

MaxxForce[®] DT, 9, 10 (2010)

Overview: Remote Engine Speed Control

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General Overview: Remote Engine Speed Control

The Remote Engine Speed Control (RESC) feature allows the operator to set and maintain a constant engine speed from outside the vehicle cab. This feature may also be known as Remote Accelerator Pedal Position (RAPP). Control over engine speed is accomplished by using remote mounted switches to turn on the RESC and select the desired engine speed.

The RESC feature includes two additional switches (remote preset & remote variable) which allow the operator to choose the mode of engine speed control operation.

This document will address unique remote engine speed control functionality for the MaxxForce® DT, 9, 10.

Description and Operation

The RESC feature remotely provides the operator engine speed control to any installed auxiliary devices. This remote control panel is located outside of the cab by the installer of the auxiliary device.

Operation

The operational control of the RESC feature consists of 4 switches located on a control panel outside the cab of the vehicle:

- **“Remote Preset”** switch allows the driver to enable or disable the remote preset Power Take Off (PTO) functionality.
- **“Remote Variable”** switch allows the driver to enable or disable the remote variable PTO functionality.
- **“Resume/Accel”** switch allows the operator to ramp up the engine or cycle through the presets.
- **“Set/Coast”** switch allows the operator to ramp down the engine or cycle through the presets.

The following visual indications may also be remotely mounted and are used in conjunction with RESC:

- Amber Warning Lamp (AWL)
- Red Stop Lamp (RSL)
- Engine Running Output

Remote Preset Switch (RPRE)

Remote preset engine speed control allows the operator to select up to 6 preset engine speeds from outside the cab while the vehicle is stationary.

Remote Variable Switch (RVAR)

Remote variable allows the operator to select any engine speed within the PTO boundaries using controls and a physical switch located outside the cab.

Remote Pedal

This optional feature gives the operator control of the engine speed outside the cab similar to that of the in-cab accelerator pedal.

Split-Shaft PTO

This optional feature is used in conjunction with RESC and is targeted for applications that use a transfer case or auxiliary driveshaft.

Feature Interaction

The RESC feature interacts with the following engine features:

- In-Cab Engine Speed Control
- Engine Cooling Fan
- Idle Shutdown Timer (IST)
- Cold Ambient Protection (CAP)

Programmable Parameters

The following programmable parameters are required for RESC and PTO operation. These parameters should be programmed to the engine speed control operation which will best suit the vehicle conditions expected.

Parameters indicated as “Customer Programmable” can be adjusted differently than the production assembly plant setting to meet the customer’s needs. If the parameter is indicated as non-customer programmable, the parameter setting is preset from the factory and can’t be changed without authorization.

NOTE: There are multiple available RESC configurations. Please see the Parameter Setup section for a few examples and specific setup instructions.

Parameters for Remote Pedal Configurations

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control – Remote Pedal Enable (7504)	This parameter sets the driveline mode for PTO operation: NOTE: Set to 1 if engine speed is to be controlled by remote throttle pedal.	0: Disable 1: Enable	YES	Customer Chosen
Aux Throttle Control – Mode (7500)	This parameter determines the conditions that the Engine Speed Control (PTO) feature will be functional. Set this parameter to enable PTO operation and to choose which inputs are used for control. <ul style="list-style-type: none"> • If set to (0) – The PTO functionality is disabled. • If set to (2) – Only the in-cab inputs will be able to control PTO. • If set to (3) – Both remote and in-cab inputs will be able to control PTO (See Note 1 & 2). • If set to (1) – Only the remote PTO inputs will be able to control PTO (See Note 2). Note 1: The last input received will take priority when Mode 3 is selected. Note 2: Mode 1 or 3 must be selected to use either the Remote Throttle Pedal or the Remote PTO switches (RPRE and RVAR)	0: Disable 1: Remote Operation Only 2: In Cab Operation Only 3: Remote and In Cab Operation	YES	Customer Chosen

