned latched rocker switch that controls one auxiliary load with a 40 AMP maximum. This feature was designed for owners who have a load that requires a RPM output of greater than 20 AMPS. Two RPM outputs are required, and power would only be available in IGN or accessory key-state.

60ACE

BDY INTG, SWITCH DUAL OUTPUT 2 Position Latched Rocker, Backlit, with “ON” Indicator Mounted on Dash, for 1; Auxiliary Load 40 AMP Maximum; Power Available Only in “Ignition (IGN)” or “Accessory” Position; Controls Two Remote Power Modules (RPMs) (requires two RPM outputs)

Through programmable parameters, the owner can send the amount of current desired to the two outputs. This allows the owner to customize the amperage supplied to the RPM output based on their specific needs.

* Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software.

Required software feature code: 595AKA

Software features that must be removed: NONE

The TEM_Dual1_Output1_Fuse_Param is programmed to allow a specified amount of current to go to the RPM output 1. If the current exceeds this specified amount, the virtual fusing shuts the output off.

The TEM_Dual1_Output2_Fuse_Param is programmed to allow a specified amount of current to go to the RPM output 2. If the current exceeds this specified amount, the virtual fusing shuts the output off.

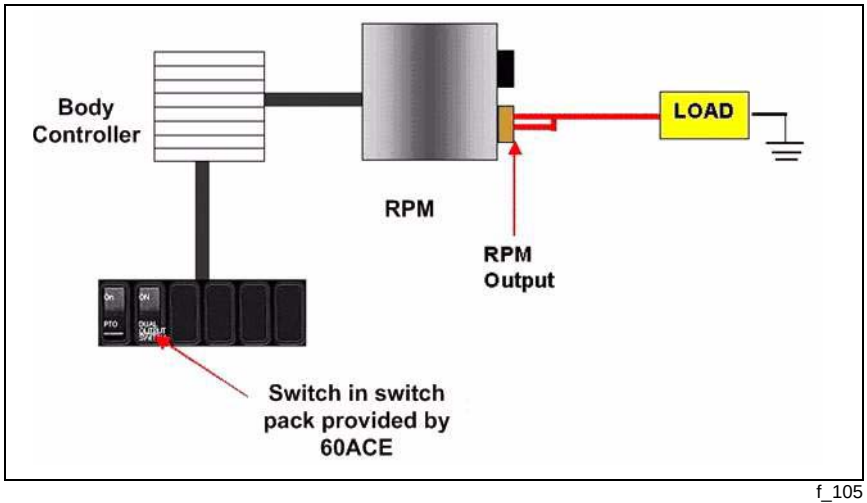
Table 101

Parameter	ID	Description	Default	Units	Min	Max	Set
TEM_Dual1_ Output1_ Fuse_Param	1988	This is the maximum current Dual 1 Output 1 is allowed to source before the virtual fusing turns the output off.	20	A	0	20	0.1
TEM_Dual1_ Output2_ Fuse_Param	1989	This is the maximum current Dual 1 Output 2 is allowed to source before the virtual fusing turns the output off.	20	A	0	20	0.1

WIRING INFORMATION

This feature requires the customer to supply the wiring that runs from the pins labeled DUAL_OUTPUT_SWITCH_Output1 and DUAL_OUTPUT_SWITCH_Output2, on the brown 8-pin RPM output connector, to the customer-installed feature that requires the load.

POWER FEATURES USING REMOTE POWER MODULES



f_105

TESTING

1. Depress the switch.
2. Verify that the desired voltage is being pulled from the RPM outputs labeled DUAL_OUTPUT_SWITCH_Output1 and DUAL_OUTPUT_SWITCH_Output2 (as programmed by the Diamond Logic® Builder software).

HOW TO ADD THIS FEATURE

- Software feature code 595AKA MUST be enabled using the Diamond Logic® Builder software (see local dealer).
- Programmable parameters must be set using the Diamond Logic® Builder software (see local dealer).
- Install the switch in the in-cab switch pack
- Customer must supply wiring from the RPM output

ONE INTERLOCKED LATCHED SWITCH DISENGAGE AT 30 MPH

This feature provides a 2-position latched rocker switch that controls one auxiliary load of 20 AMPS maximum and requires one RPM output. Output will be defaulted to turn off when vehicle speed reaches 30 MPH. The output will only be available in IGN or accessory key-state. This feature is used for applications such as a rear shining light. If the operator forgets to turn the light off before he drives away, the light will shut off when the driver hits 30 MPH.

The owner can interlock the switch with certain programmable conditions. These conditions can be set as programmable parameters using the Diamond Logic® Builder software. These parameters are listed and explained below.

60ACG

BDY INTG, SWITCH, INTERLOCKED 2 Position Latched Rocker, Backlit, with “ON” Indicator Mounted on Dash for 1; Auxiliary Load 20 Ampere (AMP) Maximum; Output will disengage when Vehicle Exceeds 30 MPH, Programmable; Power Available Only in “Ignition (IGN)” or “Accessory” Position (requires one Remote Power Module (RPM) output)

* Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section).

POWER FEATURES USING REMOTE POWER MODULES

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software.

Required software feature code: 595AKB

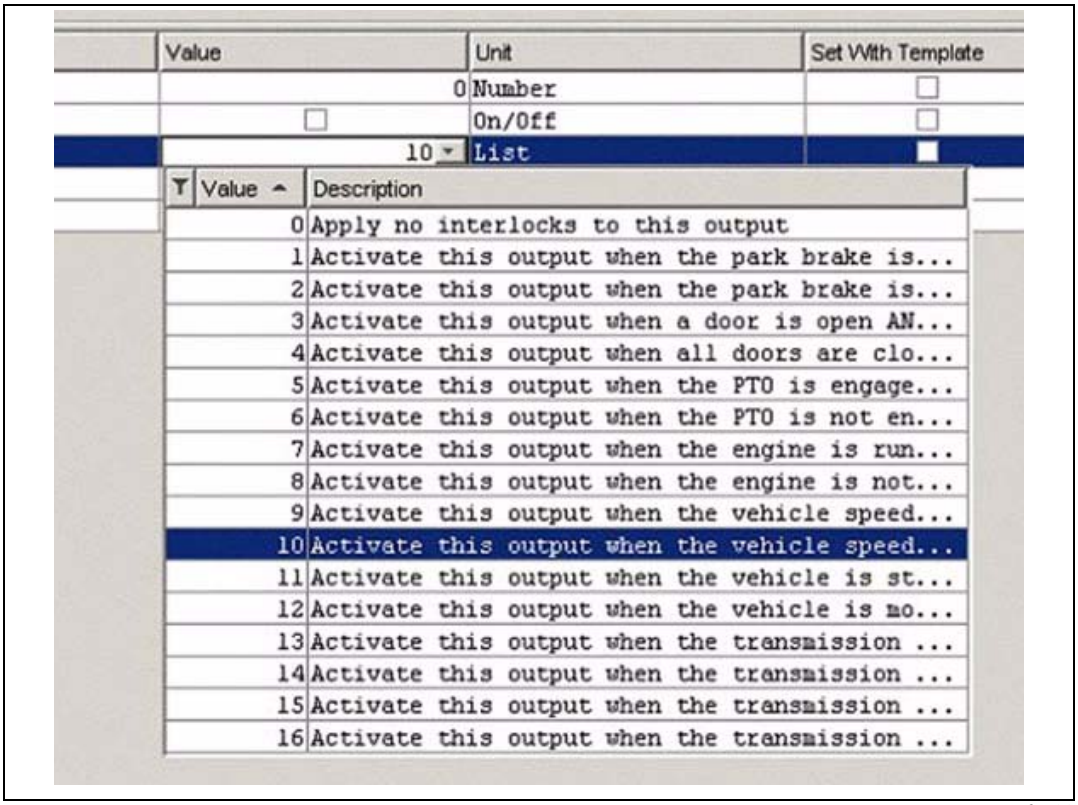
Conflicts with Software features: NONE

* TEM_Aux1_Misc_Interlock_Param

This parameter (TEM_Aux1_Misc_Interlock_Param) is the master parameter for this feature. The setting for this parameter selects the interlocking condition for the output. The following table indicates which interlocking condition corresponds to which setting for the parameter. To select the interlocking condition simply set the value of this parameter to the corresponding setting on the table.

Table 102

Setting	Interlocking Condition
0	Apply no interlocks to this output
1	Activate this output when the park brake is set AND the switch is on
2	Activate this output when the park brake is not set AND the switch is on
3	Activate this output when a door is open AND the switch is on
4	Activate this output when all doors are closed AND the switch is on
5	Activate this output when the PTO is engaged AND the switch is on (Requires a PTO feature)
6	Activate this output when the PTO is not engaged AND the switch is on (Requires a PTO feature)
7	Activate this output when the engine is running AND the switch is on
8	Activate this output when the engine is not running AND the switch is on
9	Activate this output when the vehicle speed exceeds the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
10	Activate this output when the vehicle speed is less than the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
11	Activate this output when the vehicle is stopped AND the switch is on
12	Activate this output when the vehicle is moving AND the switch is on
13	Activate this output when the transmission gear is higher than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
14	Activate this output when the transmission gear is lower than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
15	Activate this output when the transmission is in neutral AND the switch is on (Requires Automatic Transmission)
16	Activate this output when the transmission is not in neutral AND the switch is on (Requires Automatic Transmission)



Drop Down List of Possible Parameters for TEM_Aux1_Misc_Interlock_Param f_106

* TEM_Aux1_Interlock_Latches_Off

Normally, if the output is deactivated because the interlocking condition is not met, the output will re-activate as soon as the interlocking condition is re-established as long as the switch is still on. If this behavior is not desirable, the parameter TEM_Aux1_Interlock_Latches_Off parameter can be set. When it is set and the output is deactivated because the interlocking condition is not met, the output will not reactivate when the interlocking condition is re-established even if the switch is still on. To re-activate the output in this case, the switch must be re-cycled (flipped off and then on again).

* TEM_Aux1_Speed_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 9 or 10, the speed-interlock parameter (TEM_Aux1_Speed_Interlock_Param) must also be set. This parameter must be set to the actual speed to use in the condition selected by TEM_Aux1_Misc_Interlock_Param (default unit for this parameter is MPH). The speed parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 9 or 10.

Example: If you want the output to only come on when the vehicle is traveling over 15 MPH, you would set TEM_Aux1_Misc_Interlock_Param to 9 and set TEM_Aux1_Speed_Interlock_Param to 15 MPH.

* TEM_Aux1_Gear_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 13 or 14 and the vehicle has an automatic transmission, the gear-interlock parameter (TEM_Aux1_Gear_Interlock_Param) must also be set. This parameter must be set to the transmission gear to use in the condition selected by TEM_Aux1_Misc_Interlock_Param. The transmission gear is set as follows:

Table 103

Setting	Transmission Gear
125	Transmission in Neutral
126	Transmission is in the 1st forward gear
127	Transmission is in the 2nd forward gear
128	Transmission is in the 3rd forward gear
125 + x	Transmission is in the xth forward gear
124	Transmission is in the 1st reverse gear
123	Transmission is in the 2nd reverse gear
125 – y	Transmission is in the yth reverse gear

The transmission gear parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 13 or 14.

Example: For the output to only come on when the vehicle transmission is in a reverse gear, set TEM_Aux1_Misc_Interlock_Param to 10 and TEM_Aux1_Gear_Interlock_Param to 125.

* TEM_Aux1_w_Ilocks_Output_Fuse

This parameter is the value at which the output will fuse (shut off). The allowable values are from 1 to 20 Amperes.

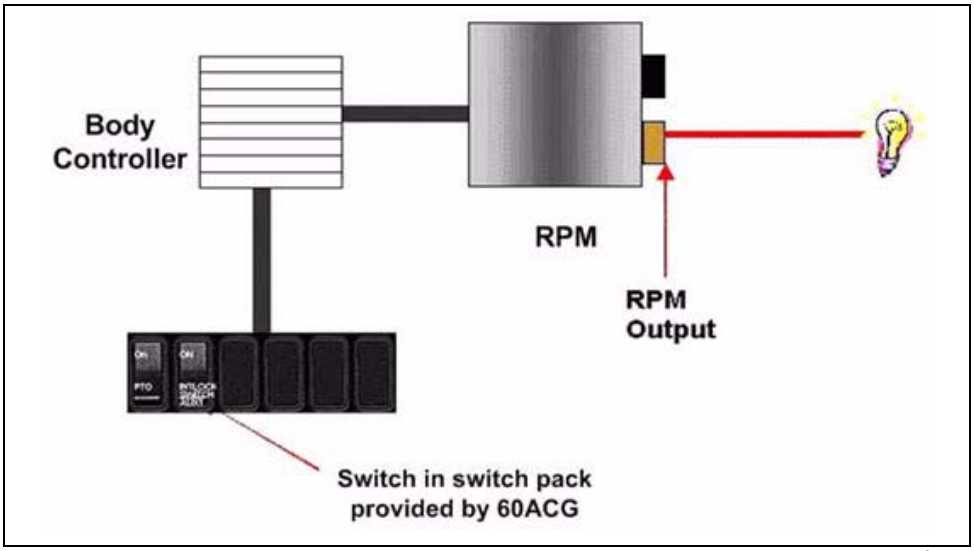
Table 104

Parameter	ID	Description	Default	Units	Min	Max	Set
TEM_Aux1_ Interlock_ Latches_Off	2006	If this is set, when the output is turned off due to an interlock, it will remain off until the switch is recycled.	Off	On/Off			
TEM_Aux1_ Speed_ Interlock_ Param	2007	The speed parameter for the TEM Aux #1 with Interlocks feature.	30	Mph	0	100	1
TEM_Aux1_ Gear_ Interlock_ Param	2008	The transmission gear parameter for the TEM Aux #1 with Interlocks feature (124 is reverse, 125 is neutral, 126 is 1st gear, 127 is second gear etc.).	0	Number	0	250	1
TEM_Aux1_ w_Ilocks_ Output_Fuse	2009	Fuse parameter for the TEM Single output with interlocks feature.	20	A	0	20	0.1
TEM_Aux1_ Misc_Interlock_ Param	2033	Miscellaneous or control parameter used for setting the interlock for the auxiliary 1 with interlocks.	10	List			

WIRING INFORMATION

The wiring out of the pin labeled INTERLOCKED_SWITCH_AUX1_Output on the Brown 8-pin RPM output connector is customer supplied.

POWER FEATURES USING REMOTE POWER MODULES



f_107

TESTING

1. Depress switch.
2. Verify that the RPM output labeled INTERLOCKED_SWITCH_AUX1_Output is obtaining the desired voltage (as programmed by the Diamond Logic® Builder software).
3. Verify the functionality of the 30 Mph interlock by violating the parameter and determine that the output shuts off.
4. Test all other interlocks by violating the programmable parameters to see if the output shuts off.

HOW TO ADD THIS FEATURE

- Software feature code 595AKB MUST be enabled using the Diamond Logic® Builder software (see local dealer).
- Programmable Parameters must be set using the Diamond Logic® Builder software (see local dealer)
- The 2-position latched rocker switch must be installed in the in-cab switch pack
- Customer must install the wiring from the RPM output.

POWER FEATURES USING REMOTE POWER MODULES

TWO INTERLOCKED LATCHED SWITCH DISENGAGE AT 30 MPH

This feature provides TWO 2-position Latched Rocker switches that control two auxiliary loads, each having a 20 AMP maximum and requiring a total of two RPM outputs. Outputs are defaulted to disengage when vehicle speed reaches 30 MPH. The outputs will only be available in IGN or accessory key-state. This feature is used for applications such as a rear shining light. If the operator forgets to turn the light off before he drives away, the light will shut off when the driver hits 30 MPH.

The owner can interlock the switch with certain programmable conditions. These conditions can be set as programmable parameters using the Diamond Logic® Builder software. These parameters are listed and explained below.

60ACH

BDY INTG, SWITCH, INTERLOCKED (2) 2 Position Latched Rockers, Backlit, with “ON” Indicator Mtd on Dash, for 2; Auxiliary Load each 20 AMP Maximum; Outputs will Disengage when Vehicle Exceeds 30 MPH, Programmable; Power Available Only in “IGN” or “Accessory” Position (requires two RPM outputs)

** This feature includes two copies of the functionality provided by 60ACG; e.g., two outputs with two switches. Each one of these outputs is exactly the same as that provided by 60ACG. The two outputs in this feature are completely autonomous (independent of each other). Each of the two outputs has its own set of five parameters as is mentioned in the description for 60ACG.

* Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through the Diamond Logic® Builder software. Programmable parameters are also programmable through the Diamond Logic® Builder software.

Required software feature codes: 595AKB, 595AKC

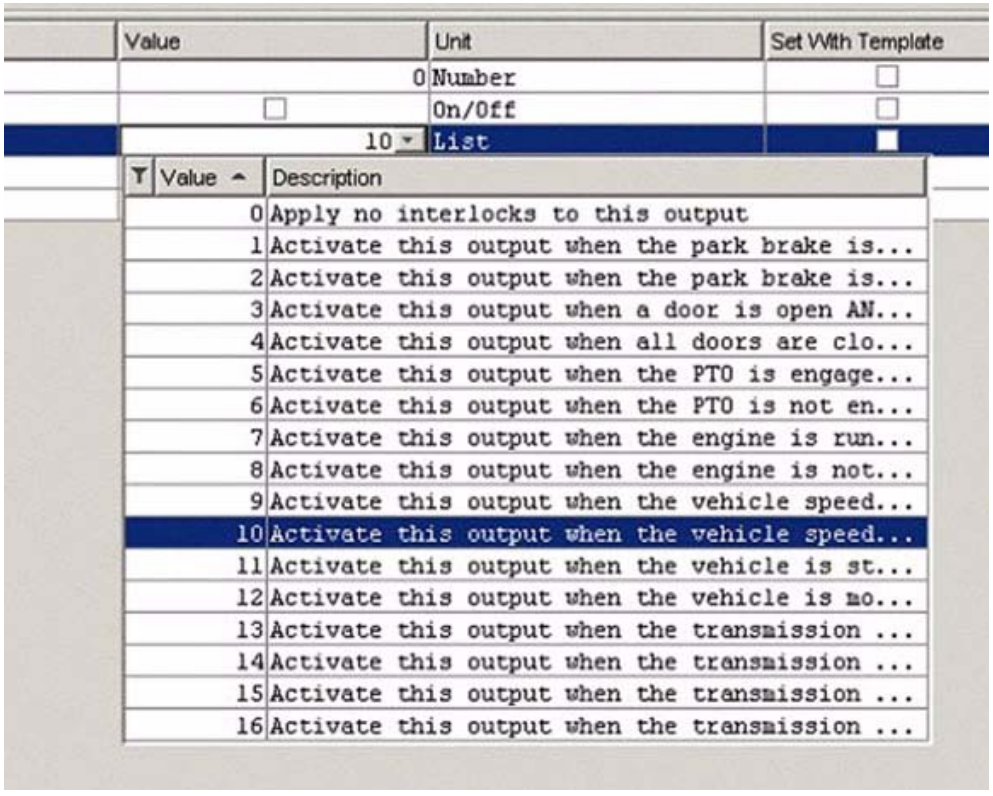
Conflicts with Software features: NONE

* TEM_Aux1_Misc_Interlock_Param

This parameter (TEM_Aux1_Misc_Interlock_Param) is the master parameter for this feature. The setting for this parameter selects the interlocking condition for the output. The following table indicates which interlocking condition corresponds to which setting for the parameter. To select the interlocking condition simply set the value of this parameter to the corresponding setting on the table.

Table 105

Setting	Interlocking Condition
0	Apply no interlocks to this output
1	Activate this output when the park brake is set AND the switch is on
2	Activate this output when the park brake is not set AND the switch is on
3	Activate this output when a door is open AND the switch is on
4	Activate this output when all doors are closed AND the switch is on
5	Activate this output when the PTO is engaged AND the switch is on (Requires a PTO feature)
6	Activate this output when the PTO is not engaged AND the switch is on (Requires a PTO feature)
7	Activate this output when the engine is running AND the switch is on
8	Activate this output when the engine is not running AND the switch is on
9	Activate this output when the vehicle speed exceeds the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
10	Activate this output when the vehicle speed is less than the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
11	Activate this output when the vehicle is stopped AND the switch is on
12	Activate this output when the vehicle is moving AND the switch is on
13	Activate this output when the transmission gear is higher than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
14	Activate this output when the transmission gear is lower than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
15	Activate this output when the transmission is in neutral AND the switch is on (Requires Automatic Transmission)
16	Activate this output when the transmission is not in neutral AND the switch is on (Requires Automatic Transmission)



Drop Down List of Possible Parameters for TEM_Aux1_Misc_Interlock_Param f_106

* TEM_Aux1_Interlock_Latches_Off

Normally, if the output is deactivated because the interlocking condition is not met, the output will re-activate as soon as the interlocking condition is re-established as long as the switch is still on. If this behavior is not desirable, the parameter TEM_Aux1_Interlock_Latches_Off parameter can be set. When it is set and the output is deactivated because the interlocking condition is not met, the output will not reactivate when the interlocking condition is re-established even if the switch is still on. To re-activate the output in this case, the switch must be re-cycled (flipped off and then on again).

* TEM_Aux1_Speed_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 9 or 10, the speed-interlock parameter (TEM_Aux1_Speed_Interlock_Param) must also be set. This parameter must be set to the actual speed to use in the condition selected by TEM_Aux1_Misc_Interlock_Param (default unit for this parameter is MPH). The speed parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 9 or 10.

Example: For the output to only come on when the vehicle is traveling over 15 MPH, set TEM_Aux1_Misc_Interlock_Param to 9 and set TEM_Aux1_Speed_Interlock_Param to 15 MPH.

* TEM_Aux1_Gear_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 13 or 14 and the vehicle has an automatic transmission, the gear-interlock parameter (TEM_Aux1_Gear_Interlock_Param) must also be set. This parameter must be set to the transmission gear to use in the condition selected by TEM_Aux1_Misc_Interlock_Param. The transmission gear is set as follows:

Table 106

Setting	Transmission Gear
125	Transmission in Neutral
126	Transmission is in the 1st forward gear
127	Transmission is in the 2nd forward gear
128	Transmission is in the 3rd forward gear
125 + x	Transmission is in the xth forward gear
124	Transmission is in the 1st reverse gear
123	Transmission is in the 2nd reverse gear
125 – y	Transmission is in the yth reverse gear

The transmission gear parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 13 or 14.

Example: For the output to only come on when the vehicle transmission is in a reverse gear, set TEM_Aux1_Misc_Interlock_Param to 10 and TEM_Aux1_Gear_Interlock_Param to 125.

* TEM_Aux1_w_Ilocks_Output_Fuse

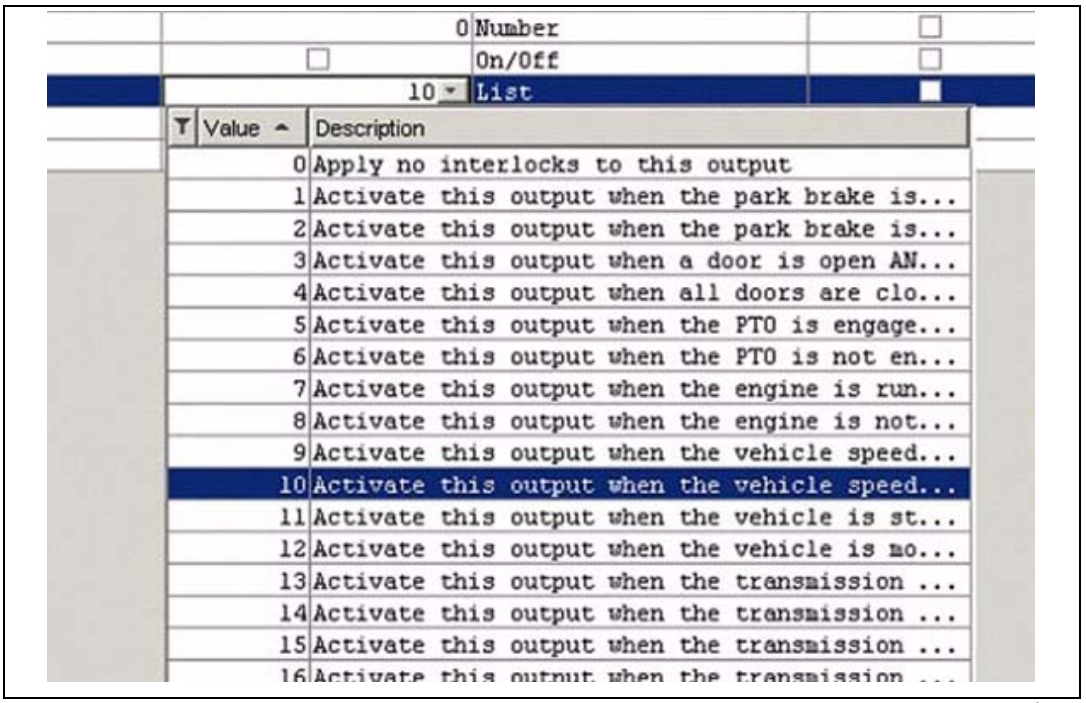
This parameter is the value at which the output will fuse (shut off). The allowable values are from 1 to 20 Amperes.

* TEM_Aux2_Misc_Interlock_Param

This parameter (TEM_Aux2_Misc_Interlock_Param) is the master parameter for this feature. The setting for this parameter selects the interlocking condition for the output. The following table indicates which interlocking condition corresponds to which setting for the parameter. To select the interlocking condition simply set the value of this parameter to the corresponding setting on the table.

Table 107

Setting	Interlocking Condition
0	Apply no interlocks to this output
1	Activate this output when the park brake is set AND the switch is on
2	Activate this output when the park brake is not set AND the switch is on
3	Activate this output when a door is open AND the switch is on
4	Activate this output when all doors are closed AND the switch is on
5	Activate this output when the PTO is engaged AND the switch is on (Requires a PTO feature)
6	Activate this output when the PTO is not engaged AND the switch is on (Requires a PTO feature)
7	Activate this output when the engine is running AND the switch is on
8	Activate this output when the engine is not running AND the switch is on
9	Activate this output when the vehicle speed exceeds the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
10	Activate this output when the vehicle speed is less than the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
11	Activate this output when the vehicle is stopped AND the switch is on
12	Activate this output when the vehicle is moving AND the switch is on
13	Activate this output when the transmission gear is higher than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
14	Activate this output when the transmission gear is lower than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
15	Activate this output when the transmission is in neutral AND the switch is on (Requires Automatic Transmission)
16	Activate this output when the transmission is not in neutral AND the switch is on (Requires Automatic Transmission)



Drop Down List of Possible Parameters for TEM_Aux2_Misc_Interlock_Param f_106

* TEM_Aux2_Interlock_Latches_Off

Normally, if the output is deactivated because the interlocking condition is not met, the output will re-activate as soon as the interlocking condition is re-established as long as the switch is still on. If this behavior is not desirable, the parameter TEM_Aux2_Interlock_Latches_Off parameter can be set. When it is set and the output is deactivated because the interlocking condition is not met, the output will not reactivate when the interlocking condition is re-established even if the switch is still on. To re-activate the output in this case, the switch must be re-cycled (flipped off and then on again).

* TEM_Aux2_Speed_Interlock_Param

If TEM_Aux2_Misc_Interlock_Param is set to 9 or 10, the speed-interlock parameter (TEM_Aux2_Speed_Interlock_Param) must also be set. This parameter must be set to the actual speed to use in the condition selected by TEM_Aux2_Misc_Interlock_Param (default unit for this parameter is MPH). The speed parameter is only used if TEM_Aux2_Misc_Interlock_Param is set to 9 or 10.

Example: For the output to only come on when the vehicle is traveling over 15 MPH, set TEM_Aux2_Misc_Interlock_Param to 9 and set TEM_Aux2_Speed_Interlock_Param to 15 MPH.

* TEM_Aux2_Gear_Interlock_Param

If TEM_Aux2_Misc_Interlock_Param is set to 13 or 14 and the vehicle has an automatic transmission, the gear-interlock parameter (TEM_Aux2_Gear_Interlock_Param) must also be set. This parameter must be set to the transmission gear to use in the condition selected by TEM_Aux2_Misc_Interlock_Param. The transmission gear is set as follows:

Table 108

Setting	Transmission Gear
125	Transmission in Neutral
126	Transmission is in the 1st forward gear
127	Transmission is in the 2nd forward gear
128	Transmission is in the 3rd forward gear
125 + x	Transmission is in the xth forward gear
124	Transmission is in the 1st reverse gear
123	Transmission is in the 2nd reverse gear
125 – y	Transmission is in the yth reverse gear

The transmission gear parameter is only used if TEM_Aux2_Misc_Interlock_Param is set to 13 or 14.

Example: For the output to only come on when the vehicle transmission is in a reverse gear, you would set TEM_Aux2_Misc_Interlock_Param to 10 and TEM_Aux2_Gear_Interlock_Param to 125.

* TEM_Aux2_w_Ilocks_Output_Fuse

This parameter is the value at which the output will fuse (shut off). The allowable values are from 1 to 20 Amperes.

POWER FEATURES USING REMOTE POWER MODULES

Table 109

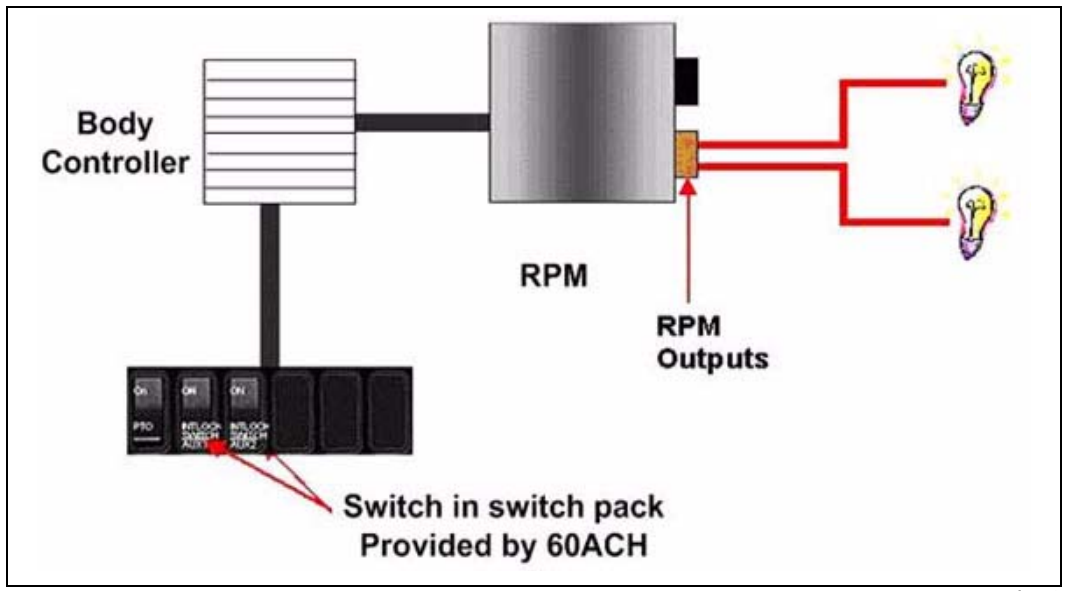
Parameter	ID	Description	Default	Units	Min	Max	Set
TEM_Aux1_ Interlock_ Latches_Off	2006	If this is set, when the output is turned off due to an interlock, it will remain off until the switch is recycled.	Off	On/Off			
TEM_Aux1_ Speed_ Interlock_ Param	2007	The speed parameter for the TEM Aux #1 with Interlocks feature.	30	Mph	0	100	1
TEM_Aux1_ Gear_ Interlock_ Param	2008	The transmission gear parameter for the TEM Aux #1 with Interlocks feature (124 is reverse, 125 is neutral, 126 is 1st gear, 127 is second gear etc.).	0	Number	0	250	1
TEM_Aux1_ w_Ilocks_ Output_Fuse	2009	Fuse parameter for the TEM Single output with interlocks feature.	20	A	0	20	0.1
TEM_Aux1_ Misc_Interlock_ Param	2033	Miscellaneous or control parameter used for setting the interlock for the auxiliary 1 with interlocks.	10	List			
TEM_Aux2_ Interlock_ Latches_Off	2010	If this is set, when the output is turned off due to an interlock, it will remain off until the switch is recycled.	Off	On/Off			
TEM_Aux2_ Speed_ Interlock_ Param	2011	The speed parameter for the TEM Aux #2 with Interlocks feature.	30	Mph	0	100	1
TEM_Aux2_ Gear_ Interlock_ Param	2012	The transmission gear parameter for the TEM Aux #2 with Interlocks feature (124 is reverse, 125 is neutral, 126 is 1st gear, 127 is second gear etc.).	0	Number	0	250	1
TEM_Aux2_ w_Ilocks_ Output_Fuse	2013	Fuse parameter for the TEM Single output with interlocks feature.	20	A	0	20	0.1
TEM_Aux2_ Misc_Interlock_ Param	2034	Miscellaneous or control parameter used for setting the interlock for the auxiliary 2 with interlocks.	10	List			

WIRING INFORMATION

The wiring out of the pin labeled INTERLOCKED_SWITCH_AUX1_Output on the Brown 8-pin RPM output connector is customer supplied.

The wiring out of the pin labeled INTERLOCKED_SWITCH_AUX2_Output on the Brown 8-pin RPM output connector is customer supplied.

POWER FEATURES USING REMOTE POWER MODULES



f_110

TESTING

1. Depress switch.
2. Verify that the RPM output labeled INTERLOCKED_SWITCH_AUX1_Output is obtaining the desired voltage (as programmed by the Diamond Logic® Builder software).
3. Verify the functionality of the 30 Mph interlock by violating the parameter and determine that the output shuts off.
4. Test all other interlocks can by violating the programmable parameters to see if the output shuts off
5. Depress the second switch.
6. Verify that the RPM output labeled INTERLOCKED_SWITCH_AUX2_Output is obtaining the desired voltage (as programmed by the Diamond Logic® Builder software).
7. Verify the functionality of the 30 MPH interlock by violating the parameter and determine that the output shuts off.
8. Test all other interlocks can by violating the programmable parameters to see if the output shuts off

HOW TO ADD THIS FEATURE

- Software feature code 595AKB and 595AKC MUST be enabled using the Diamond Logic® Builder software (see local dealer).
- Programmable parameters must be set using the Diamond Logic® Builder software (see local dealer).
- The 2-position latched rocker switch must be installed in the in-cab switch pack
- Customer must install the wiring from the RPM outputs.

POWER FEATURES USING REMOTE POWER MODULES

ONE MOMENTARY ROCKER SWITCH/REMOTE SWITCH CAPABILITY

This feature provides a three-way switch control function for a RPM output. An in-cab, 3-position momentary switch is connected to a RPM output. In addition, a customer-supplied, remote-mounted momentary switch may be used to control the same RPM output. This switch must be active at 12 volts and must use Ground (GND) to deactivate the output. Thus, a three-way switch control action may be performed with these two switch inputs. The RPM output may be turned off or on from either switch; however, an off command from either switch takes precedence and will turn the RPM output off. This feature is useful when a lamp or other load requires control from both in the cab and from a remote location on the body.

60ACS

BDY INTG, SWITCH MOMNTRY 3POS Rocker, Backlit, with “ON” Indicator Mounted on Dash, Latching Software, for 1 Auxiliary Load 20 amp. Maximum; Power Available Only in “Ignition” or “Accessory” Position, Output Also Controlled by a Customer Remote Mounted Switch (requires 1 Remote Power Module input and 1 output)

The in-cab switch provides a green lamp in the top section of the switch to indicate when the RPM output is on. The RPM provides an active high output that will source up to 20 AMPS at battery voltage levels. The output current level may be limited through programmable parameters between .1 and 20 AMPS in .1 AMP increments. This virtual fusing level is controlled in software and mimics the performance of an SAE fuse.

The RPM output may be activated with the in-cab switch provided that the IGN key is in the accessory or IGN position. The RPM output may also be activated with the remote switch input with IGN key off or on. It is important to turn off RPM outputs that have been enabled remotely before leaving a parked vehicle with the IGN key off. Otherwise, the system will remain active and drain the batteries.

60AAA or 60AAB is a prerequisite feature that must be ordered along with 60ACS. 60ACS uses a single momentary switch in place of one of the latching switches that is provided with 60AAA and 60AAB. For example, instead of the six latching switches that are provided with 60AAA, a vehicle with 60ACS will have a switch pack of five latching switches and one momentary switch.

* Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through the Diamond Logic® Builder. Programmable parameters are also programmable through the Diamond Logic® Builder.

Required software feature code: 595AKD

Conflicts with software features: NONE

The TEM_Aux1_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through auxiliary output 1. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux1_w_Ext_Switch_Init_State parameter on, the Body Controller (BC) forces the RPM output to be on whenever the truck’s key-state is turned from off to accessory or IGN.

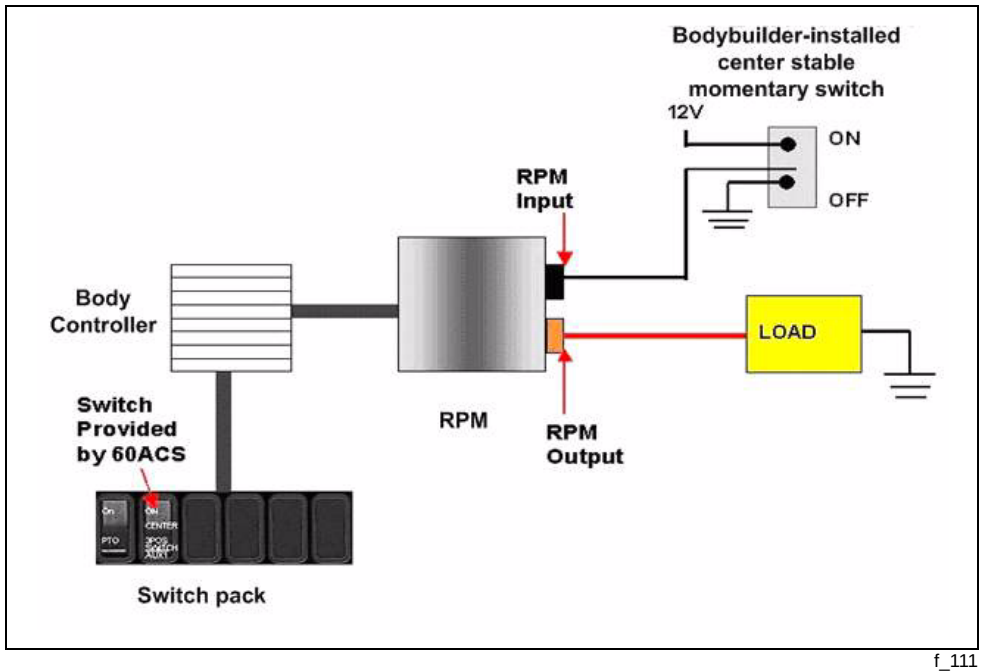
Table 110

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Aux1_w_Ext_Sw_Fuse_Level	1998	This is the level above which the RPM will fuse the TEM Auxiliary output with external switch.	20	A	0	20	0.1
TEM_Aux1_w_Ext_Switch_Init_State	2032	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #1.	Off	On/Off	NA	NA	NA

WIRING INFORMATION

Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX1_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).

Customer must install wiring from the pin labeled 3POS_SWITCH_AUX1_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).



f_111

TESTING

1. This feature allows the customer the ability to activate the output when the IGN key is turned from OFF to ACCESSORY or IGN. This functionality is obtained by turning programmable parameters (TEM_Aux1_w_Ext_Switch_Init_State ON.
2. Activate the first remote Body Builder installed switch to 12 volts by using a momentary switch action.
3. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic® Builder).
4. Verify that the green switch indicator light comes on.
5. Verify that the RPM input labeled 3POS_SWITCH_AUX1_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic® Builder).
6. Deactivate the first remote Body Builder installed switch by providing a momentary switch action to GND.

7. Verify that the RPM output goes OFF.
8. Activate the in-cab switch.
9. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts (as programmed in Diamond Logic® Builder).
10. Verify that the green switch indicator light comes on.
11. Deactivate the in-cab switch.

How To Add This Feature

- Select software feature code 595AKD using Diamond Logic® Builder (see local dealer).
- Programmable Parameters must be set using the Diamond Logic® Builder (see local dealer)
- The 3-position momentary switch with latching software must be installed in the in-cab switch pack.
- The customer must install wiring from the RPM output to the load they wish to control.
- The customer may mount a remote switch and install the wiring into the RPM input.

TWO MOMENTARY ROCKER SWITCHES/REMOTE SWITCH CAPABILITY

This feature provides three-way switch control function for two RPM outputs. Each RPM output is controlled by an in-cab, 3-position momentary switch and a 3-position momentary Body Builder-installed, remote-mounted switch. These customer-installed, remote-mounted switches must be active at 12 volts and must use GND to deactivate the output. Each in-cab, 3-position momentary switch is connected to a RPM output. In addition, each customer-supplied, remote-mounted momentary switch may be used to control the respective RPM outputs. Thus, three-way switch control action may be performed. The RPM outputs may be turned off or on from either the respective in-cab switch or the respective Body Builder switch; however, an off command from either switch takes precedence and will turn the RPM output off. This feature is useful when a lamp or other load requires control from both in the cab and from a remote location on the body.

The in-cab switches provide green lamps in the top section of the switches to indicate when the RPM outputs are on. The RPM provides active high outputs that will source up to 20 AMPS at battery voltage levels. The output current level may be limited through programmable parameters between .1 and 20 AMPS in .1 AMP increments. This virtual fusing level is controlled in software and mimics the performance of an SAE fuse.

The RPM outputs may be activated with the respective in-cab switches provided that the IGN key is in the accessory or IGN position. The RPM outputs may also be activated with the remote switch inputs with IGN key off or on. It is important to turn off RPM outputs that have been enabled remotely before leaving a parked vehicle with the IGN key off. Otherwise, the system will remain active and drain the batteries.

60ACT

BDY INTG, SWITCH MOMNTRY 3POS Rocker, Backlit, with “ON” Indicator Mounted on Dash, Latching Software, for 2; Auxiliary Load 20 AMP Maximum; Power Available Only in “IGN” or “Accessory” Position, Output Also Controlled by a Customer Remote-Mounted Switch (requires two RPM inputs and two outputs)

60AAA or 60AAB is a prerequisite feature that must be ordered along with 60ACT. 60ACT uses two momentary switches in place of two latching switches that are provided with 60AAA and 60AAB. For example, instead of the six latching switches that are provided with 60AAA, a vehicle with 60ACT will have a switch pack of four latching switches and two momentary switches.

* Please use the Diamond Logic® Builder to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

POWER FEATURES USING REMOTE POWER MODULES

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through Diamond Logic®Builder. Programmable parameters are also programmable through Diamond Logic® Builder.

Required software feature code: 595AKE

Software features that must be removed: NONE

The TEM_Aux1_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through Auxiliary output 1. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux1_w_Ext_Switch_Init_State parameter on, the BC forces the RPM auxiliary output 1 to be on whenever the truck's key-state is turned from off to accessory or IGN.

The TEM_Aux2_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through auxiliary output 2. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux2_w_Ext_Switch_Init_State parameter on, the BC forces the RPM auxiliary output 2 to be on whenever the truck's key-state is turned from off to accessory or IGN.

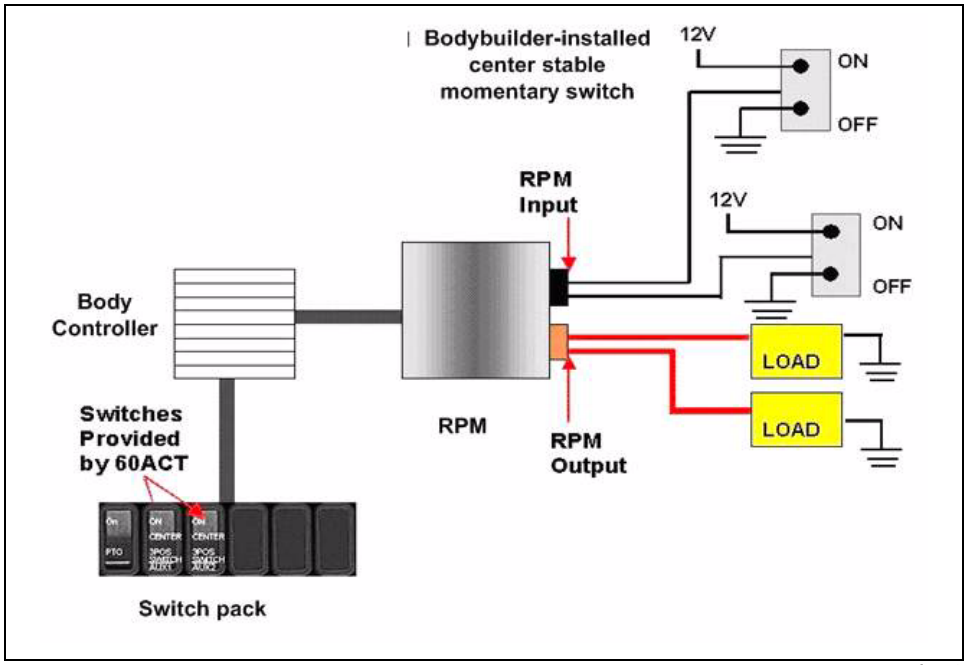
Table 111

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Aux1_w_Ext_Sw_Fuse_Level	1998	This is the level above which the RPM will fuse the TEM Auxiliary output with external switch.	20	A	0	20	0.1
TEM_Aux1_w_Ext_Switch_Init_State	2032	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #1.	Off	On/Off	NA	NA	NA
TEM_Aux2_w_Ext_Sw_Fuse_Level	2106	This is the level above which the RPM will fuse the TEM Auxiliary output #2 with external switch.	20	A	0	20	0.1
TEM_Aux2_w_Ext_Switch_Init_State	2142	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #2.	Off	On/Off	NA	NA	NA

WIRING INFORMATION

- Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX1_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).
- Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX2_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).
- Customer must install wiring from the pin labeled 3POS_SWITCH_AUX1_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).
- Customer must install wiring from the pin labeled 3POS_SWITCH_AUX2_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).

POWER FEATURES USING REMOTE POWER MODULES



f_112

TESTING

1. This feature allows the customer the ability to activate the output when the IGN key is turned from off to accessory or IGN. This functionality is obtained by turning the programmable parameters (TEM_Aux1_w_Ext_Switch_Init_State and TEM_Aux2_w_Ext_Switch_Init_State) on.
2. Activate the first remote Body Builder installed switch to 12 volts by using a momentary switch action.
3. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic® Builder).
4. Verify that the green switch indicator light comes on.
5. Verify that the RPM input labeled 3POS_SWITCH_AUX1_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic® Builder).
6. Deactivate the first remote Body Builder-installed switch by providing a momentary switch action to GND.
7. Verify that the RPM output goes OFF.
8. Activate the first in-cab switch.
9. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts (as programmed in Diamond Logic® Builder).
10. Verify that the green switch indicator light comes on.
11. Deactivate the first in-cab switch.
12. Activate the second remote Body Builder installed switch to 12 volts by using a momentary switch action.
13. Verify that the RPM output labeled 3POS_SWITCH_AUX2_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic® Builder).
14. Verify that the green switch indicator light comes on.
15. Verify that the RPM input labeled 3POS_SWITCH_AUX2_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic® Builder).

16. Deactivate the second remote Body Builder installed switch by providing a momentary switch action to GND.
17. Verify that the RPM output goes OFF.
18. Activate the second in-cab switch.
19. Verify that the RPM output labeled 3POS_SWITCH_AUX2_Output is providing the battery volts (as programmed in Diamond Logic® Builder).
20. Verify that the green switch indicator light comes on.
21. Deactivate the second in-cab switch.

How To Add This Feature

- Select software feature code 595AKE using Diamond Logic® Builder (see local dealer).
- Programmable parameters must be set using Diamond Logic® Builder (see local dealer).
- The 3-position momentary switch with latching software must be installed in the in-cab switch pack.
- The customer must install wiring from the RPM outputs to the loads that are to be controlled
- The customer may mount a switch (12 volts active and GND de-active) and install the wiring into the RPM inputs (Use the Diamond Logic® Builder software to determine switch and pin location assignments).

THREE MOMENTARY ROCKER SWITCHES/REMOTE SWITCH CAPABILITY

60ACU

BDY INTG, SWITCH MOMNTRY 3POS (3) Rocker, Backlit, with “ON” Indicator Mounted on Dash, Latching Software, for 3; Auxiliary Load 20 AMP Maximum; Power Available Only in “IGN” or “Accessory” Position, Output Also Controlled by a Customer Remote-Mounted Switch (requires three RPM inputs and three outputs)

This feature provides three-way switch control function for three RPM outputs. Each RPM output is controlled by an in-cab, 3-position momentary switch and a 3-position momentary Body Builder-installed, remote-mounted switch. These customer-installed, remote-mounted switches must be active at 12 volts and must use GND to deactivate the output. Each in-cab, 3-position momentary switch is connected to a RPM output. In addition, each customer-supplied, remote-mounted momentary switch may be used to control the respective RPM outputs. Thus, three-way switch control action may be performed. The RPM outputs may be turned off or on from either the respective in-cab switch or the respective Body Builder switch; however, an off command from either switch takes precedence and will turn the RPM output off. This feature is useful when a lamp or other load requires control from both in the cab and from a remote location on the body.

The in-cab switches provide green lamps in the top section of the switches to indicate when the RPM outputs are on. The RPM provides active high outputs that will source up to 20 AMPS at battery voltage levels. The output current level may be limited through programmable parameters between .1 and 20 AMPS in.1 AMP increments. This virtual fusing level is controlled in software and mimics the performance of an SAE fuse.

The RPM outputs may be activated with the respective in-cab switches provided that the IGN key is in the accessory or IGN position. The RPM outputs may also be activated with the remote switch inputs with IGN key off or on. It is important to turn off RPM outputs that have been enabled remotely before leaving a parked vehicle with the IGN key off. Otherwise, the system will remain active and drain the batteries.

60AAA or 60AAB is a prerequisite feature that must be ordered along with 60ACU. 60ACU uses three momentary switches in place of three latching switches that are provided with 60AAA and 60AAB. For example, instead of the six latching switches that are provided with 60AAA, a vehicle with 60ACU will have a switch pack of three latching switches and three momentary switches.

* Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

POWER FEATURES USING REMOTE POWER MODULES

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

*Software feature codes can be added through theDiamond Logic® Builder. Programmable Parameters are also programmable through the Diamond Logic® Builder.

Required software feature code: 595AKG

Software features that must be removed: NONE

The TEM_Aux1_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through Auxiliary output 1. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux1_w_Ext_Switch_Init_State parameter on, the BC forces the RPM auxiliary output 1 to be on whenever the truck's key-state is turned from off to accessory or IGN.

The TEM_Aux2_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through Auxiliary output 2. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux2_w_Ext_Switch_Init_State parameter on, the BC forces the RPM auxiliary output 2 to be on whenever the truck's key-state is turned from off to accessory or IGN.

The TEM_Aux3_w_Ext_Sw_Fuse_Level parameter sets the amount of current that flows through Auxiliary output 3. If current rises above this level, fusing takes place and the RPM output is shut down.

By turning the TEM_Aux3_w_Ext_Switch_Init_State parameter on, the BC forces the RPM auxiliary output 3 to be on whenever the truck's key-state is turned from off to accessory or IGN.

Table 112

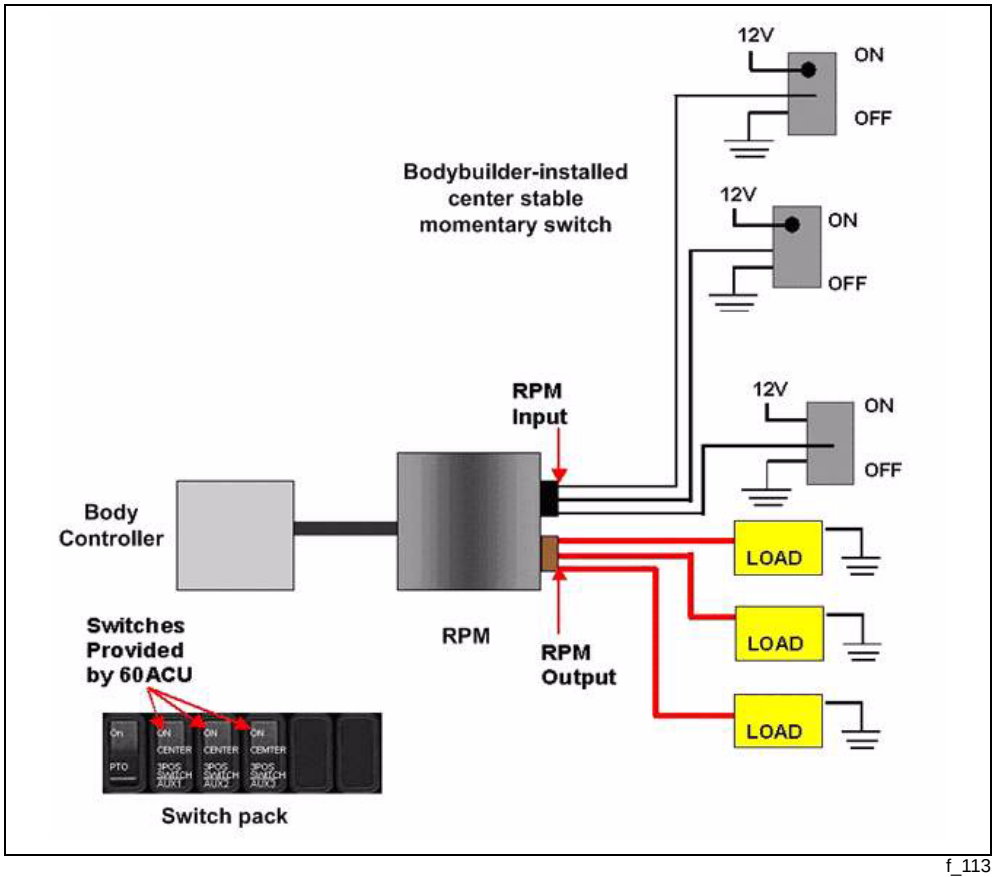
Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Aux1_w_Ext_Sw_Fuse_Level	1998	This is the level above which the RPM will fuse the TEM Auxiliary output #1 with external switch.	20	A	0	20	0.1
TEM_Aux1_w_Ext_Switch_Init_State	2032	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #1.	Off	On/Off	NA	NA	NA
TEM_Aux2_w_Ext_Sw_Fuse_Level	2106	This is the level above which the RPM will fuse the TEM Auxiliary output #2 with external switch.	20	A	0	20	0.1
TEM_Aux2_w_Ext_Switch_Init_State	2142	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #2.	Off	On/Off	NA	NA	NA
TEM_Aux3_w_Ext_Sw_Fuse_Level	2107	This is the level above which the RPM will fuse the TEM Auxiliary output #3 with external switch.	20	A	0	20	0.1
TEM_Aux3_w_Ext_Switch_Init_State	2143	This programmable parameter sets the initial State of RPM channel used with TEM Auxiliary with external switch #3.	Off	On/Off	NA	NA	NA

WIRING INFORMATION

- Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX1_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).
- Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX2_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).

POWER FEATURES USING REMOTE POWER MODULES

- Customer may mount a switch and install the wiring into the pin labeled 3POS_SWITCH_AUX3_Input in the black 23-pin RPM input connector. Installation of the remote switch is optional with this feature (see Diamond Logic® Builder for input pin location).
- Customer must install wiring from the pin labeled 3POS_SWITCH_AUX1_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).
- Customer must install wiring from the pin labeled 3POS_SWITCH_AUX2_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).
- Customer must install wiring from the pin labeled 3POS_SWITCH_AUX3_Output brown 8-pin RPM output connector to the electrical load that is to be controlled (see Diamond Logic® Builder for output pin location).



f_113

TESTING

1. This feature allows the customer the ability to activate the output when the IGN key is turned from off to accessory or IGN. This functionality is obtained by turning programmable parameters (TEM_Aux1_w_Ext_Switch_Init_State, TEM_Aux2_w_Ext_Switch_Init_State or TEM_Aux3_w_Ext_Switch_Init_State) on.
2. Activate the first remote Body Builder installed switch to 12 volts by using a momentary switch action.
3. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic® Builder).
4. Verify that the green switch indicator light comes on.
5. Verify that the RPM input labeled 3POS_SWITCH_AUX1_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic® Builder).

6. Deactivate the first remote Body Builder installed switch by providing a momentary switch action to GND.
7. Verify that the RPM output goes OFF.
8. Activate the first in-cab switch.
9. Verify that the RPM output labeled 3POS_SWITCH_AUX1_Output is providing the battery volts (as programmed in Diamond Logic®Builder).
10. Verify that the green switch indicator light comes on.
11. Deactivate the first in-cab switch.
12. Activate the second remote Body Builder installed switch to 12 volts by using a momentary switch action.
13. Verify that the RPM output labeled 3POS_SWITCH_AUX2_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic® Builder).
14. Verify that the green switch indicator light comes on.
15. Verify that the RPM input labeled 3POS_SWITCH_AUX2_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic® Builder).
16. Deactivate the second remote Body Builder installed switch by providing a momentary switch action to GND.
17. Verify that the RPM output goes OFF.
18. Activate the second in-cab switch.
19. Verify that the RPM output labeled 3POS_SWITCH_AUX2_Output is providing the battery volts (as programmed in Diamond Logic®Builder).
20. Verify that the green switch indicator light comes on.
21. Deactivate the second in-cab switch.
22. Activate the third remote Body Builder installed switch to 12 volts by using a momentary switch action.
23. Verify that the RPM output labeled 3POS_SWITCH_AUX3_Output is providing the battery volts at rated current levels (as programmed in Diamond Logic®Builder).
24. Verify that the green switch indicator light comes on.
25. Verify that the RPM input labeled 3POS_SWITCH_AUX3_Input is receiving battery volts from the customer-mounted switch (as programmed in Diamond Logic®Builder).
26. Deactivate the third remote Body Builder installed switch by providing a momentary switch action to GND.
27. Verify that the RPM output goes OFF.
28. Activate the third in-cab switch.
29. Verify that the RPM output labeled 3POS_SWITCH_AUX3_Output is providing the battery volts (as programmed in Diamond Logic® Builder).
30. Verify that the green switch indicator light comes on.
31. Deactivate the third in-cab switch.

How To Add This Feature

- Select software feature code 595AKG using Diamond Logic® Builder (see local dealer).
- Programmable parameters must be set using Diamond Logic® Builder (see local dealer).
- The 3-position momentary switch with latching software must be installed in the in-cab switch pack.
- The customer must install wiring from the RPM outputs to the loads that are to be controlled
- The customer may mount a switch (12 volts active and GND de-active) and install the wiring into the RPM inputs (use Diamond Logic® Builder to determine switch and pin location assignments).

INDICATOR LIGHTS AND ALARMS

TWO INDICATOR LIGHTS AND AUDIBLE ALARMS PROGRAMMABLE MODE FOR VARIOUS SWITCH ACTIONS (WASTE SOLUTION)

60AJC

BDY INTG, INDICATOR LIGHTS (2) One for Gate Open and One for Rear Alert, Includes Audible Alarm, Programmable Mode for Various Switch Action (requires 2 Remote Power Module (RPM) inputs).

This feature provides a custom alarm package designed for the Refuse/Waste Applications. It provides both an audible and visual alarm for Gate Open and Rear Alert. Red indicator lights are located in prime viewing area of the driver in the switch pack. Audible alarm provides a second level of warning to the driver to indicate the status of these two equipment options.

The gate open indicator light is ON constant when the gate open input is active with the park brake set. If the park brake is released, with the gate open input active, the gate open indicator shall flash at 0.6-second intervals, accompanied by an audible alarm. Flexibility is provided through programmable parameters to establish whether the inputs are active high (12V) or active low (GND). See the Diamond Logic® Builder software to set programmable parameters.

Rear Alert provides the operator the capability to communicate from the rear of the vehicle to the cab. A customer-mounted switch is wired into the black 23-pin RPM input connector (See the Diamond Logic® Builder software for pin location). The ignition (IGN) switch must be in “ignition” for this feature to function. Programmable Parameters allow the customer to establish whether the input is active at 12 volts or active at GND. When the operator activates the customer-mounted switch, the rear alert light in the gauge cluster illuminates and an audible alarm sounds.

f_114

Switch Pack Display of “Gate Open” and “Rear Alert” Indicator Lights

PROGRAMMABLE PARAMETERS

Required software feature codes: (595AMD or 595AMC**) and 595AKP

** Software feature code 595AMD should be used with an automatic transmission, whereas software feature code 595AMC should be used for a truck with a manual transmission.

Software feature codes that must be removed: NONE

The TEM_Tail_Gate_Input_Active_State parameter sets the voltage level that determines when the Gate Open alert should be active.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

When the TEM_Tail_Gate_Park_Brake_Inhibit parameter is turned ON, the tailgate alert will only alert when the Park Brake is released.

The TEM_Tail_Gate_Transmission_Interlock parameter indicates the action of the tailgate alert based on transmission gear.

0 = Ignores Gear

1 = Alert will only activate if the transmission is NOT in reverse

2 = Alert will only activate if transmission is in reverse

3 = Alert will activate for the tailgate sensor or if the transmission is in reverse

The TEM_Rear_Alert_Input_Active_State parameter sets the voltage level that determines when the rear alert should be active.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

The TEM_Tail_Gate_Alarm_Timeout parameter determines the length of time that the audible alarm will beep continuously after the gate is opened and the park brake is released. If this parameter is set to 0, the audible alarm will beep continuously as long as the gate open indicator is illuminated. Once the audible alarm has stopped continuous beeping (as set by the TEM_Tail_Gate_Alarm_Timeout parameter) and the gate open indicator remains illuminated, the TEM_Tail_Gate_Alarm_Period parameter determines the length of time between individual beeps of the audible alarm.

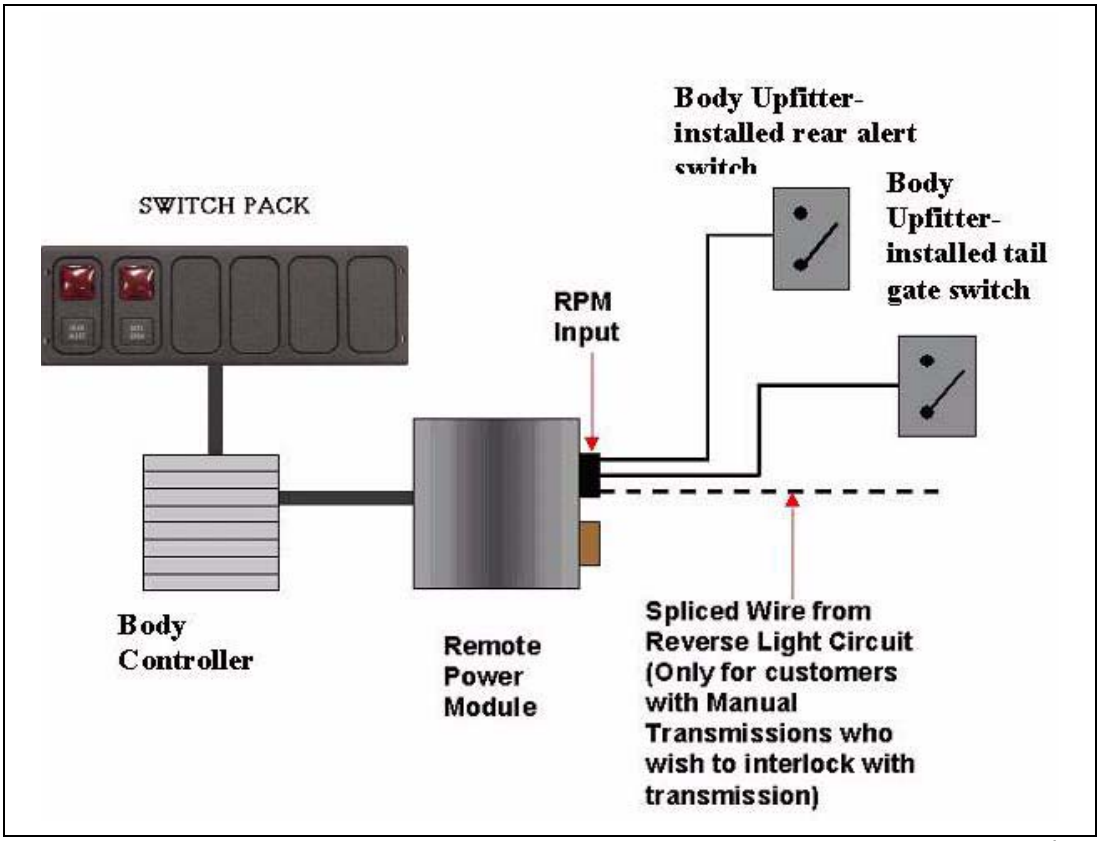
Table 113

Off – Indicates a 0 is set in for this parameter							
On – Indicates a 1 is set for the parameter							
Parameter	**ID**	**Description**	**Default**	**Units**	**Min**	**Max**	**Step**
TEM_Tail_ Gate_Input_ Active_State	2160	This parameter is used to set the voltage level that indicates when the tail gate alert should be active.	3	List	0	3	
TEM_Tail_ Gate_Park_ Brake_Inhibit	2165	When set, the tailgate alert will only alert if the park brake is not set.	Off	On/Off			
TEM_Tail_ Gate_ Transmission_ Interlock	2167	This parameter is used to determine how the tailgate alert acts based upon the transmission.	0	List			
TEM_Rear_ Alert_Input_ Active_State	2168	This parameter is used to set the voltage level that indicates when the rear alert should be active.	3	List	0	3	
TEM_Tail_ Gate_Alarm_ Period	2172	Once the audible alarm has stopped continuous beeping and the gate open indicator remains illuminated, this parameter determines the length of time between individual beeps of the audible alarm.	20	s	10	60	1
TEM_Tail_ Gate_Alarm_ Timeout	2175	This parameter determines the length of time that the audible alarm will beep continuously. If this parameter is set to 0, the audible alarm will beep continuously as long as the gate open indicator is illuminated.	10	s	10	60	1

WIRING INFORMATION

**If the truck has a manual transmission, to interlock indicator lights and alarm with the transmission, splice a wire off of the reverse light circuit and run that wire into a pin on the black 23-pin RPM input connector (see the Diamond Logic® Builder software for correct pin and switch locations). This wire will indicate to the Body Controller (BC) that the truck is in reverse. This is only required if the customer wishes to interlock the functionality of the indicator lights and audible alarm with reverse (and they have a manual transmission).

- The customer must run a wire from the tailgate switch to the pin labeled Tail_Gate_Open_Input on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for correct pin locations).
- The customer must run a wire from the rear alert switch to the pin labeled Rear_Alert_Switch_Input on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for correct pin locations).



f_115

TESTING

1. Set park brake.
2. Open the tailgate.
3. Verify that the input labeled Tail_Gate_Open_Input is receiving the correct voltage (as programmed in the Diamond Logic® Builder software).
4. Verify that the red “Gate Open” indicator light in the switch pack comes on.
5. Release park brake.
6. Verify that indicator light flashes and audible alarm sounds and works according to the set programmable parameters seen above.
7. Close tail gate.
8. Reset park brake.
9. Activate Rear Alert switch.
10. Verify that the input labeled Rear_Alert_Switch_Input is receiving the correct voltage (as programmed in the Diamond Logic® Builder software).
11. Verify that the red “Rear Alert” indicator light in the switch pack comes on and an audible alarm sounds.

How To Add This Feature

For an Automatic Transmission

- Requires Warning Assy. 3587024C1 and LED 3587031C1 be added to the switch pack if this feature is added aftermarket
- Software feature codes 595AKP and 595AMD must be enabled using the Diamond Logic® Builder software (see local dealer). NOTE: these features can be added individually in the field.
- Set programmable parameters for software feature codes using the Diamond Logic® Builder software (See Local Dealer).
- Install the wiring from tailgate switch into a pin on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for pin locations).
- Install the wiring from rear alert switch into a pin on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for pin locations).
- Customer must install indicator light labels in switch pack (indicator graphics or suitable substitutes can be used from the graphics sheets that come with the RPM kit).

For a Manual Transmission

- Requires Warning Assy. 3587024C1 and LED 3587031C1 be added to the switch pack if this feature is added aftermarket.
- Software feature codes 595AKP and 595AMC must be enabled using the Diamond Logic® Builder software (see local dealer).
- Set programmable parameters for software feature codes using the Diamond Logic® Builder software (See Local Dealer).
- Install the wiring from tailgate switch into a pin on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for pin locations).
- Install the wiring from rear alert switch into a pin on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for pin locations).
- Splice a wire into the backup light circuit and run that wire into a pin on the black 23-pin input connector on the RPM (See the Diamond Logic® Builder software for pin locations).
- Customer must install indicator light labels in switch pack (indicator graphics or suitable substitutes can be used from the graphics sheets that come with the RPM kit).

BODY INTEGRATED, INDICATOR LIGHTS (UTILITY SOLUTIONS)

60AJD

BDY INTG, INDICATOR LIGHTS (2) One for Boom Out of Stow, One for Outriggers Deployed, Includes Audible Alarm and Interlock to Parking Brake, Programmable Mode for Various Switch Actions (requires 2 RPM inputs)

This feature provides a custom alarm package designed for the Utility Application. It provides both an audible and visual alarm for Boom Out Of Stow and Outriggers Not Stowed. Red indicator lights are in viewing area of the driver in the switch pack. Audible alarm provides a second level of warning to the driver to indicate the status of these two equipment options. Indicator lights are ON constant when either the boom or outrigger inputs are active with the park brake set. If the park brake is released, with either input active, the respective indicator shall flash at 0.6-second intervals, accompanied by an audible alarm.

Switch Pack Display of “Outrig Out” and “Boom Up” f_116

PROGRAMMABLE PARAMETERS

Required software feature codes: 595AKR, 595AKS

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

If the TEM_Boom_Not_Stowed_Alarm_Inhibit parameter is turned on, the audible alarm for the boom-not-stowed will be disabled.

If the TEM_Outrig_Deploy_Alarm_Inhibit parameter is turned on, the audible alarm for the outriggers deployed warning light will be disabled.

The TEM_Consol_Boom_Not_Stow_Param parameter sets the active state of the Remote Power Module Input connected to the Boom switch. This active state indicates when the Boom is out of stow.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

The TEM_Consol_Outrig_Deployed_Param parameter sets the active state of the RPM input connected to the outrigger switch. This active state indicates when the outriggers are down.

0 = Input active when open circuit

1 = Input active when grounded

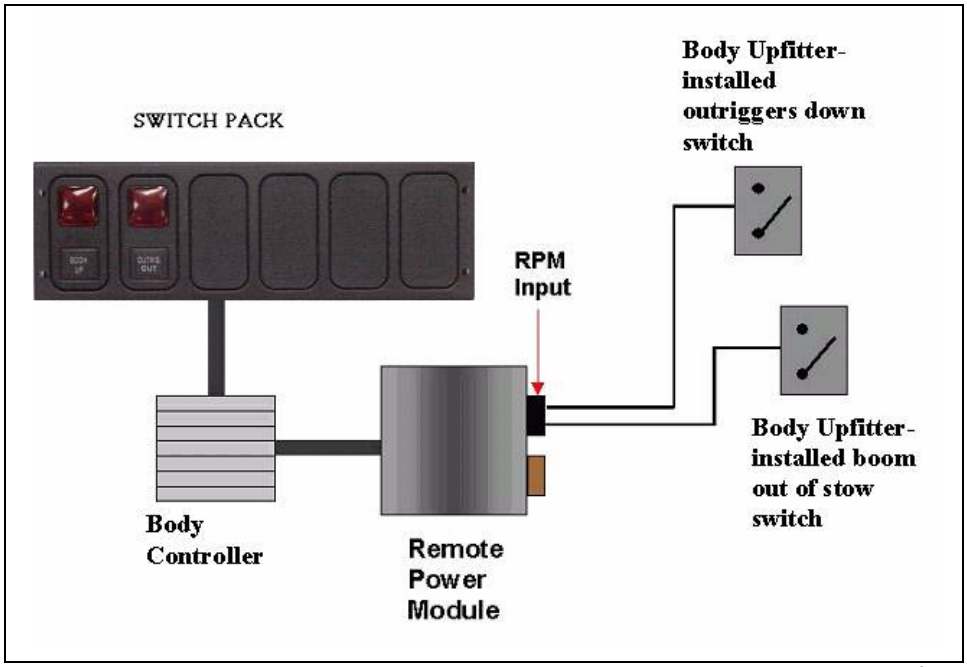
3 = Input active when at 12V

Table 114

Off – Indicates a 0 is set in for this parameter							
On – Indicates a 1 is set for the parameter							
Parameter	**ID**	**Description**	**Default**	**Units**	**Min**	**Max**	**Step**
TEM_Boom_ Not_Stowed_ Alarm_Inhibit	2061	If this parameter is set, the audible alarm for the boom-not- stowed warning light will be inhibited.	Off	On/Off			
TEM_Outrig_ Deploy_Alarm_ Inhibit	2074	If this parameter is set, the audible alarm for the outriggers deployed warning light will be inhibited.	Off	On/Off			
TEM_ Consol_ Boom_Not_ Stow_Param	2150	Active state for the RPM input connected to the boom switch(es)	1	List	0	3	
TEM_Consol_ Outrig_ Deployed_ Param	2151	Active state on the RPM input for the outriggers deployed warning light.	1	List	0	3	

WIRING INFORMATION

- The customer must run a wire from the customer-mounted “Outriggers out of Stow” switch to the pin labeled Outrig_Not_Stow_Input on the black 23-pin input connector on the RPM (see the Diamond Logic® Builder software for correct pin locations).
- The customer must run a wire from the customer-mounted “Boom out of Stow” switch to the pin labeled Boom_Not_Stow_Input on the black 23-pin input connector on the RPM (see the Diamond Logic® Builder software for correct pin locations).



f_117

TESTING

1. Set the park brake.
2. Take boom out of stow.
3. Verify that the RPM input labeled Boom_Not_Stow_Input is receiving the correct active state voltage (as programmed in the Diamond Logic® Builder software).
4. Verify that the boom up indicator light is on constantly.
5. Take off the parking brake (with boom still out of stow).
6. Verify that the boom up indicator light is now flashing and the audible alarm is sounding.
7. Set park brake and put boom back in stow.
8. Put outriggers down.
9. Verify that the RPM input labeled Outrig_Not_Stow_Input is receiving the correct active state voltage (as programmed or the Diamond Logic® Builder software).
10. Verify that the outrig out indicator light is on constantly.
11. Take off the parking brake (with outriggers still down).
12. Verify that the outrig out indicator light is now flashing and the audible alarm is sounding.

HOW TO ADD THIS FEATURE

- Requires Warning Assy. 3587024C1 and LED 3587031C1 be added to the instrument cluster if this feature is added aftermarket.
- Software feature codes 595AKR and 595AKS must be enabled using the Diamond Logic® Builder software (see local dealer). NOTE: these features can be added individually in the field.
- Set the programmable parameters for the required software feature codes using the Diamond Logic® Builder software (see local dealer).
- Customer must install wiring from the customer-mounted boom switch into a pin on the black 23-pin RPM input connector (see the Diamond Logic® Builder software for correct pin locations).

- Customer must install wiring from the customer-mounted outriggers switch into a pin on the black 23-pin RPM input connector (see the Diamond Logic® Builder software for correct pin locations).
- Customer must install indicator light labels (indicator graphics or suitable substitutes can be used from the graphics sheets that come with the RPM kit).

DUMP BOX INDICATOR LIGHTS AND ALARM

60AJK

INDICATOR LIGHTS (2), One for Body Up, One for Gate Open, Includes Audible Alarm, Programmable Mode for Various Switch Actions (Requires 2 RPM Inputs).

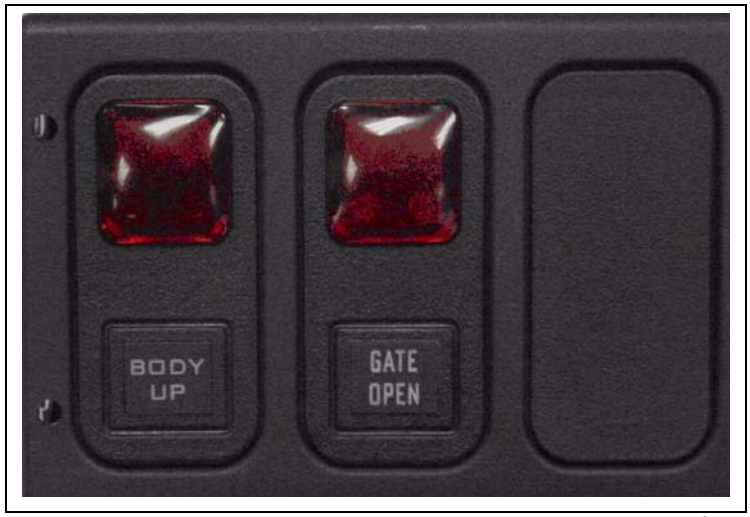
This feature provides the operator of Dump Box Applications with visual and audible warning indications for a raised dump box body and open dump gate using Body Builder-installed switches. The visual indications that are provided for this feature are a “Body Up” light and a “Gate Open” light. Red indicator lights are located in prime viewing area of the driver in the switch pack. Audible alarm provides a second level of warning to the driver to indicate the status of these two equipment options.

The “Gate Open” indicator light is on constant when the gate open input is active with the park brake set. If the park brake is released, with the gate open input active, the gate open indicator shall flash at 0.6 second intervals, accompanied by an audible alarm. Flexibility is provided through programmable parameters to establish whether the inputs are active high (12V) or active low (GND). See the Diamond Logic® Builder software to set programmable parameters.

For both the “BODY UP” and “GATE OPEN” indications, the associated light will illuminate continuously and the associated audible alarm (default off) will sound when the corresponding input has entered an active state on the condition that the park brake is set and the vehicle speed is less than or equal to 10 MPH.

For both the “BODY UP” and “GATE OPEN” indications, the associated light will illuminate in a slow flashing manner and the associated audible alarm (default of five fast beeps) will sound when the corresponding input is in an active state and either the park brake has been released or the vehicle speed has exceeded 10 MPH.

Both the “BODY UP” and “GATE OPEN” lights will be off when the RPM input is inactive.



f_118

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature codes: 595AKT and 595AKU

Software feature codes that must be removed: NONE

The TEM_Body_Up_Input_Active_State parameter indicates the state that the BC will read as active for the customer-installed switch for the dump body up function (as it goes into the RPM input). This active state will be used to tell the BC when the dump body has been raised up.

The TEM_Tail_Gate_Input_Active_State parameter indicates the state that the BC will read as active for the customer-installed switch for the dump gate open function (as it goes into the RPM input). This active state will be used to tell the BC when the dump body has been raised opened.

The TEM_Body_Up_Alarm_Beeper parameter allows the customer to set the alarm type for the condition when the dump body has been raised (active) and either the park brake has been released or the vehicle speed has exceeded 10 MPH. The default alarm type is five fast beeps.

