



Electric Medium Vocational



eMV Body Integration Quick Reference Guide
September 2022 Edition

TABLE OF CONTENTS

Preface

Safety

Chassis Diagrams

Chassis Diagrams Link	00-1
MV60E 4x2 Plan View (Example).....	00-3
MV60E Front and Rear View.....	00-4

Frames: 01

Introduction.....	01-1
Frame Information	01-4
Frame Rail Cross-Section.....	01-5
Frame Height Data – Front.....	01-6
Frame and Bump Height Data – Rear	01-6
Overhang Limits for Refuse/Recycler Bodies (MV60E)	01-7
Body Attachment (J-Hook).....	01-8

Brakes: 04

Compressor Box, Air Tank & Air Dryer Location (Top View)	04-1
--	------

Electrical: 08

General Information	08-1
Paint Booth Requirement/Guidelines.....	08-1
12 Volt Battery Box Converter (Front View)	08-2
Battery Controller HV Distribution Module (Top View)	08-3
Battery Thermal Management Unit (Top View)	08-4
Charging Port (Top View)	08-5
Compressor Box, Air Tanks, Air Dryer (Top View)	08-6
Drive Motor (Top View)	08-7
HV Batteries (Top View)	08-8
Power Inverter (Top View)	08-9

Rear Axles & Suspensions: 14

Modifications.....	14-1
--------------------	------

Cab: 16

Aftermarket Cab Modifications	16-1
-------------------------------------	------

Wheels and Tires: 16

Wheels.....	16-1
Tires.....	16-1



PREFACE

FOREWORD

The CT-471 – Body Builder Books are a set of publications of which this Body Builder is a part. The complete set contains information related to the features and specifications for each truck in the International® product line.

Disclaimer

The Body Builder Books provide product information to assist those who wish to modify these products for individual applications. Navistar, Inc. does not recommend or approve any firm or party nor make any judgements on the quality of the work performed by a particular firm or party. 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. Navistar, Inc. cannot accept responsibility for typographical errors which may have occurred. Illustrations are not always to scale and may include optional equipment and accessories but may not include all standard equipment.

Any changes to the fuel delivery and return system may negatively affect the performance of the engine. Should changes be made the installer should verify that those changes still meet the requirements of the engine for proper system performance. Navistar, Inc. cannot accept responsibility for engine performance issues, error messages, or any other issues caused by changes to the fuel delivery and return system. Please contact Navistar, Inc. for information on the engine requirements for the fuel delivery and return system if needed.

International® and the International® logotype are registered trademarks of Navistar, Inc.

CONTACTS



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Medium Duty Application Engineers:

331-332-5733 Select Option “3” for Medium Duty

<https://evaluate.internationaldelivers.com/dealerportal/contact-us>



SAFETY

Everyone who works on an eMV Electric truck must take and pass Safety Training at:

<https://www.navistareducation.com/ihtml/application/student/interface.navistar/indexTEM.htm>

TRAINING REGISTRATION

NAVISTAR
EDUCATION

INTERNATIONAL

IC

Welcome International® Truck Equipment Manufacturers

Welcome

The Navistar® Service Education team welcomes you to Navistar® Education. Please wait to be logged in. If you are having trouble with the log in process, please open a Dealer Education Case File through the iKNow Case File system.

Student Login

Username

Password

Enter

Register

Forgot Password

Dealer Login

Log in with your International® or ICBus® Dealer ID (DY Number).

Dealer Login

s_0001

Student Login

Dealer Login

Log in with your International[®] or ICBus[®] Dealer ID (DY Number).

New Users, please register:

Name *

E-mail *

Company *

Username *

Password * (Select an alphanumeric password of 4-8 characters)

Country USA Canada Other *

Note: Fields marked as * are required.

Privacy Information:
Your username, password and e-mail address allow us to differentiate you from other users and maintain your account. This information will be closely protected and used for internal purposes only. We will never willfully release your personal information to any third party without your express consent.

Disclaimer
These training programs were originally developed for Navistar dealer technicians and may reference programs or systems that are available only to Navistar dealer employees.

SAFETY COURSES

Registered Name

Home
My Current Enrollments
User Information
Course Catalog
My Transcript
Browser Check
Mobile Interface

ANNOUNCEMENTS

ONCOMMAND CONNECTION VIDEOS NEWS LMS USERS GUIDE

LMS REPORTING TUTORIALS

Certification/Certificate Assignments Perc. Compl Prerequisite Certification Title

NAVISTAR EDUCATION

Generations I

Rectangular Sign

s_0003

Select Service Training

Home
My Current Enrollments
User Information
Course Catalog
My Transcript
Browser Check
Mobile Interface

COURSE CATALOG: NAVISTAR TRAINING

filter...

Rectangular Sign

Driver Training **Management Training** **Service Training** **Systems Training**

TIPS for Retail Customers

s_0004

On the next screen select:



s_0005

ELECTRIC VEHICLE - RETAIL

On the COURSE CATALOG: ELECTRIC VEHICLE - RETAIL

Select both Courses:

- High Voltage Safety (9371)
- International eMV Overview and Walkaround (9374)

COURSE CATALOG: ELECTRIC VEHICLE - RETAIL
filter...

High Voltage Safety (9371)
See More Completed Satisfactorily More Info
▶ DUE DATE: N/A
▶ DURATION: 0.10 Hr.
▶ CEUs: 0,02
▶ Next Class: N/A

IC Bus Electric CE Series Overview and Walkaround (9370)
See More Select More Info
▶ DUE DATE: N/A
▶ DURATION: 0.10 Hr.
▶ CEUs: 0,02
▶ Next Class: N/A

International eMV Overview and Walkaround (9374)
See More Completed Satisfactorily More Info
▶ DUE DATE: N/A
▶ DURATION: 0.03 Hr.
▶ CEUs: 0,03
▶ Next Class: N/A

s_0006

Supplementary Safety Information is contained at the end of this document in the

Safety Appendix - eMV Quick Reference Guide - Body

TRAINING

- Other Training is also available on the site
- Recommended additional training is the “TIPS Video”
TIPS: Removing Red Dielectric Enamel Coating (9242)



CHASSIS DIAGRAMS

CHASSIS DIAGRAMS LINK

<https://www.internationaltrucks.com/body-builder/body-resources>

Click on CT471 (highlighted in yellow below)

INTERNATIONAL

TRUCKS

INDUSTRIES

PARTS & SERVICE

RESOURCES

ABOUT



SHOP

BODY BUILDER RESOURCES

Integration Guides and Quick References

CURRENT MODELS

[BODY INTEGRATION QUICK REFERENCE CARD](#)

[ELECTRICAL SYSTEMS INTEGRATION GUIDE HV / MV / LT / RH AND HX JANUARY 12, 2021 AND NEWER](#)

[ELECTRICAL SYSTEMS INTEGRATION GUIDE HX JANUARY 11, 2021 AND OLDER](#)

CURRENT MODELS

[ELECTRICAL SYSTEMS HV AND MV SALES DATA BOOK](#)

[ELECTRICAL SYSTEMS INTEGRATION GUIDE \(CV\)](#)

LEGACY MODELS

[BODY BUILDER ELECTRICAL GUIDE POST 2007 HPV](#)

[BODY BUILDER ELECTRICAL GUIDE PRE 2007 HPV](#)

[2007 DIAMOND LOGIC BODY INTEGRATION QRG \(PARTS\)](#)

[2007 DIAMOND LOGIC ELECTRICAL SYSTEM QRG \(CHANGES\)](#)

CT471 BODY BUILDER


[CT471 BODY BUILDER BOOK](#)


01_0140


Then click on the “eMV Electric Truck” under Configuration Diagrams.


Doc Type: Price List Date:


CT471 Body Builder Books






Commercial Vocational
September 2020


Medium Vocational
Legacy MV - July 2018


Heavy Vocational
Medium Duty Engine
July 2018


Heavy Vocational
Heavy Duty Engine
July 2018









Heavy Extreme
March 2021



**Body Builder Resources/
Electrical Systems**

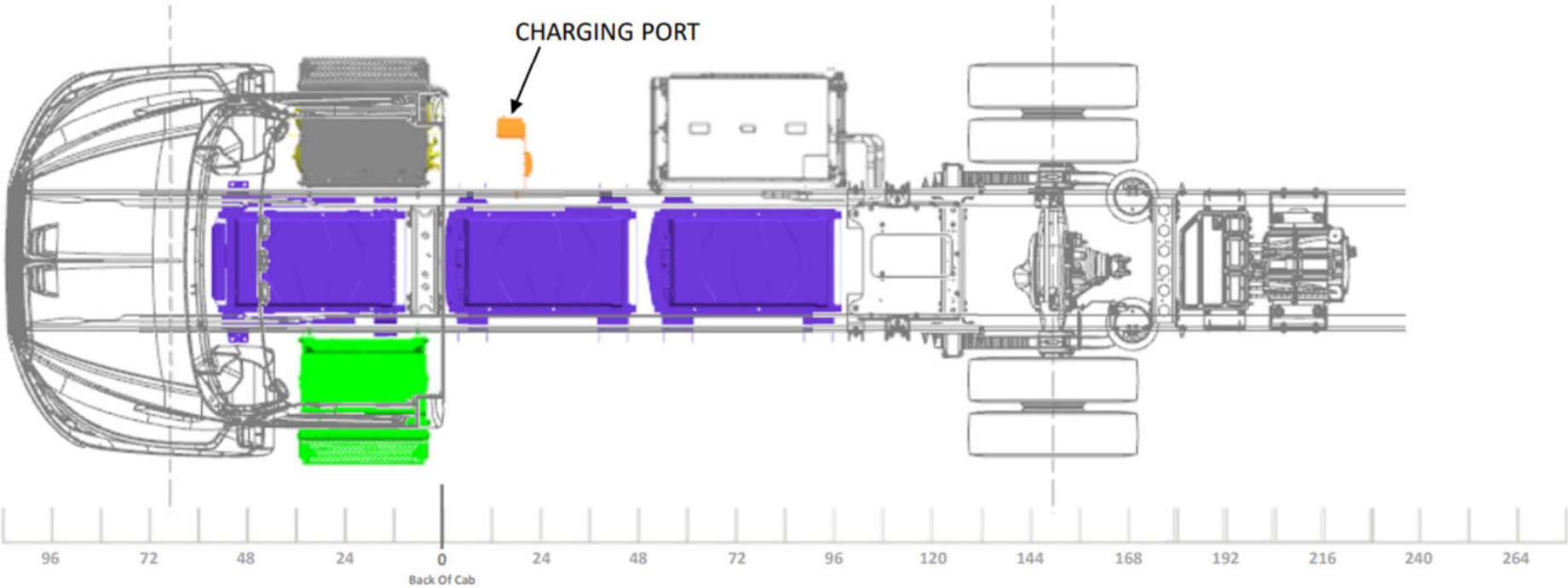
This link will navigate to the
Body Builder Resource Site.