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control – In Cab Mode (7502)	<p>Set this parameter after selecting In-Cab Or Remote and In-Cab Operation to determine which PTO mode is active.</p> <ul style="list-style-type: none"> • If set to (0) – The switches will not be used. • If set to (1) – The switches will be used to select up to 6 preset engine speeds. Refer to the Stationary Preset section for more information. • If set to (2) – The switches will be used to adjust the engine speed variably. Refer to the Stationary Variable section for more information. • If set to (3) – The switches will be used to adjust the engine speed to a desired set point to allow for vehicle movement. Refer to the Mobile Variable section for more information. 	<p>0: None 1: Stationary Preset 2: Stationary Variable 3: Mobile Variable</p>	YES	Customer Chosen
Aux Throttle Control – In Cab Operator Interface (7503)	<p>Select this parameter when accelerator, brake or clutch is desired to be ignored during engine speed control operation.</p> <ul style="list-style-type: none"> • If set to (0) – The accelerator, brake, and clutch are inputs used for PTO operation. • If set to (1) – The accelerator, brake, and clutch will be ignored during PTO operation. <p>Note: Use parameters (7510), (7511) and (7513) to provide the specific input options.</p>	<p>0: Enable 1: Disable</p>	YES	Customer Chosen
Aux Throttle Control – Preset Engine Speed 1 (SET/ COAST) (7505)	<p>This parameter sets the running engine speed set point that will be maintained when the first PTO preset speed is selected OR when SET/COAST is pressed.</p> <p>Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.</p>	<p>Range must be less than-the following setting:</p> <ul style="list-style-type: none"> • Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control – Preset Engine Speed 2 (RESUME/ACCEL) (7506)	<p>This parameter sets the running engine speed set point that will be maintained when the first PTO preset speed is selected OR when RESUME/ACCEL is pressed.</p> <p>Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.</p>	<p>Range must be less than-the following setting:</p> <ul style="list-style-type: none"> • Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control – Ramp Rate (7507)	<p>This parameter sets the speed at which the engine will attempt to increase the engine speed.</p> <p>Note 1: The engine only attempts to increase the engine speed at this rate because actual engine changes are influenced by other factors such as engine load and available engine power.</p> <p>Note 2: This parameter should be set to provide a smooth transition to the desired engine speed to accommodate applicable PTO equipment.</p>	1 – 1500 RPM	YES	100 rpm/sec (default)
Aux Throttle Control – Maximum Engine Speed (7508)	<p>The maximum engine speed that can be reached using any PTO controls.</p> <p>Note 1: This parameter must be set properly to protect PTO related equipment.</p>	Low Idle – High Idle RPM	YES	Customer Chosen (See Note 1)

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control - Return to Zero (7513)	This parameter set the return to Zero requirements for the Remote Pedal.	0: Return to Zero Required 1: Return to Zero Not Required	YES	Customer Chosen

Parameters for Preset Engine Speed PTO Configurations

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control - Preset Engine Speed 1 (SET/ COAST) (7505)	This parameter sets the running engine speed set point that will be maintained when the first (1 st) PTO preset speed is selected OR when SET/ COAST is pressed. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than-the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control - Preset Engine Speed 2 (RESUME/ ACCEL) (7506)	This parameter sets the running engine speed set point that will be maintained when the second (2 nd) PTO preset speed is selected OR when RESUME/ ACCEL is pressed. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than-the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control - Preset Engine Speed 3 (7509)	This parameter sets the running engine speed set point that will be maintained when the third (3 rd) PTO preset speed is selected OR when SET/ COAST is pressed twice. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than-the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control - Preset Engine Speed 4 (7510)	This parameter sets the running engine speed set point that will be maintained when the fourth (4 th) PTO preset speed is selected OR when RESUME/ ACCEL is pressed twice. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than-the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control – Preset Engine Speed 5 (7511)	This parameter sets the running engine speed set point that will be maintained when the fifth (5 th) PTO preset speed is selected OR when SET/ COAST is pressed three times. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)
Aux Throttle Control – Preset Engine Speed 6 (7512)	This parameter sets the running engine speed set point that will be maintained when the sixth (6 th) PTO preset speed is selected OR when RESUME/ ACCEL is pressed three times. Note 1: Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be less than the following setting: <ul style="list-style-type: none"> Aux Throttle Control - PTO Maximum Engine Speed (7508) 	YES	Customer Chosen (See Note 1)