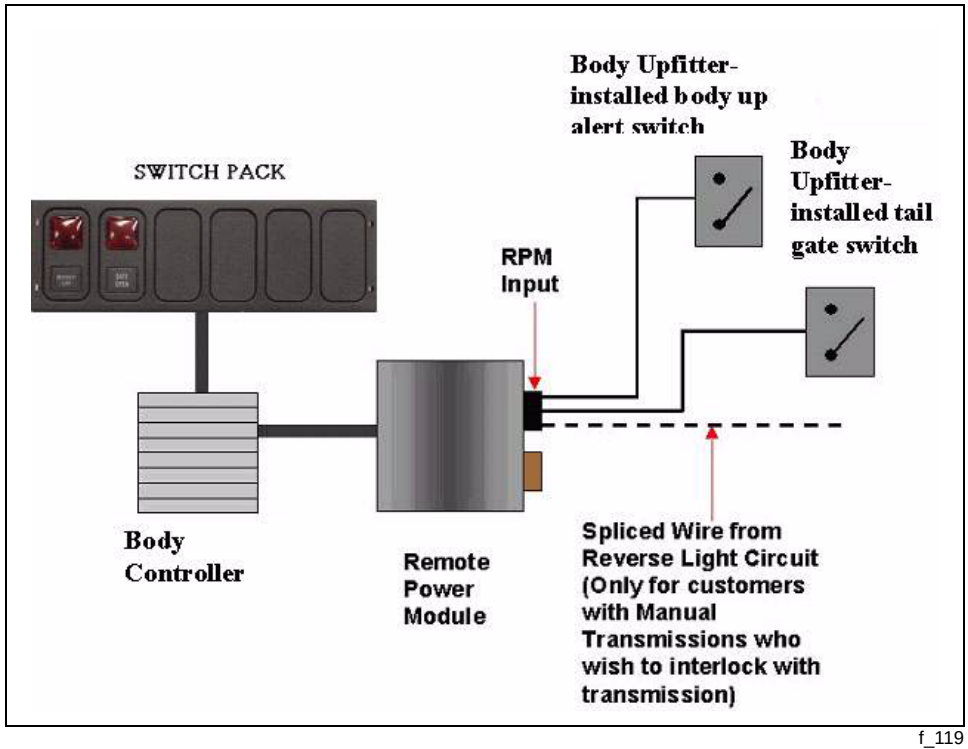
The TEM_Gate_Alarm_Beeper parameter allows the customer to set the alarm type for the condition when the dump gate has been opened (active) and either the park brake has been released or the vehicle speed has exceeded 10 MPH. The default alarm type is five fast beeps.

The TEM_Body_Up_Beeper parameter allows the customer to set the alarm type for the condition when the dump body has been raised (active) and both the park brake is set and the vehicle speed is equal to or less than 10 MPH. The default alarm type is off.

The TEM_Gate_Open_Beeper parameter allows the customer to set the alarm type for the condition when the dump gate has been opened (active) and both the park brake is set and the vehicle speed is equal to or less than 10 MPH. The default alarm type is off.

Table 115

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Body_ Up_Alarm_ Beeper	2259	Allows the selection of one of four beeper cadences 0 = Off, 1 = 5 fast beeps, 2 = 3 slow beeps, 3 = continuous beeps	1	List	0	3	1
TEM_Body_ Up_Beeper	2260207 4	Allows the selection of one of four beeper cadences 0 = Off, 1 = 5 fast beeps, 2 = 3 slow beeps, 3 = continuous beeps	0	List	0	3	1
TEM_Body_ Up_Input_ Active_ State	2261	This parameter selects the active state of the BODY UP RPM input. 0 = Open, 1 = GND, 3 = 12 volts	3	List	0	3	1
TEM_Gate_ Alarm_ Beeper	2262	Allows selection of one of four beeper cadences 0 = Off, 1 = 5 fast beeps, 2 = 3 slow beeps, 3 = continuous beeps	1	List	0	3	1
TEM_Gate_ Open_ Beeper	2263	Allows the selection of one of four beeper cadences 0 = Off, 1 = 5 fast beeps, 2 = 3 slow beeps, 3 = continuous beeps	0	List	0	3	1
TEM_Tail_ Gate_Input_ Active_State	2160	This parameter is used to set the voltage level that indicates when the tailgate alert should be active. 0 = Open, 1 = GND, 3 = 12V	3	List	0	3	1



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WIRING INFORMATION

The customer must run a wire from the customer-mounted “Gate Open” switch to the pin labeled Tail_Gate_Open_Input on the black 23-pin input connector on the RPM (see the Diamond Logic® Builder software for correct pin locations).

The customer must run a wire from the customer-mounted “Body Up” switch to the pin labeled TEM_Body_Up_Signal on the black 23-pin input connector on the RPM (see the Diamond Logic® Builder software for correct pin locations).

TESTING

1. Set park brake.
2. Open the tailgate.
3. Verify that the input labeled TEM_Tail_Gate_Input_Active_State input is receiving the correct voltage (as programmed in the Diamond Logic® Builder software).
4. Verify that the Red “Gate Open” indicator light in the switch pack comes on.
5. Release park brake.
6. Verify that indicator light flashes and audible alarm sounds and works according to the set programmable parameters seen above.
7. Close tailgate.
8. Reset park brake.
9. Raise the body.
10. Verify that the input labeled TEM_Body_Up_Input_Active_State is receiving the correct voltage (as programmed in the Diamond Logic® Builder software).
11. Verify that the red “Body Up” indicator light in the switch pack comes on, and an audible alarm sounds.
12. Reset park brake.

How To Add This Feature

- Requires Warning Assy. 3587024C1 and LED 3587031C1 be added to the instrument cluster if this feature is added aftermarket.
- Software feature codes 595AKT and 595AKU must be enabled using Diamond Logic® Builder software (See Local Dealer). NOTE: these features can be added individually in the field.
- Set programmable parameters for software feature codes using the Diamond Logic® Builder software (See Local Dealer).
- Customer must install wiring from the customer-mounted body switch into a pin on the black 23-pin RPM input connector (see the Diamond Logic® Builder software for correct pin locations).
- Customer must install wiring from the customer-mounted tailgate switch into a pin on the black 23-pin RPM input connector (see the Diamond Logic® Builder software for correct pin locations).
- Customer must install indicator light labels (indicator graphics or suitable substitutes can be used from the graphics sheets that come with the RPM kit).

DASH INDICATOR LIGHTS

60AJR

BDY INTG, DASH INDICATOR LIGHT, Red (1)

60AJS

BDY INTG, DASH INDICATOR LIGHT, Red (2)

60AJT

BDY INTG, DASH INDICATOR LIGHT, Red (3)

60AJU

BDY INTG, DASH INDICATOR LIGHT, Red (6)

60AJZ

BDY INTG, DASH INDICATOR LIGHT, Yellow (1)

60AKA

BDY INTG, DASH INDICATOR LIGHT, Yellow (2)

60AKB

BDY INTG, DASH INDICATOR LIGHT, Yellow (3)

60AKC

BDY INTG, DASH INDICATOR LIGHT, Yellow (6)

60AJV

BDY INTG, DASH INDICATOR LIGHT, Green (1)

60AJW

BDY INTG, DASH INDICATOR LIGHT, Green (2)

60AJX

BDY INTG, DASH INDICATOR LIGHT, Green (3)

60AJY

BDY INTG, DASH INDICATOR LIGHT, Green (6)

These features give the ability to order the indicator lights and associated LED's for body integration out of the factory. A total of eighteen indicators may be ordered in any combination with the exception that only one code may be ordered for each color. (For example, only one code from 60AJR, 60AJS, 60AJT, or 60AJU may be ordered to get 1, 2, 3 or 6 red lights). These indicators are installed in the Diamond Logic® switchpacks. They are not associated with any input or electrical function and must be used with Advanced Logic.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature codes:

Sales code 60AJR – 595BHL

Sales code 60AJS – 595BHM

Sales code 60AJT – 595BHN

Sales code 60AJU – 595BHP

Sales code 60AJZ – 595BHR

Sales code 60AKA – 595BHS

Sales code 60AKB – 595BHT

Sales code 60AKC – 595BHU

Sales code 60AJV – 595BHV

Sales code 60AJW – 595BHW

Sales code 60AJX – 595BHX

Sales code 60AJY – 595BHY

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

PROGRAMMABLE PARAMETERS REQUIRED

None

Indicator Light Included f_120

Location: Center Multiplex Switch Panel in Dash

TESTING

1. Create Advanced Logic in Diamond Logic® Builder to turn each light ON using RPM inputs for each light to be tested.
2. Use indicator lights as outputs
3. Apply template to vehicle
4. Program the vehicle with the template created
5. Turn on RPM inputs as needed and check indicator lights

HOW TO ADD THIS FEATURE

- Software feature codes must be enabled using Diamond Logic® Builder software (See Local Dealer). NOTE: these features can be added individually in the field.
- Customer must install indicator light labels (indicator graphics or suitable substitutes can be used from the graphics sheets that come with the RPM kit).

BODY BUILDER INTEGRATION HARNESS

BODY INTEGRATION, I/O EXPANSION HARNESS

60ABM

BDY INTG, RPM I/O HARNESS, Includes a Harness with 6 Input Blunt Cut wires and 6 Output Blunt Cut Wires, for use with one RPM.

60ABN

BDY INTG, RPM I/O HARNESS, Includes 2 Harnesses with 6 Input Blunt Cut wires and 6 Output Blunt Cut Wires, for use with two RPMs.

These features provide the I/O RPM connectors, terminals and blunt cut wires for TEMs which significantly reduces labor installation and material content previously available with just the connector. The included wires are approximately 3 feet long and ease connecting the RPM to vehicle wiring.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

For wiring information for this feature, see Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Aux Inputs and Drivers.

TESTING

Use Diamond Logic® Builder software to program and test drivers and inputs.

BODY INTEGRATION, I/O EXPANSION HARNESS

60ACW

BODY INTG, I/O EXPANSION HARNESS (for Diamond Logic® Builder only) includes a harness with five blunt-cut wires routed on lower left of IP. Two GND active inputs and two (0.5 AMP) relay driver outputs (GND active) are provided.

This feature is an input/output expansion feature for Diamond Logic® Builder to be utilized by Body Builders. This expansion feature provides the following: (2) digital inputs, (2) 0.5 AMP relay driver outputs, (1) ZVR on the BC as well as an expansion overlay harness that is part of the IP harness. The expansion overlay harness grants access to these inputs, outputs, and ZVR by providing blunt-cut wires that are strapped to the main IP harness trunk near the J1939 diagnostic connector on the interior of the cab. The overlay harness was designed to be long enough to allow the wires to be inserted into the 72-way pass thru connector if desired. Additionally, there are two (0.5 AMP) relay driver outputs not included in the overlay harness which are available only through the advanced logic capabilities of Diamond Logic® Builder.

When this feature is added to the vehicle, the BC pins will not show up on the connector view of DLB until they are written to with Advanced Logic. 595AKH must be turned on and the inputs/outputs must be used in Advanced Logic to show up on the connector view of DLB. The following pins are NOT assigned with 595AKH Diamond Logic® must be used to assign these pins.

Description Of Each Digital Input

- GND active inputs,

Digital input 1: pin F14 of BC connector #1602

Digital input 2: pin F12 of BC connector #1602

Refer to #1602 connector pinout for pinout description.

Description Of Each Relay Driver Output

- 0.5 AMP relay driver output (Active Low),

Relay driver output 1: pin E1 of the BC connector #1601

Relay driver output 2: pin E2 of the BC connector #1601

Relay driver output 3: pin E3 of the BC connector #1601

Relay driver output 4: pin E4 of the BC connector #1601

Refer to Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Aux Inputs and Drivers.

Description of ZVR

- Allows for the return of DC current from an external sensor or switch.

CAUTION: CAUTION – Do not connect any additional electrical loads to ZVR. Adding non-approved electrical loads may adversely affect total electrical operation.

Software Feature Codes/Programmable Parameters

Software Feature Codes That Must Be Added

595AKH

Software Feature Codes That Must Be Removed

None

There are no customer or Body Builder programmable features associated with this feature.

Wiring Information

For wiring information for this feature, see Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Aux Inputs and Drivers.

Testing

Use Diamond Logic® Builder software to program and test drivers and inputs.

How To Add This Feature

Add the feature code 595AKH with Diamond Logic® Builder. Create advanced logic using the GND active inputs and/or the 0.5 AMP relay driver outputs (Active Low). View the connectors tab in Diamond Logic® Builder to verify the pin assignments and connect to these circuits.

BODY BUILDER WIRING

08HAT

BODY BUILDER WIRING Includes Wires Installed through the Dash Panel and End in Engine Compartment, In Cab Wire Ends Will Have ESC Input Terminals, Engine Compartment Wire Ends will have Sealed Connectors.

Feature code 08HAT provides 8 wires from the cab through the 76 way pass-through connector located on the left (driver's) side of the dash extending 685 mm into the engine compartment for ease of connecting accessory equipment in the engine compartment to the ESC. This feature provides these circuits from the ESC without compromising the cab seal or having to drill additional holes in the cab. The wires are terminated in a sealed connector in the engine compartment and the other ends have ESC input pin termination inside the cab compartment. This will significantly reduce labor and material costs for the bodybuilder.

Software Feature Codes/Programmable Parameters

None

BODY BUILDER INTEGRATION HARNESS

WIRING INFORMATION

A 76-pin connector is provided inside the cab compartment. The pins in the following table will be used to connect the 8 auxiliary wires.

Table 116

Pin Number	Circuit Number	Gauge	Color
52	RBTEM1	16	Gray
53	RBTEM2	16	Gray
54	RBTEM3	16	Gray
55	RBTEM4	16	Gray
56	RBTEM5	16	Gray
57	RBTEM6	16	Gray
58	RBTEM7	16	Gray
59	RBTEM8	16	Gray

Terminals for the 76-Way Connector are part no. 3549418C1.

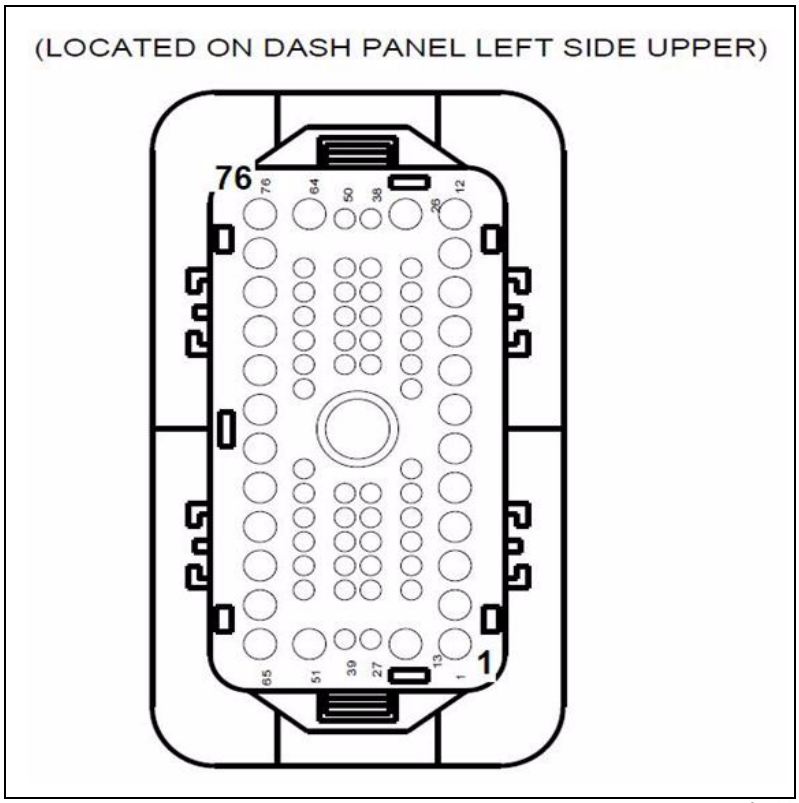

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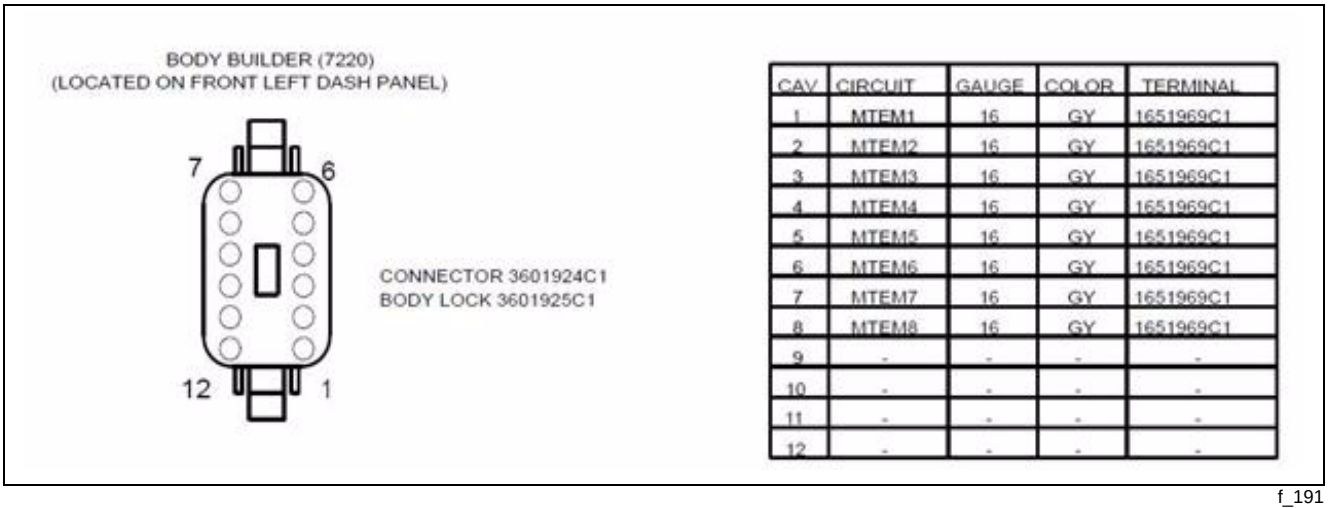
Table 117 – 12-Way Output Connector

Connector Part No.	3601924C1	1689499C1
Description	Connector, Body, 12–Way 16 Socket Deutsch	Connector, Body, 12-Way 16 Pin Deutsch
Terminal Part	1651969R1 – 16 Gauge	N/A
Connector Lock Part	3601925C1	N/A



CAV	CIRCUIT	GAUGE	COLOR	TERMINAL
1	MTEM1	16	GY	1651969C1
2	MTEM2	16	GY	1651969C1
3	MTEM3	16	GY	1651969C1
4	MTEM4	16	GY	1651969C1
5	MTEM5	16	GY	1651969C1
6	MTEM6	16	GY	1651969C1
7	MTEM7	16	GY	1651969C1
8	MTEM8	16	GY	1651969C1
9	-	-	-	-
10	-	-	-	-
11	-	-	-	-
12	-	-	-	-

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JUNCTION BLOCK STUD

08WZG

JUNCTION BLOCK Stud, 100 Amp Battery Feed, protected by a Fusable Link, Stud to be used for Body Builder Feeds Inside Cab.

This feature is a battery feed point provided inside the cab. The connection will provide up to 100 amps for body builder use. The circuit feeds off of the mega fuse on the left side of the dash panel and is protected by a fusible link connection. A 3/8” stud is provided on the left side of the instrument panel behind the gauge cluster.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

None

(PTO) POWER TAKE OFF

PTO ACCOMMODATION CABLE SHIFT

60ABA

BDY INTG, PTO ACCOMMODATION for Monitoring Cable Shift Engaged PTO, With Indicator Light and Audible Alarm in Gauge Cluster (requires one Remote Power Module (RPM) input)

This feature utilizes a customer-mounted PTO feedback switch wired to a RPM input to drive an indicator light in the gauge cluster that allows the operator to determine that the PTO is engaged. An audible alarm is used to warn the operator when the PTO is engaged during unsafe vehicle operating conditions such as when the park brake is released or the engine speed is too high. Operating limits are established through programmable parameters that are set in the Body Controller (BC). The RPM input also drives a PTO hourmeter to allow the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the PTO hourmeter, press the gauge cluster display selector button momentarily until the text portion of the display indicates “PTO Hour.”

A Cable-Shifted PTO is a gear-to-gear engagement type mechanism. Very specific transmission operating modes are required to allow safe engagement of a Cable-Shifted PTO. In essence, the PTO gear in the transmission must be stopped before engagement of a Cable-Shifted PTO should be attempted. The clutch must be depressed with the vehicle parked in order to engage the PTO for a manual transmission. An automatic transmission must be in any driving gear with vehicle parked in order to engage a Cable-Shifted PTO.

For Hybrid Electric Vehicles only, there is an additional feature code (595BBA) which must be added to make this type of PTO operable in an Eaton hybrid system.

The PTO alarms are controlled by programmable parameters set in the BC. Factory default settings for these programmable parameters are listed in the tables below.

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software. Body Builders must set programmable parameters that are appropriate for their PTO application.

Required Software Feature Codes

595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595BBA (Hybrid Electric Vehicles only)

Conflicts With Software Features

595AJZ, 595AJV, 595AJW, 595AJX, 595AJY, 595AMZ, 595BAM

Alarms

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms is turned on, then an alarm will sound if the PTO is engaged while the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms is turned on, then an alarm will sound if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit

If TEM_PTO_Non_Neut_Alarms is turned on, then an audible alarm will sound if the PTO is engaged and the transmission is taken out of neutral

If TEM_PTO_Pk_Brake_Alarms is turned on, then an audible alarm will sound if the PTO is engaged and the park brake is released

If TEM_PTO_Veh_Spd_Alarms is turned on, then an audible alarm will sound if the PTO is engaged and the vehicle speed is over the value set by TEM_PTO_Veh_Spd_Alarm_Limit

Table 117 PTO Alarms

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_Air_ Pres_Alarms	2138	If this parameter is 1, an alarm will sound if the PTO is engaged and the air pressure is below TEM_PTO_Air_Pres_Alarm_Limit	Off	NA	NA	NA
TEM_PTO_Air_ Pres_Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off	Off	NA	NA	NA
TEM_PTO_ Eng_Spd_ Alarm_Limit	2136	See TEM_PTO_Eng_ Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	On	NA	NA	NA
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	NA	NA	NA
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	NA	NA	NA
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	On	NA	NA	NA
TEM_PTO_ Veh_Spd_ Alarm_Limit	2134	See TEM_PTO_Veh_ Spd_Alarms	5 MPH	3	100	1

OTHER PARAMETERS

The TEM_RPM_PTO_Engaged_Param parameter indicates the active state that the Body Controller (BC) will read as active for the TEM PTO feedback switch. This active state will be used to indicate when the PTO is engaged.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

Table 118

Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_Air_ Pres_Alarms	2147	Active State for the TEM PTO engagement feedback switch.	1	List	List	List

WIRING INFORMATION

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs.

- The wiring to the RPM input is customer supplied.
- A wire must be connected from the Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the black 23-pin RPM input connector (J3).

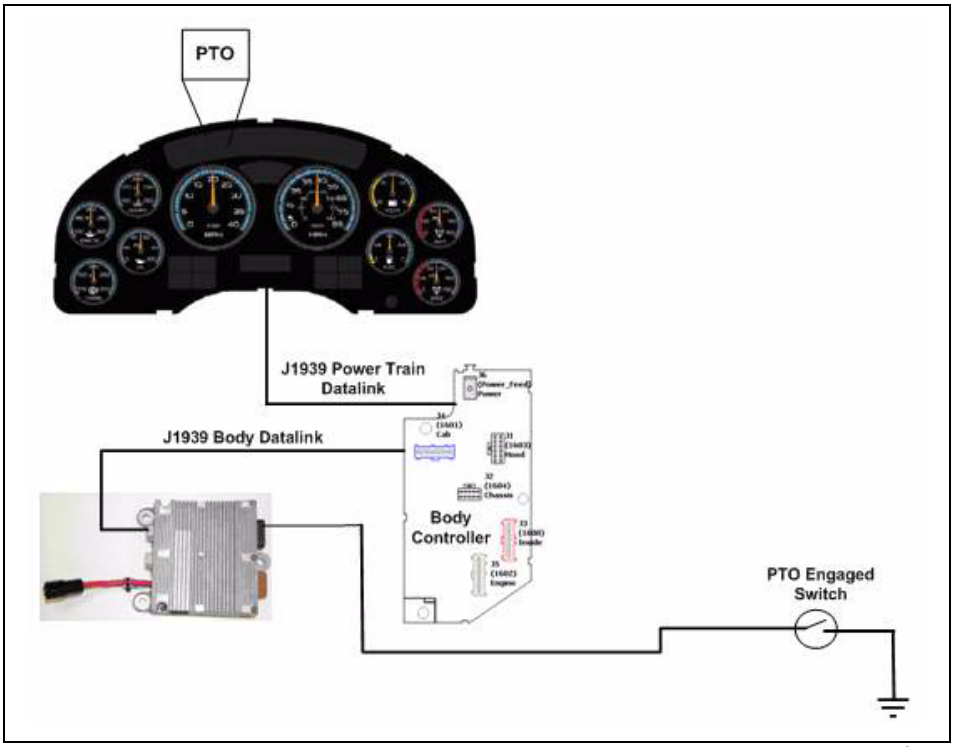


Diagram of Cable Shift PTO System f_121

RPM Connector Information

HPV Wire Terminal Kits are REQUIRED to allow Body Builders to create wire harnesses for the RPM connectors.

HPV terminal kits are pre-made kits that include six power output terminals and seals for the brown 8-way connector and six terminals for the black 23-way connector.

Table 114

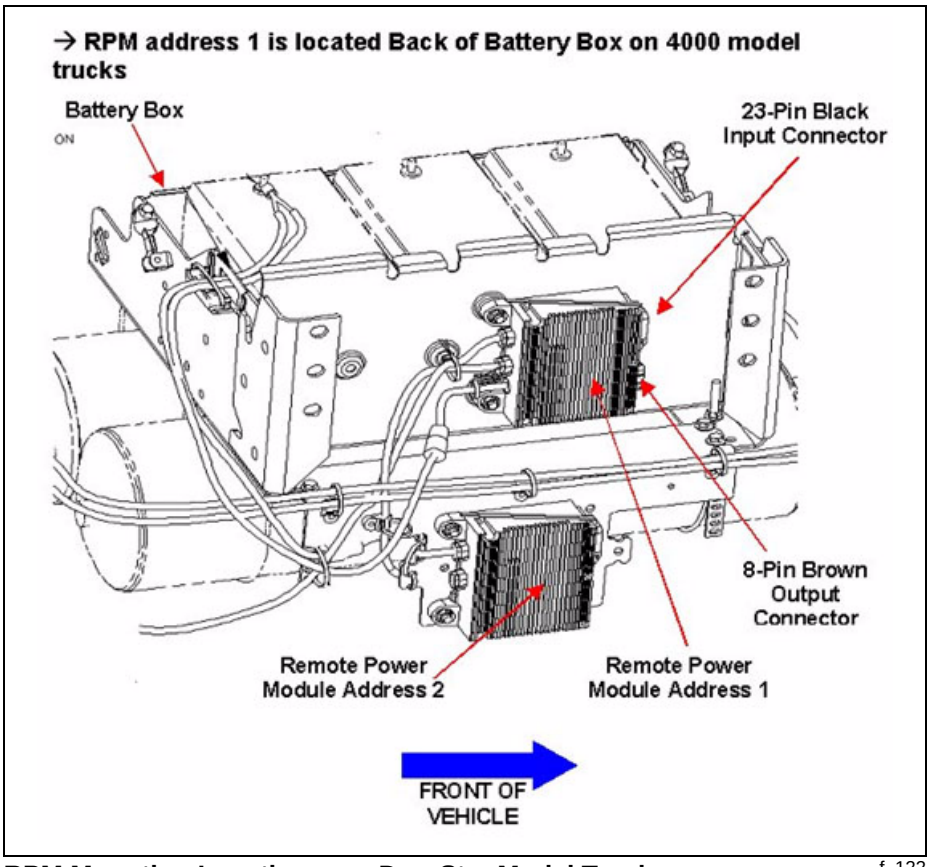
HPV Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C9

NOTE: The following connectors are optional because they are already provided with the RPMs.

This information is given so that the Body Builder could purchase connectors in the event that the original connectors were damaged or lost, or so that the Body Builder can pre-fabricate a wire harness.

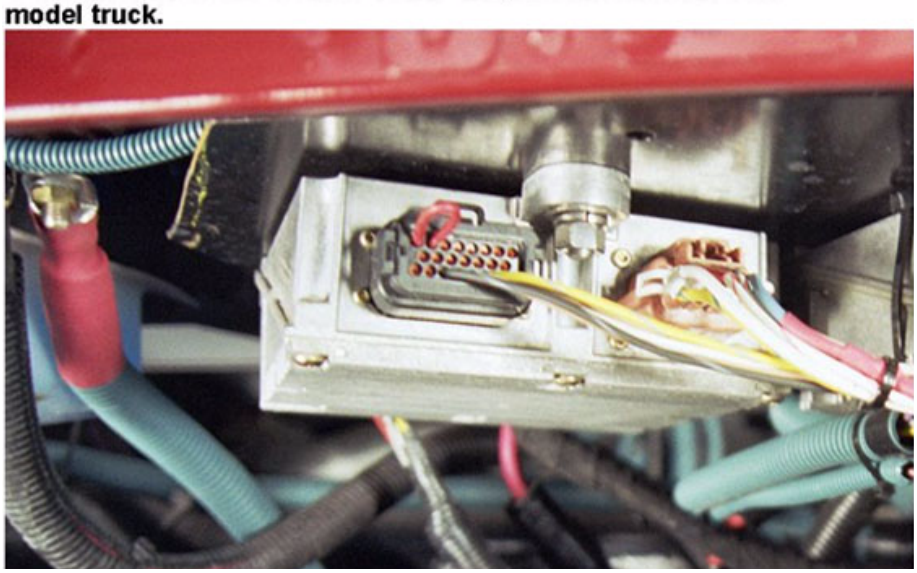
Table 115 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Built into the connector



RPM Mounting Location on a DuraStar Model Truck f_122

→ RPM address 1 is located Under Cab, driver's side on 7000 model truck.



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RPM Mounting Location on a WorkStar Model Truck

TESTING

Verify that the RPM input labeled PTO_Feedback_Switch (pin position specified by the Diamond Logic® Builder software) is receiving the correct voltage (12V or Ground (GND)) as specified by the programmable parameter 2147 in the Diamond Logic® Builder software.

Make certain that the PTO indicator light in the gauge cluster illuminates by engaging the PTO.

The audible alarm can be tested by activating a vehicle condition that will sound the alarm based upon the settings of the programmable parameters. For example, if the park brake interlock is programmed on, release the park brake and engage the PTO. The audible alarms should sound with continuous beeps.

HOW TO ADD THIS FEATURE

- Software feature codes 595AJT (595BJS or 595BJT on vehicles with 2010 compliant engines) and 595AJU must be enabled on the vehicle using the Diamond Logic® Builder software (see Local Dealer)
- Use the Diamond Logic® Builder software to make sure that software feature codes 595ACZ, 595AJV, 595AJW, 595AJX, 595AJY, and 595AMZ are NOT enabled on the vehicle (see local dealer).
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see Local Dealer)
- Connect a wire from a Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the black 23-pin connector on the RPM as defined by the Diamond Logic® Builder software program for this particular vehicle.
- Perform the PTO testing procedure that is listed above.

PTO ACCOMMODATION MUNCIE® POWERFLEX* LECTRA-SHIFT

Refer to the circuit diagram manual for PTO Accommodation for Lectra-Shift.

60ABB

BDY INTG, PTO ACCOMMODATION for Muncie Lectra-Shift PTO Engagement and Disengagement, With Switch Mounted on Dash; Includes Indicator Light and Audible Alarm in Gauge Cluster (requires one RPM input and one output)

This feature provides a center stable, momentary rocker switch in a cab switch pack that drives a RPM output and a 40 Ampere (AMP) relay that are used to engage and disengage the Muncie® Lectra-Shift PTO. The high current relay output is engaged momentarily to shift in the PTO gear mechanism. Once engaged, the RPM output is activated to keep the PTO gear in the engaged position. This feature utilizes a customer-mounted PTO feedback switch wired to a RPM input to drive an indicator light in the gauge cluster that allows the operator to determine that the PTO is engaged. An audible alarm is used to warn the operator when the PTO is engaged during unsafe vehicle operating conditions such as when the park brake is released or the engine speed is too high. Operating limits are established through programmable parameters that are set in the BCM. The RPM input also drives a PTO hourmeter to allow the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the PTO hourmeter, press the gauge cluster display selector button momentarily until the text portion of the display indicates “PTO Hour.”

The Lectra-Shift is a gear-to-gear engagement PTO mechanism. Very specific transmission operating modes are required to allow safe engagement of a Lectra-Shift PTO. In essence, the PTO gear in the transmission must be stopped before engagement of the Lectra-Shift PTO should be attempted. The clutch must be depressed with the vehicle parked in order to engage the Lectra-Shift PTO for a manual transmission. An automatic transmission must be in any driving gear with vehicle parked in order to engage the Lectra-Shift PTO. Engagement, disengagement and re-engagement parameters should be set according to the type of transmission on which the Lectra-Shift is mounted.

For Hybrid Electric Vehicles only, there is an additional feature code (595BBA) which must be added to make this type of PTO operable in an Eaton hybrid system.

The PTO alarms are controlled by programmable parameters set in the BC. Factory default settings for these programmable parameters are listed in the tables below.

Through programmable parameters, the vehicle can be programmed to customize the number of times that an operator can request a PTO engagement per key cycle. The customer can also customize the maximum time allowed to engage the solenoid per attempt, and the length of time between a failed engagement attempt and the next time the operator can attempt to engage the PTO.

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Required software feature codes: 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJV, 595AJZ, 595BBA (Hybrid Electric Vehicles only)

Software feature codes that must be removed: 595AJW, 595AJX, 595AJY, 595AMZ, 595BAM

ENGAGEMENT

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the Park Brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the Vehicle Speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 121

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	NA	NA	NA
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	NA	NA	NA
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	NA	NA	NA
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	NA	NA	NA
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	On	NA	NA	NA
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	NA	NA	NA
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	NA	NA	NA
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	Off	NA	NA	NA
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	0	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON	Off	NA	NA	NA

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 122

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1400 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	5 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1m the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be re-engaged.

NOTE: All re-engagement parameters should be set to 0 with Lectra-Shift PTOs to prevent gear grind and damage to the transmission.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed is falls TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

If TEM_PTO_Ext_Input_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active.

Table 123

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Key_ State_ Allow_ ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ReEn g	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A

ALARMS

These parameters utilize the gauge cluster to sound an alarm to the driver when certain programmable parameters are violated.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an alarm will sound if the PTO is engaged and the air pressure is below the value set by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the park brake is released.

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

Table 124 – PTO Alarms

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_Air_ Pres_Alarms	2138	If this parameter is 1, an alarm will sound if the PTO is engaged and the air pressure is below	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Alarm_Limit	2139	SeeTEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Alarm_Limit	2136	See TEM_PTO_Eng_ Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarm_Limit	2134	See TEM_PTO_Veh_ Spd_Alarms	5 mph	3	100	1

OTHER PARAMETERS

The TEM_PTO_Retaining_Solenoid_Fuse parameter is the fusing value for the Remote Power Module output feeding the retaining coil that holds the electric solenoid in the engaged position. If current exceeds this value, the BC will turn off the output.

The TEM_PTO_Lectra_Shift_Max_Retries parameter allows the customer to establish the maximum number of times that the operator can request a PTO engagement per key cycle.

The TEM_PTO_Lectra_Shift_Retry_Time parameter sets the time between a failed engagement attempt and the time that the operator can attempt to engage the PTO again.

The TEM_PTO_Allowed_Engagement_Time parameter sets the maximum time allowed for the solenoid to make one engagement attempt.

The TEM_RPM_PTO_Engaged_Param parameter indicates the state that the BC will read as active for the TEM PTO feedback switch (as it goes into the RPM input). This active state will be used to tell the BC when the PTO is engaged.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

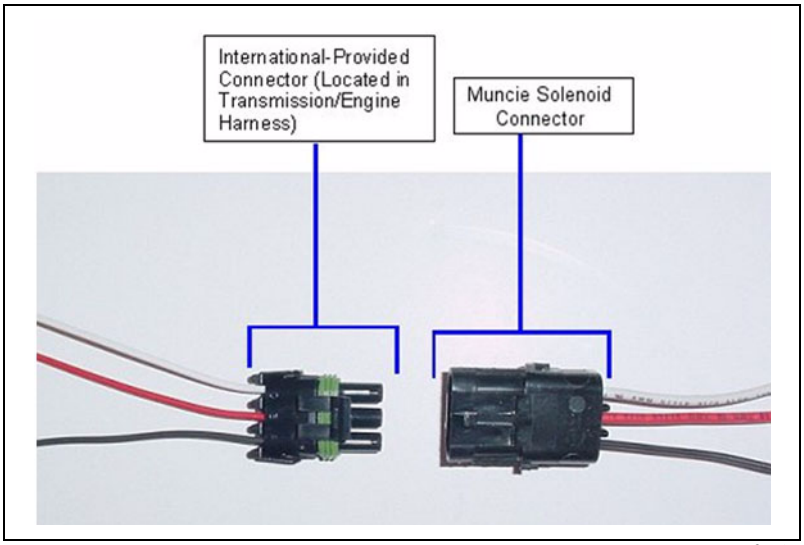
Table 125

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Retaining_ Solenoid_Fuse	2022	Fuse value for the TEM PTO Single Polarity engagement retaining solenoid power.	20 Amps	0	20	0.1
TEM_PTO_ Lectra_Shift_ Max_Retries	2058	The maximum number of times a PTO engagement request is allowed to be issued in a key cycle.	0 Retries	0	65535	1
TEM_PTO_ Lectra_Shift_ Retry_Time	2059	Time frame for retry counting in Lectra- Shift engagement algorithm.	600 Seconds	0	600	1
TEM_PTO_ Allowed_ Engagement_ Time	2057	Time allowed for engagement of the Lectra- Shift PTO.	3 Seconds	0	10	0.1
TEM_RPM_ PTO_Engaged_ Param	2147	Active State for the TEM PTO engagement feedback switch.	1	List	List	List

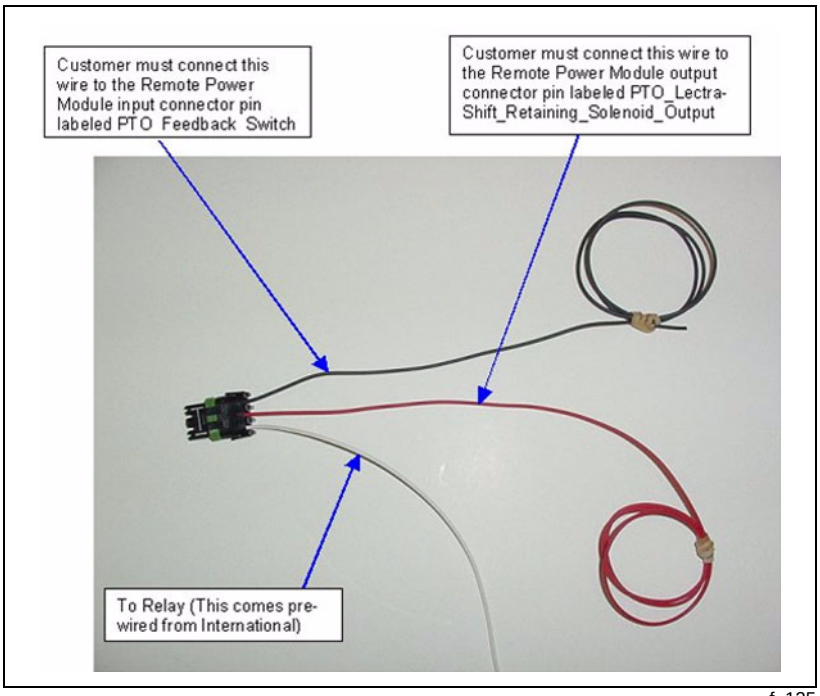
WIRING INFORMATION

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

- When a vehicle is ordered from Navistar with this feature, a 3-pin connector is provided which mates with the connector from the Muncie Lectra-Shift Solenoid. This connector is located in the transmission/engine harness located above the transmission. The customer is responsible for connecting two wires from this connector to the RPM connectors.
- The white wire is pre-wired from a relay to the Lectra-Shift connector. This wire is for the engagement coil.
- The red wire is for the holding coil in the solenoid. The red wire must be connected to the brown 8-pin RPM output connector pin labeled PTO_Lectra-Shift_Retaining_Solenoid_Output.
- The black wire is for the PTO feedback switch. The customer must wire from this pin into the black 23-pin RPM input connector pin labeled PTO_Feedback_Switch.
- When the customer has completed the wiring from the connector, plug the 3-pin connector into the connector provided by the Muncie Solenoid (See the Figure below).
- The customer is responsible for providing GND to the solenoid.

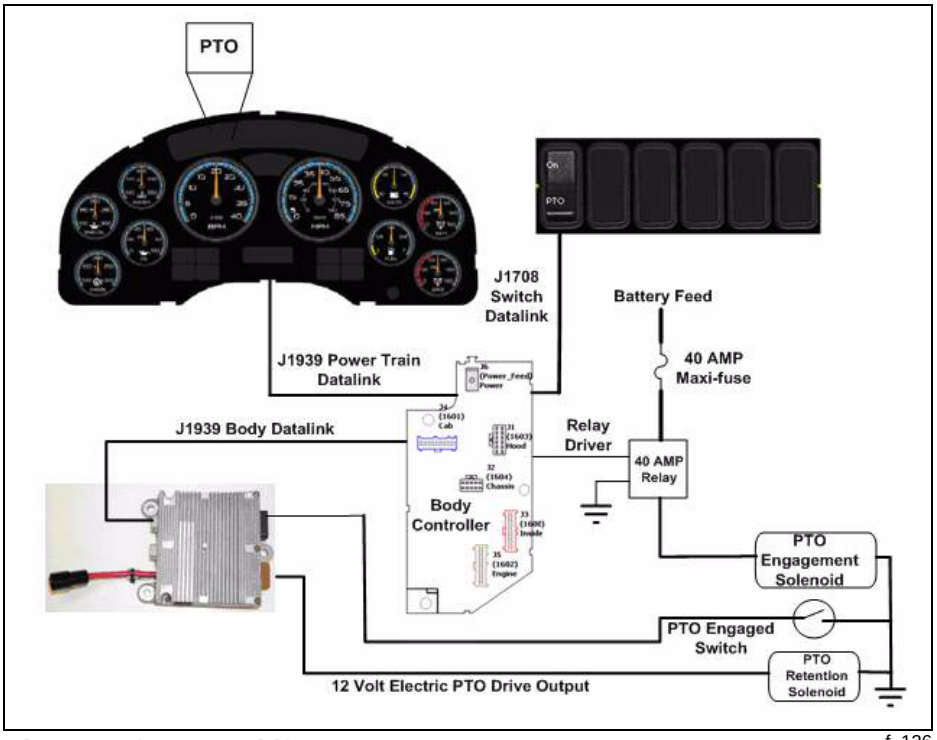


Lectra-Shift PTO Solenoid Connectors f_124



Navistar Supplied Harness for Lectra-Shift PTO f_125

(PTO) POWER TAKE OFF



f_126

Diagram of Lectra-Shift PTO System

RPM Connector Information

HPV Wire Terminal Kits are REQUIRED to allow Body Builders to create wire harnesses for the RPM connectors.

HPV terminal kits are pre-made kits that include six power output terminals and seals for the brown 8-way connector and six terminals for the black 23-way connector.

Table 126

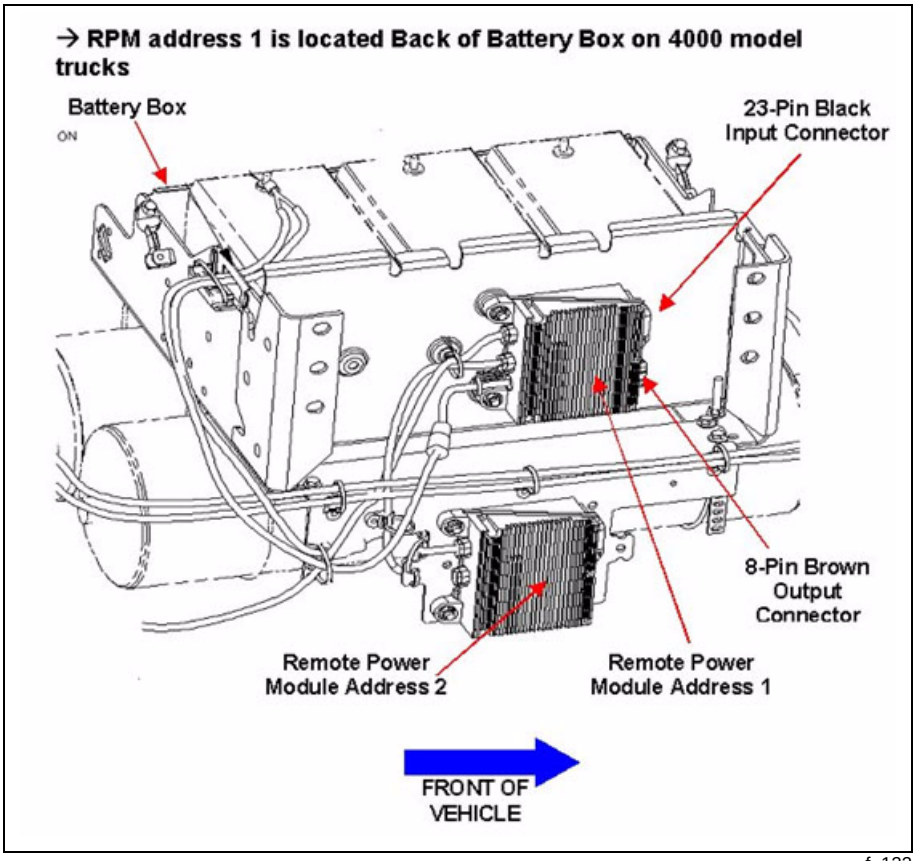
HPV Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C91

NOTE: The following connectors are optional because they are already provided with the RPMs.

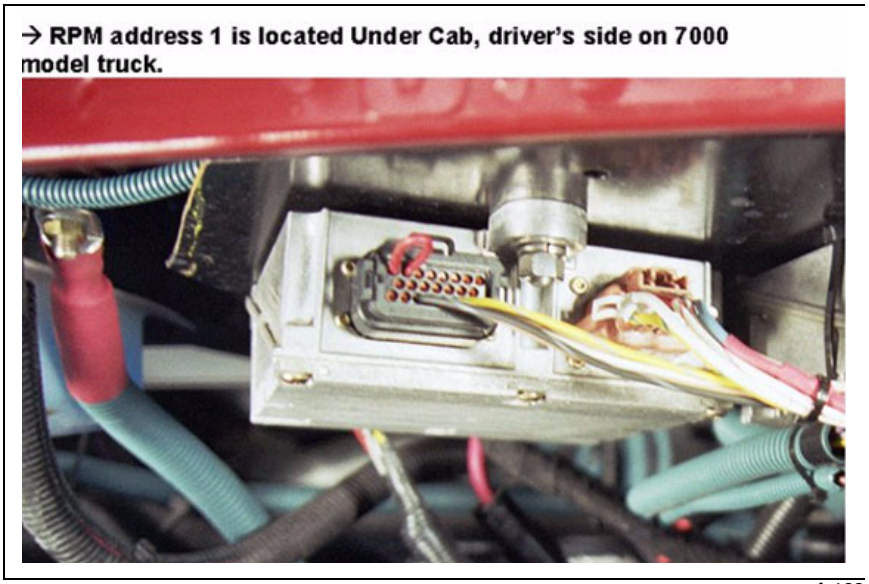
This information is given so that the Body Builder could purchase connectors in the event that the original connectors were damaged or lost, or so that the Body Builder can pre-fabricate a wire harness.

Table 127 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Built into the connector



RPM Mounting Location on a DuraStar Model Truck f_122



RPM Mounting Location on a WorkStar Model Truck f_123

TESTING

1. Depress the PTO switch in the cab to the ON position. Ensure that all PTO interlock conditions are enabled.
2. Verify that the pin labeled PTO_Lectra-Shift_Retaining_Solenoid_Output of the Brown 8-way Remote Power Module output connector has battery voltage levels present.
3. Verify that the Remote Power Module Input labeled PTO_Feedback_Switch (Pin position specified by the Diamond Logic® Builder software) is receiving the correct voltage (12V or GND) as specified by the customer in the Diamond Logic® Builder software.
4. Make certain that the switch indicator lights are functioning by engaging the PTO and verifying that the green light in the top section of the switch illuminates.
5. Make certain that the PTO indicator light in the gauge cluster is functioning by engaging the PTO.
6. The audible alarm can be tested by activating a vehicle condition that will sound the alarm based upon the settings of the programmable parameters. For example, if the park brake interlock is programmed on, release the park brake and engage the PTO. The audible alarms should sound with continuous beeps.

HOW TO ADD THIS FEATURE

A. If vehicle does not have a Remote Power Module installed, follow the Remote Power Module installation procedure listed in this document.

B. If the vehicle already has a Remote Power Module, follow the procedure listed below to add specific wiring for Lectra-Shift.

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs and outputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

- Software feature codes 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJV, and 595AJZ must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).
- Use the Diamond Logic® Builder software to make sure that software feature codes 595AJW, 595AJX, 595AJY, and 595AMZ are NOT enabled on the vehicle (see local dealer).
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see Local Dealer)
- Connect a wire from the pin labeled PTO_Lectra-Shift_Retaining_Solenoid_Output pin the brown 8-pin RPM output connector to the coil on the solenoid.
- Connect a wire from a Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the black 23-Pin RPM input connector.
- Connect a wire from Body Controller connector 1600 Pin E11 (Blue Connector) to a 40A relay to provide power for PTO Engagement.

Perform the PTO testing procedure that is listed above.

f_129

WARNING: Batteries expel explosive gases. Keep sparks, flames, burning cigarettes or other ignition (IGN) sources away at all times. Always wear safety glasses and a face shield when working near batteries to prevent personal injury and/or property damage.

Open hood and disconnect batteries on the vehicle.

IN CAB INTERIOR INSTALLATION:

Remove BC kick panel to access the BC.

1. Locate an 18 gauge wire long enough to reach from the BC Connector 1601 to the 76-way dash panel connector 1700.

2. Disconnect connector 1700 outside the cab on the dash panel.
3. Terminate one end of the wire with a BC terminal and insert it into connector 1601 pin E11.
4. Terminate the other end of the wire with a 76-way wire terminal and insert it into cavity 12 of connector 1700.
5. Install dash switch.
   a. Ensure the switch assigned to the Lectra-Shift is a center stable momentary switch.
   b. If the switch is not a momentary switch, use a DIN removal tool and remove the affected switch pack from the Instrument Panel (IP). Install a momentary switch in the position assigned to the PTO switch. Re-install the switch pack in the IP.
6. Re-install the BC kick panel.

EXTERIOR WIRING AND FUSE/RELAY INSTALLATION

1. Position an in-line 40 AMP fuse and relay near the mega-fuse in the engine compartment.
2. Terminate an 18 gauge wire with a terminal and insert one end into connector 1700 pin 12.
3. Terminate the other end with a relay socket terminal and connect it to the 40 AMP relay coil terminal 86.
4. Connect a second 18 gauge wire from the 40 AMP relay coil terminal 85 to the GND stud on the dash panel using a ring terminal.
5. Connect a 10 gauge wire from the battery side of the mega-fuse to one side of the in-line fuse.
6. Connect a 10 gauge wire from the other side of the in-line fuse to the moving contact of the 40 AMP relay.
7. Connect a 10 gauge wire from the normally open relay contact to the white wire of the Lectra-Shift supplied wire harness.
8. Tie-wrap the in-line fuse and relay to the center chassis harness. Ensure that the terminals of the relay and fuse are pointed down to prevent water intrusion.
9. Route the harness down along the engine harness next to the Engine Control Module (ECM) above the clutch linkage; follow the portion of the transmission/engine harness coming out of the engine ECM. Tape or tie-wrap the single white Lectra-Shift pull-in coil wire to the transmission/engine harness.
10. Connect the red wire to the brown 8-pin RPM output connector pin labeled PTO_Lectra_Shift_Retaining_Solenoid_Output.
11. Connect the black wire to the black 23-pin RPM input connector pin labeled PTO_Feedback_Switch.
12. Reconnect vehicle batteries.
13. Test the PTO operation.

PTO ACCOMMODATION FOR ELECTRIC OVER HYDRAULIC PTO

60ABE

BDY INTG, PTO ACCOMMODATION for Electric over Hydraulic PTO, With Switch Mounted on Dash, Includes Audible Alarm and Indicator Light in Gauge Cluster (Requires one RPM input and one output). This feature does Not Include Solenoids.

This feature provides a latched switch in a switch pack to drive one RPM output to engage an Electric over Hydraulic PTO.

This feature utilizes a customer-mounted PTO feedback switch wired to a RPM input to drive an indicator light in the gauge cluster that allows the operator to determine that the PTO is engaged. An audible alarm is used to warn the operator when the PTO is engaged during unsafe vehicle operating conditions such as when the park brake is released or the engine speed is too high. Operating limits are established through programmable parameters that are set in the BC. The RPM input also drives a PTO hourmeter to allow the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the PTO hourmeter,

press the gauge cluster display selector button momentarily until the text portion of the display indicates “PTO Hour.”

For Hybrid Electric Vehicles only, there is an additional feature code (595BBA) which must be added to make this type of PTO operable in an Eaton hybrid system.

The PTO alarms are controlled by programmable parameters set in the BC. Factory default settings for these programmable parameters are listed in the tables below.

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software. Body Builders must set programmable parameters that are appropriate for their PTO application.

Required Software Feature Codes

595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJW, 595AJZ, 595BBA (Hybrid Electric Vehicles only)

Software Feature Codes That Must Be Removed

595AJV, 595AJX, 595AJY, 595AMZ, 595BAM

Engagement

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the Transmission is NOT in Neutral or Park

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the Transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the Park Brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the Vehicle Speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_Air_Pres_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the Vehicle Primary Air Pressure is under the value prescribed be TEM_Air_Pres_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, the PTO will not be engaged if the vehicle master switch is not ON.

Table 128

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the Vehicle Primary Air Pressure is under the value prescribed by TEM_Air_Pres_Engmnt_Limit	Off	N/A	N/A	N/A
TEM_Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_Pres_Engmnt_Inhib	0	1	500	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_Pres_Engmnt_Limit	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Air_Pres_Disenages is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

IF TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 129

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Air_ Pres_Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit	0	N/A	N/A	N/A
TEM_PTO_Air_ Pres_DisEng_Limit	2116	See TEM_PTO_Air_Pres_Disengages	0	0	500	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the designated external input being in active state) when the external input is no longer in active state.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

If TEM_PTO_Air_Pres_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to low vehicle air pressure when the primary air pressure is over the value set in TEM_PTO_Air_Pres_Engmnt_Limit.

Table 130

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Ext_Input_ Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after disengagement due to the designated external input when the external input is no longer active.	Off	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after a disengage due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_Pres_Engmnt_Limit	Off	N/A	N/A	N/A

ALARMS

These parameters set the conditions in which an audible alarm in the gauge cluster will sound.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the transmission is taken out of neutral

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the park brake is released

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

Table 131 – PTO Alarms

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_Air_ Pres_Alarms	2138	If this parameter is 1, an alarm will sound if the PTO is engaged and the air pressure is below TEM_PTO_Air_Pres_Alarm_Limit	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off	Off	N/A	N/A	N/A
TEMP_PTO_Eng_ Spd_Alarm_Limit	2136	See TEM_PTO_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Veh_ Spd_Alarm_Limit	2134	See TEM_PTO_Veh_Spd_Alarms	5 mph	3	100	1

OTHER PARAMETERS

These parameters allow the customer to program the active state of the Remote Power Module Input and set the maximum current of the Remote Power Module Output.

The TEM_RPM_PTO_Engaged_Param parameter 2147 indicates the state that the BC will read as active for the TEM PTO feedback switch (as it goes into the RPM input). This active state will be used to indicate when the PTO is engaged.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

The TEM_Hyd_PTO_Engagement_Out_Param parameter sets the current at which the BC will fuse the Remote Power Module output that drives the engagement of the PTO. This is used to define the maximum amount of current that can flow through the Remote Power Module output.

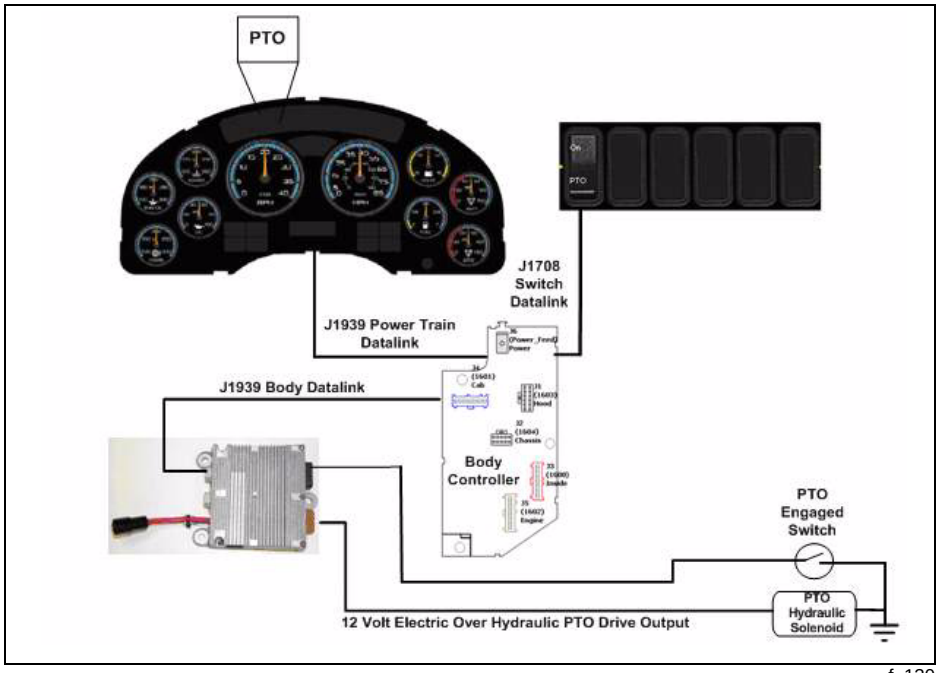
Table 132

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_RPM_PTO_ Engaged_ Param	2147	Active State for the TEM PTO engagement feedback switch.	1	List	List	List
TEM_Hyd_PTO_ Engagement_ Out_Param	1993	This is the fuse level of the Hydraulic PTO FET (Field Effect Transistor).	20 Amps	0	20	0.1

WIRING INFORMATION

Please use the Diamond Logic® Builder software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

- All wiring to RPM inputs and outputs is customer supplied.
- One wire must be connected from the pin labeled PTO_Output in the brown 8-pin RPM output connector to the coil on the hydraulic solenoid. This wire drives the engagement and disengagement of the solenoid. The customer supplies a GND wire for the hydraulic solenoid.
- A second wire must be connected from the Body Builder-installed PTO feedback switch (GND active) to the pin labeled PTO_Feedback_Switch in the black 23-pin RPM input connector. This feedback switch is used to determine whether or not the PTO is engaged by determining if the switch is in the active state. If the switch is indeed in the active state and the PTO is running, then an indicator light in the gauge cluster will be on. When the switch is not in the active state, the indicator light will not be on.
- The switch provided is labeled PTO.



Overview of Electric Over Hydraulic PTO System f_130

RPM Connector Information

HPV Wire Terminal Kits are REQUIRED to allow Body Builders to create wire harnesses for the RPM connectors.

HPV terminal kits are pre-made kits that include six power output terminals and seals for the brown 8-way connector and six terminals for the black 23-way connector.

Table 133

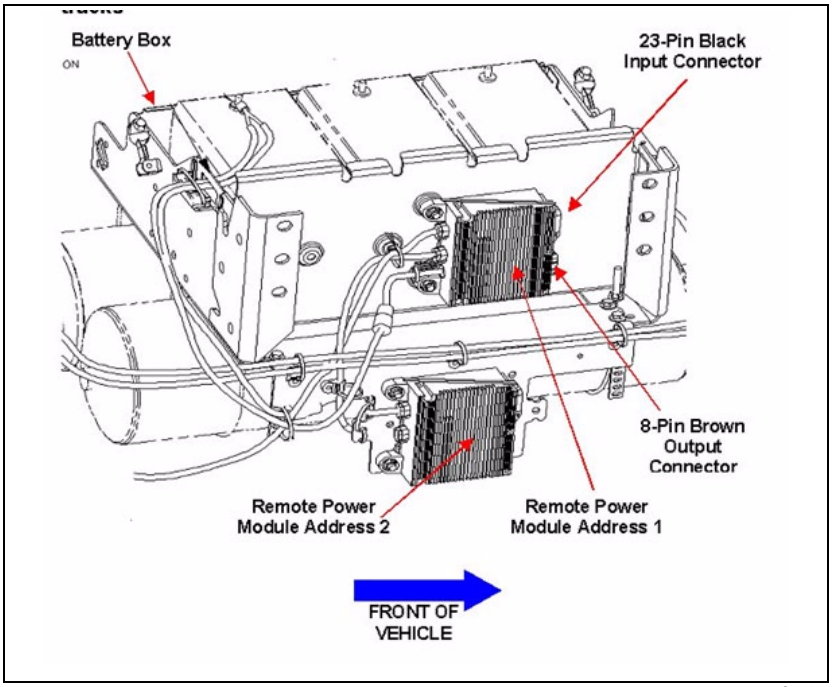
HPV Terminal Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C91

NOTE: The following connectors are optional because they are already provided with the RPMs.

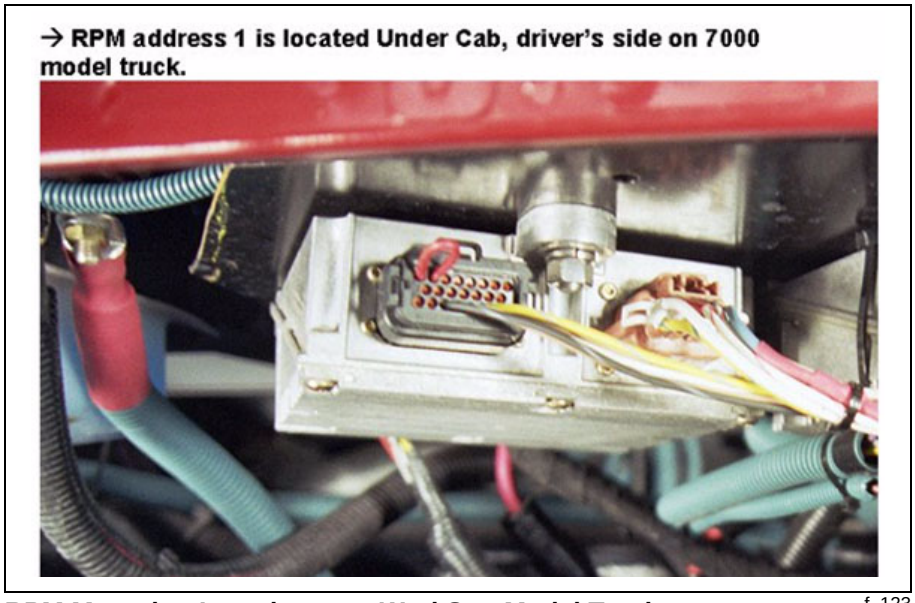
This information is given so that the Body Builder can purchase connectors in the event that the original connectors are damaged or lost, or so that the Body Builder can pre-fabricate a wire harness.

Table 134 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Built into the connector



RPM Mounting Location on a DuraStar Model Truck f_127



RPM Mounting Location on a WorkStar Model Truck f_123

TESTING

1. To determine if the PTO is working, depress the PTO switch in the cab to the on position. Ensure that all interlock conditions are enabled.
2. Verify that the pin labeled PTO_Output of the brown 8-way Remote Power Module output connector has the battery voltage levels present.
3. Verify that the RPM input labeled PTO_Feedback_Switch (pin position specified by the Diamond Logic® Builder software) is receiving the correct voltage (12V or GND) as specified by the programmable parameter in the Diamond Logic® Builder software.
4. Make certain that the indicator light in the top section of the PTO switch illuminates by engaging the PTO.
5. Make certain that the PTO indicator light in the gauge cluster illuminates by engaging the PTO.
6. The Audible Alarm can be tested by violating the set programmable parameters and determining if the Alarm sounds. For example: If the park brake interlock is programmed ON, release the park brake and engage the PTO. The audible alarm should sound with continuous beeps.

HOW TO ADD THIS FEATURE

- Software feature codes 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJW, and 595AJZ must be enabled on the vehicle using the Diamond Logic® Builder software (see local dealer).
- Use the Diamond Logic® Builder software to make sure that software feature codes 595AJV, 595AJX, 595AJY, and 595AMZ are NOT enabled on the vehicle (see local dealer).
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see Local Dealer)
- Connect a wire from the pin labeled PTO_Output in the brown 8-pin RPM output connector, to the coil on the solenoid.
- Connect a wire from a Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the black 23-Pin RPM input connector.
- Perform the PTO testing procedure that is listed above.

Constant Engagement Hydraulic Pump

Another use of 60ABE is to control a dump valve on a constantly engaged hydraulic pump. In this case the operator would use the RPM (address 1) output A to activate and deactivate the dump valve. This dump valve is used to control hydraulic pressure in the system, reducing wear on the system and increasing fuel economy.

PTO ACCOMMODATION ELECTRIC OVER AIR NON-CLUTCHED

60ABK

BDY INTG, PTO ACCOMMODATION. Accommodation for Electric over Air, Non-Clutched PTO Engagement and Disengagement, Does not Include Air Solenoid, With Switch Mounted on Dash, Includes Audible Alarm and Indicator Light in Gauge Cluster (requires one RPM input and one output)

This feature provides a momentary switch in the in-cab switch pack to drive a RPM output to engage an Electric over Air, Non-Clutched PTO.

A RPM input is used to drive an indicator light in the gauge cluster to indicate when the PTO is engaged. An audible alarm sounds when certain programmable parameters are violated. The RPM input also drives a PTO hourmeter to allow the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the hourmeter, press the gauge cluster selection button momentarily until the text portion of the display indicates “PTO Hour.”

The Non-Clutched air-shifted PTO is a gear-to-gear engagement mechanism. Very specific transmission operating modes are required to allow safe engagement of the PTO. In essence, the PTO gear in the transmission must be stopped before engagement of the PTO should be attempted. The clutch must be depressed with the vehicle parked in order to engage the PTO for a manual transmission. An automatic

transmission must be in any driving gear with vehicle parked in order to engage the PTO. Engagement, disengagement, and re-engagement parameters should be set according to the type of transmission where the Non-Clutched PTO is mounted.

For Hybrid Electric Vehicles only, there is an additional feature code (595BBA) which must be added to make this type of PTO operable in the hybrid system.

The PTO alarms are controlled by programmable parameters set in the BCM. Through these programmable parameters, the vehicle owner can customize the functionality of the PTO. Factory default settings for these programmable parameters are listed in the tables below.

Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section).

All re-engagement parameters for Non-Clutched PTOs are defaulted OFF. These parameters are defaulted to OFF because reengaging a Non-Clutched PTO automatically (after it has disengaged) could cause the gears to grind and damage the PTO.

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software. Body Builders must set programmable parameters that are appropriate for their PTO application.

Required software feature codes: 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJX, 595AJZ, 595BBA (Hybrid Electric Vehicles only)

Software feature codes that must be removed: 595AJV, 595AJW, 595AJY, 595AMZ, 595BAM

Engagement

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the Transmission is NOT in Neutral or Park.

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the Transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the Park Brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the Vehicle Speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 135

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON.	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 136

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

All re-engagement parameters should be set to 0 with non-clutched air-shifted PTOs to prevent gear grind and damage to the transmission.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

Table 137

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A

ALARMS

These parameters utilize the gauge cluster to sound an alarm to the driver when certain programmable parameters are violated.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the park brake is released.

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound if the PTO is engaged and the vehicle speed is over the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

Table 138 – PTO Alarms

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Alarms	2138	If this Parameter is 1, an alarm will sound if the primary air pressure is below TEM_PTO_Air_ Pres_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEMP_PTO_Eng_ Spd_Alarm_Limit	2136	See TEM_PTO_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Veh_ Spd_Alarm_Limit	2134	See TEM_PTO_Veh_Spd_Alarms	5 mph	3	100	1

OTHER PARAMETERS

These parameters allow the customer to program the active state of the RPM input and set the maximum current of the RPM output.

The TEM_RPM_PTO_Engaged_Param parameter 2147 indicates the state that the BC will read as active for the TEM PTO feedback switch (as it goes into the RPM input). This active state will be used to indicate when the PTO is engaged.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

The TEM_Hyd_PTO_Engagement_Out_Param parameter 1993 sets the current at which the BC will fuse the RPM output that drives the engagement of the PTO. This is used to define the maximum amount of current that can flow through the RPM output.

Table 139

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_RPM_ PTO_Engaged_ Param	2147	Active State for the TEM PTO engagement feedback switch.	1	List	List	List
TEM_Hyd_ PTO_ Engagement_ Out_Param	1993	This is the fuse level of the Hydraulic PTO FET.	20 Amps	0	20	0.1

WIRING INFORMATION

Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section).

- All wiring to RPM inputs and outputs is customer supplied.
- One wire must be connected from the pin labeled PTO_Output in the Brown 8-pin RPM output connector, to the coil on the air solenoid. This wire drives the engagement and disengagement of the solenoid. The customer supplies a GND wire for the air solenoid.
- A second wire must be connected from the Body Builder-installed PTO feedback switch (GND active) to the pin labeled PTO_Feedback_Switch in the black 23-pin RPM input connector. This switch is used to determine whether or not the PTO is engaged by determining if the switch is in the active state. If the switch is indeed in the active state and the PTO is running, then an indicator light in the gauge cluster will be on. When the switch is not in the active state, the indicator light will not be on.
- The switch provided is not labeled; therefore the customer will have to install a PTO label for the switch from the bag of switch labels provided with the vehicle. The customer should use the Diamond Logic® Builder software to determine the location of the in-cab switch.

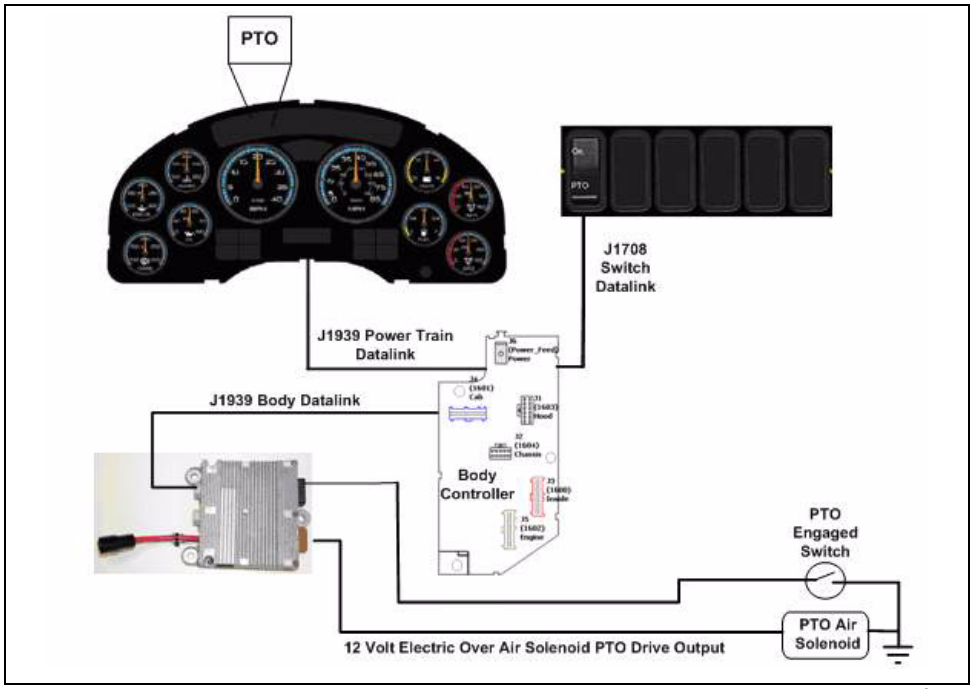


Diagram of Electric Over Air (Non-Clutched) PTO System f_131

RPM Connector Information

HPV kits are REQUIRED to allow Body Builders to wire in and out of the RPM connectors.

HPV kits are pre-made kits that include terminals and seals for BOTH RPM connectors.

Table 140

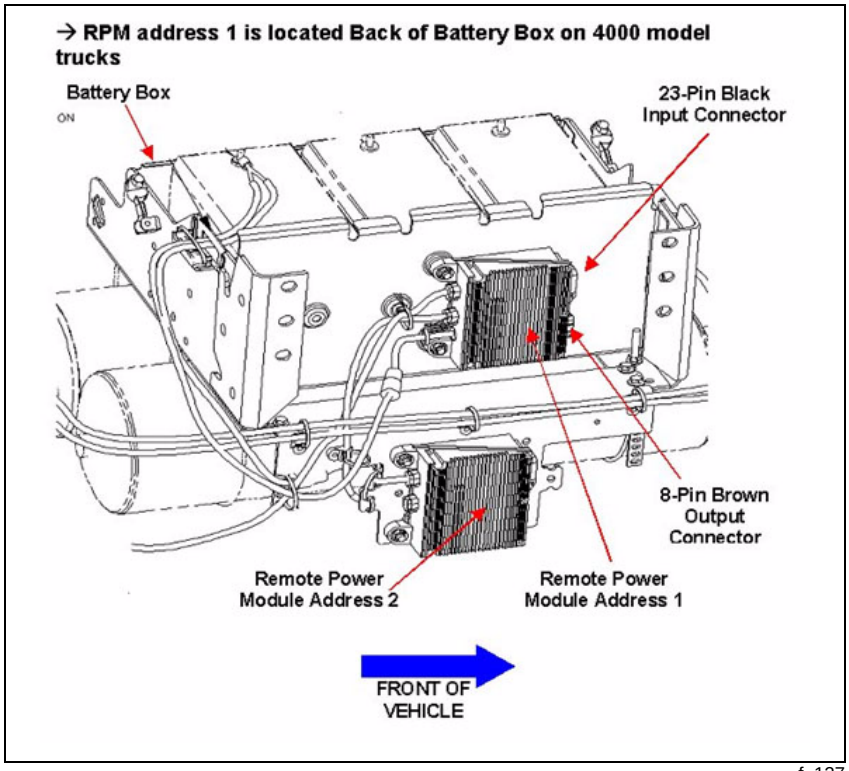
HPV Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C91

NOTE: The following connectors are optional because they are already provided with the RPMs.

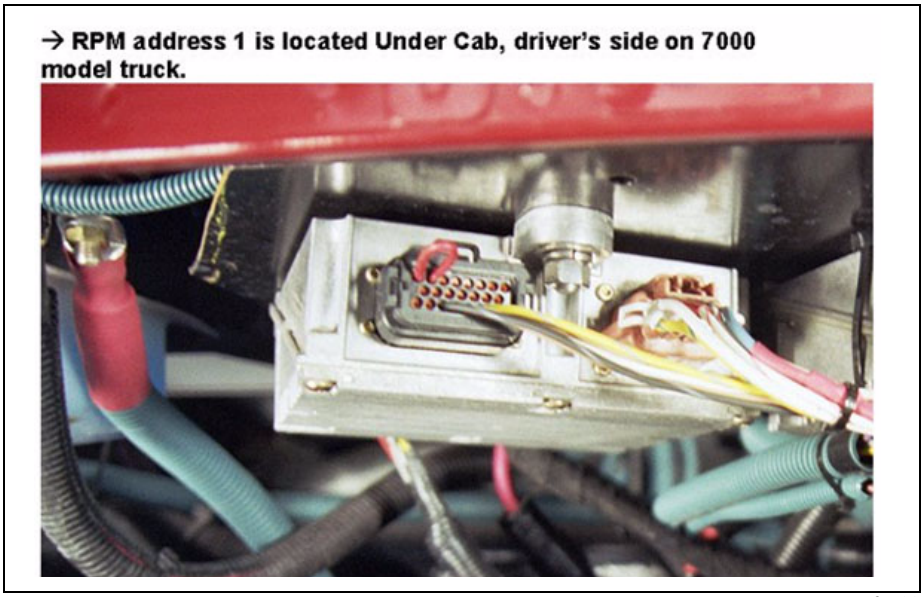
This information is given so that the Body Builder can purchase connectors in the event that the original connectors are damaged or lost, or so that the Body Builder can pre-fabricate a harness.

Table 141 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Included



RPM Mounting Location on a DuraStar Model Truck f_127



RPM Mounting Location on a WorkStar Model Truck f_123

TESTING

1. To determine if the PTO is working, depress the PTO switch in the cab to the on position. Ensure that all interlock conditions are enabled.
2. Verify that the pin labeled PTO_Output of the brown 8-way RPM output connector has the battery voltage levels present.
3. Verify that the RPM input labeled PTO_Feedback_Switch (Pin position specified by the Diamond Logic® Builder software) is receiving the correct voltage (12V or GND) as specified by the customer in the Diamond Logic® Builder software.
4. Make certain that the indicator light in the top section of the PTO switch illuminates by engaging the PTO.
5. Make certain that the PTO indicator light in the gauge cluster illuminates by engaging the PTO.
6. The audible alarm can be tested by violating the set programmable parameters and determining if the alarm sounds. For example: If the park brake interlock is programmed ON, release the park brake and engage the PTO. The audible alarm should sound with continuous beeps.

HOW TO ADD THIS FEATURE

- Software feature codes 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJX, 595AJZ and 595BBA (for Hybrids only) must be enabled on the vehicle using the Diamond Logic® Builder software (see Local Dealer).
- Use the Diamond Logic® Builder software to make sure that software feature codes 595AJV, 595AJW, 595AJY, and 595AMZ are NOT enabled on the vehicle (see Local Dealer)
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see Local Dealer)
- Connect a wire from the pin labeled PTO_Output in the Brown 8-pin RPM output connector to the coil on the solenoid.
- Connect a wire from a Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the Black 23-Pin RPM input connector.
- Perform the PTO testing procedure that is listed above.

PTO ACCOMMODATION ELECTRIC OVER AIR CLUTCHED

60ABL

BDY INTG, PTO ACCOMMODATION. Accommodation for Electric over Air, Clutched PTO Engagement and Disengagement, Does not Include Air Solenoid, With Switch Mounted on Dash, Includes Audible Alarm and Indicator Light in Gauge Cluster (requires one RPM input and one output)

This feature provides a latched switch in the in-cab switch pack to drive a RPM output that provides power to engage and disengage the Electric over Air, Clutched PTO. A RPM input is used to drive an indicator light in the gauge cluster, allowing the operator to discern whether or not the PTO is engaged. An audible alarm sounds when certain programmable parameters are violated. The RPM input also drives a PTO hourmeter to allow the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the hourmeter, press the gauge cluster selection button momentarily until the text portion of the display indicates “PTO Hour.”

For Hybrid Electric Vehicles only, there is an additional feature code (595BBA) which must be added to make this type of PTO operable in an Eaton hybrid system.

This PTO feature is a rule-based option. The operation of the PTO is governed by rules of engagement, disengagement, re-engagement, and alarms. These rules are defined through programmable parameters. Through these programmable parameters, the vehicle owner can customize the functionality of the PTO. Factory default settings for these programmable parameters are listed in the tables below.

Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section).

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® Builder software. Programmable Parameters are also programmable through the Diamond Logic® Builder software. Body Builders must set programmable parameters that are appropriate for their PTO application.

Required Software Feature Codes

595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJY, 595AJZ, 595BBA (Hybrid Electric Vehicles only)

Software Feature Codes That Must Be Removed

595AJV, 595AJW, 595AJX, 595AMZ, 595BAM

Engagement

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the Transmission is NOT in Neutral or Park

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the Transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the Park Brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the Vehicle Speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 142

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON.	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 143

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

Table 144

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2021	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2023	If this Parameter is 1, the PTO will be reengaged after a disengage due to the engine stopping when the engine is restarted	Off	N/A	N/A	N/A

ALARMS

These parameters utilize the gauge cluster to sound an alarm to the driver when certain programmable parameters are violated.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound in the cab if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the park brake is released

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

Table 145

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Alarms	2138	If this Parameter is 1, an alarm will sound if the primary air pressure is below TEM_PTO_Air_ Pres_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEMP_PTO_Eng_ Spd_Alarm_Limit	2136	See TEM_PTO_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Veh_ Spd_Alarm_Limit	2134	See TEM_PTO_Veh_Spd_Alarms	5 mph	3	100	1

OTHER PARAMETERS

These parameters allow the customer to program the active state of the RPM input and set the maximum current of the RPM output.

