KENWORTH HEAVY DUTY BODY BUILDER MANUAL

2024

T880 T680

W990

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SECTION 1 – INTRODUCTION

This manual was created to provide body builders with appropriate information and guidelines useful for the body planning and installation process. This manual contains appropriate dimensional information, guidelines for mounting bodies and modifying frames, electrical wiring information, and other information beneficial in the body installation process. This manual is specific to chassis with 2024 EPA emissions engines.

The Body Builder Manual can be very useful when specifying a vehicle, particularly when the body builder is involved in the vehicle definition and ordering process. Early in the process, professional body builders can often provide valuable information that can reduce the end cost of the body installation.

In the interest of continuing product development, Kenworth reserves the right to change specifications or products at any time without prior notice. It is the responsibility of the user to ensure that they are utilizing the latest released information. Check Kenworth.com for the latest version of the body builder manual. If you require additional information or reference materials, please contact your local Kenworth dealer.

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Contents

SECTION 2 - SAFETY AND COMPLIANCE

Safety Signals

There are several alerting messages in this book. Please read and follow them. They are there for your protection and information. These alerting messages can help you avoid injury to yourself or others and help prevent costly damage to the vehicle. Key symbols and “signal words” are used to indicate what kind of message is going to follow. Pay special attention to comments prefaced by “WARNING”, “CAUTION”, and “NOTE.” Please do not ignore any of these alerts.

⚠ WARNING

Signals a potentially hazardous situation which, if not avoided, could result in death or serious injury. This message will tell you what the hazard is, what can happen if you do not heed the warning, and how to avoid it

Example:

WARNING! Be sure to use a circuit breaker designed to meet liftgate amperage requirements. An incorrectly specified circuit breaker could result in an electrical overload or fire situation. Follow the liftgate installation instructions and use a circuit breaker with the recommended capacity

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⚠ CAUTION

Signals a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to the vehicle

Example:

CAUTION: Never use a torch to make a hole in the rail. Use the appropriate drill bit

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i NOTE

Provides general information that is related to the topic being discussed.

Example:

Note: Be sure to provide maintenance access to the battery box and fuel tank fill neck.

Signals the location of a high voltage electrical component

Example:

HAZARDOUS VOLTAGE: To reduce the risk of possible injury (Shock, Burn or Death): Components marked with High Voltage should be avoided. Service must be performed by qualified personnel only

Federal Motor Vehicle Safety Standards Compliance

As an Original Equipment Manufacturer (OEM), Kenworth Truck Company ensures that our products comply with all applicable U.S. or Canadian Federal Motor Vehicle Safety Standards. However, the fact that this vehicle has no fifth wheel and that a Body Builder (Intermediate or Final Stage Manufacturer) will be doing additional modifications means that the vehicle was incomplete when it left the build plant.

Incomplete Vehicle Certification

An Incomplete Vehicle Document is shipped with the vehicle, certifying that the vehicle is not complete. See Error! Reference source not found.. In addition, affixed to the driver's side door frame or edge is an Incomplete Vehicle Certification label. See **Figure 2 - Figure 4**. For further information on Vehicle Certification and Identification, see APPENDIX A, **"VEHICLE IDENTIFICATION**".

NOTE:

These documents list the U.S. or Canadian Federal Motor Vehicle Safety Standard (FMVSS) regulations that the vehicle complied with when it left the build plant. You should be aware that if you add, modify, or alter any of the components or systems covered by these regulations, it is your responsibility as the Intermediate or Final Stage Manufacturer to ensure that the complete vehicle is in compliance with the particular regulations upon completion of the modifications.

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INCOMPLETE VEHICLE DOCUMENT	DOCUMENTO DE VEHÍCULO INCOMPLETO	DOCUMENT DE VÉHICULE INCOMPLET
MANUFACTURED BY PACCAR OF CANADA LTD 6711 MISSISSAUGAEA RD. N. MISSISSAUGA, ON. L5N 4J8, CANADA	FABRICADO POR PACCAR OF CANADA LTD 6711 MISSISSAUGAEA RD. N. MISSISSAUGA, ON. L5N 4J8, CANADA	CONSTRUIT PAR PACCAR OF CANADA LTD 6711 MISSISSAUGAEA RD. N. MISSISSAUGA, ON. L5N 4J8, CANADA

Fecha de fabricación de vehículo incompleto:
Date de production du vehicule incomplet :
Date of incomplete vehicle manufacture: _____

Número de Identificación:
Numéro d'identification :
Identification number: _____

Peso bruto nom. del. veh (PV):
GVWR/PNBV: _____

Peso bruto nom. por eje delantero (GAWR):
PNBE avant :
GAWR front: _____

Peso bruto por eje/GAWR/PNBE: _____
Peso bruto por eje/GAWR/PNBE: _____
Peso bruto por eje/GAWR/PNBE: _____
Peso bruto por eje/GAWR/PNBE: _____
Peso bruto por eje/GAWR/PNBE: _____

Este vehículo ha sido designado para ser: (marque uno) ☐ Camión ☐ Tractocamión
Ce véhicule a été conçu pour être un : (cochez une case) Camion Porteur-remorqueur
This vehicle designed to be a: (check one) ☐ Truck ☐ Truck Tractor

Figure 1 Beginning portion of the Incomplete vehicle document

Figure 2 Locations of Information Labels - Driver's

Figure 3 Detail image of figure 4 item 1

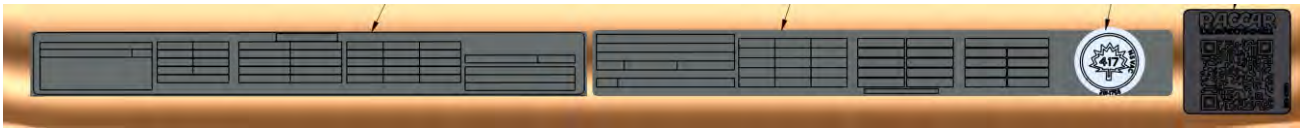


Figure 4 Detailed image of figure 4 Item 2 (Canadian Safety Mark)

As the Intermediate or Final Stage Manufacturer, you should retain the Incomplete Vehicle Document for your records. In addition, you should record and retain the manufacturer and serial number of the tires on the vehicle. Upon completion of the vehicle (installation of the body and any other modifications), you should affix your certification label to the vehicle as required by Federal law. This tag identifies you as the "Intermediate or Final Stage Manufacturer" and certifies that the vehicle complies with Federal Motor Vehicle Safety Standards. (See **Figure 2 - Figure 4**.) Be advised that regulations affecting the intermediate and final stage manufacturer may change without notice. Ensure you are referencing the most updated copy of the regulation during the certification and documentation processes.

In part, if the final stage manufacturer can complete and certify the vehicle within the instruction in the incomplete vehicle document (IVD) the certification label would need a statement that reads, "This vehicle has been completed in accordance with the prior manufacturers IVD where applicable. This vehicle conforms to all applicable Federal Motor Vehicle Safety Standards [and Bumper and Theft Prevention Standards if applicable] in effect in (month, year)."

However, if the vehicle cannot be completed and certified with in the guidance provided in the IVD, the final stage manufacturer must ensure the vehicle conforms to all applicable Federal Motor Vehicle Safety Standards (FMVSS). The final stage manufactures certification label would need a statement that reads, "This vehicle conforms to all applicable Federal Motor Vehicle Safety Standards [and Bumper and Theft Prevention Standards if applicable] in effect in (month, year).

Please refer to e-CFR Title 49: Transportation Part 567 Certification for details related to this regulation.

For Canadian final stage manufacturers see:
Motor Vehicle Safety Regulations C.R.C, c. 1038, Section 6.1 – Vehicles Manufactured in Stages
Or contact: Transport Canada
Tower C, Place de Ville, 330 Sparks Street
Ottawa, Ontario K1A
0N5 (613) 990-2309
TTY: 1-888-675-6863

Noise And Emissions Requirements

NOTE:

Vehicles may be equipped with specific emissions control components/systems in order to meet applicable Federal and California noise and exhaust emissions requirements. Tampering with these emissions control components/systems is against the rules that are established by the U.S Code of Federal Regulations, Environment Canada Regulations and California Air Resources Board (CARB). These emissions control components/systems may only be replaced with original equipment parts.

Additionally, most vehicles in North America will be equipped with a Greenhouse Gas (GHG) “Vehicle Emission Control Information” door label indicating its certified configuration. The vehicle components listed on this label are considered emission control devices.

Modifying (i.e., altering, substituting, relocating) any of the emissions control components/systems defined above will affect the noise and emissions performance/certification. Modifications that alter the overall shape and aerodynamic performance of a tractor will also affect the emission certification. If modifications are required, they must first be approved by the manufacturer. Unapproved modifications could negatively affect emissions performance/certification. There is no guarantee that proposed modifications will be approved.

Tires may be substituted provided the new tires possess a Coefficient of rolling resistance (CRR) equal to or lower than CRR of the original tires. Consult with your tire supplier(s) for appropriate replacement tires.

Contact the engine manufacturer for any requirements and restrictions prior to any modifications.

For Cummins Contact 1-800-DIESELS or your local Cummins distributor. Reference AEB 21.102.

It is possible to relocate the DEF tank; however, the relocation requirements need to be followed. Any variances from the relocation requirements may cause the emissions control components/systems to operate improperly potentially resulting in engine de-rate.

NOTE:

All 2024 engine emissions certified vehicles will be equipped with an On-Board Diagnostics (OBD) system. The OBD system is designed to detect malfunctions of any engine or vehicle component that may increase exhaust emissions or interfere with the proper performance of the OBD system itself.

The OBD system consists of computer program on one or more of the vehicle's Electronic Control Units (ECUs). This program uses information from the control system and from additional sensors to detect malfunctions. When a malfunction is detected, information is stored in the ECU(s) for diagnostic purposes. A Malfunction Indicator Light (MIL) is illuminated in the dash to alert the driver of the need for service of an emission-related component or system.

To ensure compliance to emissions regulations, the final configuration of certain features of the completed vehicle must meet specific requirements. This section describes requirements relevant for only the most common or critical modifications done by body builders. For a complete description of acceptable modifications, see the application guidance available from the manufacturer of the engine installed in the chassis.

Fuel System

The following are highlights of some of the more common or critical aspects of this system. The overall system restriction may not exceed the restriction limitations set forth by the engine manufacturer for both supply and return

- Ensure that fuel lines are not pinched or can potentially be damaged when installed between body and frame.
- Fuel lines must be routed and secured without dips or sags.
- There must be easy access to filter(s) and fill cap(s).
- The tank vent may not be obstructed.
- Added accessories (heaters, generators) cannot introduce air into system.
- Fuel tank must be located so that the full level is not above cylinder head.
- “Ultra-Low Sulfur Fuel Only” labels must be present on the dash and fuel fill for diesel-powered vehicles.
- Modification of the pressure side secondary filter and plumbing is not allowed without engine manufacturer approval.
- Body installation of fuel tank or routing of lines must not cause significant increase in fuel temperature.
- Fuel hoses shall meet or exceed OEM supplied hose material construction specifications.
- Formed nylon fuel lines with quick-connects are installed underneath the cab and hood along the frame rail. Behind the cab from the fuel tee to tanks are wire braid-reinforced rubber lines. Supply and return fittings are poka-yoked to prevent incorrect assembly.

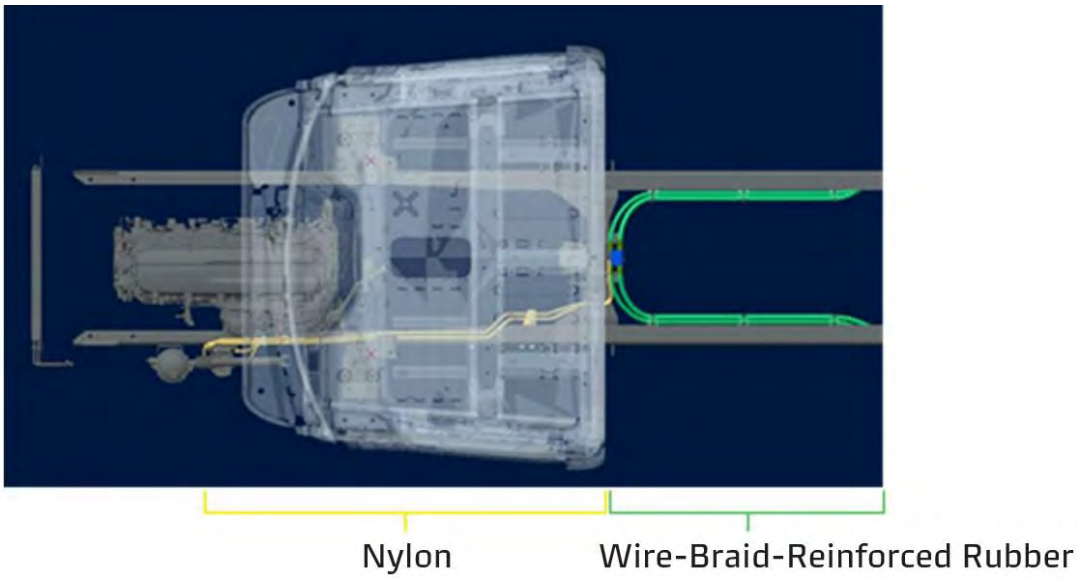


Figure 5 Fuel Line Placement by Line Type

Parts

Replacement nylon fuel line assemblies are available based on individual chassis and fuel system hardware. For other chassis changes, individual parts are listed below.

Table 1 Fuel System Parts

DESCRIPTION	USE	PART NUMBER
Supply Tee – All ports open	Dual LH and RH fuel tanks	K38-1057
Supply Tee – RH port closed	Only LH fuel tank(s)	K38-1058
Supply Tee – LH port closed	Only RH fuel tank(s)	K38-1059
Return Tee – All ports open	Dual LH and RH fuel tanks	K38-1060
Return Tee – RH port closed	Only LH fuel tank(s)	K38-1061
Return Tee – LH port closed	Only RH fuel tank(s)	K38-1062
Supply Fitting – Straight	Nylon line assemblies	K38-1069-001
Supply Fitting – 90˚	Nylon line assemblies	K38-1069-002
Return Fitting – Straight	Nylon line assemblies	K38-1069-003
Return Fitting – 90˚	Nylon line assemblies	K38-1069-004
Supply Union	Short-term repair, 12mm ID	K38-1069-010
Return Union	Short-term repair, 10mm ID	K38-1069-009
Supply Rubber Line Assembly	Fuel tee to fuel tank lines, xxx = Length in inches	V50-14860082111xxx
Return Rubber Line Assembly	Fuel tee to fuel tank lines, xxx = Length in inches	V50-14860063111xxx
Supply Steel Fitting – Straight	Rubber line assemblies, 1/2” barb	K38-1069-007
Return Steel Fitting – Straight	Rubber line assemblies, 3/8” barb	K38-1069-008
Retaining Clip	Collar on steel rubber hose fittings	K38-1069-015
Bulk Supply Nylon Line	Short-term repair, 12mm ID, xxxx = Length in mm	V50-1178-1xxxx
Bulk Return Nylon Line	Short-term repair, 12mm ID, xxxx = Length in mm	V50-1178-2xxxx
Supply APU Fitting	in-line at tee	K38-1055
Return APU Fitting	in-line at tee	K38-1056

Compressed Air System

The following are highlights of some of the more common or critical aspects of this system.

- Air system modification must meet applicable FMVSS regulations.
- Compressed Air tank may not be modified (exception – addition or removal of fittings or relocation of the tank).
- Added devices or bodywork may not interfere with or rub air lines.
- Air supply to the engine doser may not be restricted or disconnected.
- Air lines should be routed, protected from heat, and properly secured to prevent damage from other components.
- Care should be taken so that air lines do not rub against other components.
- Care should be taken to protect the air system from heat sources.

Exhaust And Exhaust After-Treatment System

The following are highlights of some of the more common or critical aspects of this system.

- The following after-treatment and exhaust system components may not be modified.
  - DPF assembly.
  - SCR Catalyst assembly.
  - Exhaust pipes between the engine and after-treatment devices (DPF, SCR Catalyst) and between after-treatment devices.
  - NOx Sensors.
  - PM Sensor.
- The following modifications may only be done within the guidelines of the "DEF System Relocation Guide.".
  - Modifications to Diesel Exhaust Fluid (DEF) throttle, suction, or pressure lines.
  - Modification or relocation of the DEF tank.
  - Modification of coolant lines to and from the DEF tank.
- All DEF and coolant lines should be routed, protected, and properly secured to prevent damage during vehicle operation or other components.
- If relocation of the DCU or ACM is necessary, use existing frame brackets and mount inside of frame flanges where necessary. Do not extend the harnesses.
- The DPF, the SCR catalyst, or their mounting may not be modified.
- The NOx sensor may not be relocated or altered in any way; this includes re-clocking the after-treatment canister or reorienting the sensor(s).
- Exhaust pipes used for tailpipes/stacks must be properly sized and must prevent water from entering.
- Ensure adequate clearance between the exhaust and body panels, hoses, and wire harnesses.
- The body in the vicinity of the DPF must be able to withstand temperatures up to 400°C (750°F).
- Do not add thermal insulation to the external surface of the DPF.
- The SCR water drain hole may not be blocked.
- Allow adequate clearance (25mm (1 inch)) for servicing the DPF sensors, wiring, and clamped joints.
- Drainage may not come in contact with the DPF, SCR catalyst, sensors or wiring.
- Allow sufficient clearance for removing sensors from DPF. Thermistors require four inches. Other sensors require one inch.
- Wiring should be routed, protected from heat, and properly secured to prevent damage from other components.
- The exhaust system from an auxiliary power unit (APU) must not be connected to any part of the vehicle after-treatment system or vehicle tail pipe.

Cooling System

The following are highlights of some of the more common or critical aspects of this system.

- Modifications to the design or locations of fill or vent lines, heater or defroster core, and surge tank are not recommended.
- Additional accessories plumbed into the engine cooling system are not permitted, at the risk of voiding vehicle warranty.
- Coolant level sensor tampering will void warranty.
- When installing auxiliary equipment in front of the vehicle, or additional heat exchangers, ensure that adequate air flow is available to the vehicle cooling system. Refer to engine manufacturer application guidelines for further detail.
- When installing FEPTO drivelines, the lower radiator anti-recirculation seal must be retained with FEPTO driveline clearance modification only.
- Changes made to cooling fan circuit and controls are not allowed, with the exception of AC minimum fan on time parameter.
- See owner's manual for appropriate winter front usage.

Air Intake System

The following are highlights of some of the more common or critical aspects of this system.

- The air intake screen may not be blocked, either fully or partially.
- Modification to the air intake system may not restrict airflow. For example, pipe diameter may not be reduced.
- All sensors must be retained in existing locations.
- To retain system seal, proper clamp torque must be used. Refer to service manual for proper clamp torque.

Electrical System.

The following are highlights of some of the more common or critical aspects of this system.

- Electrical harnesses providing battery power and electronic control signals to engine and emissions control/ vehicle OBD components including datalinks may not be spliced. These emissions control/vehicle OBD components include the following:
    - throttle pedal.
    - vehicle speed sensor.
    - after-treatment wiring.
    - 9-pin OBD Connector.
    - CAN Communication / OBD Diagnostic wiring.
- If the alternator or battery is substituted, it must meet the requirements of the engine manufacture's guidelines. This includes alternator ground voltage drop and alternator ground cable effectiveness. See the engine manufacture's guidelines for recommended test procedure. Additionally, the maximum voltage differential and the peak-peak voltage differential between the engine ECM block ground stud and battery negative terminal may not exceed 500 mV under any combination of loads or operating conditions.
- Only an OBD compliant battery disconnect switch may be installed on vehicles equipped EPA 2013 and beyond compliant diesel engines. An OBD compliant switch and harness, even in the off position, supply a small amount of power to the engine controller and enable certain emissions critical functions (e.g., DEF line purge). Any modifications to the electrical system which interrupt this power supply will cause OBD fault codes and illumination of the MIL. In addition, such a modification will render the engine non-compliant with certain emission regulations. As a general rule of thumb, you can remove and replace a battery disconnect switch on a truck equipped with a battery disconnect switch at the factory. However, if a battery disconnect switch was not installed in the factory a significant harness modification is required before a battery disconnect switch can be added.
- Installation of aftermarket transfer-cases must address the vehicle speed sensor position. The standard position of the speed sensor is at the transmission tail shaft. When a transfer-case is added it is best to relocate the

sensor to the axle side output shaft of the transfer-case. This is typically accomplished by adding a tone wheel into the driveline yoke assembly.

- Wiring extensions for the after-treatment wiring are available for relocating the DEF tank from your dealer via PACCAR Parts. For relocation of DEF tank, refer to the after-treatment section of this manual.
- The OBD/Diagnostic connector port is located below the dash to the left of the steering wheel. This connector and its location may not be changed.
- Wiring extensions for the after-treatment wiring are available for relocating the DEF tank from your dealer via PACCAR Parts. For relocation of DEF tank, refer to the after-treatment section of this manual.
- The emission system requires an accurate Outside Air Temperature (OAT) reading to accurately operate control algorithms. The OAT sensor is in the driver's side mirror assembly on Kenworth trucks and is shown in the figures below. If the body builder needs to modify the mirror assembly in any way, it is important the OAT sensor stay positioned on the mirror assembly. Running the vehicle without the OAT sensor connected will cause the MIL lamp to illuminate. If needed, a replacement sensor can be ordered from your Kenworth dealer.

Figure 6 Aerodynamic Mirror OAT Sensor Location

- Coolant Sensor considerations are given in the Cooling section above.
- The OBD/Diagnostic connector port is located below the dash to the left of the steering.
- wheel. This connector and its location may not be changed.
- All vehicles equipped with EPA 2013 compliant diesel and bi -fueled engines must be equipped with a Malfunction Indicator Lamp (MIL) lamp. This lamp is required to be an engine outline symbol as defined by ISO (Inter- national Standards Organization). The figure below shows the instrument cluster and MIL lamp position. Note this lamp location is fixed with respect to the controls and its location may not be changed if you are updating the warning lamp cards.