Parameters for PTO Override Configurations

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control – SPDT Enable (7519)	This programmable parameter allows the operator to use a single switch to activate PTO PRESET 1 or 2. NOTE 1: After PTO/ RPTO has been enabled, PTO and/ or RPTO will require a transition in the state of the PTO control switches (CC RESUME/ SET, or RVAR/ RPRE switches) to transition to a new PRESET mode from the current state. For example, a transition in the state of the PTO control switches would require a release of the CC SET switch then re-activation to transition from PRESET 1 to PRESET 3 while CC ON remains active. NOTE 2: A combination of ON, RVAR or RPRE with SET will select PRESET1. A combination of ON, RVAR, or RPRE with RESUME will select PRESET 2.	0: Disable the ability to activate the PTO enable signal (CC/PTO On, RPRE, RVAR) at the same time as the PTO incrementing signal (Set, Resume) 1: Enable the ability to activate the PTO enable signal (CC/PTO On, RPRE, RVAR) at the same time as the PTO incrementing signal (Set, Resume)	YES	Customer Chosen
Aux Throttle Control – Enable RP Overrides (7525)	This parameter allows the operator to enable or disable RP overrides.	0: Disable 1: Enable	YES	Customer Chosen

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control – Disable RP with Service Brake (7520)	This parameter allows operator to set the Service Brake to disable the Remote PTO.	0: Service Brake Disables Remote Pedal Switch 1: Service Brake Does Not Change Remote Pedal Switch	YES	Customer Chosen
Aux Throttle Control – Disable RP with Parking Brake Released (7521)	This parameter allows the use of PTO without requiring the parking brake set. Note: Depending on the calibration; some calibrations have the Parking Brake interactions with Remote PTO disabled permanently.	0: Parking Brake Disables Remote Pedal Switch 1: Parking Brake Does Not Change Remote Pedal Switch	YES	Customer Chosen
Aux Throttle Control – Disable RP with Driveline Status (7522)	This parameter allows the use of Remote PTO without requiring the Driveline Status indicate ‘driveline disengaged’. Note: For Automatic transmissions, ‘Driveline Status’ refers to the gear selector; moving the gear selector from the Park/ Neutral position will cancel the current Remote PTO mode. For Manual transmissions, ‘Driveline Status’ refers to the clutch switch or gear selector status; pressing the clutch or moving the gear selector from ‘Neutral’ will cancel the current Remote PTO mode.	0: Driveline Status Disables Remote Pedal Switch 1: Driveline Status Does Not Change Remote Pedal Switch	YES	Customer Chosen
Aux Throttle Control – Disable RP with In-Cab Controls (7523)	This parameter allows operator to disable the RP with In Cab Controls.	0: In- Cab Controls Disables Remote Pedal Switch 1: In- Cab Controls Do Not Change Remote Change Remote Pedal Switch	YES	Customer Chosen
Aux Throttle Control – Disable RP with Vehicle Speed (7524)	This parameter allows Remote PTO to be disabled with vehicle speed.	0: Vehicle Speed Limit Disables Remote Pedal Switch 1: Vehicle Speed Limit Does Not Change Remote Pedal Switch	YES	Customer Chosen

Parameters for Split Shaft PTO Configurations

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Driveline Status for Hydraulic Pressure Governor Operation (9301)	<p>This parameter sets the driveline mode for PTO operation:</p> <ul style="list-style-type: none"> If set to (0) – The ECM receives vehicle speed via SAE J1939 or hardwired from the transmission output shaft - vehicle speed sensor input. <p>NOTE: The driveline must be disengaged at all times for operation of the split shaft feature.</p> <ul style="list-style-type: none"> If set to (1) and the transfer case is engaged – The ECM receives wheel-based vehicle speed via SAE J1939 from the anti-lock brake system (ABS). <p>NOTE: A transition in driveline status will cause the split shaft feature to be deactivated.</p>	<p>0: Neutral Operation</p> <p>1: Split Shaft Operation</p>	YES	Customer Chosen NOTE: Must be set to 1 if Split Shaft operation is desired.
Vehicle Speed Source Selection When Split Shaft is Active (9307)	<p>This parameter allows the operator to select the vehicle speed display.</p> <ul style="list-style-type: none"> If set to (0) – The ECM will transmit vehicle speed to the cluster based on the SAE J1939 output from the anti-lock brake system (ABS), the speedometer will not display a vehicle speed unless the vehicle wheels are rotating. If set to (1) – The ECM will transmit vehicle speed to the cluster based on the signal from the transmission output shaft speed sensor, the speedometer will display a vehicle speed while the split shaft mode is operational based on the output shaft speed. 	<p>0: Wheel speed selected when split shaft is enabled</p> <p>1: Output shaft speed selected when split shaft is enabled</p>	YES	Customer Chosen

Parameter Setup

Possible RESC Applications:

The RESC feature is application specific. This section briefly describes a few examples of RESC configuration and operation. This configuration will likely need to be modified to meet the needs of the actual application that the owner/operator requires.