The TEM_RPM_PTO_Engaged_Param parameter 2147 indicates the state that the BC will read as active for the TEM PTO feedback switch (As it goes into the RPM input). This active state will be used to indicate when the PTO is engaged.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

The TEM_Hyd_PTO_Engagement_Out_Param parameter 1993 sets the current at which the BC will fuse the Remote Power Module output that drives the engagement of the PTO. This is used to define the maximum amount of current that can flow through the Remote Power Module output.

Table 146

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_RPM_ PTO_Engaged_ Param	2147	Active State for the TEM PTO engagement feedback switch.	1	List	List	List
TEM_Hyd_ PTO_ Engagement_ Out_Param	1993	This is the fuse level of the Hydraulic PTO FET.	20 Amps	0	20	0.1

WIRING INFORMATION

Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section).

- All wiring to RPM inputs and outputs is customer supplied.
- One wire must be connected from the pin labeled PTO_Output in the Brown 8-pin RPM output connector to the coil on the air solenoid. This wire drives the engagement and disengagement of the solenoid. The customer supplies a GND wire for the air solenoid.
- A second wire must be connected from the Body Builder-installed PTO feedback switch (GND active) to the pin labeled PTO_Feedback_Switch in the Black 23-pin RPM input connector. This switch used to determine whether or not the PTO is engaged by checking if the switch is in the active state. If the switch is indeed in the active state and the PTO is running, then an indicator light in the gauge cluster will be on. When the switch is not in the active state, the indicator light will not be on.
- The switch provided is labeled PTO.

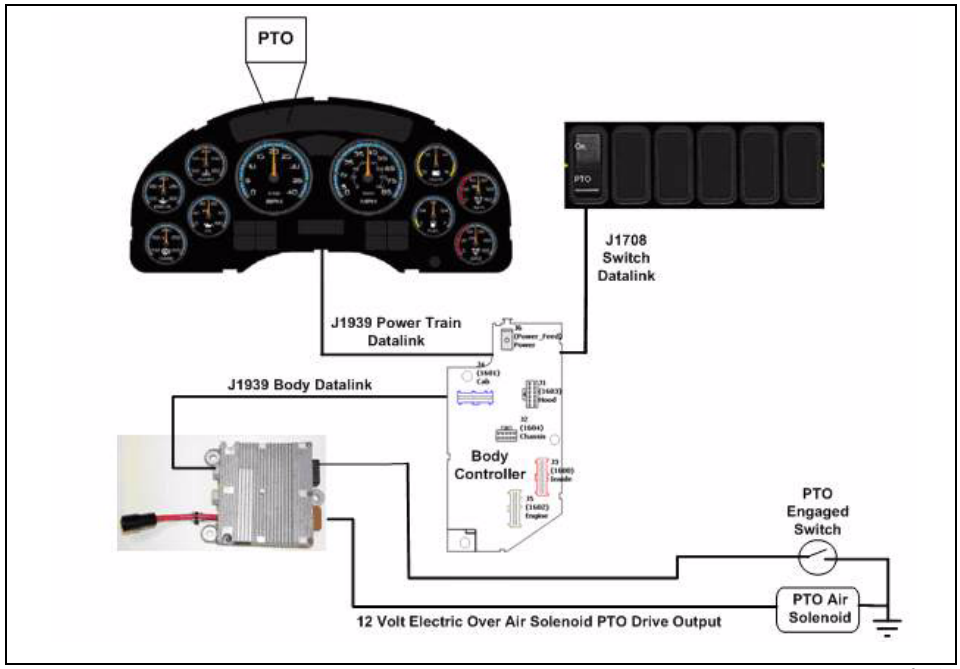


Diagram of Electric Over Air (Clutched) PTO System f_132

RPM CONNECTOR INFORMATION

HPV kits are REQUIRED to allow Body Builders to wire in and out of the RPM connectors.

HPV kits are pre-made kits that include terminals and seals for BOTH RPM connectors.

Table 147

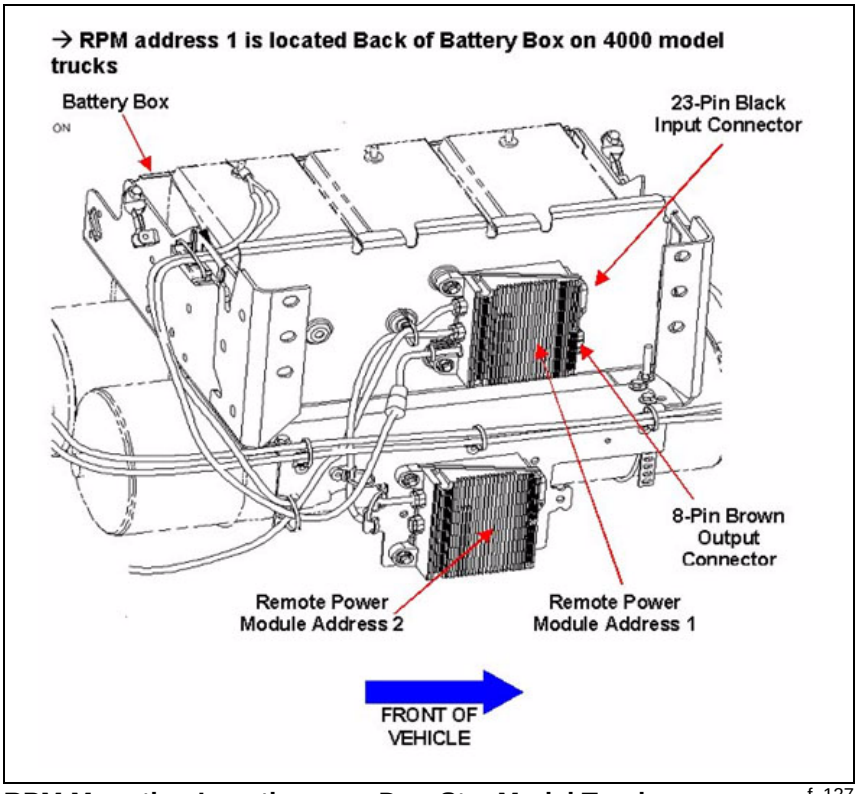
HPV Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C91

NOTE: The following connectors are optional because they are already provided with the RPMs.

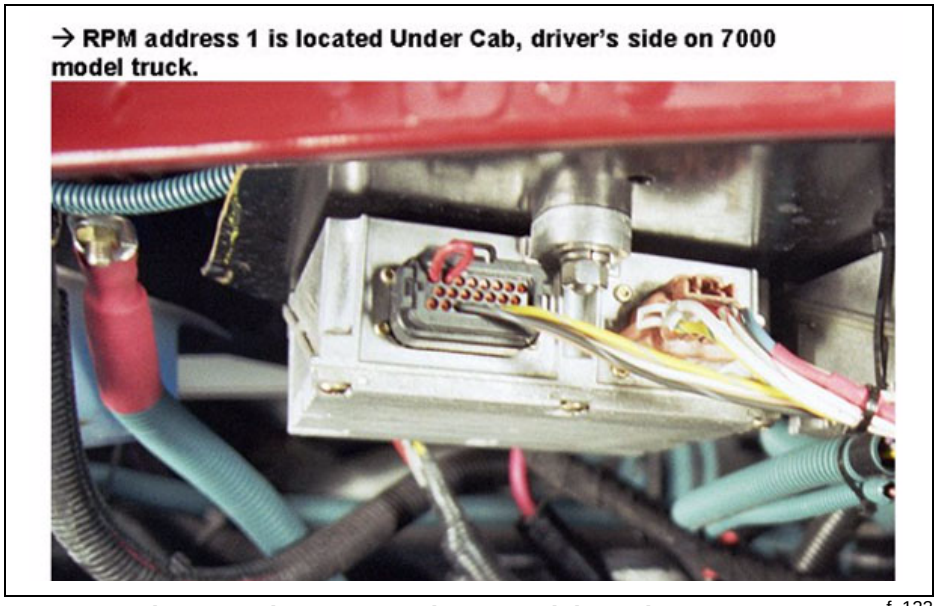
This information is given so that the Body Builder can purchase connectors in the event that the original connectors are damaged or lost, or so that the Body Builder can pre-fabricate a harness.

Table 148 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Included



RPM Mounting Location on a DuraStar Model Truck f_127



RPM Mounting Location on a WorkStar Model Truck f_123

TESTING

1. To determine if the PTO is working, depress the PTO switch in the cab to the on position. Ensure that all interlock conditions are enabled.
2. Verify that the pin labeled PTO_Output of the Brown 8-way Remote Power Module output connector has the battery voltage levels present.
3. Verify that the Remote Power Module Input labeled PTO_Feedback_Switch (Pin position specified by the Diamond Logic® Builder software) is receiving the correct voltage (12V or GND) as specified by the customer in the Diamond Logic® Builder software.
4. Make certain that the indicator light in the top section of the PTO switch illuminates by engaging the PTO.
5. Make certain that the PTO indicator light in the gauge cluster illuminates by engaging the PTO.
6. The audible alarm can be tested by violating the set programmable parameters and determining if the alarm sounds. For example, if the park brake interlock is programmed ON, release the park brake and engage the PTO. The audible alarm should sound with continuous beeps.

HOW TO ADD THIS FEATURE

- Software feature codes 595AJT (Use 595BJS or 595BJT instead of 595AJT on vehicles with 2010 compliant engines), 595AJU, 595AJY, 595AJZ and 595BBA (for Hybrids only) must be enabled on the vehicle using the Diamond Logic® Builder software (see Local Dealer).
- Use the Diamond Logic® Builder software to make sure that software feature codes 595AJV, 595AJW, 595AJX, and 595AMZ are NOT enabled on the vehicle (see Local Dealer)
- Set the desired programmable parameters for each signal using the Diamond Logic® Builder software (see Local Dealer)
- Connect a wire from the pin labeled PTO_Output in the Brown 8-pin RPM output connector to the coil on the solenoid.
- Connect a wire from a Body Builder-installed PTO feedback switch to the pin labeled PTO_Feedback_Switch in the Black 23-Pin RPM input connector.
- Perform the PTO testing procedure that is listed above.

THREE INTERLOCKED LATCHED SWITCHES DISENGAGE AT 30 MPH WITH PTO ACCOMMODATION

60AKG

BDY INTG, PTO ACCOMODATION for (3) Rocker Switches, (1) PTO Switch, (2) Generic Switches to Control (3) 30 amp relays, With Programmable Interlocks, for Body Builder Hook up in the Engine Compartment Left Side, Recommended for Automatic Transmissions

This feature provides TWO 2-position Latched Rocker switches that control two auxiliary loads requiring a total of two RPM outputs. Outputs are defaulted to disengage when vehicle speed reaches 30 MPH. The outputs will only be available in IGN or accessory key-state. This feature is used for applications such as a rear shining light. If the operator forgets to turn the light off before he drives away, the light will shut off when the driver hits 30 MPH.

The owner can interlock the switch with certain programmable conditions. These conditions can be set as programmable parameters using the Diamond Logic® Builder software. These parameters are listed and explained below.

This feature includes two copies of the functionality provided by 60ACG; e.g., two outputs with two switches. Each one of these outputs is exactly the same as that provided by 60ACG. The two outputs in this feature are completely autonomous (independent of each other). Each of the two outputs has its own set of four parameters (the five mentioned in the description for 60ACG with the exception of the RPM fuse parameters).

This feature also provides the customer with the ability to control a customer-supplied PTO with an in-dash switch. Programmable parameters allow customers to customize the functionality of their PTO.

Please use the Diamond Logic® Builder software to determine pin and switch locations for RPM inputs and outputs and to set programmable parameters (refer to pin and switch location section)

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software feature codes can be added through the Diamond Logic® Builder software. Programmable parameters are also programmable through the Diamond Logic® Builder software.

REQUIRED SOFTWARE FEATURE CODES

595BHZ, 595BKY, 595AJZ

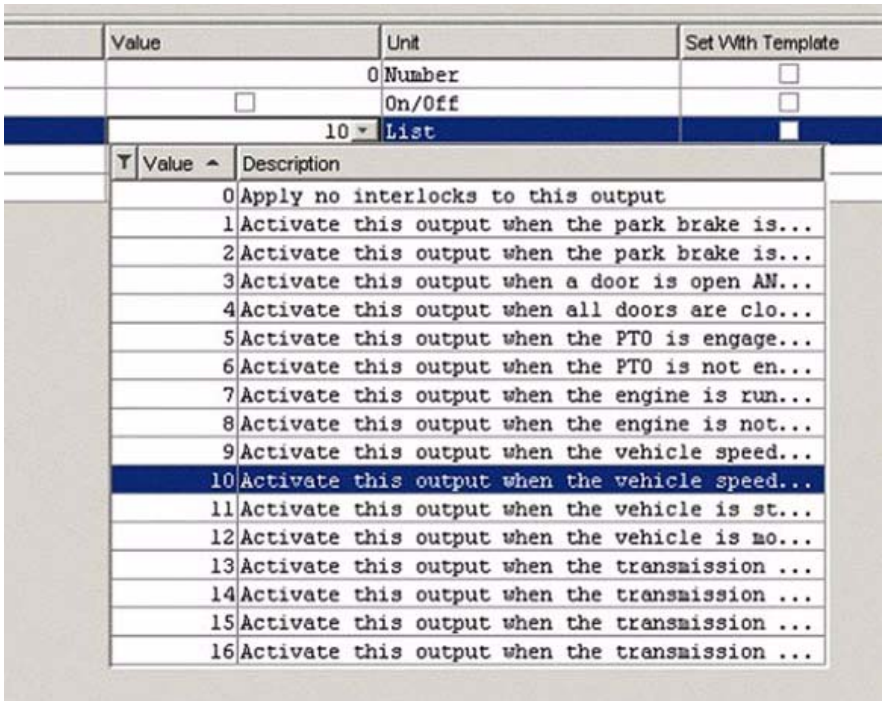
Conflicts with Software features: 595 AKB, 595AKC, 595AJV, 595AJW, 595AJX, and 595AJY

TEM_Aux1_Misc_Interlock_Param

This parameter (TEM_Aux1_Misc_Interlock_Param) is the master parameter for this feature. The setting for this parameter selects the interlocking condition for the output. The following table indicates which interlocking condition corresponds to which setting for the parameter. To select the interlocking condition simply set the value of this parameter to the corresponding setting on the table.

Table 149

Setting	Interlocking Condition
0	Apply no interlocks to this output
1	Activate this output when the park brake is set AND the switch is on
2	Activate this output when the park brake is not set AND the switch is on
3	Activate this output when a door is open AND the switch is on
4	Activate this output when all doors are closed AND the switch is on
5	Activate this output when the PTO is engaged AND the switch is on (Requires a PTO feature)
6	Activate this output when the PTO is not engaged AND the switch is on (Requires a PTO feature)
7	Activate this output when the engine is running AND the switch is on
8	Activate this output when the engine is not running AND the switch is on
9	Activate this output when the vehicle speed exceeds the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
10	Activate this output when the vehicle speed is less than the value set in TEM_Aux_1_Speed_Interlock_Param AND the switch is on
11	Activate this output when the vehicle is stopped AND the switch is on
12	Activate this output when the vehicle is moving AND the switch is on
13	Activate this output when the transmission gear is higher than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
14	Activate this output when the transmission gear is lower than TEM_Aux1_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
15	Activate this output when the transmission is in neutral AND the switch is on (Requires Automatic Transmission)
16	Activate this output when the transmission is not in neutral AND the switch is on (Requires Automatic Transmission)



Drop Down List of Possible Parameters for TEM_Aux1_Misc_Interlock_Param f_106

* TEM_Aux1_Interlock_Latches_Off

Normally, if the output is deactivated because the interlocking condition is not met, the output will re-activate as soon as the interlocking condition is re-established as long as the switch is still on. If this behavior is not desirable, the parameter TEM_Aux1_Interlock_Latches_Off parameter can be set. When it is set and the output is deactivated because the interlocking condition is not met, the output will not reactivate when the interlocking condition is re-established even if the switch is still on. To re-activate the output in this case, the switch must be re-cycled (flipped off and then on again).

* TEM_Aux1_Speed_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 9 or 10, the speed-interlock parameter (TEM_Aux1_Speed_Interlock_Param) must also be set. This parameter must be set to the actual speed to use in the condition selected by TEM_Aux1_Misc_Interlock_Param (default unit for this parameter is MPH). The speed parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 9 or 10.

Example: For the output to only come on when the vehicle is traveling over 15 MPH, set TEM_Aux1_Misc_Interlock_Param to 9 and set TEM_Aux1_Speed_Interlock_Param to 15 MPH.

* TEM_Aux1_Gear_Interlock_Param

If TEM_Aux1_Misc_Interlock_Param is set to 13 or 14 and the vehicle has an automatic transmission, the gear-interlock parameter (TEM_Aux1_Gear_Interlock_Param) must also be set. This parameter must be set to the transmission gear to use in the condition selected by TEM_Aux1_Misc_Interlock_Param. The transmission gear is set as follows:

Table 150

Setting	Transmission Gear
125	Transmission in Neutral
126	Transmission is in the 1st forward gear
127	Transmission is in the 2nd forward gear
128	Transmission is in the 3rd forward gear
125 + x	Transmission is in the xth forward gear
124	Transmission is in the 1st reverse gear
123	Transmission is in the 2nd reverse gear
125 – y	Transmission is in the yth reverse gear
The transmission gear parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 13 or 14.	

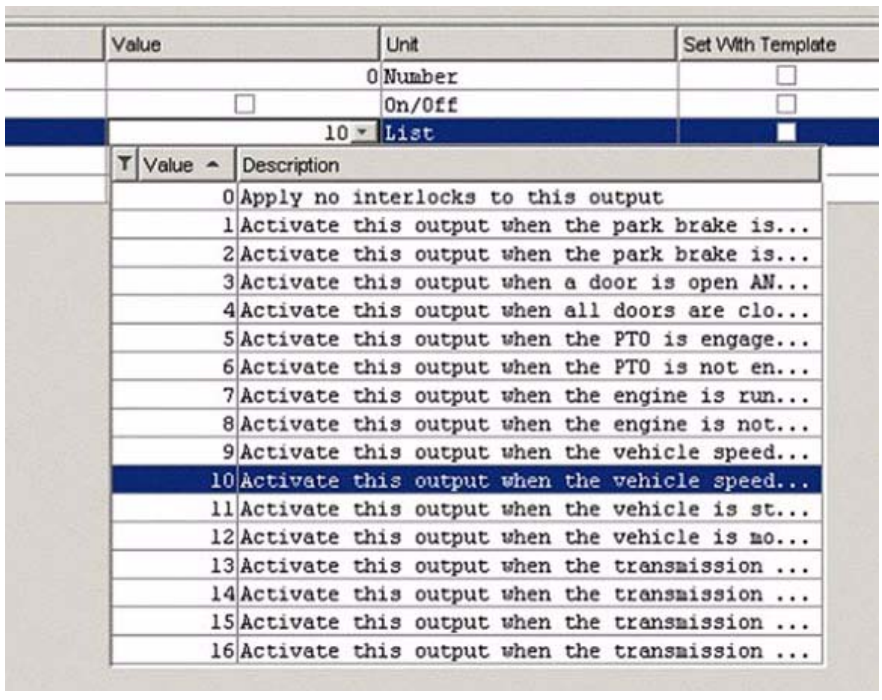
Example: For the output to only come on when the vehicle transmission is in a reverse gear, set TEM_Aux1_Misc_Interlock_Param to 10 and TEM_Aux1_Gear_Interlock_Param to 125.

* TEM_Aux2_Misc_Interlock_Param

This parameter (TEM_Aux2_Misc_Interlock_Param) is the master parameter for this feature. The setting for this parameter selects the interlocking condition for the output. The following table indicates which interlocking condition corresponds to which setting for the parameter. To select the interlocking condition simply set the value of this parameter to the corresponding setting on the table.

Table 151

Setting	Interlocking Condition
0	Apply no interlocks to this output
1	Activate this output when the park brake is set AND the switch is on
2	Activate this output when the park brake is not set AND the switch is on
3	Activate this output when a door is open AND the switch is on
4	Activate this output when all doors are closed AND the switch is on
5	Activate this output when the PTO is engaged AND the switch is on (Requires a PTO feature)
6	Activate this output when the PTO is not engaged AND the switch is on (Requires a PTO feature)
7	Activate this output when the engine is running AND the switch is on
8	Activate this output when the engine is not running AND the switch is on
9	Activate this output when the vehicle speed exceeds the value set in TEM_Aux_2_Speed_Interlock_Param AND the switch is on
10	Activate this output when the vehicle speed is less than the value set in TEM_Aux_2_Speed_Interlock_Param AND the switch is on
11	Activate this output when the vehicle is stopped AND the switch is on
12	Activate this output when the vehicle is moving AND the switch is on
13	Activate this output when the transmission gear is higher than TEM_Aux2_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
14	Activate this output when the transmission gear is lower than TEM_Aux2_Gear_Interlock_Param AND the switch is on (Requires Automatic Transmission)
15	Activate this output when the transmission is in neutral AND the switch is on (Requires Automatic Transmission)
16	Activate this output when the transmission is not in neutral AND the switch is on (Requires Automatic Transmission)



Drop Down List of Possible Parameters for TEM_Aux2_Misc_Interlock_Param

f_106

* TEM_Aux2_Interlock_Latches_Off

Normally, if the output is deactivated because the interlocking condition is not met, the output will re-activate as soon as the interlocking condition is re-established as long as the switch is still on. If this behavior is not desirable, the parameter TEM_Aux2_Interlock_Latches_Off parameter can be set. When it is set and the output is deactivated because the interlocking condition is not met, the output will not reactivate when the interlocking condition is re-established even if the switch is still on. To re-activate the output in this case, the switch must be re-cycled (flipped off and then on again).

* TEM_Aux2_Speed_Interlock_Param

If TEM_Aux2_Misc_Interlock_Param is set to 9 or 10, the speed-interlock parameter (TEM_Aux2_Speed_Interlock_Param) must also be set. This parameter must be set to the actual speed to use in the condition selected by TEM_Aux2_Misc_Interlock_Param (default unit for this parameter is MPH). The speed parameter is only used if TEM_Aux2_Misc_Interlock_Param is set to 9 or 10.

Example: For the output to only come on when the vehicle is traveling over 15 MPH, set TEM_Aux2_Misc_Interlock_Param to 9 and set TEM_Aux2_Speed_Interlock_Param to 15 MPH.

* TEM_Aux2_Gear_Interlock_Param

If TEM_Aux2_Misc_Interlock_Param is set to 13 or 14 and the vehicle has an automatic transmission, the gear-interlock parameter (TEM_Aux2_Gear_Interlock_Param) must also be set. This parameter must be set to the transmission gear to use in the condition selected by TEM_Aux2_Misc_Interlock_Param. The transmission gear is set as follows:

Table 152

Setting	Transmission Gear
125	Transmission in Neutral
126	Transmission is in the 1st forward gear
127	Transmission is in the 2nd forward gear
128	Transmission is in the 3rd forward gear
125 + x	Transmission is in the xth forward gear
124	Transmission is in the 1st reverse gear
123	Transmission is in the 2nd reverse gear
125 – y	Transmission is in the yth reverse gear
The transmission gear parameter is only used if TEM_Aux1_Misc_Interlock_Param is set to 13 or 14.	

Example: For the output to only come on when the vehicle transmission is in a reverse gear, you would set TEM_Aux2_Misc_Interlock_Param to 10 and TEM_Aux2_Gear_Interlock_Param to 125.

Table 153

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_Aux1_ Interlock_ Latches_Off	2006	If this is set, when the output is turned off due to an interlock, it will remain off until the switch is recycled.	Off	On/Off		
TEM_Aux1_ Speed_ Interlock_ Param	2007	The speed parameter for the TEM Aux #1 with Interlocks feature.	30	Mph	0	100
TEM_Aux1_ Gear_ Interlock_ Param	2008	The transmission gear parameter for the TEM Aux #1 with Interlocks feature (124 is reverse, 125 is neutral, 126 is 1st gear, 127 is second gear etc.).	0	Number	0	250
TEM_Aux1_ Misc_ Interlock_ Param	2033	Miscellaneous or control parameter used for setting the interlock for the auxiliary 1 with interlocks.	10	List		
TEM_Aux2_ Interlock_ Latches_Off	2010	If this is set, when the output is turned off due to an interlock, it will remain off until the switch is recycled.	Off	On/Off		
TEM_Aux2_ Speed_ Interlock_ Param	2011	The speed parameter for the TEM Aux #2 with Interlocks feature.	30	Mph	0	100
TEM_Aux2_ Gear_ Interlock_ Param	2012	The transmission gear parameter for the TEM Aux #2 with Interlocks feature (124 is reverse, 125 is neutral, 126 is 1st gear, 127 is second gear etc.).	0	Number	0	250
TEM_Aux2_ Misc_ Interlock_ Param	2034	Miscellaneous or control parameter used for setting the interlock for the auxiliary 2 with interlocks.	10	List		

ENGAGEMENT

*These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park.

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the park brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the vehicle speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

Table 154

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

Table 155

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

Table 156

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A

ALARMS

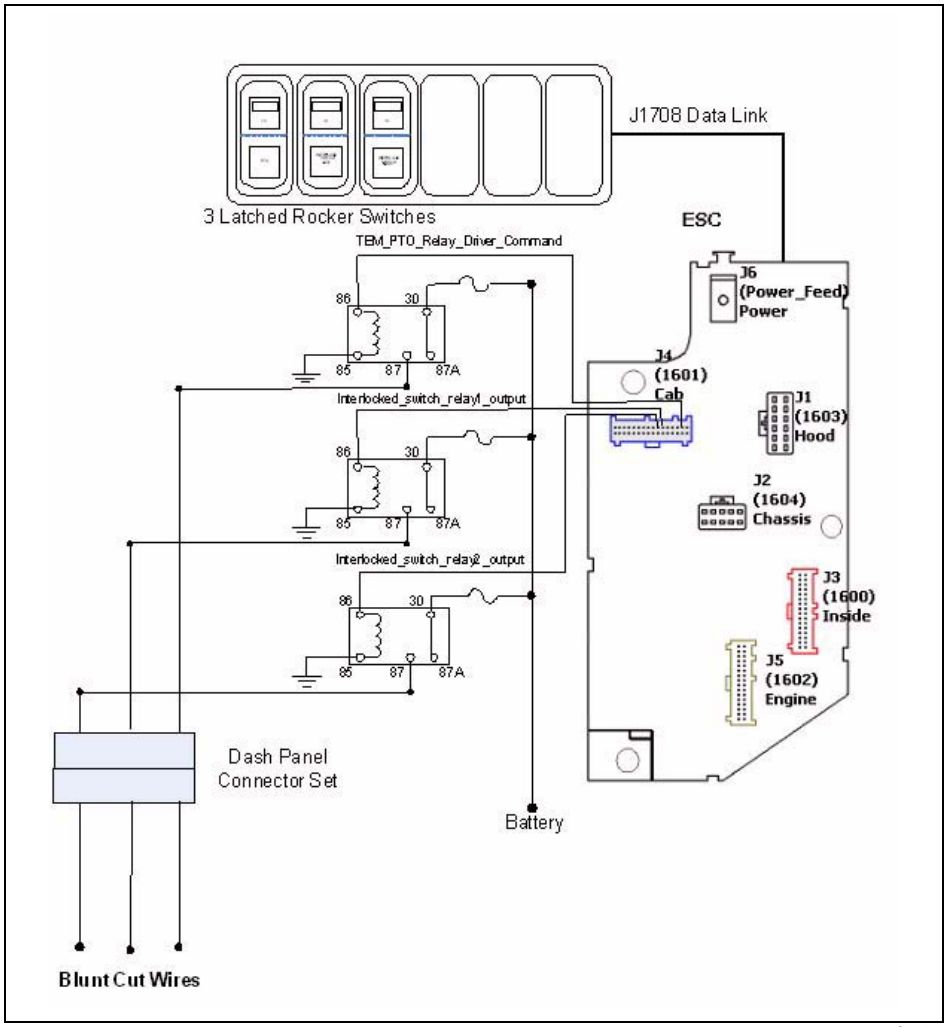
This feature does not provide any PTO feedback indications or alarms. If this functionality is required, add the feature described in the chapter for 16WLM PTO Feedback and Alarms.

WIRING INFORMATION

The wiring out of the pin labeled TEM_PTO_Relay_Driver_Command should be connected to the F2 pin on the J4 (1601) connector.

The wiring out of the pin labeled Interlocked_switch_relay1_output should be connected to the F6 pin on the J4 (1601) connector.

The wiring out of the pin labeled Interlocked_switch_relay2_output should be connected to the F7 pin on the J4 (1601) connector.



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TESTING

1. Depress switch.
2. Verify that the output labeled Interlocked_switch_relay1_output is obtaining the desired voltage (as programmed by the Diamond Logic® Builder software).
3. Verify the functionality of the 30 Mph interlock by violating the parameter and determine that the output shuts off.
4. Test all other interlocks can by violating the programmable parameters to see if the output shuts off
5. Depress the second switch.
6. Verify that the RPM output labeled Interlocked_switch_relay2_output is obtaining the desired voltage (as programmed by the Diamond Logic® Builder software).
7. Verify the functionality of the 30 MPH interlock by violating the parameter and determine that the output shuts off.
8. Test all other interlocks can by violating the programmable parameters to see if the output shuts off
9. Depress the In-cab PTO switch to the ON position.
10. Verify that all enabled interlock conditions are met.

How To Add This Feature

- Software feature codes 595BHZ, 595BKY and 595AJZ MUST be enabled using the Diamond Logic® Builder software (see local dealer).
- Software feature codes 595AJU, 595AJV, 595AJW, 595AJX, and 595AJY must NOT be enabled on the truck.
- Three (3) 2-position latched rocker switches (P/N 3578910C1) must be installed in the in-cab switch pack in the position specified by the Diamond Logic® Builder software.
- Three (3) green LED indicator lights (P/N 3578733C1) must be installed behind the upper portion of each switch.
- Three (3) amber LED indicator lights (P/N 3533928C1) must be installed behind the lower portion of each switch.
- Three (3) relays, gen. control, 4-pin micro (P/N 3600329C1) must be installed with the proper pin connections to the J4 connector described above.
- Programmable parameters must be set using the Diamond Logic® Builder software (see local dealer).
- Set desired “Engagement”, “Disengagement”, and “Re-engagement” programmable parameters.

PTO CONTROL

13XAA

PTO CONTROL, DASH MOUNTED For Customer Provided PTO; Includes Switch, Electric/Air Solenoid, Piping and Wiring

13WDH

WIRING, TRANS, BODY BUILDER, Installed Wiring for Transmission/PTO Controls, for Allison 2000, 2100, 2200, 2400, 2500 Series Transmission Only. NOTE: See the Automatic Transmission Interfaces section of this manual for connector reference information and connector location.

13WDN

PTO CONTROL, DASH MOUNTED for Customer Provided PTO; Includes 2 Independent Illuminated Switches, 2 Electric/Air Solenoids, Piping and Wiring

This feature provides the customer with the ability to control a customer-supplied PTO(s) with a single (13XAA)/two (13WDN) in-dash switch(es) and a single (13XAA)/two (13WDN) air solenoid(s). This feature provides all the software and wiring to the air solenoid located inside the driver’s side frame rail next to the transmission. Customer must supply and route air plumbing to the PTO. Programmable parameters allow customers to customize the functionality of their PTO.

Software Feature Codes/Programmable Parameters

Required Software Feature Codes (for all models other than Line Haul and ProStar):

595AJZ and 595AMZ

Software Feature Codes That Must Be Removed

595AJU, 595AJV, 595AJW, 595AJX, and 595AJY

NOTE: The parameters for 13XAA for the Line Haul and ProStar models are listed further down.

Engagement

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park.

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the park brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the vehicle speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 157

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 158

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

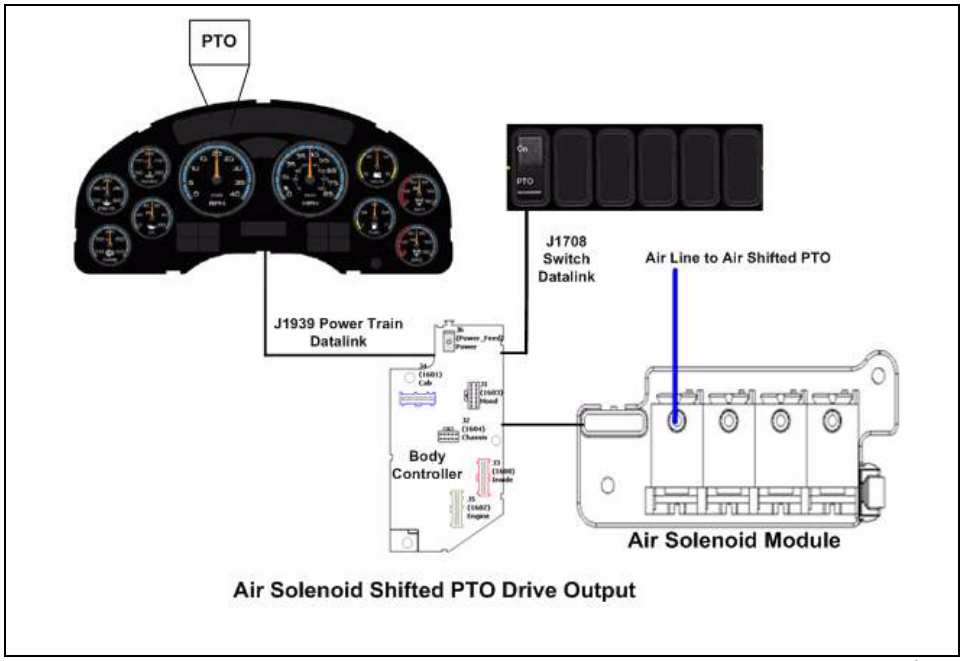
If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

Table 159

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A

WIRING INFORMATION

Customer must supply and route air plumbing from the Navistar-provided air solenoid (Located inside the driver's side frame rail, adjacent to the Transmission) to the PTO.



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TESTING

1. Depress the In-cab PTO switch to the ON position.
2. Verify that all enabled interlock conditions are met.
3. Verify that the Navistar-provided air solenoid is supplying air pressure at the solenoid output.

HOW TO ADD THIS FEATURE

- Software feature codes 595AJZ and 595AMZ must be added to the truck using the Diamond Logic® Builder software.
- Software feature codes 595AJU, 595AJV, 595AJW, 595AJX, and 595AJY must NOT be enabled on the truck.
- Set desired “Engagement”, “Disengagement”, and “Re-engagement” programmable parameters.
- Add a latched switch (P/N 3578910C1) in the in-cab switch pack in the position specified by the Diamond Logic® Builder software.
- If the truck does not already have a 4-pack solenoid base, the customer should order a 4-pack base (part number 2505594C1) and an air solenoid (part number 2506711C91).
- Add wiring as per the Electrical Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid.

PTO CONTROL ONLY FOR LINE HAUL AND PROSTAR MODELS, DASH MOUNTED FOR CUSTOMER PROVIDED PTO; INCLUDES SWITCH, ELECTRIC/AIR SOLENOID, PIPING AND WIRING

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODES

595ADD for post 2007 clusters and pre 2010 clusters – 595BKJ or 595BNP is required to be added for 2010 clusters.

Software feature 595BNP is similar to 595BKJ, but has 42 parameters available.

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

595AEB for post 2007 clusters and pre 2010 clusters – 595BKK or 595BNN is required to be removed for 2010 clusters.

These parameters set the conditions under which the PTO will be engaged and disengaged.

Software Feature Codes: 595ADD or 595BKJ

PARAMETERS

PTOa_Vehicle_Speed_Enable – Set to 0 to ignore the vehicle speed. Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOa_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOa_Engine_Speed_Enable – Set to 0 to ignore the engine speed. Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOa_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.

PTOa_Engine_Speed_Alarm_Enable – Set to 0 to not have an alarm based on engine speed. Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOa_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.

Vehicle_Speed_Alarm_Enable PTOa_– Set to 0 to not have an alarm based on vehicle speed. Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOa_Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOa_Clutch_Pedal – Set to 0 to ignore the clutch pedal or if the vehicle does not have a clutch pedal. Set to 1 to ensure that the clutch pedal is depressed for engagement.

PTOa_Engine_Running – Set to 0 to ignore the engine. Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.

PTOa_Engine_Speed_Range – Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOa_Engine_Speed_Enable to enable this interlock.

PTOa_Park_Brake – Set to 0 to ignore the park brake. Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.

PTOa_Engine_Speed_Alarm_Range – Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOa_Vehicle_Speed_Enable parameter to enable this interlock.

PTOa_Vehicle_Speed_Alarm_Range.

PTOa_Transmission_Neutral – NOTE: this parameter will only work for vehicles with automated manual transmissions. Set to 0 to ignore the transmission state. Set to 1 to ensure that the transmission is in neutral for engagement.

Table 160

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
PTOa_Vehicle_ Speed_Enable	2242	Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOa_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1..	On	N/A	N/A	N/A
PTOa_Engine_ Speed_Enable	2243	Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOa_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.	Off	N/A	N/A	N/A
PTOa_Engine_ Speed_Alarm_ Enable	2244	Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOa_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.	Off	N/A	N/A	N/A
Vehicle_Speed_ Alarm_Enable PTOa	2267	Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOa_Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.	Off	N/A	N/A	N/A
PTOa_Clutch_ Pedal	2333	Set to 1 to ensure that the clutch pedal is depressed for engagement.	Off	N/A	N/A	N/A
PTOa_Engine_ Running	2334	Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.	Off	N/A	N/A	N/A
PTOa_Engine_ Speed_Range	2336	Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOa_Engine_Speed_Enable to enable this interlock.	300	300	3000	10
PTOa_Park_Brake	2338	Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.	On	N/A	N/A	N/A
PTOa_Vehicle_ Speed_Range	2339	Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOa_Vehicle_Speed_Enable parameter to enable this interlock.	3	3	100	1
PTOa_Engine_ Speed_Alarm_ Range	2340	If an engine speed alarm is required for PTO operation, please use PTOa_Engine_Speed_Alarm_Enable parameter to enable this alarm.	300	300	3000	10
PTOa_Vehicle_ Speed_Alarm_ Range	2342	Set to a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. If the vehicle alarm is required for PTO operation, please use PTOa_Vehicle_Speed_Alarm_Enable to enable this alarm.	3	3	100	1
PTOa_ Transmission_ Neutral	2355	NOTE, this parameter will only work for vehicles with automated manual transmissions. Set to 1 to ensure that the transmission is in neutral for engagement.	On	N/A	N/A	N/A

(PTO) POWER TAKE OFF

SOFTWARE FEATURE CODES

595BNP (2010 Clusters, 42 Parameters)

PARAMETERS

ENGAGEMENT

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park.

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the park brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the vehicle speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 161

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 162

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

Table 163

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A

ALARMS

These parameters utilize the gauge cluster to sound an alarm to the driver when certain programmable parameters are violated.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound in the cab if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the park brake is released

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

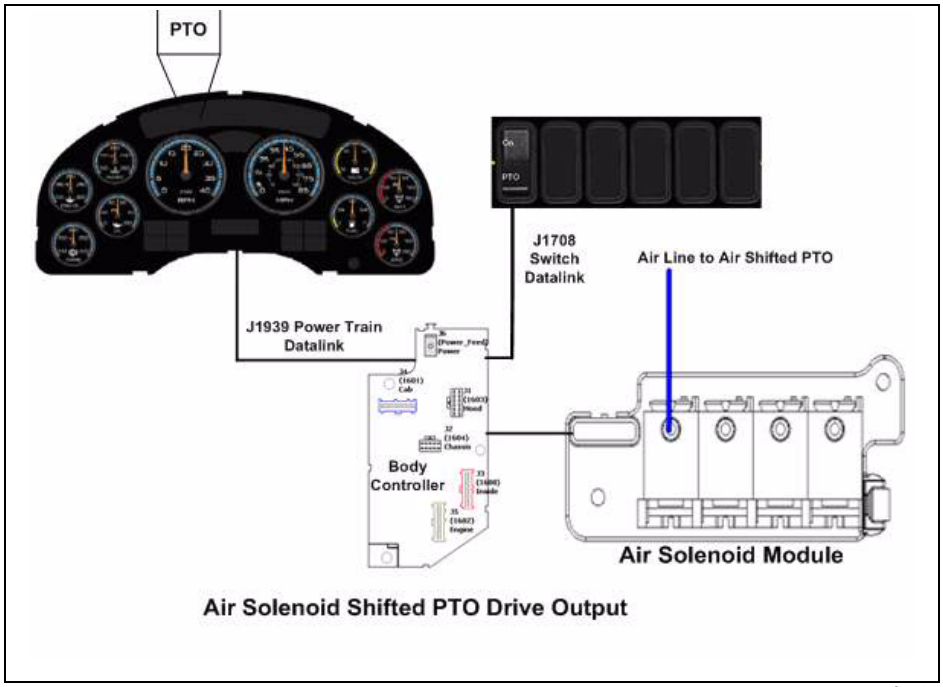
Table 164

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_Alarms	2138	If this Parameter is 1, an alarm will sound if the primary air pressure is below TEM_PTO_Air_ Pres_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Air_ Pres_Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEMP_PTO_Eng_ Spd_Alarm_Limit	2136	See TEM_PTO_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Veh_ Spd_Alarm_Limit	2134	See TEM_PTO_Veh_Spd_Alarms	5 mph	3	100	1

WIRING INFORMATION

Customer must supply and route air plumbing from the Navistar-provided air solenoid (Located inside the driver's side frame rail, adjacent to the Transmission) to the PTO.

(PTO) POWER TAKE OFF



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TESTING

1. Depress the In-cab PTO switch to the ON position.
2. Verify that all enabled interlock conditions are met.
3. Verify that the Navistar-provided air solenoid is supplying air pressure at the solenoid output.

HOW TO ADD THIS FEATURE

- Software feature codes 595ADD must be added to the truck using the Diamond Logic® Builder software for post 2007 clusters and pre 2010 clusters. For 2010 clusters add code 595BKJ.
- Software feature codes 595AEB must NOT be enabled on the truck for post 2007 clusters and pre 2010 clusters. For 2010 clusters remove code 595BKK, 595BNN.
- Set desired “Engagement”, “Disengagement”, and “Re-engagement” programmable parameters.
- Add a latched switch (P/N 3578910C1) in the in-cab switch pack in the position specified by the Diamond Logic® Builder software.
- If the truck does not already have a 4-pack solenoid base, the customer should order a 4-pack base (part number 2505594C1) and an air solenoid (part number 2506711C91).
- Add wiring as per the Electrical Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid.

13WDN - PTO CONTROL Only for Line Haul and ProStar models, DASH MOUNTED For Customer Provided PTO; Includes Switch, Electric/Air Solenoid, Piping and Wiring.

REQUIRED SOFTWARE FEATURE CODES

595AEB for post 2007 and pre 2010 clusters - 595BKK or 595BNN is required to be added for 2010 clusters.

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

595ADD for post 2007 and pre 2010 clusters – 595BKJ or 595BNP is required to be removed for 2010 clusters

SOFTWARE FEATURE CODES 595AEB OR 595BKK - PROGRAMMABLE PARAMETERS

* These parameters set the conditions under which the PTO will be engaged and disengaged.

PTOb_Clutch_Pedal – Set to 0 to ignore the clutch pedal or if the vehicle does not have a clutch pedal. Set to 1 to ensure that the clutch pedal is depressed for engagement.

PTOb _Engine_Running – Set to 0 to ignore the engine. Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.

PTOb_Engine_Speed_Range – Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOb_Engine_Speed_Enable to enable this interlock.

PTOb_Transmission_Neutral – NOTE: this parameter will only work for vehicles with automated manual transmissions. Set to 0 to ignore the transmission state. Set to 1 to ensure that the transmission is in neutral for engagement.

PTOb_Park_Brake – Set to 0 to ignore the park brake. Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.

PTOb_Vehicle_Speed_Range – Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOb_Vehicle_Speed_Enable parameter to enable this interlock.

PTOb_Engine_Speed_Enable – Set to 0 to ignore the engine speed. Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOa_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.

PTOb_Engine_Speed_Alarm_Enable – Set to 0 to not have an alarm based on engine speed. Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOa_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.

PTOb_Vehicle_Speed_Enable – Set to 0 to ignore the vehicle speed. Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOa_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOb_Vehicle_Speed_Alarm_Enable _– Set to 0 to not have an alarm based on vehicle speed. Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOb _Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOb_Engine_Speed_Alarm_Range – Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOb_Vehicle_Speed_Enable parameter to enable this interlock.

PTOb_Vehicle_Speed_Alarm_Range - Set to a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. If the vehicle alarm is required for PTO operation, please use PTOb_Vehicle_Speed_Alarm_Enable to enable this alarm.

PTOa_Vehicle_Speed_Enable – Set to 0 to ignore the vehicle speed. Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOa_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOa_Engine_Speed_Enable – Set to 0 to ignore the engine speed. Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOa_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.

PTOa_Engine_Speed_Alarm_Enable – Set to 0 to not have an alarm based on engine speed. Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOa_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.

PTOa_Vehicle_Speed_Alarm_Enable _– Set to 0 to not have an alarm based on vehicle speed. Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOa_Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.

PTOa_Clutch_Pedal – Set to 0 to ignore the clutch pedal or if the vehicle does not have a clutch pedal. Set to 1 to ensure that the clutch pedal is depressed for engagement.

PTOa_Engine_Running – Set to 0 to ignore the engine. Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.

PTOa_Engine_Speed_Range – Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOa_Engine_Speed_Enable to enable this interlock.

PTOa_Park_Brake – Set to 0 to ignore the park brake. Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.

PTOa_Vehicle_Speed_Range - Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOa_Vehicle_Speed_Enable parameter to enable this interlock.

PTOa_Engine_Speed_Alarm_Range – Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOa_Vehicle_Speed_Enable parameter to enable this interlock.

PTOa_Vehicle_Speed_Alarm_Range - Set to a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. If the vehicle alarm is required for PTO operation, please use PTOa_Vehicle_Speed_Alarm_Enable to enable this alarm.

PTOa_Transmission_Neutral – NOTE: this parameter will only work for vehicles with automated manual transmissions. Set to 0 to ignore the transmission state. Set to 1 to ensure that the transmission is in neutral for engagement.

Table 165

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
PTOb_Clutch_Pedal	2017	Set to 1 to ensure that the clutch pedal is depressed for engagement.	Off	N/A	N/A	N/A
PTOb_Engine_ Running	2018	Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.	On	N/A	N/A	N/A
PTOb_Engine_ Speed_Range	2019	Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOb_Engine_Speed_Enable to enable this interlock.	300	300	3000	10
PTOb_Transmission _Neutral	2020	NOTE, this parameter will only work for vehicles with automated manual transmissions. Set to 1 to ensure that the transmission is in neutral for engagement.	Off	N/A	N/A	N/A
PTOb_Park_Brake	2021	Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.	On	N/A	N/A	N/A
PTOb_Vehicle_ Speed_Range	2031	Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOb_Vehicle_Speed_Enable parameter to enable this interlock.	3	3	100	1
PTOb_Engine_ Speed_Enable	2050	Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOb_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.	On	N/A	N/A	N/A
PTOb_Engine_ Speed_Alarm	2051	Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOb_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.	Off	N/A	N/A	N/A
PTOb_Vehicle_ Speed_Enable	2052	Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOb_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1.	On	N/A	N/A	N/A
PTOb_Vehicle_ Speed_Alarm_ Enable	2053	Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOb_Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.	Off	N/A	N/A	N/A

(PTO) POWER TAKE OFF

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
PTOb_Engine_ Speed_Alarm_ Range	2140	Set to a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. If an engine speed alarm is required for PTO operation, please use PTOb_Engine_Speed_Alarm_Enable parameter to enable this alarm.	300	300	3000	10
PTOb_Vehicle_ Speed_Alarm_ Range	2141	Set to a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. If the vehicle alarm is required for PTO operation, please use PTOb_Vehicle_Speed_Alarm_Enable to enable this alarm.	3	3	100	1
PTOa_Vehicle_ Speed_Enable	2242	Set to 1 to require the vehicle to be below a specified vehicle speed for the PTO to engage. Please use PTOa_Vehicle_Speed_Range to specify the appropriate vehicle speed if this parameter is set to 1..	On	N/A	N/A	N/A
PTOa_Engine_ Speed_Enable	2243	Set to 1 to require the vehicle to be below a specified engine speed for the PTO to be engaged. Please use PTOa_Engine_Speed_Range to specify the appropriate engine speed if this parameter is set to 1.	Off	N/A	N/A	N/A
PTOa_Engine_ Speed_Alarm_ Enable	2244	Set to 1 to have a speed that an alarm will sound when the PTO is engaged and the engine speed is greater than the set value. Please use PTOa_Engine_Speed_Alarm_Range to specify the appropriate engine speed if this parameter is set to 1.	Off	N/A	N/A	N/A
Vehicle_Speed_ Alarm_Enable PTOa	2267	Set to 1 to have a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. Please use PTOa_Vehicle_Speed_Alarm_Range to specify the appropriate vehicle speed if this parameter is set to 1.	Off	N/A	N/A	N/A
PTOa_Clutch_ Pedal	2333	Set to 1 to ensure that the clutch pedal is depressed for engagement.	Off	N/A	N/A	N/A
PTOa_Engine_ Running	2334	Set to 1 to ensure that the engine is running to engage and disengage if the engine stops running.	Off	N/A	N/A	N/A
PTOa_Engine_ Speed_Range	2336	Set to a speed that the engine has to be below for the PTO to engage. The PTO will disengage if the engine speed becomes greater than the set value. If engine speed is required for PTO operation, please use PTOa_Engine_Speed_Enable to enable this interlock.	300	300	3000	10
PTOa_Park_Brake	2338	Set to 1 to ensure that the park brake is set for engage and disengage if the park brake is released.	On	N/A	N/A	N/A

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
PTOa_Vehicle_ Speed_Range	2339	Set to the speed that the vehicle has to be below for the PTO to engage. The PTO will disengage if the vehicle speed becomes greater than the set value. If vehicle speed is required for PTO operation, please use PTOa_Vehicle_Speed_Enable parameter to enable this interlock.	3	3	100	1
PTOa_Engine_ Speed_Alarm_ Range	2340	If an engine speed alarm is required for PTO operation, please use PTOa_Engine_Speed_Alarm_Enable parameter to enable this alarm.	300	300	3000	10
PTOa_Vehicle_ Speed_Alarm_ Range	2342	Set to a speed limit that an alarm will sound when the PTO is engaged and the vehicle speed is greater than the set value. If the vehicle alarm is required for PTO operation, please use PTOa_Vehicle_Speed_Alarm_Enable to enable this alarm.	3	3	100	1
PTOa_ Transmission_ Neutral	2355	NOTE, this parameter will only work for vehicles with automated manual transmissions. Set to 1 to ensure that the transmission is in neutral for engagement.	On	N/A	N/A	N/A

SOFTWARE FEATURE CODES

595BNN (2010 Clusters, 42 Parameters)

PARAMETERS

ENGAGEMENT

These parameters set rules that must be met in order for the PTO to be engaged.

If TEM_PTO_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTO_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTO_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTO_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTO_Eng_Spd_Engmnt_Limit

If TEM_PTO_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park.

If TEM_PTO_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTO_Pk_Brake_Engmnt_Inhib parameter is turned on, then the park brake must be set in order for the PTO to be engaged.

If TEM_PTO_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the vehicle speed is over the value prescribed by TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

If TEM_PTOb_Air_Pres_Engmnt_Inhib parameter is turned on, the PTO cannot be engaged if the primary vehicle air pressure is below the programmable parameter set by TEM_PTOb_Air_Pres_Engmnt_Limit.

If TEM_PTOb_Brake_Engmnt_Inhib parameter is turned on, then the brake pedal must be depressed in order for the PTO to engage.

If TEM_PTOb_Cltch_Engmnt_Inhib parameter is turned on, then the clutch pedal must be depressed for the PTO to engage.

If TEM_PTOb_Eng_Run_Engmnt_Inhib parameter is turned on, then the engine has to be running in order for the PTO to be engaged.

If TEM_PTOb_Eng_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the engine speed is over a certain threshold, which is defined as a programmable parameter in TEM_PTOb_Eng_Spd_Engmnt_Limit

If TEM_PTOb_Neut_Engmnt_Inhib parameter is turned on, then the PTO can only be engaged if the transmission is NOT in Neutral or Park.

If TEM_PTOb_Non_Neut_Engmnt_Inhib parameter is turned on, then the transmission must be in Neutral or Park for the PTO to be engaged.

If TEM_PTOb_Pk_Brake_Engmnt_Inhib parameter is turned on, then the park brake must be set in order for the PTO to be engaged.

If TEM_PTOb_Veh_Spd_Engmnt_Inhib parameter is turned on, then the PTO cannot be engaged if the vehicle speed is over the value prescribed by TEM_PTOb_Veh_Spd_Engmnt_Limit.

If TEM_PTOb_Mast_Switch_Engmnt_Inhib parameter is turned on, then the PTO will not be engaged if the vehicle master switch is not ON.

Table 166

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Engmnt_Inhib	2097	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Air_Pres_ Engmnt_Limit	2098	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2095	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Cltch_Engmnt_ Inhib	2094	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Engmnt_Inhib	2096	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Inhib	2092	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Engmnt_Limit	2093	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTO_ Neut_Engmnt_ Inhib	2089	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Engmnt_Inhib	2088	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTO_Pk_ Brake_Engmnt_ Inhib	2087	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Inhib	2090	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Engmnt_Limit	2091	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTO_Mast_ Switch_Engmnt_ Inhib	2099	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A
TEM_PTOb_ Air_Pres_ Engmnt_Inhib	2711	If this Parameter is 1, the PTO will not be engaged if the primary vehicle air pressure is below TEM_PTO_Air_ Pres_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTOb_ Air_Pres_ Engmnt_Limit	2712	See TEM_PTO_Air_ Pres_Engmnt_ Inhib	90 psi	1	500	1
TEM_PTO_ Brake_Engmnt_ Inhib	2676	If this Parameter is 1, the PTO will not be engaged if the brake pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTOb_ Cltch_Engmnt_ Inhib	2677	If this Parameter is 1, the PTO will not be engaged when the clutch pedal is not depressed	Off	N/A	N/A	N/A
TEM_PTOb_ Eng_Run_ Engmnt_Inhib	2678	If this Parameter is 1, the PTO will not be engaged if the engine is not running	Off	N/A	N/A	N/A

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTOb_ Eng_Spd_ Engmnt_Inhib	2679	If this Parameter is 1, the PTO will not be engaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTOb_ Eng_Spd_ Engmnt_Limit	2680	See TEM_PTO_Eng_ Spd_Engmnt_ Inhib	1000 RPM	100	5000	1
TEM_PTOb_ Neut_Engmnt_ Inhib	2681	If this Parameter is 1, the PTO will only be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTOb_ Non_Neut_ Engmnt_Inhib	2682	If this Parameter is 1, the PTO will not be engaged if the Transmission is not in Neutral or Park	Off	N/A	N/A	N/A
TEM_PTOb_Pk_ Brake_Engmnt_ Inhib	2683	If this Parameter is 1, the PTO will not be engaged if the Park Brake is not set.	Off	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ Engmnt_Inhib	2684	If this Parameter is 1, the PTO will not be engaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_Engmnt_ Limit	On	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ Engmnt_Limit	2685	See TEM_PTO_Veh_ Spd_Engmnt_ Inhib	3 MPH	1	100	1
TEM_PTOb_Mast_ Switch_Engmnt_ Inhib	2714	If this Parameter is 1, the PTO will not be engaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

DISENGAGEMENT

These parameters set the conditions under which the PTO will be disengaged.

If TEM_PTO_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTO_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTO_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTO_Eng_Spd_DisEng_Limit.

If TEM_PTO_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTO_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTO_Veh_Spd_DisEng_Limit.

If TEM_PTO_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTO_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

If TEM_PTOb_Air_Pres_Disengages parameter is turned on, then the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_Pres_DisEng_Limit.

If TEM_PTOb_Eng_Run_Disengages parameter is turned on, then the PTO will be disengaged if the engine is turned off.

If TEM_PTOb_Eng_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the engine speed rises above the value set by TEM_PTOb_Eng_Spd_DisEng_Limit.

If TEM_PTOb_ Non_Neut _Disengages parameter is turned on, then the PTO will be disengaged if the transmission is taken out of neutral.

If TEM_PTOb_Pk_Brake_Disengages parameter is turned on, then the PTO will be disengaged if the Park Brake is released.

If TEM_PTOb_Veh_Spd_Disengages parameter is turned on, then the PTO will be disengaged if the vehicle speed is over the valued specified by TEM_PTOb_Veh_Spd_DisEng_Limit.

If TEM_PTOb_Ext_Input_Disengages is turned on, then the PTO will be disengaged if the external input designated for this purpose is active.

If TEM_PTOb_Mast_Switch_Disengages is turned on, then the PTO will be disengaged if the vehicle master switch is not ON.

Table 167

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ DisEng_Limit	2116	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1
TEM_PTO_ Air_Pres_ Disengages	2115	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Disengages	2114	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ DisEng_Limit	2113	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTO_ Eng_Spd_ Disengages	2112	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Disengages	2109	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Disengages	2108	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Disengages	2110	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ DisEng_Limit	2111	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTO_Ext_ Input_Disengages	2117	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Disengages	2118	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A
TEM_PTOb_ Air_Pres_ DisEng_Limit	2719	See TEM_PTO_Air_ Pres_Disengages	80 psi	0	500	1

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTOb_ Air_Pres_ Disengages	2716	If this Parameter is 1, the PTO will be disengaged if the primary air pressure is below the value set in TEM_PTO_Air_ Pres_DisEng_ Limit.	On	N/A	N/A	N/A
TEM_PTOb_ Eng_Run_ Disengages	2686	If this Parameter is 1, the PTO will be disengaged if the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTOb_ Eng_Spd_ DisEng_Limit	2687	See TEM_PTO_ Eng_Spd_ Disengages	1800 RPM	0	5000	1
TEM_PTOb_ Eng_Spd_ Disengages	2688	If this Parameter is 1, the PTO will be disengaged if the engine speed is over the value set in TEM_PTO_Eng_ Spd_DisEng_ Limit	On	N/A	N/A	N/A
TEM_PTOb_ Non_Neut_ Disengages	2689	If this Parameter is 1, the PTO will be disengaged if the transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTOb_ Pk_Brake_ Disengages	2690	If this Parameter is 1, the PTO will be disengaged if the Park Brake is released.	Off	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ Disengages	2691	If this Parameter is 1, the PTO will be disengaged if the vehicle speed is over the value set in TEM_PTO_Veh_ Spd_DisEng_ Limit.	Off	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ DisEng_Limit	2692	See TEM_PTO_Veh_ Spd_Disengages	0 MPH	3	100	1
TEM_PTOb_Ext_ Input_Disengages	2772	If this Parameter is 1, the PTO will be disengaged if the external input designated for this purpose is active	Off	N/A	N/A	N/A
TEM_PTOb_Mast_ Switch_Disengages	2718	If this Parameter is 1, the PTO will be disengaged if the vehicle master switch is not ON	Off	N/A	N/A	N/A

RE-ENGAGEMENT

These parameters set the conditions under which the PTO can be reengaged.

If TEM_PTO_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTO_Air_Pres_Engmnt_Limit.

If TEM_PTO_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTO_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTO_Eng_Spd_Engmnt_Limit.

If TEM_PTO_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTO_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTO_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTO_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTO_Veh_Spd_Engmnt_Limit.

If TEM_PTO_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

If TEM_PTO_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

If TEM_PTOb_Air_Pres_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to low air pressure) when the primary air pressure rises about the value specified by TEM_PTOb_Air_Pres_Engmnt_Limit.

If TEM_PTOb_Eng_Run_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine stopping) when the engine is restarted.

If TEM_PTOb_Eng_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to engine overspeed) when the engine speed falls below TEM_PTOb_Eng_Spd_Engmnt_Limit.

If TEM_PTOb_Key_State_Allow_ReEng parameter is turned on, then the PTO will be allowed to reengage when the key state is returned to run.

If TEM_PTOb_Non_Neut_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to transmission out of neutral) when the transmission is placed back into neutral.

If TEM_PTOb_Pk_Brake_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to park brake released) when the park brake is reapplied.

If TEM_PTOb_Veh_Spd_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after disengagement due to the vehicle being over the vehicle speed value) when the vehicle speed falls below TEM_PTOb_Veh_Spd_Engmnt_Limit.

If TEM_PTOb_Ext_Input_Allow_ReEng parameter is turned on, then the PTO will be reengaged (after a disengage due to the designated external input being in active state) when the external input is no longer in active state.

If TEM_PTOb_Mast_Switch_Allow_ReEng is turned on, then the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again.

Table 168

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Allow_ReEng	2124	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Run_ Allow_ReEng	2122	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Allow_ReEng	2120	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTO_ Key_State_ Allow_ReEng	2069	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTO_ Non_Neut_ Allow_ReEng	2148	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Allow_ReEng	2149	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Allow_ReEng	2119	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTO_Ext_ Input_Allow_ReEng	2121	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTO_Mast_ Switch_Allow_ ReEng	2123	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A
TEM_PTOb_ Air_Pres_ Allow_ReEng	2713	If this Parameter is 1, the PTO will be reengaged after disengagement due to low vehicle air pressure when the primary air pressure is over TEM_PTO_Air_ Pres_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTOb_ Eng_Run_ Allow_ReEng	2693	If this Parameter is 1, the PTO will be reengaged after disengagement due to the engine stopping when the engine is restarted.	Off	N/A	N/A	N/A
TEM_PTOb_ Eng_Spd_ Allow_ReEng	2694	If this Parameter is 1, the PTO will be reengaged after disengagement due to engine overspeed when the engine speed is below TEM_PTO_Eng_ Spd_Engmnt_ Limit.	On	N/A	N/A	N/A
TEM_PTOb_ Key_State_ Allow_ReEng	2696	If this parameter is set, the PTO will be allowed to reengage when the key state is returned to run.	Off	N/A	N/A	N/A
TEM_PTOb_ Non_Neut_ Allow_ReEng	2697	If this Parameter is 1, the PTO will be reengaged after disengagement due to transmission out of neutral when the transmission is placed back into neutral.	Off	N/A	N/A	N/A

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTOb_ Pk_Brake_ Allow_ReEng	2698	If this Parameter is 1, the PTO will be reengaged after disengagement due to park brake released when the park brake is reapplied.	Off	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ Allow_ReEng	2699	If this Parameter is 1, the PTO will be reengaged after disengagement due to vehicle overspeed when the vehicle speed is below TEM_PTO_Veh_ Spd_Engmnt_ Limit.	Off	N/A	N/A	N/A
TEM_PTOb_Ext_ Input_Allow_ReEng	2771	If this Parameter is 1, the PTO will be reengaged after a disengage due to the designated external input when the external input is no longer active	Off	N/A	N/A	N/A
TEM_PTOb_Mast_ Switch_Allow_ ReEng	2715	If this Parameter is 1, the PTO will be reengaged after a disengage due to the master switch being turned off when the master switch is turned on again	Off	N/A	N/A	N/A

ALARMS

These parameters utilize the gauge cluster to sound an alarm to the driver when certain programmable parameters are violated.

If TEM_PTO_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTO_Air_Pres_Alarm_Limit.

If TEM_PTO_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the engine is turned off.

If TEM_PTO_Eng_Spd_Alarms parameter is turned on, then an alarm will sound in the cab if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTO_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTO_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the park brake is released

If TEM_PTO_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

If TEM_PTOb_Air_Pres_Alarms parameter is turned on, then an audible alarm will sound in the cab if the primary air pressure drops below the value specified by TEM_PTOb_Air_Pres_Alarm_Limit.

If TEM_PTOb_Eng_Run_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the engine is turned off.

If TEM_PTOb_Eng_Spd_Alarms parameter is turned on, then an alarm will sound in the cab if the PTO is engaged and the engine speed is over the value set by TEM_PTO_Eng_Spd_Alarm_Limit.

If TEM_PTOb_Non_Neut_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the transmission is taken out of neutral.

If TEM_PTOb_Pk_Brake_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the park brake is released

If TEM_PTOb_Veh_Spd_Alarms parameter is turned on, then an audible alarm will sound in the cab if the PTO is engaged and the vehicle speed is about the value set by TEM_PTO_Veh_Spd_Alarm_Limit.

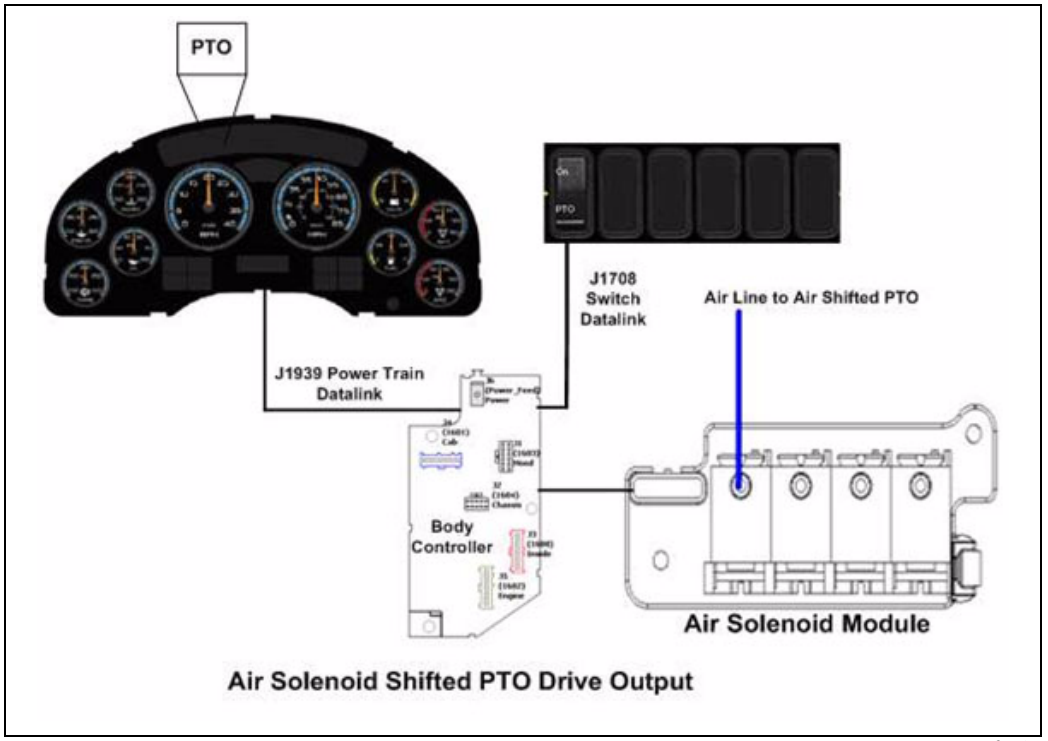
Table 169

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
TEM_PTO_ Air_Pres_ Alarms	2138	If this Parameter is 1, an alarm will sound if the primary air pressure is below TEM_PTO_Air_ Pres_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Air_Pres _Alarm_Limit	2139	See TEM_PTO_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTO_ Eng_Run_ Alarms	2137	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTO_ Eng_Spd_ Alarms	2135	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEMP_PTO_Eng_ Spd_Alarm_Limit	2136	See TEM_PTO_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTO_ Non_Neut_ Alarms	2132	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTO_ Pk_Brake_ Alarms	2131	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTO_ Veh_Spd_ Alarms	2133	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTO_Veh_ Spd_Alarm_Limit	2134	See TEM_PTO_Veh_Spd_Alarms	5 mph	3	100	1
TEM_PTOb_ Air_Pres_ Alarms	2700	If this Parameter is 1, an alarm will sound if the primary air pressure is below TEM_PTO_Air_ Pres_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTOb_Air_ Pres_Alarm_Limit	2701	See TEM_PTOb_Air_Pres_Alarms	0 psi	0	500	1
TEM_PTOb_ Eng_Run_ Alarms	2702	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine is turned off.	Off	N/A	N/A	N/A
TEM_PTOb_ Eng_Spd_ Alarms	2704	If this Parameter is 1, an alarm will sound if the PTO is engaged and the engine speed is over TEM_PTO_Eng_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEMP_PTOb_Eng_ Spd_Alarm_Limit	2703	See TEM_PTOb_Eng_Spd_Alarms	1400 RPM	0	5000	0.1
TEM_PTOb_ Non_Neut_ Alarms	2705	If this Parameter is 1, an alarm will sound if the PTO is engaged and transmission is taken out of neutral.	Off	N/A	N/A	N/A
TEM_PTOb_ Pk_Brake_ Alarms	2706	If this Parameter is 1, an alarm will sound if the PTO is engaged and the park brake is released	Off	N/A	N/A	N/A
TEM_PTOb_ Veh_Spd_ Alarms	2708	If this Parameter is 1, an alarm will sound if the PTO is engaged and the vehicle speed is over TEM_PTO_Veh_ Spd_Alarm_Limit.	Off	N/A	N/A	N/A
TEM_PTOb_Veh_ Spd_Alarm_Limit	2709	See TEM_PTOb_Veh_Spd_Alarms	5 mph	3	100	1

WIRING INFORMATION

Customer must supply and route air plumbing from the Navistar-provided air solenoid (Located inside the driver's side frame rail, adjacent to the Transmission) to the PTO.

(PTO) POWER TAKE OFF



f_137

TESTING

1. Depress the In-cab PTO 1 or PTO 2 switch to the ON position.
2. Verify that all enabled interlock conditions are met.
3. Verify that the Navistar-provided air solenoid is supplying air pressure at the solenoid output.

HOW TO ADD THIS FEATURE

- Software feature codes 595AEB must be added to the truck using the Diamond Logic® Builder software for post 2007 and pre 2010 clusters – Code 595BKK or 595BNN must be added for 2010 clusters.
- Software feature codes 595ADD must NOT be enabled on the truck for post 2007 and pre 2010 clusters – Code 595BJKKJ, BNP must be removed for 2010 clusters.
- Set desired “Engagement”, “Disengagement”, and “Re-engagement” programmable parameters.
- Add two latched switches (P/N 3578910C1) in the in-cab switch pack in the position specified by the Diamond Logic® Builder software.
- If the truck does not already have a 4-pack solenoid base, the customer should order a 4-pack base (part number 2505594C1) and two air solenoids (part number 2506711C91).
- Add wiring as per the Electrical Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid.

PTO HOURMETER

16WLM

HOURMETER, PTO for Customer Provided PTO; Indicator Light and Hourmeter in Gauge Cluster Includes Return Wire for PTO Feedback Switch

This feature provides the customer with a wire (Circuit K88B 14 gauge, light green – cut blunt – located in the transmission harness) to be wired into a PTO body builder-installed feedback switch. Also included in this feature is a PTO indicator light in the gauge cluster and a PTO hourmeter, which allows the operator to measure stationary PTO hours for maintenance records and fuel tax purposes. To view the hourmeter, press the gauge cluster selection button momentarily until the text portion of the display indicates “PTO Hour”.

This feature cannot be used if 16HGJ (Optional Transmission Oil Temperature Gauge for a MANUAL Transmission) is utilized.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

595AJU and (595AYN, for pre-2010 OR 595BJT for post-2010)

SOFTWARE FEATURE CODES THAT MUST NOT BE ENABLED

595AEW

The BC_PTO_Engaged_Param parameter defines the voltage that will be read as the active state for the PTO engagement feedback switch.

0 = Input active when open circuit

1 = Input active when grounded

3 = Input active when at 12V

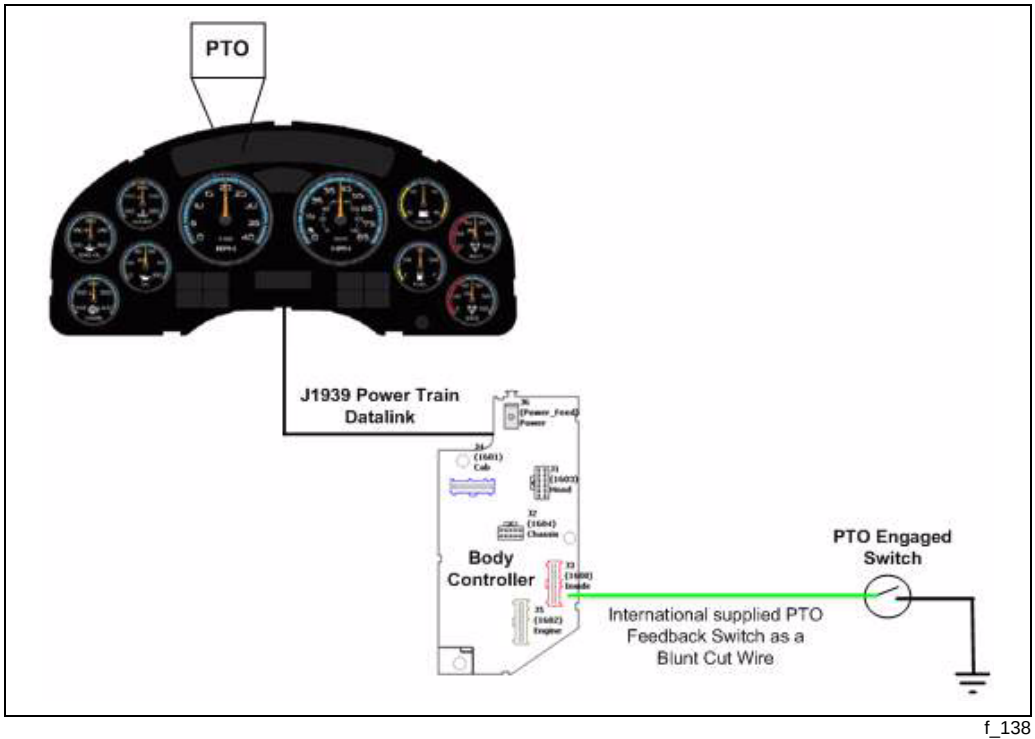
Table 170

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
BC_PTO_ Engaged_ Param	2199	Active State for the PTO engagement feedback switch.	No_Units	N/A	NA	NA

WIRING INFORMATION

The customer must wire the Navistar-provided PTO engagement feedback return wire (14 gauge, Light Green) into the PTO feedback switch which should be a GND active switch.

(PTO) POWER TAKE OFF



f_138

TESTING

1. Customer should apply the correct active state voltage (as programmed in the Diamond Logic® Builder software) to the Navistar-provided PTO engagement feedback wire.
2. Verify that the PTO indicator light in the gauge cluster comes on and stays on as long as the active state voltage is applied.

HOW TO ADD THIS FEATURE

- The customer must enable software feature code 595AJU and 595AYN using the Diamond Logic® Builder software.
- The customer must make sure that software feature code 595AEW is NOT enabled using the Diamond Logic® Builder software.
- The customer must set BC_PTO_Engaged_Param to desired active state for the PTO feedback switch.
- When adding this feature to a vehicle, alternate wiring methods must be performed. It is not possible to add a wire to connector 1702 pin 13 as described by the electrical circuit diagram manual. The dash panel grommet is sealed, and additional wires may not be added.
- In order to add this feature, connect an 18 gauge wire to the PTO feedback switch, and terminate it in an open wire terminal cavity in connector 1700 or 1701.
- Add another 18 gauge wire in the corresponding cavity on the cab harness connector, and terminate it in the BC Connector 1600 terminal pin B7.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE MOUNTED ENGINE CONTROL

12VXY

ENGINE CONTROL, REMOTE MOUNTED Provisions for: Includes module and connector for Body Builder installation of remote engine speed control with SAE J1939 communication with MaxxForce electronic engines.

12VZA

ENGINE CONTROL, REMOTE MOUNTED Provision for, Includes Wiring for Body Builder Installation of PTO Controls, With Ignition Switch Control for International® post 2007 Emissions Electronic Engines

12VZB

ENGINE CONTROL, REMOTE MOUNTED for PTO with MaxxForce 11 & 13 Engines

Feature codes 12VZA, 12VZB and 12VXY are available to control engine speed from outside the cab. 12VZA and 12VZB are hardwired remote engine speed control solutions and Remote Engine Speed Control Module (RESCM) feature code 12VXY utilizes the Diamond Logic® Electrical System to control engine speed. The operation of the engine control features behaves exactly the same whether the body builder switches are hardwired (12VZA) or multiplexed (12VXY).

Feature code 12VXY is an accommodation for a Remote Engine Speed Control Module (RESCM). This feature also provides a public J1939 datalink to the Body Controller (BC) from the RESCM. The feature has associated software (595AHA) that is programmed into the BC, which allows it to control the engine remotely through the RESCM.

There are programmable parameters that are used by 12VXY both in the BC and the Engine Control Module (ECM). The parameters in the BC are listed below and the parameters in the ECM allow the selection of disabling the cab controls, engine speed presets, stationary or variable speed control, etc. The ECM parameters are programmed with either the Master Diagnostics or ServiceMaxx software.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS (12VXY ONLY)

REQUIRED SOFTWARE FEATURE CODES

595AHA

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

The Remote_Accelerator_Enable parameter is used to enable or disable the remote accelerator function within the RESCM feature. If the parameter is set to 1, the remote accelerator function is enabled. If the parameter is set to 0, the remote accelerator function is disabled.

The RESCM_Require_Park_Brake parameter is used to enable or disable the park brake interlock within the RESCM feature. If the parameter is set to 1, the park brake interlock is enabled. If the parameter is set to 0, the park brake interlock is disabled.