Configuration Diagrams

				
Day Cab Crew Cab	<u>Redesigned MV</u> Day Cab Extended Cab Crew Cab eMV Electric Truck	<u>HV507/HV607</u> Day Cab Extended Cab Crew Cab	<u>HV507 AWD</u> Day Cab Extended Cab Crew Cab	<u>HX520</u> Day Cab Day Cab w/ Pusher Axles 56" Sleeper Cab 73" Sleeper Cab
	 <u>Legacy MV</u> Day Cab Extended Cab Crew Cab	<u>HV507 Bridge</u> <u>Formula</u>	<u>HV607 AWD</u> Day Cab Extended Cab Crew Cab	<u>HX620</u> Day Cab Day Cab w/ Pusher Axles 56" Sleeper Cab 73" Sleeper Cab
	CE Integrated Bus	CE Electric School Bus	RE Integrated Bus	TC Commercial Bus

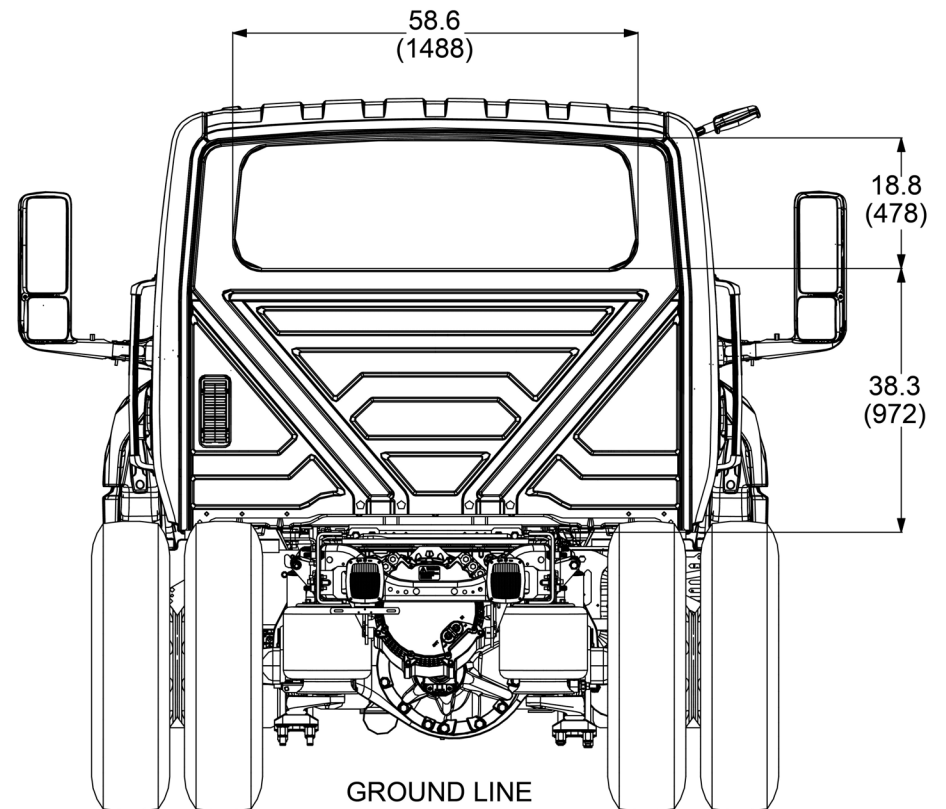
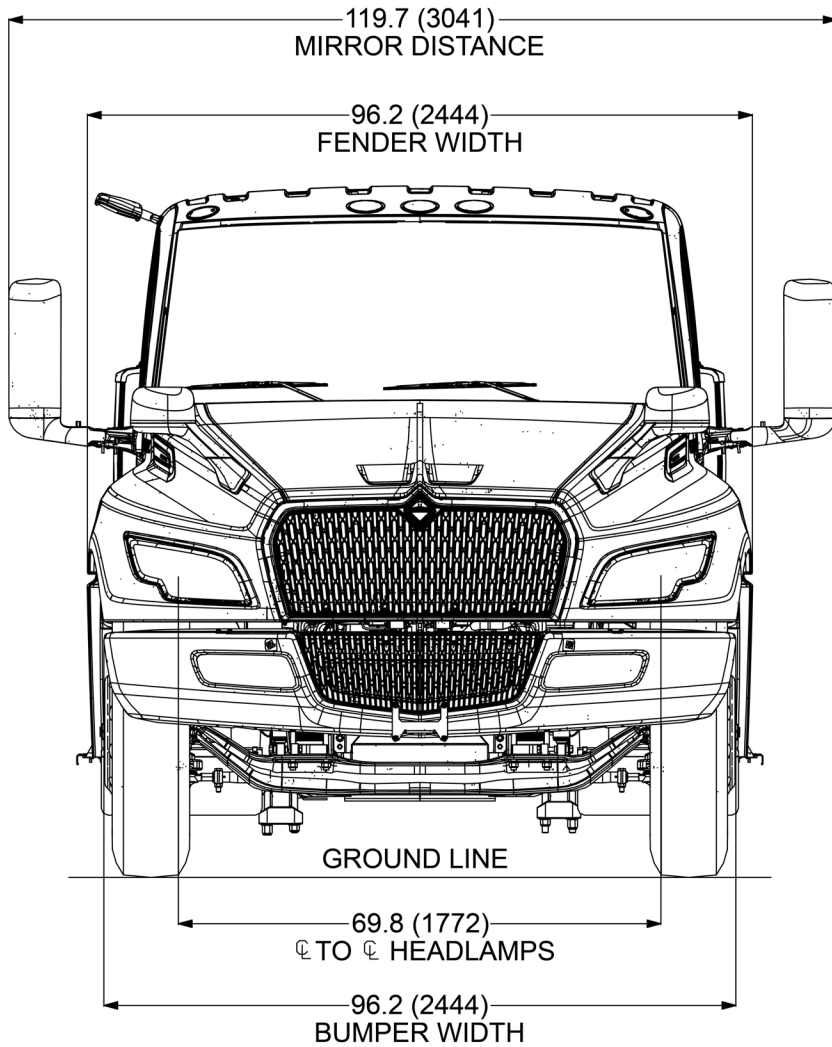
MV60E 4x2 PLAN VIEW (EXAMPLE)

Day Cab WB = 217"