Please review the description and operation section and the programmable parameters for a better understanding of how the various RESC parameters might be best configured for your vehicle.

EXAMPLE A - Typical Split - Shaft Scenario

Typical split-shaft applications may include fire pump, sewer evacuation, etc.

This example is applicable for general split-shaft operation using stationary PTO mode and with preset (s) for elevated engine speed. The presets are activated remotely OR via the cruise control switches.

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (7500)	Select 3: Enabled - Remote and In Cab Operation
Aux Throttle Control - In Cab PTO Mode (7502)	Select one of the following: 0: None 1: Stationary Preset 2: Stationary Variable 3: Mobile Variable
Driveline Status for Hydraulic Pressure Governor Operation (9301)	Select 1: Split Shaft Operation
Aux Throttle Control - Remote Pedal Enable (7504)	Select 0: Disable 1: Enable
(Optional) - Aux Throttle Control - Preset Engine Speed 1 (SET/COAST) (7505)	Set this to 900
(Optional) - Aux Throttle Control - Preset Engine Speed 2 (RESUME/ ACCEL) (7506)	Set this to 1100
(Optional) - Aux Throttle Control - Preset Engine Speed 3 (7509)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 4 (7510)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 5 (7511)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 6 (7512)	Set this to 0
(Optional) - Aux Throttle Control - In Cab Operator Interface (7503)	Select 1: Disable NOTE: The accelerator, brake, and clutch will be ignored during PTO operation.
(Optional) - Aux Throttle Control - Maximum Engine Speed (7508)	Check the recommendations for the PTO equipment.

Operation:

1. Ensure that the vehicle is completely stopped and that the parking brake is set.
2. Place the transmission in neutral.
3. Engage the split-shaft mechanism.
4. Place the transmission into the appropriate drive gear. Refer to the appropriate transmission documentation for specific instructions (Eaton, Allison, etc.).
5. Continue with desired engine speed control operation.

EXAMPLE B - Typical Utility Bucket Truck

Typical utility bucket applications may include tree trimmers, lineman bucket trucks, lamp repair trucks, etc.

This example is applicable for general utility bucket operation using a mechanical PTO with preset(s) for elevated engine speed for a stabilizing outrigger. The presets are activated remotely OR via the cruise control switches.

■ *NOTE: Propane trucks and tow trucks may use similar settings.*

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (7500)	Select 3 : Enabled - Remote and In Cab Operation
Aux Throttle Control - In Cab PTO Mode (7502)	Select one of the following: 0 : None 1 : Stationary Preset 2 : Stationary Variable
Driveline Status for Hydraulic Pressure Governor Operation (9301)	Select 0 : Neutral Operation
Aux Throttle Control - Remote Pedal Enable (7504)	Select 0 : Disable
(Optional) - Aux Throttle Control - Preset Engine Speed 1 (SET/COAST) (7505)	Set this to 900
(Optional) - Aux Throttle Control - Preset Engine Speed 2 (RESUME/ACCEL) (7506)	Set this to 1100
(Optional) - Aux Throttle Control - Preset Engine Speed 3 (7509)	Set this to 0
(Optional) - Aux Throttle Control - - Preset Engine Speed 4 (7510)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 5 (7511)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 6 (7512)	Set this to 0
(Optional) - Aux Throttle Control - In Cab Operator Interface (7503)	Select 1 : Disable NOTE : The accelerator, brake, and clutch will be ignored during PTO operation.
(Optional) - Aux Throttle Control - Maximum Engine Speed (7508)	Check the recommendations for the PTO equipment.

Operation:

1. Engage the mechanical PTO device.
2. Ramp the engine to the desired preset speed according to the equipment.
3. Continue with desired utility bucket operation.

EXAMPLE C - Typical Utility Derrick Digger

Derrick diggers are commonly used for digging holes for utility poles, ditches, etc.

This example is applicable for general utility derrick digger operation using a mechanical PTO with preset (s) for elevated engine speed for a stabilizing outrigger, variable engine speed control and remote pedal for digging from the perch. The presets are activated remotely OR via the cruise control switches.