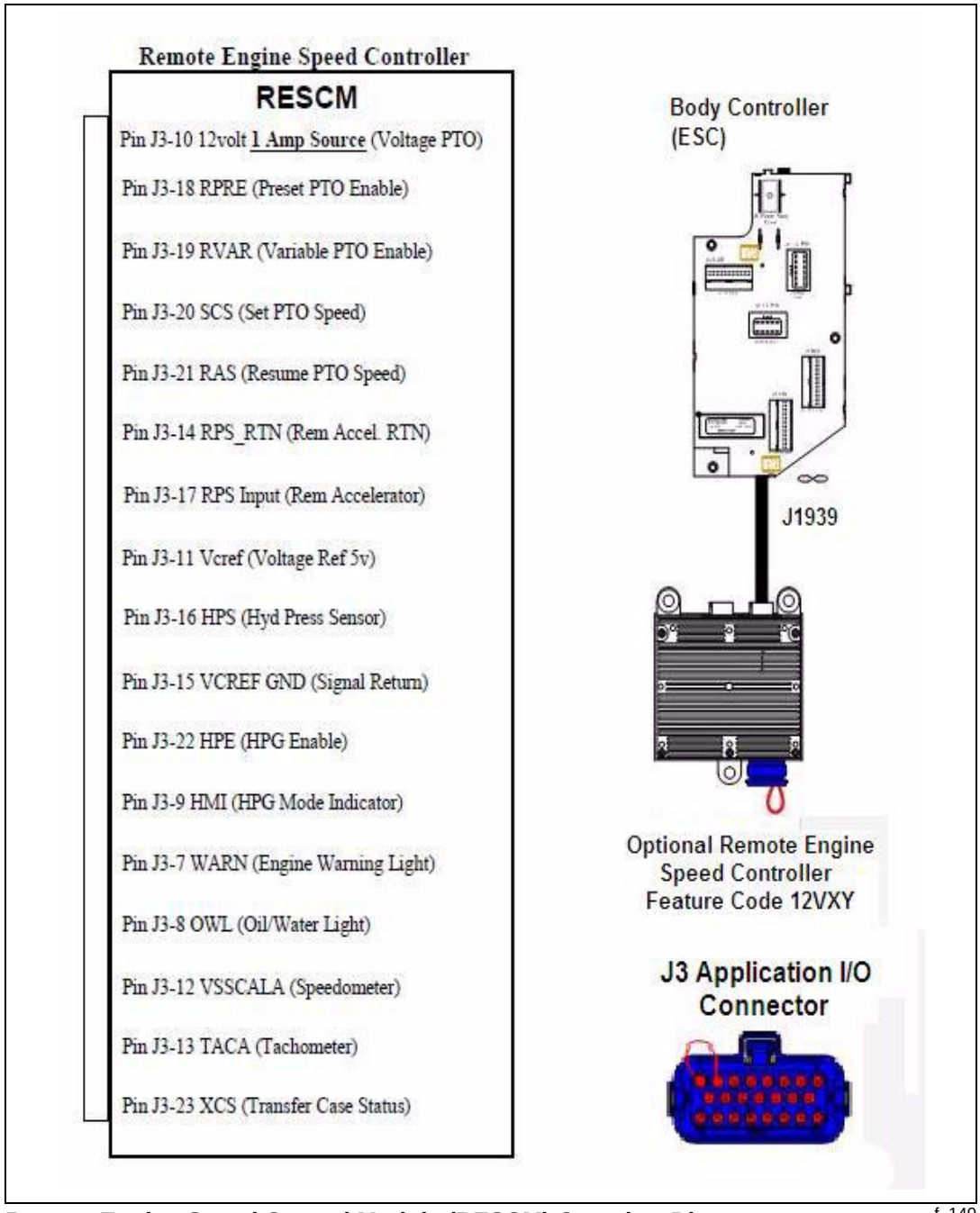
REMOTE ENGINE SPEED CONTROL FEATURES

Table 161

Parameter	ID	Description	Default	Units	Min	Max	Step
Remote_ Accelerator_ Enable	1870	Enables the remote accelerator.	1	None	-	1	1
RESCM_ Require_Park_ Brake	2240	Enables the park brake interlock for RESCM.	1	None	-	1	1

REMOTE ENGINE SPEED CONTROL FEATURES

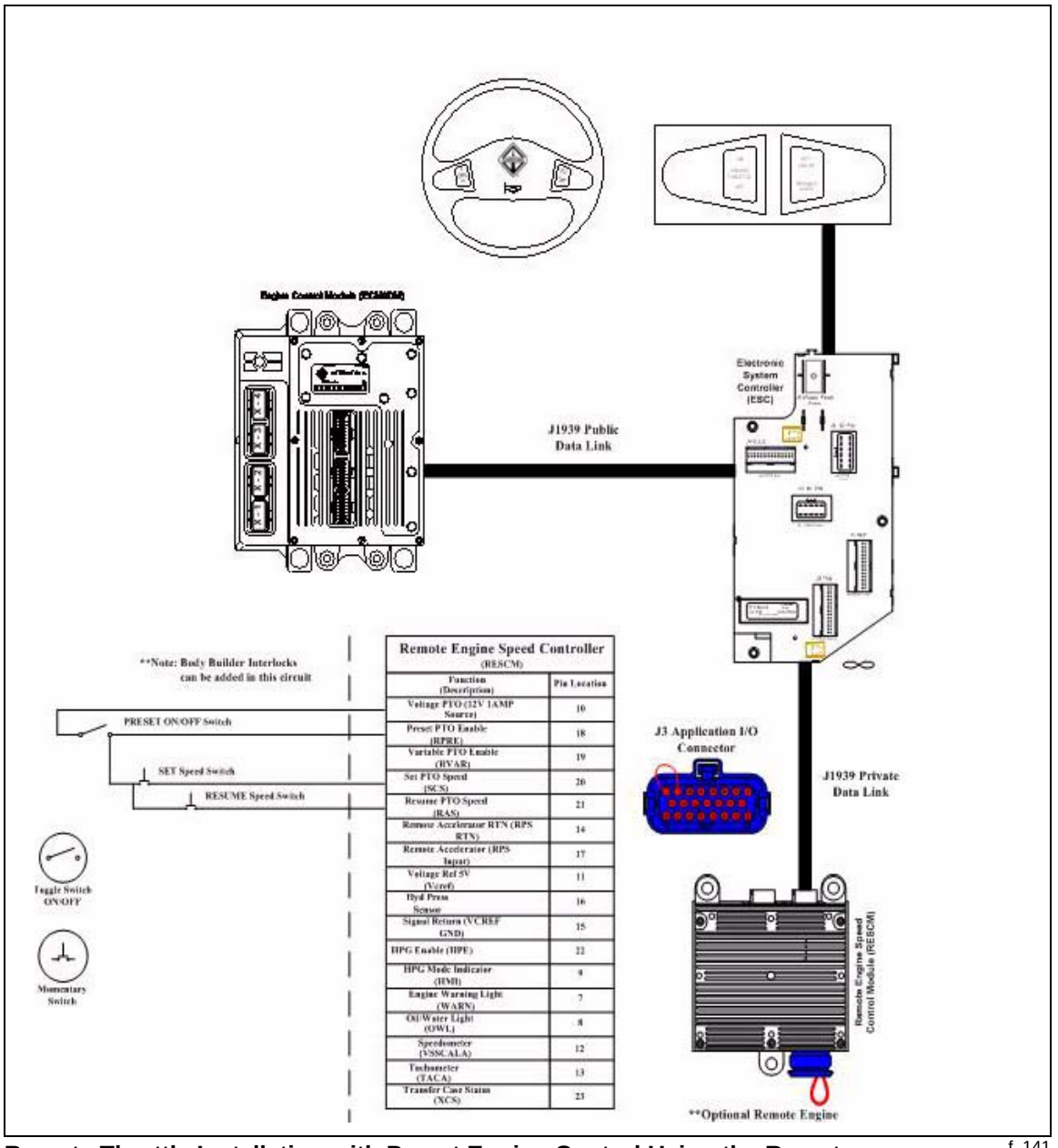
RESCM WIRING INFORMATION



Remote Engine Speed Control Module (RESCM) Overview Diagram f_140

REMOTE ENGINE SPEED CONTROL FEATURES

PRESET THROTTLE INFORMATION



Remote Engine Speed Controller (RESCM)	
Function (Description)	Pin Location
Voltage PTO (12V 1AMP Source)	10
Preset PTO Enable (RPRE)	18
Variable PTO Enable (RVAR)	19
Set PTO Speed (SCS)	20
Resume PTO Speed (RAS)	21
Remote Accelerator RTN (RPS RTN)	14
Remote Accelerator (RPS Input)	17
Voltage Ref 5V (Vcref)	11
Hyd Press Sensor	16
Signal Return (VCREF GND)	15
HPG Enable (HPE)	22
HPG Mode Indicator (HMI)	9
Engine Warning Light (WARN)	7
Oil/Water Light (OWL)	8
Speedometer (VSSCALA)	12
Tachometer (TACA)	13
Transfer Case Status (NCS)	23

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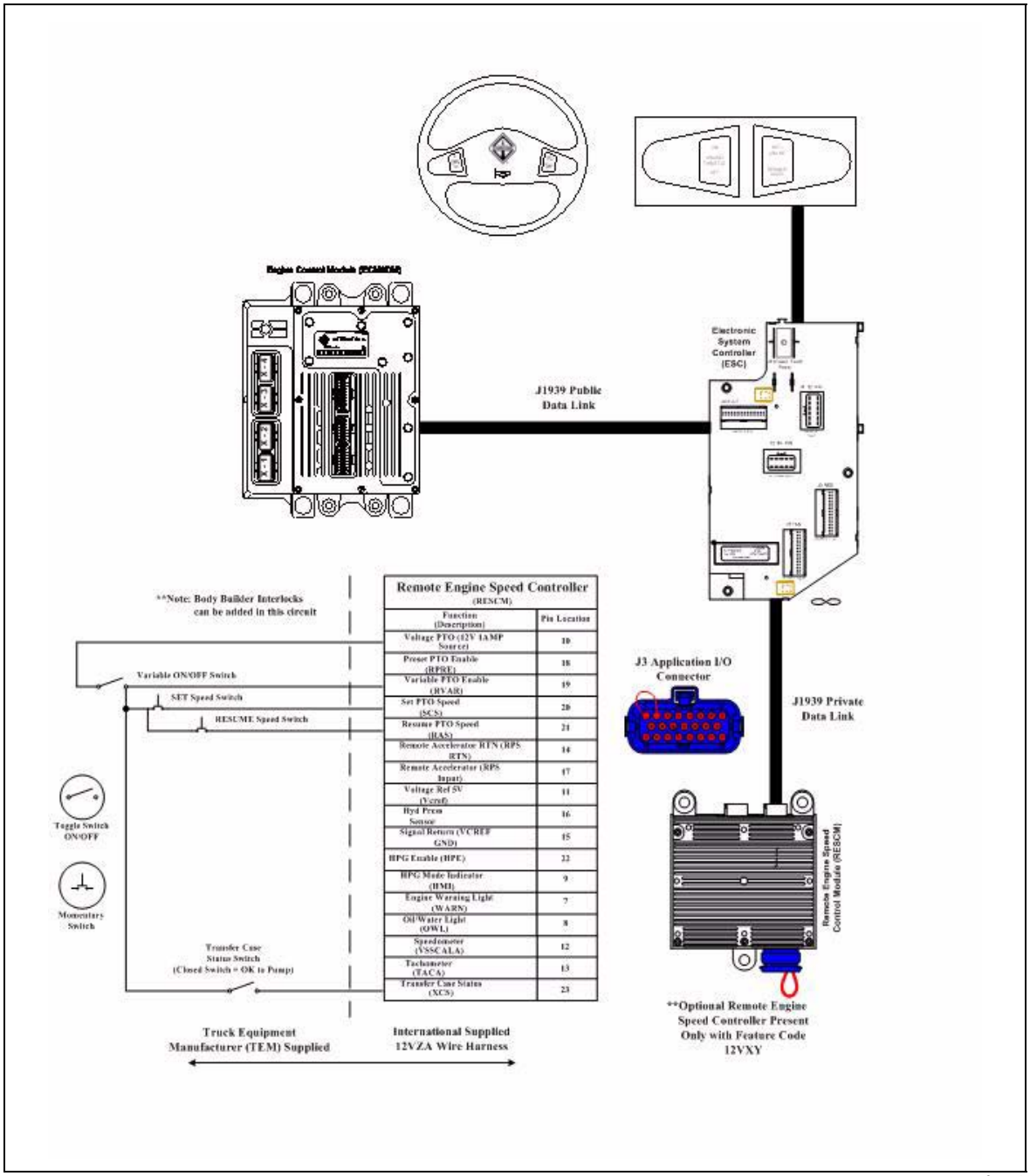
Remote Throttle Installation with Preset Engine Control Using the Remote Engine Speed Controller (RESCM)

REMOTE ENGINE SPEED CONTROL FEATURES

Split Shaft Throttle Information



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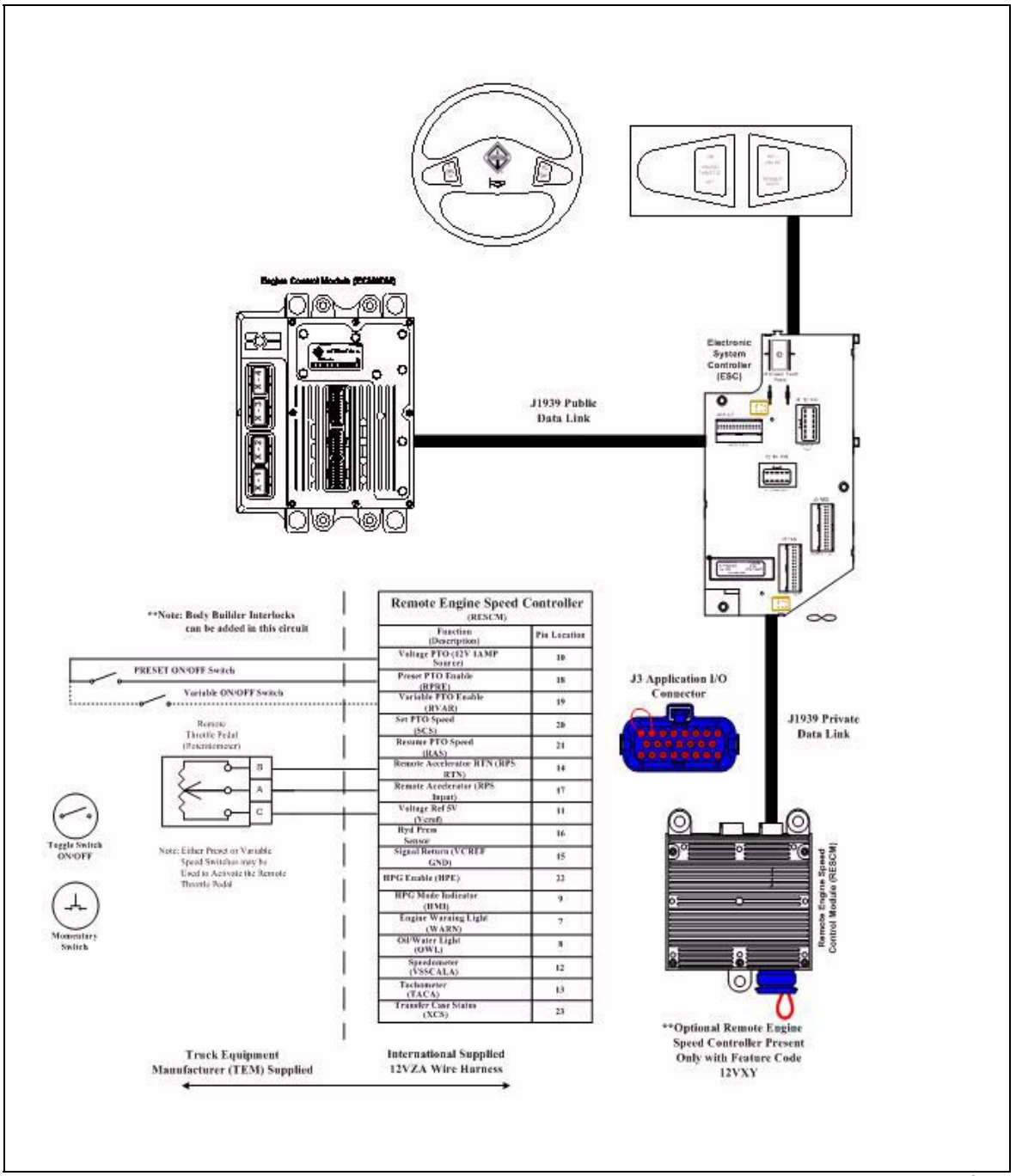
Remote Throttle Installation with Split Shaft Engine Control Using the Remote Engine Speed Controller (RESCM)

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE PEDAL INFORMATION



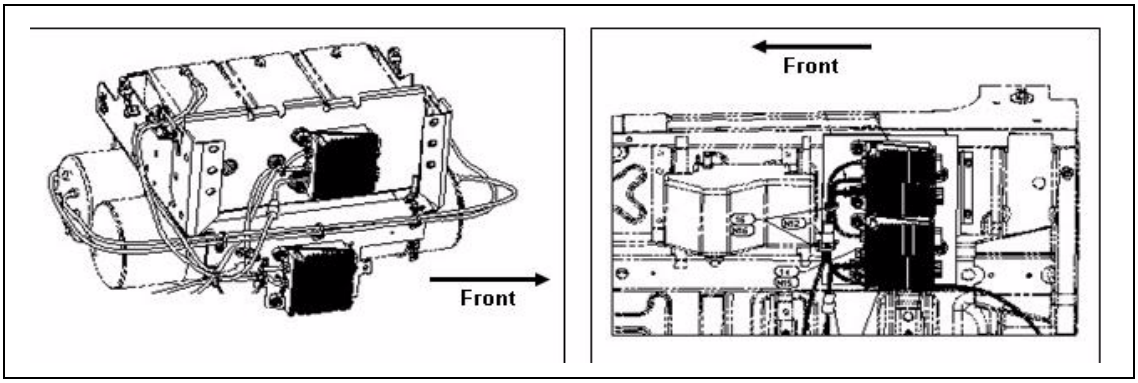
f_143

Remote Throttle Installation with a Remote Throttle Pedal Control Using the Remote Engine Speed Controller (RESCM)

REMOTE ENGINE SPEED CONTROL FEATURES

Location of Body Builder Wiring on 12VZA or 12VZB

f_144



RESCM Located on Battery Box on DuraStar Models

RESCM Located Under Cab on WorkStar Models

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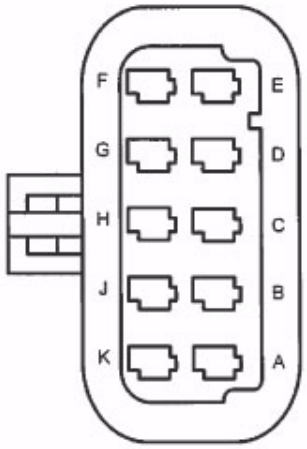
REMOTE ENGINE SPEED CONTROL FEATURES

The following page shows the connectors associated with the different sales feature codes for the Engine Body Builder connectors on both the I6 and IBB Navistar products. The connectors can be located in the engine compartment near the megafuse above the driver side wheel well.

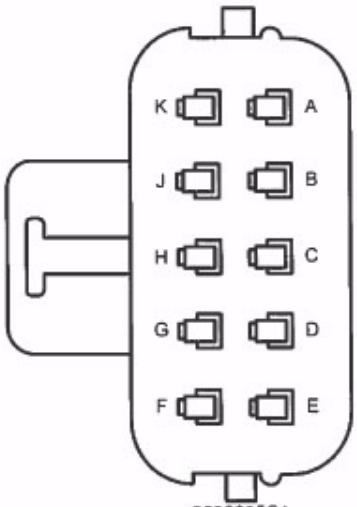
On the IBB connectors, both the he male and female connectors and terminals are used in the same way as the transmission Body Builder connectors.

REMOTE ENGINE SPEED CONTROL FEATURES



3538634C1
Terminal: 1667742C1 – 16/18g
Seal: 1661872C1 – 16/18g
Lock: 3538636C1
Pin side view

Bodybuilder Circuit	Function	Connector 4705 Cavity	Engine Connector and Pin
KJ92A15	Power	A	6018 17
KJ92A11	PTO Preset Enable	B	6019 48
KJ92A12	Variable PTO Enable	C	6019 35
KJ92A13	Preset 1 (Set)	D	6019 52
KJ92A9	Preset 2 (Resume)	E	6019 23
KJ92A10	Speedometer Output	F	6019 30
KJ92A8	Clean Tach Output	G	6019 9
KJ92A16	Malfunction Indicator Light	H	6018 57
KJ92A17	Engine Running Output	J	6018 56
Plug		K	



3538635C1
Terminal: 1661875C1 – 16/18g
Seal: 1661872C1 – 16/18g
Lock: 3538636C1
Pin side view

Bodybuilder Circuit	Function	Connector 4706 Cavity	Engine Connector and Pin
KJ92A5	Remote Pedal Signal	A	6018 13
KJ92A4	Voltage Reference 5V	B	6018 37
SG92A3 SH92A3	Signal Ground	C	6018 24
KJ92A14	Warn Engine Lamp	D	6019 17
KJ92A2	Red Stop Lamp	E	6019 28
KJ92A6	Wait To Start Light	F	6019 15
KJ92A7	Split Shaft Input/Tease	G	6019 10
SG92A1 SH92A1	Auxiliary Engine Shutdown	H	6019 13
KJ92A18	Remote Pedal Sw	J	1619 46
Plug		K	

Post 2010 IBB Engine Bodybuilder Circuits

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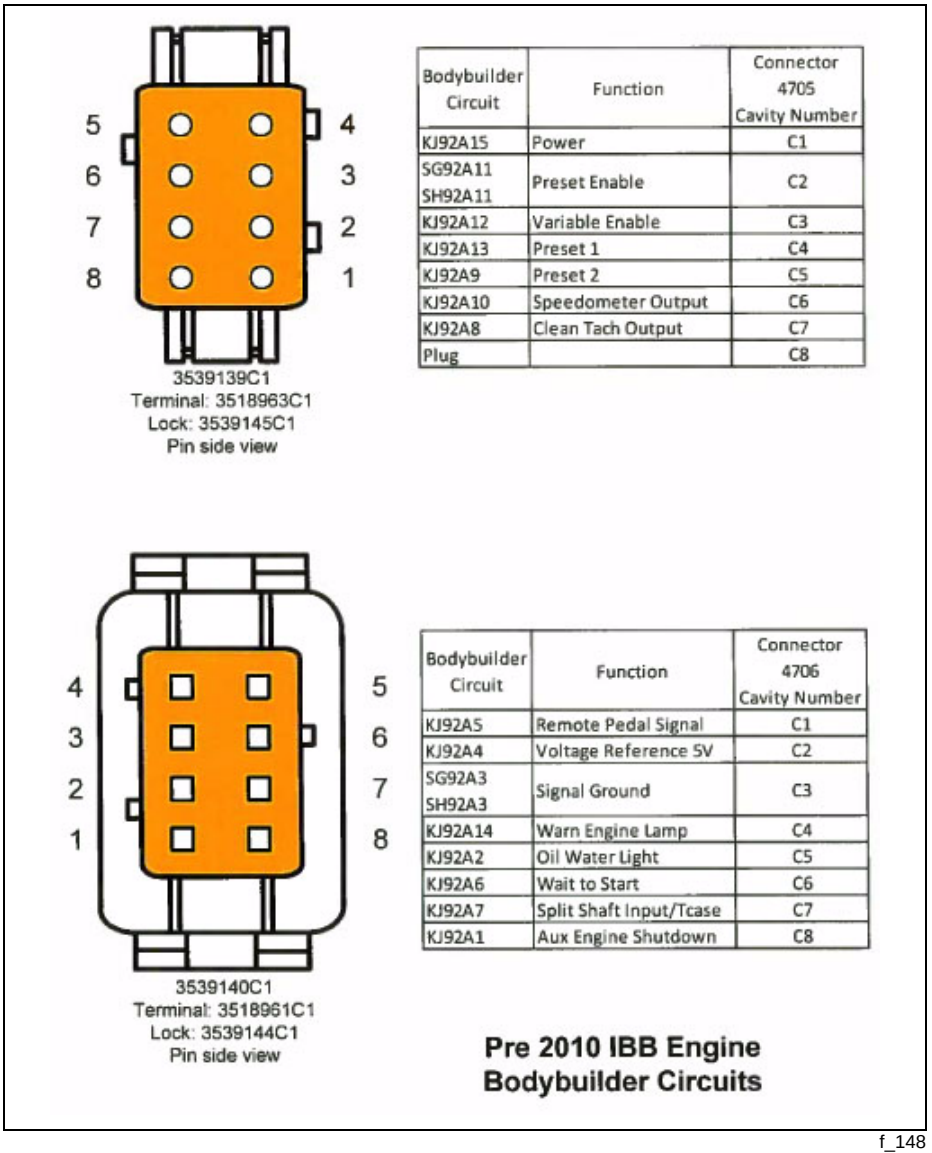
REMOTE ENGINE SPEED CONTROL FEATURES



Bodybuilder Circuit	Function	Connector 4705 Cavity Number
KJ92A15	Power	C1
SG92A11 SH92A11	Preset Enable	C2
KJ92A12	Variable Enable	C3
KJ92A13	Preset 1	C4
KJ92A9	Preset 2	C5
KJ92A10	Speedometer Output	C6
KJ92A8	Clean Tach Output	C7
Plug		C8

Bodybuilder Circuit	Function	Connector 4706 Cavity Number
KJ92A5	Remote Pedal Signal	C1
KJ92A4	Voltage Reference 5V	C2
SG92A3 SH92A3	Signal Ground	C3
KJ92A14	Warn Engine Lamp	C4
KJ92A2	Oil Water Light	C5
KJ92A6	Wait to Start	C6
KJ92A7	Split Shaft Input/Tcase	C7
KJ92A1	Aux Engine Shutdown	C8

Pre 2010 IBB Engine Bodybuilder Circuits

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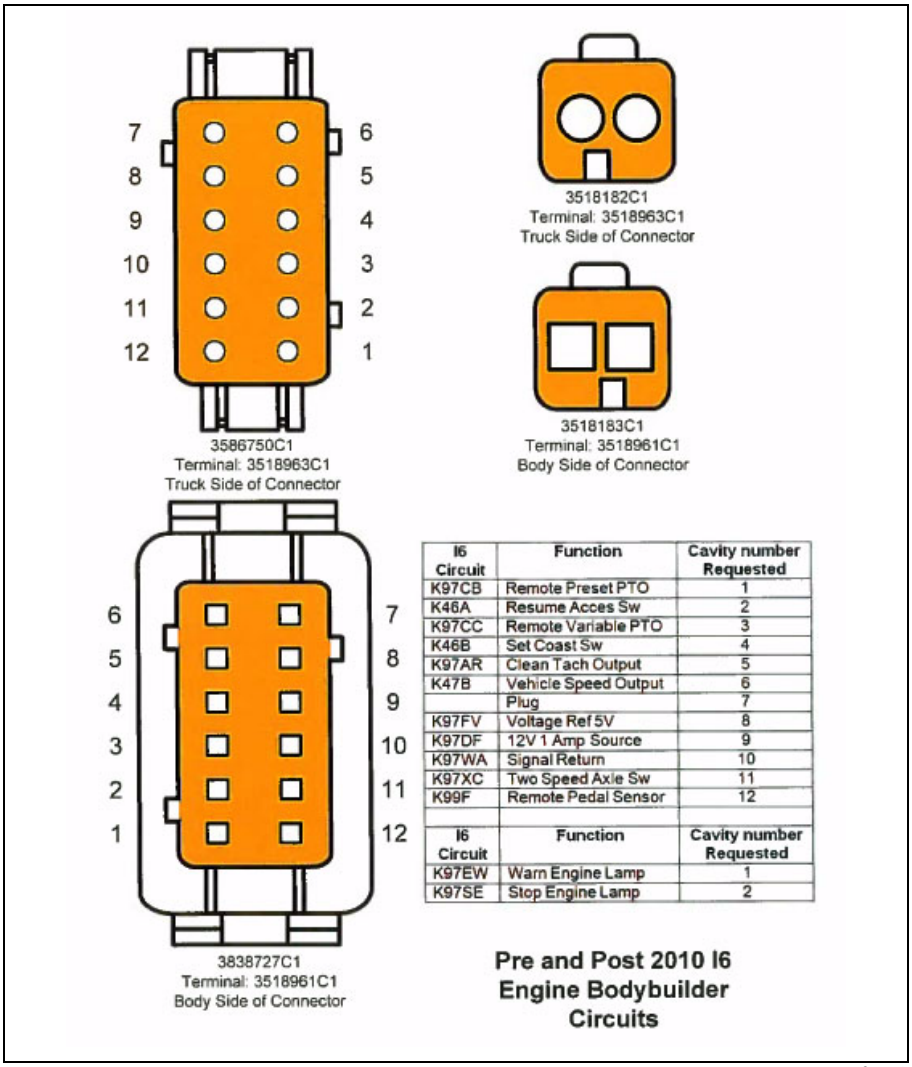
REMOTE ENGINE SPEED CONTROL FEATURES



I6 Circuit	Function	Cavity number Requested
K97CB	Remote Preset PTO	1
K46A	Resume Acces Sw	2
K97CC	Remote Variable PTO	3
K46B	Set Coast Sw	4
K97AR	Clean Tach Output	5
K47B	Vehicle Speed Output	6
	Plug	7
K97FV	Voltage Ref 5V	8
K97DF	12V 1 Amp Source	9
K97WA	Signal Return	10
K97XC	Two Speed Axle Sw	11
K99F	Remote Pedal Sensor	12

I6 Circuit	Function	Cavity number Requested
K97EW	Warn Engine Lamp	1
K97SE	Stop Engine Lamp	2

Pre and Post 2010 I6 Engine Bodybuilder Circuits

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TESTING

12VXY is tested and programmable parameters are set with Master Diagnostics or ServiceMaxx Software packages.

REMOTE ENGINE SPEED CONTROL FEATURES

THROTTLE, HAND CONTROL, STATIONARY, VARIABLE SPEED

12VXT

THROTTLE, HAND CONTROL Engine Speed Control; Electronic, Stationary, Variable Speed; Mounted on Steering Wheel

Stationary Variable Speed feature 12VXT allows the equipment operator to feather engine speed up or down to make fine adjustments to engine speed to achieve the desired functionality. The vehicle must be in a stationary position. Application examples are Fire (to throttle up to get a certain water flow), Utility Bucket, Crane, and Digger Derrick.

Software Feature Codes/Programmable Parameters

Required Software Feature Code

No software in the Body Controller (BC) is required.

Software Feature Codes That Must Be Removed

None

Wiring Information

No additional wiring is associated with this feature.

Testing

This feature is added by programming the Engine Control Module (ECM) for stationary, variable speed control.

Refer to the Body Builder Book CT-471 (PBB-71000A) for engine ECM programming functionality.

THROTTLE, HAND CONTROL, STATIONARY PRE-SET

12VXU

THROTTLE, HAND CONTROL Engine Speed Control for PTO; Electronic, Stationary Pre-Set, Two Speed Settings; Mounted on Steering Wheel

Stationary Preset Speed feature 12VXU allows the user to operate auxiliary equipment at two pre-determined engine speed settings while in a stationary position. Application examples are Garbage Packer, Recovery, Sewer Suckers, and other applications that are meant to run at a set speed.

Software Feature Codes/Programmable Parameters

Required Software Feature Code

No software in the BC is required.

Software Feature Codes That Must Be Removed

None

Wiring Information

No additional wiring is associated with this feature.

Testing

This feature is added by programming the Engine Control Module (ECM) for stationary, pre-set speed control.

Refer to the Body Builder Book CT-471 (PBB-71000A) for engine ECM programming functionality.

REMOTE ENGINE SPEED CONTROL FEATURES

THROTTLE, HAND CONTROL, MOBILE, VARIABLE SPEED

12VXV

THROTTLE, HAND CONTROL Engine Speed Control for PTO; Electronic, Mobile (Range 2 to 20 MPH), Variable Speed; Mounted on Steering Wheel

Mobile Variable Speed feature 12VXV allows the equipment operator to feather engine speed up or down to make fine adjustments to engine speed to achieve the desired functionality. The vehicle is moving; however, the accelerator and brake pedals are inoperative. Speed is controlled through the steering wheel controls. Application examples are Concrete Mixer, Asphalt Spreader, Dump (dumping gravel, etc.), and other applications that require fine control of engine speed while the vehicle is moving.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

No software in the BC is required.

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

WIRING INFORMATION

No additional wiring is associated with this feature.

TESTING

This feature is added by programming the Engine Control Module (ECM) for mobile, variable speed control.

Refer to the Body Builder Book CT-471 (PBB-71000A) for engine ECM programming functionality.

REMOTE MOUNTED ENGINE CONTROL

FEATURE CODE DESCRIPTION:

12VZA & 12VZB

ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls; With Ignition (IGN) Switch Control for International® post 2007 Emissions Electronic Engines

This feature is an accommodation for remote engine speed control using hard wires directly into the ECM for International® post 2007 emission electronic engines. This feature provides 13 blunt-cut wires on the V8 and 2 connectors on the I6 in the engine compartment above the steering shaft. These wires can be spliced to Body Builder-supplied switches and throttle control devices to control the engine speed.

There are no programmable Body Controller (BC) parameters that are used by this function. The programmable parameters are located in the ECM of the engine.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

No BC features

For proper ECM parameter programming, see the Body Builder book CT-471 PBB-71000.

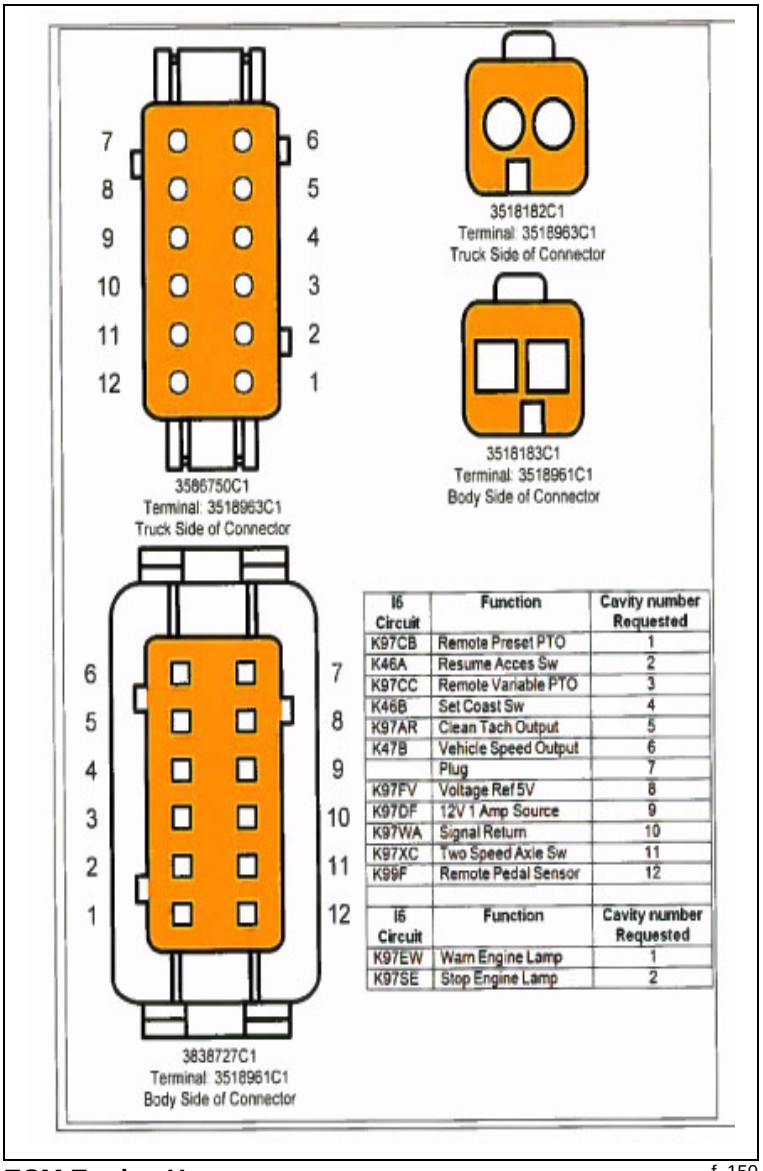
WIRING INFORMATION

The new connector associated with sales feature code 12VZA is illustrated below. The connector can be located in the engine compartment near the megafuse above the driver side wheel well.

REMOTE ENGINE SPEED CONTROL FEATURES

TESTING

12VZA & 12VZB is tested and programmable parameters are set via the Master Diagnostics or ServiceMaxx Software package.



I6 Circuit	Function	Cavity number Requested
K97CB	Remote Preset PTO	1
K46A	Resume Acces Sw	2
K97CC	Remote Variable PTO	3
K46B	Set Coast Sw	4
K97AR	Clean Tach Output	5
K47B	Vehicle Speed Output	6
	Plug	7
K97FV	Voltage Ref 5V	8
K97DF	12V 1 Amp Source	9
K97WA	Signal Return	10
K97XC	Two Speed Axle Sw	11
K99F	Remote Pedal Sensor	12

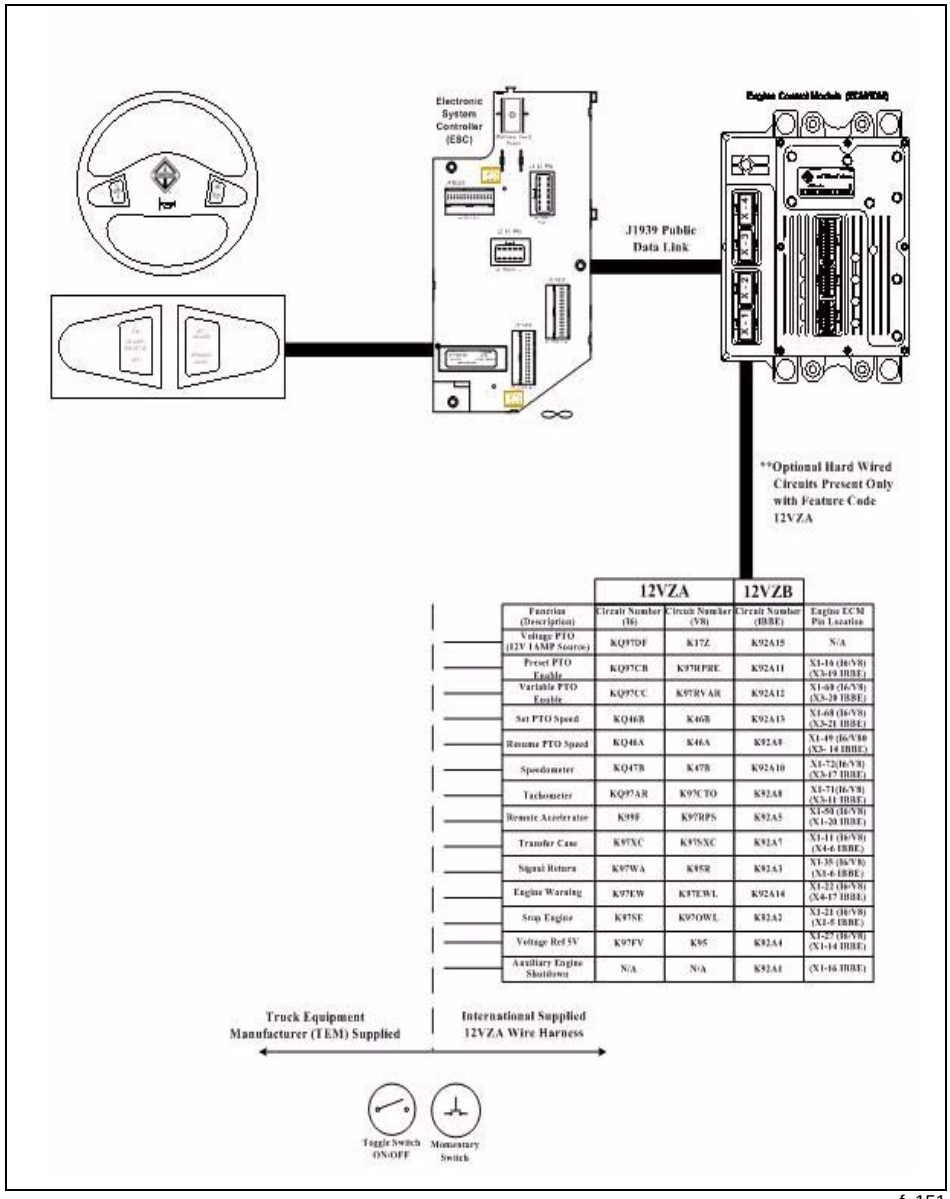
I6 Circuit	Function	Cavity number Requested
K97EW	Warn Engine Lamp	1
K97SE	Stop Engine Lamp	2

ECM Engine Harness f_150

If the Engine Harness is not provided, the following diagrams show how to hard-wire this feature.

REMOTE ENGINE SPEED CONTROL FEATURES

12VZA & 12VZB WIRING INFORMATION



Function (Description)	12VZA Circuit Number (16)	12VZA Circuit Number (V8)	12VZB Circuit Number (IBBE)	12VZB Engine ECM Pin Location
Voltage PTO (12V 1 AMP Source)	KQ97DF	K17Z	K92A15	N/A
Preset PTO Enable	KQ97CB	K97HPRE	K92A11	X1-16 (16/V8) (X3-19 IBBE)
Variable PTO Enable	KQ97CC	K97RVAR	K92A12	X1-68 (16/V8) (X3-20 IBBE)
Set PTO Speed	KQ46B	K46B	K92A13	X1-68 (16/V8) (X3-21 IBBE)
Resume PTO Speed	KQ46A	K46A	K92A9	X1-49 (16/V8) (X3- 14 IBBE)
Speedometer	KQ47B	K47B	K92A10	X1-72(16/V8) (X3-17 IBBE)
Tachometer	KQ97AR	K97CTO	K92A8	X1-71(16/V8) (X3-11 IBBE)
Remote Accelerator	K99F	K97RPS	K92A5	X1-50 (16/V8) (X1-20 IBBE)
Transfer Case	K97XC	K97SXC	K92A7	X1-11 (16/V8) (X4-6 IBBE)
Signal Return	K97WA	K95R	K92A3	X1-35 (16/V8) (X1-6 IBBE)
Engine Warning	K97EW	K97EWL	K92A14	X1-22 (16/V8) (X4-17 IBBE)
Stop Engine	K97SE	K97OWL	K92A2	X1-21 (16/V8) (X1-5 IBBE)
Voltage Ref 5V	K97FV	K95	K92A4	X1-25 (16/V8) (X1-14 IBBE)
Auxiliary Engine Shutdown	N/A	N/A	K92A1	(X1-16 IBBE)

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12VZA & 12VZB Hard Wire ECM Engine Control Overview Diagram

REMOTE ENGINE SPEED CONTROL FEATURES

12VZA AND 12VZB CIRCUIT DIAGRAM AND PIN LOCATIONS

	12VZA		12VZB	
Function (Description)	Circuit Number (I6)	Circuit Number (V8)	Circuit Number (IBBE)	Engine ECM Pin Location
Voltage PTO (12V 1AMP Source)	KQ97DF	K17Z	K92A15	N/A
Preset PTO Enable	KQ97CB	K97RPRE	K92A11	X1-16 (I6/V8) (X3-19 IBBE)
Variable PTO Enable	KQ97CC	K97RVAR	K92A12	X1-60 (I6/V8) (X3-20 (BBE)
Set PTO Speed	KQ46B	K46B	K92A13	X1-68 (I6/V8) (X3-21 IBBE)
Resume PTO Speed	KQ46A	K46A	K92A9	X1-49 (I6/V8) (X3-14 IBBE)
Speedometer	KQ47B	K47B	K92A10	X1-72 (I6/V8) X3-17 IBBE)
Tachometer	KQ97AR	K97CTO	K92A8	X1-71 (I6/V8) (X3-11 IBBE)
Remote Accelerator	K99F	K97RPS	K92A5	X1-50 (I6/V8) X1-20 IBBE)
Transfer Case	K97XC	K97SXC	K92A7	X1-11 (I6/V8) (X4-6 IBBE)
Signal Return	K97WA	K95R	K92A3	X1-35 (I6/V8) (X1-6 IBBE)
Engine Warning	K97EW	K97EWL	K92A14	X1-22 (I6/V8) (X4-17 IBBE)
Stop Engine	K97SE	K97OWL	K92A2	X1-21 (I6/V8) (X1-5 IBBE)
Voltage Ref 5V	K97FV	K95R	K92A4	X1-27 (I6/V8) (X1-14 IBBE)

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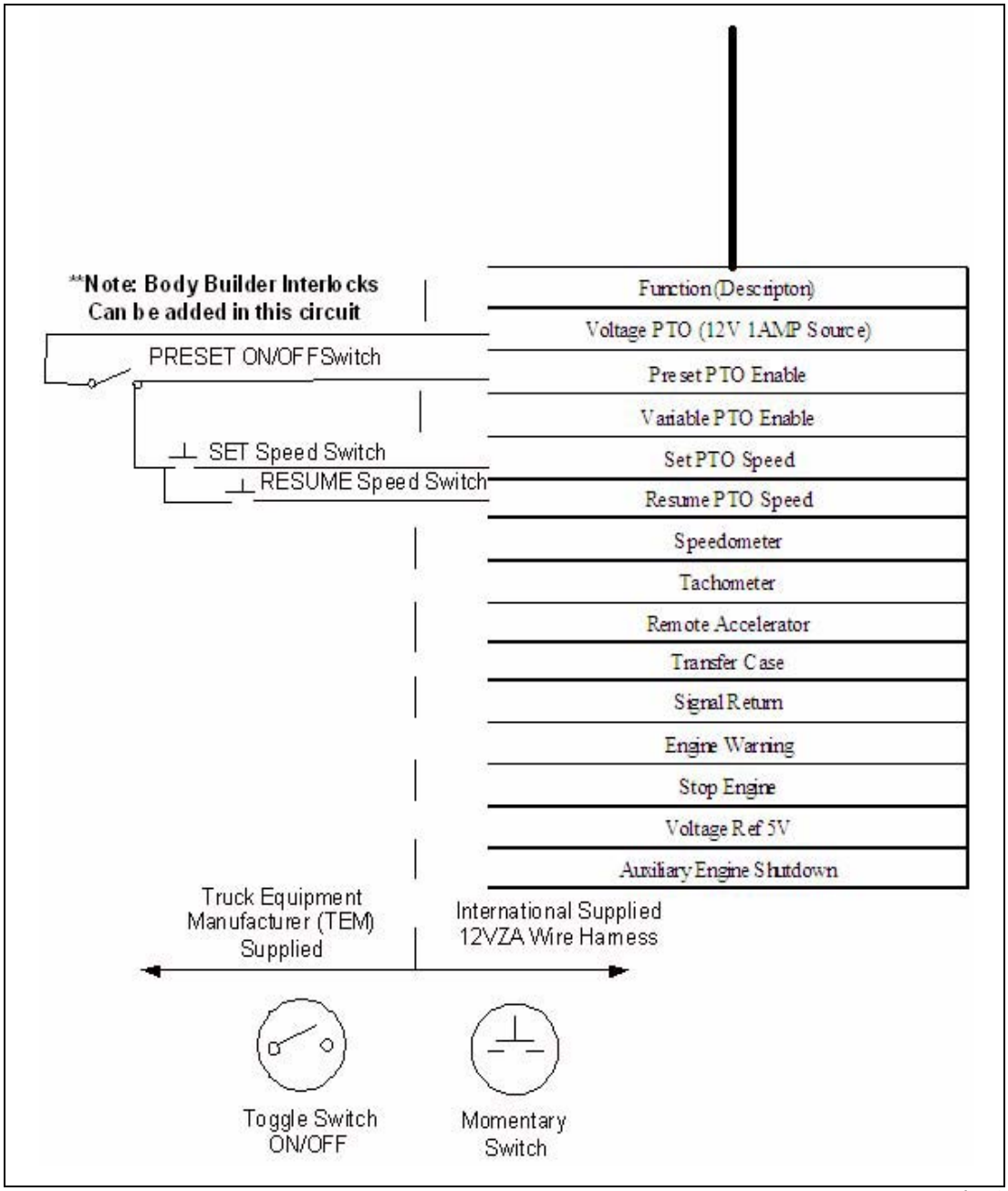
12VZA and 12VZB Circuit Diagram and Pin Locations (Reference Table for Preset Throttle, Variable Throttle, Split Shft Operations, and Remote Throttle)

REMOTE ENGINE SPEED CONTROL FEATURES

PRESET THROTTLE INFORMATION



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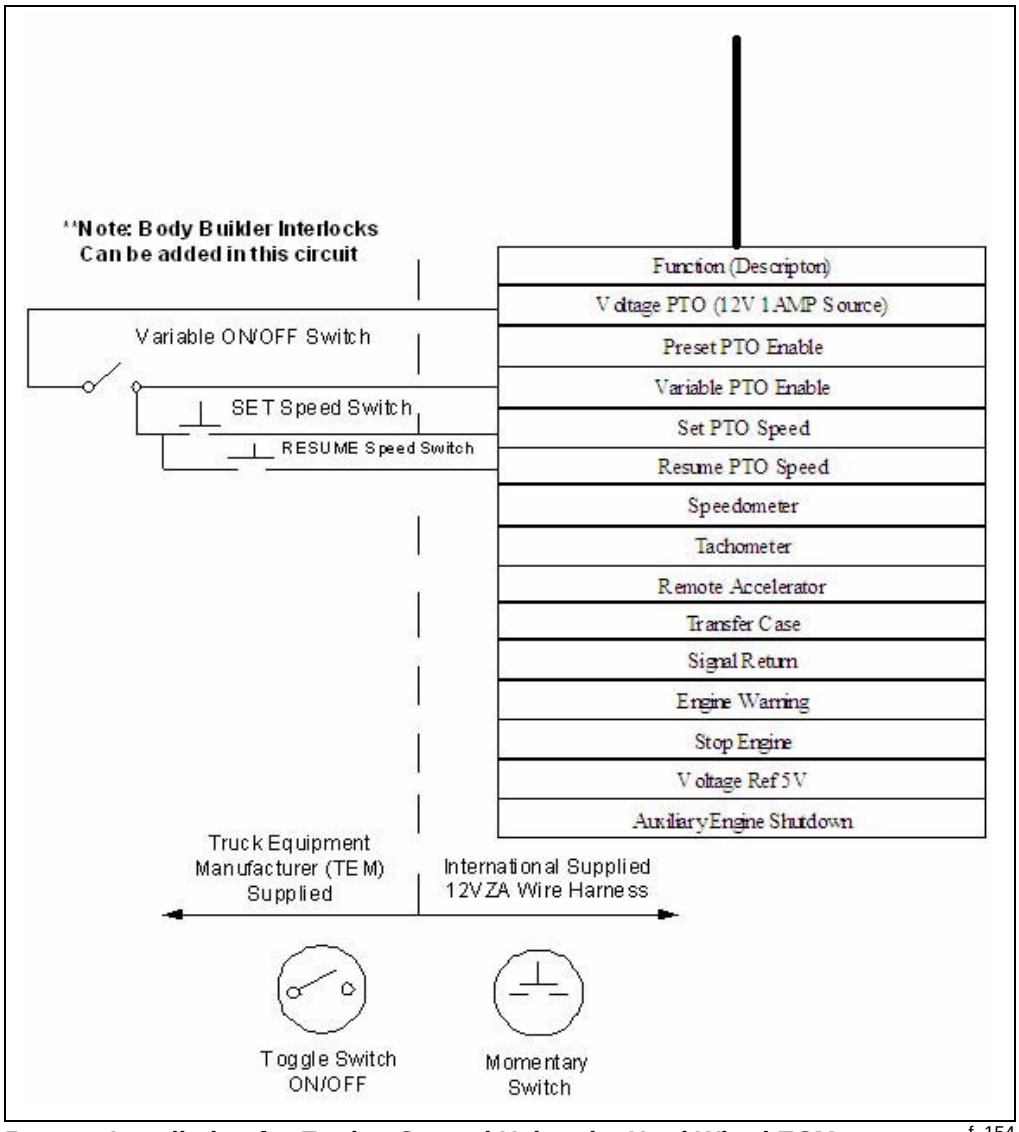
Remote Installation for Preset Engine Control Using the Hard Wired ECM Inputs

REMOTE ENGINE SPEED CONTROL FEATURES

VARIABLE THROTTLE INFORMATION



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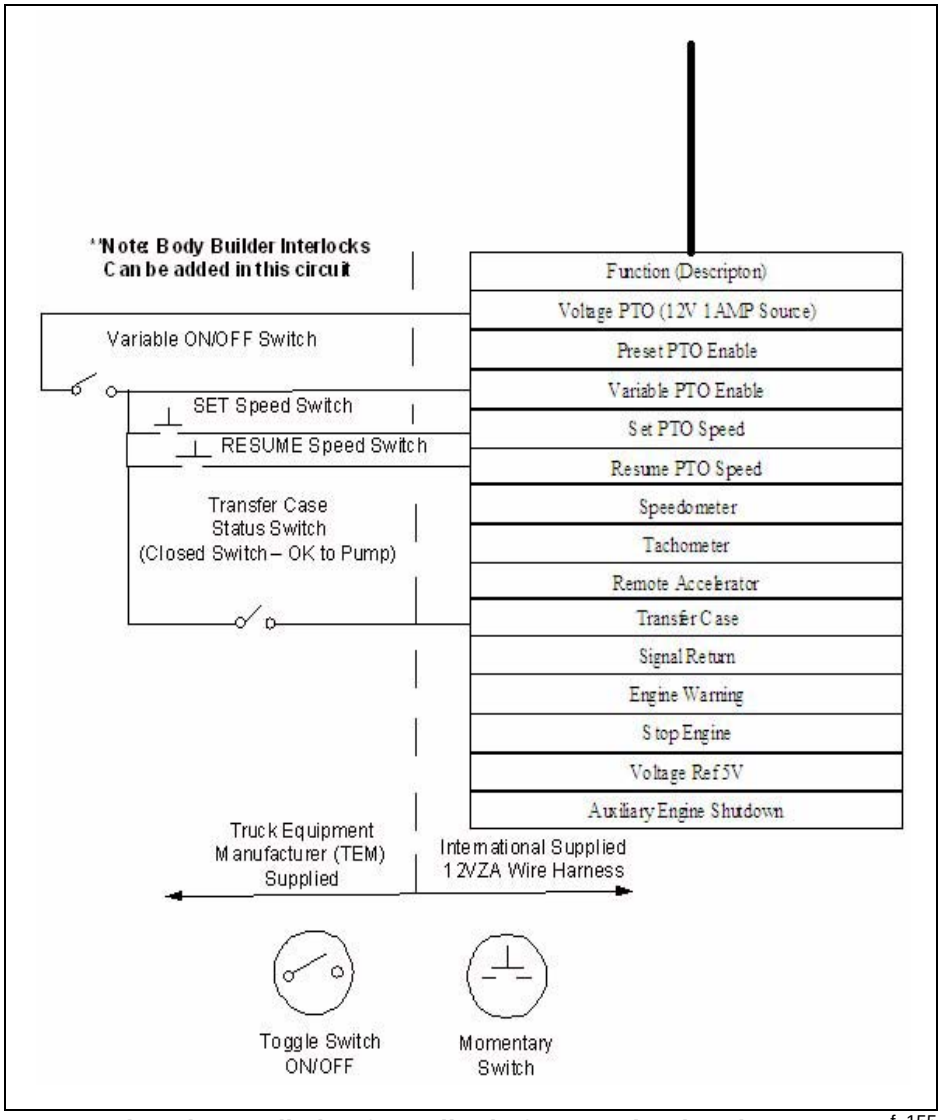
Remote Installation for Engine Control Using the Hard Wired ECM Inputs

REMOTE ENGINE SPEED CONTROL FEATURES

SPLIT SHAFT OPERATION WITH VARIABLE THROTTLE



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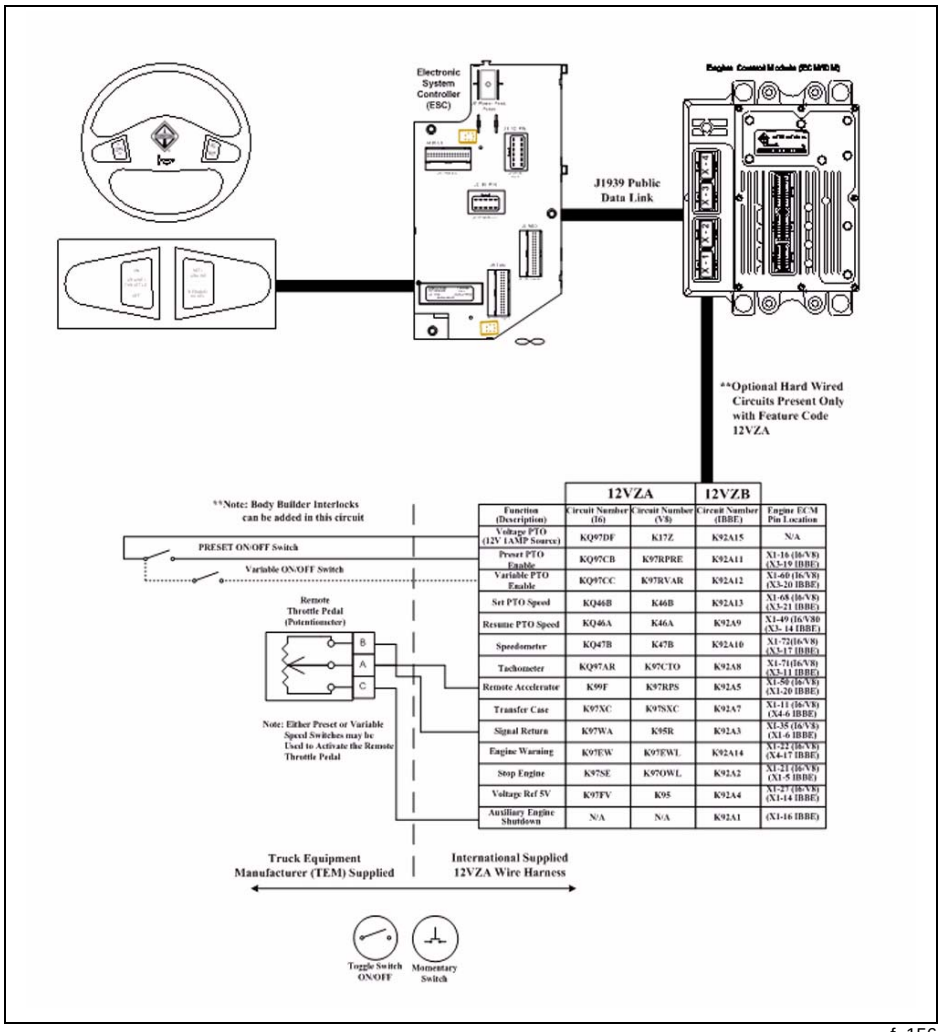
Remote Throttle Installation for Split Shaft Control Using the Hard Wire ECM Inputs

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE PEDAL



	12VZA		12VZB	
Function (Description)	Circuit Number (16)	Circuit Number (V8)	Circuit Number (IBBE)	Engine ECM Pin Location
Voltage PTO (12V LAMP Source)	KQ97DF	K17Z	K92A15	N/A
Preset PTO Enable	KQ97CB	K97RPRE	K92A11	X1-16 (16/V8) (X3-19 IBBE)
Variable PTO Enable	KQ97CC	K97RVAR	K92A12	X1-60 (16/V8) (X3-20 IBBE)
Set PTO Speed	KQ46B	K46B	K92A13	X1-68 (16/V8) (X3-21 IBBE)
Resume PTO Speed	KQ46A	K46A	K92A9	X1-49 (16/V8) (X3- 14 IBBE)
Speedometer	KQ47B	K47B	K92A10	X1-72(16/V8) (X3-17 IBBE)
Tachometer	KQ97AR	K97CTO	K92A8	X1-71(16/V8) (X3-11 IBBE)
Remote Accelerator	K99F	K97RPS	K92A5	X1-50 (16/V8) (X1-20 IBBE)
Transfer Case	K97XC	K97SXC	K92A7	X1-11 (16/V8) (X4-6 IBBE)
Signal Return	K97WA	K95R	K92A3	X1-35 (16/V8) (X1-6 IBBE)
Engine Warning	K97EW	K97EWL	K92A14	X1-22 (16/V8) (X4-17 IBBE)
Stop Engine	K97SE	K97OWL	K92A2	X1-21 (16/V8) (X1-5 IBBE)
Voltage Ref 5V	K97FV	K95	K92A4	X1-27 (16/V8) (X1-14 IBBE)
Auxiliary Engine Shutdown	N/A	N/A	K92A1	(X1-16 IBBE)

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Remote Throttle Installation with a Remote Throttle Pedal Cotnrol Using the Hard Wire ECM Inputs

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE CONTROL INTERLOCKED TO PARK BRAKE APPLIED — RECOMMENDED APPLICATION: RECOVERY

60AJA

BDY INTG, THROTTLE CONTROL Accommodation for Single Customer-Mounted External Engine Speed Control Switch, Programmable Mode for Various Switch Actions and Engine Speed Control Option; Useable Only While Vehicle is Stopped and the Park Brake is Applied (requires one Remote Power Module (RPM) input)

Truck Equipment Manufacturer (TEM) or customer-mounted single remote center stable, momentary switch; when the operator moves the switch to the up position, the switch supplies 12 volts to the RPM input to activate Remote engine speed control preset-1; when the operator returns the switch to the center position or stable position, the engine will remain at preset-1 until the operator moves the switch to the down position; in the down position, the switch then supplies a Ground (GND) to the RPM input to deactivate Remote engine speed control preset-1; when the operator returns the switch to the center position or stable position, the engine will remain at idle.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKJ

CONFLICTS WITH SOFTWARE FEATURES

595AKK, 595AKL, 595AKM, 595AKN

ACTIVATION PARAMETERS:

1. Momentary 12 volt input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH
5. Engine running and at idle
6. Optional PTO feedback is true.

DEACTIVATION PARAMETERS:

1. Momentary GND input to RPM
2. Park brake not applied
3. Transmission not in neutral or park or clutch pedal depressed
4. Vehicle speed is greater than one MPH.
5. Engine not running
6. Service brake depressed
7. Optional PTO feedback not true

FEATURE ORDERING NOTES

1. This feature requires one RPM input.
2. If 60AJA is ordered, 12VXU must also be ordered which requires entering TEM or customer-requested Remote engine speed control preset-1 RPMs.
3. TEM or customer must supply single pull, double throw, center stable, momentary switch and all associated wiring from switch to RPM.

4. The optional PTO interlock is defaulted off; this interlock only works with International® pre-engineered PTO features. If the TEM or customer has one of the International® pre-engineered PTO features and needs to have this interlock turned on, this will require an additional parameter change by someone who is at least Diamond Logic® Builder Level 2 or 3 certified.

How To Install This Feature

Software Installation:

1. Use Diamond Logic® Builder to install Body Controller (BC) software feature code 595AKJ, and set the feature code parameters to the following settings:
   a. 595AKJ – Set parameter 2035 to 1. Reference feature configuration programmable parameters.
   b. 595AKJ – Set parameter 2158 to 3. Reference feature configuration programmable parameters.
   c. 595AKJ – Set parameter 2036 to on for optional PTO interlock. Reference feature configuration programmable parameters.
2. Use Diamond Logic® Builder to remove BC software feature codes 595AKK, 595AKL, 595AKM, and 595AKN.
3. Use Master Diagnostics to program Engine control module: PTO in-cab control: on
4. Use Master Diagnostics to program Engine control module: PTO in-cab mode: stationary pre-set
5. Use Master Diagnostics to program Engine control module: PTO Power Take Off mode: remote and in-cab operation
6. Use Master Diagnostics to program Engine control module: PTO Preset-1 RPM set (700.00 to 2800.00) (Note: this is the RPM the customer or TEM has requested)

Programmable Parameters

1. 2036 TEM_Ext_Eng_Spd_Ctrl_PTO_Ilock; This parameter sets the optional PTO interlock mode on or off. If set on, the Remote engine speed control preset-1 will be interlocked to all International® pre-engineered PTO features that use a center panel switch. This means that the remote engine speed control will only be allowed to operate if the PTO is being requested to engage. If this parameter is not set, the engine speed control will operate regardless of the PTO request.
   a. On
   b. Off
2. 2035 TEM_Ext_Eng_Spd_Control_Mode; This parameter sets the mode of operation for the TEM external engine speed control feature and should be set to 1.
   a. 1, 12 volts on the engine speed control input causes engine to ramp to preset-1. GND on the same input causes the engine to return to idle.
3. 2158 TEM_Ext_ Eng_Spd_ Ctrl_Active_State; This is the active state for the external engine speed control switch input to the RPM and should be set to 3.
   a. 3, 12 volts – The input is connected to 12 volts through a switch.

REMOTE ENGINE SPEED CONTROL FEATURES

Table 162

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Ext_ Eng_Spd_ Ctrl_PTO_ Ilock	2036	If this parameter is a one, external engine speed controls will be interlocked to PTO request.	0	On/Off	0	1	1
TEM_Ext_ Eng_Speed_ Control_ Mode	2035	This parameter sets the mode of operation for the TEM external engine speed control feature.	1	List	0	3	1
TEM_Ext_ Eng_Spd_ Ctrl_Active_ State	2158	This is the active state for the external engine speed control switch.	3	List	0	1	3

HARDWARE INSTALLATION

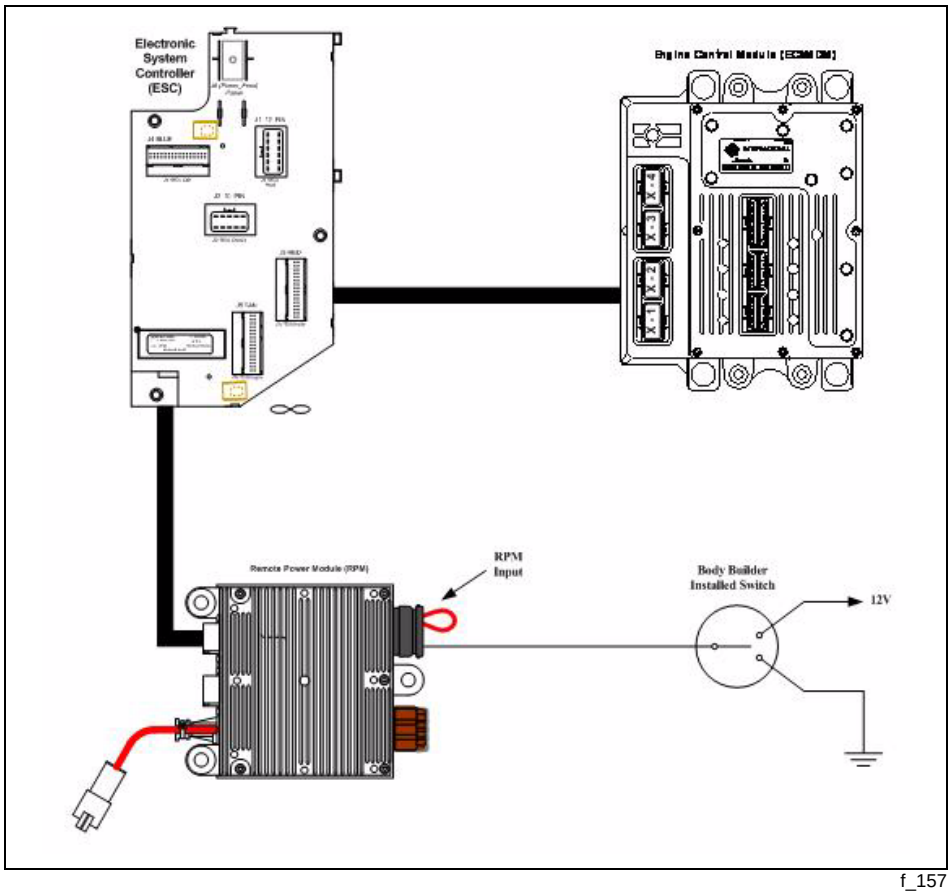
1. Reference the connectors tab within Diamond Logic® Builder to verify the correct RPM input pin on the black 23-pin connector. The pin is named Remote_Engine_Speed_Sw_Input.
2. Connect an 18 gauge wire to input pin, and run this wire to the center pole on the switch.
3. Connect one of the remaining switch poles to a 12 volt power source.
4. Connect the only remaining switch pole to a chassis GND source.
5. Mount switch.

Input connector part number – 2005482C1

Input terminal part number – 1698937C1

REMOTE ENGINE SPEED CONTROL FEATURES

60AJA WIRING INFORMATION



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Feature Testing

1. Stationary Remote engine speed control preset-1 Activation; Start engine, set park brake, transmission in neutral or park, vehicle speed is less than one MPH, and take the switch to the up position, or supply 12 volts on the input pin labeled Remote_Engine_Speed_Sw_Input, or use Diamond Logic® Builder to force the RPM input pin to the 12 volt state.
2. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® Builder software) is receiving GND as long as the switch is closed.
3. Verify that the engine ramps to the first preset speed.
4. If engine does not ramp to the first preset speed, check engine programming to verify that the correct engine speed control parameters are set.
5. Deactivate the remote engine speed control switch (release GND).
6. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® Builder software) is an open circuit when switch is in the center stable position.
7. Verify that the engine returns to idle.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE CONTROL INTERLOCKED TO PARK BRAKE APPLIED — RECOMMENDED APPLICATION: VARIOUS

60AJE

BDY INTG, THROTTLE CONTROL Accommodation for On Demand Engine Speed for Single Customer-Mounted Pressure Switch, Programmable Mode for Various Switch Actions, Useable Only While Vehicle is Stopped and the Park Brake is Applied (requires one RPM input)

TEM or customer-mounted single remote momentary, latched switch or normally open pressure switch; when the operator moves the switch to the up position or the switch closes, the switch supplies GND or 12 volts to the RPM input which starts ramping the engine to Engine Speed Preset-1, the engine will continue to ramp to the Engine Speed Preset-1 as long as the switch continues to supply either GND or 12 volts to the RPM input; when the operator moves the switch to the down position or the switch opens, the switch removes the GND or 12 volt RPM input to deactivate Remote engine speed control preset-1 returning the engine to idle.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKK

CONFLICTS WITH SOFTWARE FEATURES

595AKJ, 595AKL, 595AKM, 595AKN

ACTIVATION PARAMETERS:

1. Momentary or latched GND or 12 volt input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH
5. Engine running and at idle
6. Optional PTO feedback is true.

DEACTIVATION PARAMETERS:

1. No GND or 12 volt input to RPM
2. Park brake not applied
3. Transmission not in neutral or park or clutch pedal depressed
4. Vehicle speed is greater than one MPH.
5. Engine not running
6. Service brake depressed
7. Optional PTO feedback not true

FEATURE ORDERING NOTES

1. This feature requires one RPM input.
2. If 60AJE is ordered, 12VXU must also be ordered which requires entering TEM or customer-requested Remote engine speed control preset-1 RPMs.
3. TEM or customer must supply single momentary, latched or normally open pressure switch and all associated wiring from switch to RPM.
4. The optional PTO interlock is defaulted off; this interlock only works with International® pre-engineered PTO features. If the TEM or customer has one of the International® pre-engineered PTO features and needs to have this interlock turned on, this will require an additional parameter change by someone who is

at least Diamond Logic® Builder Level 2 or 3 certified.

How To Install This Feature

Software Installation

1. Use Diamond Logic® Builder to install Body Controller (BC) software feature code 595AKK, and set the feature code parameters to the following settings:
   a. 595AKK – Set parameter 2035 to 3. Reference feature configuration programmable parameters.
   b. 595AKK – Set parameter 2158 to 3 for 12 volt input or 1 for GND input. Reference feature configuration programmable parameters.
   c. 595AKK – Set parameter 2036 to on for optional PTO interlock. Reference feature configuration programmable parameters.
2. Use Diamond Logic® Builder to remove BC software feature codes 595AKJ, 595AKL, 595AKM, and 595AN.
3. Use Master Diagnostics to program Engine control module: PTO in-cab control: on
4. Use Master Diagnostics to program Engine control module: PTO in-cab mode: stationary pre-set
5. Use Master Diagnostics to program Engine control module: PTO Power Take Off mode: remote and in-cab operation
6. Use Master Diagnostics to program Engine control module: PTO Preset-1 RPM set (700.00 to 2800.00) (Note: this is the RPM the customer or TEM has requested).

Programmable Parameters

1. 2036 TEM_Ext_Eng_Spd_Ctrl_PTO_Ilock; This parameter sets the optional PTO interlock mode on or off. If set on, the Remote engine speed control preset-1 will be interlocked to all International® pre-engineered PTO features that use a center panel switch. This means that the remote engine speed control will only be allowed to operate if the PTO is being requested to engage. If this parameter is not set, the engine speed control will operate regardless of the PTO request.
   a. On
   b. Off
2. 2035 TEM_Ext_Eng_Spd_Control_Mode; This parameter sets the mode of operation for the TEM external engine speed control feature and should be set to 3.
   a. 3, Engine will ramp for only as long as the engine speed control input is held in its active state.
3. 2158 TEM_Ext_ Eng_Spd_ Ctrl_Active_State; This is the active state for the external engine speed control switch input to the RPM and should be set to 3 or 1.
   a. 3, 12 volts – The input is connected to 12 volts through a switch.
   b. 1, GND – The input is connected to GND through a switch.

REMOTE ENGINE SPEED CONTROL FEATURES

Table 163

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Ext_ Eng_Spd_ Ctrl_PTO_ Ilock	2036	If this parameter is a one, external engine speed controls will be interlocked to PTO request.	0	On/Off	0	1	1
TEM_Ext_ Eng_Speed_ Control_ Mode	2035	This parameter sets the mode of operation for the TEM external engine speed control feature.	3	List	0	3	1
TEM_Ext_ Eng_Spd_ Ctrl_Active_ State	2158	This is the active state for the external engine speed control switch.	1	List	0	1	3

HARDWARE INSTALLATION

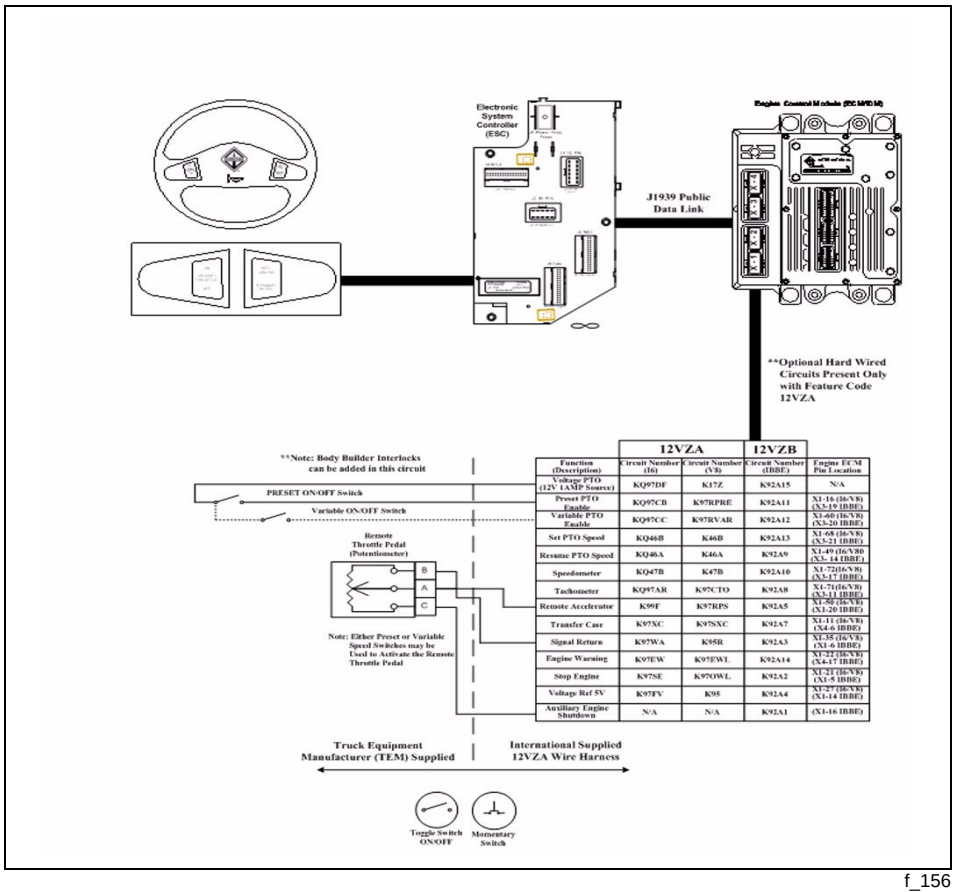
1. Reference the connectors tab within Diamond Logic® Builder to verify the correct RPM input pin on the black 23-pin connector. The pin is named Remote_Engine_Speed_Sw_Input.
2. Connect an 18 gauge wire to input pin, and run this wire to one pole on the switch.
3. Connect the remaining switch pole to a 12 volt or GND power source.
4. Mount switch.

Input connector part number – 2005482C1

Input terminal part number – 1698937C1

REMOTE ENGINE SPEED CONTROL FEATURES

60AJE WIRING INFORMATION



Function (Description)	12VZA Circuit Number (16)	12VZA Circuit Number (V8)	12VZB Circuit Number (IBBE)	Engine ECM Pin Location
Voltage PTO (12V 1AMP Source)	KQ97DF	K17Z	K92A15	N/A
Preset PTO Enable	KQ97CB	K97RPRE	K92A11	X1-16 (16/V8) (X3-19 IBBE)
Variable PTO Enable	KQ97CC	K97RVAR	K92A12	X1-60 (16/V8) (X3-20 IBBE)
Set PTO Speed	KQ46B	K46B	K92A13	X1-68 (16/V8) (X3-21 IBBE)
Resume PTO Speed	KQ46A	K46A	K92A9	X1-49 (16/V8) (X3- 14 IBBE)
Speedometer	KQ47B	K47B	K92A10	X1-72(16/V8) (X3-17 IBBE)
Tachometer	KQ97AR	K97CTO	K92A8	X1-71(16/V8) (X3-11 IBBE)
Remote Accelerator	K99F	K97RPS	K92A5	X1-50 (16/V8) (X1-20 IBBE)
Transfer Case	K97XC	K97SXC	K92A7	X1-11 (16/V8) (X4-6 IBBE)
Signal Return	K97WA	K95R	K92A3	X1-38 (16/V8) (X1-6 IBBE)
Engine Warning	K97EW	K97EWL	K92A14	X1-22 (16/V8) (X4-17 IBBE)
Stop Engine	K97SE	K97OWL	K92A2	X1-21 (16/V8) (X1-5 IBBE)
Voltage Ref 5V	K97FV	K95	K92A4	X1-27 (16/V8) (X1-14 IBBE)
Auxiliary Engine Shutdown	N/A	N/A	K92A1	(X1-16 IBBE)

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FEATURE TESTING

1. Stationary Remote engine speed control preset-1 Activation; Start engine, set park brake, transmission in neutral or park, vehicle speed is less than one MPH, and take the switch to the closed position, or supply 12 volts or GND on the input pin labeled Remote_Engine_Speed_Sw_Input, or use Diamond Logic® Builder to force the RPM input pin to the 12 volt or GND state.
2. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® software) is receiving GND or 12 volts as long as the switch is closed.
3. Verify that the engine ramps to the first preset speed.
4. If engine does not ramp to the first preset speed, check engine programming to verify that the correct engine speed control parameters are set.
5. Deactivate the remote engine speed control switch (release GND).
6. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® Builder software) is an open circuit when switch is in the down or open position.
7. Verify that the engine returns to idle.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE CONTROL INTERLOCKED TO PARK BRAKE APPLIED — RECOMMENDED APPLICATION: UTILITY

60AJG

BDY INTG, THROTTLE CONTROL Accommodation for Single Customer-Mounted External Engine Speed Control Switch, for Utility Applications, Programmable Mode for Various Switch Actions and Engine Speed Control Option, Only with Vehicle Stopped and Park Brake is Applied (requires one RPM input)

TEM or customer-mounted single remote, momentary switch; when the operator moves the switch to the up position or the switch closes for the first time, the switch supplies the GND or 12 volts to the RPM input which activates Engine Speed Preset-1; when the operator moves the switch to the down position or the switch opens, the engine will remain at Engine Speed Preset-1; when the operator moves the switch to the up position or the switch closes for the second time, Remote engine speed control preset-1 is deactivated returning the engine to idle.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKL

CONFLICTS WITH SOFTWARE FEATURES

595AKJ, 595AKK, 595AKM, 595AKN

ACTIVATION PARAMETERS

1. First momentary GND or 12 volt input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH
5. Engine running and at idle
6. Optional PTO feedback is true.

DEACTIVATION PARAMETERS:

1. Second momentary GND or 12 volt input to RPM
2. Park brake not applied
3. Transmission not in neutral or park or clutch pedal depressed
4. Vehicle speed is greater than one MPH.
5. Engine not running
6. Service brake depressed
7. Optional PTO feedback not true

FEATURE ORDERING NOTES

1. This feature requires one RPM input.
2. If 60AJG is ordered, 12VXU must also be ordered which requires entering TEM or customer-requested Remote engine speed control preset-1 RPMs.
3. TEM or customer must supply single momentary switch and all associated wiring from switch to RPM.
4. The optional PTO interlock is defaulted off; this interlock only works with International® pre-engineered PTO features. If the TEM or customer has one of the International® pre-engineered PTO features and needs to have this interlock turned on, this will require an additional parameter change by someone who is at least Diamond Logic® Builder Level 2 or 3 certified.