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MV60E FRONT AND REAR VIEW

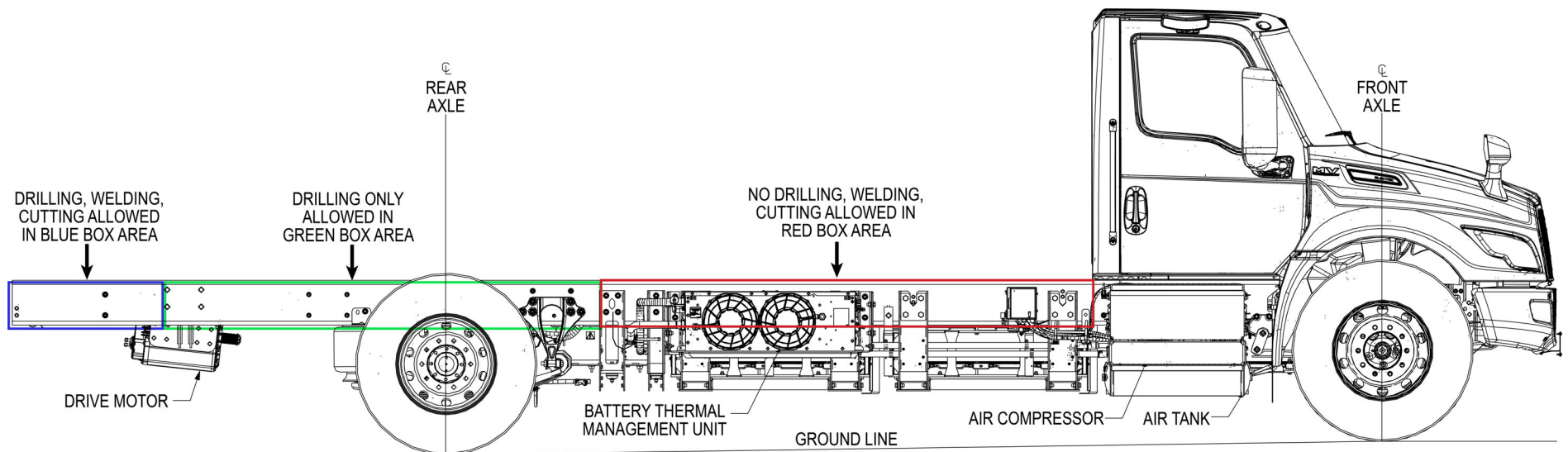


FRAMES

INTRODUCTION

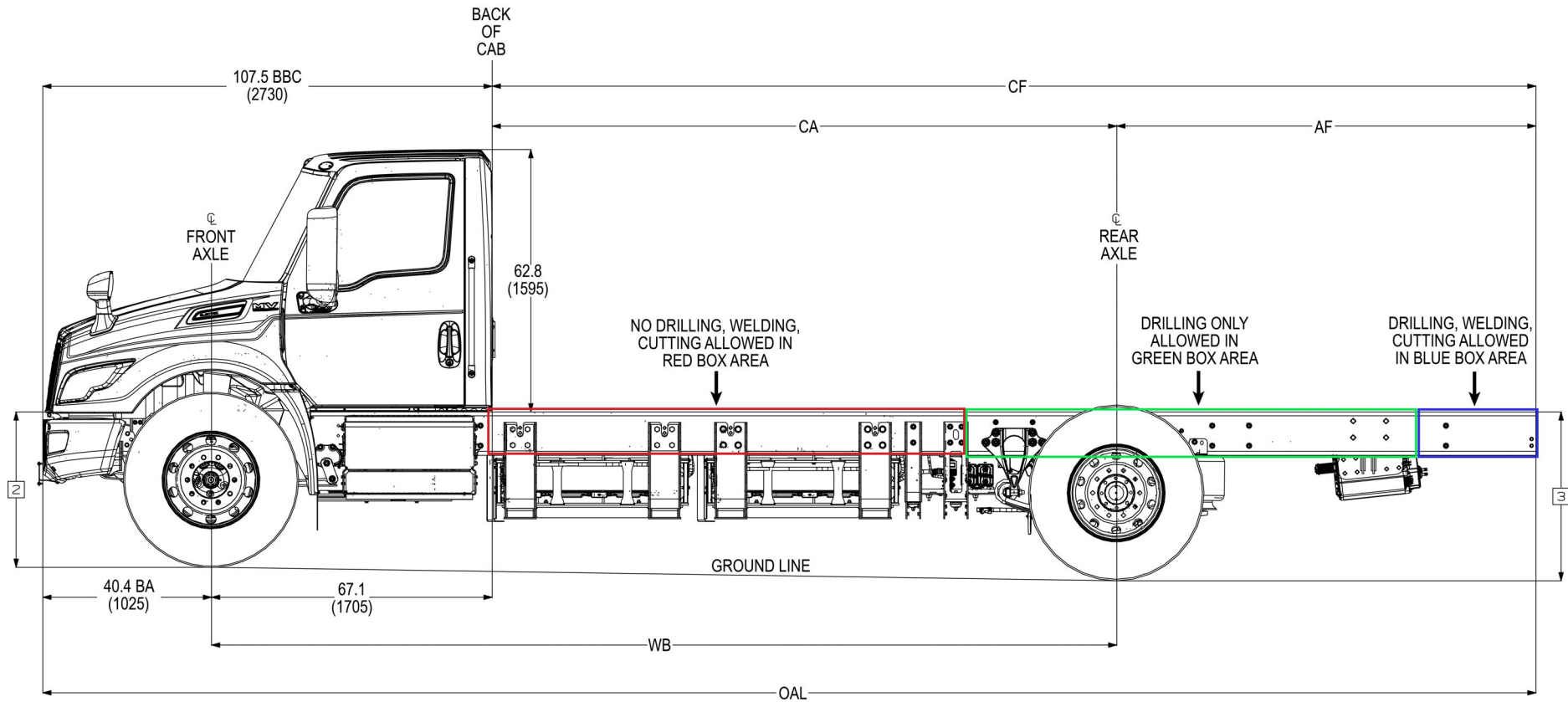
The frame is the structure that carries and supports the rated load under anticipated driving conditions and secures the major components of a vehicle in their relative positions. The frame assembly consists of two sidemembers and depending upon the length of the frame, five or more crossmembers.

RIGHT SIDE VIEW

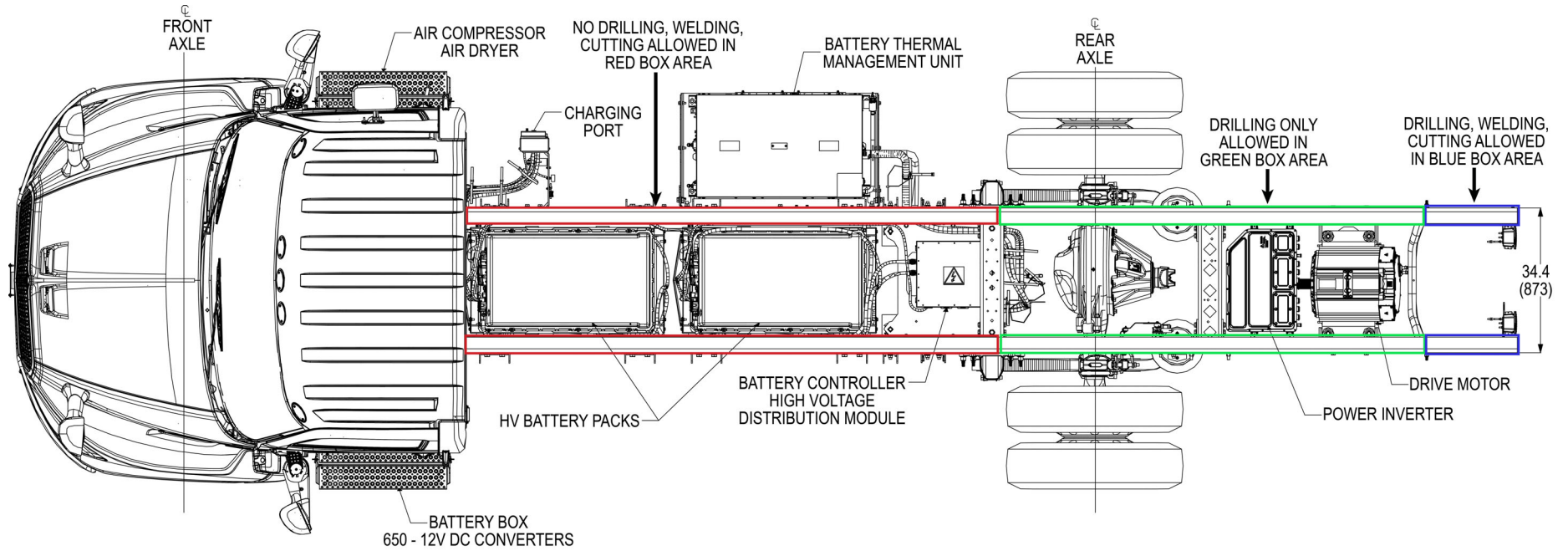


01_0340

LEFT SIDE VIEW



TOP VIEW



01_0342

FRAME INFORMATION

FRAME DAMAGE REPAIR – All Frame Damage Repair Must Be Done by a Navistar Electric Vehicle Certified Dealer.

NO Straightening and/or reinforcing the frame.

NO Frame Alignment

NO Repairing the damaged area and reinforcing the frame side member.

NO Replacing the frame side members and/or cross member

FRAME MODIFICATION

Prohibited Modification on entire truck chassis

Changes in Wheelbase

Reinforcement neither welded nor bolt on to Increase Capacity

Increase in Local Stress

Paint Booth

Under coating or protective coatings or waxes regardless of application, type, or temperature

**PERMITTED WITH RESTRICTIONS NOTED - REFERENCE THE ABOVE
DIAGRAMS**

Drilling or Notching

Welding or Flame Cutting

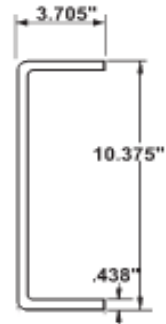
Mechanical Cutting

	Wheel Base	Rear Suspension and Motor	In After Motor
	<u>RED</u> area	<u>GREEN</u> area	<u>BLUE</u> area
Drilling or Notching	N	Y	Y
Welding or Flame Cutting	N	N	Y
Mechanical Cutting	N	N	Y

Reference the above diagrams in the BLUE After Motor area

As long as the electric motor is covered to prevent weld spatter and /or debris from entering the motor housing both cutting the frame behind the electric motor to shorten the frame is acceptable with either sawing or torch cutting. Also welding is acceptable in the after motor section, for example to add a lift gates. Mechanical cutting or sawing is preferred to torch cutting. Whenever it is necessary to cut the frame, the side member should be cut at an angle of 90° to the longitudinal axis.

FRAME RAIL CROSS-SECTION



01CAH

01_0059

Frame Key Code	Side Rail & Reinforcement Descriptions ^[2]						
	Dimensions (inches)			Yield Strength Nominal (psi)	Material #	Section Modulus ^[1]	Resisting Bending Moment (In.-Lbs.)
	Depth	Width	Thickness			Nominal	Design
Straight Channel Side Rail							
01CAH ^[4]	10.375	3.705	0.438	120,000	C	20.11	2,413,200

NOTES:

C = Heat Treated Alloy Steel

[1]=Section Modulus: Nominal calculated using design dimensions; indicates the design load capacity of the frame

[2]=Reinforcement dimensions and specifications are shown in italics

[3]=Rail depth given is for base rail... depth of kick-up in AF section is 6.495"

[4]=Limited to 33,000-lb GVWR

FRAME HEIGHT DATA – FRONT

Front Suspension			Spindle To Bottom Of Frame (in.)		Model
Type	Code	Capacity (lbs)	Unloaded – D _r	Loaded – D _f	
Parabolic	03ADC	12,000	7.50	5.60	MV60E

NOTE: Top of standard frame in model

Frame Code	Frame Description	Frame Rail Height (F)
01CAH	7/16" x 10 3/8" Straight Rail – 120 psi Yield Strength	10.375"