Figure 7 Digital Dash (15in) for T680/T880/W990 (EPA 2021+)

- In addition to the sensors and lamps above, the emission system also depends on signals from the exhaust DPF (Diesel Particulate Filter), SCR (Selective Catalytic Reduction), and NOx sensor. Wiring between these devices, the Dosing Control Unit (DCU) and engine ECM should not be tampered with or altered in any way.

Air Intake System

The following are highlights of some of the more common or critical aspects of this system.

- The air intake screen may not be blocked, either fully or partially.
- Modification to the air intake system may not restrict airflow. For example, pipe diameter may not be reduced.
- All sensors must be retained in existing locations.
- To retain system seal, proper clamp torque must be used. Refer to service manual for proper clamp torque.

Charge Air Cooler System

The following are highlights of some of the more common or critical aspects of this system.

- The Charge Air Cooler may not be modified.
- The installation of engine overspeed shutdown devices must not introduce restriction in the intake system.
- All plumbing associated with the charge air cooler may not be modified.

Bendix Fusion

Some vehicles are equipped with a Bendix Wingman Fusion bumper mounted radar. When mounting cattle guards or other equipment to the front of the bumper, it is important to follow the manufacturers' guidelines for radar clearance.

CAUTION: Failure to follow the Bendix Guidelines for radar clearance may prevent the Bendix Wingman system from functioning as intended. **Check Bendix literature and follow their current guidelines.**
Fusion 2.0 Radar Clearance Guidelines reference Bendix SD-61-4963
Fusion 2.109adar Clearance Guidelines reference Bendix SD-29-50022

Below are a couple of important excerpts from Bendix Documents regarding front radar clearance.

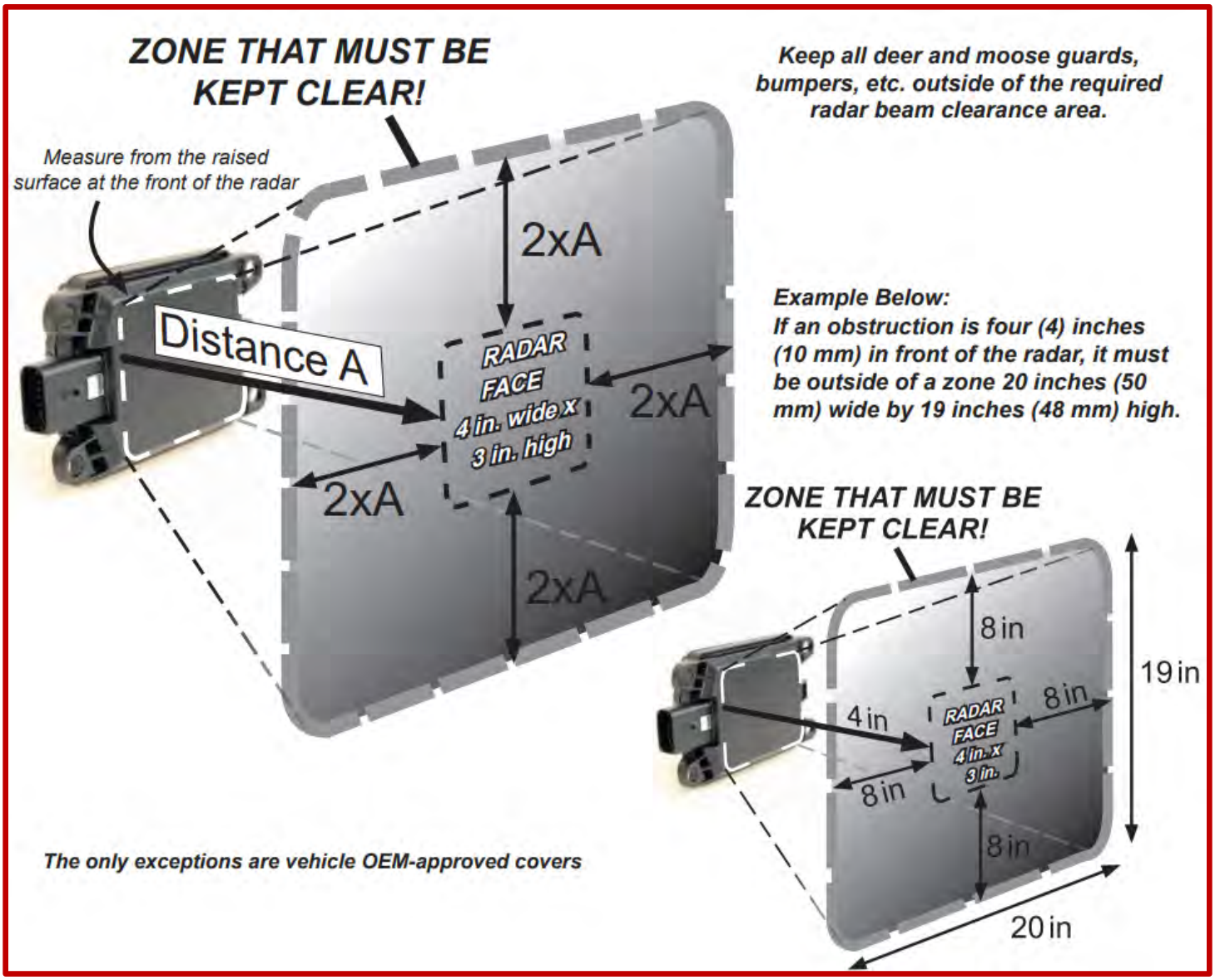


Figure 8 Fusion 2.0 Radar Clearance Guidelines from Bendix SD-61-4963

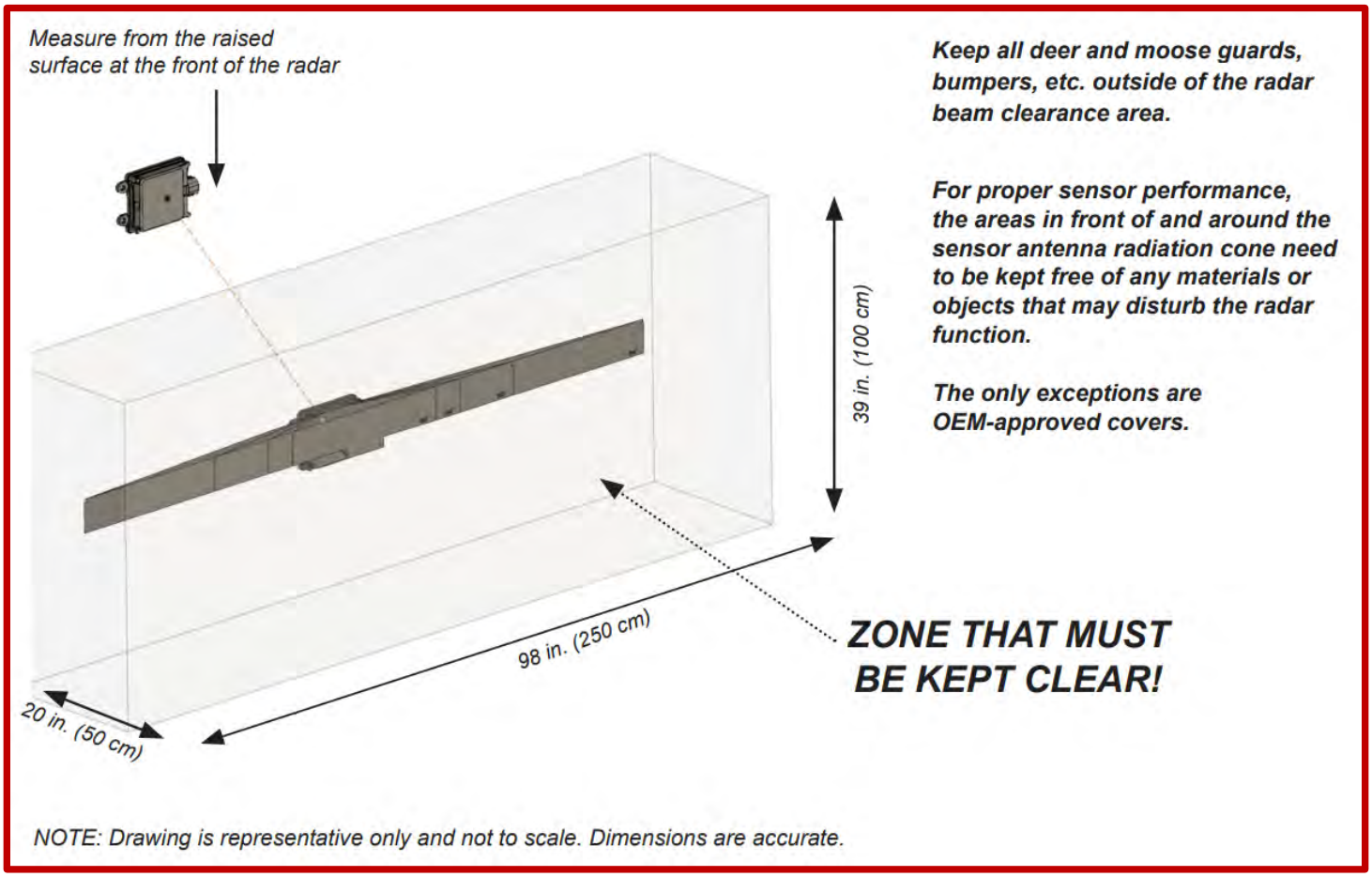


Figure 9 Fusion 2.10 Radar Clearance Guidelines from Bendix SD-29-50022

SECTION 3 - DIMENSIONS

Introduction

This section has been designed to provide enough information to successfully layout a chassis in the body planning process. All dimensions are inches unless otherwise noted. Optional equipment may not be depicted. Please contact your local Kenworth dealer if more dimensional information is desired.

Abbreviations

Table 2 Abbreviations used

AF	After Frame – Frame rail overhang behind rear axle(s)
CA	Cab to Axle – Dimension from back of the cab to the centerline of the rear axle(s)
WB	Wheelbase – Measured from front axle to the centerline of the rear axle(s)
FS	Front suspension height
RS	Rear suspension height
SOC	Side of cab
BOC	Back of cab
UC	Under cab
BBC	Bumper to back of cab
BFA	Bumper to front axle
FAB	Front axle to back of cab
FDA	Front drive axle
FEPTO	Front engine PTO extension. Measured from the front of the grille to the front of the bumper
SFFA	Set forward Front axle (T880S, W990)
SBFA	Set Back Front Axle (T680, T880)
BS	Bumper Setting

Overall Dimensions

This section includes drawings and charts for the following Class 8 models: T680, T880, and W990 including Daycab, 40in, 52in Mid Roof, 52in Flat Roof, 76in Mid Roof, and 76in High Roof sleepers.

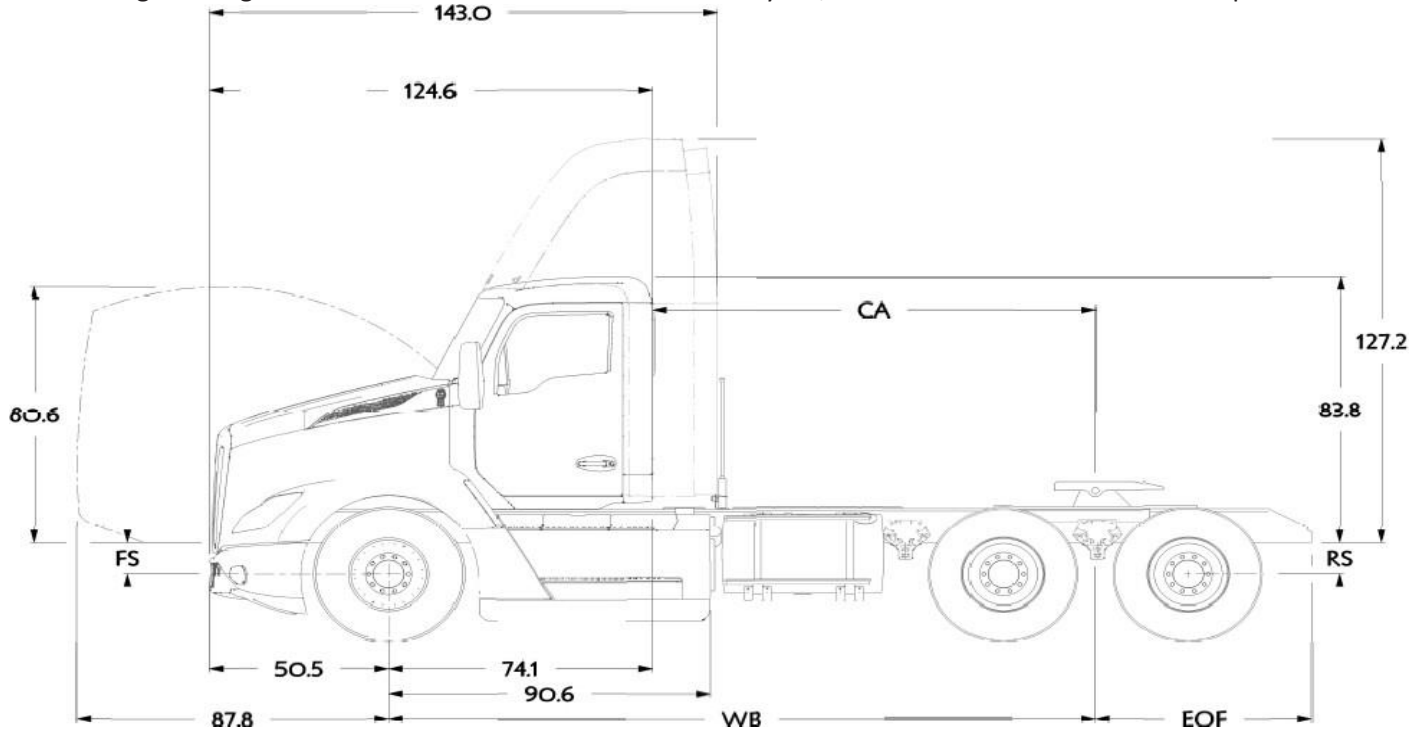
All dimensions are in inches (in). The drawings and dimensions illustrate important measurements critical to designing bodies of all types. See the "**Error! Reference source not found.**" at the beginning of the manual to locate the drawing that you need.

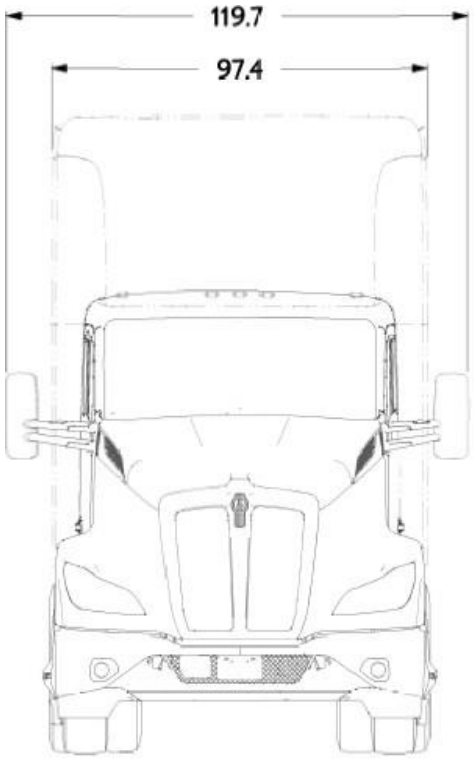
Note: To determine overall height please reference the charts in the "Ride Heights" section and add that value to the height. All heights are given from the bottom of the frame rail.
Kenworth also offers .dxf (Drawing Exchange Format) files and 3D frame layouts for chassis on order, four-six weeks prior to build. Please speak with your salesperson to request this feature when specifying your chassis.

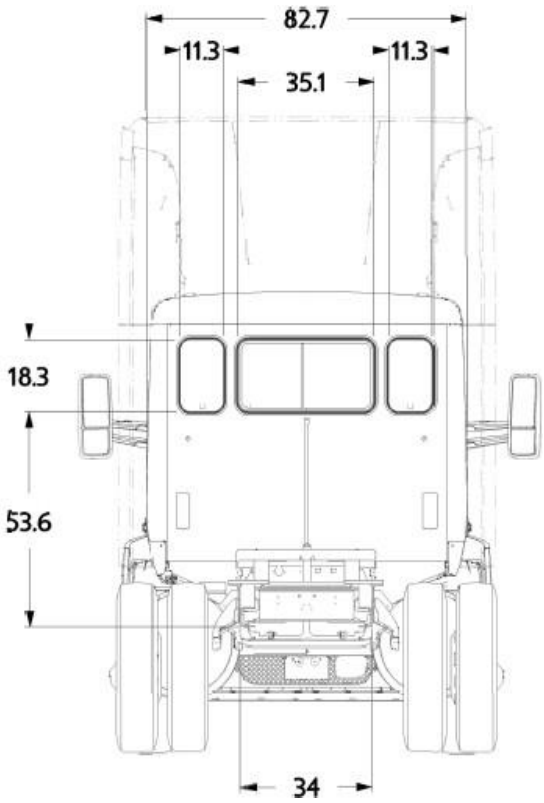
Daycabs

T680 Standard Hood Daycab

The following drawings are of a standard T680 Standard Hood Daycab, shown with standard chassis components.

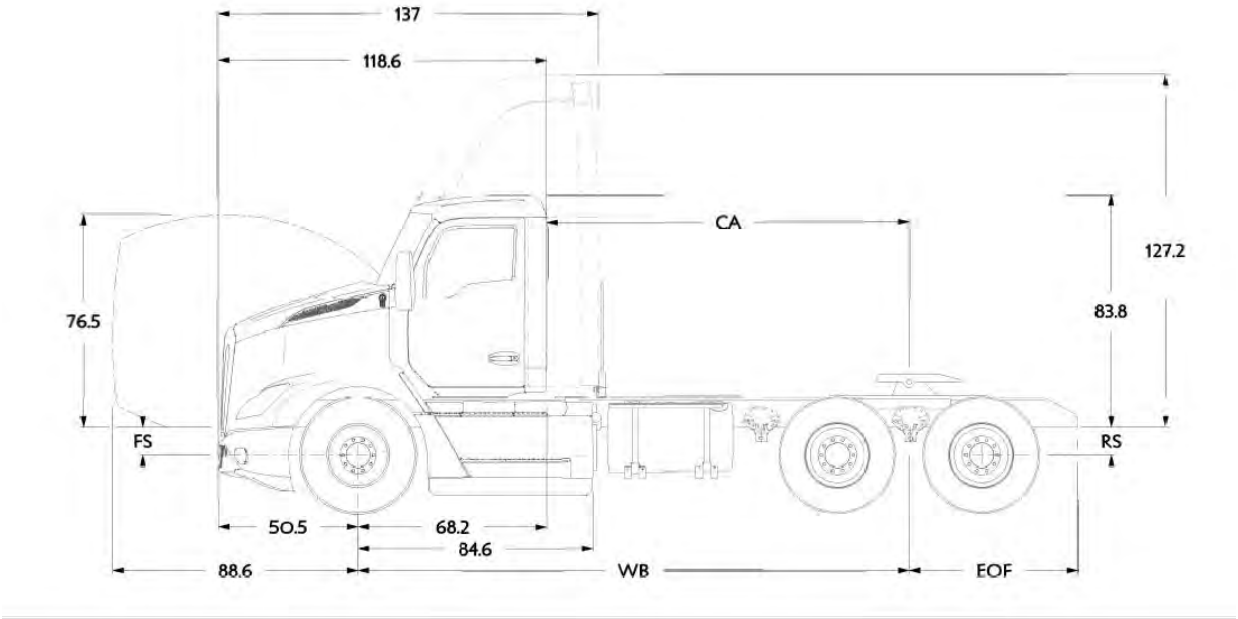


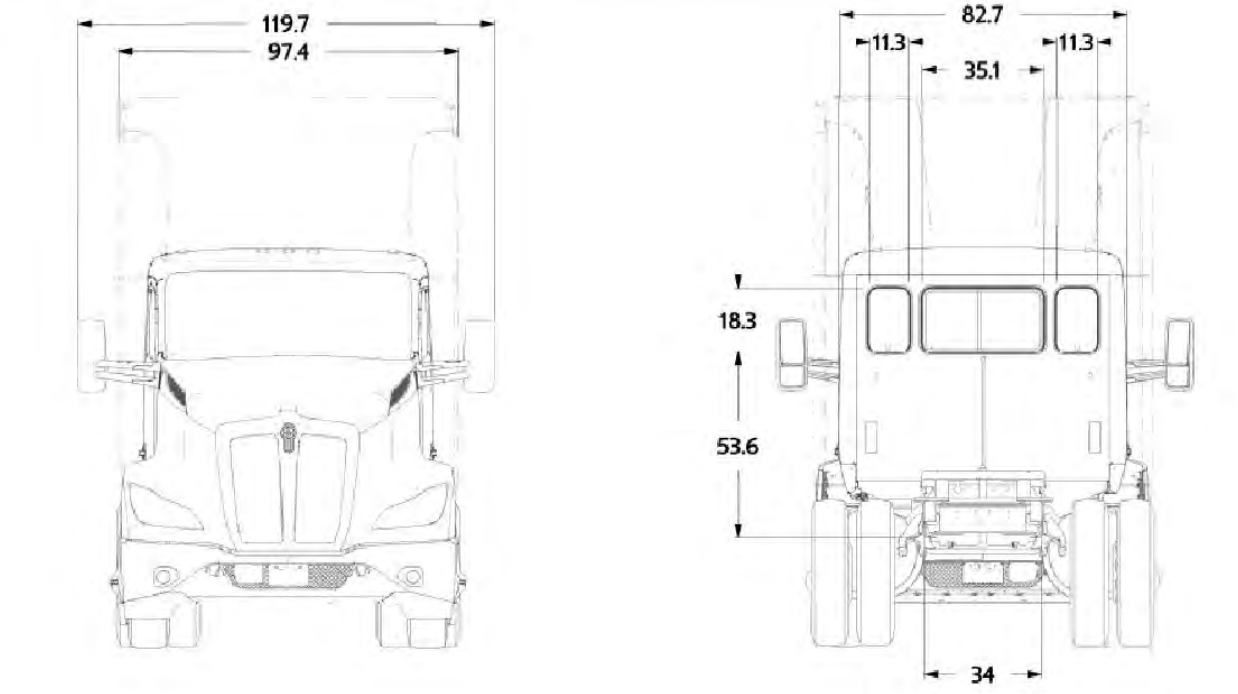




T680 MX Optimized Hood Daycab

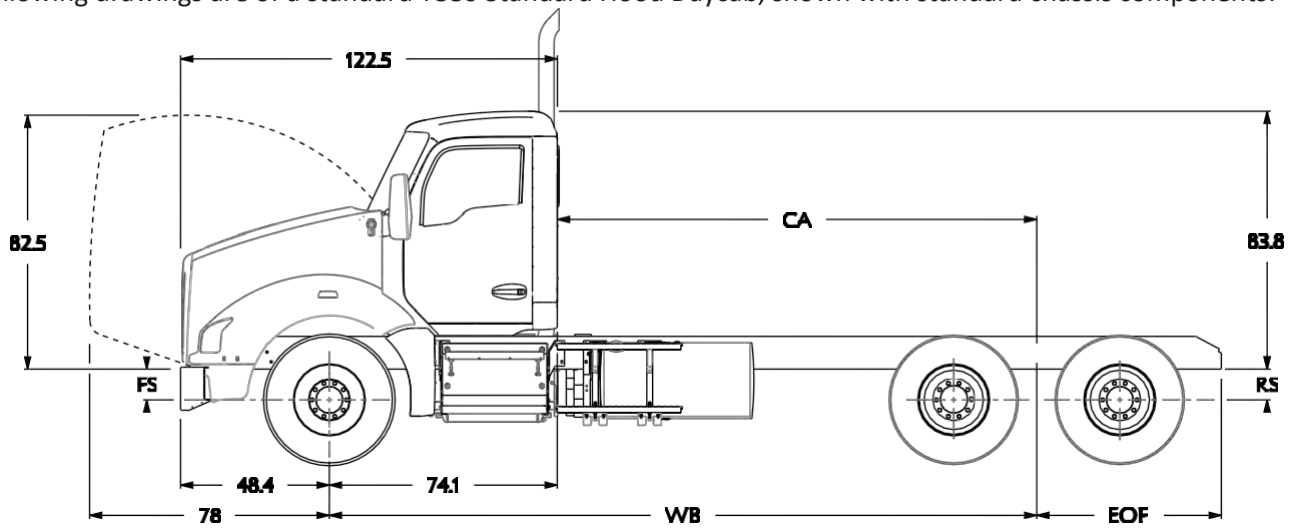
The following drawings are of a standard T680 MX Optimized Hood Daycab, shown with standard chassis components.