REMOTE ENGINE SPEED CONTROL FEATURES

How To Install This Feature

Software Installation

1. Use Diamond Logic® to install Body Controller (BC) software feature code 595AKL, and set the feature code parameters to the following settings:
   a. 595AKL – Set parameter 2035 to 2. Reference feature configuration programmable parameters.
   b. 595AKL – Set parameter 2158 to 3 for 12 volt input or 1 for GND input. Reference feature configuration programmable parameters.
   c. 595AKL – Set parameter 2036 to on for optional PTO interlock. Reference feature configuration programmable parameters.
2. Use Diamond Logic® Builder to remove BC software feature codes 595AKK, 595AKJ, 595AKM, and 595AKN.
3. Use Master Diagnostics to program Engine control module: PTO in-cab control: on
4. Use Master Diagnostics to program Engine control module: PTO in-cab mode: stationary pre-set
5. Use Master Diagnostics to program Engine control module: PTO Power Take Off mode: remote and in-cab operation
6. Use Master Diagnostics to program Engine control module: PTO Preset-1 RPM set (700.00 to 2800.00) (Note: this is the RPM the customer or TEM has requested)

Programmable Parameters

1. 2036 TEM_Ext_Eng_Spd_Ctrl_PTO_Ilock; This parameter sets the optional PTO interlock mode on or off. If set on, the Remote engine speed control preset-1 will be interlocked to all International® pre-engineered PTO features that use a center panel switch. This means that the remote engine speed control will only be allowed to operate if the PTO is being requested to engage. If this parameter is not set, the engine speed control will operate regardless of the PTO request.
   a. On
   b. Off
2. 2035 TEM_Ext_Eng_Spd_Control_Mode; This parameter sets the mode of operation for the TEM external engine speed control feature and should be set to 3.
   a. 3, Pulling the engine speed control input momentarily to its active state causes the engine to ramp to preset-1; another momentary active state causes the engine to return to idle.
3. 2158 TEM_Ext_ Eng_Spd_ Ctrl_Active_State; This is the active state for the external engine speed control switch input to the RPM and should be set to 3 or 1.
   a. 3, 12 volts – The input is connected to 12 volts through a switch.
   b. 1, GND – The input is connected to GND through a switch.

Table 164

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Ext_ Eng_Spd_ Ctrl_PTO_ Ilock	2036	If this parameter is a one, external engine speed controls will be interlocked to PTO request.	0	On/Off	0	1	1
TEM_Ext_ Eng_Speed_ Control_ Mode	2035	This parameter sets the mode of operation for the TEM external engine speed control feature.	2	List	0	3	1
TEM_Ext_ Eng_Spd_ Ctrl_Active_ State	2158	This is the active state for the external engine speed control switch.	1	List	0	1	3

REMOTE ENGINE SPEED CONTROL FEATURES

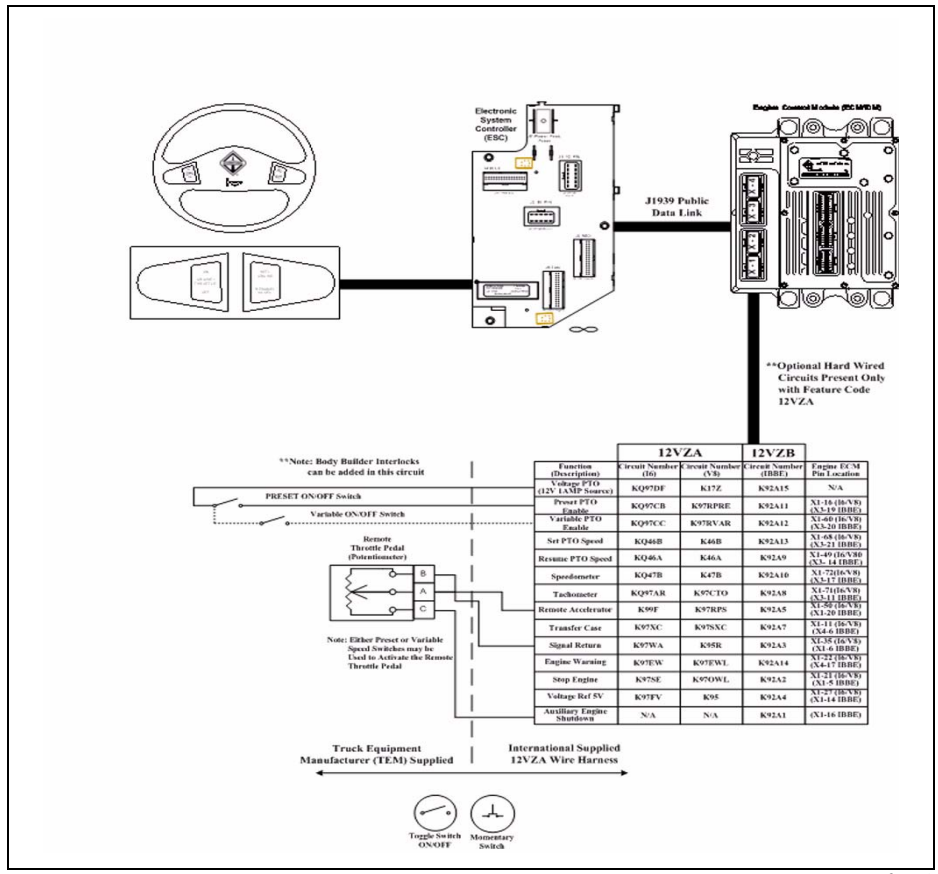
HARDWARE INSTALLATION

1. Reference the connectors tab within Diamond Logic® to verify the correct RPM input pin on the black 23-pin connector. The pin is named Remote_Engine_Speed_Sw_Input.
2. Connect an 18 gauge wire to input pin, and run this wire to one pole on the switch.
3. Connect the remaining switch pole to a 12 volt or GND power source.
4. Mount switch.

Input connector part number – 2005482C1

Input terminal part number – 1698937C1

60AJG WIRING INFORMATION



	12VZA		12VZB	
Function (Description)	Circuit Number (16)	Circuit Number (V8)	Circuit Number (IBBE)	Engine ECM Pin Location
Voltage PTO (12V LAMP Source)	KQ97DF	K17Z	K92A15	N/A
Preset PTO Enable	KQ97CB	K97RPRE	K92A11	X1-16 (16/V8) (X3-19 IBBE)
Variable PTO Enable	KQ97CC	K97RVAR	K92A12	X1-60 (16/V8) (X3-20 IBBE)
Set PTO Speed	KQ46B	K46B	K92A13	X1-68 (16/V8) (X3-21 IBBE)
Resume PTO Speed	KQ46A	K46A	K92A9	X1-49 (16/V8) (X3- 14 IBBE)
Speedometer	KQ47B	K47B	K92A10	X1-72(16/V8) (X3-17 IBBE)
Tachometer	KQ97AR	K97CTO	K92A8	X1-71(16/V8) (X3-11 IBBE)
Remote Accelerator	K99F	K97RPS	K92A5	X1-50 (16/V8) (X1-20 IBBE)
Transfer Case	K97XC	K97SXC	K92A7	X1-11 (16/V8) (X4-6 IBBE)
Signal Return	K97WA	K95R	K92A3	X1-35 (16/V8) (X1-6 IBBE)
Engine Warning	K97EW	K97EWL	K92A14	X1-22 (16/V8) (X4-17 IBBE)
Stop Engine	K97SE	K97OWL	K92A2	X1-21 (16/V8) (X1-5 IBBE)
Voltage Ref 5V	K97FV	K95	K92A4	X1-27 (16/V8) (X1-14 IBBE)
Auxiliary Engine Shutdown	N/A	N/A	K92A1	(X1-16 IBBE)

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FEATURE TESTING

1. Stationary Remote engine speed control preset-1 Activation; Start engine, set park brake, transmission in neutral or park, vehicle speed is less than one MPH, and take the switch to the closed position, or supply 12 volts or GND on the input pin labeled Remote_Engine_Speed_Sw_Input, or use Diamond Logic® Builder to force the RPM input pin to the 12 volt or GND state.
2. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® Builder software) is receiving GND or 12 volts as long as the switch is closed.
3. Verify that the engine ramps to the first preset speed.
4. If engine does not ramp to the first preset speed, check engine programming to verify that the correct engine speed control parameters are set.

5. Deactivate the remote engine speed control switch (release GND).
6. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® software) is an open circuit when switch is in the down or open position.
7. Verify that the engine returns to idle.

REMOTE THROTTLE CONTROL INTERLOCKED TO PARK BRAKE APPLIED — RECOMMENDED APPLICATION: UTILITY

60AJH

BDY INTG, THROTTLE CONTROL for Dual Function Input, for Utility Applications, Remote Throttle Control When Engine is Running, and Activating Output for Emergency Power When the Engine is Not Engaged; Useable Only When Vehicle is Stopped and Park Brake is Applied (requires one RPM input and output)

Stationary Remote engine speed control preset-1 interlocked to park brake and transmission in neutral or park and vehicle speed and engine running or optional PTO interlock; when engine is not running, the GND input will turn on a 12 volt, 20 Ampere (AMP) RPM out used to control emergency pump.

TEM or customer-mounted single remote, momentary or normally open pressure switch; when the operator moves the switch to the up position or the switch closes for the first time, the switch supplies a GND to the RPM input which activates Engine Speed Preset-1; when the operator moves the switch to the down position or the switch opens, the engine will remain at Engine Speed Preset-1; when the operator moves the switch to the up position or the switch closes for the second time, the switch supplies a GND to the RPM input which deactivates Remote engine speed control preset-1 returning the engine to idle; when the engine is not running and the operator moves the switch to the up position and holds or the switch closes and holds, the switch will supply a GND signal to the RPM input which then turns on a 12 volt, 20 AMP RPM output used for emergency pump control.

Software Feature Codes/Programmable Parameters

Required Software Feature Code

595AKM

Conflicts With Software Features

595AKJ, 595AKK, 595AKL, 595AKN

Activation Parameters, Preset-1

1. First momentary GND input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH
5. Engine running and at idle
6. Optional PTO feedback is true.

Deactivation Parameters, Preset-1:

1. Second momentary GND input to RPM
2. Park brake not applied
3. Transmission not in neutral or park or clutch pedal depressed
4. Vehicle speed is greater than one MPH.
5. Engine not running
6. Service brake depressed

7. Optional PTO feedback not true

ACTIVATION PARAMETERS, EMERGENCY PUMP:

1. Hold GND input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH.
5. Engine not running
6. Optional PTO feedback is true

FEATURE ORDERING NOTES

1. This feature requires one RPM input, one 12 volt, 20 AMP RPM output.
2. If 60AJH is ordered, 12VXU must also be ordered which requires entering TEM or customer-requested Remote engine speed control preset-1 RPMs.
3. TEM or customer must supply single momentary or normally open pressure switch and all associated wiring from switch to RPM.

HOW TO INSTALL THIS FEATURE

Software Installation

1. Use Diamond Logic® to install Body Controller (BC) software feature code 595AKM, and set the feature code parameters to the following settings:
   a. 595AKM – Set Parameter 2060, fusing value for the output driving the emergency pump in the combination remote engine speed control emergency pump feature.
   b. 595AKM – Set parameter 2035 to 2. Reference feature configuration programmable parameters.
   c. 595AKM – Set parameter 2158 to 1 for GND input. Reference feature configuration programmable parameters.
   d. 595AKM – Set parameter 2036 to on for optional PTO interlock. Reference feature configuration programmable parameters.
2. Use Diamond Logic® to remove BC software feature codes 595AKK, 595AKJ, 595AKL, and 595AKN.
3. Use Master Diagnostics to program Engine control module: PTO in-cab control: on
4. Use Master Diagnostics to program Engine control module: PTO in-cab mode: stationary pre-set
5. Use Master Diagnostics to program Engine control module: PTO Power Take Off mode: remote and in-cab operation
6. Use Master Diagnostics to program Engine control module: PTO Preset-1 RPM set (700.00 to 2800.00) (Note: this is the RPM the customer or TEM has requested)

PROGRAMMABLE PARAMETERS

1. 2060 TEM_Emergency_Pump_Fuse; fusing value for the output driving the emergency pump in the combination remote engine speed control emergency pump feature
2. 2036 TEM_Ext_Eng_Spd_Ctrl_PTO_Ilock; This parameter sets the optional PTO interlock mode on or off. If set on, the Remote engine speed control preset-1 will be interlocked to all International® pre-engineered PTO features that use a center panel switch. This means that the remote engine speed control will only be allowed to operate if the PTO is being requested to engage. If this parameter is not set, the engine speed control will operate regardless of the PTO request.
   a. On
   b. Off

3. 2035 TEM_Ext_Eng_Spd_Control_Mode; This parameter sets the mode of operation for the TEM external engine speed control feature and should be set to 1.
   a. 2, Pulling the engine speed control momentarily to its active state causes engine to ramp to preset-1; another momentary active state causes the engine to return to idle.
4. 2158 TEM_Ext_ Eng_Spd_ Ctrl_Active_State; This is the active state for the external engine speed control switch input to the RPM and should be set to 1.
   a. 1, GND – The input is connected to GND through a switch.

Table 165

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_ Emergency_ pump_Fuse	2060	Fusing value for the output driving the emergency pump in the combination remote engine speed control emergency pump feature	0	A	0	20	0.1
TEM_Ext_Eng_ Spd_Ctrl_PTO_ Ilock	2036	If this parameter is a one, external engine speed controls will be interlocked to PTO request.	0	On/Off	0	1	1
TEM_Ext_Eng_ Spd_Control_M ode	2035	This parameter sets the mode of operation for the TEM external engine speed control feature.	2	List	0	3	1
TEM_Ext_Eng_ Spd_Ctrl_Active _State	2158	This is the active state for the external engine speed control switch.	1	List	0	3	1

HARDWARE INSTALLATION

1. Reference the connectors tab within Diamond Logic® to verify the correct RPM input pin on the black 23-pin connector. The pin is named Remote_Engine_Speed_Sw_Input.
2. Reference the connectors tab within Diamond Logic® to verify the correct RPM output pin on the brown connector. The pin is named Utility_Emergency_Pump_Output.
3. Connect an 18 gauge wire to input pin, and run this wire to one pole on the switch.
4. Connect the remaining switch pole to a GND power source.
5. Connect emergency pump relay to RPM output connector using 12 gauge wire.
6. Mount switch.

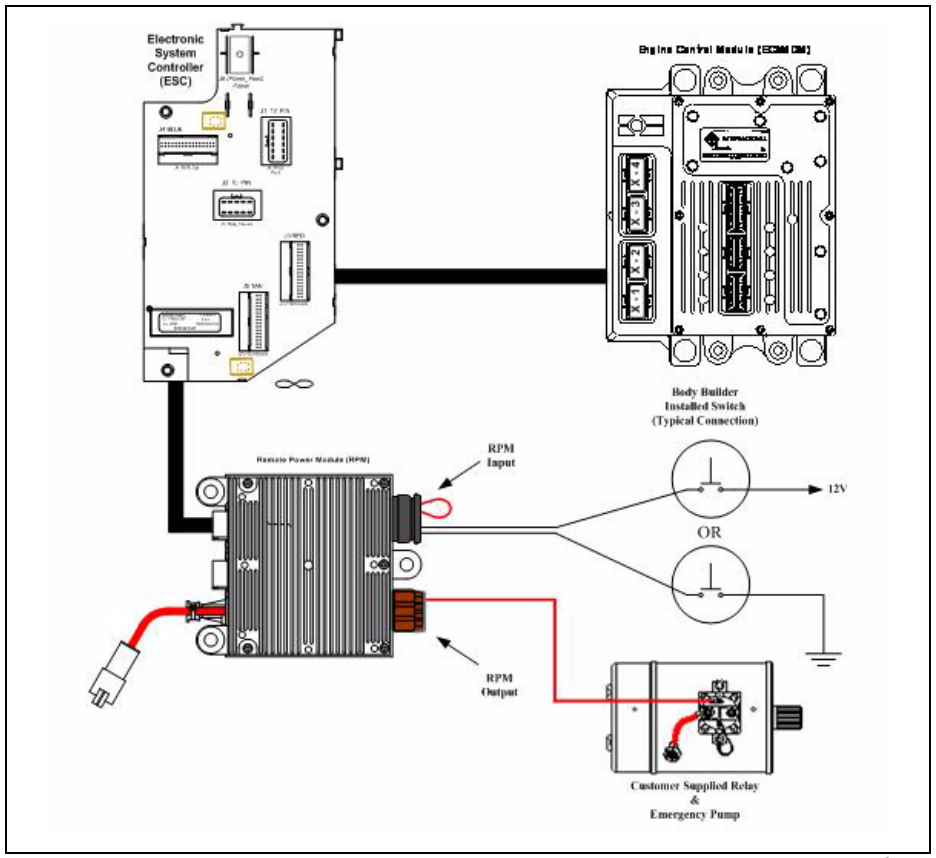
Input connector part number – 2005482C1

Input terminal part number – 1698937C1

REMOTE ENGINE SPEED CONTROL FEATURES

60AJH WIRING INFORMATION

Figure 140



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FEATURE TESTING

1. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® software) is receiving GND as long as the switch is closed.
2. Verify that the engine ramps to the first preset speed.
3. If engine does not ramp to the first preset speed, check engine programming to verify that the correct engine speed control parameters are set.
4. Deactivate the remote engine speed control switch (release GND).
5. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® Builder software) is an open circuit when switch is in the down or open position.
6. Verify that the engine returns to idle.
7. Verify 12 volts 20 AMPS on RPM output connector labeled Utility_Emergency_Pump_Output.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE THROTTLE CONTROL INTERLOCKED TO PARK BRAKE APPLIED — RECOMMENDED APPLICATION: REFUSE

60AJJ

BDY INTG, THROTTLE CONTROL Accommodation for Single Customer-Mounted Momentary Switch, for Refuse Applications, Programmable Mode Various Switch Actions, Useable Only While Vehicle is Stopped and the Park Brake is Applied (requires one RPM input)

TEM or customer-mounted single remote, latched switch; when the operator moves the switch to the up position or the switch closes, the switch supplies 12 volts to the RPM input which activates Engine Speed Preset-1, the engine will stay at Engine Speed Preset-1 as long as the switch continues to supply 12 volts to the RPM input; when the operator moves the switch to the down position or the switch opens, the switch removes the 12 volt RPM input to deactivate Remote engine speed control preset-1 returning the engine to idle.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKN

CONFLICTS WITH SOFTWARE FEATURES

595AKJ, 595AKK, 595AKL, 595AKM

ACTIVATION PARAMETERS:

1. Latched switch that supplies 12 volt input to RPM
2. Park brake applied
3. Transmission in neutral or park or clutch pedal not depressed
4. Vehicle speed is less than one MPH
5. Engine running and at idle
6. Optional PTO feedback is true.

DEACTIVATION PARAMETERS:

1. No 12 volt input to RPM
2. Park brake not applied
3. Transmission not in neutral or park or clutch pedal depressed
4. Vehicle speed is greater than one MPH.
5. Engine not running
6. Service brake depressed
7. Optional PTO feedback not true

FEATURE ORDERING NOTES

1. This feature requires one RPM input.
2. If 60AJJ is ordered, 12VXU must also be ordered which requires entering TEM or customer-requested Remote engine speed control preset-1 RPMs.
3. TEM or customer must supply single latched switch and all associated wiring from switch to RPM.
4. The optional PTO interlock is defaulted off; this interlock only works with International® pre-engineered PTO features. If the TEM or customer has one of the International® pre-engineered PTO features and needs to have this interlock turned on, this will require an additional parameter change by someone who is at least Diamond Logic® Level 2 or 3 certified.

REMOTE ENGINE SPEED CONTROL FEATURES

How To Install Feature

Software Installation

1. Use Diamond Logic® Builder to install Body Controller (BC) software feature code 595AKN, and set the feature code parameters to the following settings:
   a. 595AKN – Set parameter 2035 to 3. Reference feature configuration programmable parameters.
   b. 595AKN – Set parameter 2158 to 3 for 12 volt input. Reference feature configuration programmable parameters.
   c. 595AKN – Set parameter 2036 to on for optional PTO interlock. Reference feature configuration programmable parameters.
2. Use Diamond Logic® to remove BC software feature codes 595AKJ, 595AKK, 595AKL, and 595AKM.
3. Use Master Diagnostics to program Engine control module: PTO in-cab control: on
4. Use Master Diagnostics to program Engine control module: PTO in-cab mode: stationary pre-set
5. Use Master Diagnostics to program Engine control module: PTO Power Take Off mode: remote and in-cab operation
6. Use Master Diagnostics to program Engine control module: PTO Preset-1 RPM set (700.00 to 2800.00) (Note: this is the RPM the customer or TEM has requested)

Programmable Parameters

1. 2036 TEM_Ext_Eng_Spd_Ctrl_PTO_Ilock; This parameter sets the optional PTO interlock mode on or off. If set on, the Remote engine speed control preset-1 will be interlocked to all International® pre-engineered PTO features that use a center panel switch. This means that the remote engine speed control will only be allowed to operate if the PTO is being requested to engage. If this parameter is not set, the engine speed control will operate regardless of the PTO request.
   a. On
   b. Off
2. 2035 TEM_Ext_Eng_Spd_Control_Mode; This parameter sets the mode of operation for the TEM external engine speed control feature and should be set to 3.
   a. 3, Engine will ramp for only as long as the engine speed control input is held in its active state.
3. 2158 TEM_Ext_ Eng_Spd_ Ctrl_Active_State; This is the active state for the external engine speed control switch input to the RPM and should be set to 3.
   a. 3, 12 volts – The input is connected to 12 volts through a switch.

Table 166

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Ext_ Eng_Spd_ Ctrl_PTO_ Ilock	2036	If this parameter is a one, external engine speed controls will be interlocked to PTO request.	0	On/Off	0	1	1
TEM_Ext_ Eng_Speed_ Control_ Mode	2035	This parameter sets the mode of operation for the TEM external engine speed control feature.	3	List	0	3	1
TEM_Ext_ Eng_Spd_ Ctrl_Active_ State	2158	This is the active state for the external engine speed control switch.	1	List	0	1	3

Hardware Installation

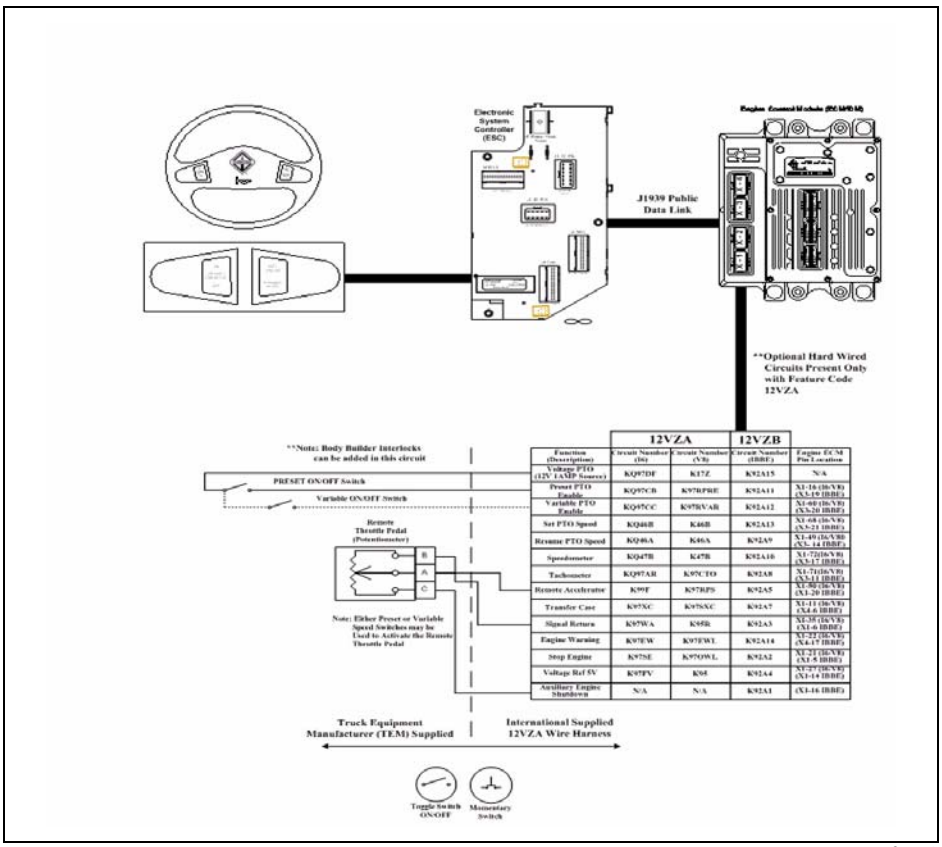
1. Reference the connectors tab within Diamond Logic® to verify the correct RPM input pin on the black 23-pin connector. The pin is named Remote_Engine_Speed_Sw_Input.

2. Connect an 18 gauge wire to input pin, and run this wire to one pole on the switch.
3. Connect the remaining switch pole to a 12 volt power source.
4. Mount switch.

Input connector part number – 2005482C1

Input terminal part number – 1698937C1

60AJJ WIRING INFORMATION



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FEATURE TESTING

1. Stationary Remote engine speed control preset-1 Activation; Start engine, set park brake, transmission in neutral or park, vehicle speed is less than one MPH, and take the switch to the closed position, or supply 12 volts on the input pin labeled Remote_Engine_Speed_Sw_Input, or use Diamond Logic® to force the RPM input pin to the 12 volt.
2. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® software) is receiving 12 volts as long as the switch is closed.
3. Verify that the engine ramps to the first preset speed.
4. If engine does not ramp to the first preset speed, check engine programming to verify that the correct engine speed control parameters are set.
5. Deactivate the remote engine speed control switch (release 12 volts).
6. Verify the RPM input labeled Remote_Engine_Speed_Sw_Input (pin position specified Diamond Logic® software) is an open circuit when switch is in the down or open position.
7. Verify that the engine returns to idle.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE ENGINE SPEED CONTROL – CATERPILLAR AND CUMMINS ENGINES

Caterpillar and Cummins engine controllers must be programmed using the appropriate diagnostic/programming software for these functions to operate properly. Please see a certified Caterpillar or Cummins dealer for proper installation and functionality of these features.

REMOTE ENGINE SPEED CONTROL FEATURES AVAILABLE WITH CATERPILLAR ENGINES

Feature codes 12VYC and 12VXY are not available on Caterpillar engines. The following features are available to the Body Builder by directly wiring to the engine controller:

- Vehicle Speed
- Engine Speed
- Remote PTO On/Off
- Remote PTO Ramp Up/Ramp Down
- Frequency Output Signals for Driving Off-board Engine Warning Lights
- Remote Throttle (Pedal) Control

Remote Engine Speed Control Features Available with 2004 Cummins Engines

Vehicle speed on a Cummins engine can be accessed on a datalink or via a second vehicle speed sensor added to the transmission.

ACCESSORY WIRING

12VYL

ACCESSORY WIRING, SPECIAL For Road Speed Wire Coiled Under Instrument Panel for Customer Use

This feature provides a vehicle speed signal source from the engine ECM. This speedometer output is calibrated to 30,000 pulses per mile.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software feature codes can be added through the Diamond Logic® software. Programmable parameters are also programmable through the Diamond Logic® software.

REQUIRED SOFTWARE FEATURE CODES

None

CONFLICTS WITH SOFTWARE FEATURES

None

PROGRAMMABLE PARAMETERS

None

WIRING INFORMATION

The Road Speed Wire is coiled under the instrument panel.

TESTING

Specific testing requirements depend upon the customer application.

REMOTE ENGINE SPEED CONTROL FEATURES

REMOTE AIR SOLENOID MODULE

TEM AIR SOLENOIDS

Refer to Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid.

Normally Closed

08WGA

SOLENOID, AIR for Customer Use; Provides (1) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Available Only With Key in “Ignition (IGN)” or “Accessory” Position; Air Will Exhaust with Key in “Off” Position

08WGB

SOLENOID, AIR for Customer Use; Provides (2) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Available Only With Key in “IGN” or “Accessory” Position; Air Will Exhaust with Key in “Off” Position

08WGC

SOLENOID, AIR for Customer Use; Provides (3) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Available Only With Key in “IGN” or “Accessory” Position; Air Will Exhaust with Key in “Off” Position

08WGD

SOLENOID, AIR for Customer Use; Provides (4) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Available Only With Key in “IGN” or “Accessory” Position; Air Will Exhaust with Key in “Off” Position

08WKM

SOLENOID, AIR for Customer Use; Provides (6) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Available Only With Key in “Ignition” or “Accessory” Position; Air Will Exhaust with key in “Off” Position

Normally Open

08WGP

SOLENOID, AIR for Customer Use; Provides (5) Normally Open Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Exhausted Only With Key in “IGN” or “Accessory” Position; Air Will be Supplied with Key in “Off” Position

08WGR

SOLENOID, AIR for Customer Use; Provides (6) Normally Open Pilot Air Source, Approx. 4 CFM, Includes Switch in Cab; Air Exhausted Only With Key in “IGN” or “Accessory” Position; Air Will be Supplied with Key in “Off” Position

These air solenoids provide Instrument Panel (IP)-mounted, rocker switches and normally closed and/or normally open air solenoids that allow the operator to control up to four normally closed or five or six normally open body-mounted air accessories from the cab. Note: these air solenoids are to be used as a pilot air source and are not to be used as an air supply. All of the air solenoid feature codes include windowed latching rocker switches and do not include any interlock features. Product graphics are included for application to each switch window.

REMOTE AIR SOLENOID MODULE

The air solenoids will turn off and the air will be exhausted for normally closed solenoids, and air pressure will be maintained with the normally open solenoids with the IGN key turned off. Take precautions to ensure that equipment controlled by these solenoids will not cause personal injury when the IGN key is turned off.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE INSTALLED BASED ON THE FEATURE CODE BEING INSTALLED

08WGA — 595AHX; 08WGB — 595AHY; 08WGC — 595AHZ; 08WGD — 595AJA; 08WGP — 595AKZ; 08WGR — 595AJC; 08WKM --- 595BBD

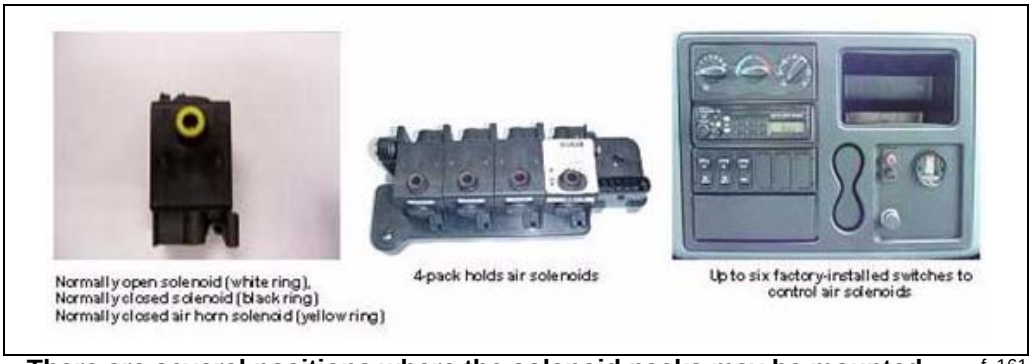
SOFTWARE FEATURE CODES THAT MUST NOT BE ENABLED

None

WIRING INFORMATION

Use the Diamond Logic® Builder software to determine switch locations of the air solenoid switches.

Customer supplies air plumbing from the air solenoids to the desired air-controlled accessory.



There are several positions where the solenoid packs may be mounted. f_161

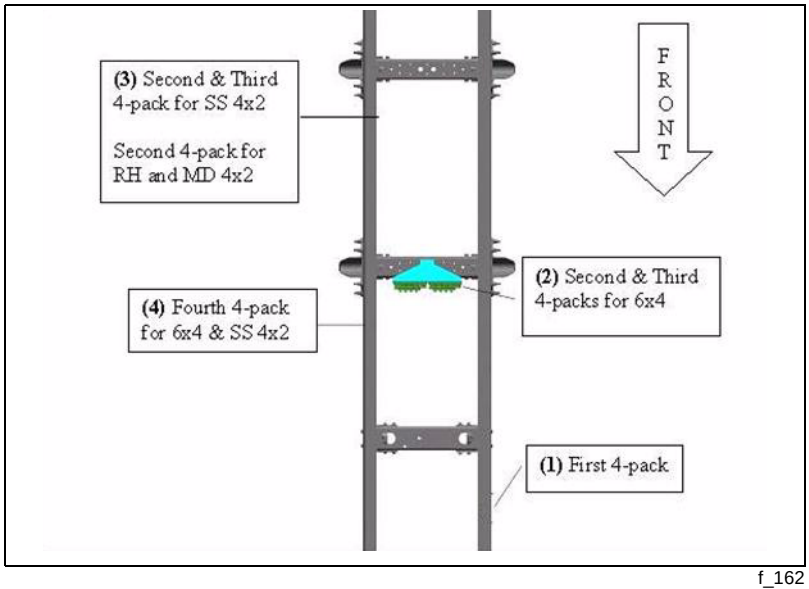
(1) The first 4-pack is mounted on the inboard side of the driver's side frame rail in front of the rear cab crossmember.

(2) The second and third 4-packs for a 6x4 suspension are mounted on the forward rear suspension crossmember.

(3) The second and third 4-packs for a 4x2 suspension are located on the passenger side frame rail in front of the rear suspension crossmember.

(4) A 6x4 or SS 4x2 can have a fourth 4-pack which mounts on the passenger side frame rail in front of the forward rear suspension crossmember.

REMOTE AIR SOLENOID MODULE



f_162

TESTING

Directions For 4-Pack

This procedure can be used for each auxiliary air solenoid added to the vehicle.

1. Activate the in-cab auxiliary air solenoid switch.
2. Verify that the particular air solenoid either provides air pressure for normally closed or exhausts the air for normally open solenoids.
3. Verify that the proper pin in the air solenoid 4-pack connector has battery voltage.
4. Pin A for all air solenoids should have continuity with the negative battery stud.

HOW TO ADD THESE FEATURES

See the “How Do I – General Information” section of this electrical guide.

Feature codes 595AHX, 595AHY, 595AHZ, 595AJA, 595AKZ, or 595AJC must be added depending on the number and type of air outputs desired.

Use the Diamond Logic® Builder software to determine correct in-cab switch location(s) for the switches controlling the air outputs.

REMOTE AIR SOLENOID MODULE

Below is a listing of parts that may be required depending on how the vehicle was equipped at the factory.

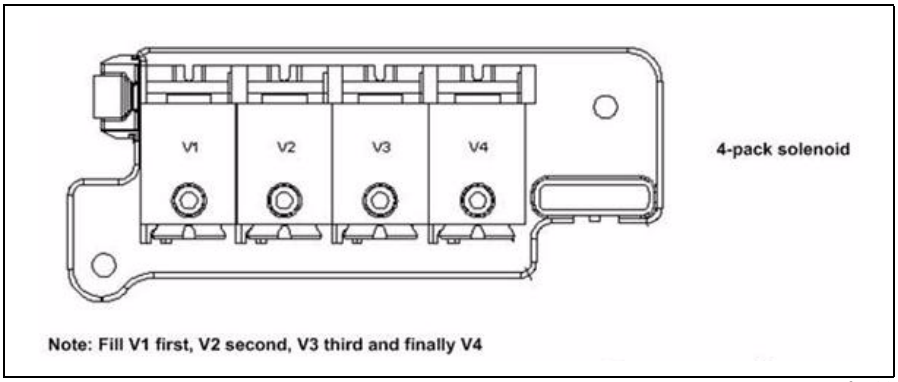
Table 167

Part Number	Description
3610975C1	Support, 4-pack Solenoid (Bracket for 7700 w /Chalmers or HMX suspension)
3610976C1	Support, 8-pack Solenoid (Bracket holds 2 4-pack solenoids for 7700 w /Chalmers or HMX suspension)
3610977C1	Support, 4-pack Solenoid (Bracket for 7700 w/ Hendrickson Air suspension w/ 3/8 frame rails)
3610978C1	Support, 8-pack Solenoid (Bracket holds 2 4-pack solenoids for 7700 w/ Hendrickson Air suspension w/ 3/8 frame rails)
3610973C1	Support, 4-pack Solenoid (All other 6x4 vehicles)
3610974C1	Support, 8-pack Solenoid (Bracket holds 2 4-pack solenoids for all other 6x4 vehicles)
2506711C91	Kit, Air Brake Solenoid N.C. (includes labels and O-rings)
2506712C91	Kit, Air Brake Solenoid N.O. (includes labels and O-rings)
2506713C91	Kit, Air Horn Solenoid (includes labels and O-rings)
3549776C4	Housing, Switch 6-Pack DIN Multiplex
3549777C4	Housing, Switch 12-Pack DIN Multiplex

SCENARIOS FOR ADDING AIR SOLENOIDS

The vehicle has a 4-pack with unused solenoid locations.

Add the solenoid to the solenoid pack, and add the appropriate rocker to the switch pack. See the Switch Pack section for switch information, and use the Diamond Logic® Builder software in conjunction with Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid for terminal and connector information. The BC will have to be programmed for the additional solenoid and switch. Add solenoids per the view below.



f_163

The vehicle does not have any solenoid switch pack.

A 4-pack and solenoid(s) will have to be added. The solenoids are controlled by the BC. There is no multiplexing from the BC to the solenoid pack. See the Switch Pack section for switch information and use the Diamond Logic® Builder software in conjunction with Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid for terminal and connector information.

The vehicle has a 4-pack, but it is full.

Use the same procedure that was used above for a vehicle that already has a solenoid pack that is completely full. A total of two 4-packs may be added to DuraStar and 8000 series vehicles. Four total 4-packs may be added to WorkStar series vehicles. Additional 4-packs are required to be wired per Circuit Diagram Manual S08322, Chapter 10, Chassis Accessories, Air Solenoid.

The BC will have to be programmed for the additional air features to work properly.

SWITCH, AIR HORN, PASSENGER, FIRE TRUCK

08WEE

SWITCH, AIR HORN, PASSENGER Fire Truck Application; Switch Located in Instrument Panel (IP) Close to Passenger; Driver Also To Activate Switch at Steering Wheel

The passenger side air horn switch provides a method for an individual to activate the vehicle air horn from the passenger seat. The feature consists of a hard wired momentary switch that is located in the lower right corner of the central IP. This second rocker switch is used in conjunction with the air horn switch that is located in the steering wheel.

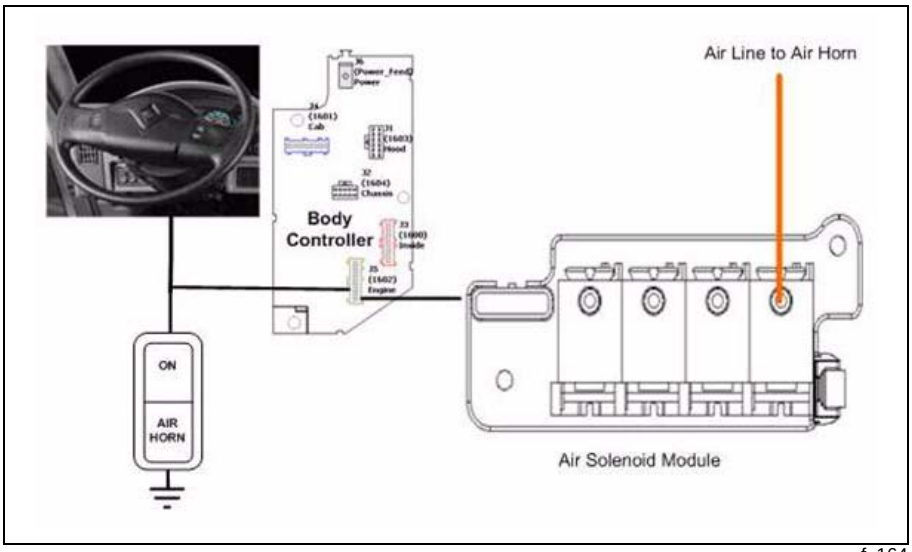
SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

The air horn software feature code 595ALD must be enabled on the vehicle Body Controller (BC) using the Diamond Logic® Builder software (see local dealer).

There are no programmable parameters associated with this feature.

WIRING INFORMATION

Both the hard wired rocker switch in the IP and the air horn switch in the steering wheel are connected to a single input on the BC connector 1602 Pin F8. The air solenoid is driven from the BC output connector 1602 Pin E12.



f_164

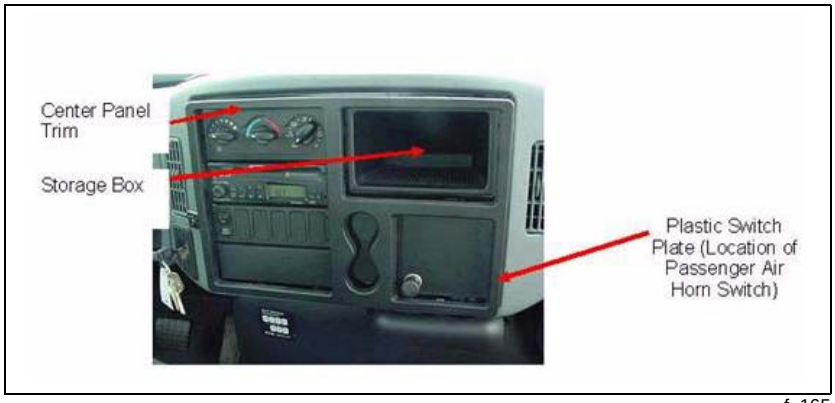
Air Horn Switch Part Number 3551415C1

TESTING SYSTEM OPERATION

1. Turn the Ignition (IGN) key to the accessory position.
2. Momentarily depress the air horn switch in the steering wheel. Note that the air horn sounds.
3. Momentarily depress the air horn rocker switch. Note that the air horn sounds.

HOW TO ADD THIS FEATURE

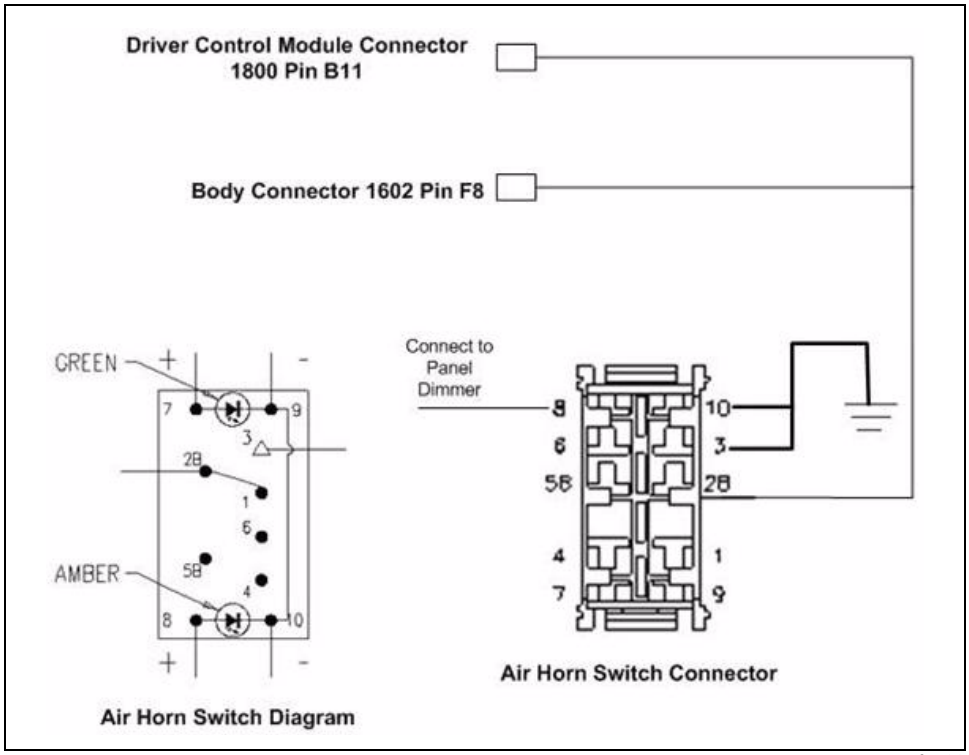
1. Remove the central IP trim piece.



Center Panels to Remove f_165

2. Locate an open switch position in the lower right corner of the IP.
3. Use a switch hole punching tool to cut a hole in the plastic plate of the central IP plate.
4. Remove the storage box or 12-pack of switches located above plastic plate. Use a scribe or other marker tool to outline the hard wired switch openings in the steel plate located behind the plastic switch plate.
5. Drill a pilot hole in the center of the desired switch location.
6. Use the switch punch to open the hole in the plastic plate. The recommended method to create a rectangular switch slot is to use a Green Lee Punch (part number ZTSE4426 from SPX).
7. Insert the air horn switch in the plastic plate.
8. Wire the mating switch connector as Circuit Diagram Manual S08322, Chapter 4 Cab Accessories, Horn – Electric.
9. Attach the switch connector to the air horn switch.
10. Reinstall the plastic switch plate and central IP trim piece.

REMOTE AIR SOLENOID MODULE



f_166

General Circuit Diagram for Adding the Passenger Side Air Horn Switch

REMOTE AIR SOLENOID MODULE

REMOTE START/STOP

REMOTE START/STOP

Refer to the circuit diagram in S08322, Chapter 10, Chassis Accessories, Remote Start/Stop.

60ABC

BDY INTG, REMOTE START/STOP To Start and Stop Vehicle Engine

The Remote Start/Stop feature provides the operator with the ability to remotely start or stop the engine from a single ground (GND) active switch closure located on the vehicle body equipment. The vehicle park brake must be set, and the hood of the vehicle must be closed. The vehicle must also be equipped with an automatic transmission and must be in neutral. This feature requires the customer to provide the GND active switch as well as the wiring from that switch into the Remote Start/Stop connector located in the middle of the chassis. The customer will also provide the terminals and seals for the International®-provided connector.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKW

SOFTWARE FEATURE CODE THAT MUST BE REMOVED

595AKV

If TEM_Rem_Start_Stop_PTO_Ilock is turned on, then the operator can only use Remote Start/Stop when the in-cab, International® PTO switch is in the ON position.

The TEM_Rem_Start_Stop_Crank_Delay_Gen2 parameter determines how long the engine will wait before starting once the remote start/stop feature is activated.

Table 168

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Rem_Start_Stop_PTO_Ilock	2192	If this parameter is set, the remote start/stop functionality will not function unless the PTO switch is in the on position.	Off	On/Off	N/A	N/A	N/A
TEM_Rem_Start_Stop_Crank_Delay_Gen2	2438	This is the time that the remote start/stop feature delays before starting to crank the engine.	0.5	S	0.1	1	0.01

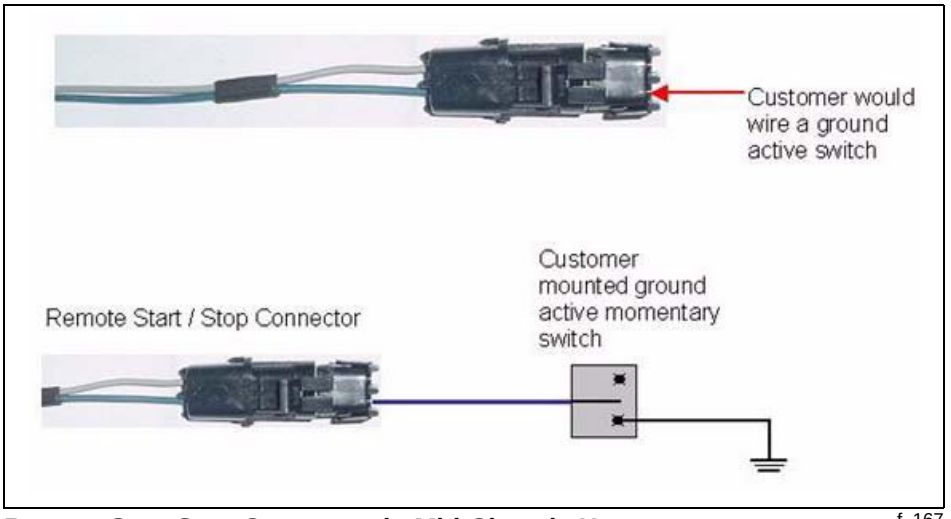
WIRING INFORMATION

- When 60ABC is ordered on a truck, a connector (# 9778) is provided for the TEM to wire into for Remote Start/Stop. This connector is located in the mid-chassis harness. The mid-chassis harness is located approximately halfway between the rear axle (or forward-rear axle for trucks with tandem rear axles) and the back of the cab on the driver's side frame rail. The customer should wire into the circuit with the Dark Blue wire (# N104CA).
- The customer must provide a GND active momentary switch that is wired into the mid-chassis Remote Start/Stop connector.
- The customer must also order the terminals and seals (based on their wire gauge) for the International®-provided connector so that the customer can wire the switch into the connector.

Table 169

Customer Wire Gauge	Terminal Part Numbers	Seal Part Numbers
12AWG	1673748C1	0589390C1
14AWG	0587577C1	0589391C1
16AWG	0587577C1	1652325C1

REMOTE START/STOP



Remote Start Stop Connector in Mid-Chassis Harness f_167

TESTING

1. When starting and stopping the engine, make sure that the Body Builder switch is providing a GND signal to the mid-chassis wire. The vehicle ignition (IGN) key must be in the ON position and the hood must be closed.
2. If the engine is running, a momentary switch closure of the body builder-supplied switch will stop the engine.
3. If the engine is stopped, push and hold the body builder-supplied switch until the vehicle starts.

HOW TO ADD THIS FEATURE

Refer to the circuit diagram in S08322, Chapter 10, Chassis Accessories, Remote Start/Stop for proper circuit and connector/pin information.

REMOTE START/STOP WITH EMERGENCY PUMP

Refer to the circuit diagram in S08322, Chapter 10, Chassis Accessories, Remote Start/Stop.

60ABD

BDY INTG, REMOTE START/STOP To Start and Stop Vehicle Engine, Will Start Emergency Pump Motor, Programmable Time Intervals

The Remote Start/Stop feature provides the ability to remotely start or stop the engine from a single GND active switch closure located on the vehicle body equipment. This feature operates in two modes, namely the remote start/stop mode and the emergency pump mode. The vehicle park brake must be set and the hood of the vehicle must be closed. The vehicle must also be equipped with an automatic transmission and must be in neutral. The user may engage the same switch to control an emergency pump solenoid/motor combination, if the vehicle engine cannot be restarted.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

REQUIRED SOFTWARE FEATURE CODE

595AKV

SOFTWARE FEATURE CODE THAT MUST BE REMOVED

595AKW

If TEM_Rem_Start_Stop_PTO_Ilock is turned on, then the operator can only use Remote Start/Stop when the in-cab, International® PTO switch is in the ON position.

If the engine shuts off unexpectedly or will not start, 60ABD provides the operator with the ability to use an emergency pump solenoid/motor. The TEM_Remote_Engine_Stop_Time parameter sets the time to hold the switch down, after the engine has unexpectedly shut off, before the emergency pump activates. Also, if the truck is stopped remotely and the remote switch is held in the active position, the emergency pump will start by holding the switch for the time set by the TEM_Remote_Engine_Stop_Time parameter.

The TEM_Rem_Start_Stop_Crank_Delay_Gen2 parameter determines how long the engine will wait before starting once the remote start/stop feature is activated

Table 170

Parameter	ID	Description	Default	Units	Min	Max	Step
TEM_Rem_Start_Stop_PTO_Ilock	2192	If this parameter is set, the remote start/stop functionality will not function unless the PTO switch is in the on position.	Off	On/Off	N/A	N/A	N/A
TEM_ Remote_Engine_Stop_Time	2072	Time allotted to stop the engine for the remote engine start stop with emergency pump feature.	5	S	-	6-	0.01
TEM_Rem_Start_Stop_Crank_Delay_Gen2	2438	This is the time that the remote start/stop feature delays before starting to crank the engine.	0.5	S	0.1	1	0.01

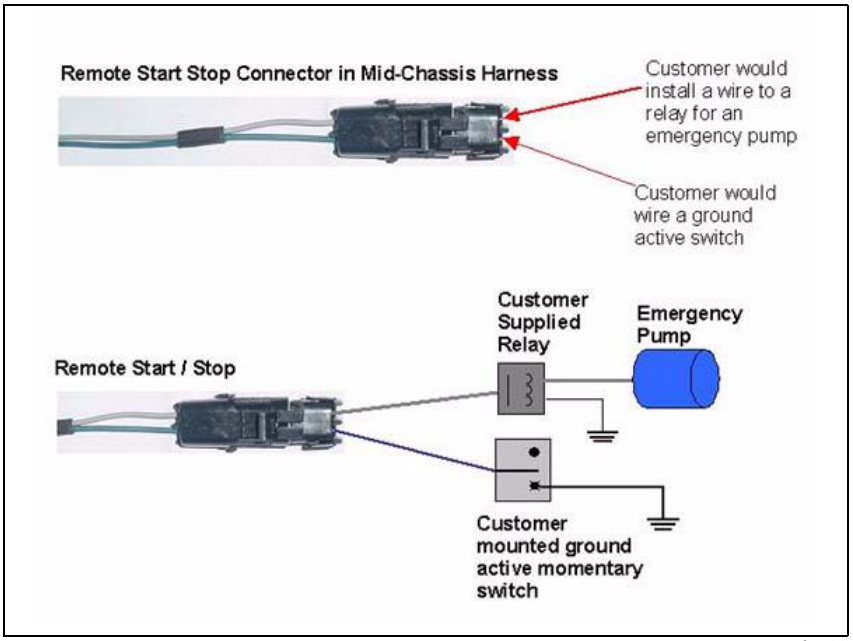
WIRING INFORMATION

- When 60ABD is ordered on a truck, two mid-chassis wires with a connector (# 9778) are provided for the TEM to wire into for Remote Start/Stop with emergency pump. This connector is located in the mid-chassis harness. The mid chassis harness is located approximately halfway between the rear axle (or forward-rear axle for trucks with tandem rear axles) and the back of the cab on the driver's side frame rail.
- The first wire is the wire used to stop and start the engine (# N104CA). It is a dark blue wire.
- The second wire is used to control an emergency pump (#N59CA). It is a grey wire.
- The customer must also order the terminals and seals (based on their wire gauge) for the International®-provided connector so that the customer can wire the switch into the connector.

Table 171

Customer Wire Gauge	Terminal Part Numbers	Seal Part Numbers
12AWG	1673748C1	0589390C1
14AWG	0587577C1	0589391C1
16AWG	0587577C1	1652325C1

- The customer must provide a GND active momentary switch that is wired into the mid-chassis connector.
- If the customer orders 60ABD but decides not to use an emergency pump, the customer should simply use the Diamond Logic® Builder software to enable software feature code 595AKW, and remove software feature code 595AKV.



f_168

Navistar does not suggest adding a remote start on vehicles with manual transmissions.

TESTING

1. When starting and stopping the engine, make sure that the Body Builder switch is providing a GND signal to the mid-chassis wire. The vehicle IGN key must be in the ON position and the hood must be closed.
2. If the engine is running, a momentary switch closure of the body builder-supplied switch will stop the engine.
3. If the engine is stopped, push and hold the body builder-supplied switch until the vehicle starts.
4. If the engine will not start, release the start/stop switch momentarily, activate the switch again, and hold it until the emergency pump control wire supplies GND to the emergency pump relay. The emergency pump will remain ON as long as the switch is active.

HOW TO ADD THIS FEATURE

Refer to the circuit diagram in S08322, Chapter 10, Chassis Accessories, Remote Start/Stop for proper circuit and connector/pin information.

LIFT GATE ACCOMMODATION PACKAGE

POWER SOURCE FOR LIFT GATE

08WJA

POWER SOURCE, SPECIAL for Customer-Installed Lift Gate; 200 AMP max, includes 2 gauge power cable to end-of-frame, switch on Instrument Panel (IP), with a time out feature, battery discharge protection, controlling a mag switch which provides power

08WJB

POWER SOURCE, for Customer-Installed Lift Gate; heavy duty, includes 0 gauge power cable to end-of-frame, switch on IP, with a time out feature, battery discharge protection, controlling a mag switch which provides power

08WJH

POWER SOURCE, SPECIAL Special Socket; Dual Pole Terminal, for Power Lift Gate Feed, Battery Feed Thru 150 Amp Circuit Breaker To Operate Lift Gate On Trailer

08WCM

POWER SOURCE, SPECIAL Special Socket; Single Terminal, for Power Lift Gate Feed, Battery Feed Thru 150 Amp Circuit Breaker, To Operate Lift Gate On Trailer, Includes a 15’ Power Cable Coiled in Cab

Feature code 08WJA or 08WJB provides a factory-installed, dedicated power source for lift gate operation. This feature includes an IP-mounted master switch, which illuminates when the system is turned on, and an optional “AUX” button on the key fob to enable or disable the lift gate. The purpose of the in-cab master switch and the “AUX” button on the key fob is to help prevent unauthorized use of the lift gate. These switches also activate a 60 minute timer in the BC that will disable the lift gate after 60 minutes. For continued use of the lift gate, the master switch or the aux button on the key fob must be used to activate the system for an additional ten minutes. A Battery Protection Module, activated by the BC 60 minute timer, and a 200 AMP mag switch, mounted in or at the battery box, enables power to the lift gate motor. A circuit protected cable from the battery to the mag switch and a heavy gauge wire routed from the mag switch to the end of frame, to provide power to the lift gate motor is also provided.

This feature will provide battery discharge protection for users who operate the lift gate with or without the engine running. Without the engine running, key off, the Battery Protection Module will constantly monitor battery voltage and shut down the lift gate operation before battery voltage reaches a state of charge that will not allow the vehicle to restart. With the key switch in any position except start or off, an audible alarm will also sound in the cab during certain low voltage conditions. In addition to battery voltage monitoring, this feature has time out functionality from the BC to automatically disable the lift gate after a selected time. The default time out is 60 minutes. A road speed interlock from the BC is provided that activates above approximately 2 MPH. If activated, the indicator light in the switch flashes and the lift gate is disabled by the BC which prevents the lift gate from being operated while the vehicle is in motion. The lift gate master switch, or the aux button on the key fob, must be activated again to continue use of the lift gate after vehicle has stopped.

The lift gate shall be activated for 60 minutes when the key switch is in any position and the lift gate switch is pressed to the momentary on position (up position), or key fob aux button is pressed, and the vehicle speed is lower than 2 MPH and voltage conditions are met.

The lift gate shall be deactivated when any of the following conditions are met:

1. The lift gate switch is pressed to the momentary off position (down position), or the push button is cycled depending on the programmable feature on the vehicle.
2. The aux button on the key fob is pressed.

3. The voltage is lower than the safe voltage value, and the shutdown override time expires or the vehicle speed is greater than 2 MPH.
4. The programmable time limit, set at 60 minutes, has been reached.

A cable accommodation is required to fit body van length of 14-26 feet. An additional 40 inch cable length is provided for ease of installation.

Design accommodation for a lift gate with maximum current draw of up to 200 AMPS for code 08WJA and 200+ AMPS for code 08WJB is available.

This feature can work with the work light feature but cannot work with the work light Remote Keyless Entry (RKE) key fob feature.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software feature codes can be added through the Diamond Logic® Builder software. Programmable parameters are also programmable through the Diamond Logic® software.

REQUIRED SOFTWARE FEATURE CODE

595AYM for lift gate with rocker switch or 595AGN for lift gate with push button switch in the left side cluster switch B location. Be careful: 595AGN “LIFT GATE WIRING PAK Push Button B” may conflict with other “B” located switch features like Lamp Check (595AZY).

SOFTWARE FEATURES THAT MUST BE REMOVED

595ABT

The Lift_Gate_Alarm_Time parameter is programmed to allow the operation of the lift gate for a period of 60 seconds. At the end of 60 seconds, the master switch or the aux button on the key fob must be used to reactivate the system.

The Lift_Gate_Enable_Timeout parameter is programmed to allow continual operation of the lift gate, in 10 minute increments, with the master switch or aux button on the key fob after the time out period of 60 minutes.

The Lift_Gate_Enable_Hi_Current parameter will set an alarm if amperage load goes above the programmed value.

The Lift_Gate_Enable_Lo_Current parameter will set an alarm if amperage load goes below the programmed value.

The Lift_Gate_Enable_OC_Current parameter will set an alarm if amperage load goes below the programmed value.

The Lift_Gate_Enable_Timeout parameter can be adjusted to vary the amount of time, in ten minute increments, that the lift gate will remain enabled. If this value is set to 6, the lift gate will remain enabled for 60 minutes from the time that it is enabled.

The Lift_Gate_Disable_Threshold parameter will disable the lift gate feature if the voltage falls below this threshold voltage.

Table 172

Parameter	ID	Description	Default	Units	Min	Max	Step
ift_Gate_ Alarm_Time	2249	Lift Gate Alarm Time Value	60	s	1	120	1
Lift_Gate_ Enable_Hi_ Current	2234	Lift Gate Enable High Current Detection Level (AMPS)	10	A	0	10	0.1
Lift_Gate_ Enable_Lo_ Current	2233	Work Light Low Current Detection Level (AMPS)	0.3	A	0	10	0.1
Lift_Gate_ Enable_OC_ Current	2232	Lift Gate Enable Open Circuit Detection Level (AMPS)	0.3	A	0	10	0.1
Lift_Gate_ Enable_Timeou t	2235	Amount of time, in 10 minute increments, that the lift gate will remain enabled.	60	Min	10	240	10
Lift_Gate_Disab le_Threshold	2239	Voltage threshold below which the lift gate is disabled	11.5	V	11.5	13.8	0.1

WIRING INFORMATION

For 08WJA and 08WJB

Please refer to Circuit Diagram Manual S08337, Chapter 10, Chassis Accessories, Power Source, Customer Installed Lift Gate.

For 08WJA

The Body Builder will be required to cut the 2 straplocks securing the power cable and route and clip the power cable to the lift gate motor. Then trim the power cable to length and add a lug terminal for securing cable to the lift gate motor. Two product graphics, from the plastic bag for Body Builders, need to be installed on the van body in the approximate locations shown.

For 08WJB

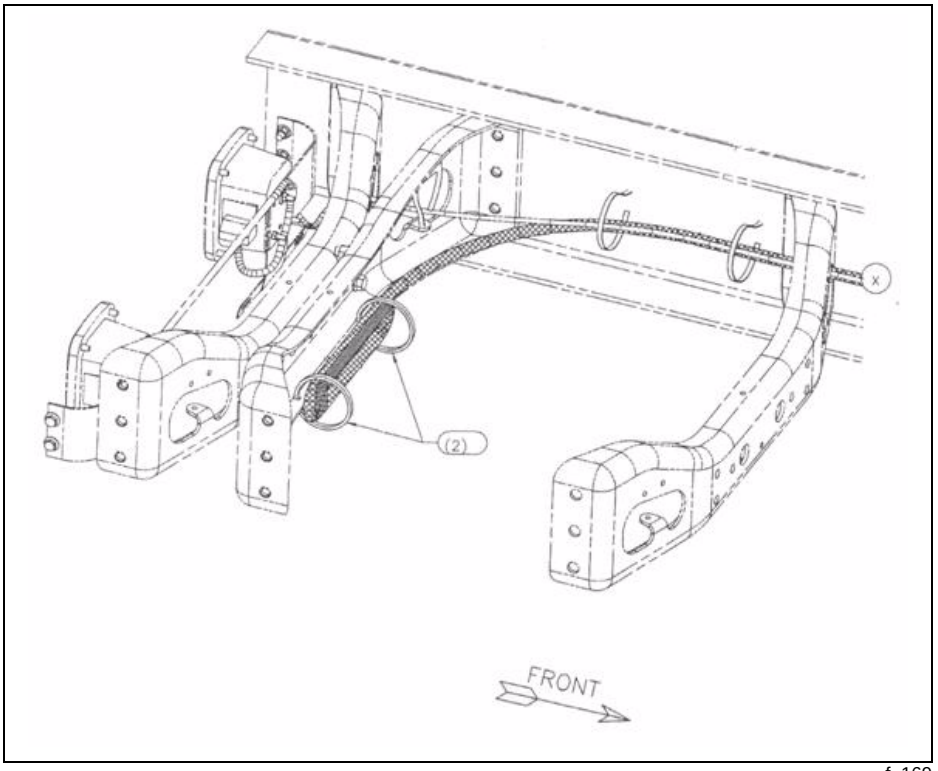
The Body Builder will be required to route a 0 gauge cable from the mag switch, back along the frame to the lift gate motor.

Code 08WJB is identical to code 08WJA with the following exceptions:

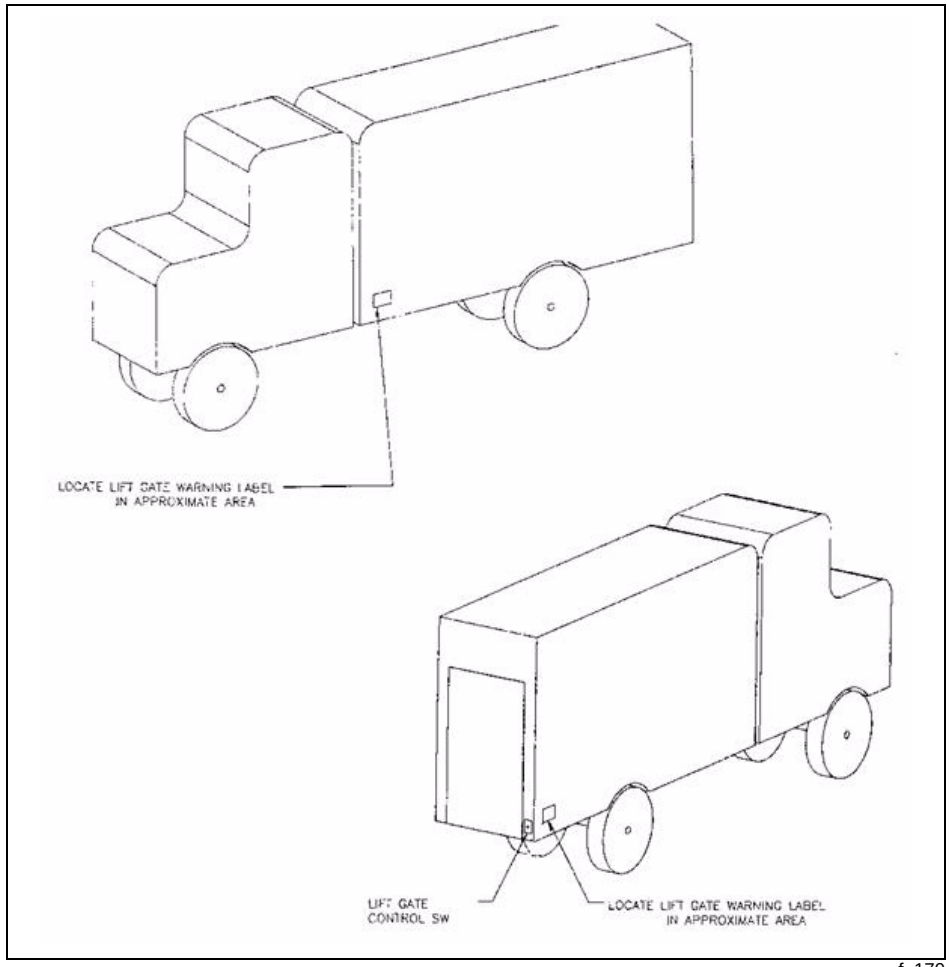
Added – 3598246C91 Cable Assy, Lift Gate Feed with “0” gauge cable and 3-10 Awg fusible links.

Removed – 3592398C91 Cable Assy, Lift Gate Feed with “2” gauge cable and 2-10 Awg fusible links.

Also the 3592400C93-REF “2” gauge Cable Assy, Lift Gate – 33.5 feet Ref – Cut to length is changed to “0” gauge cable. The Body Builder will be required to remove the “2” gauge cable from the mag switch, back along the frame to the lift gate motor and replace it with the “0” gauge cable.



Harness Routing Diagram f_169



Warning Label Locations Diagram f_170

TESTING

1. The body builder or lift gate installer must bring the batteries up to a full charge before trying to test the system for functionality.
2. With the batteries at a full charge, voltage in the 12.6 to 12.9 range and the lift gate power controlled by the Battery Protection System, the system will operate as described in the above section.

HOW TO ADD THIS FEATURE

Use the Diamond Logic® software to add the following software feature:

REQUIRED SOFTWARE FEATURE CODE

595AYM for lift gate with rocker switch or 595AGN for lift gate with push button switch

SOFTWARE FEATURES THAT MUST BE REMOVED

595ABT

HARDWARE

Please refer to Circuit Diagram Manual S08337, Chapter 10, Chassis Accessories, Customer Installed Lift Gate for circuit locations and routing and an International® dealer for parts information.

LIFT GATE ACCOMMODATION PACKAGE

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

60AAC

BDY INTG, POWER INVERTER 3000 Watt Dynamic (With Engine Running); On/Off Switch in Instrument Panel (IP); Includes 120 volt AC Wiring; Connection for Customer-Mounted Power Outlet

60AAE

BDY INTG, POWER INVERTER Temporary Mount on Frame Rail for Customer Installation; 3000 Watt Dynamic (With Engine Running); On/Off Switch in IP; Includes 120 volt AC Wiring Connection for Customer-Mounted Power Outlet

WARNING: Shock hazard. Only trained technicians should service high voltage components. High voltage circuits and components contain voltage levels that may cause equipment damage, electric shock, and/or deadly electrocution if handled incorrectly.

WARNING: DO NOT OPEN the PowerPack 3. Hazardous voltages exist internally even after the PowerPack 3 is removed from the vehicle. Only a Qualified Technician may perform service inside the PowerPack 3. Failure to follow this warning may result in property damage, personal injury, or death.

WARNING: The alternator may generate high voltage, particularly at high rpm, which can be harmful. Do not touch the 3–phase output terminals. Failure to follow this warning may result in property damage, personal injury or death.

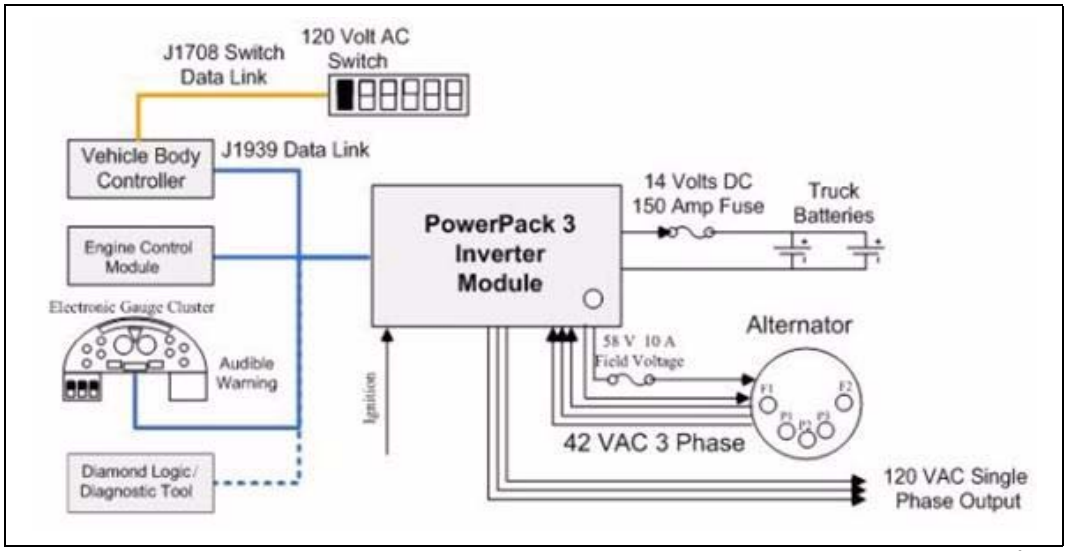
WARNING: The alternator output is a hazardous 3–phase AC voltage — Do not cut the cable or touch the terminals. Failure to follow this warning could result in property damage, personal injury, or death.

The PowerPack 3 Inverter system is an advanced Power Generation and Power Management system to provide both DC power and an on-board 120 volt AC power source. The PowerPack 3 system is integrated with the Diamond Logic® Electrical system. The DC portion of the system provides 14 volts DC at a maximum of 100 Amperes (AMPS) to charge the vehicle batteries. The AC portion of the system provides a 120 Volts AC single, phase 60 Hertz output at a maximum of 25 AMPS. The system may be ordered from International®, factory-installed either mounted in the battery box or as a temporary mounted inverter module behind the cab. The body upfitter is tasked with mounting the inverter in a body compartment with the temporary mount.

The PowerPack system consists of an inverter module, a special 3-phase 42 volt AC alternator, a multiplexed switch in the cab, and associated wiring harness. The engine must be running in order for the PowerPack system to generate AC or DC voltages. The 120 volt AC output is only functional when the vehicle is stationary with the park brake set. The 120 volt AC output contains a Ground (GND) fault interrupter device and a weather sealed power plug.

CAUTION: If 120 volts AC Shore power is integrated into the body wiring, the shore power connection must never be directly connected to the PowerPack 3 AC output.

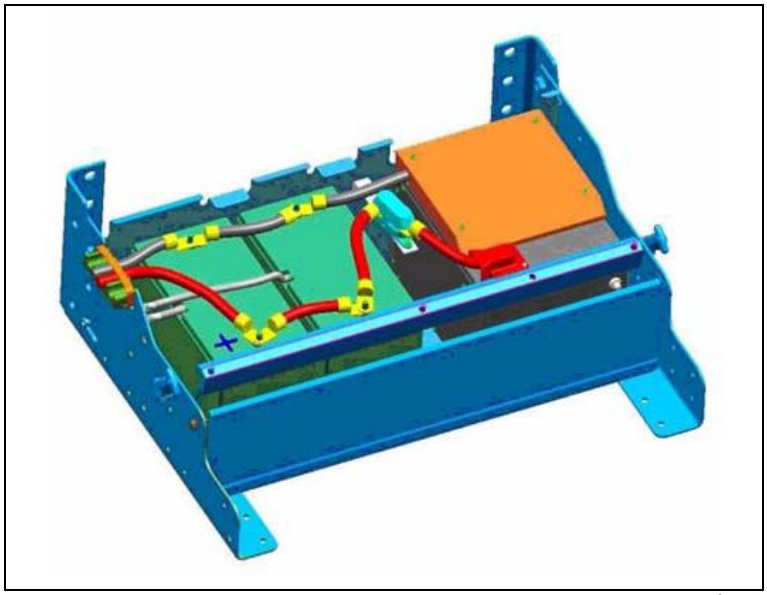
POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES



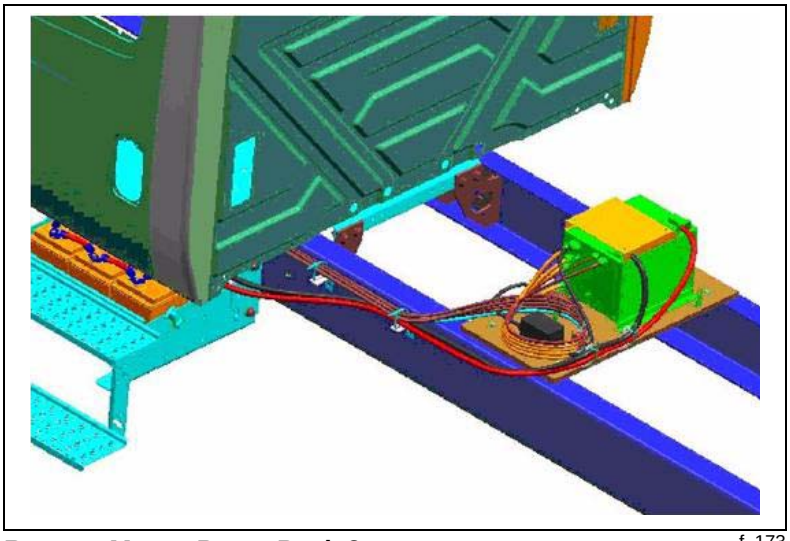
PowerPack 3 Block Diagram

f_171

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

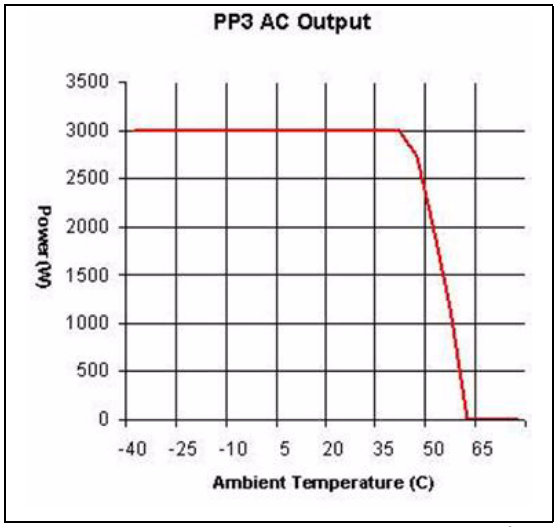


Battery Box Mounted PowerPack 3 f_172

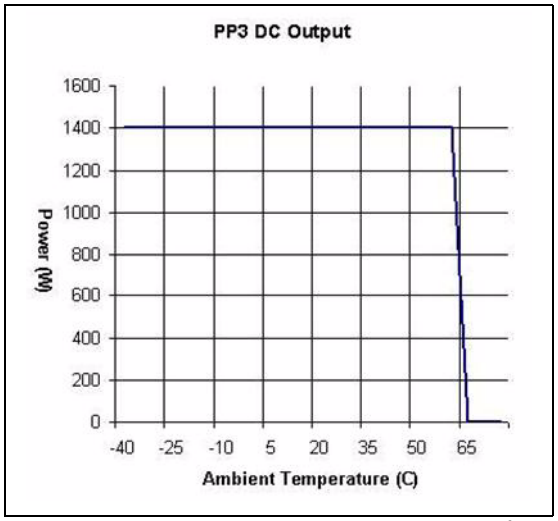


Remote Mount PowerPack 3 f_173

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES



AC Derating Curve f_174



DC Derating Curve f_175

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

Using PowerPack 3 With Remote Engine Speed Control

PowerPack 3 provides full power output for the 120 volt AC section at an engine RPM of 935 or greater. The PowerPack 3 inverter module uses special datalink commands to raise the engine RPM to 935 when the 120 volt AC rocker switch is turned on. Since the engine cannot respond to both datalink commands and direct Engine Control Module (ECM) hard wired engine speed control commands, the body upfitter must use specific alternative wiring methods to permit remote engine speed control from remote body locations as well as allow PowerPack 3 to raise engine speed as required. Vehicles equipped with PowerPack 3 may not be used with the feature 12VZA which provides remote engine speed control through hard wires connected directly to the engine ECM. The following alternative features are compatible with PowerPack 3 and may be used to achieve various engine speed control functions.

- Preset or variable engine speed control using the steering wheel cruise control switches
- Preset variable or remote pedal/throttle using the Remote Engine Speed Control Module (RESCM). Requires Body Controller (BC) feature 595AHA
- Preset 1 using Remote Power Module (RPM) inputs; i.e., feature code 60AJE
- Preset or variable engine speed control using Diamond Logic® Advanced Ladder Logic

When the PowerPack 3 AC output is turned off and no other form of remote engine speed control is requested, the engine will be at an idle speed of approximately 700 RPM. If the PowerPack 3 AC switch is turned on, the engine speed shall be increased to 935 RPM. If another form of remote engine speed control is activated, the PowerPack 3 will release engine speed control to that input. When the remote engine speed request is removed, the engine will return to 935 RPM until the PowerPack is turned off.

Body Controller: Software Feature Codes/Programmable Parameters

Stationary Mode

Software feature code 595AZU must be enabled on the vehicle Body Controller using the Diamond Logic® Builder software (see local dealer).

Parameter PPE3_param_incrThrottle_rqst_enable will enable the automatic throttle request. This will automatically ramp the engine to the value set in parameter 2344 when the PowerPack is requested on.

Parameter PPE3_param_incrThrottle_startDelay is the amount of time that the PowerPack will wait to turn on. This is to allow the engine to ramp to the operating RPM before the PowerPack is activated.

Parameter PPE3_param_incrThrottle_targetRPMs is the target RPM for the engine to ramp to when the PowerPack is activated.

Parameter PPE3_param_incrThrottle_timeout is the amount of time that the inverter is inhibited from coming back on due to inadequate engine speed.