NOTE: Oil field trucks may use similar settings.

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (7500)	Select 3: Enabled - Remote and In Cab Operation
Aux Throttle Control - In Cab PTO Mode (7502)	Select one of the following: 0: None 1: Stationary Preset 2: Stationary Variable
Driveline Status for Hydraulic Pressure Governor Operation (9301)	Select 0: Neutral Operation
Aux Throttle Control - Remote Pedal Enable (7504)	Select 1: Enable
(Optional) - Aux Throttle Control - Preset Engine Speed 1 (SET/COAST) (7505)	Set this to 620
(Optional) - Aux Throttle Control - Preset Engine Speed 2 (RESUME/ACCEL) (7506)	Set this to 1200
(Optional) - Aux Throttle Control - Preset Engine Speed 3 (7509)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 4 (7510)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 5 (7511)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 6 (7512)	Set this to 0
(Optional) - Aux Throttle Control - In Cab Operator Interface (7503) Select this parameter when accelerator, brake or clutch is desired to be ignored during engine speed control operation. If set to 0 : The accelerator, brake, and clutch are inputs used for PTO operation. If set to 1 : The accelerator, brake, and clutch will be ignored during PTO operation. Note: Use parameters (7520) through (7525) to provide the specific input options.	Select 0: ON or 1: OFF
(Optional) - Aux Throttle Control - Maximum Engine Speed (7508)	Check the recommendations for the PTO equipment.

Operation:

1. Engage the mechanical PTO device.
 2. Activate remote preset engine speed.
 3. Operate outriggers.
 4. REMOTE CONTROL: a. Activate remote variable, b. Operate digger (adjusting engine speed variably as required)
- OR -
5. PEDESTAL: a. Activate remote pedal, b. Operate digger

EXAMPLE D - Typical Construction Dump Scenario

Typical construction dump applications may include dump bodies, landscape dumps, etc.

This example is applicable for general construction dump operation using a mechanical PTO with preset (s) for elevated engine speed for raising and lowering the dump body. The presets are activated remotely OR via the cruise control switches.

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (7500)	Select 3: Enabled - Remote and In Cab Operation.
Aux Throttle Control - In Cab PTO Mode (7502)	Select one of the following: 0: None 1: Stationary Preset 2: Stationary Variable 3: Mobile Variable
Driveline Status for Hydraulic Pressure Governor Operation (9301)	Select 0: Neutral Operation
Aux Throttle Control - Remote Pedal Enable (7504)	Select 0: Disable
(Optional) - Aux Throttle Control - Preset Engine Speed 1 (SET/COAST) (7505)	Set this to 1100
(Optional) - Aux Throttle Control - Preset Engine Speed 2 (RESUME/ACCEL) (7506)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 3 (7509)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 4 (7510)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 5 (7511)	Set this to 0
(Optional) - Aux Throttle Control - Preset Engine Speed 6 (7512)	Set this to 0
(Optional) - Aux Throttle Control - In Cab Operator Interface (7503) Select this parameter when accelerator, brake or clutch is desired to be ignored during engine speed control operation. If set to 0: The accelerator, brake, and clutch are inputs used for PTO operation. If set to 1: The accelerator, brake, and clutch will be ignored during PTO operation. Note: Use parameters (7520) through (7525) to provide the specific input options.	Select 0: ON or 1: OFF
(Optional) - Aux Throttle Control - Maximum Engine Speed (7508)	Check the recommendations for the PTO equipment.

Operation:

1. Engage the mechanical PTO device.
2. Ramp the engine to the desired preset speed according to the equipment.
3. Continue with desired construction dump body operation.

Frequently Asked Questions

Can the RESC feature be used for split-shaft operation, such as a fire pump application?

Yes, refer to the Split-Shaft PTO section and Example A in the Parameter Setup section for more information.

How do I configure my engine parameters for utility derrick digger operation?

Refer to “Example C” in the Parameter Setup section for more information.

Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
CAP	Cold Ambient Protection
ECM	Engine Control Module
IST	Idle Shutdown Timer
PTO	Power Take Off
RAPP	Remote Accelerator Pedal Position
RAS	Resume/ Acela Switch
RESC	Remote Engine Speed Control
RPRE	Remote Preset Power Take Off
SCS	Speed Control Switch
VSS	Vehicle Speed Sensor