FRAME AND BUMP HEIGHT DATA – REAR

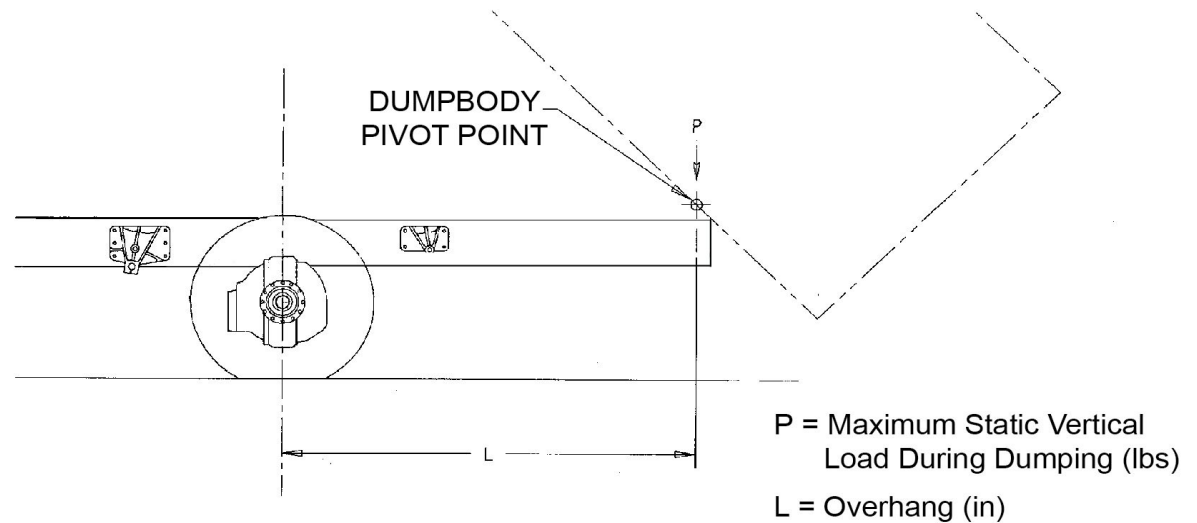
Model	Suspension Code	Rear Suspension		Spindle to Bottom of Sidemember		
		Type	Capacity	Unloaded – D _r	Loaded – D _r '	Bump – D _r "
MV60E	14TDV	Air	21,000	9.25" ± 0.25"	9.25" ± 0.25"	—

OVERHANG LIMITS FOR REFUSE/RECYCLER BODIES (MV60E)

Dump, and other similar pivoting bodies, impose a great deal of stress on the frame rails in the rear suspension area. The body installer has the responsibility for determining the pivot pin load and for establishing operating guidelines to prevent exceeding this load.

The limits shown in this chart are for equal loading on both sidemembers, i.e. the center of gravity of the raised body is ideally centered and the chassis is on solid, level ground. If the center of gravity is laterally offset due either to uneven loading, uneven ground, or both, the bending moment on one of the rails could increase substantially. For this reason the body installer should derate the overhang limits to account for the lateral shift if either of these factors apply.

Suspension	Load "P" (lb)	Overhang "L" (in)
		01CAH (7/16" 120ksi)
Air	6,000	145
	8,000	115
	10,000	93
	12,000	77
	14,000	65
	16,000	57
	18,000	51
	20,000	47
	22,000	43
	24,000	39

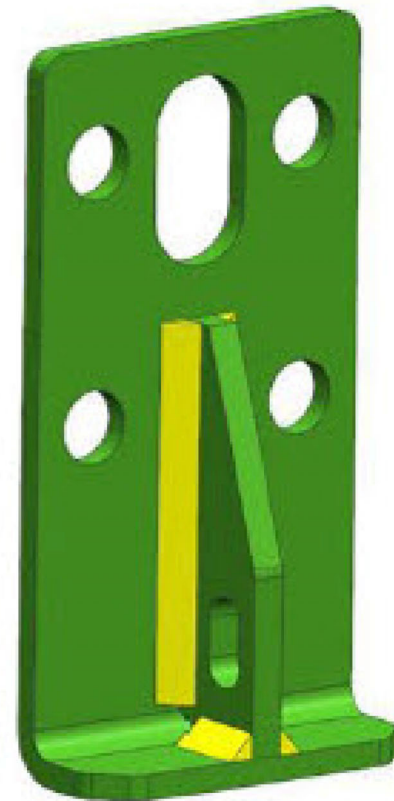
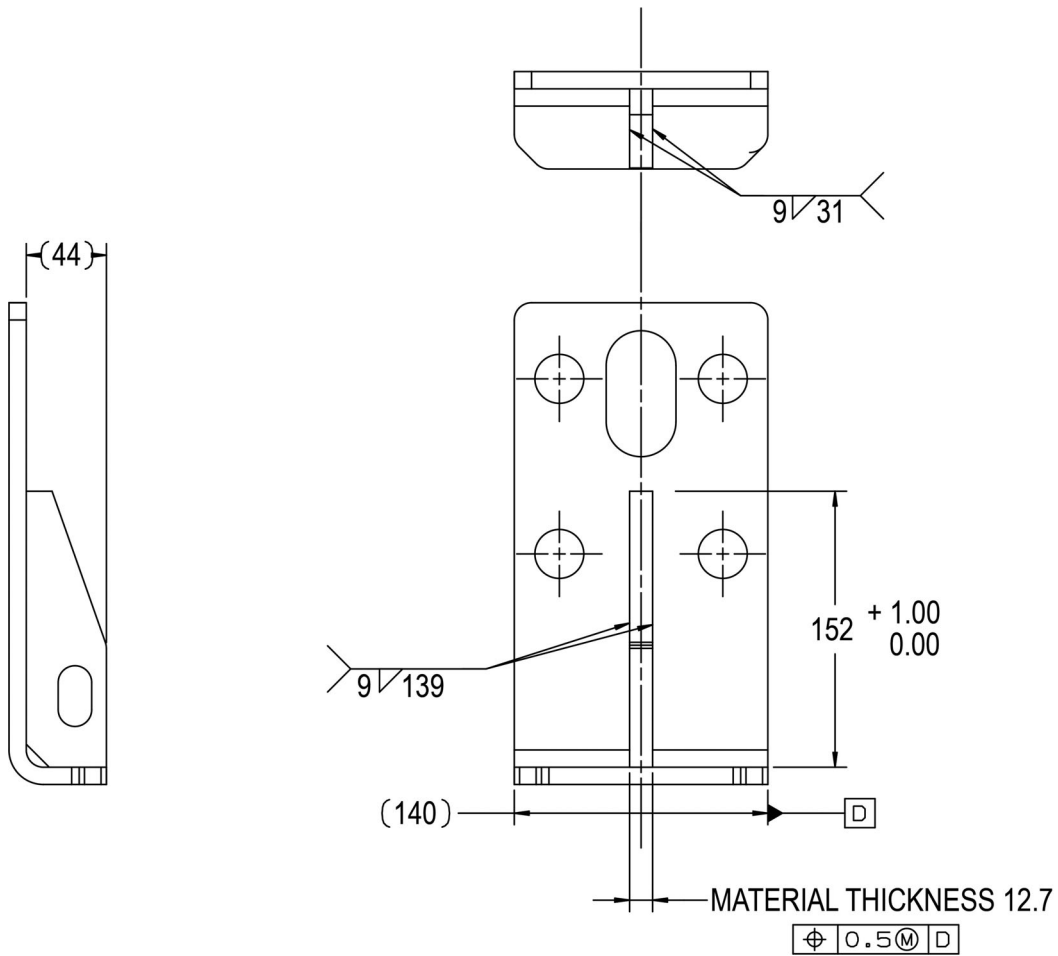


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BODY ATTACHMENT (J-HOOK)

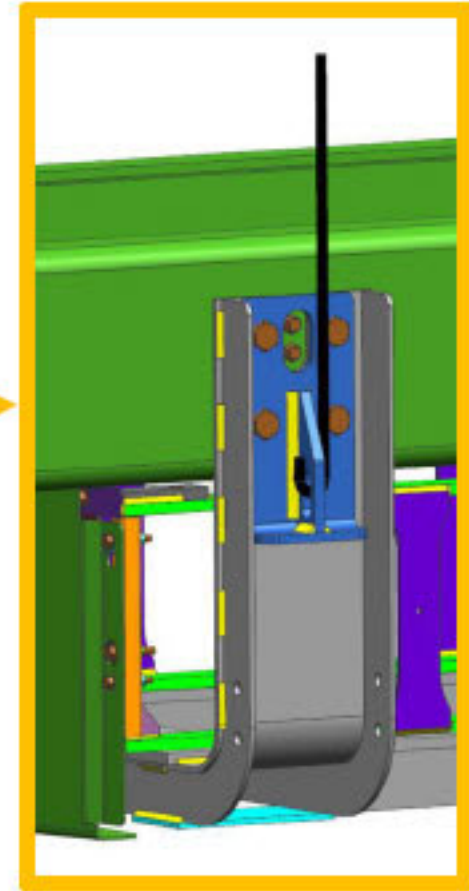
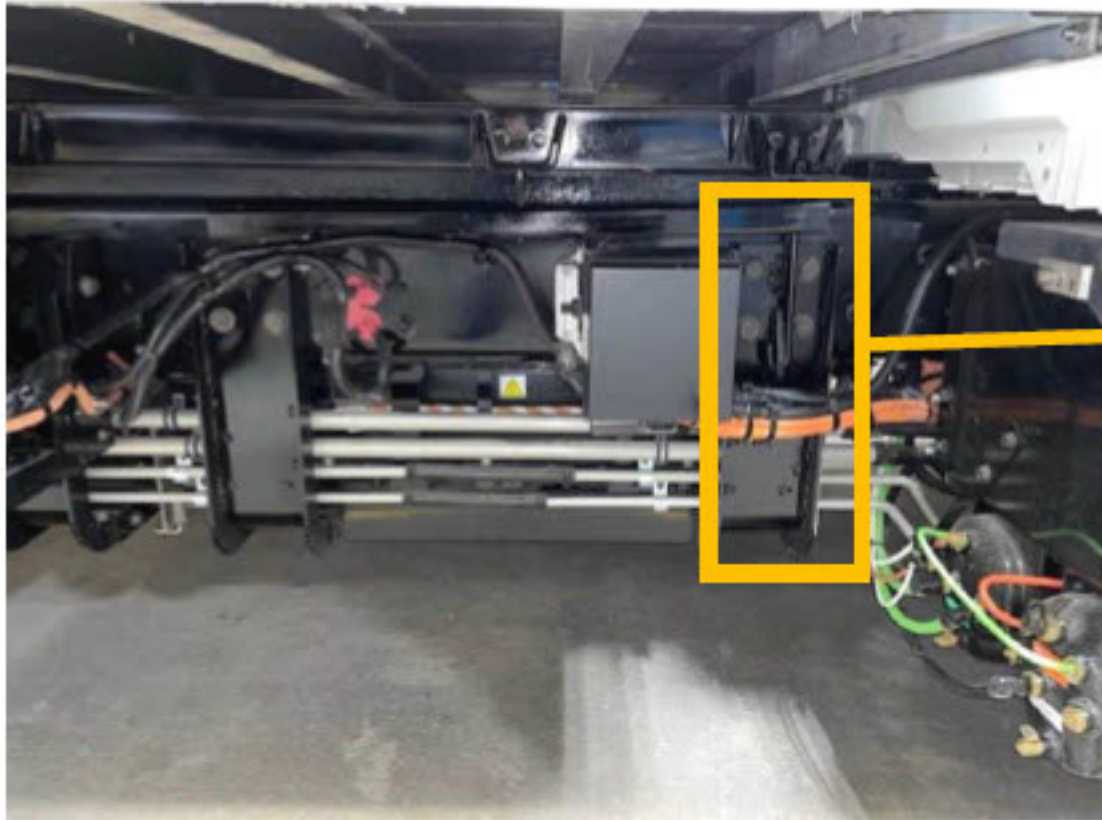
J-Hook Attachment Option - Bracket