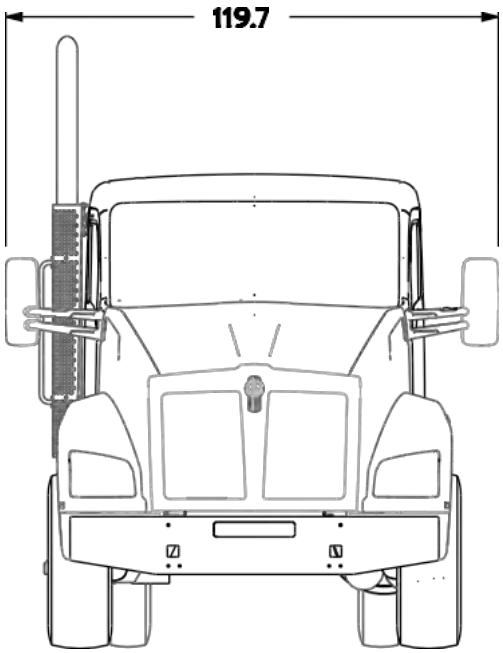


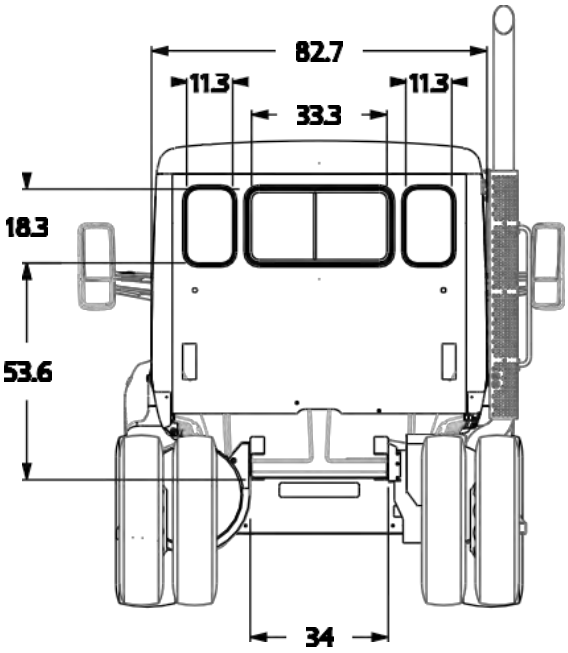


T880 Standard Hood Daycab

The following drawings are of a standard T880 Standard Hood Daycab, shown with standard chassis components.

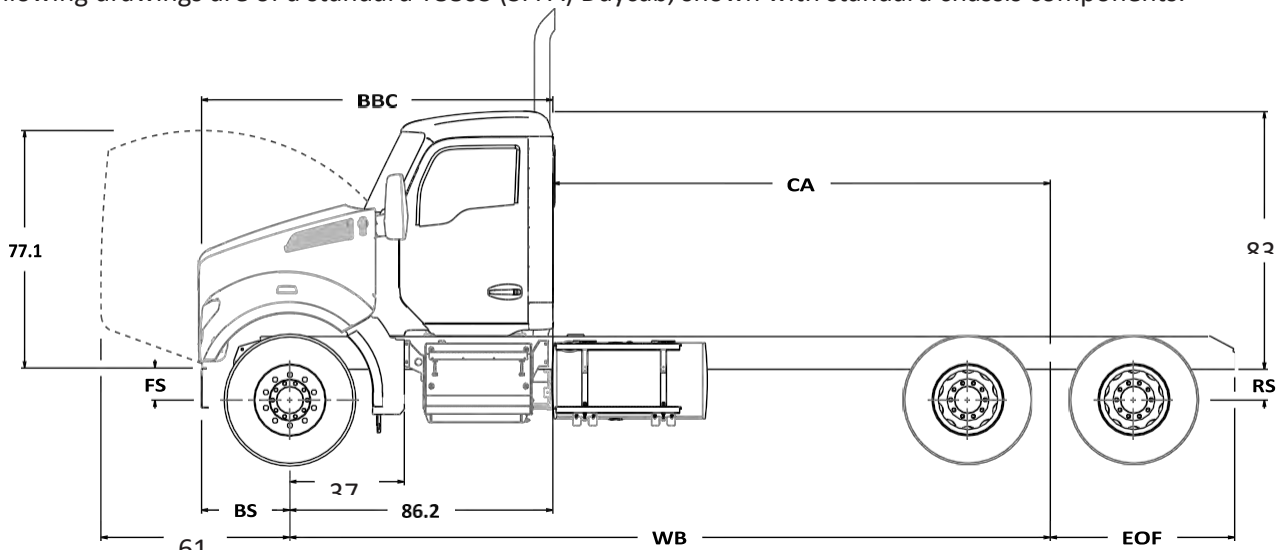


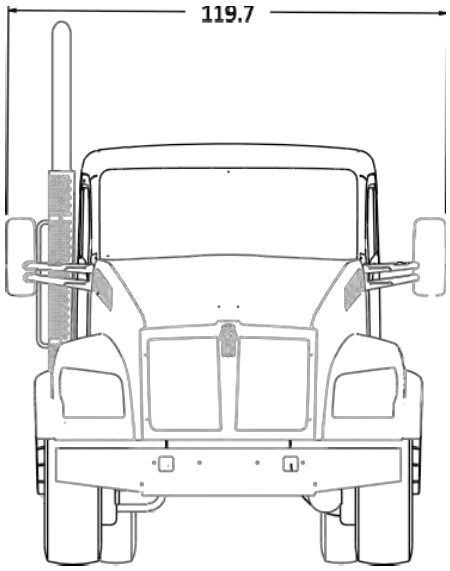


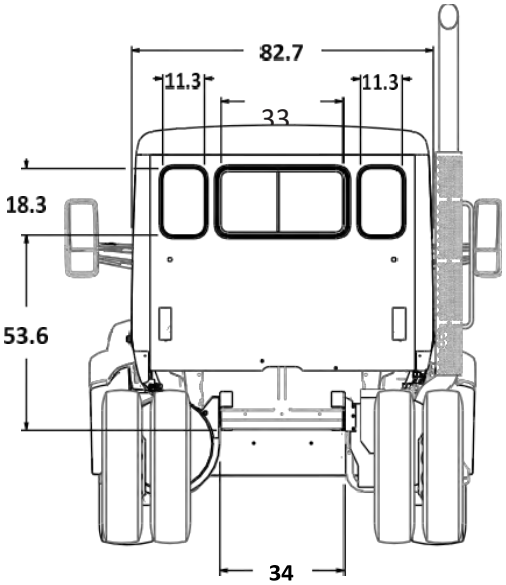


T880s (SFFA) Daycab

The following drawings are of a standard T880S (SFFA) Daycab, shown with standard chassis components.

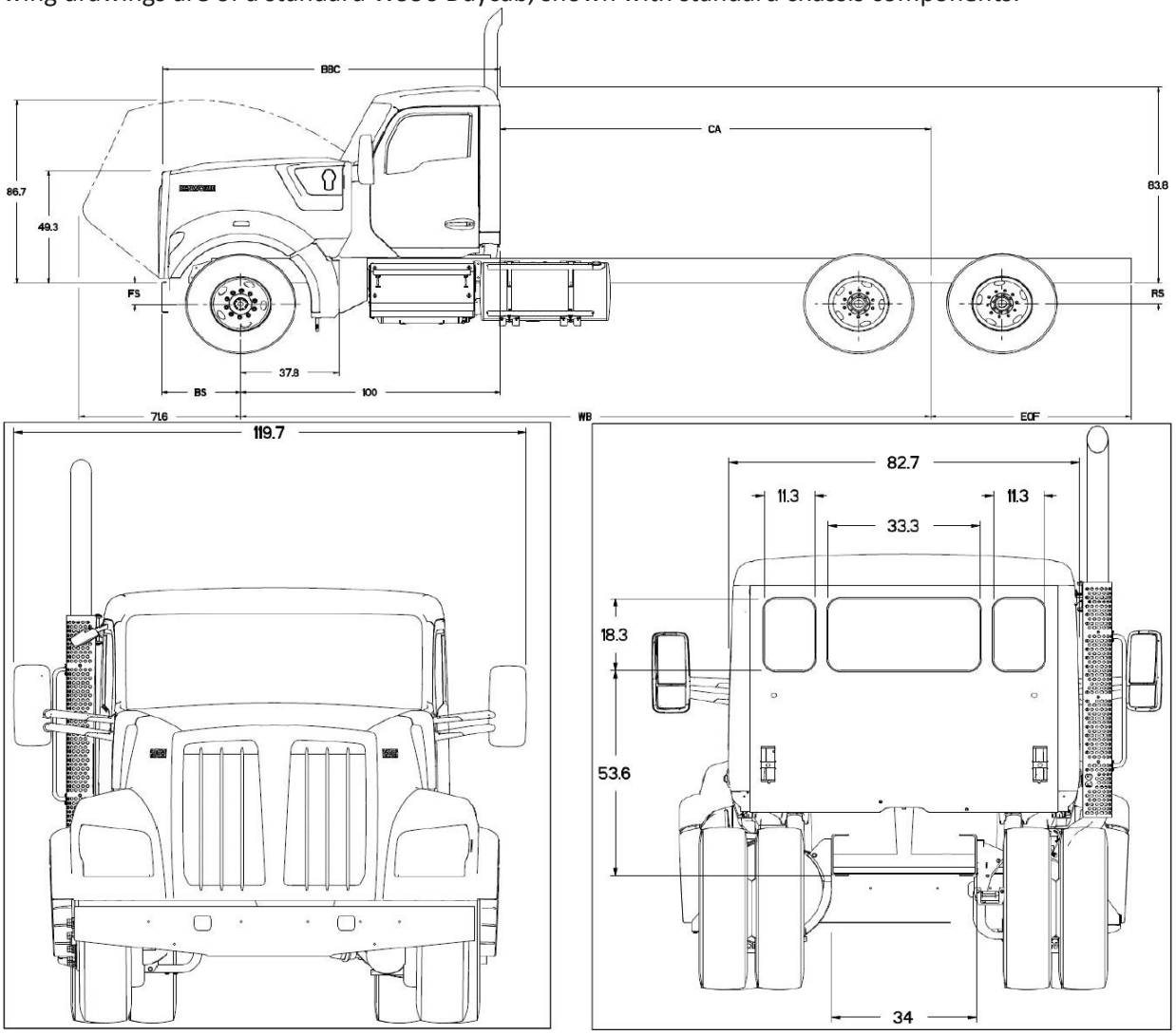






W990 Daycab

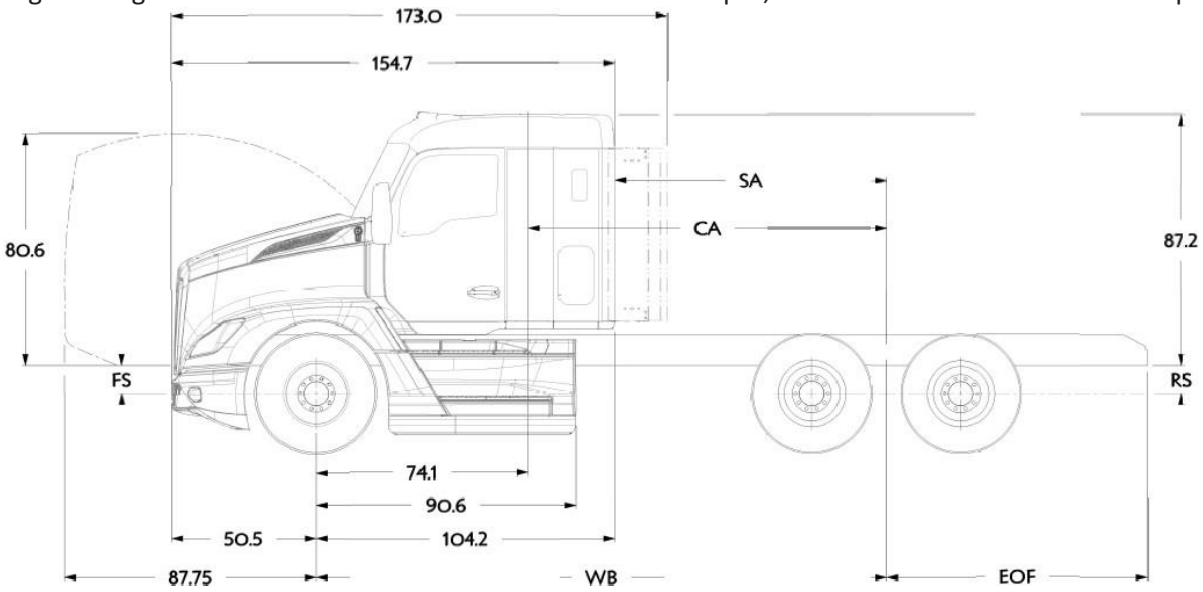
The following drawings are of a standard W990 Daycab, shown with standard chassis components.

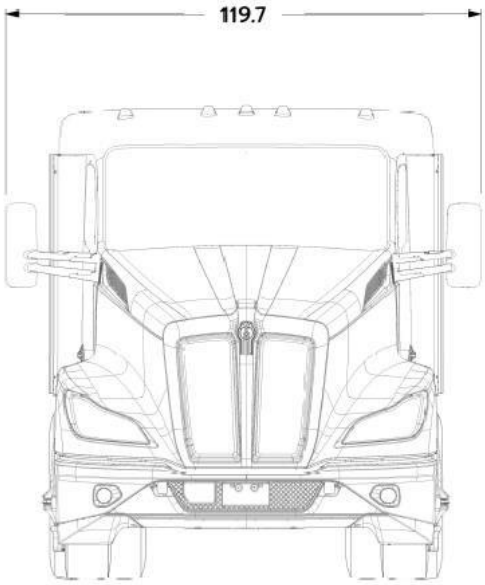


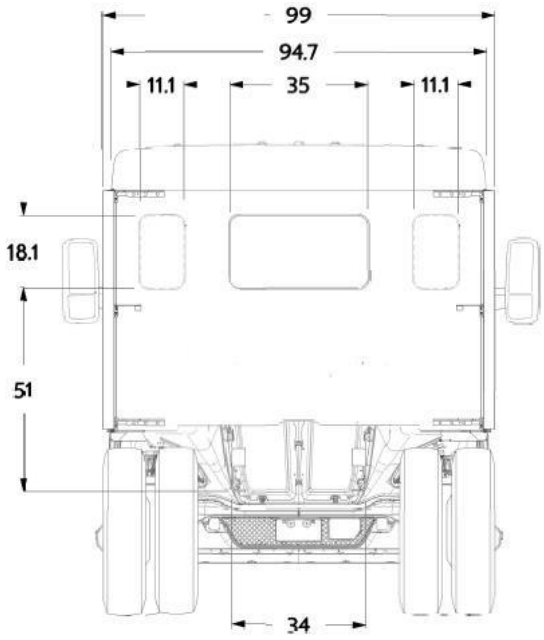
Sleepers

T680 Standard Hood 40in Sleeper

The following drawings are of a standard T680 Standard Hood 40” Sleeper, shown with standard chassis components.

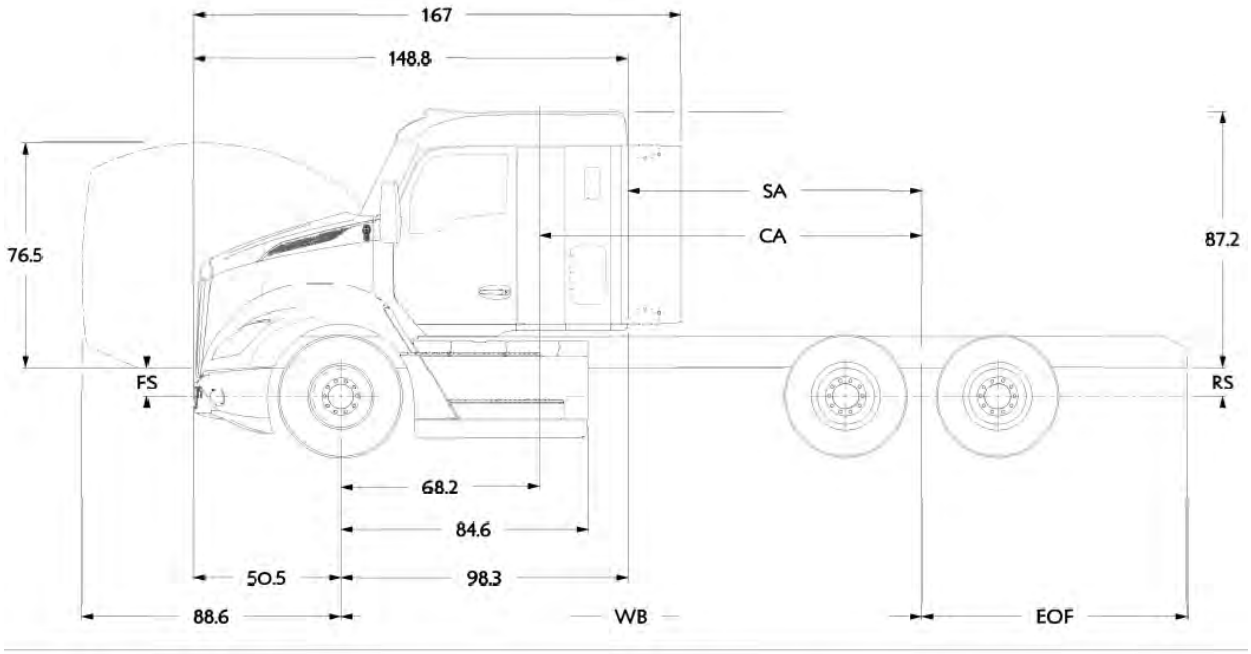


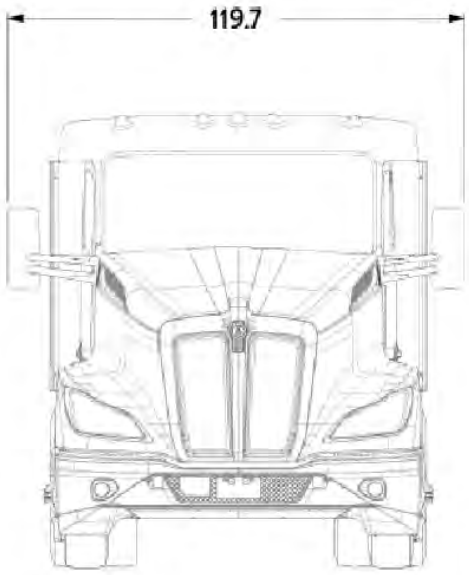


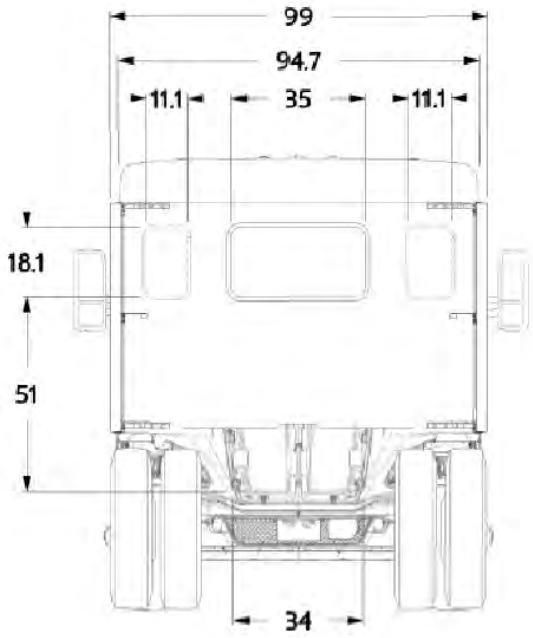


T680 MX Optimized Hood 40in Sleeper

The following drawings are of a standard T680 MX Optimized Hood 40in Sleeper, shown with standard chassis components.