Table 173

Parameter	ID	Description	Default	Units	Min	Max	Step
PPE3_param_incrThrottle_rqst_enable	2357	If this is true, then the automatic throttle increase request has been enabled.	1	On/Off	0	1	1
PPE3_param_incrThrottle_startDelay	2399	This parameter allows the throttle to ramp to the target RPM prior to enabling the PPE. The logic for this parameter is that a maximum load on the PPE would turn off the inverter if the alternator RPMs are not at target.	2	Seconds	0	5	0.1
PPE3_param_incrThrottle_targetRPMs	2344	This is the target RPM rate for the throttle increase feature.	935	RPM	900	2000	1
PPE3_param_incrThrottle_timeout	2345	The amount of time until the inverter is inhibited because the engine speed is not at an adequate level	5	Seconds	0	30	0.1

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

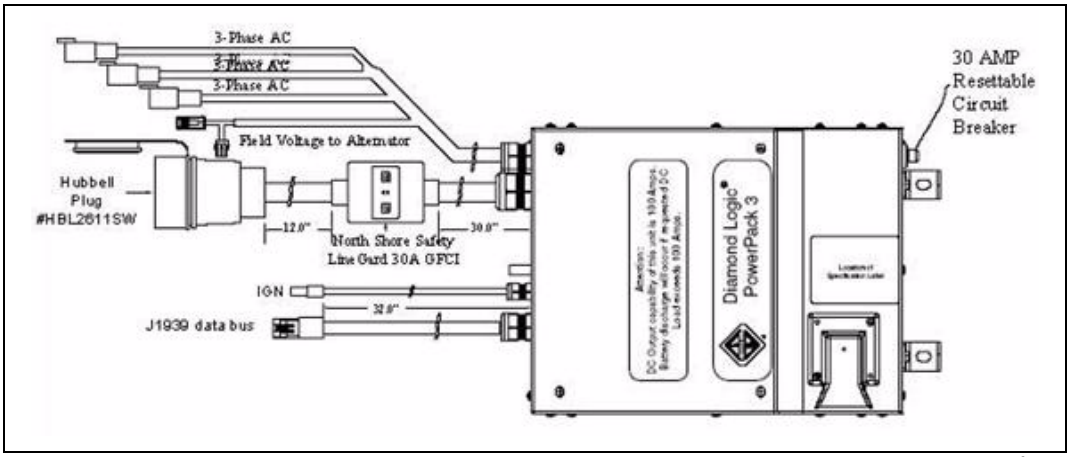
WIRING INFORMATION

WARNING: All electrical connections to the PowerPack 3 must be made by a qualified electrician. Failure to follow this warning could result in property damage, personal injury, or death.

A Hubbell Watertight Safety-Shroud male plug (Hubbell part number HBL2611SW) is needed to connect to the AC output plug to mate with the PowerPack supplied Hubbell Watertight Safety-Shroud female socket (Hubbell part number HBL2613SW). These plugs are available at electrical and industrial supply houses.

Using this part combination will allow for a weather resistant connection to the PowerPack 3 unit. Alteration of the AC output plug, failure to use the correct male plug, or removal of the supplied socket will not guarantee a watertight connection.

The AC output from the PowerPack 3 is wired to a Ground Fault Circuit Interrupter (GFCI) to ensure protection against GND fault conditions. Be aware that standard duplex GFCI and non-GFCI receptacles need to be protected with a circuit breaker, usually rated for 15 or 20 AMPS.



PowerPack 3 Inverter/Regulator Component Detail f_176

PowerPack 3 Kit, Left Side under Cab for vehicles built after March 2007.

PowerPack 3 Kit, Right Side under Cab for vehicles built after March 2007.

PowerPack 3 Kit, Remote Mount for vehicles built after March 2007.

Fuse, 58 volt, 10 amp: Alternator Field Wire fuse. Navistar Part Number: 2590768C1

TESTING SYSTEM OPERATION

- Start engine; ensure that the park brake is set.
- Verify that the batteries are being charged. The voltmeter should be reading greater than 13.5 volts.
- Depress 120 VAC rocker switch in IP.
- Verify that the engine ramps to 935 RPM.
- Verify green light in rocker switch is on solid within five seconds.
- Verify 120 volt AC output voltage.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

f_177

POWERPACK 3 TROUBLESHOOTING

If the PowerPack 3 output does not power up or shuts down during vehicle operation, follow these steps to troubleshoot the system:

1. Set the 120VAC ON/OFF switch to OFF position, and ensure interlocks are satisfied, as described above, correcting as necessary.
2. Attempt to restart the PowerPack 3 by pressing the ON switch.
3. If the unit continues to shut-down, (blinking green light in the rocker switch) disconnect any AC loads before restarting the PowerPack 3.
4. Check for green light on GFCI. If there is a red light press the reset button on GFCI.
5. Press the 120VAC switch to OFF, check the 30-Amp circuit breaker, and reset if necessary.
6. Wait several minutes to allow the system alternator and PowerPack 3 unit to cool, and then attempt to restart.
7. If the unit does not restart, then turn the vehicle's ignition OFF, and then back ON again. This will restart the PowerPack 3 output protection circuits.
8. If the above steps fail to restart the PowerPack 3 unit, then have the system serviced by a qualified technician.

NOTE: If the unit does not restart, the problem could be caused by overheating or other circuit protection devices. If the PowerPack 3 circuit breaker or the GFCI device is tripped, the green light in rocker switch will continue to show an indication that AC power is ON. Be advised to check these other elements of the system if 120 volt AC power is not present as expected.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

Table 174 – Diagnostic Indications Using the In-Cab Rocker Switch or Diamond Logic® (Pre-2007 Vehicles)

SPN	FMI	Byte 7	Byte 8	Switch Indicator Blink Rate	Condition Description/Comments/Probable Cause(s)
168	2	0	0	Fast	Communication fault from ESC to the PowerPack. Check for open circuit or short in J1939 datalink. If switch is not blinking, verify vehicle is programmed for PowerPack feature and the switchpack is operating correctly.
168	3	0	0	Fast	DC module over voltage on vehicle DC bus. System detected voltage over 15 volts. Remove any external power supply/charger from vehicle
168	3	0	0	Slow	AC module over voltage condition on high voltage DC bus. Likely an internal failure for AC output. AC has been shut down. DC output remains on.
168	4	0	0	Fast	DC module under voltage condition on vehicle DC bus. System detected low DC voltage. This could be due to insufficient power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
168	4	0	0	Slow	AC module under voltage condition on high voltage DC bus. System detected low internal voltages. This could be due to insufficient input power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
168	6	0	0	Slow	AC module has shut down due to overload condition. AC overloaded, remove some or all of AC load.
168	8	0	0	Fast	Phase missing fault/alternator fault. One of the three 3-phase wires has an open circuit. Check the 3 phase wires from the alternator to the PowerPack.
168	16	0	0	Fast	DC module over temperature condition. PowerPack is experiencing extremely high internal temperatures. AC and DC has been shut down. Allow the system to cool down.
168	16	0	0	Slow	AC module over temperature condition. PowerPack has detected high internal temperatures although less severe. AC inverter has shut down, but DC output remains on. Shut the system down to all it to cool down or remove some of the loads.
168	17	0	0	Fast	PowerPack Fuse Open. Check DC battery charging connections from PowerPack. Check 150A fuse.
639	14	37	255	Fast	Communication fault between PowerPack and the ESC. Check for open circuit or short in J1939 datalink. Also, check the ignition circuit to the PowerPack module

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

Table 175 – Diagnostic Indications Using the In-Cab Rocker Switch or Diamond Logic® (2007 Vehicles and post-2007)

SPN	FMI	Byte 7	Byte 8	Switch Indicator Blink Rate	Condition Description/Comments/Probable Cause(s)
520467	9	0	0	Fast	Communication fault from ESC to the PowerPack. Check for open circuit or short in J1939 datalink. If switch is not blinking, verify vehicle is programmed for PowerPack feature and the switchpack is operating correctly.
168	3	0	0	Fast	DC module over voltage on vehicle DC bus. System detected voltage over 15 volts. Remove any external power supply/charger from vehicle
520664	3	0	0	Slow	AC module over voltage condition on high voltage DC bus. Likely an internal failure for AC output. AC has been shut down. DC output remains on.
168	4	0	0	Fast	DC module under voltage condition on vehicle DC bus. System detected low DC voltage. This could be due to insufficient power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
520644	4	0	0	Slow	AC module under voltage condition on high voltage DC bus. System detected low internal voltages. This could be due to insufficient input power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
520771	6	0	0	Slow	AC module has shut down due to overload condition. AC overloaded, remove some or all of AC load.
115	2	0	0	Fast	Phase missing fault/alternator fault. One of the three 3-phase wires has an open circuit. Check the 3 phase wires from the alternator to the PowerPack.
520774	0	0	0	Fast	DC module over temperature condition. PowerPack is experiencing extremely high internal temperatures. AC and DC has been shut down. Allow the system to cool down.
520773	0	0	0	Slow	AC module over temperature condition. PowerPack has detected high internal temperatures although less severe. AC inverter has shut down, but DC output remains on. Shut the system down to all it to cool down or remove some of the loads.
520772	31	0	0	Fast	PowerPack Fuse Open. Check DC battery charging connections from PowerPack. Check 150A fuse.
639	9	37	255	Fast	Communication fault between PowerPack and the ESC. Check for open circuit or short in J1939 datalink. Also, check the ignition circuit to the PowerPack module

NOTE: A complete aftermarket parts kit is under development. The PowerPack 3 kit part number is not available at this time.

How To Add This Feature

1. Remove power from batteries.
   a. Remove the lid from the battery box.
   b. Remove all battery cables from the batteries and battery box, starting with the negative terminals.
2. Replace the 3 battery box with a 4 battery box.
   a. Remove cab steps from the battery box.
   b. Remove the front side of the battery box.
   c. Remove all batteries.
   d. Remove old battery box from the frame rail.
   e. Remove any options that may be on box, and transfer to new box.

f. Attach new 4 battery box to the frame rail. Some new mounting holes may need drilled in the frame rail. Re-use existing holes as much as possible.

g. Add cover hold downs, and add new box to frame, 777937C1 retainers, 934871R1 nuts, 30278R1 screws, 30264R1 washers.

h. Put batteries in the two forward locations of the 4 battery box.

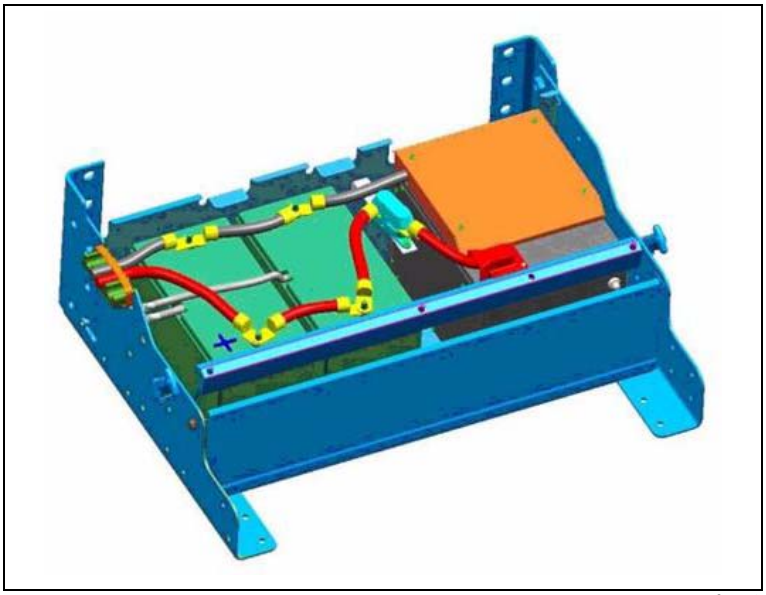
i. Install the PowerPack 3 Inverter Module in the most rearward location of the battery box. Align the PP3 module such that the mounting stud on the rear panel of the module projects through the rear of the battery box.

j. Ensure that the PP3 harnesses are carefully routed through the openings in the rear panel of the battery box without kinking or pinching.

k. Attach the battery box hold down bracket to secure the batteries and the PP3 Inverter Module.

l. Attach the retainer nut to the PP3 module stud on the back side of the battery box.

m. Attach vent tubes to each battery, and route out of battery box.



f_172

Sample Inverter on Installation on the Driver's Side of the Vehicle

3. Add new alternator.

a. Remove air filter and cover turbo intake to prevent items from falling into intake.

b. Remove serpentine belt and old alternator.

c. Tie off old cables.

1. Seal terminal ends with heat shrink tube, fold back onto trunk of harness, and tape to trunk of harness.

d. Attach the Leece-Neville alternator (part number 3606039C91) to the engine. Transfer belt pulley from old alternator to the new alternator.

e. Check alternator mounting bolt torque. DO NOT OVER TORQUE.

1. Alternator to bracket mounting bolts 30 to 35 lb ft

f. Add new alternator harness overlay.

1. Route the PP3 harness next to existing engine harness to the starter; then follow battery cables to the battery box.
2. At base of battery box, route inverter cables to back of battery box by going under the frame rail.

g. Use tie wraps, every 12 inches, to attach the alternator harness to the battery cables.

ALTERNATOR HARNESS

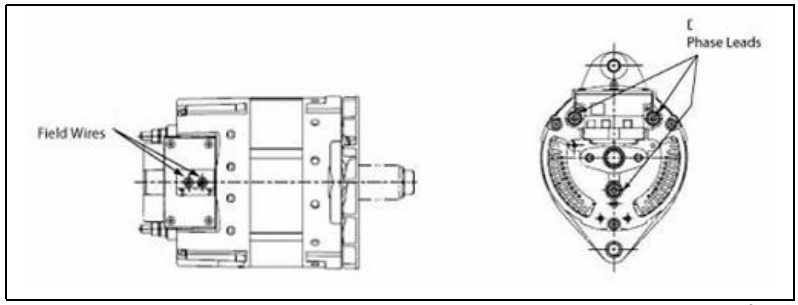
The harness from the PowerPack 3 to the alternator must be properly routed and securely fastened to avoid any hot or sharp areas and to prevent cable movement. Failure to use the proper size wire can result in overheating conditions that could cause fire, personal injury, and void of warranty.

h. Add Ignition (IGN) lead to the in-cab fuse relay panel.

1. Connect an 18 gauge wire from the PowerPack 3 IGN feed connector to the dash pass thru connector 1702 pin 5.
2. Connect an 18 gauge wire from the dash pass thru connector 1702 pin 5 to an IGN feed in the cab fuse/relay panel cavity G2-H2 (see fuse box detail).
3. Add 10 AMP fuse to fuse locations G2-H2.
4. Connect to inverter overlay harness (connector 9740 at the center of valve cover). Strap lock the connector to the main center chassis harness.
5. Remove terminating resistor from J1939 datalink back bone harness (connector 7801M located on the top center of the engine valve cover). Connect the PP3 J1939 datalink harness (connector 7801M) to J1939 inverter (connector 7801N). Save J1939 terminator resistor assembly.
6. Strap harness to existing harnesses.

Keep clear of sharp edges or anything that can rub or damage wire insulation.

4. Connect harness wires to the alternator.
   a. Attach 3-Phase AC output ring terminal wires to bolt studs on the back of alternator. 80-120 in lb (inch-pounds, NOT foot-pounds) Three phase wire attachment order to the alternator does not matter.
   b. Attach field coil wires to the top of alternator using two nuts 15-20 in lb (inch- pounds, NOT foot-pounds).



3-Phase and Field Wire Alternator Connections f_178

5. Make connections from the PowerPack 3 wire harness to the inverter module.
   a. At back of the battery box:

1. Connect 3-Phase AC alternator connectors (9741, 9742, and 9743) which are large 4 gauge, 1-pin connectors. Ensure the connectors are fully mated with a positive click of the male connector into the female connector.
2. Connect inverter IGN connector (7899) 1-pin connector.
3. Connect inverter J1939 connector (7801R) 3-pin connector.
4. Connect field voltage connector (9740) 2-pin connector.

b. Connect terminating resistor connector to (7801L) located on inverter harness near inverter connection to the J1939 data bus connector.

6. Secure PowerPack 3 harness to the chassis harness.
   a. Keep harness clear of sharp edges or anything that can rub or damage wire insulation. Use tie wraps every 12 inches to attach the PP3 alternator harness to battery cables.
7. Confirm connections.
8. Remove cloth from air intake, and reinstall air filter.

WARNING: Shock Hazard. Never make electrical connections to a “live” unit. Make the connections to the PowerPack 3 first and the batteries last. Failure to follow this warning may result in property damage, personal injury or death.

9. Installing battery cables

Step 1: Make sure that the batteries are disconnected from the vehicle.

Step 2: Install the in-line fuse on the positive battery terminal or within 18 inches of the battery or DC wiring bus system.

Step 3: Route, but DO NOT connect, the positive DC (red) input cable from the PowerPack 3 to the in-line fuse on the battery or DC wiring bus system. Make sure to protect all cables from where they contact hard or sharp edges.

Step 4: Connect the PowerPack 3 to the battery in THIS order.

A. Install washers and nuts, and torque terminal nuts. (120 inch-pounds)
B. Connect red cables to the positive battery posts.
C. Connect black cables to the negative battery posts.

Step 5: Verify that all connections are tight and the cables are secure.

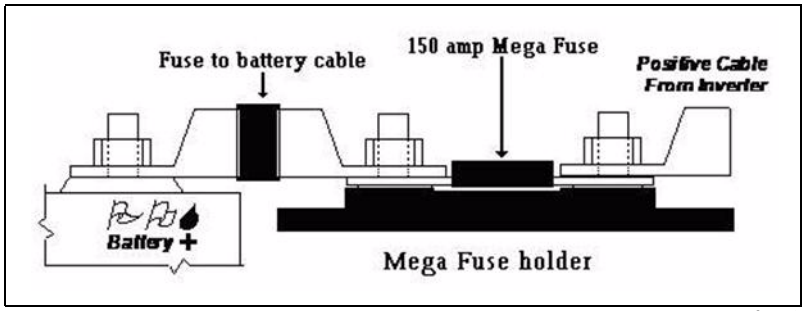
GENERAL CABLE INSTALLATION TIPS:

WARNING: Fire and Explosion Hazard. Double check the polarity of the DC input connections. Reverse polarity may severely damage the PowerPack 3. Fire and/or explosion of the batteries may also occur as a result of reversed polarity. Failure to follow this warning may result in property damage, personal injury or death.

DC cables should be as short as possible. The optional installation kit includes all DC cables. The PowerPack 3 is polarity sensitive, and careful attention must be paid to the polarity. The black DC cable must be connected to the battery negative (-) and the negative (-) PowerPack 3 terminal, located under the top cover (orange).

The red DC cable must be connected to the fuse which is connected to the positive (+) battery connection and the positive (+) PowerPack 3 terminal, located under the red cover.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES



f_179

Fuse Wiring

Route the AC power wiring separately from the DC wiring and low voltage wiring such as audio and video signal wires with as much physical separation from the AC wires as possible.

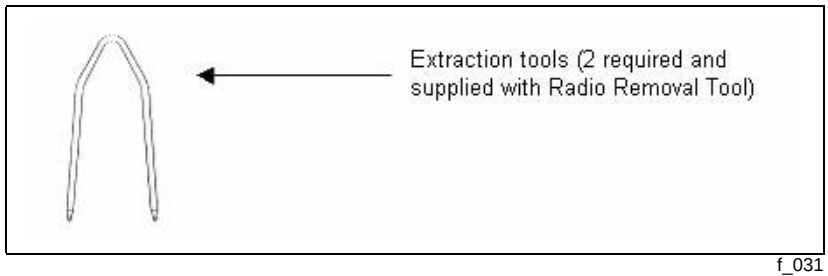
WARNING: Fire Hazard. Make sure all connections are tight and properly made. Failure to follow this warning may result in property damage, personal injury or death.

CAUTION: An in-line 150 AMP DC fuse is REQUIRED on the positive battery cable to properly protect the PowerPack 3 and batteries. Failure to properly fuse the input leads to the PowerPack 3 can result in damage to the unit.

10. Add switch to switch pack.

REMOVAL/REPLACEMENT OF SWITCHES AND SWITCH PACKS

To remove a switch pack from the IP, use the DIN radio removal tool part number 2504954C1.



f_031

Insert the extraction tools (2) into the two holes on either side of a switch pack housing until the locking tabs are fully depressed. The switch pack can then be removed from the panel and the extraction tools removed.

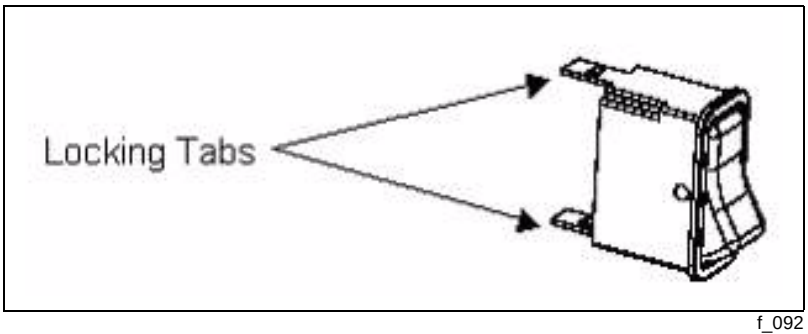
f_096

To remove individual switches or blanks from a switch pack, squeeze the locking tabs on the rear of the switch or blank (top and bottom) and push it from the housing.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

To install a switch pack in the panel, make the necessary connections, and then simply push the assembly into place until the locking tabs are fully engaged.

NOTE: The switch pack can be inadvertently installed upside down. To avoid this when no switches are present in the housing, make sure the white wire in the lead assemblies on the rear of the housing are towards the top.



f_092

To install a switch in the switch pack housing, insert the switch in the proper slot, and push in until the switch locking tabs are fully engaged (switches are keyed and cannot be installed upside down).

LED INSTALLATION

The LEDs are installed from the rear of the switch housing (snap fit rear cover must first be removed). The amber backlight LED (part number 3533928C1) must be installed in the lower position and the green indicator LED (part number 3578733C1) in the upper position. The LEDs can be identified by the color of the base – black for the amber LED and white for the green LED.

To install an LED, insert it into the hole in the printed wiring board and, with a small flat blade screwdriver, turn the LED clockwise until locked. Replace the rear cover when complete.

11. Program Vehicle.
    a. Using DLB, activate feature 0595AJU “BC PROG, INVERTER ON In-Cab Multiplex Switch enables 3kw Inverter.”
    b. After 0595AJU is activated, use DLB to locate position for 120 volt on switch location. Make note of location for switch install. Exit DLB.
    c. Use Master Diagnostics to program the engine for proper operation with PowerPack 3

Open Master Diagnostics. Turn IGN key on. Open com port, go to view >session>basic plus session. Right click add/delete parameters, delete all currently selected parameters from “Selected Parameters” window. In the available parameters window, double click on:

PTO Power Take Off mode

PTO in-cab control

PTO remote pedal

If PTO in-cab control is on, set Power Take Off mode to remote and in-cab operation.

If in-cab control is off, then set PTO mode to remote operation only.

Set remote pedal on.

Default ramp rate 100.

Right click, enter password, right click, then program all.

Cycle IGN key from off to on.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

12. Checking system operation
    a. Start engine, and ensure that the park brake is set.
    b. Verify that the batteries are being charged. Voltmeter should be reading greater than 13.5 volts.
    c. Depress 120 VAC rocker switch in IP.
    d. Verify that the engine ramps to 935 RPM.
    e. Verify green light in rocker switch is on solid within 5 seconds.
    f. Check 120 volt AC output voltage.

POWERPACK 3 FOR MOBILE OPERATION

60AKD

BDY INTG, AUX POWER GEN HYBRID (1) 5000 Watt, Eaton, On/Off (APG) Button on Shift Selector, Mounted Inside Rail, Back of Cab, Includes (3) 120 Volt AC Power Outlets, (to be mounted by body builder)

60AKE

BDY INTG, AUX POWER GEN HYBRID (1) 5000 Watt, Eaton, On/Off (APG) Button on Shift Selector, Mounted Left Side Outside Rail, Back of Cab, Includes (3) 120 Volt AC Power Outlets, (to be mounted by body builder)

As an added feature to the International® Hybrid offerings, International® has announced the release of the Auxiliary Power Generator. The APG enhances the current Eaton Hybrid Power Systems capabilities by offering our customers a convenient way to produce exportable power without the need for a separate source of power generation. Currently, the only vocation approved for this unit is the Utility segment. The addition of the APG enhances the Utility application's reduction in emissions as well as the associated fuel savings.

f_180

PROGRAMMABLE PARAMETERS

None

LOCATION

60AKD mounted Inside Rail, Back of Cab; 60AKE mounted Left Side Outside Rail, Back of Cab

APPLICATION RECOMMENDATION

Optional Equipment – Any application that requires mobile power at a work site, such as Utility, Recovery, Construction or Rescue applications.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

POWERPACK 3 FOR MOBILE OPERATION

60AJN

BDY INTG, POWER INVERTER 3000 Watt Dynamic (With Engine Running); On/Off Switch in Instrument Panel (IP); Includes 120 volt AC Wiring; Connection for Customer-Mounted Power Outlet

60AJP

BDY INTG, POWER INVERTER Mobile and Stationary; Temp Mount on Frame Rail for Customer Installation; 3000 Watt, On/Off Switch in Instrument Panel, Includes 120 Volt AC Wiring Connection for Customer Mounted Power Outlet, Body Company Must be a Certified PowerPack 3 Installer or Warranty will be VOID.

WARNING: Shock hazard. Only trained technicians should service high voltage components. High voltage circuits and components contain voltage levels that may cause equipment damage, electric shock, and/or deadly electrocution if handled incorrectly.

WARNING: DO NOT OPEN the PowerPack 3. Hazardous voltages exist internally even after the PowerPack 3 is removed from the vehicle. Only a Qualified Technician may perform service inside the PowerPack 3. Failure to follow this warning may result in property damage, personal injury, or death.

WARNING: Shock Hazard. The alternator may generate high voltage, particularly at high rpm, which can be harmful. Do not touch the 3–phase output terminals. Failure to follow this warning may result in property damage, personal injury or death.

WARNING: Shock Hazard. The alternator output is a hazardous 3–phase AC voltage — Do not cut the cable or touch the terminals. Failure to follow this warning could result in property damage, personal injury, or death.

The PowerPack 3 Inverter system is an advanced Power Generation and Power Management system to provide both DC power and an on-board 120 volt AC power source. The PowerPack 3 system is integrated with the Diamond Logic® Electrical system. The DC portion of the system provides 14 volts DC at a maximum of 100 Amperes (AMPS) to charge the vehicle batteries. The AC portion of the system provides a 120 VAC single phase 60 Hertz output at a maximum of 25 AMPS. The system may be ordered from International®, factory-installed either mounted in the battery box or as a temporary mounted inverter module behind the cab. The body builder is tasked with mounting the inverter in a body compartment with the temporary mounted feature.

The PowerPack system consists of an inverter module, a special 3-phase 42 volt AC alternator, a multiplexed switch in the cab, and associated wiring harness. The engine must be running in order for the PowerPack system to generate AC or DC voltages. The 120 volt AC output is only functional when the vehicle is stationary with the park brake set. The 120 volt AC output contains a Ground (GND) fault interrupter device and a weather sealed power plug.

CAUTION: If 120 volts AC Shore power is integrated into the body wiring, the shore power connection must never be directly connected to the PowerPack 3 AC output.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

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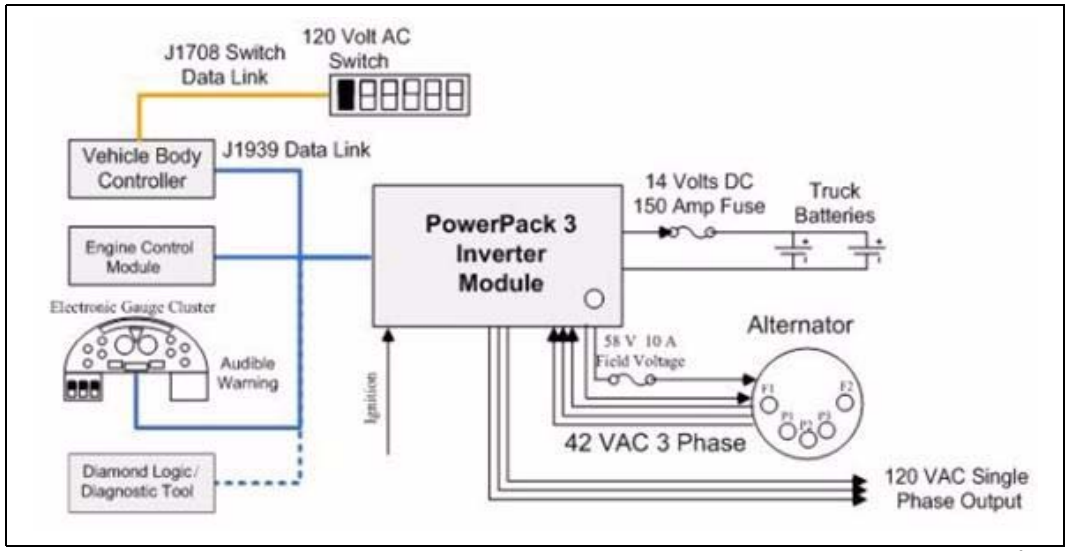

PowerPack 3 Block Diagram

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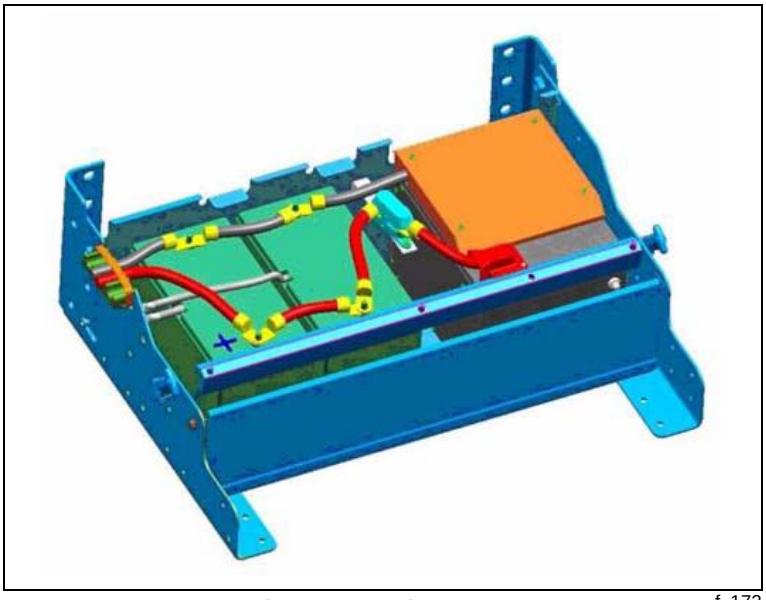
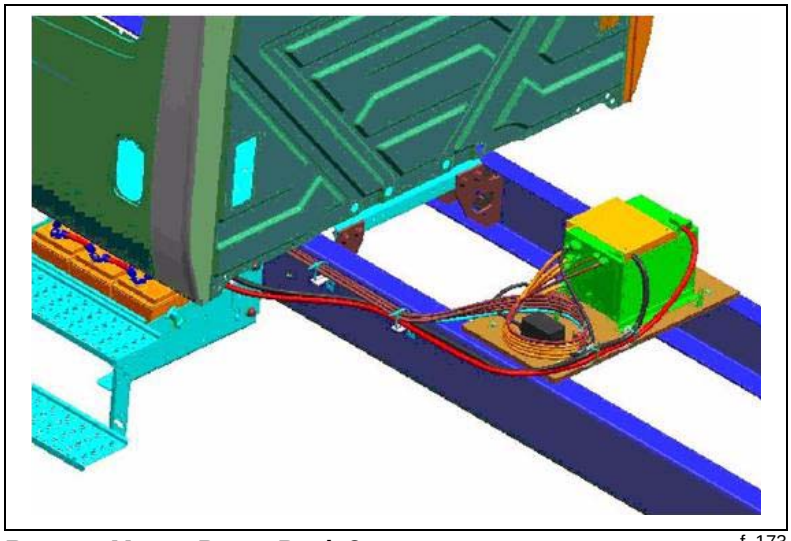
POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

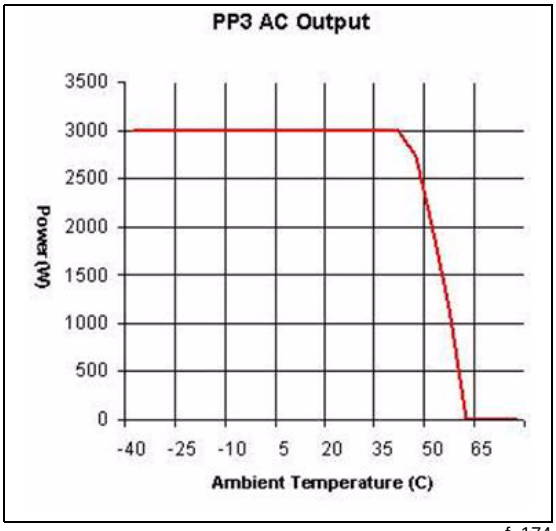


Battery Box Mounted PowerPack 3 f_172

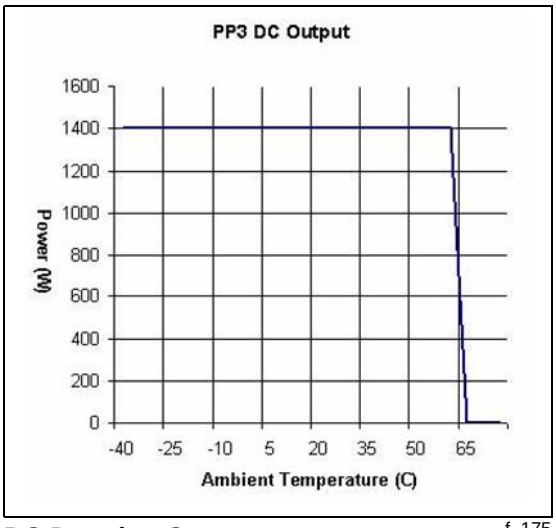


Remote Mount PowerPack 3 f_173

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES



AC Derating Curve f_174



DC Derating Curve f_175

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

USING POWERPACK 3 WITH REMOTE ENGINE SPEED CONTROL

PowerPack 3 provides full power output for the 120 volt AC section at any engine speed. Vehicles equipped with the mobile version of PowerPack 3 may be used with any of the following engine speed control functions.

- Preset or variable engine speed control using the steering wheel cruise control switches
- Preset variable or remote pedal/throttle using the Remote Engine Speed Control Module (RESCM). Requires Body Controller (BC) feature 595AHA
- Preset 1 using Remote Power Module (RPM) inputs; i.e., feature code 60AJE
- Preset or variable engine speed control using Diamond Logic® Advanced Ladder Logic
- 12VZA which provides remote engine speed control through hard wires connected directly to the engine ECM.

BODY CONTROLLER: SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Mobile Operation

Software feature code 595BAH must be enabled on the vehicle Body Controller using the Diamond Logic® software (see local dealer).

Parameter: PPE3_Stationary or Mobile: In Stationary mode the AC function can be used only while the trucked is parked with the park brake set. Mobile operation enables 120 AC anytime the engine is running. These features are defaulted to Mobile Operation.

Parameter: PPE3_Auto ON or Manual ON: Allows the AC power to turn ON automatically each time the vehicle is started. These features are defaulted to AUTO ON.

Parameter: PPE3_Auto Restart: Allows the PowerPack to restart should there be an over current situation. The number restart retries and duration before the restart is also programmable. These features are defaulted to Auto Restart ON with 3 retries with 40 seconds between retries.

Parameter: PPE3_ReStart_Attempts: Number of times the PowerPack will attempt to re-start the system after an overload. These features are defaulted to 3 retries.

Parameter: PPE3_ReStart_Delay: The amount of time between re-start attempts should there be an over current situation. These features are defaulted to 40 seconds between retries.

Parameter: PPE3_param_incrThrottle_rqst_enable will enable the automatic throttle request. This will automatically ramp the engine to the value set in parameter 2344 when the PowerPack is requested on. This parameter is defaulted OFF for these features.

Parameter: PPE3_param_incrThrottle_startDelay is the amount of time that the PowerPack will wait to turn on. This is to allow the engine to ramp to the operating RPM before the PowerPack is activated. This parameter is defaulted to 2 seconds for these features.

Parameter: PPE3_param_incrThrottle_targetRPMs is the target RPM for the engine to ramp to when the PowerPack is activated. This parameter is defaulted to 935 RPM for these features.

Parameter: PPE3_param_incrThrottle_timeout is the amount of time that the inverter is inhibited from coming back on due to inadequate engine speed. This parameter is defaulted to 5 seconds for these features.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

Table 176 – Programmable Parameters used with 595BAH

Parameter	ID	Description	Default	Units	Min	Max	Step
PPE3_param_Auto_or_Manual_ON	2473	If this is true, then the AC Power is automatically activated when the engine is started.	1	On/Off	0	1	1
PPE3_param_mobile_or_stationary	2487	If this is true, then the AC Power is available any time the engine is running	1	On/Off	0	1	1
PPE3_param_Auto_ReStart	2488	If this is true, then the PowerPack 3 system will automatically attempt a re-start after an over load event.	1	On/Off	0	1	1
PPE3_param_ReStart_Attempts	2490	This number indicates the number of re-start attempts after an overload event.	3	Number	0	7	1
PPE3_param_ReStart_Delay	2489	If this is true, then the automatic throttle increase request has been enabled.	40	Seconds	0	60	10
PPE3_param_incrThrottle_rqst_enable	2357	If this is true, then the automatic throttle increase request has been enabled.	0	On/Off	0	1	1
PPE3_param_incrThrottle_startDelay	2399	This parameter allows the throttle to ramp to the target RPM prior to enabling the PPE. The logic for this parameter is that a maximum load on the PPE would turn off the inverter if the alternator RPMs are not at target.	2	Seconds	0	5	0.1
PPE3_param_incrThrottle_targetRPMs	2344	This is the target RPM rate for the throttle increase feature.	935	RPM	900	2000	1
PPE3_param_incrThrottle_timeout	2345	The amount of time until the inverter is inhibited because the engine speed is not at an adequate level	5	Seconds	0	30	0.1

WIRING INFORMATION

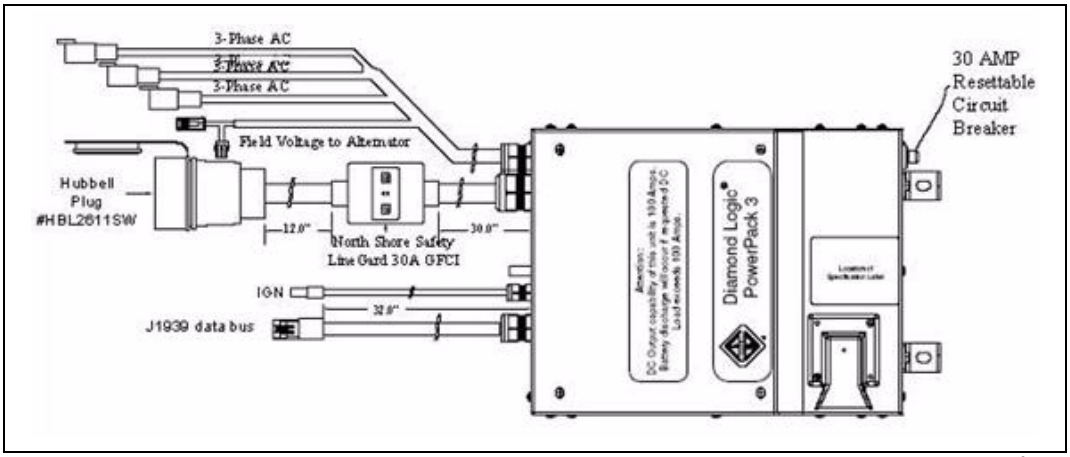
WARNING: All electrical connections to the PowerPack 3 must be made by a qualified electrician. Failure to follow this warning could result in property damage, personal injury, or death.

A Hubbell Watertight Safety-Shroud male plug (Hubbell part number HBL2611SW) is needed to connect to the AC output plug to mate with the PowerPack supplied Hubbell Watertight Safety-Shroud female socket (Hubbell part number HBL2613SW). These plugs are available at electrical and industrial supply houses.

Using this part combination will allow for a weather resistant connection to the PowerPack 3 unit. Alteration of the AC output plug, failure to use the correct male plug, or removal of the supplied socket will not guarantee a watertight connection.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

The AC output from the PowerPack 3 is wired to a Ground Fault Circuit Interrupter (GFCI) to ensure protection against GND fault conditions. Be aware that standard duplex GFCI and non-GFCI receptacles need to be protected with a circuit breaker, usually rated for 15 or 20 AMPS. ..



PowerPack 3 Inverter/Regulator Component Detail f_176

PowerPack 3 Kit, Left Side under Cab for vehicles built after March 2007.

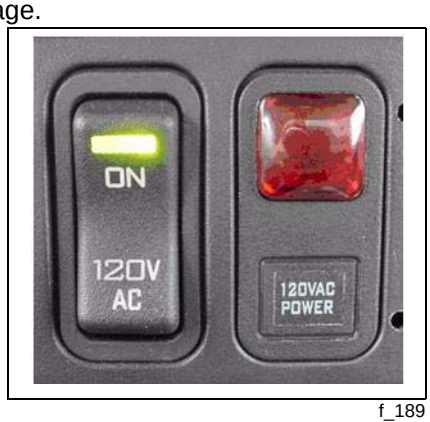
PowerPack 3 Kit, Right Side under Cab for vehicles built after March 2007.

PowerPack 3 Kit, Remote Mount for vehicles built after March 2007.

Fuse, 58 volt, 10 amp: Alternator Field Wire fuse. International® Part Number: 2590768C1

TESTING SYSTEM OPERATION

1. Start the engine. Verify that the batteries are being charged. The voltmeter should be reading greater than 13.5 volts.
2. Verify green light in rocker switch is ON solid within five seconds.
3. Verify 120 volt AC output voltage.



f_189

POWERPACK 3 TROUBLESHOOTING

If the PowerPack 3 output does not power up or shuts down during vehicle operation, follow these steps to troubleshoot the system:

1. Set the 120VAC ON/OFF switch to OFF position, and ensure interlocks are satisfied, as described above, correcting as necessary.
2. Attempt to restart the PowerPack 3 by pressing the ON switch.

3. If the unit continues to shut-down, (blinking green light in the rocker switch and red warning light illuminated) disconnect any AC loads before restarting the PowerPack 3.
4. Check for green light on GFCI. If there is a red light press the reset button on GFCI.
5. Press the 120VAC switch to OFF, check the 30-Amp circuit breaker, and reset if necessary.
6. Wait several minutes to allow the system alternator and PowerPack 3 unit to cool, and then attempt to restart.
7. If the unit does not restart, then turn the vehicle's ignition OFF, and then back ON again. This will restart the PowerPack 3 output protection circuits.
8. If the above steps fail to restart the PowerPack 3 unit, then have the system serviced by a qualified technician.

NOTE: If the unit does not restart, the problem could be caused by overheating or other circuit protection devices. If the PowerPack 3 circuit breaker or the GFCI device is tripped, the green light in rocker switch will continue to show an indication that AC power is ON. Be advised to check these other elements of the system if 120 volt AC power is not present as expected.

Table 177 – Diagnostic Indications Using the In-Cab Rocker Switch or Diamond Logic® (Pre-2007 Vehicles)

SPN	FMI	Byte 7	Byte 8	Switch Indicator Blink Rate	Condition Description/Comments/Probable Cause(s)
168	2	0	0	Fast	Communication fault from ESC to the PowerPack. Check for open circuit or short in J1939 datalink. If switch is not blinking, verify vehicle is programmed for PowerPack feature and the switchpack is operating correctly.
168	3	0	0	Fast	DC module over voltage on vehicle DC bus. System detected voltage over 15 volts. Remove any external power supply/charger from vehicle
168	3	0	0	Slow	AC module over voltage condition on high voltage DC bus. Likely an internal failure for AC output. AC has been shut down. DC output remains on.
168	4	0	0	Fast	DC module under voltage condition on vehicle DC bus. System detected low DC voltage. This could be due to insufficient power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
168	4	0	0	Slow	AC module under voltage condition on high voltage DC bus. System detected low internal voltages. This could be due to insufficient input power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
168	6	0	0	Slow	AC module has shut down due to overload condition. AC overloaded, remove some or all of AC load.
168	8	0	0	Fast	Phase missing fault/alternator fault. One of the three 3-phase wires has an open circuit. Check the 3 phase wires from the alternator to the PowerPack.
168	16	0	0	Fast	DC module over temperature condition. PowerPack is experiencing extremely high internal temperatures. AC and DC has been shut down. Allow the system to cool down.
168	16	0	0	Slow	AC module over temperature condition. PowerPack has detected high internal temperatures although less severe. AC inverter has shut down, but DC output remains on. Shut the system down to all it to cool down or remove some of the loads.
168	17	0	0	Fast	PowerPack Fuse Open. Check DC battery charging connections from PowerPack. Check 150A fuse.
639	14	37	255	Fast	Communication fault between PowerPack and the ESC. Check for open circuit or short in J1939 datalink. Also, check the ignition circuit to the PowerPack module

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

Table 178 – Diagnostic Indications Using the In-Cab Rocker Switch or Diamond Logic® Builder (2007 Vehicles and post-2007)

SPN	FMI	Byte 7	Byte 8	Switch Indicator Blink Rate	Condition Description/Comments/Probable Cause(s)
0467	9	0	0	Fast	Communication fault from ESC to the PowerPack. Check for open circuit or short in J1939 datalink. If switch is not blinking, verify vehicle is programmed for PowerPack feature and the switchpack is operating correctly.
168	3	0	0	Fast	DC module over voltage on vehicle DC bus. System detected voltage over 15 volts. Remove any external power supply/charger from vehicle
520664	3	0	0	Slow	AC module over voltage condition on high voltage DC bus. Likely an internal failure for AC output. AC has been shut down. DC output remains on.
168	4	0	0	Fast	DC module under voltage condition on vehicle DC bus. System detected low DC voltage. This could be due to insufficient power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
520644	4	0	0	Slow	AC module under voltage condition on high voltage DC bus. System detected low internal voltages. This could be due to insufficient input power from the alternator. Check the 3 phase wires from the alternator to the PowerPack.
520771	6	0	0	Slow	AC module has shut down due to overload condition. AC overloaded, remove some or all of AC load.
115	2	0	0	Fast	Phase missing fault/alternator fault. One of the three 3-phase wires has an open circuit. Check the 3 phase wires from the alternator to the PowerPack.
520774	0	0	0	Fast	DC module over temperature condition. PowerPack is experiencing extremely high internal temperatures. AC and DC has been shut down. Allow the system to cool down.
520773	0	0	0	Slow	AC module over temperature condition. PowerPack has detected high internal temperatures although less severe. AC inverter has shut down, but DC output remains on. Shut the system down to all it to cool down or remove some of the loads.
520772	31	0	0	Fast	PowerPack Fuse Open. Check DC battery charging connections from PowerPack. Check 150A fuse.
639	9	37	255	Fast	Communication fault between PowerPack and the ESC. Check for open circuit or short in J1939 datalink. Also, check the ignition circuit to the

NOTE: A complete aftermarket parts kit is under development. The PowerPack 3 kit part number is not available at this time.

How To Add This Feature

1. Remove power from batteries.
   a. Remove the lid from the battery box.
   b. Remove all battery cables from the batteries and battery box, starting with the negative terminals.
2. Replace the 3 battery box with a 4 battery box.
   a. Remove cab steps from the battery box.
   b. Remove the front side of the battery box.
   c. Remove all batteries.
   d. Remove old battery box from the frame rail.
   e. Remove any options that may be on box, and transfer to new box.

f. Attach new 4 battery box to the frame rail. Some new mounting holes may need drilled in the frame rail. Re-use existing holes as much as possible.

g. Add cover hold downs, and add new box to frame, 777937C1 retainers, 934871R1 nuts, 30278R1 screws, 30264R1 washers.

h. Put batteries in the two forward locations of the 4 battery box.

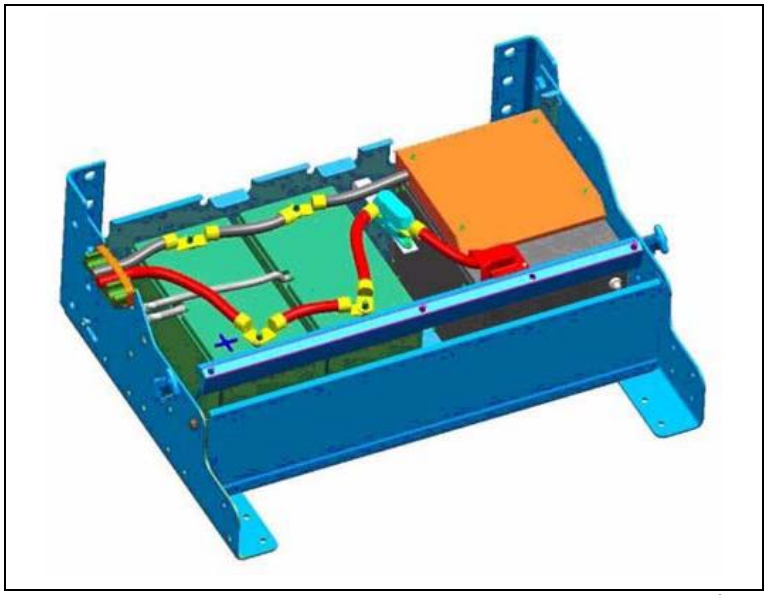
I. Install the PowerPack 3 Inverter Module in the most rearward location of the battery box. Align the PP3 module such that the mounting stud on the rear panel of the module projects through the rear of the battery box.

j. Ensure that the PP3 harnesses are carefully routed through the openings in the rear panel of the battery box without kinking or pinching.

k. Attach the battery box hold down bracket to secure the batteries and the PP3 Inverter Module.

l. Attach the retainer nut to the PP3 module stud on the back side of the battery box.

m. Attach vent tubes to each battery, and route out of battery box.



f_172

Sample Inverter on Installation on the Driver's Side of the Vehicle

3. Add new alternator.
   a. Remove air filter and cover turbo intake to prevent items from falling into intake.
   b. Remove serpentine belt and old alternator.
   c. Tie off old cables.
      1. Seal terminal ends with heat shrink tube, fold back onto trunk of harness, and tape to trunk of harness.
   d. Attach the Leece-Neville alternator (part number 3606039C91) to the engine. Transfer belt pulley from old alternator to the new alternator.
   e. Check alternator mounting bolt torque. DO NOT OVER TORQUE.
      1. Alternator to bracket mounting bolts 30 to 35 lb ft

f. Add new alternator harness overlay.

   1. Route the PP3 harness next to existing engine harness to the starter; then follow battery cables to the battery box.

   2. At base of battery box, route inverter cables to back of battery box by going under the frame rail.

g. Use tie wraps, every 12 inches, to attach the alternator harness to the battery cables.

ALTERNATOR HARNESS

The harness from the PowerPack 3 to the alternator must be properly routed and securely fastened to avoid any hot or sharp areas and to prevent cable movement. Failure to use the proper size wire can result in overheating conditions that could cause fire, personal injury, and void of warranty.

h. Add Ignition (IGN) lead to the in-cab fuse relay panel.

   1. Connect an 18 gauge wire from the PowerPack 3 IGN feed connector to the dash pass thru connector 1702 pin 5.

   2. Connect an 18 gauge wire from the dash pass thru connector 1702 pin 5 to an IGN feed in the cab fuse/relay panel cavity G2-H2 (see fuse box detail).

   3. Add 10 AMP fuse to fuse locations G2-H2.

   4. Connect to inverter overlay harness (connector 9740 at the center of valve cover). Strap lock the connector to the main center chassis harness.

   5. Remove terminating resistor from J1939 datalink back bone harness (connector 7801M located on the top center of the engine valve cover). Connect the PP3 J1939 datalink harness (connector 7801M) to J1939 inverter (connector 7801N). Save J1939 terminator resistor assembly.

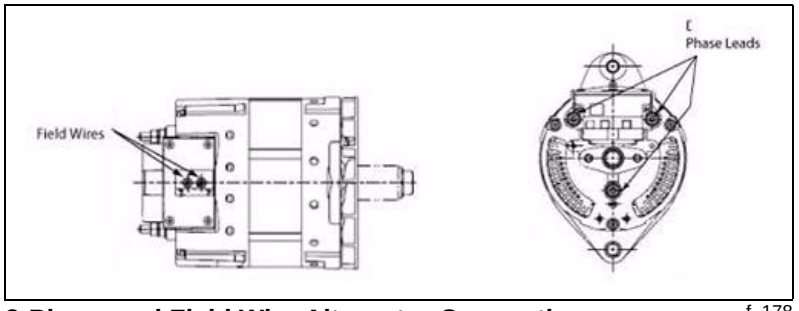
   6. Strap harness to existing harnesses.

Keep clear of sharp edges or anything that can rub or damage wire insulation.

4. Connect harness wires to the alternator.

   a. Attach 3-Phase AC output ring terminal wires to bolt studs on the back of alternator. 80-120 in lb (inch-pounds, NOT foot-pounds) Three phase wire attachment order to the alternator does not matter.

   b. Attach field coil wires to the top of alternator using two nuts 15-20 in lb (inch- pounds, NOT foot-pounds).



3-Phase and Field Wire Alternator Connections f_178

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

5. Make connections from the PowerPack 3 wire harness to the inverter module.
   a. At back of the battery box:
      1. Connect 3-Phase AC alternator connectors (9741, 9742, and 9743) which are large 4 gauge, 1-pin connectors. Ensure the connectors are fully mated with a positive click of the male connector into the female connector.
      2. Connect inverter IGNITION connector (7899) 1-pin connector.
      3. Connect inverter J1939 connector (7801R) 3-pin connector.
      4. Connect field voltage connector (9740) 2-pin connector.
   b. Connect terminating resistor connector to (7801L) located on inverter harness near inverter connection to the J1939 data bus connector.
6. Secure PowerPack 3 harness to the chassis harness.

a. Keep harness clear of sharp edges or anything that can rub or damage wire insulation. Use tie wraps every 12 inches to attach the PP3 alternator harness to battery cables.

7. Confirm connections.
8. Remove cloth from air intake, and reinstall air filter.

WARNING: Shock Hazard. Never make electrical connections to a “live” unit. Make the connections to the PowerPack 3 first and the batteries last. Failure to follow this warning may result in property damage, personal injury or death.

9. Installing battery cables

Step 1: Make sure that the batteries are disconnected from the vehicle.

Step 2: Install the in-line fuse on the positive battery terminal or within 18 inches of the battery or DC wiring bus system.

Step 3: Route, but DO NOT connect, the positive DC (red) input cable from the PowerPack 3 to the in-line fuse on the battery or DC wiring bus system. Make sure to protect all cables from where they contact hard or sharp edges.

Step 4: Connect the PowerPack 3 to the battery in THIS order.

A. Install washers and nuts, and torque terminal nuts. (120 inch-pounds)

B. Connect red cables to the positive battery posts.

C. Connect black cables to the negative battery posts.

Step 5: Verify that all connections are tight and the cables are secure.

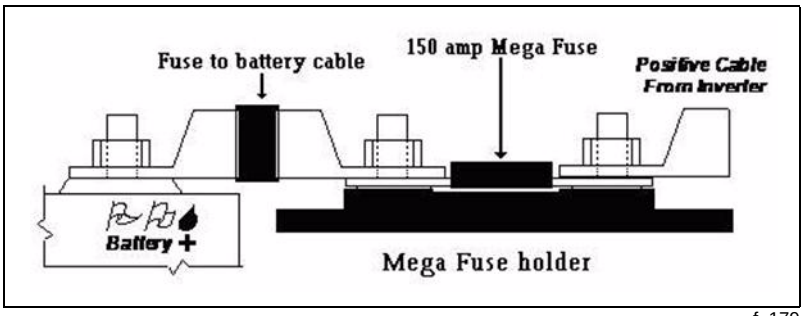
GENERAL CABLE INSTALLATION TIPS:

WARNING: Fire and Explosion Hazard. Double check the polarity of the DC input connections. Reverse polarity may severely damage the PowerPack 3. Fire and/or explosion of the batteries may also occur as a result of reversed polarity. Failure to follow this warning may result in property damage, personal injury or death.

DC cables should be as short as possible. The optional installation kit includes all DC cables. The PowerPack 3 is polarity sensitive, and careful attention must be paid to the polarity. The black DC cable must be connected to the battery negative (-) and the negative (-) PowerPack 3 terminal, located under the top cover (orange).

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

The red DC cable must be connected to the fuse which is connected to the positive (+) battery connection and the positive (+) PowerPack 3 terminal, located under the red cover.



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Fuse Wiring

Route the AC power wiring separately from the DC wiring and low voltage wiring such as audio and video signal wires with as much physical separation from the AC wires as possible.

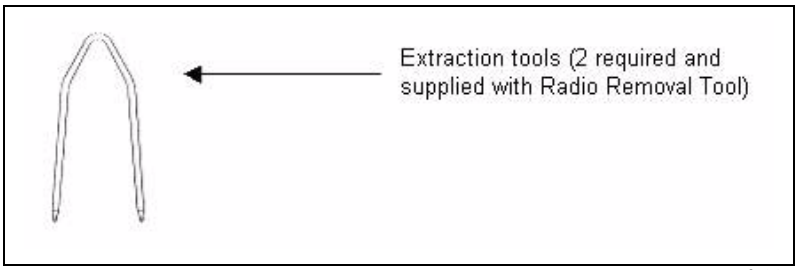
WARNING: Fire Hazard. Make sure all connections are tight and properly made. Failure to follow this warning may result in property damage, personal injury or death.

CAUTION: An in-line 150 AMP DC fuse is REQUIRED on the positive battery cable to properly protect the PowerPack 3 and batteries. Failure to properly fuse the input leads to the PowerPack 3 can result in damage to the unit.

10. Add switch to switch pack.

REMOVAL/REPLACEMENT OF SWITCHES AND SWITCH PACKS

To remove a switch pack from the IP, use the DIN radio removal tool part number 2504954C1.



f_031

Insert the extraction tools (2) into the two holes on either side of a switch pack housing until the locking tabs are fully depressed. The switch pack can then be removed from the panel and the extraction tools removed.

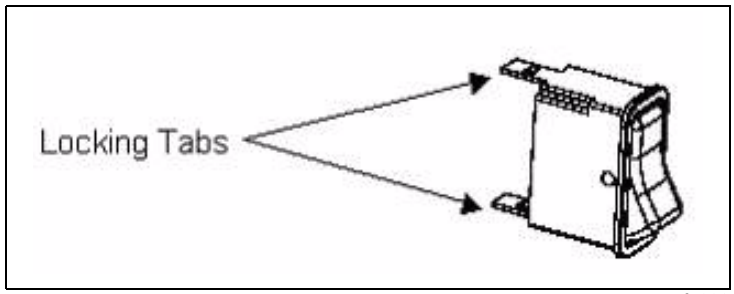
f_096

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

To remove individual switches or blanks from a switch pack, squeeze the locking tabs on the rear of the switch or blank (top and bottom) and push it from the housing.

To install a switch pack in the panel, make the necessary connections, and then simply push the assembly into place until the locking tabs are fully engaged.

NOTE: The switch pack can be inadvertently installed upside down. To avoid this when no switches are present in the housing, make sure the white wire in the lead assemblies on the rear of the housing are towards the top.



f_092

To install a switch in the switch pack housing, insert the switch in the proper slot, and push in until the switch locking tabs are fully engaged (switches are keyed and cannot be installed upside down).

LED INSTALLATION

The LEDs are installed from the rear of the switch housing (snap fit rear cover must first be removed). The amber backlight LED (part number 3533928C1) must be installed in the lower position and the green indicator LED (part number 3578733C1) in the upper position. The LEDs can be identified by the color of the base – black for the amber LED and white for the green LED.

To install an LED, insert it into the hole in the printed wiring board and, with a small flat blade screwdriver, turn the LED clockwise until locked. Replace the rear cover when complete.

11. Program Vehicle.
    a. Using DLB, activate feature 0595AJU “BC PROG, INVERTER ON In-Cab Multiplex Switch enables 3kw Inverter.”
    b. After 0595AJU is activated, use DLB to locate position for 120 volt on switch location. Make note of location for switch install. Exit DLB.
12. Checking system operation
    a. Start engine, and ensure that the park brake is set.
    b. Verify that the batteries are being charged. Voltmeter should be reading greater than 13.5 volts.
    c. Verify green light in rocker switch is ON solid within 5 seconds.
    d. Check 120 volt AC output voltage.

POWERPACK 3 PRIMARY AND TEMPORARY MOUNT FEATURES

THEFT DETERRENT

THEFT DETERRENT

60ACX

BODY INTG, THEFT DETERRENT SYS Includes one (1) Switch Pack of Six Switches

The International® Theft Deterrent system provides a means to help control the mobility of a vehicle. Once the vehicle has been started, the driver is required to enter a pre-programmed code (theft deterrent code). The theft deterrent code must also be entered when driving is resumed after the vehicle is at idle with the park brake set. The theft deterrent feature is effective in preventing a vehicle from being driven by unauthorized individuals.

THEFT DETERRENT CODE

The theft deterrent code is any combination of one to eight digits (between 1 and 99999999) selected by the customer. The Theft Deterrent system will come from the factory disabled. The dealer will be responsible for enabling the system and programming the desired theft deterrent code during the regular dealer Pre-Delivery Inspection (PDI). This is not included in the normal PDI reimbursement and is not a warranty expense.

THEFT DETERRENT SWITCHES

Six switches located in the Instrument Panel (IP) provide the functions of the Theft Deterrent system. Five of the switches are dual digit switches (3-position, center stable momentary switches) numbered 0 to 9. The remaining switch is the ENGINE STOP/CLEAR ENTRY switch, which is a combination switch indicator and a standard momentary switch (see the illustration below).

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The red ENGINE STOP indicator portion of the ENGINE STOP/CLEAR ENTRY switch flashes to alert the driver that the theft deterrent code must be entered (within the preprogrammed time delay or the engine will shut down). The momentary CLEAR ENTRY position is pressed whenever the driver needs to clear a failed code so that the correct code can be re-entered.

NOTE: If the operator enters the wrong security code, the vehicle must be stopped and the park brake must be set/engaged before the system will clear the previous theft deterrent code entry.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software feature code 595AYU must be enabled on the vehicle Body Controller (BC) using the Diamond Logic® Builder software (see local dealer).

PROGRAMMABLE PARAMETERS

Anti_Theft_Active_Min: Length of time the engine is shut down

Anti_Theft_Code_Length: Number of digits in the theft deterrent code

Anti_Theft_Code_Master_Lo: Lower 4 digits of the numerical theft deterrent code to be entered by the driver

Anti_Theft_Code_Master_Hi: Upper 4 digits of the numerical theft deterrent code to be entered by the driver

Anti_Theft_Enable: Parameter to enable or disable the theft deterrent feature

Anti_Theft_Warning_Time: The amount of time after the park brake has been released or the vehicle starts moving until the vehicle enters shutdown mode

Table 179

Parameter	ID	Description	Default	Units	Min	Max	Step
Anti_Theft_ Active_Min	2227	The minimum amount of time the truck is disabled once it enters shutdown mode	10	Seconds	10	60	1
Anti_Theft_ Code_Length	2257	The number representing the code length in terms of number of digits	5	Number	1	8	1
Anti_Theft_ Code_Master_ Lo	2224	Lower 4 numbers of the anti-theft code required to keep truck operating	2345	Number	0	9999	1
Anti_Theft_ Code_Master_ Hi	2226	Upper 4 numbers of the anti-theft code required to keep truck operating	0001	Number	0	9999	1
Anti_Theft_ Enable	2222	Enables and disables the anti-theft feature	0	On/Off	0	1	1
Anti_Theft_ Warning_Time	2245	The amount of time after the park brake has been released or the vehicle starts moving until the vehicle enters shutdown mode	1	Seconds	1	655	1

WIRING INFORMATION

2588809C93 KIT, THEFT DETERRENT

Table 180

Item	Part Number	Quantity	Description
1	2588808C91	001	MODULE, THEFT DETERRENT SWITCH
2	3519350C1	001	RELAY, MICRO SPDT
3	239481R1	002	TERMINAL, CABLE
4	3544921C1	004	SLEEVE, CABLE INSULATING* HEAT S
5	3515517C1	004	TERMINAL, CABLE 280 M/P FEMALE
6	3535930C1	001	TERMINAL, CABLE* GT 280 SERIES 5
7	3535937C1	001	SEAL, CABLE TERMINAL* GT 280 SER
8	997129R2	AR	CABLE, LIGHTING, 18 GAUGE W/GXL
9	2588813R2	001	MANUAL, INST THEFT DETER KIT
10	3522073C1	001	TERMINAL, CABLE FEMALE

TESTING

Engine Start/Theft Deterrent Code Entry Sequence:

The correct engine start and theft deterrent code entry sequence is as follows:

1. Driver starts vehicle with park brake set.
2. The driver enters the code programmed by the dealer by pressing the switch positions for that code (read from left to right). For example, if the code is 54321, the driver should press switch positions 5 4 3 2 1 in that order.

If an error is made while entering the code, the driver presses the CLEAR ENTRY position of ENGINE STOP/CLEAR ENTRY switch and enters the correct code. The park brake must be set for clearing the incorrect code.

3. When the correct code is entered, the gauge cluster alarm will sound one short beep and, at the same time, the ENGINE STOP indicator will flash once. If the wrong code is entered, the gauge cluster will sound one long beep and the ENGINE STOP indicator will be illuminated for approximately 1.5 seconds.
4. Park brake is released.
5. Vehicle may be driven without interruption.

NOTE: The theft deterrent code must be re-entered every time the park brake is set/engaged or when the key switch is cycled from the run position.

Table 181 – System Response Table

Driver Action	System Alerts	Engine Operating Status
Engine started with park brake set	No system alerts	Engine runs without interruption.
Correct theft deterrent code entered (vehicle stopped and park brake set)	Gauge cluster alarm will sound one short beep and, at the same time, the ENGINE STOP indicator will flash once.	Engine runs without interruption.
Engine started with park brake released	Warning sequence is begun. The gauge cluster alarm will beep continuously, and the red ENGINE STOP indicator will flash slowly.	Engine will shut down unless theft deterrent code is entered within programmed delay time.
Engine started and driven greater than 3 MPH	Warning sequence is begun. The gauge cluster alarm will beep continuously, and the red ENGINE STOP indicator will flash slowly.	Engine will shut down unless theft deterrent code is entered within programmed delay time.
Park brake is released with engine running.	Warning sequence is begun. The gauge cluster alarm will beep continuously, and the red ENGINE STOP indicator will flash slowly.	Engine will shut down unless correct theft deterrent code is entered within programmed delay time.
Correct theft deterrent code is entered after the warning sequence has begun (within the programmed delay time).	The continuous alarm beeps, and ENGINE STOP indicator flashing stops after the alarm sounds once and the ENGINE STOP indicator flashes once.	Engine runs without interruption.
Incorrect theft deterrent code is entered.	Alarm activates for one long beep, and ENGINE STOP indicator turns on for ~ 1.5 seconds.	Engine runs without interruption until the programmed time delay expires.
Clear switch is depressed with park brake set.	No system alerts. Theft deterrent code must be entered before driving vehicle.	Engine runs without interruption.
Clear switch is depressed with park brake released (assumes correct code previously entered).	No action. Previously entered theft deterrent code is not cleared.	Engine runs without interruption.
With vehicle stopped while in warning mode, set park brake (within the programmable delay time).	The ENGINE STOP indicator stops flashing, and the alarm stops beeping. The theft deterrent code must be entered before driving vehicle.	Engine runs without interruption.

NOTE: There is a ten second period between the beginning of the warning sequence and engine shut down. During this period, the vehicle can be started and moved. Once shutdown occurs, the sequence can be re-initiated after a programmable time delay (default = 10 seconds).

THEFT DETERRENT TROUBLESHOOTING TIPS

Please review the following problem descriptions for help with installation.

The theft deterrent feature can be enabled using the Diamond Logic® software program. Those who do not have the software will need to see an International® dealer for programming assistance.

1. Existing vehicle switches no longer operate:

   Solution: The theft deterrent switch pack populates in the first switch location in the IP. Physically locate the switch pack in the DIN location below the radio, and ensure that the cab harness connector for switch packs is plugged into the theft deterrent switch pack. Use Diamond Logic® Builder (DLB) to determine the new location for existing vehicle switches. Physically move those switches in the switch packs to match the DLB layout.
2. The engine shuts down even though the correct theft deterrent code was entered:

The theft deterrent code must be entered AFTER the engine is started and before the park brake is released. After the engine is started, enter the correct theft deterrent code. The ENGINE STOP indicator in the top portion of the first switch will illuminate for one fast blink with the correct code entered. If the wrong code is entered, the ENGINE STOP light will be illuminated for 1.5 seconds, hence the system will still be armed to shut down until the correct code is entered.

3. Theft deterrent code never works:

   The theft deterrent code has been designed to be as flexible as possible and still work with the overall design of the Body Controller (BC) in the vehicle. It is important that programmable parameters are set correctly. The theft deterrent code is controlled by three programmable parameters. They are as follows:

   Anti_Theft_Code_Length Number of digits in theft deterrent code

   Anti_Theft_Code_Master_Hi Upper portion of theft deterrent code

   Anti_Theft_Code_Master_Lo Lower portion of theft deterrent code

   The theft deterrent code may be any length from one to eight digits. The Anti_Theft_Code_Length programmable parameter must contain the length of the desired code. For example, if the theft deterrent code is 739042, then the code length should have a 6 entered for the Anti_Theft_Code_Length parameter. Use DLB to enter the code length under the FEATURES tab. Find the desired programmable parameter in the list on the bottom half of the screen.

   The theft deterrent code must be entered in two different parameters.

   The Anti_Theft_Code_Master_Lo is the right most 4 digits of the code.

   The Anti_Theft_Code_Master_Hi is the left or upper digits of the theft deterrent code.

   For example, if the theft deterrent code is 739042, enter the following digits into the two parameters:

   Anti_Theft_Code_Master_Hi: 73

   Anti_Theft_Code_Master_Lo: 9042

   For theft deterrent codes that are four digits or less, place a 0 in the parameter Anti-Theft_Code_Master_Hi. It is not necessary to enter a leading zero in the code as long as the code length is four digits or less.

4. Can leading zeros be entered in the theft deterrent code?

   Leading zeroes may be used in either parameter as long as the Anti_Theft_Code_Length count is large enough to include them in the count.

   For example, if the theft deterrent code is 0142, the programmable parameters should be entered as follows:

   Anti_Theft_Code_Length: 4

   Anti_Theft_Code_Master_Hi: 0

   Anti_Theft_Code_Master_Lo: 0142

   On early versions, the leading zero will not stay visible in the parameter entry, but the 0 still needs to be entered on the switch packs when entering the theft deterrent code.

   For example, if the theft deterrent code is 075142, the programmable parameters should be entered as follows:

   Anti_Theft_Code_Length: 6

   Anti_Theft_Code_Master_Hi: 07

   Anti_Theft_Code_Master_Lo: 5142

   For example, if the theft deterrent code is 60925, the programmable parameters should be entered as follows:

   Anti_Theft_Code_Length: 5

   Anti_Theft_Code_Master_Hi: 6

   Anti_Theft_Code_Master_Lo: 0925

5. Once the engine shut down sequence is initiated, the engine stumbles but does not shut down. The theft deterrent relay keeps cycling off and on.

   The Ignition (IGN) interrupter relay that was added for this system must have the coil powered from an un-switched battery source. This stumbling condition is caused by the relay being powered from an IGN source instead of a battery source. Ensure an un-switched battery feed powers the coil of the theft deterrent relay.

6. Engine will not shut down even though the ENGINE STOP light is on for a constant ten seconds.

   Ensure that the theft deterrent relay coil is connected to the BC connector 1601 pin # for pre 2007 engine vehicles or BC connector 1601 Pin E4 for post 2007 engine vehicles. If the relay is not being energized, the vehicle engine will still be de-powered through an alternate means, thus rendering the vehicle immobile. If the shut down sequence has been initiated and the ENGINE STOP light is illuminated for ten seconds, then the theft deterrent relay should also be energized to kill the engine.

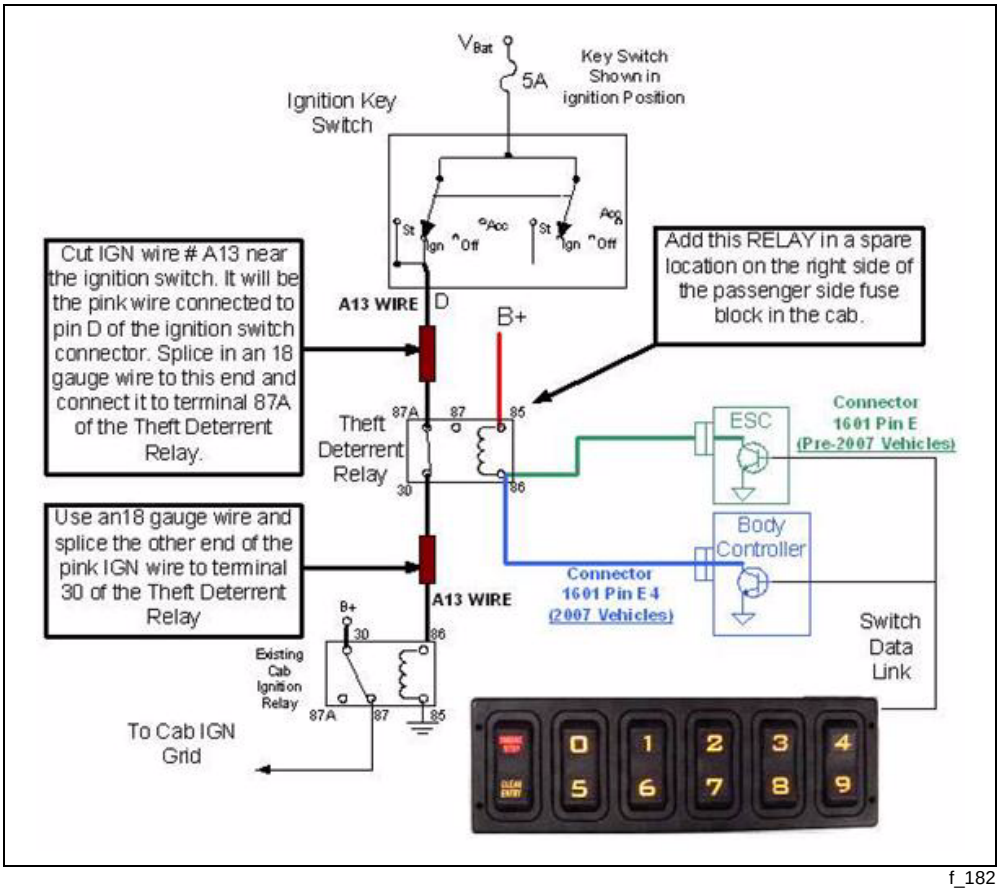
Lost Of Forgotten Theft Deterrent Codes

In the event of a lost or forgotten theft deterrent code, the dealer will be the customer's point of contact – Navistar Tech Services personnel will not provide any information to callers concerning theft deterrent codes.

How To Add This Feature

1. 2007 - Purchase a theft deterrent kit, part number 2588809C93, from a local International® dealer
2. Add software feature code 595AYU to the vehicle BC using the Diamond Logic® software (see local dealer).
3. Install theft deterrent kit as per this drawing.
4. Test the system.

THEFT DETERRENT



f_182

HYBRID ELECTRIC VEHICLE

HYBRID ELECTRIC VEHICLE

Eaton 6SPD Hybrid Power Electronics Carrier

13ZYV

HEV, POWER ELECTRONICS CARRIER {Eaton} With Hybrid, Temporary Mounted, Includes Cooling System LSM Back of Fuel Tank

13ZYW

HEV, POWER ELECTRONICS CARRIER {Eaton} With Hybrid, Temporary Mounted, Includes Cooling System LSM Back of Battery Box

13ZYX

HEV, POWER ELECTRONICS CARRIER {Eaton} With Hybrid, Temporary Mounted, Includes Cooling System LSM Behind PEC

Eaton 6SPD Hybrid With ePTO Capability

13GUE

TRANSMISSION, MANUAL {Eaton Fuller Eaton Hybrid EH-8E406A-UP} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, ePTO Capability, Less APG Capability

13GUG

TRANSMISSION, MANUAL {Eaton Fuller Eaton Hybrid EH-8E406A-UPG} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, ePTO Capability, APG Capability

These features include warning lights, hood open light and capability to activate up to four demand circuits for PTO operation (Requires six RPM inputs and one output)

The Eaton Hybrid system uses electric energy stored in a large high voltage (HV) battery. An electric motor connected to the driveline prior to the transmission gears assists the engine to drive the truck which can improve fuel economy. The diesel engine is connected to the driveline as needed by means of an electric clutch. Energy is re-generated during deceleration (braking) and during efficient diesel engine operating conditions.

This feature also adds the functionality for operating a PTO in a diesel engine off mode (called electric PTO, or ePTO). The E-PTO mode consists of electric PTO operation while the diesel engine is off most of the time. It includes vehicle interlocks, engagement, disengagement, and automatic control of diesel engine on/off operation. The system will run the diesel engine automatically as needed to recharge the High Voltage Battery, as well as if the 12 volt batteries are low or the air pressure is low.

IMPORTANT! Hands on training for the basic hybrid components is required along with reviewing documentation provided by Eaton Corporation, This includes all cautions and warnings, before attempting to diagnose, service or relocate any of the Hybrid electric components.

This feature comprises the following functions: 595BAL, 595BAM, 595BAN, 595BJA and 595BBL broken down into the components of each feature as described below:

595BAL

This feature provides a hood open warning lamp [Red] and a hood open switch to prevent starting the diesel engine when the hood is open.

595BAN

This feature provides two hybrid warning lamps (CHECK HYBRID [Amber] and STOP HYBRID [Red]) in a center panel mounted switch pack.

595BAM or 595BJA

This feature provides an air solenoid to control a PTO engagement mechanism. This feature also provides for up to four demand circuits through RPM inputs that cause the hybrid electric motor to run and turn the PTO shaft via the clutch gear and transmission counter shafts. Each of these circuits have separate parameters that can be set to keep the hybrid electric motor running for a period of time after the demand circuit becomes inactive. This feature provides an RPM input to disable the PTO, as required. Programmable parameters allow the system designer to select the active state for this input. This feature will also request the Hybrid Control Module (HCM) to start the diesel engine if the air pressure or 12-volt chassis battery voltage falls below established parameter values.

This feature uses an RPM input to monitor the PTO feedback switch on the PTO mechanism. Note: To utilize a PTO hour meter, feature 595AJU (pre-2010) OR 595BJA (post-2010) must be added (using Diamond Logic® software).

For convenience a diagram of the RPM pin connections (Figure 3) is included in this document.

595BBL

This feature adds advanced logic for open center hydraulic systems. It is similar to 595BAM and 595BJA, but specifically assigns the following signals to the equivalent pins as follows:

595BAM/595BJA	595BBL
HEV_Electric_Motor_Demand_Circuit_1_Input =	Aerial_Boom_Request_Signal_Input
HEV_Electric_Motor_Demand_Circuit_2_Input =	Boom_Tool_Circuit_Signal_Input
HEV_Electric_Motor_Demand_Circuit_3_Input =	Lower_Ground_Tool_Circuit_Signal_Input
HEV_Electric_Motor_Demand_Circuit_4_Input =	Outrigger_Motion_Switch_Signal_Input

Please use the Diamond Logic® software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

Software Feature Codes/Programmable Parameters

Software feature codes can be added through the Diamond Logic® software. Programmable Parameters are also programmable through the Diamond Logic® Builder software. Body Builders must set programmable parameters that are appropriate for their PTO application.

Refer to the Hybrid Electrical Troubleshooting Guide for more information.

Required Software Feature Codes

595BAL, 595BAM or 595BJA, 595BAN or 595BBN

Software Feature Codes That Must Be Removed

595AJT

ePTO DEMAND CIRCUITS [595BAM or 595BJA]

These parameters set active states for demand circuits used in ePTO control and the length of time that the hybrid electric motor will be requested on after a demand circuit becomes inactive. These conditions are monitored such that the system will automatically start and stop as needed.