(dimensions in mm)



BODY ATTACHMENT (J-HOOK)

J-Hook Attachment Option - Bracket



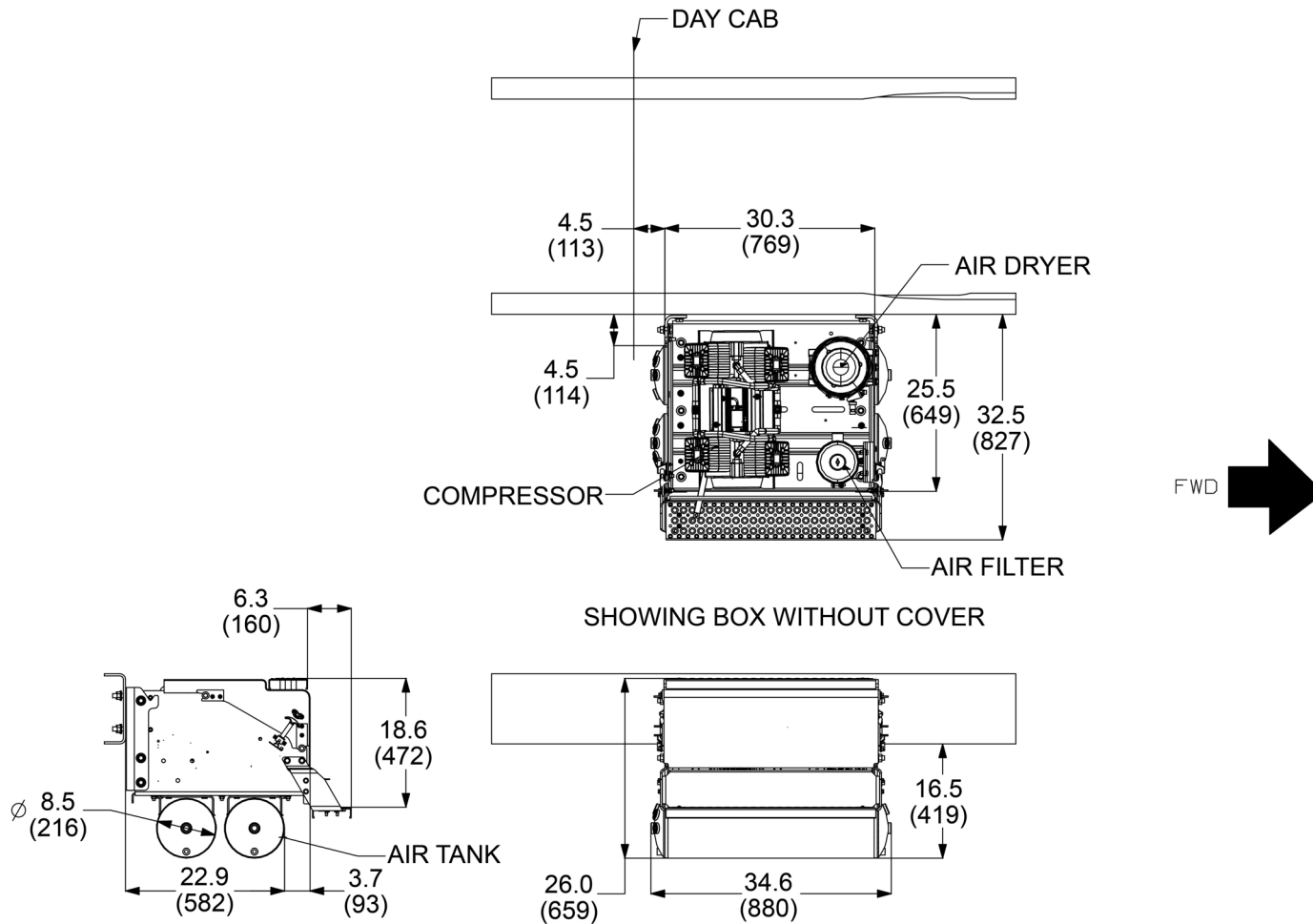
eMV J-Hook Installation



BRAKES

Do not modify the brakes or brake system components

COMPRESSOR BOX, AIR TANK & AIR DRYER LOCATION (TOP VIEW)



mv60e_compressor box_air tanks_air dryer_top

COMPRESSOR BOX, AIR TANK & AIR DRYER LOCATION (TOP VIEW)



ELECTRICAL

GENERAL INFORMATION

High Voltage

No changes are authorized for the High Voltage system as outlined in the training.

Drive Train

No changes are authorized for the electric drivetrain or components

12 Volt System (ie., low voltage system)

Refer to the [Electrical Systems Integration Guide eMV](#) under Integration Guides and Quick References:

<https://www.internationaltrucks.com/body-builder/body-resources>

PAINT BOOTH REQUIREMENT/GUIDELINES

Requirement:

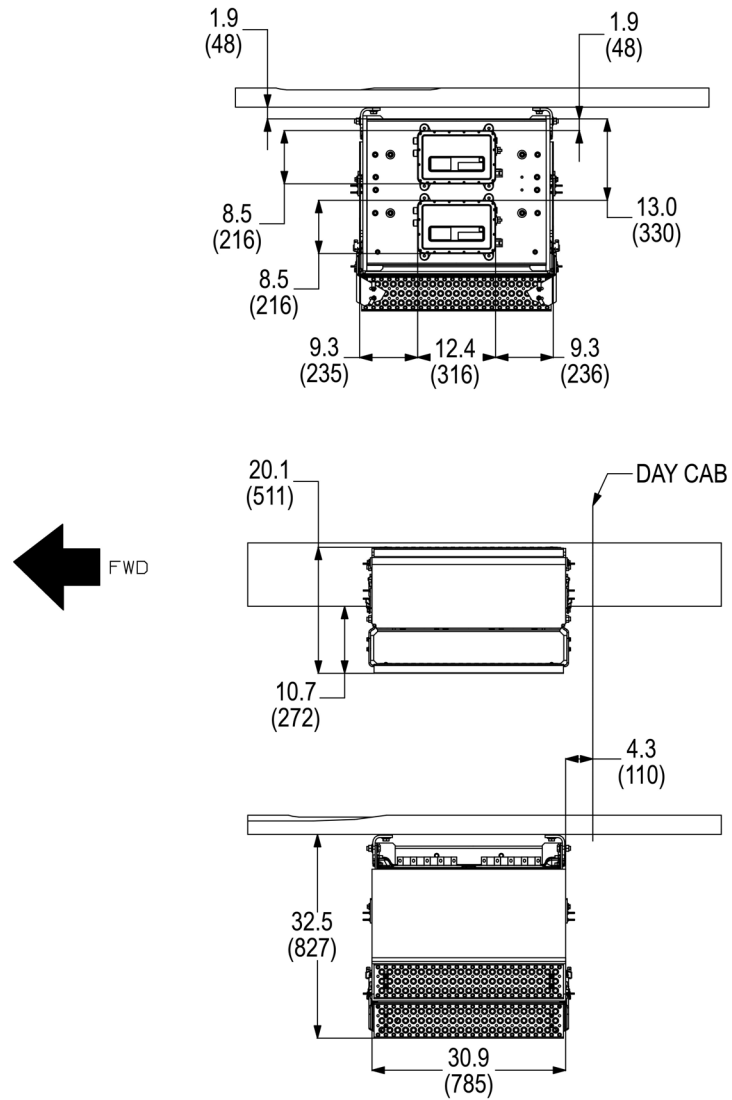
No DTCs (Diagnostic Trouble Codes), MILs (Malfunction Indicator Lamps), or DIC (Driver Interface Center) messages requesting vehicle maintenance present on the vehicle prior to paint booth.