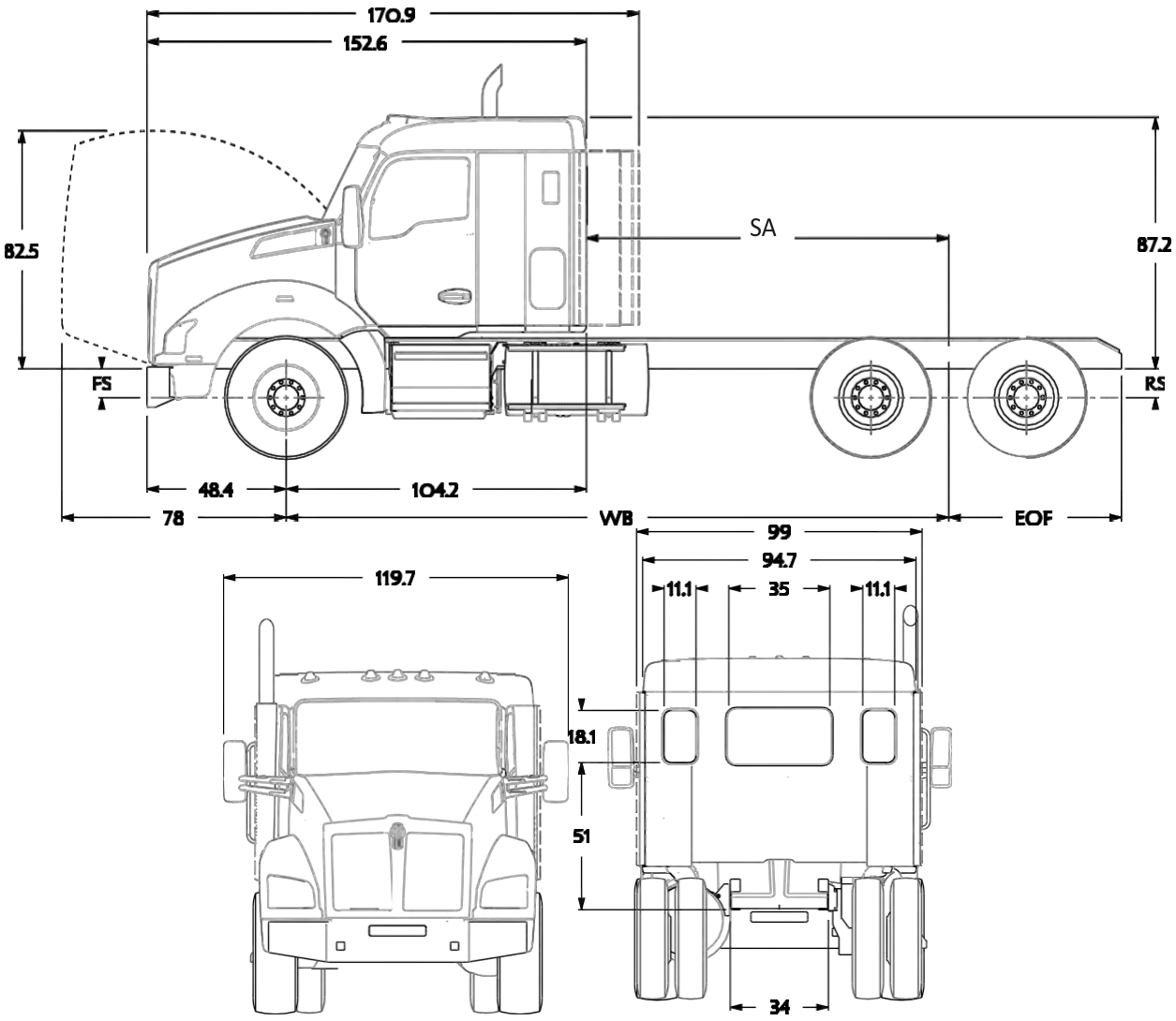






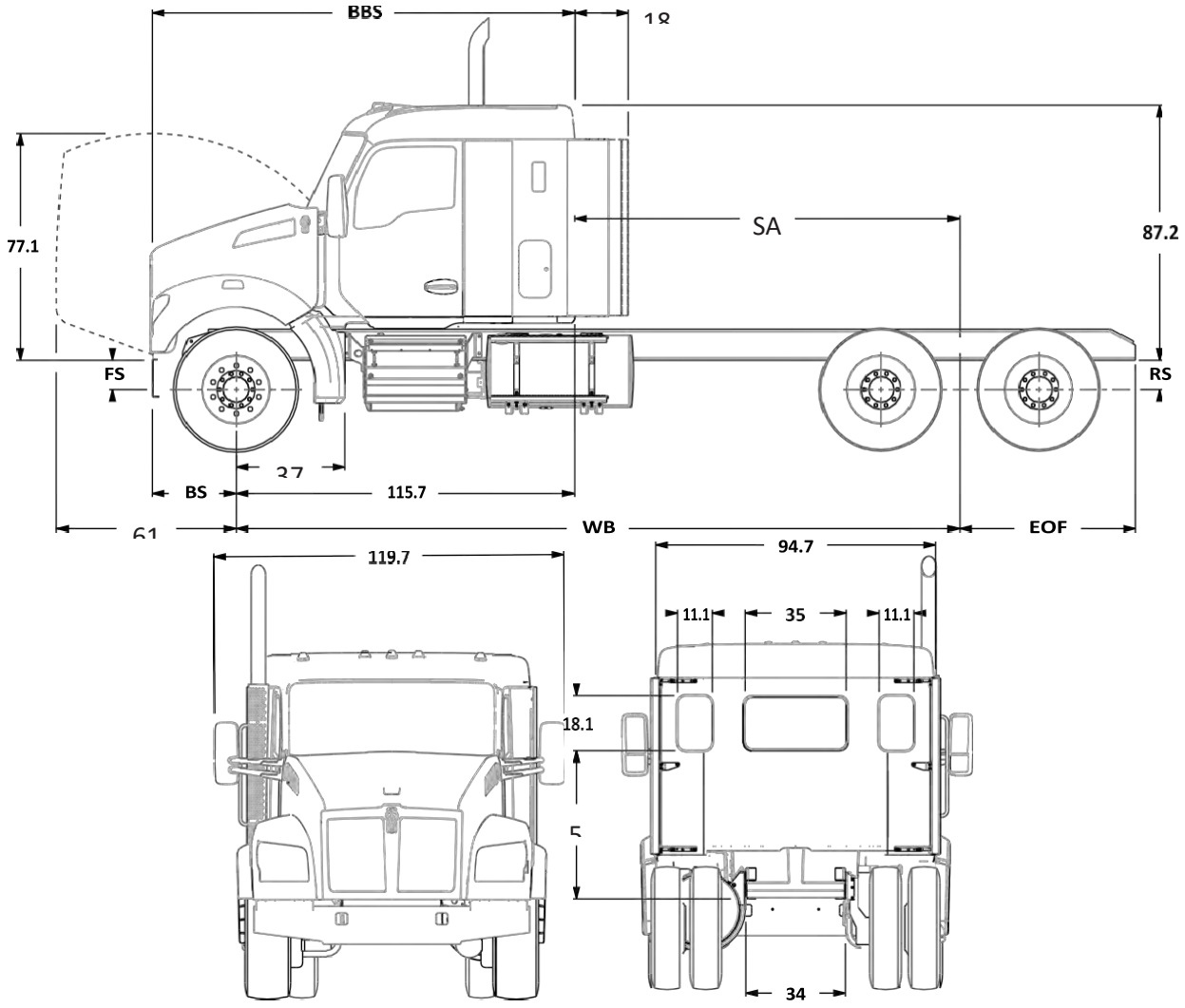
T880 Standard Hood 40in Sleeper

The following drawings are of a standard T880 Standard Hood 40in Sleeper, shown with standard chassis components.



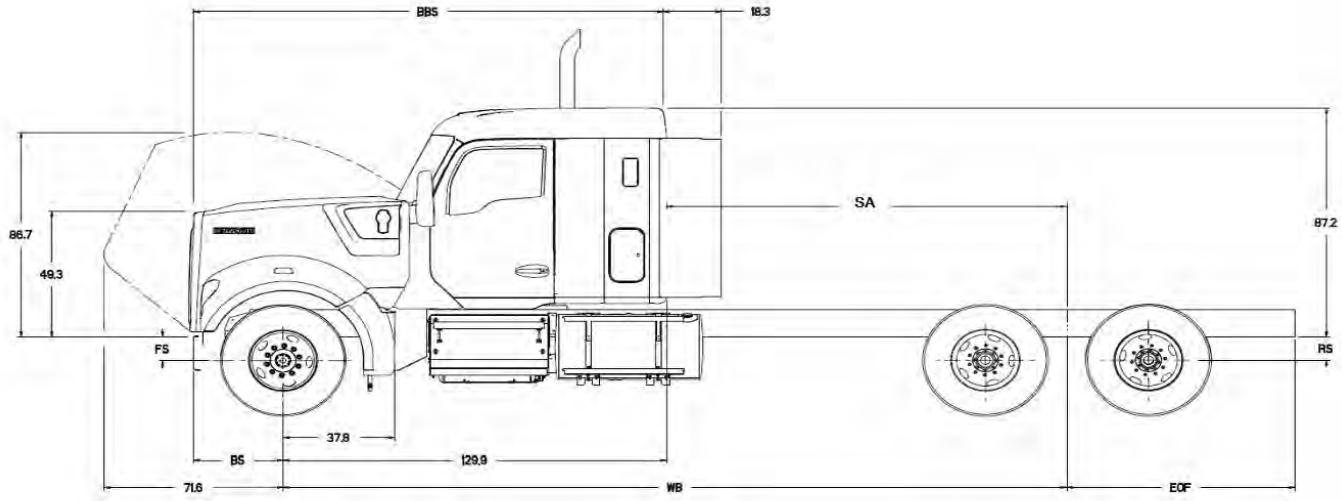
T880s (SFFA) MX Optimized Hood 40in Sleeper

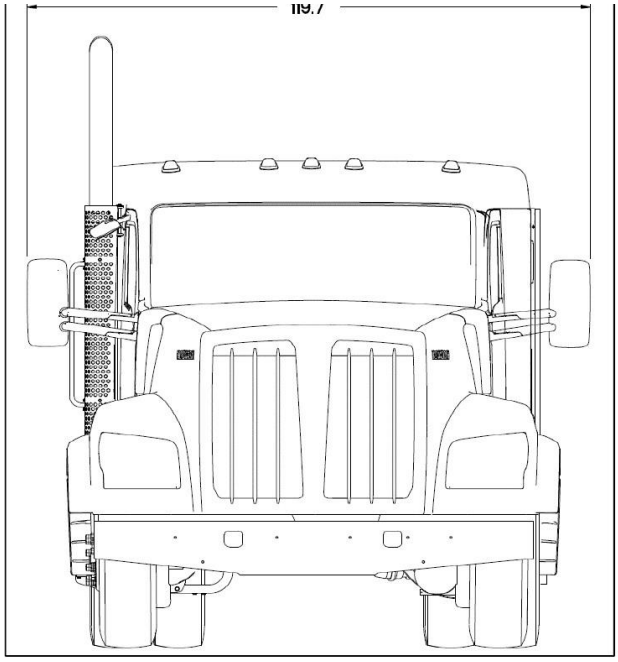
The following drawings are of a standard T880S SFFA (Short) Hood 40in Sleeper, shown with standard chassis components.

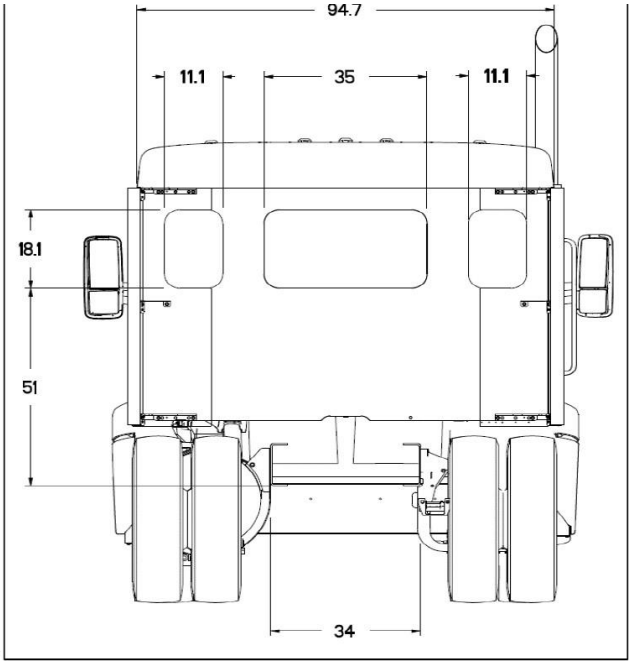


W990 40in Sleeper

The following drawings are of a standard W990 40in Sleeper, shown with standard chassis components.

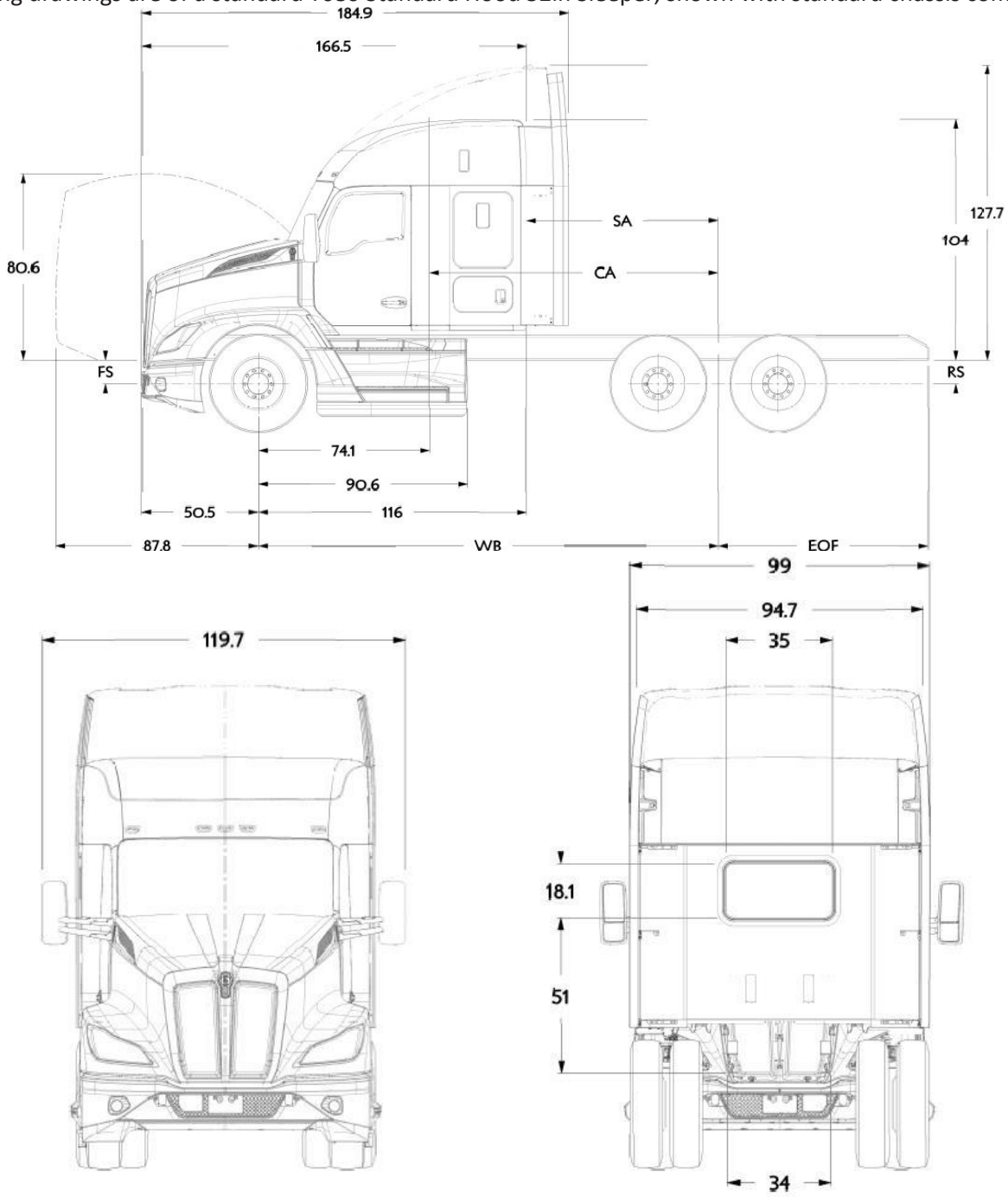






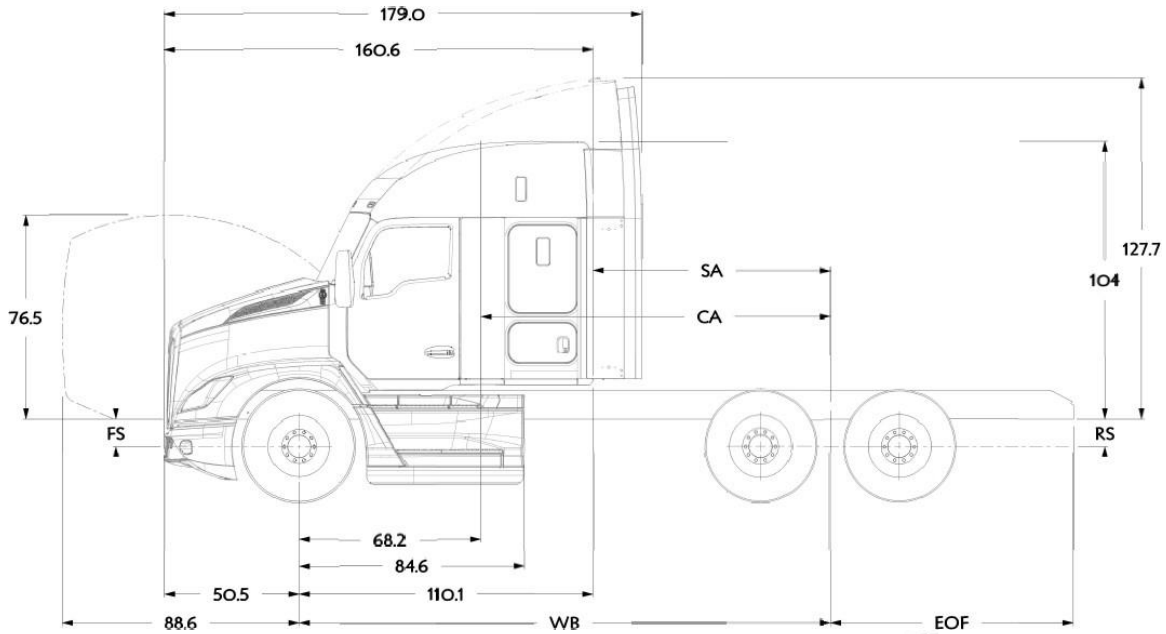
T680 Standard Hood 52in Sleeper

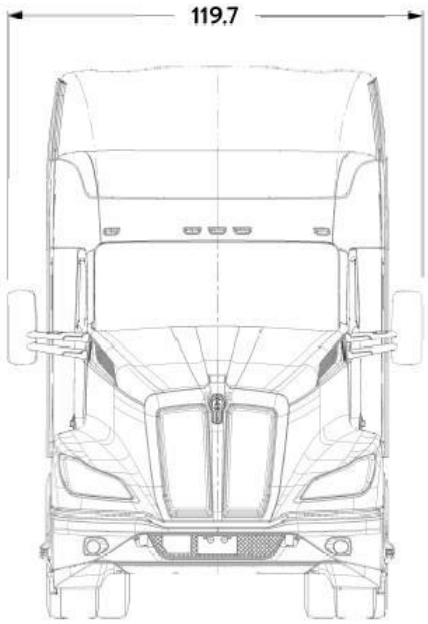
The following drawings are of a standard T680 Standard Hood 52in Sleeper, shown with standard chassis components.

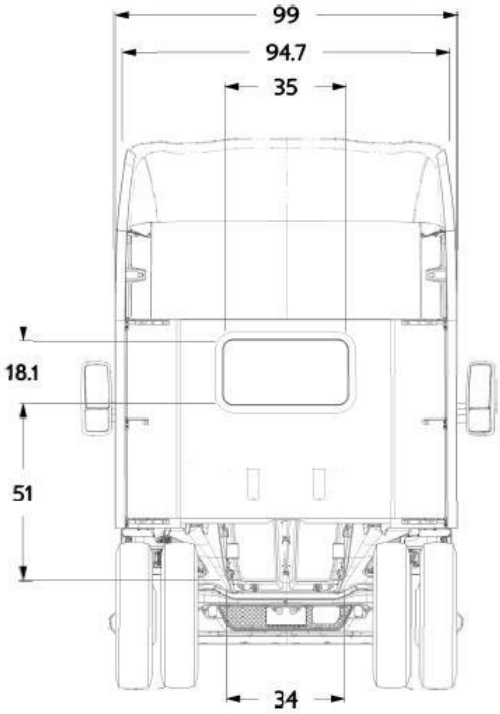


T680 MX Optimized Hood 52in Sleeper

The following drawings are of a standard T880 MX Optimized Hood 52in Sleeper, shown with standard chassis components.