The HEV_Electric_Motor_Demand_Cir_1_Enabled parameter enables this input as hydraulic demand input circuit #1 for use in ePTO control as either active high or active low. Disabling it allows this input to be used in other logic without affecting the ePTO logic.

0 = disabled

1 = input active when grounded

3 = input active when at 12V.

The HEV_Electric_Motor_Demand_Cir_1_Motor_On_Time parameter sets the amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive. After this time, the motor will turn off until demand is requested active again.

The HEV_Electric_Motor_Demand_Cir_2_Enabled parameter enables this input as hydraulic demand input circuit #2 for use in ePTO control as either active high or active low. Disabling it allows this input to be used in other logic without affecting the ePTO logic.

0 = disabled

1 = input active when grounded

3 = input active when at 12V.

The HEV_Electric_Motor_Demand_Cir_2_Motor_On_Time parameter sets the amount of time that the hybrid electric motor will be on after demand circuit #2 becomes inactive. After this time, the motor will turn off until demand is requested active again

The HEV_Electric_Motor_Demand_Cir_3_Enabled parameter enables this input as hydraulic demand input circuit #3 for use in ePTO control as either active high or active low. Disabling it allows this input to be used in other logic without affecting the ePTO logic.

0 = disabled

1 = input active when grounded

3 = input active when at 12V.

The HEV_Electric_Motor_Demand_Cir_3_Motor_On_Time parameter sets the amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive. After this time, the motor will turn off until demand is requested active again

The HEV_Electric_Motor_Demand_Cir_4_Enabled parameter enables this input as hydraulic demand input circuit #4 for use in ePTO control as either active high or active low. Disabling it allows this input to be used in other logic without affecting the ePTO logic.

0 = disabled

1 = input active when grounded

3 = input active when at 12V.

The HEV_Electric_Motor_Demand_Cir_4_Motor_On_Time parameter sets the amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive. After this time, the motor will turn off until demand is requested active again

Table 182

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
HEV_Electric_Motor_Demand_Cir_1_Enabled	2391	Enables input as hydraulic demand circuit #1 for use in ePTO control as either active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.0 = Disabled1 = Enabled active low3 = Enabled active high	1 (List)	0	3	
HEV_Electric_Motor_Demand_Cir_1_Motor_On_Time	2495	Amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive	0s	0	600	1
HEV_Electric_Motor_Demand_Cir_2_Enabled	2396	Enables input as hydraulic demand circuit #2 for use in ePTO control as either active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.0 = Disabled1 = Enabled active low3 = Enabled active high	1 (List)	0	3	
HEV_Electric_Motor_Demand_Cir_2_Motor_On_Time	2390	Amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive	30s	0	600	1
HEV_Electric_Motor_Demand_Cir_3_Enabled	2400	Enables input as hydraulic demand circuit #3 for use in ePTO control as either active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.0 = Disabled1 = Enabled active low3 = Enabled active high	1 (List)	0	3	
HEV_Electric_Motor_Demand_Cir_3_Motor_On_Time	2304	Amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive	60s	0	600	1
HEV_Electric_Motor_Demand_Cir_4_Enabled	2425	Enables input as hydraulic demand circuit #4 for use in ePTO control as either active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.0 = Disabled1 = Enabled active low3 = Enabled active high	1 (List)	0	3	
HEV_Electric_Motor_Demand_Cir_4_Motor_On_Time	2270	Amount of time that the hybrid electric motor will be on after demand circuit #1 becomes inactive	120s	0	600	1

ePTO OPEN CENTER HYDRAULIC SYSTEMS (595BBL)

These parameters set active states for demand circuits used in ePTO control and the length of time that the hybrid electric motor will be requested on after a demand circuit becomes inactive. These conditions are monitored such that the system will continue to run once started and automatically stop as needed.

The Aerial_Boom_Request_Signal_Active_State parameter sets the logical active state at the aerial boom demand input that will cause the initiation of the hybrid electric traction motor.

2 = disabled

0 = enabled active floating

3 = input active high

1 = input active low

The Aerial_Boom_Circuit_Demand_Timeout parameter sets the amount of time that the hybrid electric traction motor will continue to run following the operation of the aerial boom.

The Emergency_Pump_Interlocked_To_ePTO_Request_Parameter enables emergency pump to be ON only in ePTO mode.

The Emergency_Pump_Maximum_Run_Timer_Enabled parameter enables an internal timer limiting the continuous operation of the emergency pump.

The Emergency_Pump_Maximum_Run_Time parameter sets the amount of time that the emergency pump will be requested ON once the emergency pump request switch has been initiated and maintained its active state.

The Outrigger_Motion_Switch_Request_Signal_Active_State parameter is the logical active state at the outrigger motion switch device that will cause the initiation of the hybrid electric traction motor.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Outrigger_Traction_Motor_Operation_Timeout parameter sets the amount of time that the hybrid electric motor will continue to run following the operation of the chassis mounted equipment's outriggers.

The Prohibit_Driving_Interlock_Parameter enables prohibit driving functionality to be activated.

The Lower_Ground_Tool_Request_Signal_Active_State parameter is the logical active state at the lower tool circuit demand input that will cause the initiation of the hybrid electric traction motor.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Lower_Ground_Tool_Circuit_Demand_Timeout parameter sets the amount of time that the hybrid electric traction motor will continue to run following the operation of any specific lower tool function where the demand is no longer generating back pressure (“demand”) within the hydraulic system.

The Lower_Ground_Tool_Circuit_Switch_Action parameter is the type of switch device used to operate the lower tools.

0 = disabled

1 = latching

2 = momentary

The Lower_Ground_Tool_Continuous_Run_Parameter enables a continuous run cycle where the hybrid electric traction motor will continue to run as long as the lower tool switch request logic is active.

The Boom_Tool_Request_Signal_Active_State parameter is the logical active state at the boom tool circuit demand input that will cause the initiation of the hybrid electric traction motor.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Boom_Tool_Circuit_Demand_Timeout parameter sets the amount of time that the hybrid electric traction motor will continue to run following the operation of any specific upper bucket tool function where the demand is no longer generating back pressure (“demand”) within the hydraulic system.

The Boom_Tool_Continuous_Run_Parameter enables a continuous run cycle where the hybrid electric traction motor will continue to run as long as the boom tool switch request logic is active.

The Boom_Not_Stowed_Parameter specifies the logical active state at the boom stow switch device/s used to determine the stowed /out of stow status of the aerial tower.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Outriggers_Not_Stowed_Parameter specifies the logical active state at the outrigger motion switch device/s that will cause the initiation of the hybrid electric traction motor.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Emergency_Pump_Request_Signal_Active_State specifies the logical active state at the emergency pump input that will cause the initiation of the emergency pump.

2 = disabled

0 = enabled active floating

3 = enabled active high

1 = enabled active low

The Key_ON_Biased_RPM_Output_Delay parameter is used to delay the activation of the Key_ON biased RPM output during the initialization of the HCM and subsequent systems.

The Emergency_Pump_Power_Output_Current_Limit parameter is the emergency pump output (RPM) fuse value.

The Key_ON_Biased_RPM_Output_Current_Limit parameter is the key state biased power output (RPM) fuse value.

Table 183

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
Aerial_Boom_ Request_Signal_ Active_State	2587	Enables input as aerial boom demand for use in ePTO control as active floating, active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.2 = Disabled0 = Enabled active floating1 = Enabled active low3 = Enabled active high	3 (List)	0	3	
Aerial_Boom_ Circuit_Demand_ Timeout	2589	Amount of time that the hybrid electric motor will be on after aerial boom demand becomes inactive	7s	0	655	1s
Emergency_Pump_ Interlocked_To_ ePTO_Request_ Parameter	2590	Enables emergency pump to be ON (On/Off)	Off			
Emergency_Pump_ Maximum_Run_ Timer_Enable	2591	Enables an interal timer limiting the continuous operation of emergency pump (On/Off)	Off			
Emergency_Pump_ Maximum_Run_ Time	2592	Time that the emergency pump will be requested ON once the emergency pump request switch has been initiated	30s	0	655	1s
Outrigger_Motion_ Switch_Request_ Signal_Active_State	2618	Enables input as outrigger motion switch for use in ePTO control as either active floating, active high or active low. Disabling this input frees it to be used in other logic without affecting the ePTO logic.2 = Disabled0 = Enabled active floating1 = Enabled active low3 = Enabled active high	3 (List)	0	3	
Outrigger_Traction_ Motor_Operation_ Timeout	2619	Amount of time that the hybrid electric motor will continue to run following the operation of the chassis mounted equipment outriggers.	7s	0	655	1
Prohibit_Driving_ Interlock_Parameter	2620	Enables prohibit driving functionality to be activated (On/Off).	On			
Lower_Ground_Tool _Request_Signal_ Active_State	2621	Logical active state at the lower tool circuit demand input that will cause the initiation of the hybrid electric traction motor.2 = Disabled0 = Enabled active floating3 = Enabled active high1 = Enabled active low	1 (List)	0	3	
Lower_Ground_Tool _Circuit_Demand_ Timeout	2622	Amount of time that the hybrid electric motor will continue to run following the operation of any specific lower tool function.	60s	0	655	1
Lower_Ground_Tool _Circuit_Switch_ Action	2623	Type of switch device used to operate the lower tools.0 = Disabled1 = Latching2 = Momentary	2 (List)	0	2	
Lower_Ground_Tool _Continuous_Run_ Parameter	2524	Enables a continuous run cycle where the hybrid electric traction motor will continue to run as long as the lower tool switch request logic is active. (On/Off)	Off			
Boom_Tool_ Request_Signal_ Active_ State	2625	Logical active state at the boom tool circuit demand input that will cause the initiation of the hybrid electric traction motor.2 = Disabled0 = Enabled active floating3 = Enabled active high1 = Enabled active low	3 (List)	0	3	
Boom_Tool_Circuit_ Demand_Timeout	2626	Amount of time that the hybrid electric motor will continue to run following the operation of any specific upper bucket tool function.	30s	0	655	1

Off – Indicates a 0 is set in for this parameter On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
Boom_Tool_ Continuous_Run_ Parameter	2627	Enables a continuous run cycle where the hybrid electric traction motor will continue to run as long as the boom tool switch request logic is active. (On/Off)	Off			
Boom_Not_Stowed _Parameter	2647	Logical active state at the boom stow switch device/s used to determine the stowed/out of stow status of aerial tower.2 = Disabled0 = Enabled active floating3 = Enabled active high1 = Enabled active low	3 (List)	0	3	
Outriggers_Not_ Stowed_Parameter	2648	Logical active state at the outrigger motion switch device/s that will cause the initiation of the hybrid electric traction motor.2 = Disabled0 = Enabled active floating3 = Enabled active high1 = Enabled active low	3 (List)	0	3	
Emergency_Pump_ Request_Signal_ Active_State	2649	Logical active input state at the emergency pump input that will cause the initiation of the emergency pump.2 = Disabled0 = Enabled active floating3 = Enabled active high1 = Enabled active low	1 (List)	0	3	
Key_ON_Biased_ RPM_Output_Delay	2727	Amount of time to delay the activation of the Key_ON biased RPM output during the initialization of the HCM and subsequent systems.	0s	0	655	1
Emergency_Pump_ Power_Output_ Current_Limit	2739	Emergency pump power output (RPM) fuse value.	20A	0	20	0.1A
Key_ON_Biased_ RPM_Output_ Current_Limit	2740	Key state biased power output (RPM) fuse value.	20A	0	20	0.1A

RUN/STOP DIESEL ENGINE

These parameters set the conditions under which the ESC will request to start the diesel engine to recharge the air supply or battery voltage and to stop running the diesel engine when not needed. These conditions are monitored such that the system will automatically start and stop the diesel engine as needed.

The HEV_Run_Engine_Max_Air_Pressure parameter is the pressure above which the Hybrid Control Module (HCM) will be requested to quit running the diesel engine to recharge the air supply. This pressure must be greater than HEV_Run_Engine_Min_Air_Pressure.

The HEV_Run_Engine_Max_Air_Press_Time parameter sets the amount of time that the diesel engine will run after the air pressure supply reaches the upper air pressure limit set for ePTO (set by HEV_Run_Engine_Max_Air_Pressure). This allows the diesel engine to run for a minimum amount of time.

The HEV_Run_Engine_Max_Battery_Voltage parameter sets the battery voltage limit that must be met for the diesel engine to stop running after a set amount of time. This voltage must be greater than HEV_Run_Engine_Min_Battery_Voltage.

The HEV_Run_Engine_Max_Bat_Volt_Time parameter sets the amount of time to recharge the batteries before the ESC will request the diesel engine to stop running. This parameter sets the minimum amount of time that the diesel engine will run if the 12-volt batteries are low.

The HEV_Run_Engine_Min_Air_Pressure parameter sets the minimum desired ePTO operating air pressure. If in ePTO mode and the system air pressure falls below this value for a set amount of time, the HCM will be requested to start the diesel engine to recharge the air supply.

The HEV_Run_Engine_Min_Air_Press_Time parameter sets the amount of time that air pressure is below the minimum before the ESC will request the Hybrid Control Module (HCM) to start the diesel engine to recharge the air supply.

The HEV_Run_Engine_Min_Battery_Voltage parameter sets the minimum battery voltage level during ePTO with diesel engine off. If in ePTO mode and the battery voltage falls below this value for a set amount of time, the HCM will be requested to start the diesel engine to recharge the batteries.

The HEV_Run_Engine_Min_Bat_Volt_Time parameter sets the amount of time that the voltage is below the minimum (HEV_Run_Engine_Min_Battery_Voltage parameter) before the ESC will request the HCM to start the diesel engine to recharge the 12V batteries.

Table 184

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
HEV_Run_Engine_Max_Air_Pressure	2520	Pressure above which the Hybrid Control Module (HCM) will be requested to quit running the diesel engine to recharge the air supply	120psi	90	150	1
HEV_Run_Engine_Max_Air_Press_Time	2517	Amount of time that the diesel engine will run after the air pressure supply reaches the upper air pressure limit set for ePTO (set by HEV_Run_Engine_Max_Air_Pressure)	10s	0	600	1
HEV_Run_Engine_Max_Battery_Voltage	25143	Battery voltage limit that must be met for the diesel engine to stop running after a set amount of time	13.2V	0	20	0.1
HEV_Run_Engine_Max_Bat_Volt_Time	2516	Amount of time to recharge the batteries before the ESC will request the diesel engine to stop running	300s	0	600	1
HEV_Run_Engine_Min_Air_Pressure	2521	Minimum desired ePTO operating air pressure. If in ePTO mode and the system air pressure falls below this value for a set amount of time, the HCM will be requested to start the diesel engine to recharge the air supply	100psi	90	150	1
HEV_Run_Engine_Min_Air_Press_Time	2519	Amount of time that air pressure is below the minimum before the ESC will request the Hybrid Control Module (HCM) to start the diesel engine to recharge the air supply	10s	0	600	1
HEV_Run_Engine_Min_Battery_Voltage	2513	Minimum battery voltage level during ePTO with diesel engine off. If in ePTO mode and the battery voltage falls below this value for a set amount of time, the HCM will be requested to start the diesel engine to recharge the batteries	12.1V	0	20	0.1
HEV_Run_Engine_Min_Bat_Volt_Time	2515	Amount of time that the voltage is below the minimum (HEV_Run_Engine_Min_Battery_Voltage parameter) before the ESC will request the HCM to start the diesel engine to recharge the 12V batteries	60s	0	600	1

ePTO

These parameters set various input/output conditions for operating ePTO.

The HEV_Body_Equipment_Power_Current_Limit parameter sets the fuse value for the HEV ePTO Body Equipment Power output (on the RPM).

The HEV_ePTO_Disengagement_Enabled parameter enables the PTO disengagement/disable signal by selecting the input to the RPM as either active high (12V) or active low (ground). When the input goes active, it will immediately disengage the PTO by deactivating the air solenoid. Disabling it (0) allows this input to be used in other logic code without affecting the ePTO logic.

0 = disabled

1 = input active when grounded

3 = input active when at 12V.

The HEV_ePTO_Engaged_State parameter indicates the active state of the Hybrid Electric Vehicle (HEV) ePTO clutch engaged feedback signal into the RPM.

0 = disabled

1 = engaged when pulled low

3 = engaged when pulled high

The HEV_Body_Equipment_Power_Interlock_Enabled parameter allows the Body Equipment Power output to be interlocked to the ePTO request from the HCM. When this parameter is enabled, power at this RPM output will automatically be turned on when ePTO mode is requested. With this parameter turned off, this power will be on automatically with key on and interlocks met (park brake set, transmission in neutral, etc.).

Table 185

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
HEV_PTO_Body_Equipment_Power_Current_Limit	2522	Sets the fuse value for the HEV ePTO Body Equipment Power output (on the RPM)	20A	0	20	0.1
HEV_ePTO_Disengagement_Enabled	2533	Enables the PTO disengagement/disable signal by selecting the input to the RPM as either active high (12V) or active low (ground)0 = Disabled1 = Enabled active low3 = Enabled active high	3	0	3	List
HEV_ePTO_Engaged_State	2523	Indicates the active state of the Hybrid Electric Vehicle (HEV) ePTO clutch engaged feedback signal into the RPM	1	0	3	List
HEV_Body_Equipment_Power_Interlock_Enabled	2494	Allows the Body Equipment Power output to be interlocked to the ePTO request from the HCM. When this parameter is enabled, power at this RPM output will automatically be turned on when ePTO mode is requested.	On			

The KeyState_Debounce_Time parameter allows the debounce time to be specified for the HEV_Prohibit_Driving signal.

Table 186

Off – Indicates a 0 is set in for this parameter						
On – Indicates a 1 is set for the parameter						
Parameter	**ID**	**Description**	**Default**	**Min**	**Max**	**Step**
KeyState_ Debounce_Time	2730	KeyState debounce time for HEV_Prohibit_Driving signal	5000 ms	0	65 535 000	10 ms

HEV SIGNALS AVAILABLE TO ADVANCED LOGIC

The following signals are available for use in Advanced Logic in Diamond Logic®. Some of the signals are used in conjunction with some of the parameters defined above.

ePTO DEMAND CIRCUITS

The HEV_Electric_Motor_Demand_Circuit_1_Input signal is the Hybrid Electric Vehicle Hydraulic Demand Input Circuit 1. It is an input signal connected to RPM1 Input 1. The input must be enabled by setting the HEV_Demand_Cir_1_Enabled parameter. Refer to parameter descriptions above for the proper settings.

The HEV_Electric_Motor_Demand_Circuit_2_Input signal is the Hybrid Electric Vehicle Hydraulic Demand Input Circuit 2. It is an input signal connected to RPM1 Input 2. The input must be enabled by setting the HEV_Demand_Cir_2_Enabled parameter. Refer to parameter descriptions above for the proper settings.

The HEV_Electric_Motor_Demand_Circuit_3_Input signal is the Hybrid Electric Vehicle Hydraulic Demand Input Circuit 3. It is an input signal connected to RPM1 Input 3. The input must be enabled by setting the HEV_Demand_Cir_3_Enabled parameter. Refer to parameter descriptions above for the proper settings.

The HEV_Electric_Motor_Demand_Circuit_4_Input signal is the Hybrid Electric Vehicle Hydraulic Demand Input Circuit 4. It is an input signal connected to RPM1 Input 4. The input must be enabled by setting the HEV_Demand_Cir_4_Enabled parameter. Refer to parameter descriptions above for the proper settings.

The HEV_Demand_Circuit_1_DLB_Disable_Req signal can be used in DLB ladder logic to request the Body Controller (BC) to disable Demand Circuit # 1 input. If the circuit is active, the hybrid electric motor will not be requested to run due to this input as long as it is disabled. The demand timer is not affected.

The HEV_Demand_Circuit_2_DLB_Disable_Req signal can be used in DLB ladder logic to request the Body Controller (BC) to disable Demand Circuit # 2 input. If the circuit is active, the hybrid electric motor will not be requested to run due to this input as long as it is disabled. The demand timer is not affected.

The HEV_Demand_Circuit_3_DLB_Disable_Req signal can be used in DLB ladder logic to request the Body Controller (BC) to disable Demand Circuit # 3 input. If the circuit is active, the hybrid electric motor will not be requested to run due to this input as long as it is disabled. The demand timer is not affected.

The HEV_Demand_Circuit_4_DLB_Disable_Req signal can be used in DLB ladder logic to request the Body Controller (BC) to disable Demand Circuit # 4 input. If the circuit is active, the hybrid electric motor will not be requested to run due to this input as long as it is disabled. The demand timer is not affected.

HOOD OPEN

The HEV_Hood_Open signal is an input reflecting the status of the Hood Open Switch (ON = open, OFF = closed).

HYBRID FAULT

The HEV_Check_Hybrid_Input signal is an input from the Hybrid Control Module (HCM) to indicate a non-critical fault in the hybrid system.

The HEV_Stop_Hybrid_Input signal is an input signal from the Hybrid Control Module (HCM) to indicate a critical fault in the hybrid system.

Interlock Conditions

The HEV_Prohibit_Driving_Req2 signal is a read only data link output from the ESC to the HCM which then passes it to the transmission control module (TCM) on public data link from the Hybrid Control Module (HCM) to prohibit the vehicle from being driven.

The HEV_Prohibit_Driving_DLB_Req2 is a written to data link semaphore1 output from the ESC to the HCM which then passes it to the transmission control module (TCM) on public data link from the Hybrid Control Module (HCM) to prohibit the vehicle from being driven.

The HEV_OK_To_Start_Engine signal is a data link output from the ESC to the HCM to allow the diesel engine to be started.

Diesel Engine/Hybrid Electric Motor

The HEV_Run_Engine_Req signal is a data link output from the ESC to the HCM.

The HEV_Run_Engine_DLB_Req2 signal is a written to data link semaphore1output from the ESC to the HCM requesting the diesel engine to run.

The HEV_Run_Electric_Motor_Req signal is a data link output from the ESC to the HCM requesting the hybrid electric motor to run.

The HEV_Run_Electric_Motor_DLB_Req signal is a written to data link semaphore1 output from the ESC to the HCM requesting the hybrid electric motor to run.

The HEV_Air_Pressure_Low signal indicates that the HCM is being requested to run the engine because the air pressure is low.

The HEV_Battery_Voltage_Low signal indicates that the HCM is being requested to run the engine because the battery voltage is low.

ePTO

The HEV_PTO_Disengagement_Input signal is a body builder provided hardware input3 signal connected to RPM1 input 5, disabling the ePTO air solenoid (ON = disable ePTO, OFF = allow normal ePTO operation).

The Hybrid_PTO_Disengagement_DLB_Req signal is a written to data link semaphore1output signal disabling the ePTO air solenoid (ON = disable ePTO, OFF = allow normal ePTO operation).

The HEV_ePTO_Engaged signal is a data link output from ESC to the HCM indicating that the ePTO is engaged.

The HEV_ePTO_Requested signal is an input signal from the Hybrid Control Module (HCM) to the Body Controller (BC) indicating that the operator has pressed the ePTO switch to engage (or disengage) the PTO. This signal will be active as long as the PTO is requested to be engaged.

The HEV_PTO_Air_Solenoid_Cmd signal is a data link input signal from the HCM to the ESC indicating that the in cab, shift console mounted ePTO button has been depressed and all interlocks are met.

Air Pressure

The HEV_Filtered_Pressure signal can be used in DLB ladder Logic to get the filtered pressure value (psi).

The HEV_Pressure_Filter_Reset_Flag signal can be used in DLB ladder logic to reset the pressure filter.

The HEV_Unfiltered_Pressure signal can be used in DLB ladder logic to get the unfiltered pressure (psi).

Notes

1. Semaphores are messages sent to another module to request that the other module take action.
2. These signals may become unavailable in a future release of the software.
3. Please use the Diamond Logic® software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view).

Wiring Information

Please use the Diamond Logic® software to determine pin locations for RPM inputs (refer to the CONNECTOR screen view) and to set programmable parameters (refer to the FEATURE screen view).

- All wiring to RPM inputs and outputs is customer supplied.
- One wire may be connected to an RPM output (RPM #1, brown connector terminal A labeled PTO_Output in the DLB connector view) and use as a 12-volt, 20 ampere source power for body builder installed equipment. (Note: this RPM output can be biased to either the accessory key position or interlocked to the activation of the ePTO mode of operation [default state] via feature 595BAM parameter 2494).
- A second wire must be connected from the Body Builder-installed PTO feedback switch (GND active) to the pin labeled PTO_Feedback_Switch in the black 23-pin RPM input connector. This feedback switch is used to determine whether or not the PTO is engaged by determining if the switch is in the active state. If the switch is in its active state, then an indicator light in the gauge cluster shall be activated. When the switch is not in the active state, the indicator light will not be on.
- The switch provided is labeled PTO.

RPM Connector Information

HPV Wire Terminal Kits are REQUIRED to allow Body Builders to create wire harnesses for the RPM connectors.

HPV terminal kits are pre-made kits that include six power output terminals and seals for the brown 8-way connect7r and six terminals for the black 23-way connector.

Table 185

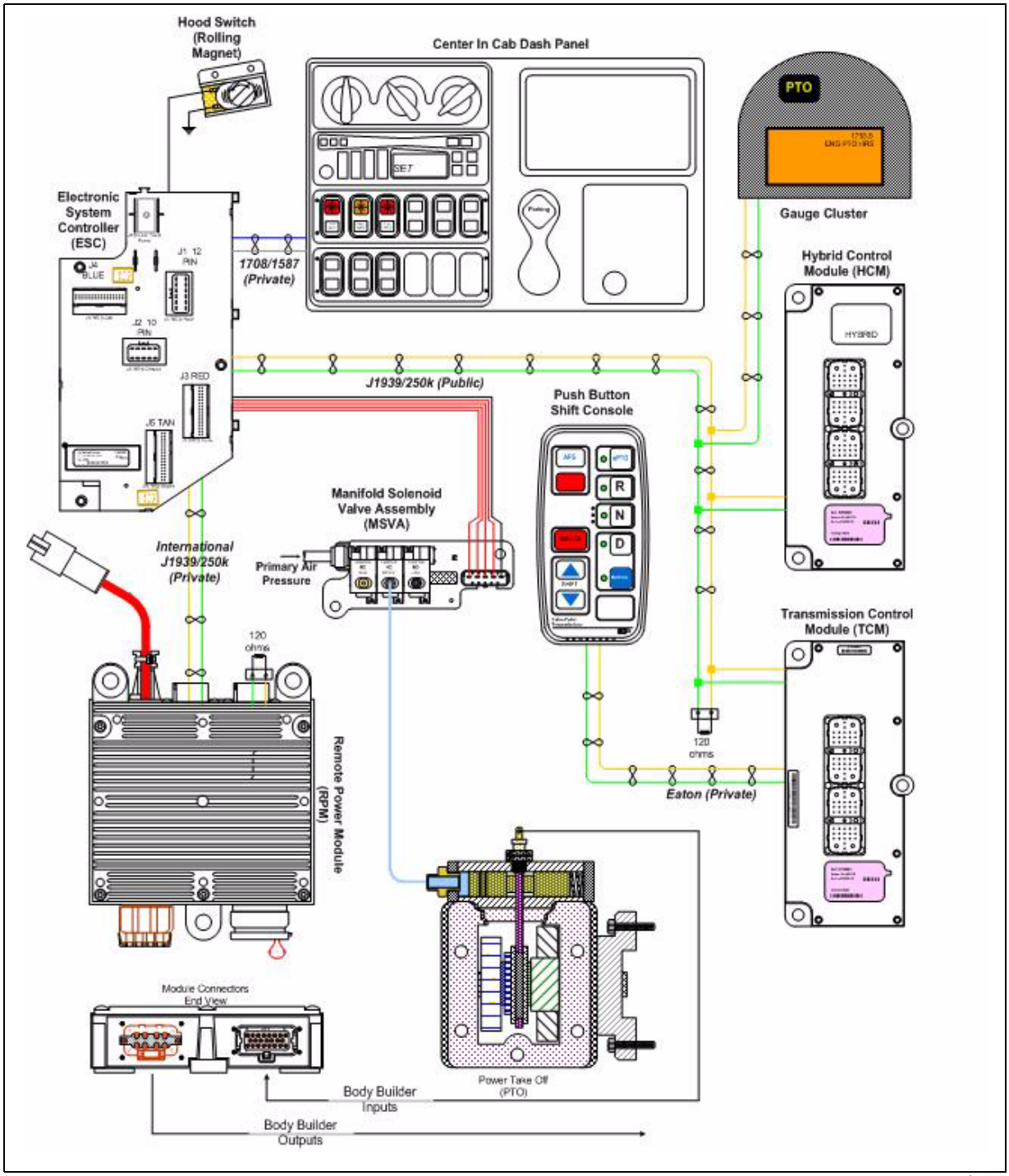
HPV Terminal Kits	Part Number
RPM Terminal Kit 12 Gauge	2585651C91
RPM Terminal Kit 14 Gauge	2585423C91

NOTE: The following connectors are optional because they are already provided with the RPMs.

This information is given so that the Body Builder can purchase connectors in the event that the original connectors are damaged or lost, or so that the Body Builder can pre-fabricate a wire harness.

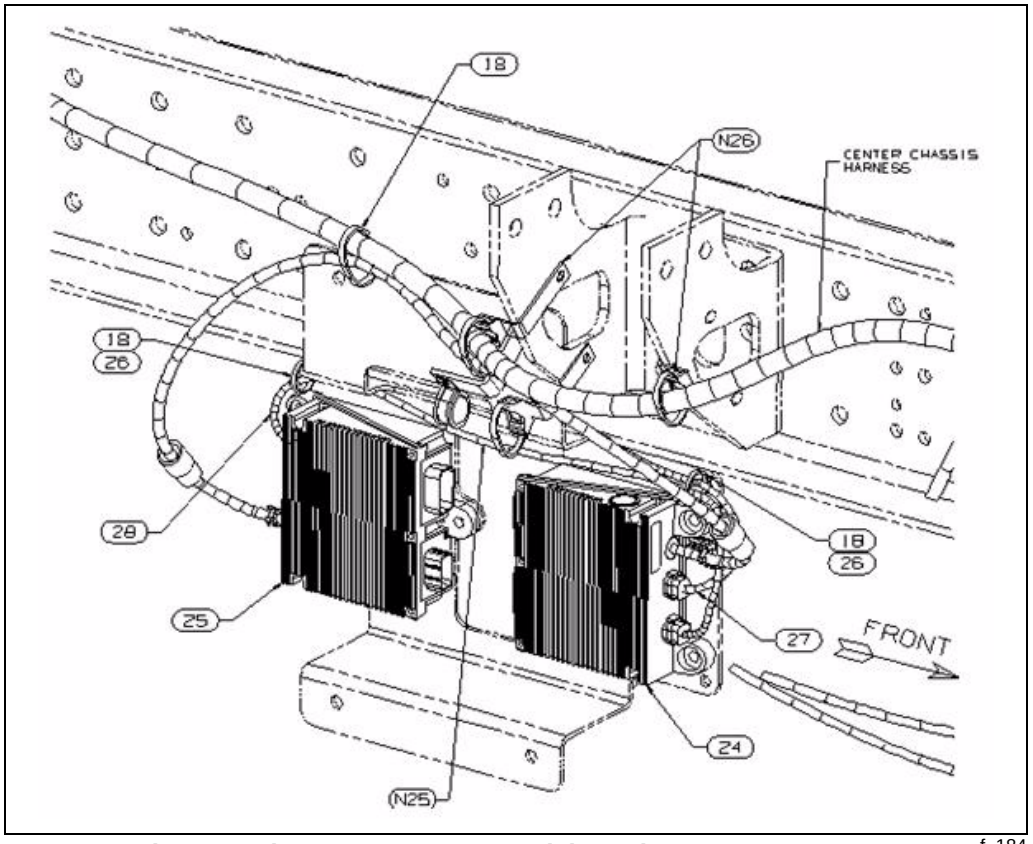
Table 188 – 8-Way RPM Output Connector (Brown) and 23-Way RPM Input Connector (Black)

Connector Part No.	3548934C1	2585981C91
Description	Connector, Body, Brown 8–Way RPM Output	Connector, Body, Black 23-Way RPM Input Kit
Terminal Part	3534163C1 – 12 Gauge 3535931C1 – 14 Gauge 3535930C1 – 16 & 18 Gauge	1698937C1
Cable Seal Part	C3548945C1 – 12 & 14 Gauge 3535937C1 – 16 & 18 Gauge	N/A
Connector Lock Part	3548943C1	N/A
CPA Lock	3573833C1	N/A
Cavity Plug	3535938C1	Built into the connector



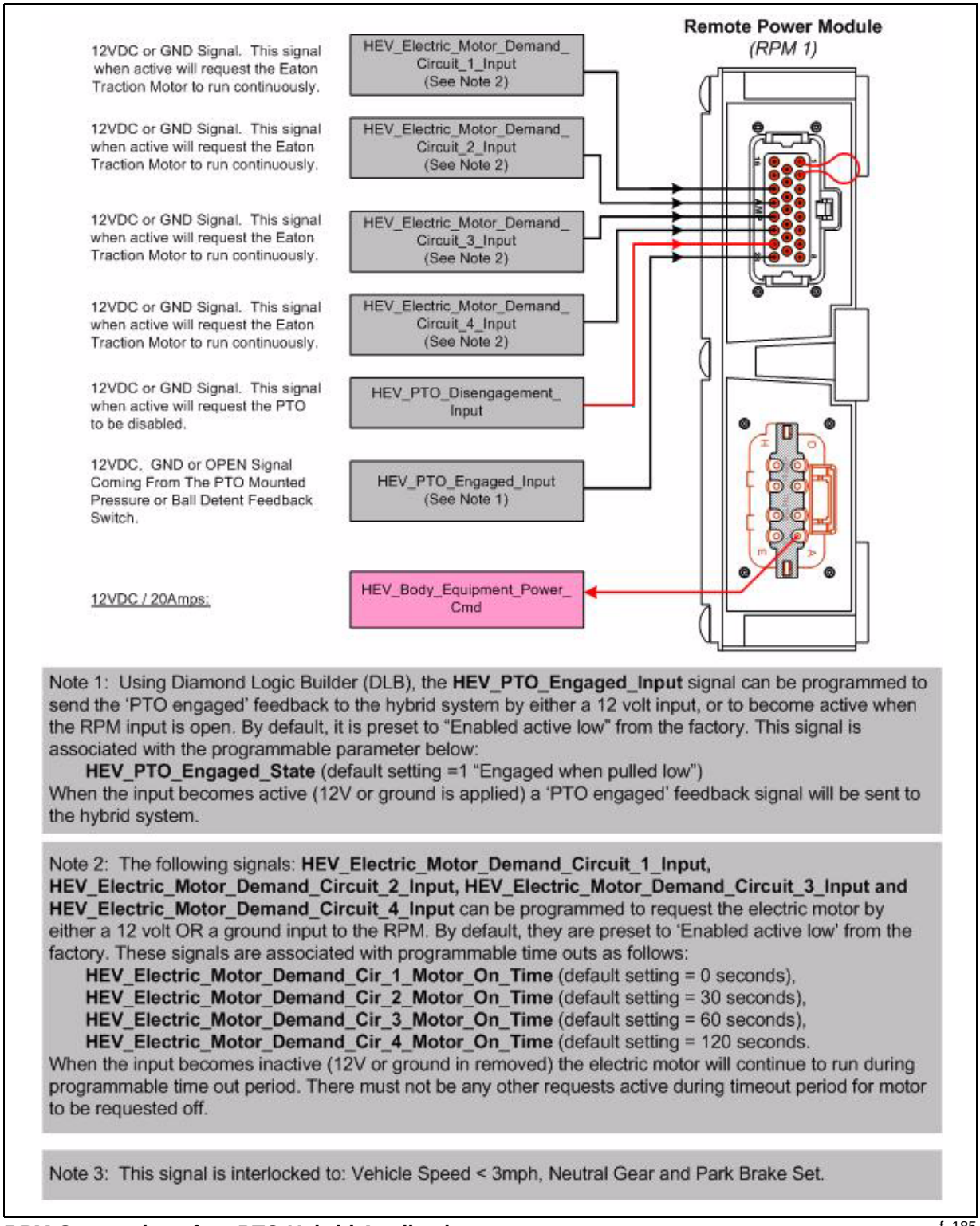
f_183

Overview of Hybrid with ePTO Capability



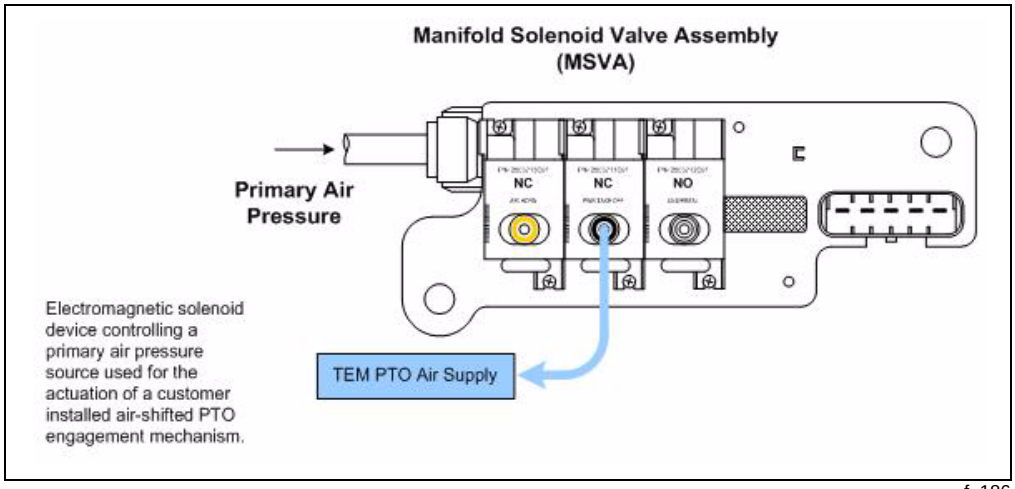
RPM Mounting Location on a DuraStar Model Truck f_184

Body Builder Integration Points: This is where the connections are made to integrate the hybrid ePTO application with the chassis. The following two figures illustrate the necessary connections.



RPM Connections for ePTO Hybrid Application

f_185



Air Solenoid Connections for ePTO Hybrid Application f_186

Mounting positions for air solenoids are different based upon vehicle air accessory content. Locate the air solenoid labeled “Pwr Take Off” for controlling the PTO mechanism.

Normal System Operation Test

NORMAL SYSTEM OPERATION TEST

- Start the diesel engine with transmission in neutral and the park brake set and the chassis’ hood closed. Make sure the air pressure is greater than 110 psi and battery voltage is greater than 13.3 volts.
- Depress the ePTO button on the shifter.
- Verify that PTO lamp in the gauge cluster is turned on when the ePTO is successfully engaged.
- Verify that the diesel engine shuts off.
- Activate one of the hybrid demand circuit inputs. Verify that the hybrid electric motor activates.
- De-activate the hybrid demand circuit input. Verify that the hybrid electric motor shuts off after the programmed timeout period has elapsed.

General System Tests

- To determine if the HOOD OPEN warning is working, open the hood and check that the HOOD OPEN light is on and that the diesel engine cannot be started. (This functionality/feature also includes the park brake and the in-cab key switch in ignition run position. The feature is designed to prevent the hybrid electric motor from cranking or starting the engine. If the hood is open and/or the park brake is not set, the engine can still be started from the in-cab-key switch.)
- Verify that the pin labeled HEV_ePTO_Body_Equip_Pwr_Cmd of the brown 8-way Remote Power Module output connector has the battery voltage levels present. (If parameter 2494 is enabled [default] this output will source 12 volts at 20 amperes once the unit is in the ePTO mode of operation. Otherwise it will source 12 volts at 20 amperes when the in-cab key switch is in the ignition/run position and the vehicle is stationary).
- Verify that the RPM input labeled HEV_ePTO_Engaged_Feedback, HEV_Remote_PTO_Disable, HEV_Demand_Circuit_1, HEV_Demand_Circuit_2, HEV_Demand_Circuit_3 and HEV_Demand_Circuit_4 (pin positions specified by the Diamond Logic® software) is receiving the correct voltage (12V or GND) as specified by the programmable parameter in the Diamond Logic® software.
- Verify that the STOP HYBRID and CHECK HYBRID lamps work by cycling the in-cab key switch to the ignition/run position. This action will initiate a lamp test, illuminating these lamps for a period of 8 seconds following the key switch initialization.
- If the Service Disconnect switch is pushed in, the Check Hybrid light should be solid ON to indicate the hybrid system is offline.

LOW AIR PRESSURE TEST

- Start the diesel engine with transmission in neutral and the park brake set. Make sure the air pressure is greater than 110 psi and battery voltage is greater than 13.3 volts.
- Depress the ePTO button on the shifter.
- Verify that the diesel engine shuts off.
- Depress the brake pedal a number of times to allow air pressure to drop below the minimum air pressure (default = 100 psi).
- Wait for the minimum air pressure time to elapse (default = 10 sec).
- Verify that the diesel engine starts to recharge the air supply.

ePTO DISABLE TEST

- Start the diesel engine with transmission in neutral and the park brake set. Make sure the air pressure is greater than 110 psi and battery voltage is greater than 13.3 volts.
- Depress the ePTO button on the shifter.
- Verify that the diesel engine shuts off.
- Disengage the ePTO through the RPM input “HEV_Remote_PTO_Disable”.
- Verify that the ePTO is disabled.
- Once the HEV_Remote_PTO_Disable switch has been activated, the PTO mechanism cannot be re-engaged until the HEV_Remote_PTO_Disable switch has been returned to its inactive state and the ePTO request switch located in the Eaton shift console is recycled.

HOW TO ADD THIS FEATURE

- This feature cannot be added aftermarket at the present time.

EATON 6-SPD HYBRID WITHOUT ePTO CAPABILITY

13GUB

TRANSMISSION, MANUAL {Eaton Fuller Eaton Hybrid EH-8E406A-T} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, Without ePTO Capability

13GUC

TRANSMISSION, MANUAL {Eaton Fuller Eaton Hybrid EH-8E406A-CDG} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls and APG Capability; Without ePTO Capability

13GUD

TRANSMISSION, MANUAL {Eaton Fuller Eaton Hybrid EH-8E406A-CD} 6-Speed Automated Manual, Hybrid Drive Unit, With Electronic Shift Controls, Without ePTO Capability

13GSB

EATON 6SPD HYBRID WITHOUT ePTO CAPABILTY for a Hybrid Electric Vehicle, includes warning lights.

13GSS

EATON 6SPD HYBRID WITHOUT ePTO CAPABILTY for a Hybrid Electric Vehicle, includes warning lights – Beverage Tractor Only.

This feature provides two warning lamps (STOP HYBRID and CHECK HYBRID) in a switch pack. A software feature (see below) will need to be added if the vehicle will have a mechanical PTO installed.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

Software feature codes can be added through the Diamond Logic® software.

REQUIRED SOFTWARE FEATURE CODE

595BAN

Optional software feature code: 595BBA (used if a mechanical PTO is installed on the vehicle). Please see the appropriate PTO sections elsewhere in this manual for the specific PTO installed.

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

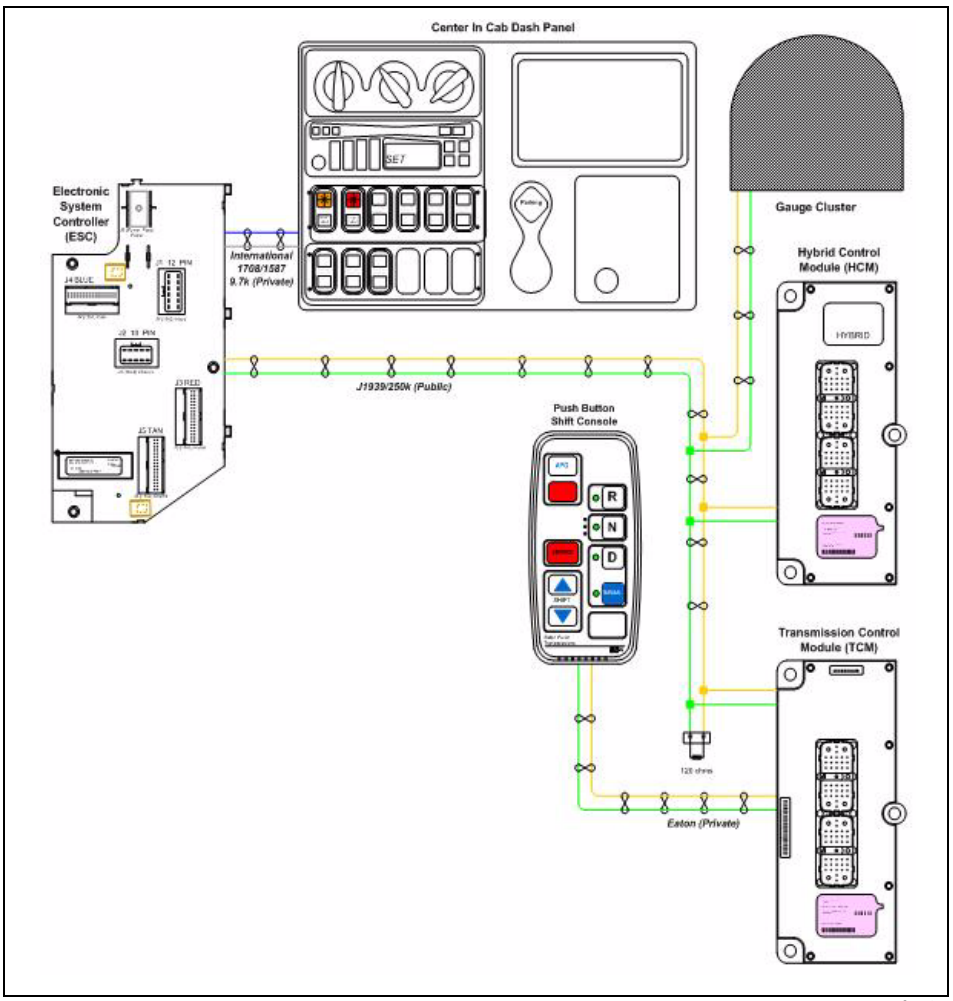
HEV SIGNALS AVAILABLE TO ADVANCED LOGIC

The following signals are available for use in Advanced Logic in Diamond Logic®.

HYBRID FAULT

The HEV_Check_Hybrid_Input signal is an input from the Hybrid Control Module (HCM) to indicate a non-critical fault in the hybrid system.

The HEV_Stop_Hybrid_Input signal is an input signal from the Hybrid Control Module (HCM) to indicate a critical fault in the hybrid system.



Overview of Hybrid Without ePTO Capability f_187

TESTING

1. Verify that the STOP HYBRID and CHECK HYBRID lamps work by having key in run position and perform a bulb check. The lamps should be on for 8 seconds.
2. Simulate the light turning on with Diamond Logic® or Eaton Service Ranger service tools.
3. If the Service Disconnect switch is pushed in, the Check Hybrid light should be flashing to indicate the hybrid system is offline.

HOW TO ADD THIS FEATURE

- This feature cannot be added aftermarket at the present time.

HYBRID DISPLAY LOCATED IN AUXILIARY GAUGE AND SWITCH PACK (AGSP)

595BBN

HEV DRIVER DISPLAY Located in AGSP

This feature provides gauges for a visual display of the instantaneous fuel economy, high voltage battery state of charge and electric motor torque. It also contains Hybrid Warning and Hybrid Stop Light Indicators.

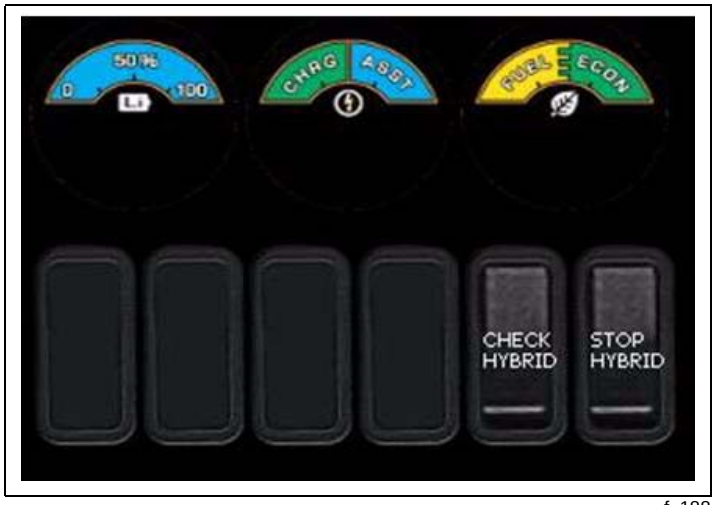
The fuel economy gauge shows how fuel efficient the vehicle is running. Filter parameters may be set to keep the calculation reasonable.

The state of charge indicates percentage of charge for the high voltage battery pack. Filtering is also allowed on the state of charge measurement.

The torque gauge displays the amount of torque on the electric motor. Filtering is also allowed on the torque measurement.

Each of the above gauges parameters may be set for high and low values for warning indicators to be set.

The feature also comes with six switches in a switch pack. The rightmost two positions will be filled with the hybrid warning lamps (CHECK HYBRID [Amber] and STOP HYBRID [Red]). The open switch locations are available for other applications.



AGSP for Hybrid Electric Vehicle f_188

Software Feature Codes/Programmable Parameters

Required Software Feature Code

595BBN

Software Feature Code That Must Be Removed

595BAN

The Fuel_Econ_Filter_Heavy_Weight parameter defines the weight value for the instantaneous fuel economy heavy filter. Heavy filtering is used for pedal < 75%.

The Fuel_Econ_Filter_Lite_Weight parameter defines the weight value for the instantaneous fuel economy low filter. Light filtering is used for rapid acceleration (i.e. pedal > 75%.

The HEV_Fuel_Econ_Filter_Param parameter defines the gauge filter parameter for fuel economy. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Fuel_Econ_Alrm_Ty_Param parameter defines the alarm type for the fuel economy warning (continuous, short beeps, long beeps).

The possible settings are:

0 = No alarm (default)

1 = Continuous single tone

2 = One long beep

3 = One short beep

4 = Five short beeps

5 = Repetitive short beeps

6 = Three long beeps

7 = Ten short beeps

The HEV_Fuel_Econ_MaxWL_Gen2 parameter sets the maximum point for the fuel economy application in-gauge warning light. When the fuel economy rises above this set parameter, the warning light in the gauge will illuminate.

The HEV_Fuel_Econ_MinWL_Gen2 parameter sets the minimum point for the fuel economy application in-gauge warning light. When the fuel economy falls below this set parameter, the warning light in the gauge will illuminate.

The HEV_SOC_Filter_Param parameter sets the gauge filter value for the battery state of charge. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The SOC_Alarm_Ty_Param parameter defines the alarm type for the state of charge warning (continuous, short beeps, long beeps).

The possible settings are:

0 = No alarm (default)

1 = Continuous single tone

2 = One long beep

3 = One short beep

4 = Five short beeps

5 = Repetitive short beeps

6 = Three long beeps

7 = Ten short beeps

The HEV_SOC_MaxWL_Gen2 parameter sets the maximum point for the state of charge application in-gauge warning light. When the state of charge value rises above this set parameter, the warning light in the gauge will illuminate.

The HEV_SOC_MinWL_Gen2 parameter sets the minimum point for the state of charge application in-gauge warning light. When the state of charge value falls below this set parameter, the warning light in the gauge will illuminate.

The HEV_Torque_Param parameter sets the gauge filter value for the torque. The higher the number is, the faster the update rate. 255 is the fastest update rate available, and 1 is the slowest update rate available.

The Torque_Alarm_Ty_Param parameter defines the alarm type for the torque warning (continuous, short beeps, long beeps).

The possible settings are:

0 = No alarm (default)

1 = Continuous single tone

2 = One long beep

3 = One short beep

4 = Five short beeps

5 = Repetitive short beeps

6 = Three long beeps

7 = Ten short beeps

The HEV_Torque_MaxWL_Gen2 parameter sets the maximum point for the torque application in-gauge warning light. When the torque value rises above this set parameter, the warning light in the gauge will illuminate.

The HEV_Torque_MinWL_Gen2 parameter sets the minimum point for the torque application in-gauge warning light. When the torque value falls below this set parameter, the warning light in the gauge will illuminate.

Table 189

Parameter	ID	Description	Default	Units	Min	Max	Step
Fuel_Econ_Filter_Heavy_Weight	2733	Weight value for Inst. Fuel Econ heavy filter	10	No_ Units	0	32768	1
Fuel_Econ_Filter_Lite_Weight	2731	Weight low value for Inst. Fuel Econ light filter	32	No_ Units	0	32768	1
HEV_Fuel_Econ_Filter_Param	2581	Gauge filter parameter	20	No_Units	0	255	1
Fuel_Econ_Alrm_Ty_Param	2723	The type of alarm that will occur when the needle reaches a warning area on the gauge	No alarm	List	0	7	1
HEV_Fuel_Econ_MaxWL_Gen2	2585	Gauge warning light threshold parameter	254	No_Units	0	65535	1
HEV_Fuel_Econ_MinWL_Gen2	2584	Gauge warning light threshold parameter	0	No_Units	0	65535	1
HEV_SOC_Filter_Param	2580	Gauge filter parameter	10	No_Units	0	255	1
SOC_Alarm_Ty_Param	2724	The type of alarm that will occur when the needle reaches a warning area on the gauge	No alarm	List	0	7	1
HEV_SOC_MaxWL_Gen2	2582	Gauge warning light threshold parameter	254	No_Units	0	65535	1
HEV_SOC_MinWL_Gen2	2583	Gauge warning light threshold parameter	0	No_Units	0	65535	1
HEV_Torque_Param	2577	Gauge filter parameter	255	No_Units	0	255	1
Torque_Alarm_Ty_Param	2725	The type of alarm that will occur when the needle reaches a warning area on the gauge	No alarm	List	0	7	1
HEV_Torque_MaxWL_Gen2	2579	Gauge warning light threshold parameter	254	No_Units	0	65535	1
HEV_Torque_MinWL_Gen2	2578	Gauge warning light threshold parameter	0	No_Units	0	65535	1

WIRING INFORMATION

The Hybrid Display Module Kit is listed below. The wiring for this kit is the same as the wiring requirements for the Auxiliary Gauge and Switch Pack (AGSP) as found in the circuit diagrams under Cab Accessories Switch Pack Optional Gauge Pack, p. 15.

Table 190

Kit	Part Number
Hybrid Display Module	2604309C91

HOW TO ADD THIS FEATURE

Select software feature 595BBN using the Diamond Logic® software (See Local Dealer).

HYBRID ELECTRIC VEHICLE

HYBRID ELECTRIC VEHICLE

DOME LIGHT, PARK BRAKE SIGNAL, AND SERVICE BRAKE SIGNAL

DOME LIGHT, PARK BRAKE SIGNAL, AND SERVICE BRAKE SIGNAL

The following features are part of the General Electrical System Code (08000) and are documented here for informational purposes only. They are standard features that come with all vehicles.

DOME LIGHT FEATURES

Standard Feature

595AKY

The dome light feature allows for the ability to program the amount of time the dome light stays on after the cab doors have been closed, the initial brightness the dome lights will go to when the cab doors are shut and the ability of “theater dimming” (gradually fading to black instead of immediately turning off).

Dome lamps are controlled by the BC. After the door is shut, the dome lamps stay on for 20 seconds at 80% voltage and a slight dimming of the lamp can be observed. After the 20 seconds, the lamps will dim then go out. The BC can be programmed by the dealer to go out as soon as the door is closed.

The dome circuit is fused internal to the BC at 10 AMP. If the vehicle has courtesy lights, do not exceed five AMPS additional load. If the vehicle does not have courtesy lights, do not exceed eight AMPS additional load.

If additional loads are required, use a relay. If a relay is added, theater dimming must be turned off to prevent relay chatter.

CAUTION: Care must be taken when splicing into the dome lamp circuit. Do not splice into the door switch circuits. The door switch circuits go to the BC and do not function the same as vehicles without a BC.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

595AKY

If the Dome_Light_Dim_Enable parameter is turned on, the dome light theater dimming feature is enabled.

The Dome_Light_Dim_Step_Size parameter sets the percentage that the light will be reduced for each 20-millisecond loop.

The Dome_Light_PWM_Percent_Level parameter is the programmable percentage of maximum voltage that the dome light will be pulling when it is waiting to dim.

The Dome_Light_Wait_Time parameter sets the amount of time, after the door is shut, that the dome light stays at the voltage set by Dome_Light_PWM_Percent_Level before dimming at the rate set by Dome_Light_Dim_Step_Size.

If the current in the dome light circuit falls below the level set by the Dome_Light_Lo_Current parameter, the BC will register a fault code.

If the current in the dome light circuit exceeds the level set by the Dome_Light_Hi_Current parameter, the BC will shut off the circuit and register a fault code.

The Dome_Light_OC_Current parameter should be left at its factory default of zero.

The Dome_Light_Key_Off_Timeout parameter sets the amount of time that the dome light will remain on after the truck is turned off and the door is left open.

DOME LIGHT, PARK BRAKE SIGNAL, AND SERVICE BRAKE SIGNAL

Table 191

Parameter	ID	Description	Default	Units	Min	Max	Step
Dome_ Light_Dim_ Enable	177	Enable/disable dome light theater dimming. A value of 1 enables, and a value of 0 disables the dimming feature.	1	No_ Units	NA	NA	NA
Dome_ Light_Dim_ Step_Size	178	The size (in percentages) that the dome light_ req should be stepped down each loop	1	Percent	1	10	1
Dome_Light_P WM_Percent_ Level	179	The level at which the dome light should be set while it is waiting to dim	80	Percent	10	100	5
Dome_Light_ Wait_Time	182	This is the amount of time the dome light should wait before dimming.	20	s	1	655	1
Dome_Light_ Lo_Current	1895	Dome Light Low Current Detection Level (AMPS)	0	A	0	10	0.1
Dome_Light_ Hi_Current	1896	Dome Light High Current Detection Level (AMPS)	10	A	0	10	0.1
Dome_Light_ OC_Current	1897	Dome Light Open Circuit Detection Level (AMPS)	0	A	0	10	0.1
Dome_Light_ Key_Off_ Timeout	2213	The amount of time that the dome light will remain on after the truck is turned off and the door is left open	10	min	1	120	1

PARK BRAKE APPLIED BC CONNECTIONS

Navistar provides a location to obtain a “Park Brake Applied” status signal.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

595ANR

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

There are no programmable parameters for this feature.

Pin F1 of connector #1601 is switched to 12V when the park brake is applied. This pin is rated for a maximum load current of 0.5 AMP. This pin can be connected to a relay coil to activate a relay for park brake interlock. To use the pin, remove cavity plug from connector and insert a wire and terminal.

BRAKE APPLIED BC CONNECTIONS

International® provides a location to obtain a “Brake Applied” status signal.

CAUTION: CAUTION – If a stop lamp circuit is required, do not splice into the circuits that go to the brake switches (air or hydraulic). Circuits that come from the low current, brake switches must not be altered. Any attempt to alter will result in system trouble.

SOFTWARE FEATURE CODES/PROGRAMMABLE PARAMETERS

SOFTWARE FEATURE CODES THAT MUST BE ADDED

595ABC

SOFTWARE FEATURE CODES THAT MUST BE REMOVED

None

There are no programmable parameters for this feature.

DOME LIGHT, PARK BRAKE SIGNAL, AND SERVICE BRAKE SIGNAL

If sales codes 08HAB, 08HAE, or 08HAU were not ordered, you will need to pin into the body controller to gain access to this signal. A relay will have to be added to provide the required voltage and current. See features 08HAB, 08HAE, or 08HAU in Section 13 of this book.

Pin F15 of connector #1601 is switched to 12V when the service brake is applied. This pin is rated for a maximum load current of 0.5 AMP. This pin can be connected to a relay coil to activate a relay for park brake interlock. To use the pin, remove cavity plug from connector and insert a wire and terminal.

DOME LIGHT, PARK BRAKE SIGNAL, AND SERVICE BRAKE SIGNAL

CROSS REFERENCE

This section has been added to assist you in cross referencing software feature codes from pre–2007 and post–2007 model years. It is presented in two ways, the first is sorted by the pre–2007 software feature code and the second is sorted on the post–2007 feature code.

Table 195 – 595 Feature Codes Sorted by Pre-2007 Feature Code Number

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
514011	595ANL	ESC PROG, RR AXLE 'Shift Control W/AUTO TRANS
595006	None	ESC PROG, AIR SOLENOID CONTROLLED/SWITCH
595007	595AEP	ESC PROG, AIR PRESSURE W/AIR COMPRESSOR
595008	595ABB	ESC PROG, AIR PRESSURE GAUGE/AIR BRAKE
595009	595ABV	ESC PROG, AIR ABS WARN LIGHT & FULL POWER BRAKES, NOT TRAILER
595010	None	ESC PROG, HYD ABS WARN LIGHT NOT TRAILER
595011	595ACB	ESC PROG, TRACTION WARN LIGHT NOT TRAILER
595012	595ABW	ESC PROG TRAILER ABS W/LIGHT
595013	None	Not Required or Implemented for 2007 BC
595014	595AAZ	ESC PROG, PARK BRAKES W/IND LIGHT
595015	595AAD	ESC PROG, BRAKE SWITCH
595016	595AGC	ESC PROG, ENGINE EXHAUST BRAKE
595017	595ANE	ESC PROG, ENGINE COMPRESSION BRAKE
595018	595ALB	ESC PROG, HEADLIGHTS DAY/RUN
595019	595AMS 595AMT 595ACE	ESC PROG, FOG LIGHT ACCOM PACKAGE
595020	None	Not Required or Implemented for 2007 BC ESC PROG, PARKING/MARKER
595021	595AAL	ESC PROG, TURN SIGNALS/BRAKE
595022	595ALD	ESC PROG, AIR HORN W/ OR WITHOUT SWITCH
595023	595AAV	ESC PROG, ELECTRIC HORN CITY
595024	595AKY	ESC PROG, DOME LIGHT W/DIM
595025	None	Not Required or Implemented for 2007 BC ESC PROG, WORK LIGHT W/TIMER/KEYLESS ENTRY
595026	None	Not Required or Implemented for 2007 BC ESC PROG, CRUISE CONTROL IND LIGHT
595027	None	Not Required or Implemented for 2007 BC ESC PROG, DIAGNOSTICS
595028	None	Not Required or Implemented for 2007 BC ESC PROG, VIRTUAL FUSE LEVELS FOR OMITTED ITEMS
595029	None	Not Required or Implemented for 2007 BC ESC PROG, WINDSHIELD WIPER
595030	595ABC	ESC PROG, TRAILER MARKER LIGHTING
595031	595AAC	ESC PROG, IGNITION KEY
595032	595AHE	ESC PROG, REMOTE POWER MODULE #1
595033	595ACY	ESC PROG, FIFTH WHEEL SLIDE
595034	595AHA	ESC PROG, REMOTE ENGINE SPEED CONTROL
595035	None	Not Required or Implemented for 2007 BC ESC PROG, TRANSMISSION PTO
595036	None	Not Required or Implemented for 2007 BC ESC PROG, TRANSMISSION RETARDER
595037	595ADP	ESC PROG, CLUTCH SWITCH
595038	595AYP	ESC PROG, AUTO NEUTRAL
595039	595ALN	ESC PROG, REAR AXLE SHIFT CONTROL
595040	595ACU	ESC PROG, DIFFERENTIAL LOCK
595041	595ACZ	ESC PROG, POWER DIVIDER LOCK
595042	None	Not Required or Implemented for 2007 BC ESC PROG, AIR SUSPENSION DUMP
595043		ESC PROG. FUEL FILTER PLUGGED W/LIGHT

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595044		ESC PROG, WATER IN FUEL WARNING LIGHT
595045	None	Not Required or Implemented for 2007 BC ESC PROG, HEATED MIRRORS
595046	None	Not Required or Implemented for 2007 BC ELECTRICAL SYSTEM CONTROLLER, INFINEON
595047	595ALE	ESC PROG, POWER WINDOW & DOOR LOCKS 1 Door
595048	595AYD	ESC PROG, LOW WASHER FLUID W/LIGHT
595049	None	Not Required or Implemented for 2007 BC ESC PROG, ELECT PARAM DEFAULT SETTINGS
595050	None	Not Required or Implemented for 2007 BC ESC PROG, REFRIDGERANT CONTROL HVAC
595051	595ACW	ESC PROG, ENGINE FAN OVERRIDE
595052	595ABD	ESC PROG, SINGLE FUEL TANK
595054	None	Not Required or Implemented for 2007 BC ESC PROG, DUAL FUEL TANKS W/SINGLE ENABLED PUMP
595057	None	Not Required or Implemented for 2007 BC
595058	None	Not Required or Implemented for 2007 BC
595059	None	Not Required or Implemented for 2007 BC
595060	595ADZ	ESC PROG, XMSM OIL TEMP GAUGE FOR AUTOMATIC TRANSMISSION
595061	595ABP	ESC PROG, VOLTMETER
595063	595ABA	ESC PROG, SEATBELT INDICATOR
595064	None	Not Required or Implemented for 2007 BC
595065	None	Not Required or Implemented for 2007 BC
595066	595ABL	ESC PROG, ENGINE OIL PRESS GAUGE
595067	595ABK	ESC PROG, ENGINE COOLANT TEMP
595068	None	Not Required or Implemented for 2007 BC ESC PROG, BATTERY FEED FUSE DETECTION
595069	595ABN	ESC PROG, VEHICLE SPEED GAUGE
595070	None	Not Required or Implemented for 2007 BC ESC PROG, ENGINE SPEED GAUGE
595071	None	Not Required or Implemented for 2007 BC ESC PROG, TURBO BOOST
595072	None	Not Required or Implemented for 2007 BC
595073	None	Not Required or Implemented for 2007 BC
595074	None	Not Required or Implemented for 2007 BC
595075	595ANP	ESC PROG, BRAKE APPL GAUGE IN EGC/AGSP
595076	None	Not Required or Implemented for 2007 BC ESC PROG, TURBO BOOST
595077	None	Not Required or Implemented for 2007 BC ESC PROG, FUEL PRESS GAUGE
595078	None	Not Required or Implemented for 2007 BC
595079	None	Not Required or Implemented for 2007 BC T/R DATA, WARNING LIGHTS
595080	None	Not Required or Implemented for 2007 BC ESC PROG, AIR SOLENOID POWER
595081	None	Not Required or Implemented for 2007 BC ESC PROG, TRANS WARN LIGHT LCT
595082	None	Not Required or Implemented for 2007 BC ESC PROG, TRANS WARN LIGHT WTEC
595083	595AAP	ESC PROG, CRUISE 'CONTROL SWITCH STATE
595084	None	Not Required or Implemented for 2007 BC ESC PROG, ENGINE FAN REQUEST
595085	None	Not Required or Implemented for 2007 BC ESC PROG, GAUGE CLUSTER ALARM HANDLER
595086	595AYA	ESC PROG, DUAL REAR AXLE TEMP GAUGE
595087	595AYB	EESC PROG, SINGLE REAR AXLE TEMP GAUGE
595088	None	Not Required or Implemented for 2007 BC ESC PROG, PTO ENGAGED IND LIGHT
595089	None	Not Required or Implemented for 2007 BC ESC PROG, RANGE INHIBITED LCT WARN LT

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595090	None	Not Required or Implemented for 2007 BC ESC PROG, RANGE WARN LIGHT WTEC
595091	595ANG	ESC PROG, RETARD OVER HEAT WARN Light
595092	595ALX	ESC PROG, WAIT TO START IND LIGHT
595093	595AYK	ESC PROG, FRONT AIR ASSIST SUSPENSION
595094	None	Not Required or Implemented for 2007 BC ESC PROG, AUTO ENGINE SHUTDOWN/OVERRIDE
595095	None	Not Required or Implemented for 2007 BC ESC PROG, ENGINE STATE
595096	None	Not Required or Implemented for 2007 BC ESC PROG, DASH MTG PRO FOR CUSTOMER
595097	595ADX	ESC PROG, OIL TEMP GAUGE ENGINE
595098	None	Not Required or Implemented for 2007 BC ESC PROG, PRESSURE GOVERNOR FIRE TRUCK
595099	595AMV 595AMW 595AYY	BC PROG, SNOW PLOW LIGHTS Push Button Location A BC PROG, SNOW PLOW LIGHTS Push Button Location B ESC PROG, SNOW PLOW LIGHTS
595100	595ADK	ESC PROG, AIR SHIELD LIGHT
595101	None	Not Required or Implemented for 2007 BC
595102	None	Not Required or Implemented for 2007 BC ESC PROG, CRUISE/RESCM OUTPUT HANDLER
595103	None	ESC PROG, HARDWARE CONFIG DATA MD ONLY
595104	None	Not Required or Implemented for 2007 BC ESC PROG, NETWORK CONFIG DATA MD ONLY
595105	595AYS	ESC PROG, IP CONFIG MD ONLY
595106	595AAK	ESC PROG, OMIT DAYTIME RUNNING LIGHTS
595107	595ABY	ESC PROG, POWER WINDOWS & LOCKS, 2 Doors
595108	595AEJ	ESC PROG, POWER WINDOWS & LOCKS, 4 Doors
595109	None	Not Required or Implemented for 2007 BC
595110	595ANN	ESC PROG, STOP RELAY Active With Brake Lights
595111	595ANB	ESC PROG, MARKER INTERRUPT SW Located in Switch Pack
595112	595ADR	T/R DATA, NO PRNDL
595113	595AEL	T/R DATA, PRNDL w/LCT 5 SPD With Park Pawl & Shifter Interlock for MD Only
595114	595AET	T/R DATA, PRNDL w/5 Speed NO/Power PK/PAWL
595115	595AEV	T/R DATA, PRNDL LCT 5 Speed W/Power Park
595116	595AEU	T/R DATA W/WTEC 5 & 6 Speed
595117	None	Not Required or Implemented for 2007 BC T/R DATA, PRNDL EATON TRANS DISPLAY
595118	595ALV	ESC PROG, HEATER DIAGNOSTICS
595119	595AHB	ESC PROG, REMOTE POWER MOD #4
595120	595AHC	ESC PROG, REMOTE POWER MOD #7
595121	595AHD	ESC PROG, REMOTE POWER MOD #2 BOC
595122	595AHG	ESC PROG, SINGLE SPD XFER CASE W/PROTECT
595123	None	Not Required or Implemented for 2007 BC ESC PROG, XFER CASE FOR 4X4
595124	None	Not Required or Implemented for 2007 BC ESC PROG, XFER CASE FOR 6X6
595125	595ALK	ESC PROG, AUXILIARY TRANS
595126	595ABH	T/R DATA, ENGINE TYPE Caterpillar
595127	595ABJ	T/R DATA, ENGINE TYPE Cummins
595128	None	Not Required or Implemented for 2007 BC
595129	595ABZ	ESC PROG, KEYLESS ENTRY REMOTE
595130	595ABG	T/R DATA, ENGINE TYPE International®
595131	None	Not Required or Implemented for 2007 BC
595132	None	Not Required or Implemented for 2007 BC
595133	None	Not Required or Implemented for 2007 BC
595134	None	Not Required or Implemented for 2007 BC
595135	None	Not Required or Implemented for 2007 BC
595136	None	Not Required or Implemented for 2007 BC
595137	595AHW	ESC PROG, HAZARD LT OVERRIDE BRAKES LT

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595138	None	Not Required or Implemented for 2007 BC
595139	None	Not Required or Implemented for 2007 BC
595140	None	Not Required or Implemented for 2007 BC
595141	None	Not Required or Implemented for 2007 BC
595142	None	Not Required or Implemented for 2007 BC
595143	595ADN	T/R DATA, METRIC GAUGE
595144	None	Not Required or Implemented for 2007 BC ESC PROG, HYDROMAX MODULE ALARM
595145	595AEW	ESC PROG, TRANS OIL TEMP GAUGE MANUAL
595146	595AEZ	ESC PROG, AMMETER GAUGE 150 AMP
595147	None	Not Required or Implemented for 2007 BC ESC PROG, TRANS WARN LIGHT LCT & WTEC
595148	None	ESC PROG, RANGE INHIBITED LCT & WTEC
595149	None	Not Required or Implemented for 2007 BC
595150	595ANP	ESC PROG, BRAKE APPLICATION GAUGE W/AIR BRAKE
595151	595AMY	ESC PROG, SWITCHED ACCESSORY LOAD
595152	None	Not Required or Implemented for 2007 BC ESC PROG, LOAD INDICATION GAUGE
595153	595AAW	ESC PROG, LOW ENGINE COOLANT LEVEL WARNING LAMP
595154	None	Not Required or Implemented for 2007 BC ELECTRICAL SYSTEM CONTROLLER, HITACH
595157	595ALY	ESC PROG, HUMPHREY DRAIN VALVES
595158	595AHL	ESC PROG, 6X6 AND 4X4 TRANSFER CASES
595159	595ALZ	ESC PROG, PRNDL Interlock for Column Shifter
595160	595AHK	ESC PROG, 2-SPD AXLE Parameter for MEXICO EXPORT, AND DOMESTIC Manuals
595161	595AHT	ESC PROG, FOG LIGHTS – OMIT LAMPS
595162	595ALW	ESC PROG, OMIT STOP AND REAR TAIL LOW CURRENT AND OPEN CIRCUIT DIAGNOSTICS
595163	595ADV	ESC PROG, PDL BUZZER
595164	595AEK	ESC PROG, TRACTION CONTROL {Wabco} With Traction Warning Light, for Full Power Hydraulic Brake or Air Brakes, Not Including Trailer
595166	595ALC	ESC PROG, 2-SPD AXLE W/XMNSN IN NEUTRAL: & W/BRAKE PEDAL & 0 SPEED
595167	595ANM	ESC PROG, ENGINE DISPLAY for HDD Engines
595168	595AJE	ESC PROG, OMIT WORK LHT DIAGNOSTICS
595169	None	Not Required or Implemented for 2007 BC ESC PROG, AIR POWERED PARK BRAKE, FOR HYDRAULIC
595170	595AJT	(TEM) ESC PROG, PTO MONITOR With Indicator and Alarm
595171	595AJV	(TEM) ESC PROG, PTO SHIFT With Lectra Shift Control
595172	595AKJ	(TEM) ESC PROG, EXTERNAL ENGINE SPEED CONT'ROL With single external control
595173	595AJK	(TEM) ESC PROG, AUXILIARY LOAD (1) With Single Latched Switches
595174	595AJL	(TEM) ESC PROG, AUXILIARY LOAD (2) With Single Latched Switches
595175	595AJM	(TEM) ESC PROG, AUXILIARY LOAD (3) With Single Latched Switches
595176	None	(TEM) ESC PROG, INTERLOCKED AUX LOAD #1 WITH SINGLE LATCHED SWITCH
595177	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, INTERLOCKED AUX LOAD #2 WITH SINGLE LATCHED SWITCH
595178	595AKA	(TEM) ESC PROG, DUAL OUTPUT AUX #1 With Single Latched Switch
595179	595AJZ	(TEM) ESC PROG, PTO LOGIC With Dash Switch and engagement/disengagement logic
595180	595ALR	ESC PROG, FULL POWER HYDRAULIC BRAKES
595181	595AKB	(TEM) ESC PROG, INTERLOCK AUXILIARY LOAD #1 with rocker switch and <30 MPH Interlock
595182	595AKC	(TEM) ESC PROG, INTERLOCK AUXILIARY LOAD #2 with rocker switch and < 30 MPH Interlock
595183	595AJN	(TEM) ESC PROG, AUXILIARY LOAD (4) With single latched switch
595184	595AHJ	ESC PROG, HARDWIRED TRANSMISSION RETARDER
595185	595AAX	ESC PROG, PTO, SWITCH, ENGINE
595186	595ALS	ESC PROG, FULL POWERED PARK BRAKE W/FULL POWERED BRAKES, HYDRAULIC
595187	None	Not Required or Implemented for 2007 BC ESC PROG, ECONOMY MODE LT W/LCT TRANS
595188	595AAH	ESC PROG, LIGHTS ON W/WIPERS

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595189	595AJP	(TEM) ESC PROG, AUXILIARY LOAD (5) With single latched switch
595190	595AJR	(TEM) ESC PROG, AUXILIARY LOAD (6)With single latched switch
595192	595ABE	ESC PROG, DUAL FUEL TANKS W/RELAY DRIVEN PUMP
595193	595AJW	(TEM) ESC PROG, PTO SHIFT for Hydraulic Clutch engagement mechanism
595194	None	(TEM) ESC PROG, INTERLOCKED AUX LOAD #3 With single latched switch
595195	None	(TEM) ESC PROG, INTERLOCKED AUX LOAD #4 With single latched switch
595196	595AKM	(TEM) ESC PROG, EXTERNAL ENGINE SPEED CONTROL for combined Emergency Power Output and Utility Application
595197	595AMD	(TEM) ESC PROG, WARNING LIGHT TAILGATE Open for TCM
595198	595AKP	(TEM) ESC PROG, IN-CAB ALARM externally controlled
595199	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, PTO DISENGAGE (kill switch with external switch accommodation)
595200	595AKD	(TEM) ESC PROG, DUALLY CONTROLLED AUX LOAD (1) with internal switches and external switch accommodations
595201	595AKR	(TEM) ESC PROG, AERIAL BOOM WARNING Light and Buzzer
595202	595AKS	(TEM) ESC PROG, OUTRIGGER WARNING Light and Buzzer
595203	595AHU	(TEM) ESC PROG, ELECTRIC TRAILER BRAKE Accommodation and ESC Input and Light Control
595204	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, SPECIAL ENGINE AUTO RAMPING WITH PTO ENGAGED
595206	595AHM	ESC PROG, VANDAL LOCK WARNING
595207	None	ESC PROG, PTO SWITCH CRUISE ENABLE, engine speed control feature
595208	595AER	ESC PROG, ENGINE SPEED GAUGE 4000 RPM
595209	None	(BUS) ESC PROG, HARDWIRE CONFIG DATA - PT
595210	595AGB	(BUS) ESC PROG, EMERGENCY EXIT BUZZER
595212	595AEX	(BUS) ESC PROG, CROSSING GATE DISABLE Switch
595213	595AGL	(BUS) ESC PROG, POST TRIP INSPECTION
595214	595AGP	(BUS) ESC PROG, PUPIL WARNING LIGHTS, Steering Wheel Mounted (Sequential)
595215	595AGR	(BUS) ESC PROG, PUPIL WARNING LIGHTS, Steering Wheel Mounted (Non-Sequential)
595218	595AGS	(BUS) ESC PROG, PUPIL WARNING LIGHTS, Panel Mounted Switch, (Non-Sequential)
595219	595AMN	(BUS) ESC PROG, RED PUPIL WARNING LIGHT OVERRIDE Switch
595220	None	Not Required or Implemented for 2007 BC
595221	595AHN	(BUS) ESC PROG, WHEELCHAIR LIFT INTERLOCK With Indicator Light in Cluster
595222	None	Not Required or Implemented for 2007 BC
595223	595AKX	(BUS) ESC PROG, CRUISE/THROTTLE Switches in the 6 Switch Pack
595224	595ALU	(BUS) ESC PROG, FOG LIGHTS Bus Only
595225	595AGT	(BUS) ESC PROG, PUPIL WARNING LIGHTS, Panel Mounted Switch, (Sequential)
595227	595AYT	(BUS) ESC PROG, IP CONFIGURATION DATA – PT
595228	595AEV	(BUS) T/R DATA PROG, PRNDL W/LCT 5-SPD W/PWR PK
595229	None	Not Required or Implemented for 2007 BC (BUS) ESC PROG, COMBINATION STOP TURN SIGNAL/BRAKE
595230	595AMA	(BUS) ESC PROG, HAZARD LIGHTS “ON” With Pupil Warning Lights
595231	595AZX	(BUS) ESC PROG, TEM ENABLERS
595232	595AAA	ELECTRICAL SYSTEM CONTROLLER, HITACHI ESC2
595233	None	Not Required or Implemented for 2007 BC ESC PROG, WATER IN FUEL LIGHT, ESC2
595234	None	Not Required or Implemented for 2007 BC ESC PROG, BATTERY FEED FUSE DETECTION, ESC2
595235	None	Not Required or Implemented for 2007 BC ESC PROG, HYDRAULIC BRAKE SPLIT Hydro-Max, ESC2
595238	595AKE	(TEM) ESC PROG, DUALLY CONTROLLED AUX LOAD (2) with internal switches and external switch accommodations
595239	595AKG	(TEM) ESC PROG, DUALLY CONTROLLED AUX LOAD (3) with internal switches and external switch accommodations
595240	595AKL	(TEM) ESC PROG, EXTERNAL ENGINE SPEED CONTROL For Utility Application
595241	595AKK	(TEM) ESC PROG, EXTERNAL ENGINE SPEED CONTROL for Utility application for on-Demand Engine Speed