Guidelines:

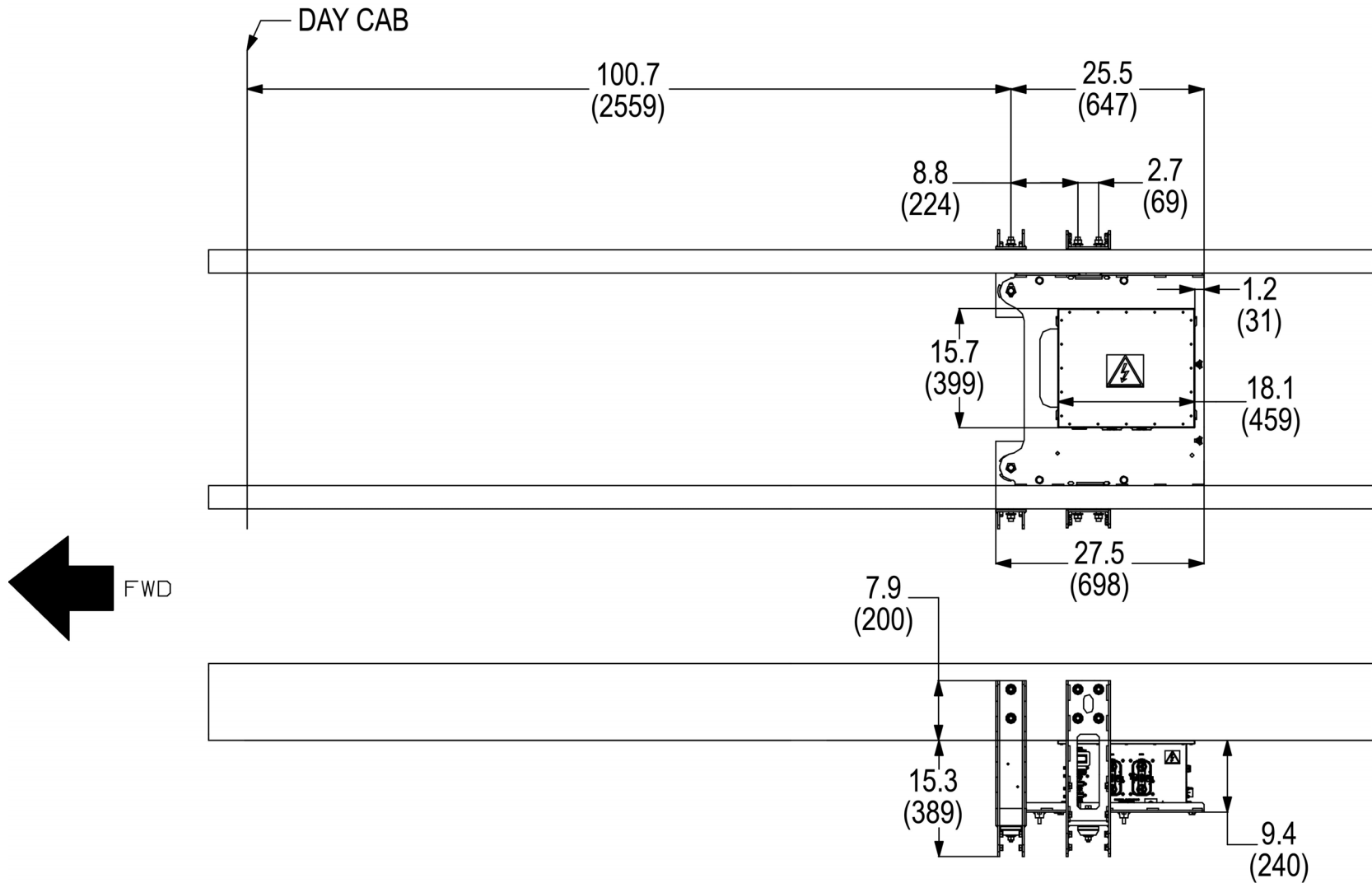
1. Do not let the paint booth temperature exceed 50C (122F).
2. Do not let the paint booth humidity exceed 85%.
3. Ensure the vehicle is off during painting and curing.
4. Ensure that the vehicle's batteries have a maximum of 50% state of charge.
5. Limit the vehicle curing time in the paint booth to only the time required to cure the paint, and do not leave the vehicle curing for more than 4 hours at a time.
6. Do not paint on the vehicle's battery packs or any HV components/labels. Ensure they are well wrapped and covered during the paint process to minimize ingress of paint particles and vapors. Give special attention to any labeling to be certain that it will not be obscured by paint.
7. It is recommended that the paint booth be Class 1 Div 1 rated.

12 VOLT BATTERY BOX CONVERTER (FRONT VIEW)

12 VOLT BATTERY BOX CONVERTER (FRONT VIEW)



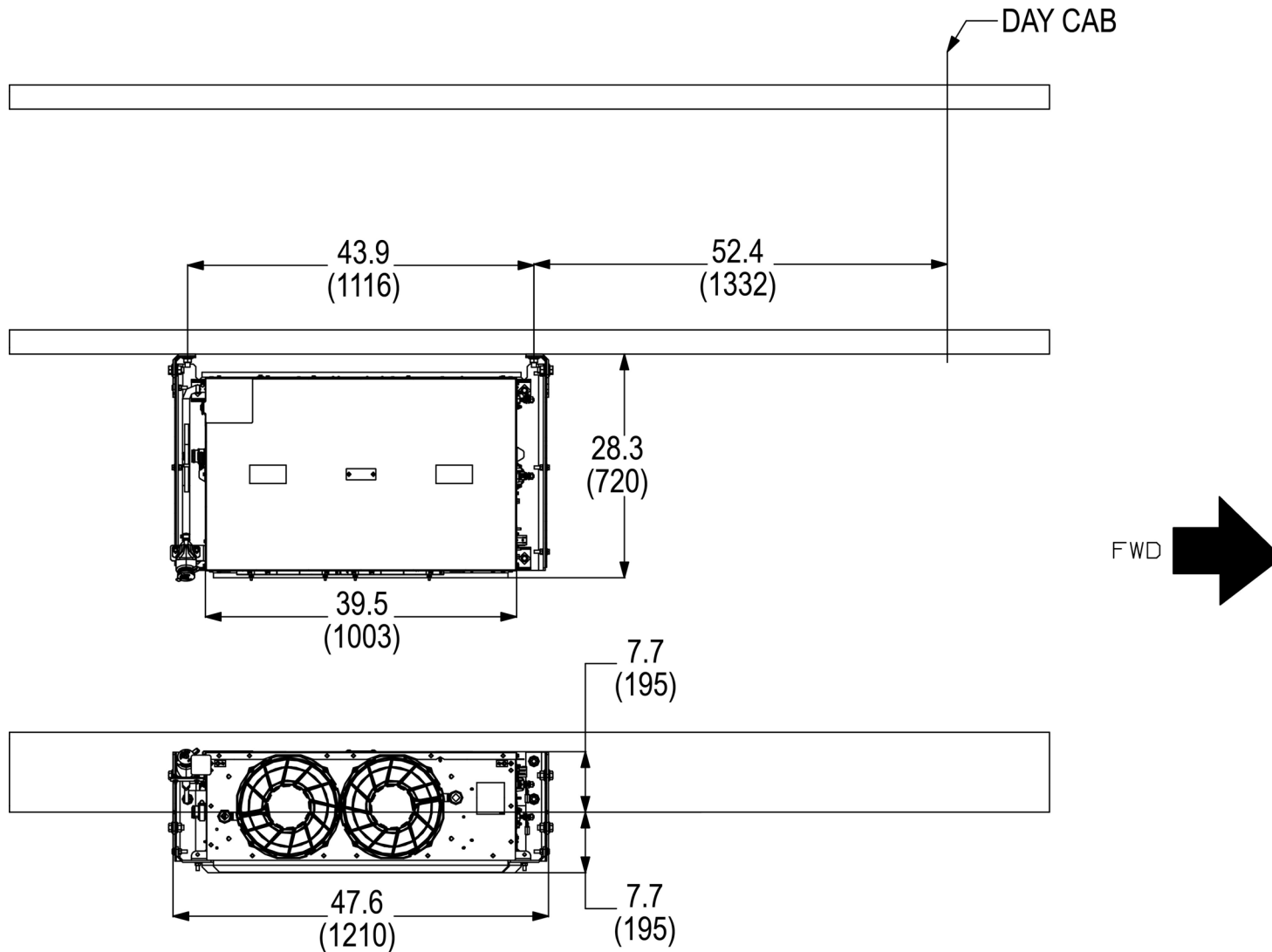
BATTERY CONTROLLER HV DISTRIBUTION MODULE (TOP VIEW)



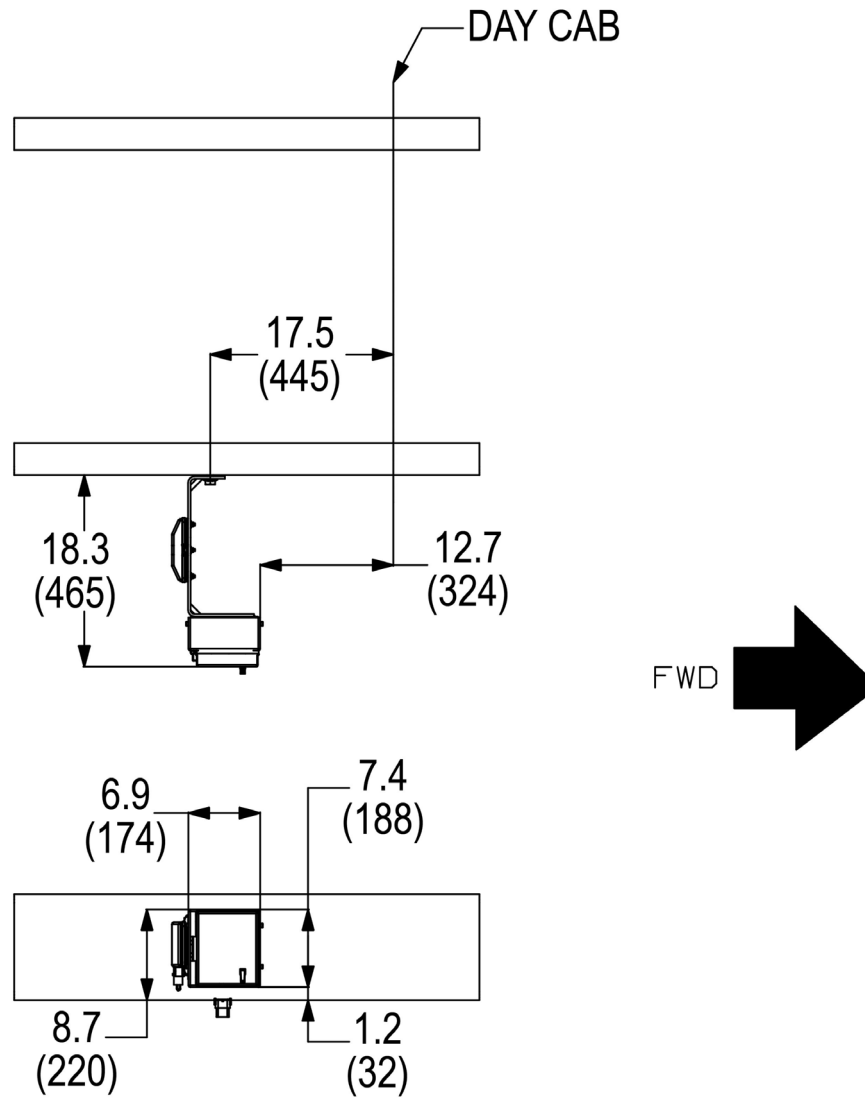
mv60e_battery controller_hv distribution module_top_view