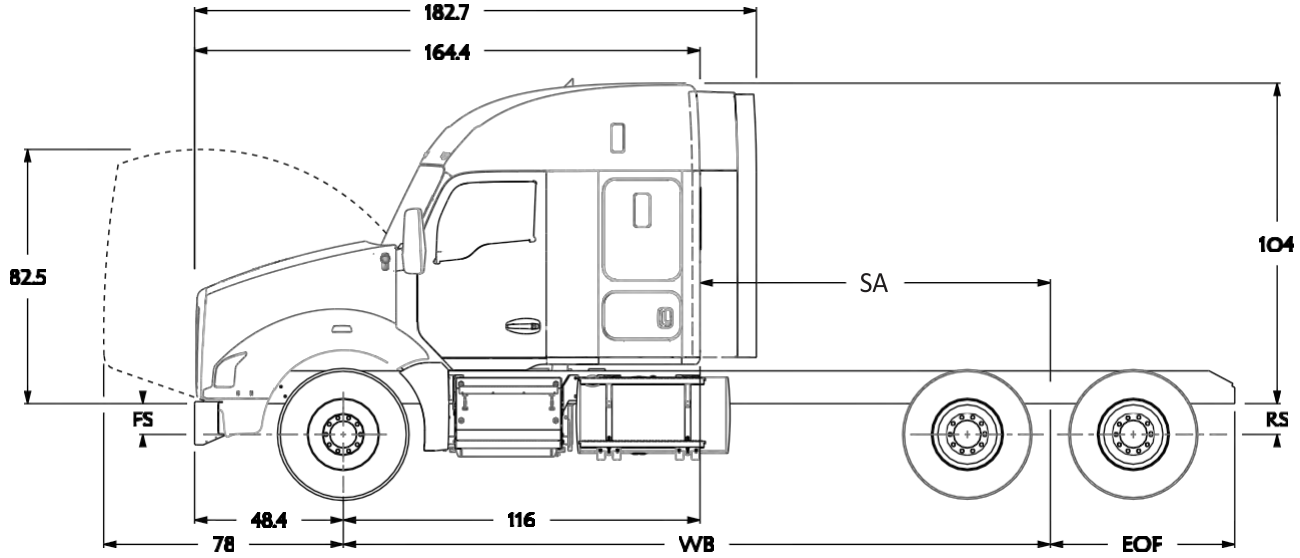


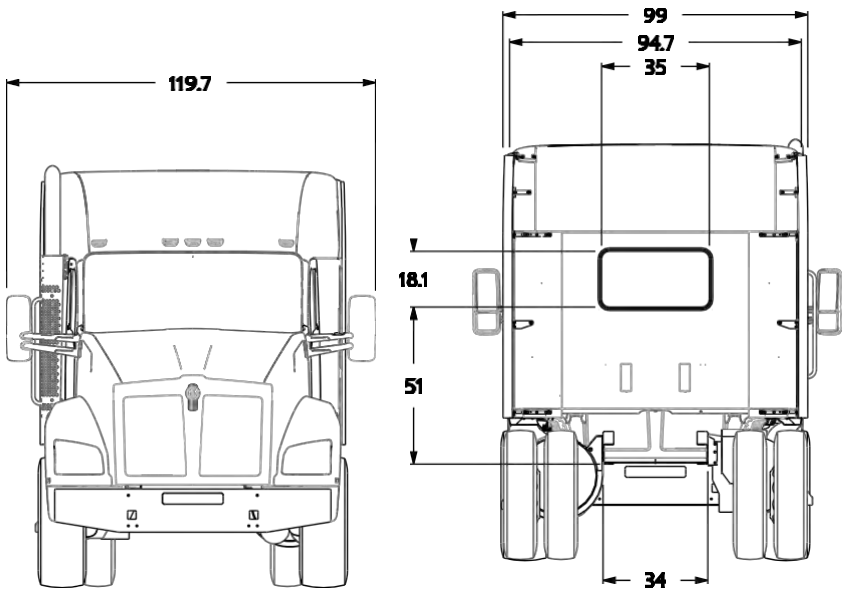




T880 Standard Hood With 52in Sleeper

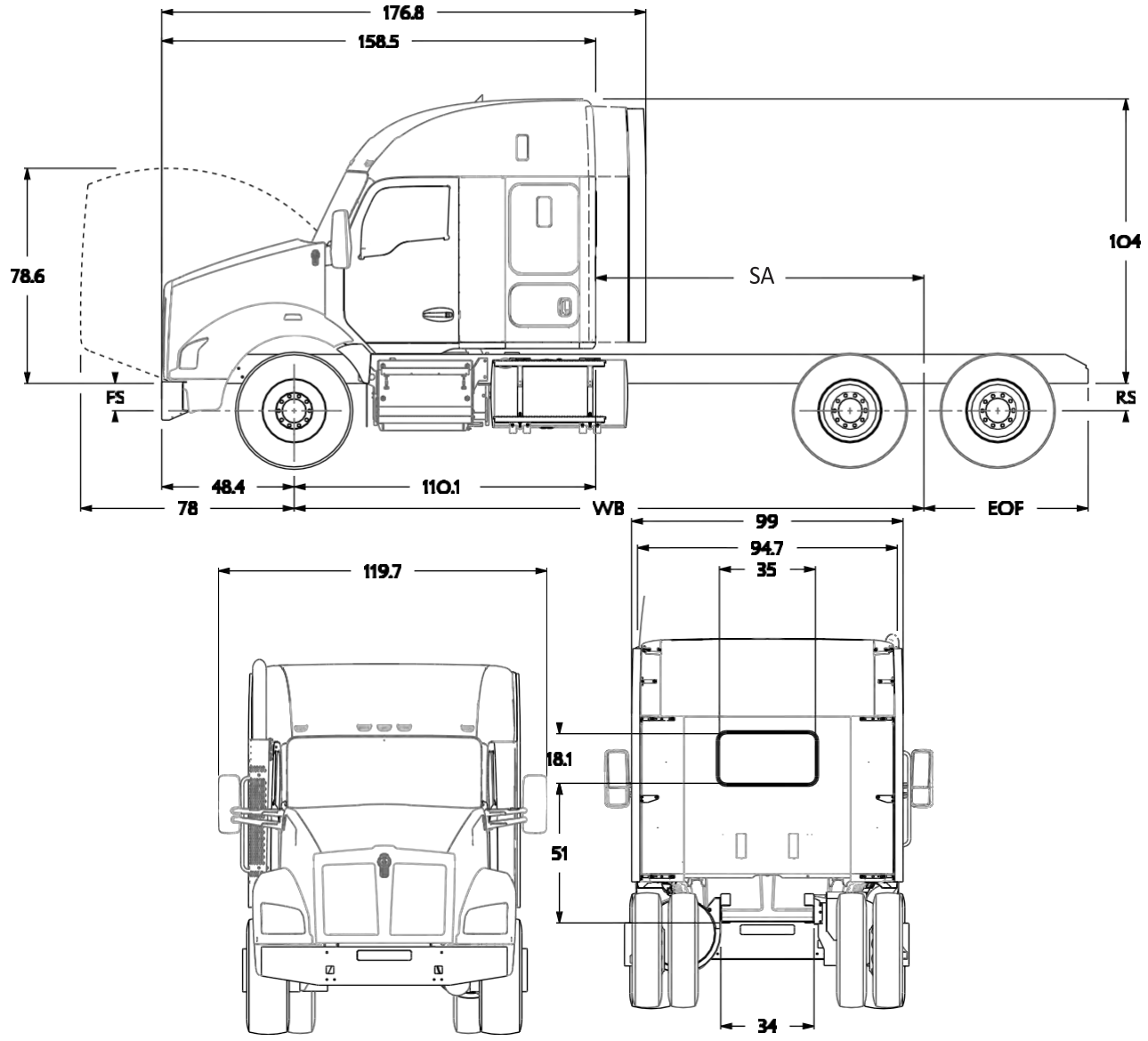
The following drawings are of a standard T880 Standard Hood with 52in Sleeper, shown with standard chassis components.





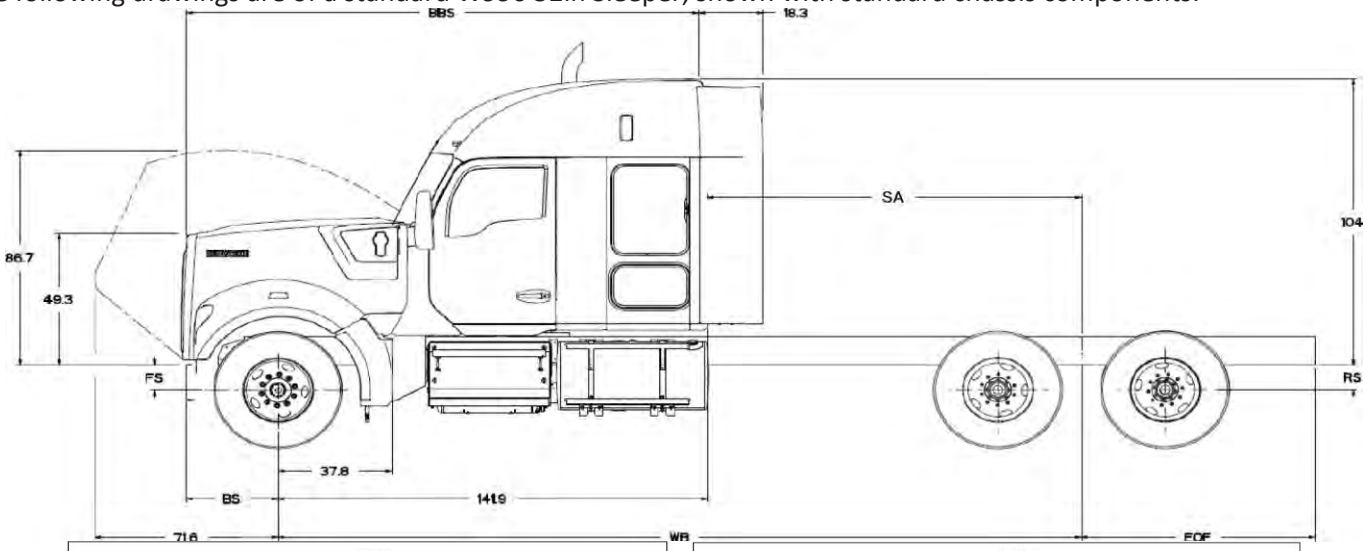
T880 MX Optimized Hood 52in Sleeper

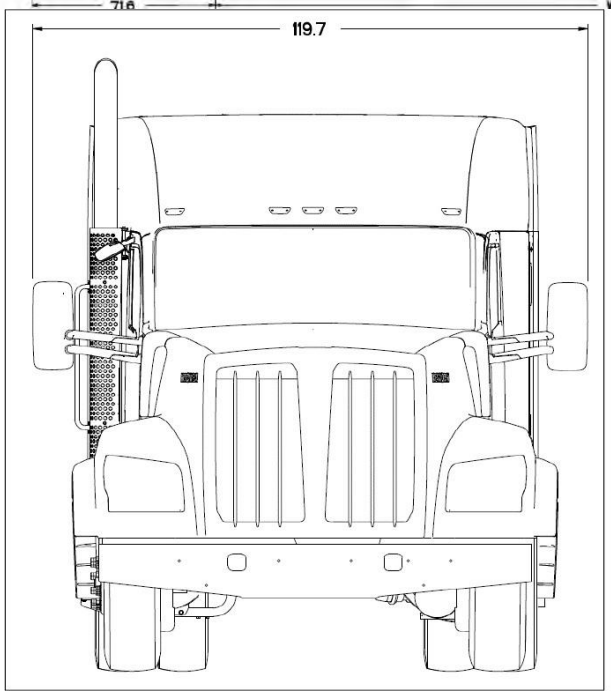
The following drawings are of a standard T880 MX Optimized Hood with 52in Sleeper, shown with standard chassis components.

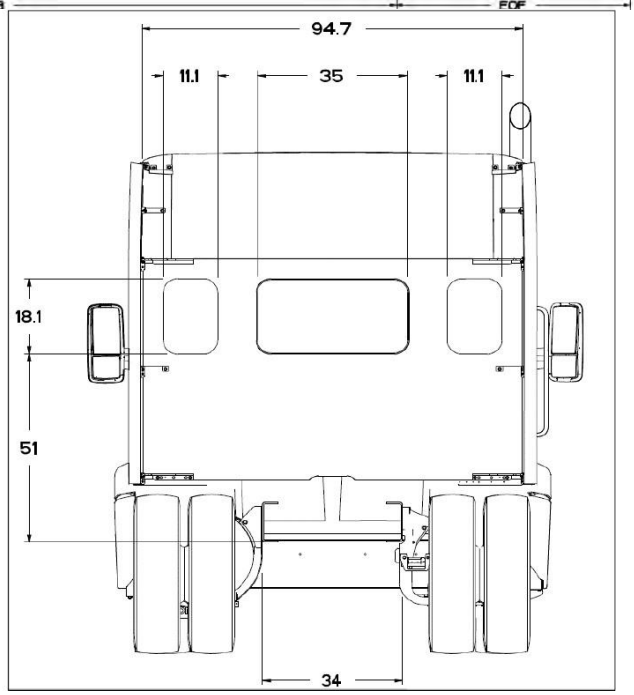


W990 52in Sleeper

The following drawings are of a standard W990 52in Sleeper, shown with standard chassis components.

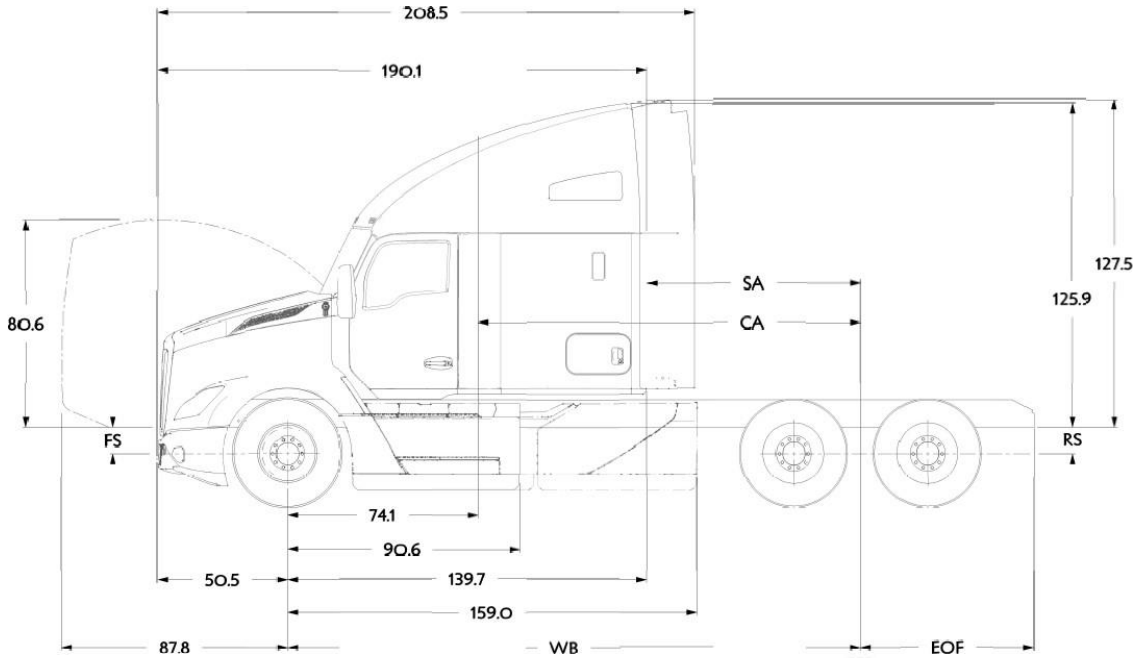


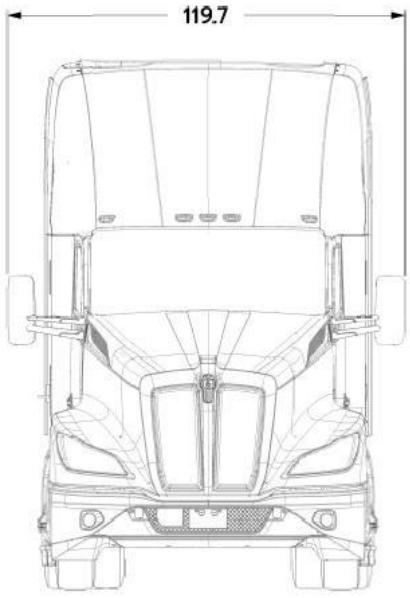


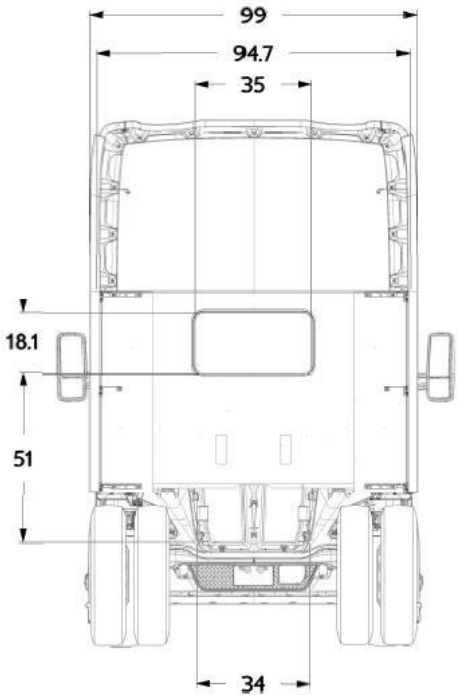


T680 Standard Hood 76in High-Roof Sleeper

The following drawings are of a standard T680 Standard Hood with 76in High-Roof Sleeper, shown with Standard Chassis Components.