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595242	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, SPECIAL AERIAL PKG, for Aerial Device position and warning system
595243	None	Not Required or Implemented for 2007 BC
595244	595AJY	(TEM) ESC PROG, PTO SHIFT for electric over air clutched engagement mechanism
595245	595AKW	(TEM) ESC PROG, REMOTE START/STOP Without Emergency Pump Motor Functionality
595246	595AKV	(TEM) ESC PROG, REMOTE START/STOP With Emergency Pump Motor Functionality
595247	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, SPECIAL REMOTE WARNING, for use with a remote filter clogged warning light
595248	595AJU	(TEM) ESC PROG, PTO HOURMETER ENABLE
595249	595AMP 595AMR	ESC PROG, HEATED MIRRORS
595250	595ABR	ESC PROG, WORK LIGHT W/TIMER & KEYLESS ENTRY
595251	595AZZ	BC PROG, PARK/MARKER LIGHTS Dual Output, 20 AMP ESC PROG, PARKING/MARKER W/15AMP FUSE
595252	595AJX	(TEM) ESC PROG, PTO SHIFT for electric over air non-clutched engagement mechanism
595253	595AYC	ESC PROG, WINDSHIELD WIPER ESC2
595254	595ADW	ESC PROG, ENG OIL TEMP GAUGE W/DISCRETE INPUT
595255	595AMC	(TEM) ESC PROG, WARNING LIGHT TAILGATE OPEN for Manual Transmission
595256	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, PTO TEMPORARY DISABLE accommodation
595259	595AHX	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally closed solenoid (qty 1)
595260	595AHY	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally closed solenoid (qty 2)
595261	595AHZ	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally closed solenoid (qty 3)
595262	595AJA	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally closed solenoid (qty 4)
595263	595AKN	(TEM) ESC PROG, EXTERNAL ENGINE SPEED CONTROL for Refuse application for on-demand engine speed
595265	595AJH	(TEM) ESC PROG, High Current Load relay output
595266	595AYN	(TEM) ESC PROG, PTO MONITOR with Indicator and ESC input
595267	595AMZ	(TEM) ESC PROG, PTO SHIFT for electric over air clutched mechanism with included solenoid
595269	595ALA	(TEM) ESC PROG, XFER CASE With Neutral Gear, for 6X6 or 4X4
595270	595AGU	(BUS) ESC PROG, PUPIL WARNING LIGHTS, Panel Mounted Switch, With Override “RED” Light
595271	595AGE	(BUS) ESC PROG, DOOR CONTROL Steering Wheel Mounted
595272	595AGG	(BUS ESC PROG, DOOR CONTROL, Panel Mounted
595273	595ACA	ESC PROG, SUSPENSION DUMP, DUAL SOLENOIDS
595274	595AHH	ESC PROG, XFER CASE PTO Accommodation with 4X4 or 6X6 Transfer Case With Neutral Gear
595275	595ALG	(BUS) ESC PROG, DAYTIME RUNNING LIGHT
595276	595AEY	(BUS) ESC PROG, CROSSING GATE DISABLE, Stop Arm Inhibit
595277	595AJS	(TEM) ESC PROG, ADD AUX LOAD (6) Additional Rocker Switches (same as 595243)
595278	595AME	(BUS) ESC PROG, AIR PRESSURE GAUGES Primary & Secondary, for Air Brake Chassis
595279	595AMG	(BUS) ESC PROG, AIR PRESSURE GAUGES for Hydraulic Chassis With Air Compressor
595280	None	Not Required or Implemented for 2007 BC ELECTRICAL SYSTEM CONTROLLER, Hitachi ESC2, FOR BUS
595281	None	Not Required or Implemented for 2007 BC ESC PROG, REAR AXLE SHIFT CONTROL Zero Solenoid Count
595282	595AJG	ESC PROG, REMOTE POWER MOD #4 Mounted At End of Frame; max. 20 amps per Channel; Max 80 amp Total (Includes 1 Switch Pack With 6 Latched Switches)
595283	595AKH	ESC PROG, I/O EXPANSION Harness (for Diamond Logic® Builder) Provides 2 Digital Inputs & 2 Relay Driver Outputs
595284	595ALJ	ESC PROG, SPECIAL FUEL WARNING SINGLE TANK Low Fuel Warning Light and Audible Alarm Activated Separately so Warning Light is Activated Prior to Audible Alarm
595285	595ALH	(BUS) ESC PROG, DAYTIME RUNNING LIGHT Non-Programmable

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595286	595AGV	(BUS) ESC PROG, PUPIL WARNING LIGHTS Panel Mounted Switch, (Non-Sequential), Manual Activated Stop Arm and Crossing Gate With Alarm
595287	595AYL	(BUS) PROG, THROTTLE Without Cruise Control, in the Switch Packs
595288	595AJD	ESC PROG, WIPERS W/SPEED OVERRIDE for ESC2
595289	None	ESC PROG, WIPERS W/SPEED OVERRIDE FOR ESC1
595291	595AGK	ESC PROG, FUEL FILTER PLUGGED W/LIGHT/I6 ENG
595292	595AMB	(BUS) ESC PROG, SEPARATE STOP TURN SIGNAL/BRAKE
595293	595AGN 595AYM	ESC PROG, LIFT GATE WIRING PACKGE
595295	595AGM	ESC PROG, WATER IN FUEL LIGHT With J1939, for 2004 International® I6 Engines
595296	595AZY	ESC PROG, PRE-TRIP, ALL EXTERIOR LAMPS “”
595297	595AKZ	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally open solenoids (qty 5)
595298	595AJJ	(TEM) ESC PROG, IP CLUSTER DISPLAY Omit Display of Fault Codes in Instrument Cluster, Requires Service Tool to Retrieve and View Fault Codes
595299	595AKT	(TEM) ESC PROG, WARN TAILGATE OPEN Dump Box Application
595300	595AJC	(TEM) ESC PROG, UNIVERSAL AIR SOLENOID using normally open solenoids (qty 6)
595301	595AKU	(TEM) ESC PROG, WARN DUMP BODY UP Application
595302	None	Not Required or Implemented for 2007 BC (BUS) ESC PROG, BUS FMVSS VALIDATION
595303	None	Not Required or Implemented for 2007 BC (BUS) ESC PROG, BUS ABS FMVSS VALIDATION
595304	None	Not Required or Implemented for 2007 BC (BUS) ESC PROG, BUS PWL FMVSS VALIDATION
595306	595AEH	(BUS) ESC PROG, EXTERIOR LIGHT CHECK with Rocker Switch Activation
595307	595AGH	(BUS) ESC PROG, Redundant Door Controls
595308	595AGJ	(BUS) ESC PROG, Manual Door
595309	None	Not Required or Implemented for 2007 BC ESC PROG, AXLE, LIFT, CONTROLS for Automated and Manual Controls
595310	None	Not Required or Implemented for 2007 BC ELECTRICAL SYSTEM CONTROLLER, NVM, FOR BUS
595311	None	Not Required or Implemented for 2007 BC ELECCTRICAL SYSTEM CONTROLLER, NVM, FOR TRUCK
595312	595AGW	(BUS) ESC PROG, PUPIL WARNING – Steering Wheel Mounted (SEQUENTIAL WHERE DOOR CLOSED EXTINGUISHES RED PWL MODE)
595313	595AGX	(BUS) ESC PROG, PUPIL WARNING – SEQUENTIAL FLASHERS VARIATION WITH A THREE POSITION ROTARY DOOR SWITCH
595314	595AAH	ESC PROG, HEADLIGHTS ON W/WIPERS
595315	595AGA	(BUS) ESC PROG, Red Always Hot Override With Exit Buzzer
595316	595ANK	ESC PROG, VORAD ENGINE DISPLAY
595317	595AEL	(BUS) T/R DATA , PRNDL W/LCT 5-SPD With Park Pawl & Shifter Interlock
595318	595AGY	(BUS) ESC PROG, PUPIL WARNING LIGHTS Steering Wheel Mounted Switch, (Sequential) With Illinois Master Switch (SEQUENTIAL)
595319	595AGZ	(BUS) ESC PROG, PUPIL WARNING LIGHTS Steering Wheel Mounted Switch, With Illinois Master Switch (SEQUENTIAL WHERE DOOR CLOSED EXTINGUISHES RED PWL MODE)
595320	None	Not Required or Implemented for 2007 BC (BUS) ESC PROG, HARDWARE CONFIG DATA – PT with Extra Advanced Logic Outputs
595321	595AYY	ESC PROG, PLOW LIGHTS compatible w/ Fog Lights
595322	595AMX	(BUS) ESC PROG, IDLE SYSTEM, ENGINE RAMP With Low Battery
595323	595AHP	(BUS) ESC PROG, WHEELCHAIR LIFT INTERLOCK W/XMSN IN PARK ONLY
595324	595AMH	(BUS) T/R DATA, PRNDL W/LCT 5-SPD W/PWR PK W/LIFT DOOR SWITCH
595325	595AMJ	(BUS) T/R DATA, PRNDL W/LCT 5-SPD With Park Pawl and Shifter Interlock With Lift Door Switch
595326	595AHR	(BUS) ESC PROG, WHEELCHAIR LIFT INTERLOCK W/XMSN IN PARK ONLY W/O INDICATOR
595327	595AHS	(BUS) ESC PROG, WHEELCHAIR LIFT INTERLOCK W/O INDICATOR
595328	595AZV	ESC PROG, PARK BRAKE ALARM
595329	None	Not Required or Implemented for 2007 BC ESC PROG, IDLE WARNING SHUTDOWN IND LIGHT
595330	595AMM	ESC PROG, TRANSMISSION WARN IND for LCT AND WTEC
595331	595AND	ESC PROG, ECONOMY MODE LIGHT

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595332	595ANC	ESC PROG, RANGE INHIBITED WARN Light, for LCT and WTEC XMSNs, Allison Gen 4 XMSNs
595333	595AZU	ESC PROG, INVERTER ON In Cab Multiplex Switch enables 3kw Inverter
595334	595AYU	ESC PROG, THEFT DETERRENT SYSTEM
595335	None	Not Required or Implemented for 2007 BC ESC PROG, AUXILLIARY IGNITION, 1 AMP
595336	595ADL	ESC PROG, REFRIDGERANT CONTROL, HVAC W/LIGHT IN LOWER CLUSTER
595337	595AZS	(BUS) ESC PROG, DLB PWL AND TURN SIGNAL GATEWAYS, w/engineering read/write access
595338	595AZM	(BUS) ESC PROG, POST TRIP INSPECTION With Snooze
595339	595ANA	ESC PROG, ENGINE RAMP With A/C on, BUS
595341	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, EXTERNAL ENGINE SPEED CONTROL for UTILITY application for on-demand engine speed
595342	None	Not Required or Implemented for 2007 BC (TEM) ESC PROG, SPECIAL AERIAL PKG, for Aerial Device position and warning system
595343	595AZN	ESC PROG, POST TRIP INSPECTION for Child Reminder System
595344	595ANY	ESC PROG, INTERLOCK WHEELCHAIR Less Indicator Light in Cluster, for Cutaway Bus Chassis
595345	595AZR	ESC PROG, DUAL A/C COMPRESSOR ACCOMMODATION; for Low Speed Acceleration Disable for Aftermarket A/C System
595346	595AZW	ESC PROG, SPECIAL FUEL WARNING SINGLE TANK; Low Fuel Warning Light and Audible Alarm Activated Separately so Warning Light is Activated Prior to Audible Alarm; Gauge shows full at 7/8 Capacity
595347	None	Not Required or Implemented for 2007 BC ESC PROG, TURN SIGNAL/BRAKE WITH BULB OUT DETECTION
595348	595AYV	ESC PROG, XFER CASE STATUS GEN 4 ALLISON
595349	None	Not Required or Implemented for 2007 BC ESC PROG, IND LIGHT AIR BRAKE PRESSURE FAILURE
595350	None	Not Required or Implemented for 2007 BC ESC PROG, TRACTION CONTROL IND (Wabco) WITH TRACTION WARNING LIGHT, FOR FULL POWER HYDRAULIC BRAKE, AIR BRAKE SYSTEM, NOT INCLUDING TRAILER
595351	595AZJ	ESC PROG, MAX SPEED PARAMETER; Set at 80 mph, With Bus Models with Steering Wheel Control Pupil Warning lights.
595352	None	Not Required or Implemented for 2007 BC ESC PROG, TRACTION CONTROL (Wabco ATC ENABLE/DISABLE) With Traction Warning Light, for Full Power Hydraulic
595353	None	Not Required or Implemented for 2007 BC ESC PROG, TRACTION CONTROL (Bendix ATC OFF ROAD) With Traction Control Warning Light & Switch, for Air Brake Systems Only, Not Including Trailers
595354	None	Not Required or Implemented for 2007 BC ESC PROG, WORK LIGHT Includes Keyless Entry and Timer Function Effects, (2) Default Switch Located in Center Panel
None	595ADA	BC PROG, BRAKE APPL GAUGE IN Prostar Secondary Gauge Cluster
None	595ADB	BC PROG, TRAILER AUX CIRCUIT Accessory Powered
None	595ADC	BC PROG, TRAILER AUX CIRCUIT Battery Powered
None	595ADD	BC PROG, TRANSMISSION PTO Single
None	595ADG	BC PROG, FUEL HEATER Will be Activated by BC
None	595ADH	BC PROG, COMPASS DISPLAY
None	595ADS	BC PROG, PRNDL Gear Display Eaton
None	595ADT	BC PROG, PRNDL Gear Display Freedomline
None	595ADU	BC PROG, INTERIOR FLOOR LIGHTS in Cab
None	595AEA	BC PROG, ROLL STABILITY PROG
None	595AEB	BC PROG, TRANSMISSION PTO Dual PTO
None	595AEC	BC PROG, ELECT LOAD W/ICON SYS
None	595AED	BC PROG, BRAKE WARN INDICATOR Light and Audible Alarm; Parking Brake/Motion Warning System for Engaged Parking Brake
None	595AEE	BC PROG, COLLISION AVOIDANCE Requires Input From the Right Turn Signal.

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595AEG	BC PROG, SKIRT LIGHTS Customer Supplied
None	595AES	BC PROG, EXTERIOR LIGHT CHECK for MD, RH & SS
None	595BAA	BC PROG, AIR POWER HYD PARK
None	595BAB	BC PROG, ENGINE FAN DRIVE {Borg-Warner} Variable Speed
None	595BAC	BC PROG, PRNDL With 1000/2000 5 Speed Transmission With Power Park & Arens Shifter
None	595AAE	BC PROG, WINDSHIELD WIPER
None	595AAG	BC PROG, HEADLIGHTS W/DRL With Auto
None	595AAJ	BC PROG, HEADLIGHT REMINDER
None	595AAM	BC PROG, PARK/MARKER LIGHTS
None	595AAN	BC PROG, MARKER INTERRUPT SW Located in Steering Wheel
None	595AAR	BC PROG, INTERIOR DOME LIGHTS in Cab
None	595AAS	BC PROG, INTERIOR DOME LIGHTS in Sleeper
None	595AAT	BC PROG, INTERIOR FLOOR LIGHTS in Sleeper
None	595AAU	BC PROG, HEATED MIRRORS Rocker Switch, Aftermarket Only
None	595ABM	BC PROG, TACHOMETER 2500 RPM
None	595ABS	BC PROG, WORKLIGHT ON W/BACKUP
None	595ABT	BC PROG, REMOTE for Worklights
None	595ABU	BC PROG, REMOTE for Trailer Auxiliary Circuit Battery Powered
None	595ABX	BC PROG, EXTERIOR LIGHT CHECK for ProStar
None	595ACC	BC PROG, AXLE TEMP GAUGE Dual
None	595ACD	BC PROG, AXLE TEMP GAUGE Single
None	595ACE	BC PROG, FOG LIGHTS Rocker Switch
None	595ACG	BC PROG, OUTSIDE TEMP MONITOR
None	595ACL	BC PROG, ELECTRICAL LOAD CONTL
None	595ACM	BC PROG, ENGINE COMPRESSION BRAKE Located in Steering Wheel
None	595ACN	BC PROG, AIR HORN Analog Input
None	595ACP	BC PROG, FIFTH WHEEL UNLOCK
None	595ACR	BC PROG, FRT AXLE LOAD MONITOR
None	595ACS	BC PROG, RR AXLE LOAD MONITOR
None	595ACT	BC PROG, LOCKING DIFFERENTIAL Includes Two Switches one for each Differential
None	595ACV	BC PROG, ENGINE AIR MONITOR
None	595ACX	BC PROG, INTAKE MANIFOLD PRESS
None	595ADJ	BC PROG, REMOTE START/STOP In Bunk
None	595ADM	BC PROG, HVAC In Sleeper
None	595ADY	BC PROG, TRANS OIL TEMP Through Body
None	595ALL	BC PROG, SNOW PLOW LIGHTS Rocker Switch
None	595ALM	BC PROG, FLASHER SYS OUTPUTS
None	595ALT	BC PROG, FUEL TANK GAUGE Single Left Side
None	595AMU	BC PROG, WORK LIGHT Rocker Switch
None	595ANR	BC PROG, PARK BRAKE RELAY
None	595ANS	BC PROG, MAX. ENGINE OIL TEMP Before the Warn Indicator Light is Activated
None	595ANT	BC PROG, IDLE MANAGEMENT SYS for Cummins ICON, W/Freedomline Xmsns, Cruise Control State Must be Maintained Across Key Cycles Instead of Resetting
None	595ANU	BC PROG, ENGINE IDLE Increment/Decrement to allow idle adjust on Cummins or IBB Engines
None	595ANV	BC PROG, DIAGNOSTICS LOCATION No On Board Display
None	595ANW	BC PROG, DIAGNOSTICS LOCATION Display in Gauge Cluster
None	595ANX	BC PROG, DIAGNOSTICS LOCATION In VID
None	595ANZ	BC PROG, IDLE MANAGEMENT SYS for Cummins ICON, N/Freedomline Xmsns, Cruise Control State Must be Maintained Across Key Cycles Instead of Resetting
None	595AXY	BC PROG, FUEL TANK GAUGE Dual Right Side Draw
None	595AYE	BC PROG, IP CONFIGURATION for ProStar
None	595AYG	BC PROG, ENGINE TYPE MFG International® HDD
None	595AYH	BC PROG, ENGINE FAN DRIVE Variable Speed
None	595AYJ	BC PROG, CRUSE CONT'L STEER WH ON/OFF, With Diagnosable Switches
None	595AYM	BC PROG, LIFT GATE WIRING PACK Rocker Position
None	595AYR	BC PROG, ECONOMY MODE SWITCH
None	595AYW	BC PROG, EXHAUST CLOGGED IND. Indicator for Clogged Diesel Particulate Filter in Aftertreatment

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595AYX	BC PROG, EXHAUST HIGH TEMP Indicator for High Exhaust Temperatures (Aftertreatment)
None	595AYZ	BC PROG, INHIBIT REGEN SWITCH Latched (TWO POSITION, BI-STABLE)
None	595AZA	BC PROG, INHIBIT REGEN SWITCH Momentary (THREE POSITION, CENTER-STABLE)
None	595AZB	BC PROG, ENGINE COMPRESSION BR With Programmable Levels; Uses On/Off Switch in Steering Wheel and 1/2/3 Switch in Switchpack
None	595AZC	BC PROG, ENGINE COMPRESSION BR With Programmable Levels; Located in Switch Pack
None	595AZD	BC PROG, ENGINE COMPRESSION BR With Variable & Programmable Levels; Located in Switch Pack
None	595AZE	BC PROG, EXHAUST TEMP LIGHT Indicator Light in IP; for High Exhaust Temperatures (Aftertreatment) for ProStar.
None	595AZG	BC PROG, EXHAUST CLOGGED IND. Indicator Light in IP; for Clogged Diesel Particulate Filter In Aftertreatment, for ProStar
None	595AZH	BC PROG, PARKED REGEN SWITCH for Aftertreatment
None	595AZK	BC PROG, FRT AXLE LOAD MONITOR Meets SAE Standard, Forward Axle
None	595AZL	BC PROG, RR AXLE LOAD MONITOR Meets SAE Standards, for Rear Axle
None	595BAD	BC PROG, BODY CONTROLLER for Bus Body Controller
None	595BAE	BC PROG, DATA LOG INDICATOR for Telematics System
None	595BAG	BC PROG, SEATBELT LIGHT IND. Alarm and Continuous Flashing Indicator until Seatbelt is Fastened
None	595BAH	BC PROG, INVERTER ON Stationary and Moving
None	595BAJ	BC PROG, INVERTER ON Stationary Only
None	595BAK	BC PROG, ENGINE IDLE SHUTDOWN Indicator Light in Cluster Warning that Engine Ready to Shutdown
None	595BAL	BC PROG, INDICATOR, HOOD OPEN for Hybrid Electric Vehicle
None	595BAM	BC PROG, HEV E-PTO for Hybrid Electric Vehicle
None	595BAN	BC PROG, WARNING LIGHTS for Hybrid Electric Vehicle
None	595BAP	BC PROG, SEATBELT LIGHT IND. for BUS; Alarm and Continuous Flashing Indicator until Seatbelt is Fastened
None	595BAR	BC PROG, IDLE MANAGEMENT SYS for Heat/HVAC
None	595BAS	BC PROG, REMOTE ENGINE SPEED With Cummins Engine
None	595BAT	BC PROG, HEADLIGHTS W/DRL With Pupil Warning with Auto
None	595BAU	BC PROG, HEADLIGHT REMINDER for Bus
None	595BAV	Engine Exhaust Regeneration Control and Monitoring for BUS
None	595BAW	BC PROG, FIFTH WHEEL UNLOCK Includes Two Air Solenoids
None	595BAX	BC PROG, TRACTION CONTROL IND {Wabco ATC ENABLE?DISABLE} With Traction Warning Light, for Full Power Hydraulic
None	595BAY	BC PROG, 5TH WHEEL JAW MONITOR Includes Two Warning Indicators
None	595BAZ	BC PROG, FOG LIGHTS With Auto Headlights, Rocker Switch to be located in Center Panel Switch Housing, for Bus
None	595BBA	BC PROG, CONVENTIONAL PTO With HEV (non-ePTO)
None	595BBB	BC PROG, ENGINE FAN OVERRIADE for Low Air Pressure, No Switch
None	595BBC	BC PROG, AIR SUSPENSION DUMP Programmable Max Speed
None	595BBD	BC PROG, AIR SOLENOID #6 (Universal Normally Closed)
None	595BBE	BC PROG, PRNDL Gear Display Eaton with Park Prawl
None	595BBG	BC PROG, THEFT DETERRENT SYS for ProStar
None	595BBH	BC PROG, PRNDL No PRNDL With 1000/2000 6 Speed Transmission not With Power Park or Park Prawl
None	595BBJ	BC PROG, PRNDL No PRNDL With 1000/2000 6 Speed Transmission With Power Park & Shifter Interlock
None	595BBL	BC PROG, HEV ADVANCED LOGIC for Open Center Hydraulic Systems
None	595BBM	BC PROG, ENGINE IDLE SHUTDOWN 2010 Indicator Light in Cluster Warning that Engine Ready to Shutdown
None	595BBN	BC PROG, HEV DRIVER DISPLAY Located in AGSP
None	595BBR	BC PROG, TURN SIGNAL BULB OUT ECE R48 Compliant with Fault Detection
None	595BHG	SINGLE SPD XFER CASE W/ODOMETER SHUTOFF
None	595BHH	HEADLIGHT REMINDER #2
None	595BHJ	BC PROG, LOGIC BUILDER FOR DLB LIGHT ACCESS

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595BHK	BC PROG, HVAC In Cab With Switch Controls (Bergstrom)
None	595BHL	BC PROG, DASH IND. LT RED (1)
None	595BHM	BC PROG, DASH IND. LT RED (2)
None	595BHN	BC PROG, DASH IND. LT RED (3)
None	595BHP	BC PROG, DASH IND. LT RED (6)
None	595BHR	BC PROG, DASH IND. LT GREEN (1)
None	595BHS	BC PROG, DASH IND. LT GREEN (2)
None	595BHT	BC PROG, DASH IND. LT GREEN (3)
None	595BHU	BC PROG, DASH IND. LT GREEN (6)
None	595BHV	BC PROG, DASH IND. LT YELLOW (1)
None	595BHW	BC PROG, DASH IND. LT YELLOW (2)
None	595BHX	BC PROG, DASH IND. LT YELLOW (3)
None	595BHY	BC PROG, DASH IND. LT YELLOW (6)
None	595BHZ	BC PROG, AUXILIARY LOAD #7 for (2) Rocker Switches and (2) Relays
None	595BJA	BC PROG, HEV E-PTO 2010 Hybrid Electric Vehicle
None	595BJB	BC PROG, WAIT TO START IND. 2010
None	595BJC	BC PROG, EXHAUST CLOGGED IND. 2010, Indicator for Clogged Diesel Particulate Filter in Aftertreatment
None	595BJD	BC PROG, EXHAUST HIGH TEMP 2010, Indicator for High Exhaust Temperatures (Aftertreatment)
None	595BJE	BC PROG, INHIBIT REGEN SWITCH 2010, Latched
None	595BJG	BC PROG, INHIBIT REGEN SWITCH 2010, Momentary
None	595BJH	BC PROG, IP CONFIGURATION 2010, for MD, RH & SS
None	595BJJ	BC PROG, PARKED REGEN SWITCH 2010 Aftertreatment
None	595BJK	BC PROG, RANGE INHIBITED WARN 2010, Light for 1000, 2000, 3000 & 4000 Allison Gen 4 Transmission
None	595BJL	BC PROG, TRACTION CONTROL IND (Bendix ATC Off Road) 2010, With Traction Warning Light, for Air Brakes
None	595BJM	BC PROG, IP CONFIGURATION 2010, for ProStar & LoneStar
None	595BJN	BC PROG, HVAC 2010, In Sleeper (Behr) and Cab (Bergstrom)
None	595BJP	BC PROG, TRACTION CONTROL IND (Wabco ATC MUD/SNOW) 2010, With Traction Warning Light, for Full Power Hydraulic Brake or Air Brakes, Not Including Trailer
None	595BJR	BC PROG, LOGIC BUILDER 2010 Enabler
None	595BJS	BC PROG, PTO MONITOR 2010, for Indicator and Alarm Connected to Remote Power Module
None	595BJT	BC PROG, PTO MONITOR 2010, for Indicator and Alarm Connected to Body Controller
None	595BJU	BC PROG, IP CONFIGURATION 2010 for Bus
None	595BJV	BC PROG, PARKED REGEN SWITCH 2010, for Aftertreatment Switch Blank for BUS
None	595BJW	BC PROG, DIESEL PART FILTER ID 2010 Level Indicator
None	595BJX	BC PROG, XFER CASE 2 SPD W/2007 V8
None	595BJY	BC PROG, TRACTION CONTROL IND {(Wabco ATC ENABLE/DISABLE}) 2010, With Traction Warning Light, for Full Power Hydraulic
None	595BJZ	BC PROG, HEADLIGHTS WIG WAG With Bus Pupil Warning Lights
None	595BKA	BC PROG, FULL TIME LIGHTS
None	595BKB	BC PROG, IDLE MANAGEMENT SYSTEM for Heat/HVAC (Bergstrom)
None	595BKC	BC PROG, HVAC, In Sleeper (Bergstrom) and Cab (Behr)
None	595BKD	BC PROG, BODY CONTROLLER for Truck Body Controller #2
None	595BKE	BC PROG, BODY CONTROLLER for Bus Body Controller #2
None	595BKG	BC PROG, INTERLOCK WHEELCHAIR 2010 With Indicator Light in Cluster
None	595BKH	BC PROG, INTERLOCK WHEELCHAIR 2010 With Transmission in Park, Indicator Light in Cluster, Bus Only
None	595BKJ	BC PROG, TRANSMISSION PTO SINGLE, for 2010
None	595BKK	BC PROG, TRANSMISSION PTO for 2010; Dual PTO
None	595BKL	BC PROG, ENGINE RETARDER for 2010; Located in Steering Wheel
None	595BKM	BC PROG, ENGINE RETARDER for 2010; With Programmable Levels; Uses On/Off Switch in Steering Wheel and 1/2½/3 Switch in Switchpack
None	595BKN	BC PROG, ENGINE COMPRESSION BRAKE with Optional Jake Brake Foot Pedal
None	595BKX	BC PROG, TRACTION CONTROL IN {Bendix ATC ENABLE/DISABLE} With Traction Warning Light, for Air Brakes

CROSS REFERENCE

ESC 595 Code	2007 BC 595 Code	PRE 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595BKY	BC PROG, PTO SHIFT for (1) Dash Switch with 30 AMP Relay, for Customer Provided PTO
None	595BKZ	BC PROG, HVAC 2010, In Cab With Remote AC Condenser
None	595BLA	BC PROG, HVAC 2010, In Cab & Sleeper With Remote AC Condenser
None	595BLB	BC PROG, HVAC 2010 in Cab With Remote AC Condenser, with Pinout/Relay Drivers 31 & 32
None	595BLM	BC PROG, HVAC Condenser Pusher Fan Control
None	595BLN	BC PROG, HEADLIGHTS WIG WAG With Highbeam Flash
None	595BLP	BC PROG, HEADLIGHTS WIG WAG With Lowbeam or Highbeam Flash
None	595BLS	BC PROG, AIR SUSP LOAD CONTRL for Tandem Weight Bias Suspension Air Control Valve
None	595BLT	BC PROG, SNOW VALVE Engine Air Intake
None	595BLU	BC PROG, REAR AXLE LOAD MONITOR #7 for Tandem Hendrickson HAS 40-6-K
None	595BLV	BC PROG, REAR AXLE LOAD MONITOR #2 for Single HAS 23K
None	595BLW	BC PROG, REAR AXLE LOAD MONITOR #3 for Single IROS Long MSM 12-15.5K
None	595BLX	BC PROG, REAR AXLE LOAD MONITOR #4 for Single IROS Long MSM 18-21K
None	595BLY	BC PROG, REAR AXLE LOAD MONITOR #5 for Single IROS Short MSM 20K
None	595BLZ	BC PROG, REAR AXLE LOAD MONITOR #6 for Tandem Hendrickson HTB 40K
None	595BMA	BC PROG, ROLL STABILLITY PROG {Wabco}
None	595BMH	BC PROG, TRANS HILL START AID for Ultra Shift Plus Transmission
None	595BMJ	BC PROG, FOG LIGHTS REAR ECE R38 Compliant, Red LED
None	595BMK	BC PROG, FOG LIGHTS ECE R19/48 Compliant
None	595BML	BC PROG, DAYTIME RUN/LIGHT ECE R87/48 Compliant
None	595BMN	BC PROG, IND DAY RUN/LIGHTS ECE R48, On Dash
None	595BMS	BC PROG, TRACTION CONTROL IND {Bendix ATC Enable/Disable} with Traction Warning Light, for Air Brakes, with 2010 Cluster
None	595BMT	BC PROG, IND LIGHT AIR BRAKE Pressure Failure
None	595BMU	BC PROG, ADJ SPEED LIMIT Include Switch in Center Panel
None	595BMV	BC PROG, ACCELERATOR INTERLOCK
None	595BMW	BC PROG, UPSHIFT INDICATOR LIGHT
None	595BMX	BC PROG, USER ACTIVATED DATA Logger
None	595BMY	BC PROG, ELECTRICAL LOAD CONTRL 11.8 Volts
None	595BMZ	BC PROG, PARKED REGEN SWITCH 2010, Aftertreatment to Allow Parked Regen Below Light Level for Service Use Only, Do Not Infuse
None	595BNA	BC PROG, BRAKE LT W/Retarder ECE or ADR Compliant; Brake Light ON with Retarder Activated
None	595BNB	BC PROG, DM1 HEARTBEAT for pre 2007 Engines
None	595BNJ	BC PROG, HYDRAULIC BRAKE SPLIT for Hydro Max
None	595BNN	BC PROG, TRANSMISSION PTO Dual PTO, for 2010 with 42 Parameters
None	595BNP	BC PROG, TRANSMISSION PTO, Single PTO, for 2010 with 42 Parameters
None	595BNY	BC PROG, ENGINE FAN WARNING BUZZER
None	595BPB	BC PROG, ENGINE FAN DRIVE Variable Speed
None	595BPC	BC PROG, CRUISE SWITCH DISABLE with Park Brake Set
None	595BPD	BC PROG, PRNDL with 1000/2000 6 SPD Transmission not With Power Park or Park Prawl
None	595BPE	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Park Prawl and Shifter Interlock
None	595BPG	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Power Park and Shifter Interlock
None	595BPK	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable and Park Prawl and Shifter Interlock
None	595BPL	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable not With Power Park or Park Prawl
None	595BPM	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable and Power Park and Shifter Interlock

Table 197 – 595 Feature Codes Sorted by Post-2007 Feature Code Number

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595AAA	595232	BC PROG, BODY CONTROLLER
595AAC	595031	BC PROG, KEY STATE
595AAD	595015	BC PROG, BRAKE SWITCH
595AAE	None	BC PROG, WINDSHIELD WIPER
595AAG	None	BC PROG, HEADLIGHTS W/DRL With Auto
595AAH	595188	BC PROG, LIGHTS ON W/WIPERS
595AAH	595314	BC PROG, LIGHTS ON W/WIPERS
595AAJ	None	BC PROG, HEADLIGHT REMINDER
595AAK	595106	BC PROG, DRL OMIT
595AAL	595021	BC PROG, TURN SIGNALS/BRAKE With Combined Stop and Turns
595AAM	None	BC PROG, PARK/MARKER LIGHTS
595AAN	None	BC PROG, MARKER INTERRUPT SW Located in Steering Wheel
595AAP	595083	BC PROG, CRUISE CONT'L STEER WHEEL
595AAR	None	BC PROG, INTERIOR DOME LIGHTS in Cab
595AAS	None	BC PROG, INTERIOR DOME LIGHTS in Sleeper
595AAT	None	BC PROG, INTERIOR FLOOR LIGHTS in Sleeper
595AAU	None	BC PROG, HEATED MIRRORS Rocker Switch, Aftermarket Only
595AAV	595023	BC PROG, HORN ELECTRIC
595AAW	595153	BC PROG, LOW ENGINE COOLANT
595AAX	595185	BC PROG, THROTTLE SWITCH Pack On/Off
595AAZ	595014	BC PROG, PARK BRAKE INDICATOR
595ABA	595063	BC PROG, SEATBELT INDICATOR
595ABB	595008	BC PROG, AIR PRESSURE GAUGES
595ABC	595030	BC PROG, TRAILER LIGHTING
595ABD	595052	BC PROG, FUEL TANK GAUGE Single Right Side
595ABE	595192	BC PROG, FUEL TANK GAUGE Dual Left Side Draw
595ABG	595130	BC PROG, ENGINE TYPE MFG International®
595ABH	595126	BC PROG, ENGINE TYPE MFG Caterpillar
595ABJ	595127	BC PROG, ENGINE TYPE MFG Cummins
595ABK	595067	BC PROG, ENGINE COOLANT TEMP
595ABL	595066	BC PROG, ENGINE OIL PRESS GAUGE
595ABM	None	BC PROG, TACHOMETER 2500 RPM
595ABN	595069	BC PROG, SPEEDOMETER
595ABP	595061	BC PROG, VOLTMETER
595ABR	595250	BC PROG, WORK LIGHT Push Button B
595ABS	None	BC PROG, WORKLIGHT ON W/BACKUP
595ABT	None	BC PROG, REMOTE for Work Lights
595ABU	None	BC PROG, REMOTE for Trailer Auxiliary Circuit Battery Powered
595ABV	595009	BC PROG, ABS INDICATOR for Full Power Hydraulic OR Air Brake Systems, Not Including Trailer
595ABW	595012	BC PROG, TRAILER ABS INDICATOR
595ABX	None	BC PROG, EXTERIOR LIGHT CHECK for ProStar
595ABY	595107	BC PROG, POWER WINDOW/DOOR LOCK With 2 Doors
595ABZ	595129	BC PROG, KEYLESS ENTRY REMOTE
595ACA	595273	BC PROG, AIR SUSPENSION DUMP
595ACB	595011	BC PROG, TRACTION CONTROL IND {Bendix ATC Off Road} With Traction Warning Light, for Air Brakes
595ACC	None	BC PROG, AXLE TEMP GAUGE Dual
595ACD	None	BC PROG, AXLE TEMP GAUGE Single
595ACE	595019	BC PROG, FOG LIGHTS Rocker Switch
595ACG	None	BC PROG, OUTSIDE TEMP MONITOR
595ACL	None	BC PROG, ELECTRICAL LOAD CONTL
595ACM	None	BC PROG, ENGINE COMPRESSION BRAKE Located in Steering Wheel
595ACN	None	BC PROG, AIR HORN Analog Input
595ACP	None	BC PROG, FIFTH WHEEL UNLOCK
595ACR	None	BC PROG, FRONT AXLE LOAD MONITOR
595ACS	None	BC PROG, REAR AXLE LOAD MONITOR
595ACT	None	BC PROG, LOCKING DIFFERENTIAL Includes Two Switches one for each Differential

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595ACU	595040	BC PROG, LOCKING DIFFERENTIAL for Single & Dual With Single Switch
595ACV	None	BC PROG, ENGINE AIR MONITOR
595ACW	595051	BC PROG, ENGINE FAN OVERRIDE Includes Manual Switch for Automatic Manual Fan Control
595ACX	None	BC PROG, INTAKE MANIFOLD PRESS
595ACY	595033	BC PROG, FIFTH WHEEL SLIDE
595ACZ	595041	BC PROG, POWER DIVIDER LOCK
595ADA	None	BC PROG, BRAKE APPL GAUGE IN Prostar Secondary Gauge Cluster
595ADB	None	BC PROG, TRAILER AUX CIRCUIT Accessory Powered
595ADC	None	BC PROG, TRAILER AUX CIRCUIT Battery Powered
595ADD	None	BC PROG, TRANSMISSION PTO Single
595ADG	None	BC PROG, FUEL HEATER Will be Activated by BC
595ADH	None	BC PROG, COMPASS DISPLAY
595ADJ	None	BC PROG, REMOTE START/STOP In Bunk
595ADK	595100	BC PROG, AIR SHIELD LIGHTING
595ADL	595336	BC PROG, HVAC In Cab
595ADM	None	BC PROG, HVAC In Sleeper
595ADN	595143	BC PROG, METRIC GAUGE
595ADP	595037	BC PROG, CLUTCH SWITCH
595ADR	595112	BC PROG, PRNDL No PRNDL, Manual Transmission
595ADS	None	BC PROG, PRNDL Gear Display Eaton
595ADT	None	BC PROG, PRNDL Gear Display Freedomline
595ADU	None	BC PROG, INTERIOR FLOOR LIGHTS in Cab
595ADV	595163	BC PROG, PDL WARNING BUZZER
595ADW	595254	BC PROG, MONITOR ENG OIL TEMP Through Body Controller
595ADX	595097	BC PROG, MONITOR ENG OIL TEMP Through ECM
595ADY	None	BC PROG, TRANS OIL TEMP Through Body
595ADZ	595060	BC PROG, TRANS OIL TEMP Through TCM
595AEA	None	BC PROG, ROLL STABILITY PROG
595AEB	None	BC PROG, TRANSMISSION PTO Dual PTO
595AEC	None	BC PROG, ELECT LOAD W/ICON SYS
595AED	None	BC PROG, BRAKE WARN INDICATOR Light and Audible Alarm; Parking Brake/Motion Warning System for Engaged Parking Brake
595AEE	None	BC PROG, COLLISION AVOIDANCE Requires Input From the Right Turn Signal.
595AEG	None	BC PROG, SKIRT LIGHTS Customer Supplied
595AEH	595306	BC PROG, EXTERIOR LIGHT CHECK for Bus
595AEJ	595108	BC PROG, POWER WINDOW/DOOR LOCK With 4 Doors
595AEK	595164	BC PROG, TRACTION CONTROL IND {Wabco ATC MUD/SNOW} With Traction Warning Light, for Full Power Hydraulic Brake or Air Brakes, Not Including Trailer
595AEL	595113	BC PROG, PRNDL With 1000/2000 5 SPD Transmission With Park Pawl & Shifter Interlock
595AEL	595317	BC PROG, PRNDL With 1000/2000 5 SPD Transmission With Park Pawl & Shifter Interlock
595AEP	595007	BC PROG, AIR PRESSURE GAUGES Auxiliary
595AER	595208	BC PROG, TACHOMETER 4000 RPM
595AES	None	BC PROG, EXTERIOR LIGHT CHECK for MD, RH & SS
595AET	595114	BC PROG, PRNDL With 1000/2000 5 Speed Transmission not With Power Park or Park Pawl
595AEU	595116	BC PROG, PRNDL With 3000/4000 5 & 6 Speed Transmission
595AEV	595115	BC PROG, PRNDL With 1000/2000 5 Speed Transmission With Power Park & Shifter Interlock
595AEV	595228	BC PROG, PRNDL With 1000/2000 5 Speed Transmission With Power Park & Shifter Interlock
595AEW	595145	BC PROG, TRANS OIL TEMP
595AEX	595212	BC PROG, CROSSING GATE DISABLE Switch Mounted in Panel
595AEY	595276	BC PROG, CROSSING GATE DISABLE Switch With Stop Arm Inhibit, Mounted in Panel
595AEZ	595146	BC PROG, AMMETER 150 AMP
595AGA	595315	BC PROG, BUZZER EMERGENCY EXIT Red Always Hot Override With Exit Buzzer
595AGB	595210	BC PROG, BUZZER EMERGENCY EXIT and Warning Light
595AGC	595016	BC PROG, ENGINE EXHAUST BRAKE

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595AGE	595271	BC PROG, SWITCH, DOOR CONTROL Steering Wheel Mounted
595AGG	595272	BC PROG, SWITCH, DOOR CONTROL Mounted in Panel
595AGH	595307	BC PROG, SWITCH, DOOR CONTROL Mounted in Panel and Steering Wheel
595AGJ	595308	BC PROG, SWITCH, DOOR CONTROL for Manual Door Input Switch
595AGK	595291	BC PROG, FUEL FILTER PLUGGED
595AGL	595213	BC PROG, POST TRIP INSPECTION
595AGM	595295	BC PROG, WATER IN FUEL IND.
595AGN	595293	No Previous Feature BC PROG, LIFT GATE WIRING PAK Push Button B
595AYM	595293	No Previous Feature BC PROG, LIFT GATE WIRING PAK Push Button B
595AGP	595214	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Steering Wheel Mounted (Sequential), Auto Activated Stop Arm and Crossing Gate Without Alarm
595AGR	595215	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Steering Wheel Mounted (Non-Sequential)
595AGS	595218	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Panel Mounted Switch, (Non-Sequential), Auto Activated Stop Arm and Crossing Gate Without Alarm
595AGT	595225	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Panel Mounted Switch, (Sequential)
595AGU	595270	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Panel Mounted Switch, With Override “RED” Light
595AGV	595286	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Panel Mounted Switch, (Non-Sequential), Manual Activated Stop Arm and Crossing Gate With Alarm
595AGW	595312	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Steering Wheel Mounted Switch, (Sequential), With Door Deactivation, Auto Activated Stop Arm and Crossing Gate Without Alarm
595AGX	595313	BC PROG, PUPIL WARNING LIGHTS 8 Lamps, Panel Mounted Switch 3 Position With (Sequential) Operation
595AGY	595318	BC PROG, PUPIL WARNING LIGHTS Steering Wheel Mounted Switch, (Sequential) With Illinois Master Switch
595AGZ	595319	BC PROG, PUPIL WARNING LIGHTS Steering Wheel Mounted Switch, (Sequential) With Illinois Master Switch, With Door Deactivation
595AHA	595034	BC PROG, REMOTE ENGINE SPEED
595AHB	595119	BC PROG, REMOTE POWER MOD #4
595AHC	595120	BC PROG, REMOTE POWER MOD #7
595AHD	595121	BC PROG, REMOTE POWER MOD #2
595AHE	595032	BC PROG, REMOTE POWER MOD #1
595AHG	595122	BC PROG, SINGLE SPD XFER CASE
595AHH	595274	BC PROG, TRANSFER CASE PTO
595AHJ	595184	BC PROG, TRANSMISSION RETARDER
595AHK	595160	BC PROG, 2-SPD AXLE Parameter for Use With Manual Transmission
595AHL	595158	BC PROG, TRANSFER CASE 2-SPD
595AHM	595206	BC PROG, VANDAL LOCK WARNING
595AHN	595221	BC PROG, INTERLOCK WHEELCHAIR With Indicator Light in Cluster
595AHP	595323	BC PROG, INTERLOCK WHEELCHAIR With Transmission in Park, Indicator Light in Cluster, Bus Only
595AHR	595326	BC PROG, INTERLOCK WHEELCHAIR With Transmission in Park, Less Indicator Light in Cluster, Bus Only
595AHS	595327	BC PROG, INTERLOCK WHEELCHAIR Less Indicator Light in Cluster, Bus Only
595AHT	595161	BC PROG, FOG LIGHTS OMIT DIAGNOSTICS
595AHU	595203	BC PROG, ELECTRIC TRAILER BRAKE
595AHW	595137	BC PROG, HAZARD OVERRIDE BRAKE
595AHX	595259	BC PROG, AIR SOLENOID MODULE #1
595AHY	595260	BC PROG, AIR SOLENOID MODULE #2
595AHZ	595261	BC PROG, AIR SOLENOID MODULE #3
595AJA	595262	BC PROG, AIR SOLENOID MODULE #4
595AJC	595300	BC PROG, AIR SOLENOID MODULE #6
595AJD	595288	BC PROG, WIPERS W/SPD OVERRIDE Includes Hi, Lo and Intermittent Speeds Plus Washer Effects, Wiper Will be Forced to Slow Intermittent With Park Brake Set and Wiper Left On for a Pre-determined time
595AJE	595168	BC PROG, WORK LHT DIAGNOSTICS OMIT

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595AJG	595282	BC PROG, REMOTE POWER MOD #4 With Latched Switches
595AJH	595265	BC PROG, SWITCH AUXILIARY In Center Panel, With 40 amp Fuse Circuit, Accessory Controlled
595AJK	595173	BC PROG, AUXILIARY LOAD for (1) Rocker Switch
595AJL	595174	BC PROG, AUXILIARY LOAD for (2) Rocker Switches
595AJM	595175	BC PROG, AUXILIARY LOAD for (3) Rocker Switches
595AJN	595183	BC PROG, AUXILIARY LOAD for (4) Rocker Switches
595AJP	595189	BC PROG, AUXILIARY LOAD for (5) Rocker Switches
595AJR	595190	BC PROG, AUXILIARY LOAD for (6)Rocker Switches
595AJS	595277	BC PROG, ADD AUX SWITCHES for (6) Rocker Switches
595AJT	595170	BC PROG, PTO MONITOR for Indicator and Alarm Connected to Remote Power Module
595AJU	595248	BC PROG, PTO HOURMETER ENABLER Captures Hours PTO is Engaged and Displayed on LCD Cluster
595AJV	595171	BC PROG, PTO SHIFT for Lectra Shift Control
595AJW	595193	BC PROG, PTO SHIFT for Hydraulic Clutch or Pneumatic Non Clutch Engagement Accommodation
595AJX	595252	BC PROG, PTO SHIFT With Pneumatic Non Clutch Engagement Accommodation
595AJY	595244	BC PROG, PTO SHIFT With Pneumatic Engagement Mechanism for Clutch type Electric Over Air PTO
595AJZ	595179	BC PROG, PTO CONTROL LOGIC for Dash Switch
595AKA	595178	BC PROG, DUAL OUTPUT AUX #1 With Single Latched Switch
595AKB	595181	BC PROG, INTERLOCK AUX LOAD #1
595AKC	595182	BC PROG, INTERLOCK AUX LOAD #2
595AKD	595200	BC PROG, DUAL CONTL AUX LOAD#1
595AKE	595238	BC PROG, DUAL CONTL AUX LOAD#2
595AKG	595239	BC PROG, DUAL CONTL AUX LOAD#3
595AKH	595283	BC PROG, DLB I/O EXPANSION Includes 2 Digital Inputs & 2 Relay Driver Outputs
595AKJ	595172	BC PROG, EXT ENGINE SPD CONT'L for single external control
595AKK	595241	BC PROG, EXT ENGINE SPD CONT'L for on Demand Engine Speed With Utility Application
595AKL	595240	BC PROG, EXT ENGINE SPD CONT'L With Utility Application
595AKM	595196	BC PROG, EXT ENGINE SPD CONT'L for Emergency Power Output and Utility Application
595AKN	595263	BC PROG, EXT ENGINE SPD CONT'L On Demand Engine Speed for Refuse
595AKP	595198	BC PROG, ALARM IN CAB With External Control
595AKR	595201	BC PROG, AERIAL BOOM WARNING Light and Buzzer
595AKS	595202	BC PROG, OUTRIGGER WARNING Light and Buzzer
595AKT	595299	BC PROG, TAILGATE OPEN WARNING Light and Buzzer
595AKU	595301	BC PROG, DUMP BODY UP WARNING Light and Buzzer
595AKV	595246	BC PROG, REMOTE START/STOP With Emergency Pump Motor Functionality
595AKW	595245	BC PROG, REMOTE START/STOP Without Emergency Pump Motor Functionality
595AKX	595223	BC PROG, THROTTLE CRUISE Switches in 6 Pack
595AKY	595024	BC PROG, DOME LIGHTS
595AKZ	595297	BC PROG, AIR SOLENOID MODULE #5
595ALA	595269	BC PROG, TRANSFER CASE 2-SPD With Neutral Gear, for 6x6 or 4x4
595ALB	595018	BC PROG, HEADLIGHTS W/DRL Less Auto
595ALC	595166	BC PROG, 2-SPD AXLE Parameter for Use With Automatic Transmission
595ALD	595022	BC PROG, AIR HORN Digital Input
595ALE	595047	BC PROG, POWER WINDOW/DOOR LOCK With 1 Door
595ALG	595275	BC PROG, HEADLIGHTS W/DRL Active with Pupil Warning Lights or Engine Running with Park Brake Released
595ALH	595285	BC PROG, DAYTIME RUN/LIGHT Non-Programmable; With Low Beams and Marker Lights on Full
595ALJ	595284	BC PROG, FUEL WARNING Low Fuel Warning Light and Audible Alarm Activated Separately so Warning Light is Activated Prior to Audible Alarm
595ALK	595125	BC PROG, AUXILIARY TRANS
595ALL	None	BC PROG, SNOW PLOW LIGHTS Rocker Switch
595ALM	None	BC PROG, FLASHER SYS OUTPUTS
595ALN	595039	BC PROG, RR AXLE SHIFT CONTROL Without Dash Mounted HI/LOW switch
595ALR	595180	BC PROG, HYDRAULIC BRAKE SPLIT for Full Power System

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595ALS	595186	BC PROG, POWER PARK BRAKE SPLIT for Full Power System
595ALT	None	BC PROG, FUEL TANK GAUGE Single Left Side
595ALU	595224	BC PROG, FOG LIGHTS Bus Only
595ALV	595118	BC PROG, HEATER DIAGNOSTICS
595ALW	595162	BC PROG, STOP/TURN/PARK/MARKER DIAGNOSTICS OMIT
595ALX	595092	BC PROG, WAIT TO START IND.
595ALY	595157	BC PROG, DRAIN VALVE {HUMPHERY}
595ALZ	595159	BC PROG, PRNDL Interlock for Column Shifter with Allison 1000 & 2000 Series
595AMA	595230	BC PROG, HAZARD LIGHTS “ON” With Pupil Warning Lights
595AMB	595292	BC PROG, TURN SIGNALS/BRAKE Hazard Lights, With Separate Stop and Turns
595AMC	595255	BC PROG, TAILGATE OPEN WARNING Light and Buzzer, for Use With Non-Electronic Transmissions Only
595AMD	595197	BC PROG, TAILGATE OPEN WARNING Light and Buzzer, for Use With Electronic Transmissions Only
595AME	595278	BC PROG, AIR PRESSURE GAUGES Primary & Secondary, for Air Brake Chassis, for Bus Without Door Switch
595AMG	595279	BC PROG, AIR PRESSURE GAUGES for Hydraulic Chassis With Air Compressor, for Bus without Door Switch
595AMH	595324	BC PROG, PRNDL W/1000/2000 5-SPD With Power Park and Lift Door BUS
595AMJ	595325	BC PROG, PRNDL 1000/2000 5-SPD With Park Pawl and Shifter Interlock With Lift Door Switch, for Bus
595AMM	595330	BC PROG, TRANSMISSION WARN IND for 1000,2000, 3000, & 4000
595AMN	595219	BC PROG, OVERRIDE DOOR/FLASH Switch, Mounted in Panel, for Red Pupil Warning Lights
595AMP	595249	BC PROG, HEATED MIRRORS in Push Button Location A
595AMR	595249	BC PROG, HEATED MIRRORS in Push Button Location B Aftermarket Only
595AMS	595019	BC PROG, FOG LIGHTS Push Button Location A
595AMT	595019	BC PROG, FOG LIGHTS Push Button Location B
595AMU	None	BC PROG, WORK LIGHT Rocker Switch
595AMV 595AMW 595AYY	595099	BC PROG, SNOW PLOW LIGHTS Push Button Location A BC PROG, SNOW PLOW LIGHTS Push Button Location B
595AMX	595322	BC PROG, ENGINE RAMP With Low Battery
595AMY	595151	BC PROG, SWITCH AUXILIARY In Center Panel, With 30 amp Fuse Circuit, Accessory Controlled
595AMZ	595267	BC PROG, PTO SHIFT for Customer Provided PTO, Mounted on Dash, With Programmable Parameters for, Engagement, Disengagement, and Reengagement
595ANA	595339	BC PROG, ENGINE RAMP With A/C on
595ANB	595111	BC PROG, MARKER INTERRUPT SW Located in Switch Pack
595ANC	595332	BC PROG, RANGE INHIBITED WARN Light, for 1000, 2000, 3000 & 4000 Allison Gen 4 Transmission
595AND	595331	BC PROG, ECONOMY MODE LIGHT 95 for Allison Transmissions
595ANE	595017	BC PROG, ENGINE COMPRESSION BRAKE Located in Switch Pack
595ANG	595091	BC PROG, RETARD OVER HEAT WARN Light
595ANK	595316	BC PROG, IP CENTER PANEL #1 Location, Reserved for Non-Multiplexed Functionality
595ANL	514011	BC PROG, REAR AXLE SWITCH CON’T With Dash Mounted HI/LOW switch
595ANM	595167	BC PROG, ENGINE DISPLAY for HDD Engines
595ANN	595110	BC PROG, STOP RELAY Active With Brake Lights
595ANP	595075	BC PROG, BRAKE APPL GAUGE IN EGC/AGSP
595ANP	595150	BC PROG, BRAKE APPL GAUGE IN EGC/AGSP
595ANR	None	BC PROG, PARK BRAKE RELAY
595ANS	None	BC PROG, MAX. ENGINE OIL TEMP Before the Warn Indicator Light is Activated
595ANT	None	BC PROG, IDLE MANAGEMENT SYS for Cummins ICON, W/Freedomline Xmsns, Cruise Control State Must be Maintained Across Key Cycles Instead of Resetting
595ANU	None	BC PROG, ENGINE IDLE Increment/Decrement to allow idle adjust on Cummins or IBB Engines
595ANV	None	BC PROG, DIAGNOSTICS LOCATION No On Board Display
595ANW	None	BC PROG, DIAGNOSTICS LOCATION Display in Gauge Cluster
595ANX	None	BC PROG, DIAGNOSTICS LOCATION In VID

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595ANY	595344	BC PROG, INTERLOCK WHEELCHAIR Less Indicator Light in Cluster, for Cutaway Bus Chassis
595ANZ	None	BC PROG, IDLE MANAGEMENT SYS for Cummins ICON, N/Freedomline Xmsns, Cruise Control State Must be Maintained Across Key Cycles Instead of Resetting
595AXY	None	BC PROG, FUEL TANK GAUGE Dual Right Side Draw
595AYA	595086	BC PROG, AXLE TEMP GAUGE Dual
595AYB	595087	BC PROG, AXLE TEMP GAUGE Single, for SS & Medium
595AYC	595253	BC PROG, WINDSHIELD WIPER Without Low Washer Fluid Indicator
595AYD	595048	BC PROG, LOW WASHER FLUID IND.
595AYE	None	BC PROG, IP CONFIGURATION for ProStar
595AYG	None	BC PROG, ENGINE TYPE MFG International® HDD
595AYH	None	BC PROG, ENGINE FAN DRIVE Variable Speed
595AYJ	None	BC PROG, CRUISE CONT'L STEER WH ON/OFF, With Diagnosable Switches
595AYK	595093	BC PROG, FRONT AIR SUSPENSION
595AYL	595287	BC PROG, THROTTLE CRUISE Without Cruise in Switch Pack
595AYM	None	BC PROG, LIFT GATE WIRING PAK Rocker Position
595AYN	595266	BC PROG, PTO MONITOR for Indicator and Alarm Connected to Body Controller
595AYP	595038	BC PROG, AUTO NEUTRAL
595AYR	None	BC PROG, ECONOMY MODE SWITCH
595AYS	595105	BC PROG, IP CONFIGURATION for MD, RH, & SS
595AYT	595227	BC PROG, IP CONFIGURATION for Bus
595AYU	595334	BC PROG, THEFT DETERRENT SYSTEM to Read a Combination Code From a 6-Pack and Send TSC1 Messages to Limit Engine Speed if an Incorrect Code is Entered
595AYV	595348	BC PROG, XFER CASE STATUS To TCM; for Allison Gen 4 Transmissions
595AYW	None	BC PROG, EXHAUST CLOGGED IND. Indicator for Clogged Diesel Particulate Filter in Aftertreatment
595AYX	None	BC PROG, EXHAUST HIGH TEMP Indicator for High Exhaust Temperatures (Aftertreatment)
595AYY	595321	BC PROG, SNOW PLOW LIGHTS GEN 2, With Rocker Switch
595AYZ	None	BC PROG, INHIBIT REGEN SWITCH Latched (TWO POSITION, BI-STABLE)
595AZA	None	BC PROG, INHIBIT REGEN SWITCH Momentary (THREE POSITION, CENTER-STABLE)
595AZB	None	BC PROG, ENGINE COMPRESSION BRAKE With Programmable Levels; Uses On/Off Switch in Steering Wheel and 1/2/3 Switch in Switchpack
595AZC	None	BC PROG, ENGINE COMPRESSION BR With Programmable Levels; Located in Switch Pack
595AZD	None	BC PROG, ENGINE COMPRESSION BR With Variable & Programmable Levels; Located in Switch Pack
595AZE	None	BC PROG, EXHAUST TEMP LIGHT Indicator Light in IP; for High Exhaust Temperatures (Aftertreatment) for ProStar.
595AZG	None	BC PROG, EXHAUST CLOGGED IND. Indicator Light in IP; for Clogged Diesel Particulate Filter In Aftertreatment, for ProStar
595AZH	None	BC PROG, PARKED REGEN SWITCH for Aftertreatment
595AZJ	595351	BC PROG, MAX SPEED PARAMETER for PWL; Set at 80 mph, With Bus Models with Steering Wheel Control Pupil Warning lights.
595AZK	None	BC PROG, FRONT AXLE LOAD MONITOR Meets SAE Standard, Forward Axle
595AZL	None	BC PROG, REAR AXLE LOAD MONITOR Meets SAE Standards, for Rear Axle
595AZM	595338	BC PROG, POST TRIP INSPECTION With Snooze
595AZN	595343	BC PROG, POST TRIP INSPECTION for Child Reminder System
595AZR	595345	BC PROG, A/C COMPRESSOR ACCOM. DUAL; for Low Speed Acceleration Disable for Aftermarket A/C System
595AZS	595337	BC PROG, ADVANCED LOGIC DLB for Service and Engineering Changes on Bus Only Not to be infused on any vehicle (DO NOT INFUSE)
595AZU	595333	BC PROG, INVERTER ON In Cab Multiplex Switch enables 3kw Inverter
595AZV	595328	BC PROG, PARK BRAKE ALARM
595AZW	595346	BC PROG, SPECIAL FUEL WARNING SINGLE TANK; Low Fuel Warning Light and Audible Alarm Activated Separately so Warning Light is Activated Prior to Audible Alarm; Gauge shows full at 7/8 Capacity
595AZX	595231	BC PROG, LOGIC BUILDER Enabler
595AZY	595296	BC PROG, EXTERIOR LIGHT CHECK Push Button "B"; for MD, RH & SS

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595AZZ	595251	BC PROG, PARK/MARKER LIGHTS Dual Output, 20AMP
595BAA	None	BC PROG, AIR POWER HYD PARK
595BAB	None	BC PROG, ENGINE FAN DRIVE {Borg-Warner} Variable Speed
595BAC	None	BC PROG, PRNDL With 1000/2000 5 Speed Transmission With Power Park & Arens Shifter
595BAD	None	BC PROG, BODY CONTROLLER for Bus Body Controller
595BAE	None	BC PROG, DATA LOG INDICATOR for Telematics System
595BAG	None	BC PROG, SEATBELT LIGHT IND. Alarm and Continuous Flashing until Seatbelt is Fastened
595BAH	None	BC PROG, INVERTER ON Stationary and Moving
595BAJ	None	BC PROG, INVERTER ON Stationary Only
595BAK	None	BC PROG, ENGINE IDLE SHUTDOWN Indicator Light in Cluster Warning that Engine Ready to Shutdown
595BAL	None	BC PROG, INDICATOR, HOOD OPEN for Hybrid Electric Vehicle
595BAM	None	BC PROG, HEV E-PTO for Hybrid Electric Vehicle
595BAN	None	BC PROG, WARNING LIGHTS for Hybrid Electric Vehicle
595BAP	None	BC PROG, SEATBELT LIGHT IND. for BUS; Alarm and Continuous Flashing Indicator until Seatbelt is Fastened
595BAR	None	BC PROG, IDLE MANAGEMENT SYS for Heat/HVAC
595BAS	None	BC PROG, REMOTE ENGINE SPEED With Cummins Engine
595BAT	None	BC PROG, HEADLIGHTS W/DRL With Pupil Warning with Auto
595BAU	None	BC PROG, HEADLIGHT REMINDER for Bus
595BAV	None	Engine Exhaust Regeneration Control and Monitoring for BUS
595BAW	None	BC PROG, FIFTH WHEEL UNLOCK Includes Two Air Solenoids
595BAX	None	BC PROG, TRACTION CONTROL IND {Wabco ATC ENABLE/DISABLE} With Traction Warning Light, for Full Power Hydraulic
595BAY	None	BC PROG, 5TH WHEEL JAW MONITOR Includes Two Warning Indicators
595BAZ	None	BC PROG, FOG LIGHTS With Auto Headlights, Rocker Switch to be located in Center Panel Switch Housing, for Bus
595BBA	None	BC PROG, CONVENTIONAL PTO With HEV (non-ePTO)
595BBB	None	BC PROG, ENGINE FAN OVERRIADE for Low Air Pressure, No Switch
595BBC	None	BC PROG, AIR SUSPENSION DUMP Programmable Max Speed
595BBD	None	BC PROG, AIR SOLENOID #6 (Universal Normally Closed)
595BBE	None	BC PROG, PRNDL Gear Display Eaton with Park Prawl
595BBG	None	BC PROG, THEFT DETERRENT SYS for ProStar
595BBH	None	BC PROG, PRNDL No PRNDL With 1000/2000 6 Speed Transmission not With Power Park or Park Prawl
595BBJ	None	BC PROG, PRNDL No PRNDL With 1000/2000 6 Speed Transmission With Power Park & Shifter Interlock
595BBL	None	BC PROG, HEV ADVANCED LOGIC for Open Center Hydraulic Systems
595BBM	None	BC PROG, ENGINE IDLE SHUTDOWN 2010 Indicator Light in Cluster Warning that Engine Ready to Shutdown
595BBN	None	BC PROG, HEV DRIVER DISPLAY Located in AGSP
595BBR	None	BC PROG, TURN SIGNAL BULB OUT ECE R48 Compliant with Fault Detection
595BHG	None	BC PROG, SINGLE SPD XFER CASE W/ODOMETER SHUTOFF
595BHH	None	BC PROG, HEADLIGHT REMINDER #2
595BHJ	None	BC PROG, LOGIC BUILDER FOR DLB LIGHT ACCESS
595BHK	None	BC PROG, HVAC In Cab With Switch Controls (Bergstrom)
595BHL	None	BC PROG, DASH IND. LT RED (1)
595BHM	None	BC PROG, DASH IND. LT RED (2)
595BHN	None	BC PROG, DASH IND. LT RED (3)
595BHP	None	BC PROG, DASH IND. LT RED (6)
595BHR	None	BC PROG, DASH IND. LT GREEN (1)
595BHS	None	BC PROG, DASH IND. LT GREEN (2)
595BHT	None	BC PROG, DASH IND. LT GREEN (3)
595BHU	None	BC PROG, DASH IND. LT GREEN (6)
595BHV	None	BC PROG, DASH IND. LT YELLOW (1)
595BHW	None	BC PROG, DASH IND. LT YELLOW (2)
595BHX	None	BC PROG, DASH IND. LT YELLOW (3)
595BHY	None	BC PROG, DASH IND. LT YELLOW (6)

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595BHZ	None	BC PROG, AUXILIARY LOAD #7 for (2) Rocker Switches and (2) Relays
595BJA	None	BC PROG, HEV E-PTO 2010 Hybrid Electric Vehicle
595BJB	None	BC PROG, WAIT TO START IND. 2010
595BJC	None	BC PROG, EXHAUST CLOGGED IND. 2010, Indicator for Clogged Diesel Particulate Filter in Aftertreatment
595BJD	None	BC PROG, EXHAUST HIGH TEMP 2010, Indicator for High Exhaust Temperatures (Aftertreatment)
595BJE	None	BC PROG, INHIBIT REGEN SWITCH 2010, Latched
595BJG	None	BC PROG, INHIBIT REGEN SWITCH 2010, Momentary
595BJH	None	BC PROG, IP CONFIGURATION 2010, for MD, RH & SS
595BJJ	None	BC PROG, PARKED REGEN SWITCH 2010 Aftertreatment
595BJK	None	BC PROG, RANGE INHIBITED WARN 2010, Light for 1000, 2000, 3000 & 4000 Allison Gen 4 Transmission
595BJL	None	BC PROG, TRACTION CONTROL IND (Bendix ATC Off Road) 2010, With Traction Warning Light, for Air Brakes
595BJM	None	BC PROG, IP CONFIGURATION 2010, for ProStar & LoneStar
595BJN	None	BC PROG, HVAC 2010, In Sleeper (Behr) and Cab (Bergstrom)
595BJP	None	BC PROG, TRACTION CONTROL IND (Wabco ATC MUD/SNOW) 2010, With Traction Warning Light, for Full Power Hydraulic Brake or Air Brakes, Not Including Trailer
595BJR	None	BC PROG, LOGIC BUILDER 2010 Enabler
595BJS	None	BC PROG, PTO MONITOR 2010, for Indicator and Alarm Connected to Remote Power Module
595BJT	None	BC PROG, PTO MONITOR 2010, for Indicator and Alarm Connected to Body Controller
595BJU	None	BC PROG, IP CONFIGURATION 2010 for Bus
595BJV	None	BC PROG, PARKED REGEN SWITCH 2010, for Aftertreatment Switch Blank for BUS
595BJW	None	BC PROG, DIESEL PART FILTER ID 2010 Level Indicator
595BJX	None	BC PROG, XFER CASE 2 SPD W/2007 V8
595BJY	None	BC PROG, TRACTION CONTROL IND (Wabco ATC ENABLE/DISABLE) 2010, With Traction Warning Light, for Full Power Hydraulic
595BJZ	None	BC PROG, HEADLIGHTS WIG WAG With Bus Pupil Warning Lights
595BKA	None	BC PROG, FULL TIME LIGHTS Provides Head Lights, Park Lights, and Panel Lights when the Engine is Running
595BKB	None	Not Required or Implemented for 2007 BC BC PROG, IDLE MANAGEMENT SYSTEM for Heat/HVAC (Bergstrom)
595BKC	None	Not Required or Implemented for 2007 BC BC PROG, HVAC, In Sleeper (Bergstrom) and Cab (Behr)
595BKD	None	BC PROG, BODY CONTROLLER for Truck Body Controller #2
595BKE	None	BC PROG, BODY CONTROLLER for Bus Body Controller #2
595BKG	None	BC PROG, INTERLOCK WHEELCHAIR 2010 With Indicator Light in Cluster
595BKH	None	BC PROG, INTERLOCK WHEELCHAIR 2010 With Transmission in Park, Indicator Light in Cluster, Bus Only
595BKJ	None	BC PROG, TRANSMISSION PTO Single, for 2010
595BKK	None	BC PROG, TRANSMISSION PTO for 2010; Dual PTO
595BKL	None	BC PROG, ENGINE RETARDER for 2010; Located in Steering Wheel
595BKM	None	BC PROG, ENGINE RETARDER for 2010; With Programmable Levels; Uses On/Off Switch in Steering Wheel and 1/2/3 Switch in Switchpack
595BKN	None	BC PROG, ENGINE COMPRESSION BRAKE with Optional Jake Brake Foot Pedal
595BKX	None	BC PROG, TRACTION CONTROL IND {Bendix ATC ENABLE/DISABLE} With Traction Warning Light, for Air Brakes
595BKY	None	BC PROG, PTO SHIFT for (1) Dash Switch with 30 AMP Relay, for Customer Provided PTO
595BKZ	None	BC PROG, HVAC 2010, In Cab With Remote AC Condenser
595BLA	None	BC PROG, HVAC 2010, In Cab & Sleeper With Remote AC Condenser
595BLB	None	BC PROG, HVAC 2010 in Cab With Remote AC Condenser, with Pinout/Relay Drivers 31 & 32
595BLM	None	BC PROG, HVAC Condenser Pusher Fan Control
595BLN	None	BC PROG, HEADLIGHTS WIG WAG With Highbeam Flash
595BLP	None	BC PROG, HEADLIGHTS WIG WAG With Lowbeam or Highbeam Flash
595BLS	None	BC PROG, AIR SUSP LOAD CONTRL for Tandem Weight Bias Suspension Air Control Valve

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
595BLT	None	BC PROG, SNOW VALVE Engine Air Intake
595BLU	None	BC PROG, REAR AXLE LOAD MONITOR #7 for Tandem Hendrickson HAS 40-6-K
595BLV	None	BC PROG, REAR AXLE LOAD MONITOR #2 for Single HAS 23K
595BLW	None	BC PROG, REAR AXLE LOAD MONITOR #3 for Single IROS Long MSM 12-15.5K
595BLX	None	BC PROG, REAR AXLE LOAD MONITOR #4 for Single IROS Long MSM 18-21K
595BLY	None	BC PROG, REAR AXLE LOAD MONITOR #5 for Single IROS Short MSM 20K
595BLZ	None	BC PROG, REAR AXLE LOAD MONITOR #6 for Tandem Hendrickson HTB 40K
595BMA	None	BC PROG, ROLL STABILLITY PROG {Wabco}
595BMH	None	BC PROG, TRANS HILL START AID for Ultra Shift Plus Transmission
595BMJ	None	BC PROG, FOG LIGHTS REAR ECE R38 Compliant, Red LED
595BMK	None	BC PROG, FOG LIGHTS ECE R19/48 Compliant
595BML	None	BC PROG, DAYTIME RUN/LIGHT ECE R87/48 Compliant
595BMN	None	BC PROG, IND DAY RUN/LIGHTS ECE R48, On Dash
595BMS	None	BC PROG, TRACTION CONTROL IND {Bendix ATC Enable/Disable} with Traction Warning Light, for Air Brakes, with 2010 Cluster
595BMT	None	BC PROG, IND LIGHT AIR BRAKE Pressure Failure
595BMU	None	BC PROG, ADJ SPEED LIMIT Include Switch in Center Panel
595BMV	None	BC PROG, ACCELERATOR INTERLOCK
595BMW	None	BC PROG, UPSHIFT INDICATOR LIGHT
595BMX	None	BC PROG, USER ACTIVATED DATA Logger
595BMY	None	BC PROG, ELECTRICAL LOAD CONTRL 11.8 Volts
595BMZ	None	BC PROG, PARKED REGEN SWITCH 2010, Aftertreatment to Allow Parked Regen Below Light Level for Service Use Only, Do Not Infuse
595BNA	None	BC PROG, BRAKE LT W/Retarder ECE or ADR Compliant; Brake Light ON with Retarder Activated
595BNB	None	BC PROG, DM1 HEARTBEAT for pre 2007 Engines
595BNJ	None	BC PROG, HYDRAULIC BRAKE SPLIT for Hydro Max
595BNN	None	BC PROG, TRANSMISSION PTO Dual PTO, for 2010 with 42 Parameters
595BNP	None	BC PROG, TRANSMISSION PTO, Single PTO, for 2010 with 42 Parameters
595BNY	None	BC PROG, ENGINE FAN WARNING BUZZER
595BPB	None	BC PROG, ENGINE FAN DRIVE Variable Speed
595BPC	None	BC PROG, CRUISE SWITCH DISABLE with Park Brake Set
595BPD	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission not With Power Park or Park Prawl
595BPE	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Park Prawl and Shifter Interlock
595BPG	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Power Park and Shifter Interlock
595BPK	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable and Park Prawl and Shifter Interlock
595BPK	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable not With Power Park or Park Prawl
595BPM	None	BC PROG, PRNDL with 1000/2000 6 SPD Transmission With Sixth-Gear Disable and Power Park and Shifter Interlock
None	595006	Not Required or Implemented for 2007 BC
None	595010	Not Required or Implemented for 2007 BC
None	595013	Not Required or Implemented for 2007 BC
None	595020	Not Required or Implemented for 2007 BC
None	595025	Not Required or Implemented for 2007 BC
None	595026	Not Required or Implemented for 2007 BC
None	595027	Not Required or Implemented for 2007 BC
None	595028	Not Required or Implemented for 2007 BC
None	595029	Not Required or Implemented for 2007 BC
None	595035	Not Required or Implemented for 2007 BC
None	595036	Not Required or Implemented for 2007 BC
None	595042	Not Required or Implemented for 2007 BC
None	595045	Not Required or Implemented for 2007 BC
None	595046	Not Required or Implemented for 2007 BC
None	595049	Not Required or Implemented for 2007 BC
None	595050	Not Required or Implemented for 2007 BC

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595054	Not Required or Implemented for 2007 BC
None	595057	Not Required or Implemented for 2007 BC
None	595058	Not Required or Implemented for 2007 BC
None	595059	Not Required or Implemented for 2007 BC
None	595064	Not Required or Implemented for 2007 BC
None	595065	Not Required or Implemented for 2007 BC
None	595068	Not Required or Implemented for 2007 BC
None	595070	Not Required or Implemented for 2007 BC
None	595071	Not Required or Implemented for 2007 BC
None	595072	Not Required or Implemented for 2007 BC
None	595073	Not Required or Implemented for 2007 BC
None	595074	Not Required or Implemented for 2007 BC
None	595076	Not Required or Implemented for 2007 BC
None	595077	Not Required or Implemented for 2007 BC
None	595078	Not Required or Implemented for 2007 BC
None	595079	Not Required or Implemented for 2007 BC
None	595080	Not Required or Implemented for 2007 BC
None	595081	Not Required or Implemented for 2007 BC
None	595082	Not Required or Implemented for 2007 BC
None	595084	Not Required or Implemented for 2007 BC
None	595085	Not Required or Implemented for 2007 BC
None	595088	Not Required or Implemented for 2007 BC
None	595089	Not Required or Implemented for 2007 BC
None	595090	Not Required or Implemented for 2007 BC
None	595094	Not Required or Implemented for 2007 BC
None	595095	Not Required or Implemented for 2007 BC
None	595096	Not Required or Implemented for 2007 BC
None	595098	Not Required or Implemented for 2007 BC
None	595101	Not Required or Implemented for 2007 BC
None	595102	Not Required or Implemented for 2007 BC
None	595103	Not Required or Implemented for 2007 BC
None	595104	Not Required or Implemented for 2007 BC
None	595109	Not Required or Implemented for 2007 BC
None	595117	Not Required or Implemented for 2007 BC
None	595123	Not Required or Implemented for 2007 BC
None	595124	Not Required or Implemented for 2007 BC
None	595128	Not Required or Implemented for 2007 BC
None	595131	Not Required or Implemented for 2007 BC
None	595132	Not Required or Implemented for 2007 BC
None	595133	Not Required or Implemented for 2007 BC
None	595134	Not Required or Implemented for 2007 BC
None	595135	Not Required or Implemented for 2007 BC
None	595136	Not Required or Implemented for 2007 BC
None	595138	Not Required or Implemented for 2007 BC
None	595139	Not Required or Implemented for 2007 BC
None	595140	Not Required or Implemented for 2007 BC
None	595141	Not Required or Implemented for 2007 BC
None	595142	Not Required or Implemented for 2007 BC
None	595144	Not Required or Implemented for 2007 BC
None	595147	Not Required or Implemented for 2007 BC
None	595148	Not Required or Implemented for 2007 BC
None	595149	Not Required or Implemented for 2007 BC
None	595152	Not Required or Implemented for 2007 BC
None	595154	Not Required or Implemented for 2007 BC
None	595169	Not Required or Implemented for 2007 BC
None	595176	Not Required or Implemented for 2007 BC
None	595177	Not Required or Implemented for 2007 BC
None	595187	Not Required or Implemented for 2007 BC
None	595194	Not Required or Implemented for 2007 BC
None	595195	Not Required or Implemented for 2007 BC

CROSS REFERENCE

2007 BC 595 CODE	ESC 595 CODE	POST 2007 Feature Description
All denotes 2000, DuraStar, WorkStar, 8000, Bus and Prostar Models		
None	595199	Not Required or Implemented for 2007 BC
None	595204	Not Required or Implemented for 2007 BC
None	595207	Not Required or Implemented for 2007 BC
None	595209	Not Required or Implemented for 2007 BC
None	595220	Not Required or Implemented for 2007 BC
None	595222	Not Required or Implemented for 2007 BC
None	595229	Not Required or Implemented for 2007 BC
None	595233	Not Required or Implemented for 2007 BC
None	595234	Not Required or Implemented for 2007 BC
None	595235	Not Required or Implemented for 2007 BC
None	595242	Not Required or Implemented for 2007 BC
None	595243	Not Required or Implemented for 2007 BC
None	595247	Not Required or Implemented for 2007 BC
None	595256	Not Required or Implemented for 2007 BC
None	595280	Not Required or Implemented for 2007 BC
None	595281	Not Required or Implemented for 2007 BC
None	595289	Not Required or Implemented for 2007 BC
None	595302	Not Required or Implemented for 2007 BC
None	595303	Not Required or Implemented for 2007 BC
None	595304	Not Required or Implemented for 2007 BC
None	595309	Not Required or Implemented for 2007 BC
None	595310	Not Required or Implemented for 2007 BC
None	595311	Not Required or Implemented for 2007 BC
None	595320	Not Required or Implemented for 2007 BC
None	595341	Not Required or Implemented for 2007 BC
None	595342	Not Required or Implemented for 2007 BC
None	595347	Not Required or Implemented for 2007 BC

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