BATTERY THERMAL MANAGEMENT UNIT (TOP VIEW)

BATTERY THERMAL MANAGEMENT UNIT (TOP VIEW)



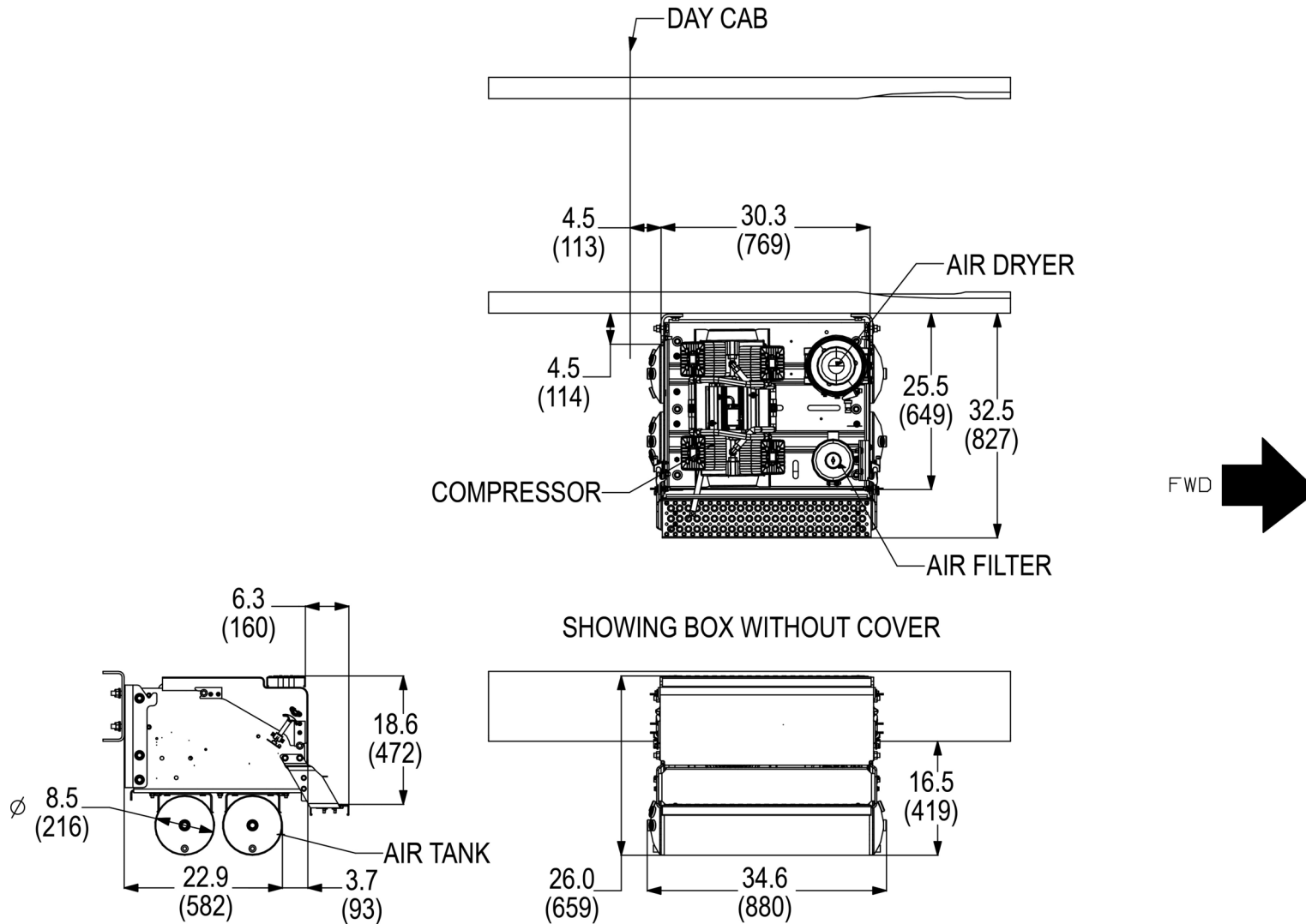
CHARGING PORT (TOP VIEW)



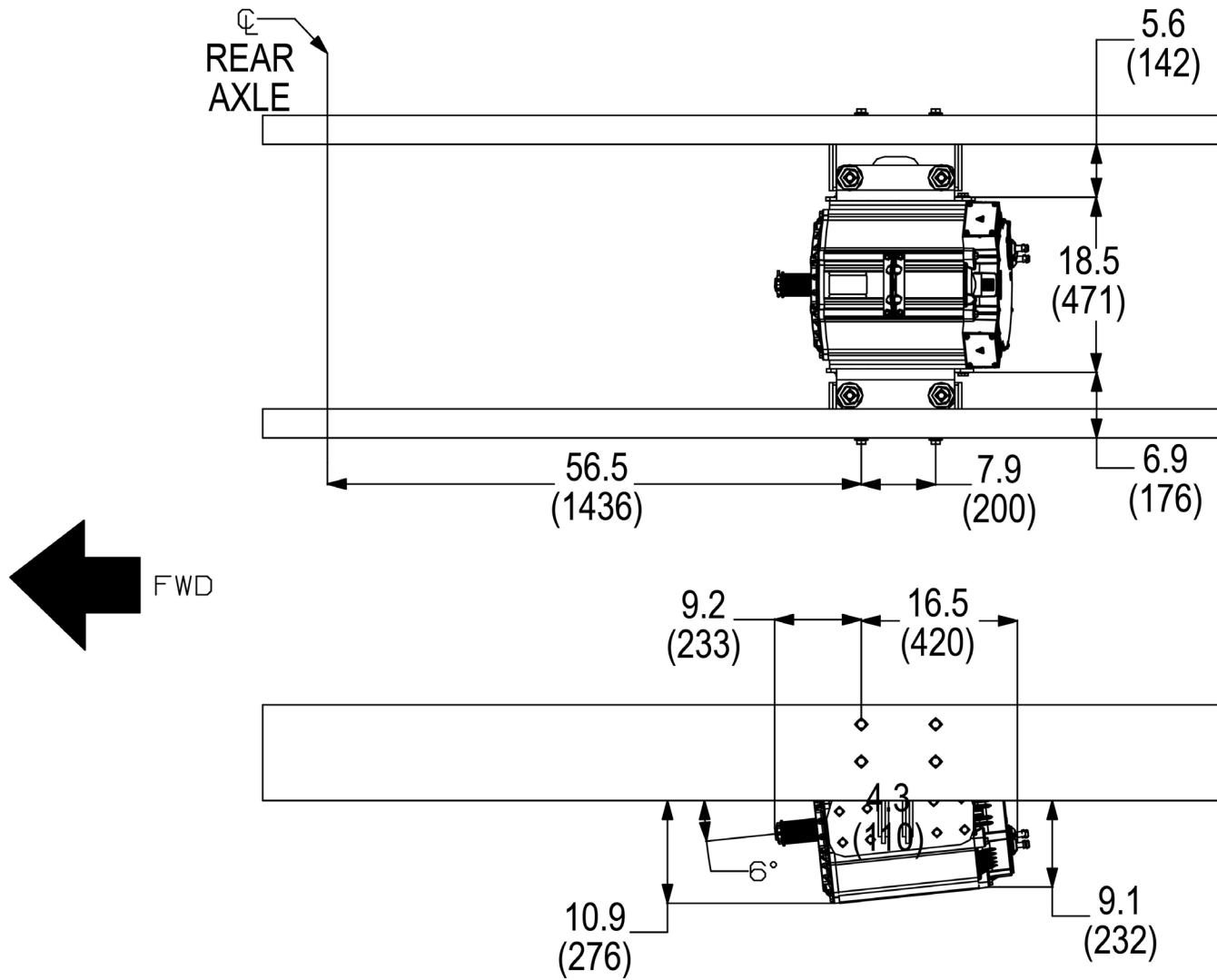
mv60e_charging port_top_view

COMPRESSOR BOX, AIR TANKS, AIR DRYER (TOP VIEW)

COMPRESSOR BOX, AIR TANKS, AIR DRYER (TOP VIEW)