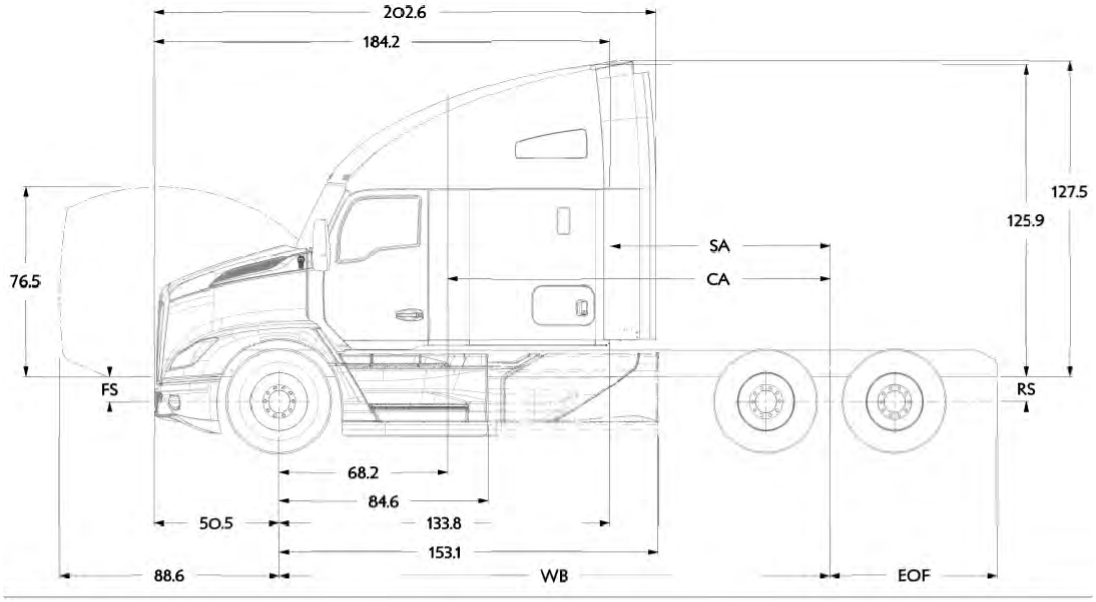


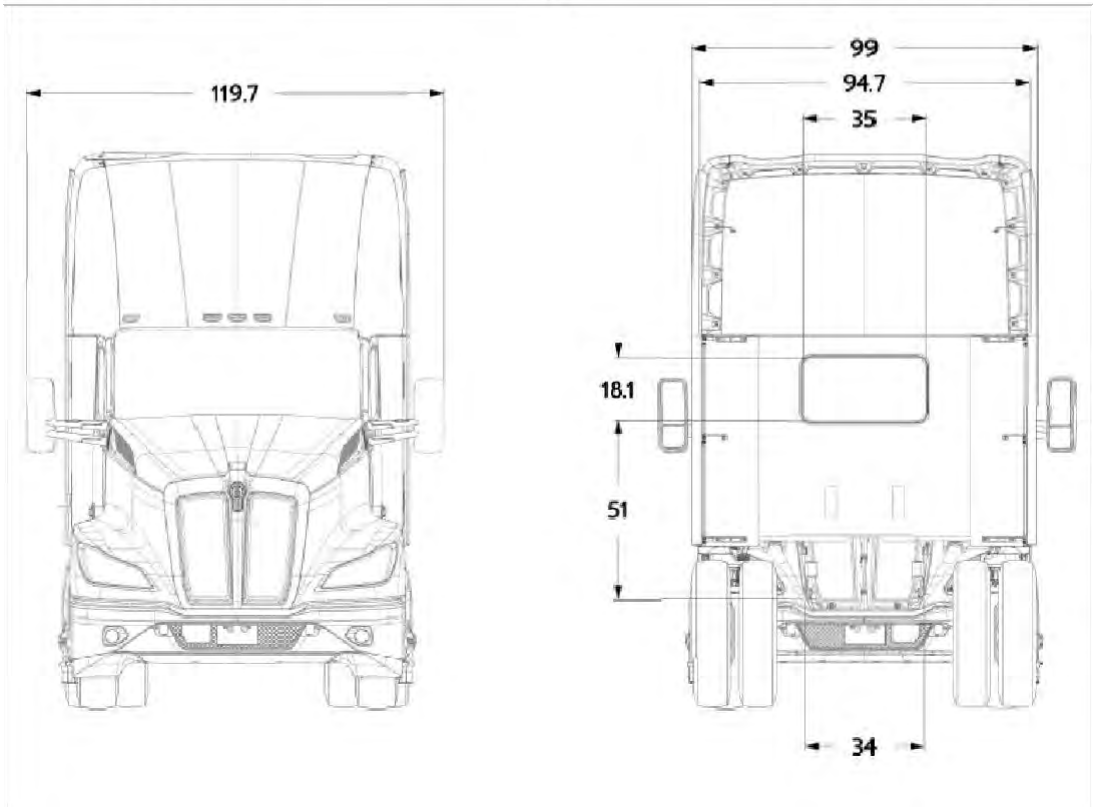




T680 MX (Short) Hood 76in High-Roof Sleeper

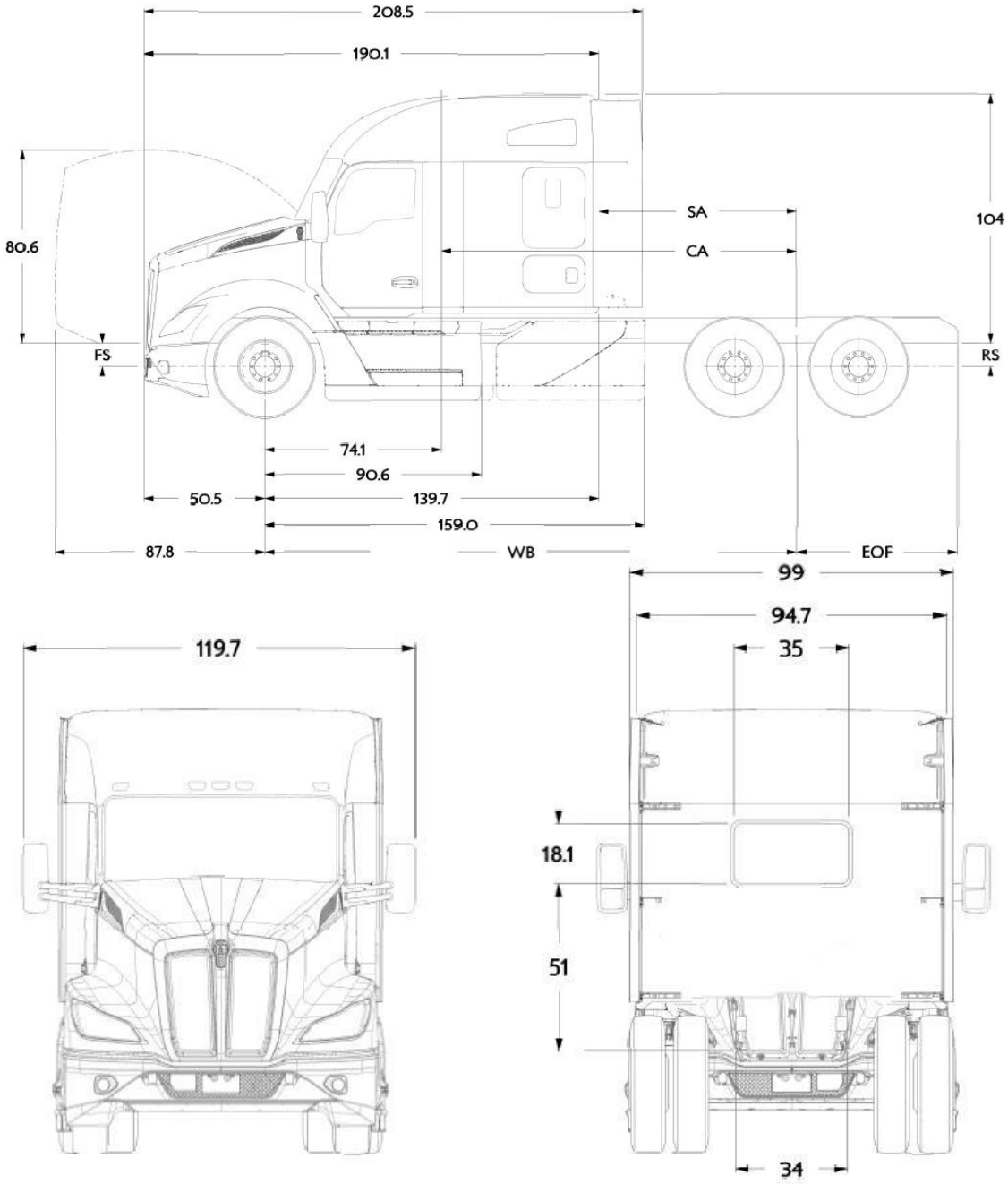
The following drawings are of a standard T680 MX (Short) hood with 76in High-Roof Sleeper, shown with standard chassis components.





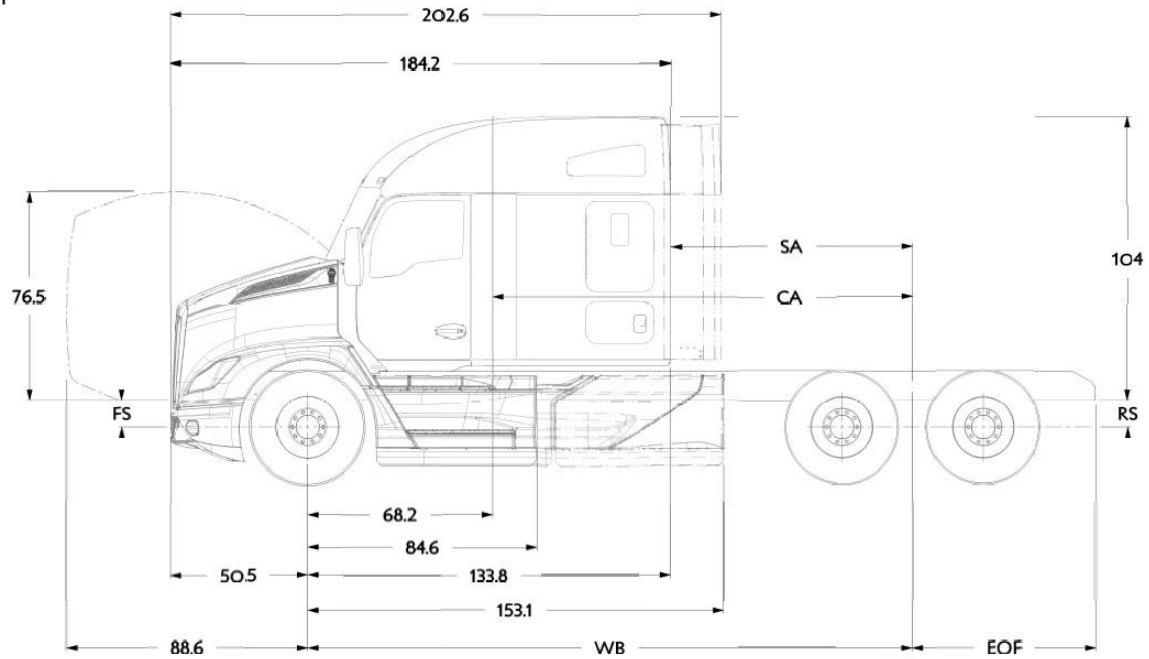
T680 Standard Hood 76in Mid-Roof Sleeper

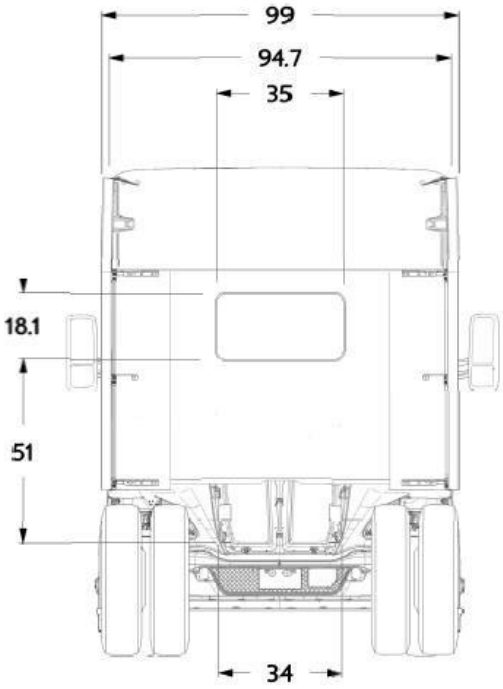
The following drawings are of a standard T680 Standard Hood with 76in Mid-Roof Sleeper, shown with standard chassis components.



T680 MX Optimized Hood 76in Mid-Roof Sleeper

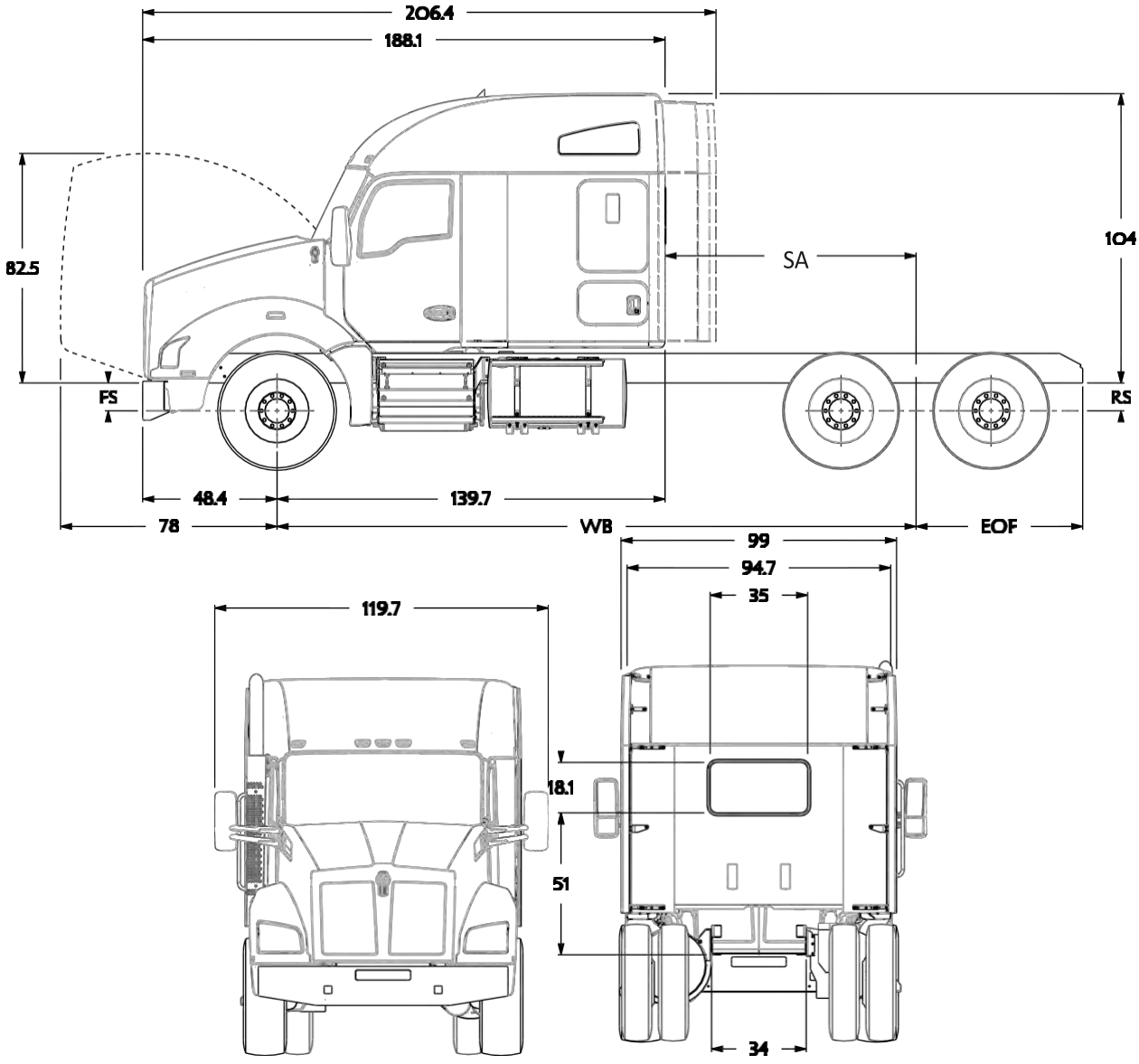
The following drawings are of a standard T680 MX Optimized hood with 76un Mid-Roof Sleeper, shown with standard chassis components.





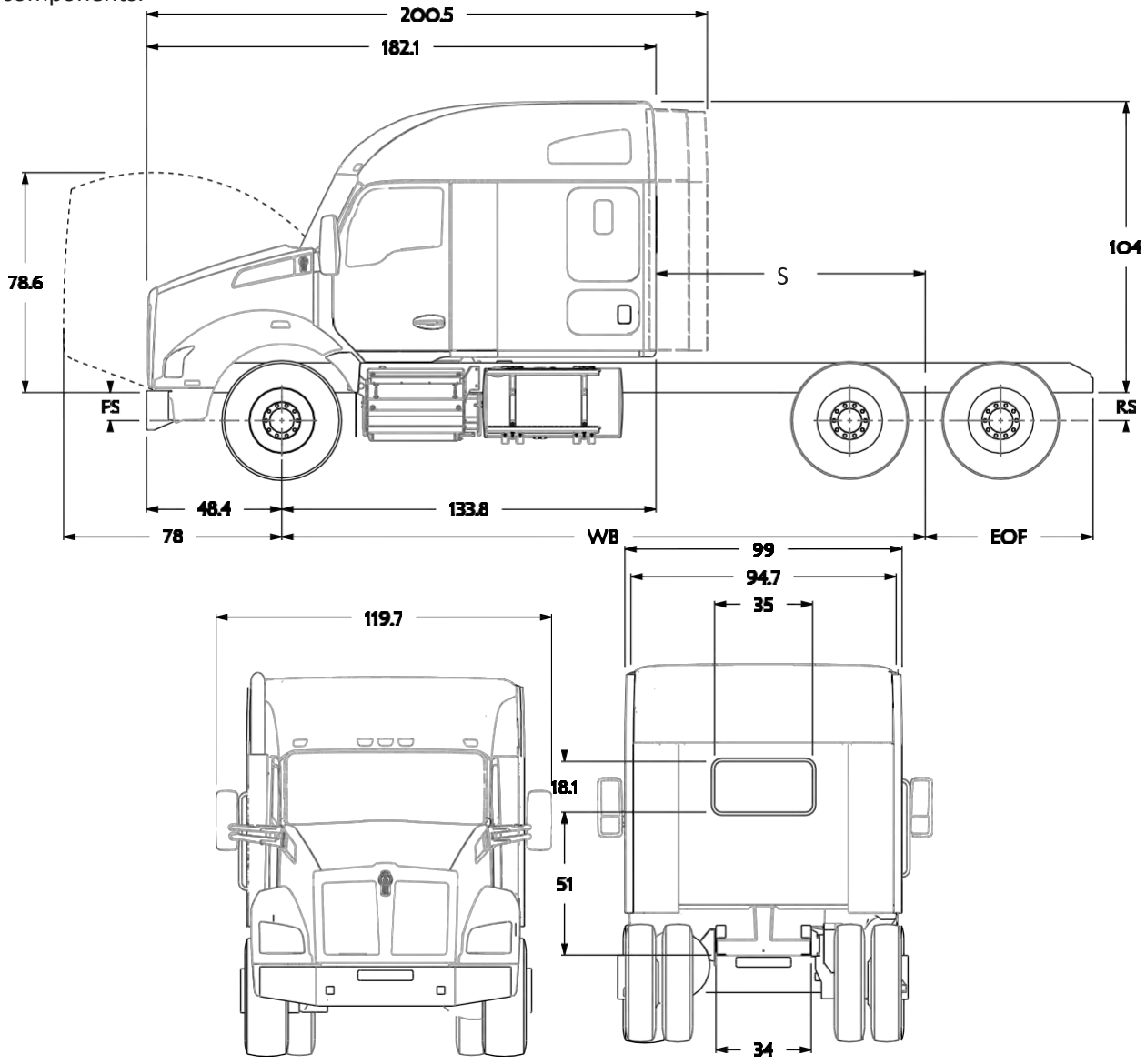
T880 Standard Hood 76in Mid-Roof Sleeper

The following drawings are of a standard T880 Standard Hood with 76in Mid-Roof Sleeper, shown with standard chassis components.



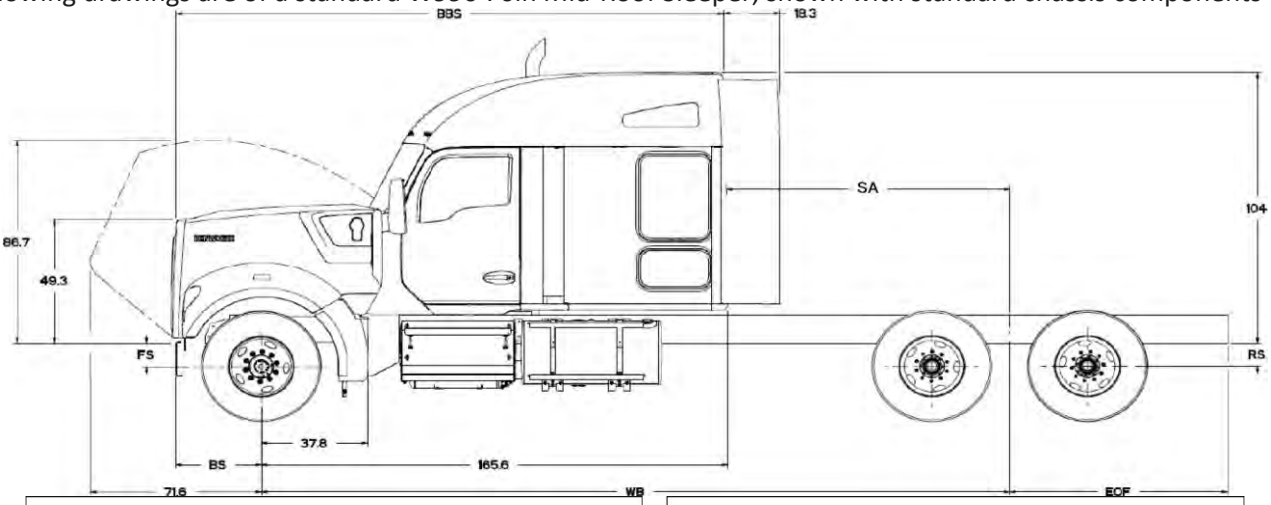
T880 MX Optimized Hood 76in Mid-Roof Sleeper

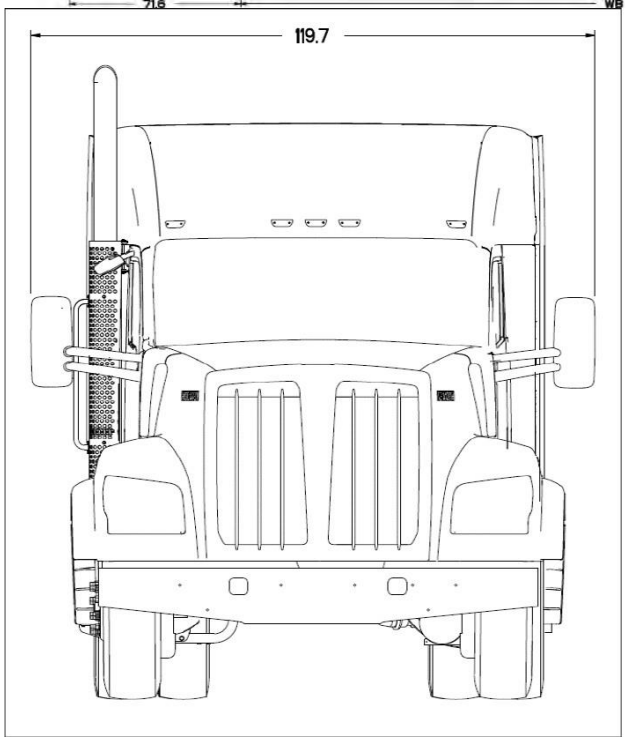
The following drawings are of a standard T880 MX Optimized Hood with 76in Mid-Roof Sleeper, shown with standard chassis components.

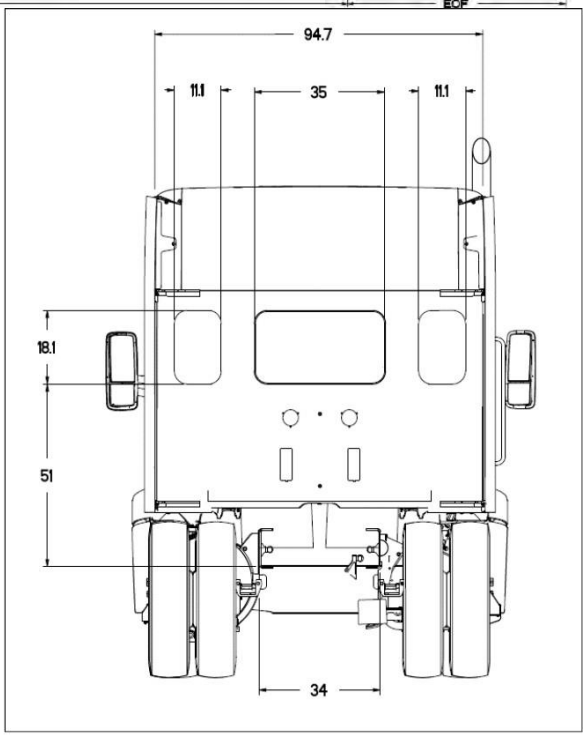


W990 76in Mid-Roof Sleeper

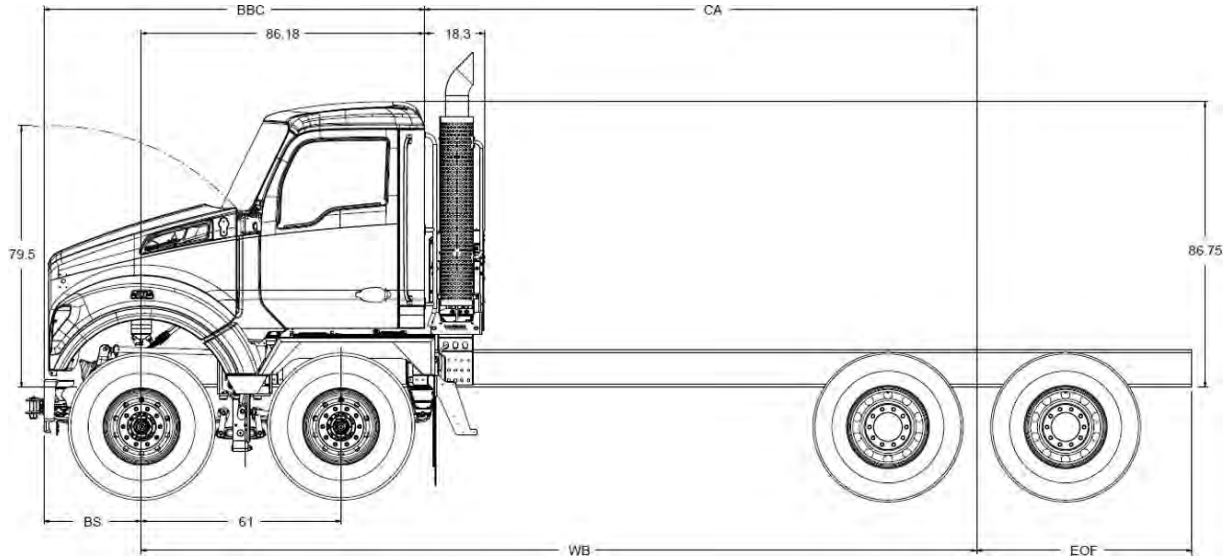
The following drawings are of a standard W990 76in Mid-Roof Sleeper, shown with standard chassis components







T880s Twin Steer Daycab With 61in Axle Spacing



Frame Layouts

The dimensions in the frame layout section are intended to aid in layout of the chassis, and to help determine the best possible combination of fuel tanks, battery boxes, the diesel particulate filter (DPF) / SCR canister, and Diesel Exhaust Fluid (DEF) tank. For your application, the layouts focus on the under-cab area, with appropriate dimensional information included for pertinent back of cab components. Not all optional equipment is included in this section. Additional components may be placed on the rail behind components shown. The Back of Cab components are shown primarily for reference. For more specific requirements please work with your local Kenworth Dealer.

Please read the instructions carefully.

The following dimensions are consistent across the entire section to aid in the comparison of one layout option to another.

Component Abbreviation	Description
B	Battery Box
D	DEF Tank
E	Exhaust
F1	Fuel Tank RHS
F2	Fuel Tank LHS
T	Toolbox

Common Optional Components

The frame layouts that follow contain the minimum frame requirements to be operational (fuel tanks, battery box, and after-treatment components). All layouts are shown with standard length battery boxes unless otherwise noted. Dimensions for these components have been provided below to help complete the frame layout for chassis with more fuel tanks, additional toolboxes, etc.

Table 3 Fuel Tank Overall Length (in)

	Fuel Tank Overall Length (in)		
Tank Capacity (Gallons)	Fuel Tank Diameter		
	22in	24.5in	28.5in
45	NA	23.0	NA
56	35.6	NA	NA
60	38.0	30.6	NA
75	47.3	38.5	28.7
90	NA	45.5	34.3
100	62.2	50.0	NA
105	NA	NA	38.8
110	NA	55.0	NA
120	74.3	60.6	45.8
135	NA	67.2	50.9
150	NA	74.5	56.2
177	NA	NA	66.1

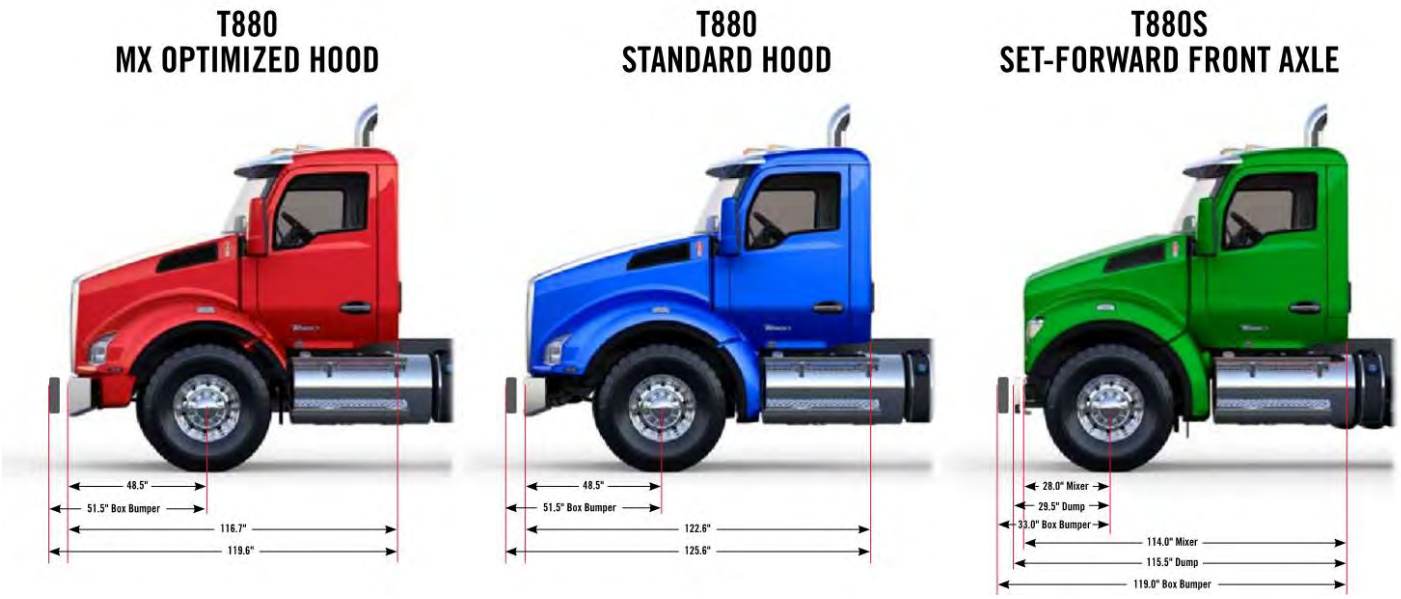
Table 4 Battery Box Center Frame Lengths (in)

Battery Box Center Frame Lengths (in)			
Battery Box Type	T680	T880	W990
Parallel Short	34.8	34.8	34.8
Parallel Extended	42.0	42.0	42.0
Parallel BOC	34.8	34.8	34.8
Cantilever (Standard)	17.8	17.8	17.8
Cantilever (Vocational)	15.2	15.2	15.2

Daycab Chassis Layout Options

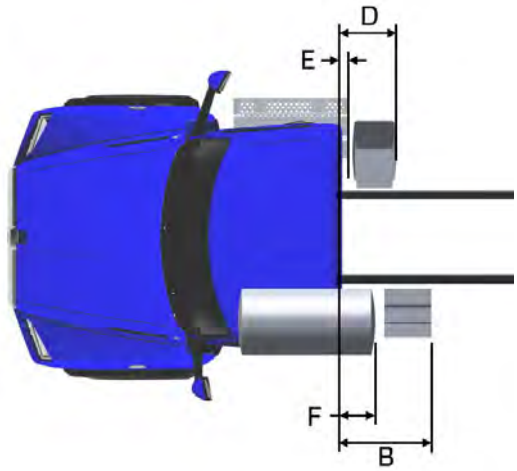
To help simplify the layouts for the T880s we are color coding the hoods with the following colors

- Red - MX optimized hood
- Blue - Standard Hood
- Green- Set forward front axle



Layout charts

T880 SBFA (Standard Hood)



Layout Definition:

- T880 SBFA – Standard Hood
- RHUC DPF/SCR
- RH BOC DEF
- LHUC Fuel
- LH BOC Battery Box

Dimension E:
(BOC to DPF/SCR) = 2.7in

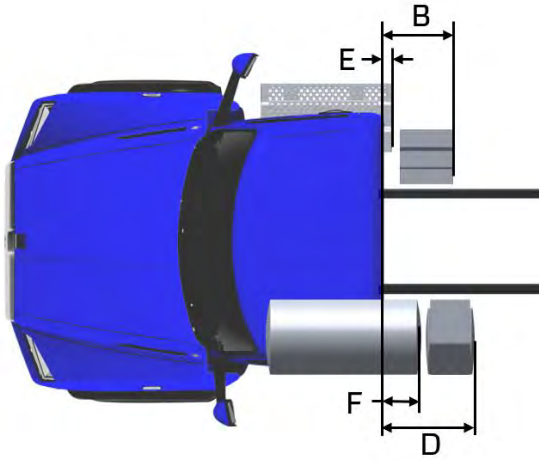
Figure 10 T880 STANDARD HOOD

Table 5 T880 (SBFA) Standard Hood D1 Layout Dimensions

Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	-2.1*	19.5	18.5	26.3	30.2
	60	38	0.4	21.4			
	75	47.3	9.6	31.3			
	100	62.2	24.5	47			
	120	74.3	36.6	58.8			
24.5 in	60	30.6	-6.5	15.5			
	75	38.5	0.6	23.4			
	90	45.5	7.7	31.3			
	100	50	12.2	23			
	110	55	17.2	41.1			
	120	60.6	22.8	45.1			
	135	67.2	29.4	52.9			
	150	74.5	36.7	58.8			
28.5 in	75	28.7	-8.8*	13.9			
	90	34.3	-3.3*	19.5			
	105	38.8	-0.4*	23.4			
	110	42.4	4.0*	25.4			
	120	45.8	7.4*	29.3			
	135	50.9	12.5*	35.2			
	150	56.2	17.8*	41.1			
	177	66.1	27.7*	51			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

* N/A W/ DUAL SIDE OF CAB OR BACK OF CAB EXHAUST



Layout Definition:

- T880 SBFA – Standard Hood
- RHUC DPF/SCR
- RH BOC Battery Box
- LHUC Fuel
- LH BOC DEF

Dimension E:
(BOC to DPF/SCR) = 2.7in

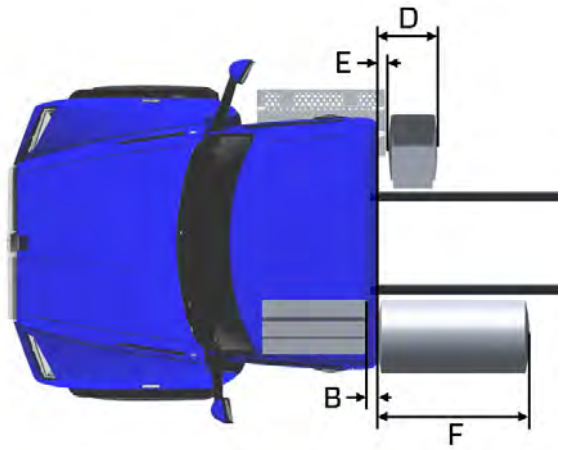
Figure 11 T880 STANDARD HOOD

Dimension B (BOC to Cantilever Battery Box) = 25.4in
Dimension E (BOC to DPF/SCR) = 2.7in

Table 6 T880 (SBFA) Standard Hood

T880 (SBFA) Standard Hood							
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	-2.1*	19.5	10.5	16.4	20.3
	60	38	0.4	21.4	12.5	18.4	22.3
	75	47.3	9.6	31.3	22.3	28.2	32.1
	100	62.2	24.5	47	36.1	42	45.9
	120	74.3	36.6	58.8	47.9	53.8	57.7
24.5 in	60	30.6	-6.5	15.5	4.6	10.5	14.4
	75	38.5	0.6	23.4	13.4	19.3	23.2
	90	45.5	7.7	31.3	20.3	26.2	30.1
	100	50	12.2	23	24.3	30.2	34.1
	110	55	17.2	41.1	30.2	36.1	40
	120	60.6	22.8	45.1	36.1	42	45.9
	135	67.2	29.4	52.9	42	47.9	51.8
	150	74.5	36.7	58.8	49.9	55.8	59.7
28.5 in	75	28.7	-8.8*	13.9	8.5	14.4	18.3
	90	34.3	-3.3*	19.5	12.5	18.4	22.3
	105	38.8	-0.4*	23.4	20.3	26.2	30.1
	110	42.4	4.0*	25.4	26.2	32.1	36
	120	45.8	7.4*	29.3	30.2	36.1	40
	135	50.9	12.5*	35.2	40	45.9	49.8
	150	56.2	17.8*	41.1	10.5	16.4	20.3
	177	66.1	27.7*	51	12.5	18.4	22.3

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A W/ DUAL SIDE OF CAB OR BACK OF CAB EXHAUST



Layout Definition:

- T880 SBFA – Standard Hood
- RHUC DPF/SCR
- RH BOC DEF
- LHUC Battery Box
- LH BOC FUEL

Dimension E:
(BOC to DPF/SCR) = 2.7in

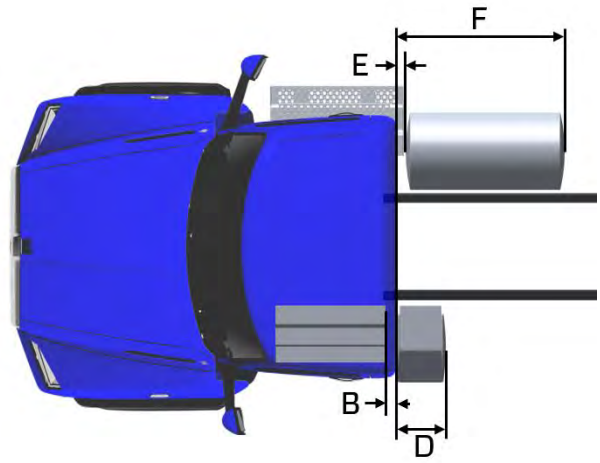
Figure 12 T880 STANDARD HOOD

Dimension B (BOC to 34” Short Battery Box) = -2.5in
Dimension B (BOC to 40” Long Battery Box) = 3.5in
Dimension E (BOC to DPF/SCR) = 2.7in

Table 7 T880 (SBFA) Standard Hood

Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	39.7	18.5*	26.3*	30.2*
	60	38	42			
	75	47.3	51			
	100	62.2	66			
	120	74.3	78			
24.5 in	60	30.6	35			
	75	38.5	43			
	90	45.5	50			
	100	50	54.5			
	110	55	59.5			
	120	60.6	65			
	135	67.2	71.7			
	150	74.5	78.8			
28.5 in	75	28.7	32.6			
	90	34.3	38.2			
	105	38.8	42.7			
	110	42.4	46.3			
	120	45.8	49.7			
	135	50.9	54.8			
	150	56.2	60.1			
	177	66.1	70			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* ADD 6.0 INCHES FOR 40IN LONG BATTERY BOX



Layout Definition:

- T880 SBFA – Standard Hood
- RHUC DPF/SCR
- RH BOC Fuel
- LHUC Battery Box
- LH BOC DEF

Dimension E:
(BOC to DPF/SCR) = 2.7in

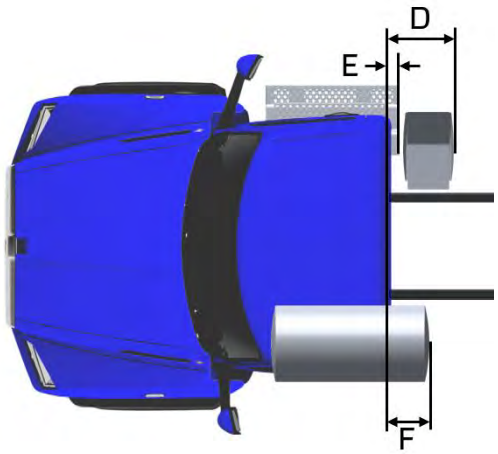
Figure 13 T880 STANDARD HOOD

Dimension B (BOC to 34” Short Battery Box) = -2.5in
Dimension B (BOC to 40” Long Battery Box) = 3.5in
Dimension E (BOC to DPF/SCR) = 2.7in

Table 8 T880 (SBFA) Standard Hood

T880 (SBFA) Standard Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	40.9	12.5*	18.4*	22.3*
	60	38	43.3			
	75	47.3	52.4			
	100	62.2	67.2			
	120	74.3	79.2			
24.5 in	60	30.6	36.1			
	75	38.5	44.1			
	90	45.5	51.1			
	100	50	55.5			
	110	55	60.5			
	120	60.6	66.1			
	135	67.2	72.8			
	150	74.5	80.1			
28.5 in	75	28.7	33.8			
	90	34.3	39.3			
	105	38.8	43.9			
	110	42.4	47.5			
	120	45.8	50.9			
	135	50.9	55.9			
	150	56.2	61.3			
	177	66.1	71.2			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34” SHORT BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS
* ADD 6.0 INCHES FOR 40IN LONG BATTERY BOX



Layout Definition:

- T880 SBFA – Standard Hood
- RHUC DPF/SCR
- RH BOC DEF
- LHUC Fuel
- In Cab Battery Box

Dimension E:
(BOC to DPF/SCR) = 2.7in

Figure 14 T880 STANDARD HOOD

Dimension E (BOC to DPF/SCR) = 2.7in

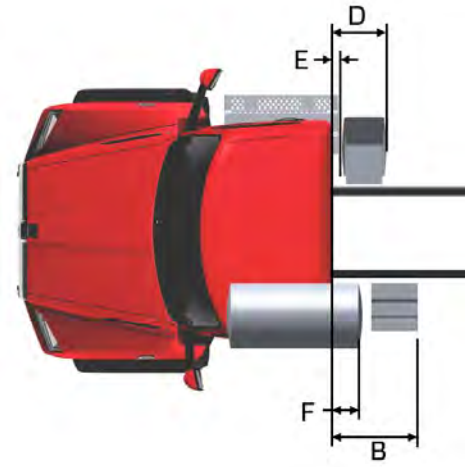
Table 9 T880 (SBFA) Standard Hood

T880 STANDARD HOOD						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	-2.1	18.5	26.6	30.2
	60	38	0.4			
	75	47.3	9.6			
	100	62.2	24.5			
	120	74.3	36.6			
24.5 in	60	30.6	-6.5			
	75	38.5	0.6			
	90	45.5	7.7			
	100	50	12.2			
	110	55	17.2			
	120	60.6	22.8			
	135	67.2	29.4			
	150	74.5	36.7			
28.5 in	75	28.7	-8.8*			
	90	34.3	-3.3*			
	105	38.8	-0.4*			
	110	42.4	4.0*			
	120	45.8	7.4*			
	135	50.9	12.5*			
	150	56.2	17.8*			
	177	66.1	27.7*			

* N/A W/DUAL SIDE OF CAB EXHAUST

T880 SBFA Short Hood (MX-Optimized)

Table 10 T880 MX-OPTIMIZED HOOD



Dimension E (BOC to DPF/SCR) = 2.7in

Table 11 T880 (SBFA) MX-Optimized Hood Layout Dimensions

T880 MX Optimized Hood							
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	-2.1*	19.5	18.5	26.3	30.2
	60	38	0.4	21.4			
	75	47.3	9.6	31.3			
	100	62.2	24.5	47			
	120	74.3	36.6	58.8			
24.5 in	60	30.6	-6.5	15.5			
	75	38.5	0.6	23.4			
	90	45.5	7.7	31.3			
	100	50	12.2	23			
	110	55	17.2	41.1			
	120	60.6	22.8	45.1			
	135	67.2	29.4	52.9			
	150	74.5	36.7	58.8			
28.5 in	75	28.7	-8.8*	13.9			
	90	34.3	-3.3*	19.5			
	105	38.8	-0.4*	23.4			
	110	42.4	4.0*	25.4			
	120	45.8	7.4*	29.3			
	135	50.9	12.5*	35.2			
	150	56.2	17.8*	41.1			
	177	66.1	27.7*	51			