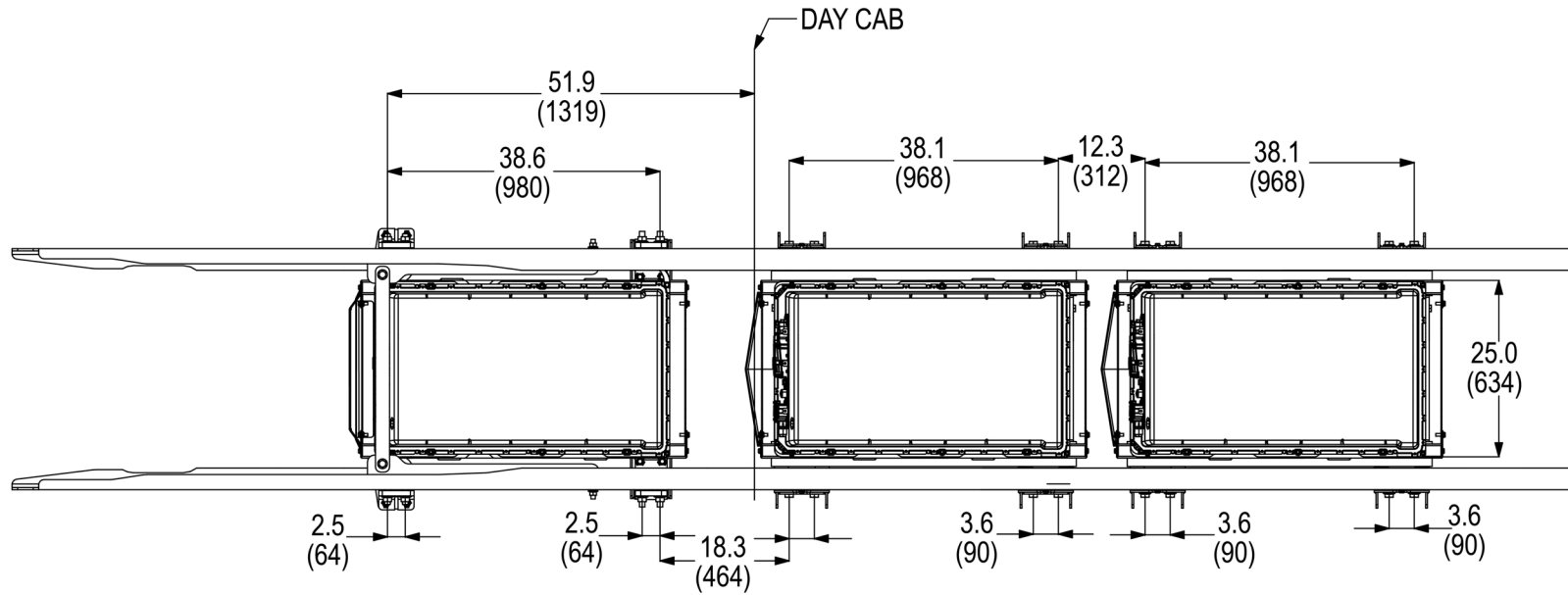


DRIVE MOTOR (TOP VIEW)

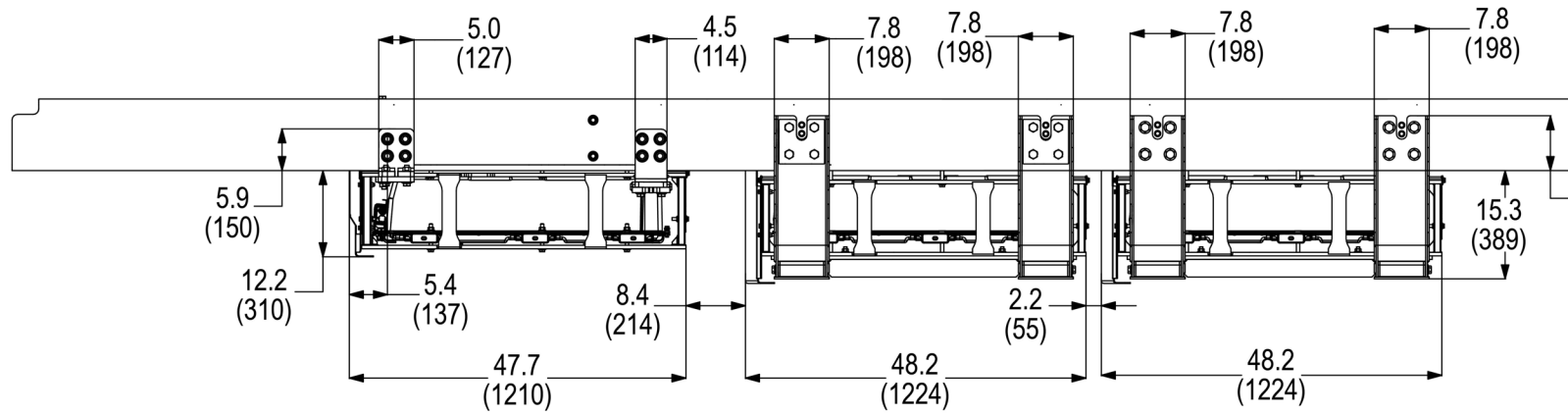


mv60e_drive motor_top_view

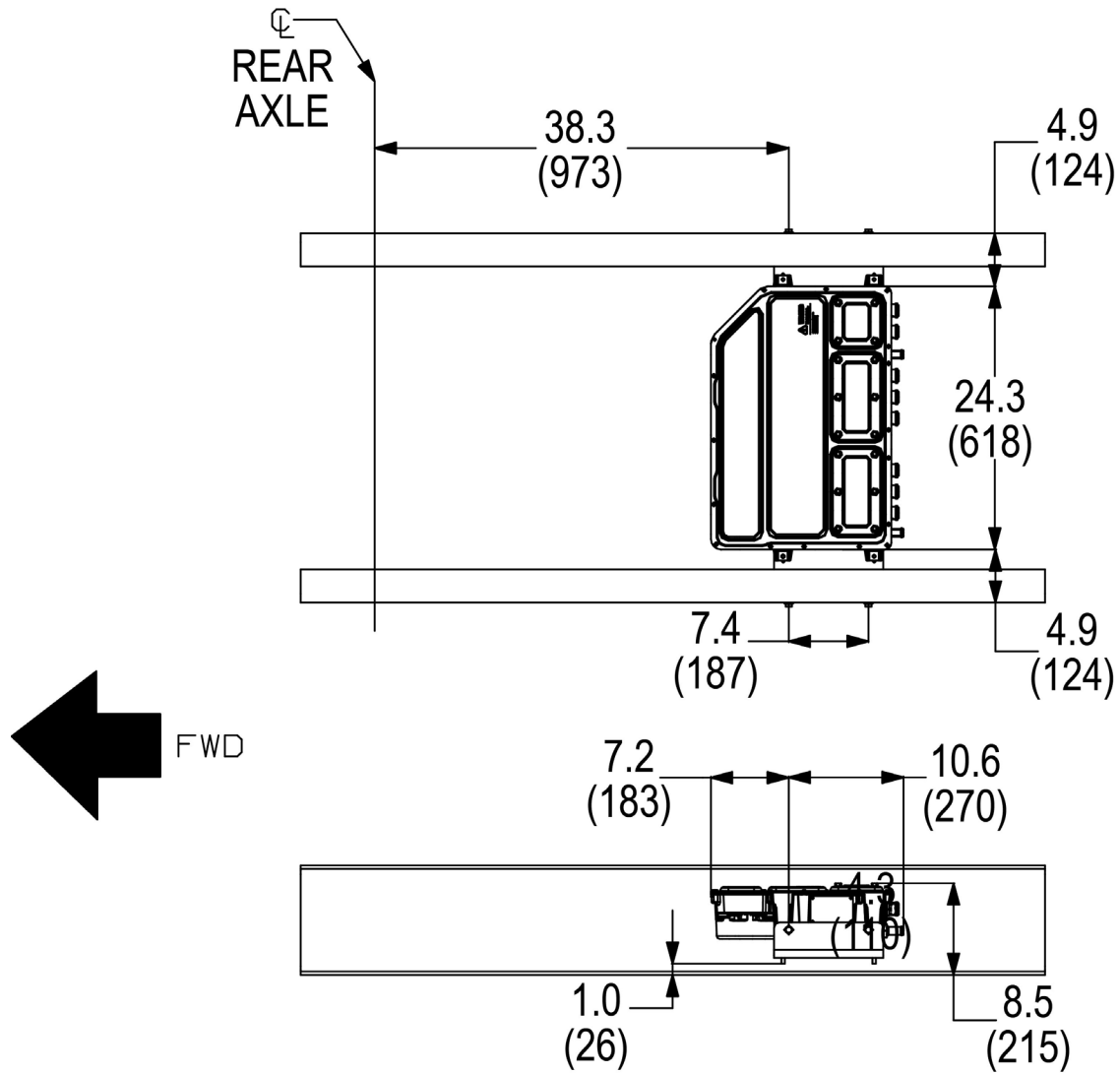
HV BATTERIES (TOP VIEW)



FWD



POWER INVERTER (TOP VIEW)



mv60e_power inverter_top_view



REAR AXLES & SUSPENSIONS

MODIFICATIONS

NO MODIFICATIONS ARE ALLOWED TO THE FRONT OR REAR AXLES OR SUSPENSIONS.



CAB

AFTERMARKET CAB MODIFICATIONS

Navistar will not provide guidance or approval for any aftermarket cab modifications, with the exception of a cab back panel cutout. Modifications made to the CIW structure by a vehicle alterer/modifier become the responsibility of the vehicle alterer/modifier.

AIR CONDITIONING SYSTEM MODIFICATIONS

The HVAC system provided with International® trucks should not be modified. NO additional components should be added to the factory Installed HVAC system as it is delivered from the manufacturer. If additional air conditioning capacity is needed, a completely independent system should be added to handle the additional load requirements of the Body Builder. There are additional costs for a second system; it would however, provide for optimal performance from both HVAC systems.

THE FACTORY INSTALLED SYSTEM CANNOT BE MODIFIED IN ANY MANNER. MODIFICATION OF THE HVAC SYSTEM WILL VOID THE INTERNTAIONAL WARRANTY ON THAT SYSTEM.

eMV QUICK REFERENCE GUIDE - BODY MODIFICATION REQUESTS

ANY REQUESTS FOR EXCEPTIONS OR CLARIFICATIONS OR MODIFICATIONS TO THIS DOCUMENT SHOULD BE ROUTED TO THE eMV/ eMOBILITY TEAM

EV Field Service Manager

- Kyle Maki: Kyle.Maki@Navistar.com



WHEELS AND TIRES

WHEELS

eMV uses specific 22.5x8.25 wheels.

TIRES

eMV tires are carefully selected and calibrated 11R22.5 tires to minimize rolling resistance and optimize revolutions per mile.





Navistar, Inc.
2701 Navistar Drive
Lisle, IL 60532