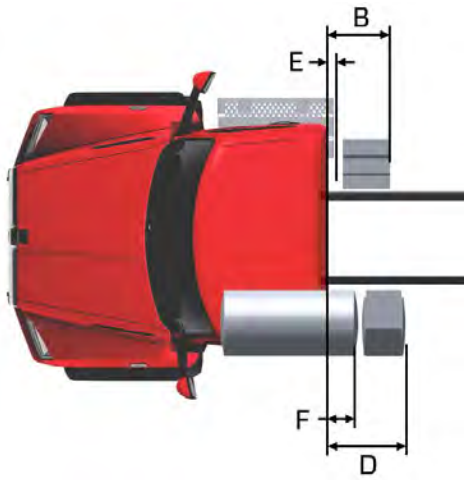


Figure 15 T880 MX-OPTIMIZED HOOD

Table 12 T880 (SBFA) MX-Optimized Hood

T880 MX-OPTIMIZED HOOD							
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	-2.1*	19.5	10.5	16.4	20.3
	60	38	0.4	21.4	12.5	18.4	22.3
	75	47.3	9.6	31.3	22.3	28.2	32.1
	100	62.2	24.5	47	36.1	42	45.9
	120	74.3	36.6	58.8	47.9	53.8	57.7
24.5 in	60	30.6	-6.5	15.5	6.5**	12.4**	16.3**
	75	38.5	0.6	23.4	12.4	18.3	22.2
	90	45.5	7.7	31.3	20.3	26.2	30.1
	100	50	12.2	23	24.2	30.1	34
	110	55	17.2	41.1	28.1	34	37.9
	120	60.6	22.8	45.1	34	39.9	43.8
	135	67.2	29.4	52.9	41.9	47.8	51.7
	150	74.5	36.7	58.8	47.8	53.7	57.6
28.5 in	75	28.7	-8.8*	13.9	10.4	16.3	20.2
	90	34.3	-3.3*	19.5	10.4	16.3	20.2
	105	38.8	-0.4*	23.4	14.4	20.3	24.2
	110	42.4	4.0*	25.4	18.3	25.7	36.2
	120	45.8	7.4*	29.3	20.3	26.2	30.1
	135	50.9	12.5*	35.2	24.2	30.1	34
	150	56.2	17.8*	41.1	30.1	36	39.9
	177	66.1	27.7*	51	39.9	45.8	49.7

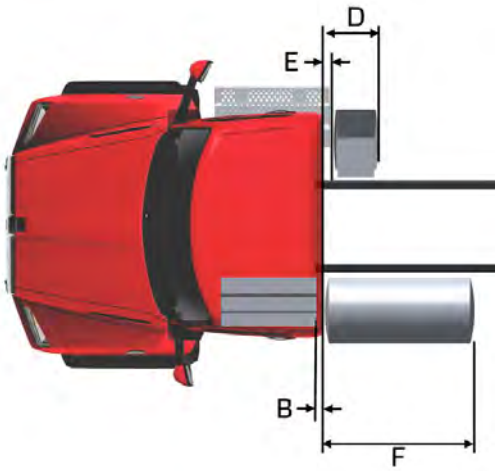


Figure 16 T880 MX-OPTMIZED HOOD

Dimension B (BOC to 34” Short Battery Box) = -2.5in
Dimension B (BOC to 40” Long Battery Box) = 3.5in
Dimension E (BOC to DPF/SCR) = 2.7in

Table 13 T880 (SBFA) MX-Optimized Hood

Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	39.7	18.5*	26.3*	30.2*
	60	38	42			
	75	47.3	51			
	100	62.2	66			
	120	74.3	78			
24.5 in	60	30.6	35			
	75	38.5	43			
	90	45.5	50			
	100	50	54.5			
	110	55	59.5			
	120	60.6	65			
	135	67.2	71.7			
	150	74.5	78.8			
28.5 in	75	28.7	32.6			
	90	34.3	38.2			
	105	38.8	42.7			
	110	42.4	46.3			
	120	45.8	49.7			
	135	50.9	54.8			
	150	56.2	60.1			
	177	66.1	70			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* ADD 6.0 INCHES FOR 40IN LONG BATTERY BOX

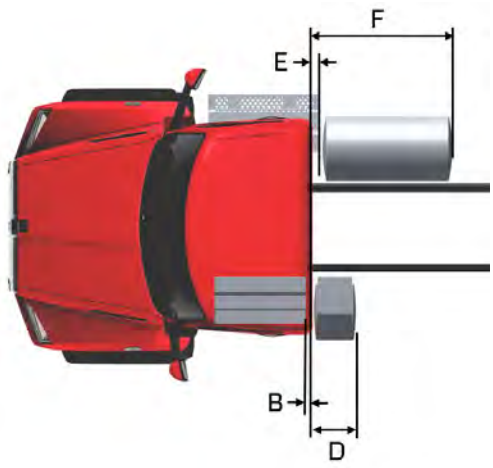


Figure 17 T880 MX-OPTIMIZED HOOD

Dimension B (BOC to 34” Short Battery Box) = -2.5in
Dimension B (BOC to 40” Long Battery Box) = 3.5in
Dimension E (BOC to DPF/SCR) = 2.7in

Table 14 T880 (SBFA) MX-Optimized Hood

T880 (SBFA) MX-Optimized Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	40.9	12.5*	18.4*	22.3*
	60	38	43.3			
	75	47.3	52.4			
	100	62.2	67.2			
	120	74.3	79.2			
24.5 in	60	30.6	36.1			
	75	38.5	44.1			
	90	45.5	51.1			
	100	50	55.5			
	110	55	60.5			
	120	60.6	66.1			
	135	67.2	72.8			
	150	74.5	80.1			
28.5 in	75	28.7	33.8			
	90	34.3	39.3			
	105	38.8	43.9			
	110	42.4	47.5			
	120	45.8	50.9			
	135	50.9	55.9			
	150	56.2	61.3			
	177	66.1	71.2			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34” SHORT BATTERY BOX. OPTIONAL BOXES WILL AFFECT THES DIMENSIONS
* ADD 6.0 INCHES FOR 40IN LONG BATTERY BOX

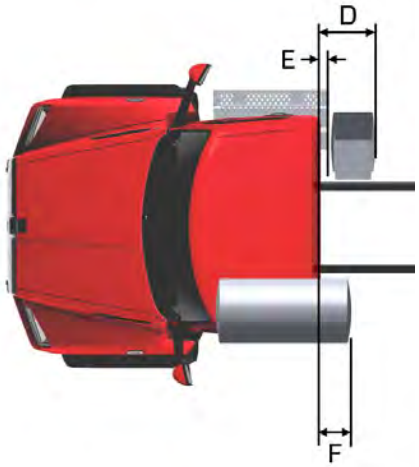


Figure 18 T880 MX-OPTIMIZED HOOD

Dimension E (BOC to DPF/SCR) = 2.7in

Table 15 T880 (SBFA) MX-Optimized Hood

T880 (SBFA) MX-Optimized Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	-2.1	18.5	26.6	30.2
	60	38	0.4			
	75	47.3	9.6			
	100	62.2	24.5			
	120	74.3	36.6			
24.5 in	60	30.6	-6.5			
	75	38.5	0.6			
	90	45.5	7.7			
	100	50	12.2			
	110	55	17.2			
	120	60.6	22.8			
	135	67.2	29.4			
	150	74.5	36.7			
28.5 in	75	28.7	-8.8*			
	90	34.3	-3.3*			
	105	38.8	-0.4*			
	110	42.4	4.0*			
	120	45.8	7.4*			
	135	50.9	12.5*			
	150	56.2	17.8*			
	177	66.1	27.7*			

* N/A W/DUAL SIDE OF CAB EXHAUST

T880s SFFA (MX Optimized Hood)

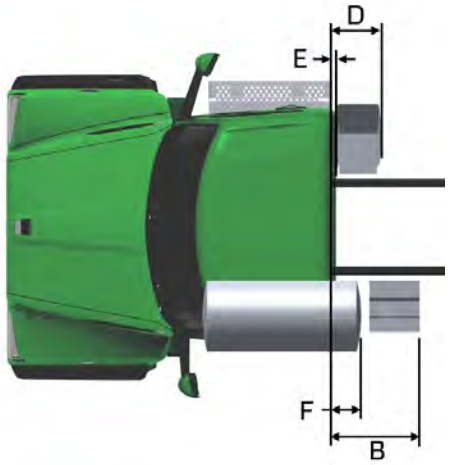


Figure 19 T880S (SFFA) MX-OPTIMIZED HOOD

Dimension E (BOC to DPF/SCR) = 0.2in

Table 16 T880S (SFFA) MX-Optimized Hood

T880S (SFFA) MX-Optimized Hood							
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	35.6	-8.2	16.5	22.4	26.3
	60	38	38	-5.2			
	75	47.3	47.3	0			
	100	62.2	62.2	14.9			
	120	74.3	74.3	27			
24.5 in	60	30.6	-7.4	15.5			
	75	38.5	-4.4	17.5			
	90	45.5	-1.3	21.4			
	100	50	3.2	25.4			
	110	55	8.1	31.3			
	120	60.6	13.7	37.2			
	135	67.2	22.4	45.1			
	150	74.5	27.7	51			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

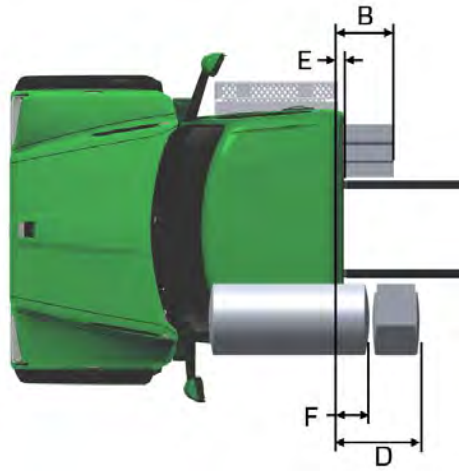


Figure 20 T880S (SFFA) MX-OPTIMIZED HOOD

Dimension B (BOC to Cantilever Battery Box) = 23.4in
Dimension E (BOC to DPF/SCR) = 0.2in

Table 17 T880S (SFFA) MX-Optimized Hood

T880S (SFFA) MX-OPTIMIZED HOOD							
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension B BOC to Battery Box (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length			Small	Med	Large
22 in	56	35.6	-2.1*	19.5	6.5***	12.4***	16.3***
	60	38	0.4	21.4	6.5**	12.4**	16.3**
	75	47.3	9.6	31.3	16.4	22.3	26.2
	100	62.2	24.5	47	32.1	38	41.9
	120	74.3	36.6	58.8	43.9	49.8	53.7
24.5 in	60	30.6	-6.5	15.5	6.5**	12.4**	16.3**
	75	38.5	0.6	23.4	6.5	12.4	16.3
	90	45.5	7.7	31.3	12.5	18.4	22.3
	100	50	12.2	23	16.4	22.3	26.2
	110	55	17.2	41.1	20.3	26.2	30.1
	120	60.6	22.8	45.1	26.2	32.1	36
	135	67.2	29.4	52.9	32.1	38	41.9
	150	74.5	36.7	58.8	40	45.9	49.8

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A W/ DUAL SIDE OF CAB OR BACK OF CAB EXHAUST
** ADD 2 INCHES FOR DUAL SIDE OF CAB EXHAUST
*** ADD 3.9 INCHES FOR DUAL SIDE OF CAB EXHAUST

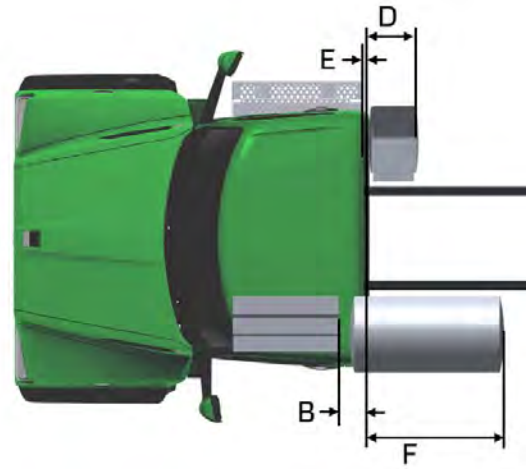


Figure 21 T880S (SFFA) MX-OPTMIZED HOOD

Table 18 T880S (SFFA) MX-Optimized Hood

T880S (SFFA) MX-Optimized Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	36.3	18.5*	26.3*	30.2*
	60	38	38.7			
	75	47.3	48			
	100	62.2	62.9			
	120	74.3	74.9			
24.5 in	60	30.6	31.9			
	75	38.5	39.7			
	90	45.5	46.7			
	100	50	51.2			
	110	55	56.2			
	120	60.6	61.8			
	135	67.2	68.5			
	150	74.5	75.7			
28.5 in	75	28.7	29.4			
	90	34.3	35			
	105	38.8	39.5			
	110	42.4	43.1			
	120	45.8	46.5			
	135	50.9	51.6			
	150	56.2	56.9			
	177	66.1	66.9			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

* ADD 6.0 INCHES FOR 40IN LONG BATTERY BOX

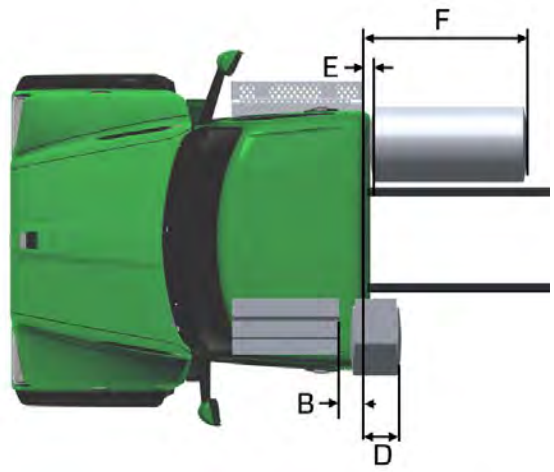


Figure 22 T880S (SFFA) MX-OPTIMIZED HOOD

Dimension B (BOC to 34” Short Battery Box) = -6.5in
Dimension B (BOC to 40” Long Battery Box) = -4.0in
Dimension E (BOC to DPF/SCR) = 0.2in

Table 19 T880S (SFFA) MX-Optimized Hood

T880 (SBFA) MX-Optimized Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	38.8	10.5*	16.4*	20.3*
	60	38	41.2			
	75	47.3	50.4			
	100	62.2	65.3			
	120	74.3	77.3			
24.5 in	60	30.6	34.1			
	75	38.5	42.1			
	90	45.5	49.1			
	100	50	53.5			
	110	55	58.5			
	120	60.6	64.1			
	135	67.2	70.8			
	150	74.5	78.1			
28.5 in	75	28.7	31.8			
	90	34.3	37.3			
	105	38.8	41.9			
	110	42.4	45.5			
	120	45.8	48.9			
	135	50.9	53.9			
	150	56.2	59.3			
	177	66.1	69.2			

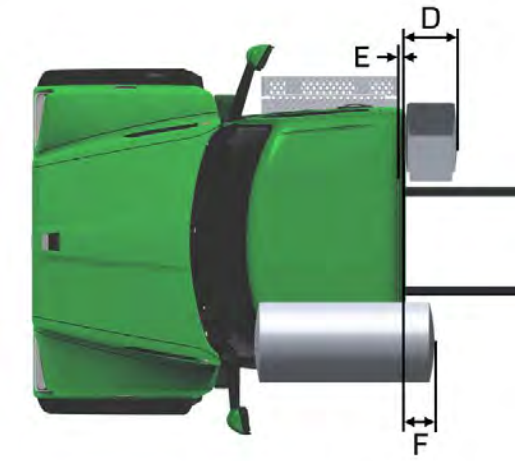


Figure 23 T880S (SFFA) MX-OPTIMIZED HOOD

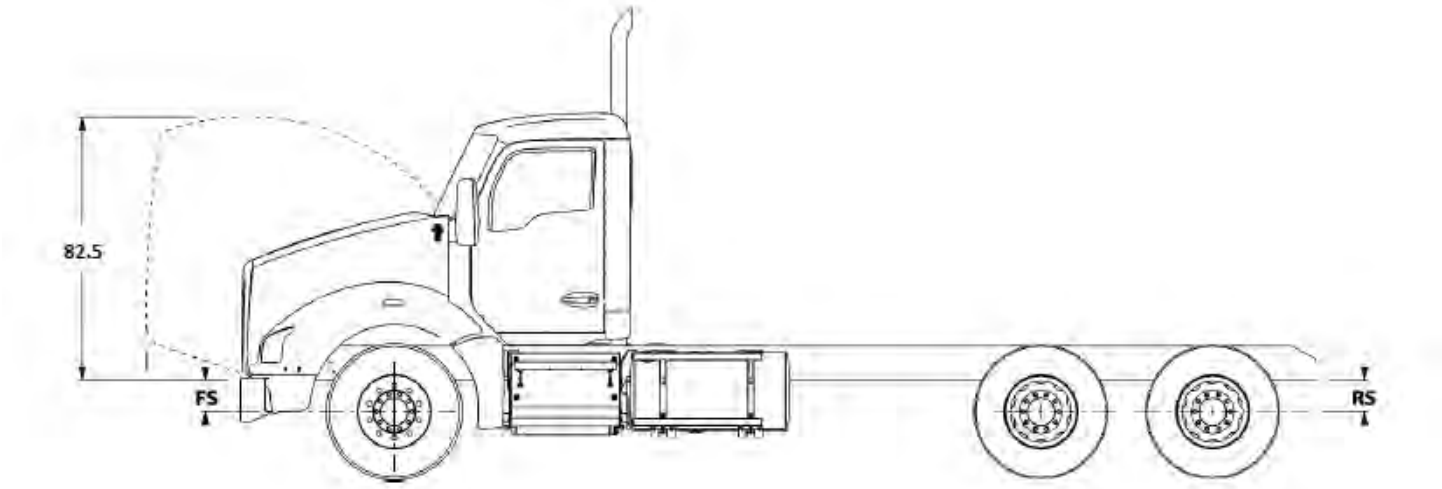
Dimension E (BOC to DPF/SCR) = 2.7in

Table 20 T880S (SFFA) MX-Optimized Hood

T880S (SFFA) MX-Optimized Hood						
Fuel Tank Size			Dimension F BOC to Fuel Tank (in)	Dimension D BOC to DEF Tank (in)		
Diameter	Gallons	Length		Small	Med	Large
22 in	56	35.6	-2.1	16.5	22.4	26.3
	60	38	0.4			
	75	47.3	9.6			
	100	62.2	24.5			
	120	74.3	36.6			
24.5 in	60	30.6	-6.5			
	75	38.5	0.6			
	90	45.5	7.7			
	100	50	12.2			
	110	55	17.2			
	120	60.6	22.8			
	135	67.2	29.4			
	150	74.5	36.7			

Front Suspension

Ride Heights



The Front Suspension (FS) and Rear Suspension (RS) ride heights are provided as a basic tool to determine the overall height of the cab, height of exhaust components, and frame heights. The heights are all calculated from the centerlines of the axles, please be sure to include the tire radius dimension to determine overall height.

Table 21 Front Suspension Ride Heights

Front Suspension (FS)	Laden:	Unladen:
12K Taper leaf	10.3”	11.5”
13.2K Taper leaf	10.3”	11.5”
14.6K Taper leaf	10.3”	11.7”
16K Taper leaf	10.6”	12.3”
20K Taper leaf	10.4”	11.9”
22K Multi-stage Taper leaf	10.7”	12.7”

To calculate the frame height, use the following formulas:

- *Front Frame Height* = FS + 1/2 Front Tire Diameter
- *Rear Frame Height* = RS + 1/2 Rear Tire Diameter

NOTE:

The height of the frame rail itself, will not affect overall vehicle height, as all components are located from the bottom of the frame rail.

Rear Suspension

The table below provides laden and unladen heights for all Rear Suspensions offered on the Kenworth T680, T880, and W990 models. Common Rear Suspensions are shown here, for detailed suspensions please use the Rear suspension layouts on the following pages.

Table 22 Rear Suspension

Rear Suspension	Laden:	Unladen:
Kenworth AG400L	8.5”	8.5”
Kenworth AG400	9”	9”
Kenworth AG460	10.5”	10.5”
Kenworth AG690 Tridem	10.5”	10.5”
Reyco 79KB 23K Rating	8.3”	10.8”
Reyco 102 38K Rating	9.2”	10.8”
Chalmers 854-40-L-HS 40K Rating	9.6”	11”
Chalmers 854-46-H 46K Rating	10.1”	12.4”
Chalmers 854-50-H-HS 50K Rating	10.8”	12.5”
Chalmers 865-65-XL 65K Rating	13”	15.7”
Hendrickson HAULMAAX EX HMX400 15.5” Saddle	8.5”	10.5”
Hendrickson HAULMAAX EX HMX400 16.5” Saddle	9.5”	11.5”
Hendrickson HAULMAAX EX HMX400 17.5” Saddle	10.5”	12.5”
Hendrickson HAULMAAX EX HMX460 15.5” Saddle	8.5”	10.5”
Hendrickson HAULMAAX EX HMX460 16.5” Saddle	9.5”	11.5”
Hendrickson HAULMAAX EX HMX460 17.5” Saddle	10.5”	12.5”
Hendrickson HAULMAAX EX HMX460 18.5” Saddle	11.5”	13.5”
Hendrickson HAULMAAX EX HMX520 16.5” Saddle	9.5”	11.5”
Hendrickson HAULMAAX EX HMX520 17.5” Saddle	10.5”	12.5”
Hendrickson HAULMAAX EX HMX520 18.5” Saddle	11.5”	13.5”
Hendrickson Primaax EX 46K Rating	10”	10”
Hendrickson RT463 6” Saddle 46K Rating	10”	11.1”
Hendrickson RT463 7.19” Saddle 46K Rating	11.2”	12.5”
Hend RT523 52K 6” Saddle	9.9”	11”
Neway ADZ246 46K Rating	10” or 12”	10” or 12”
Neway ADZ252 52K Rating	10” or 12”	10” or 12”
Neway ADZ369 69K Tridem	10” or 12”	10” or 12”
Neway ADZ378 78K Tridem	10”	10”

Rear Suspension Layouts

The rear suspension layouts are provided as a tool to help layout body installers prior to arrival. The applicable dimensions are shown. Be sure to check the axle spacing that is shown, as alternate spacings may exist and could change some of the dimensions. The dimensions shown below are the most typical installations. In special cases some hole locations will move. If you are planning on using the holes shown for your body installation, please confirm with your local KW dealer that the drawing below will be the installation used on your specific truck. Ensure that proper torque is used to reinstall any suspension components.

It would be a good idea in this case to order the frame layout of your chassis during the truck ordering process. This can be done on any Kenworth truck and will be provided 4-6 weeks ahead of the build schedule.

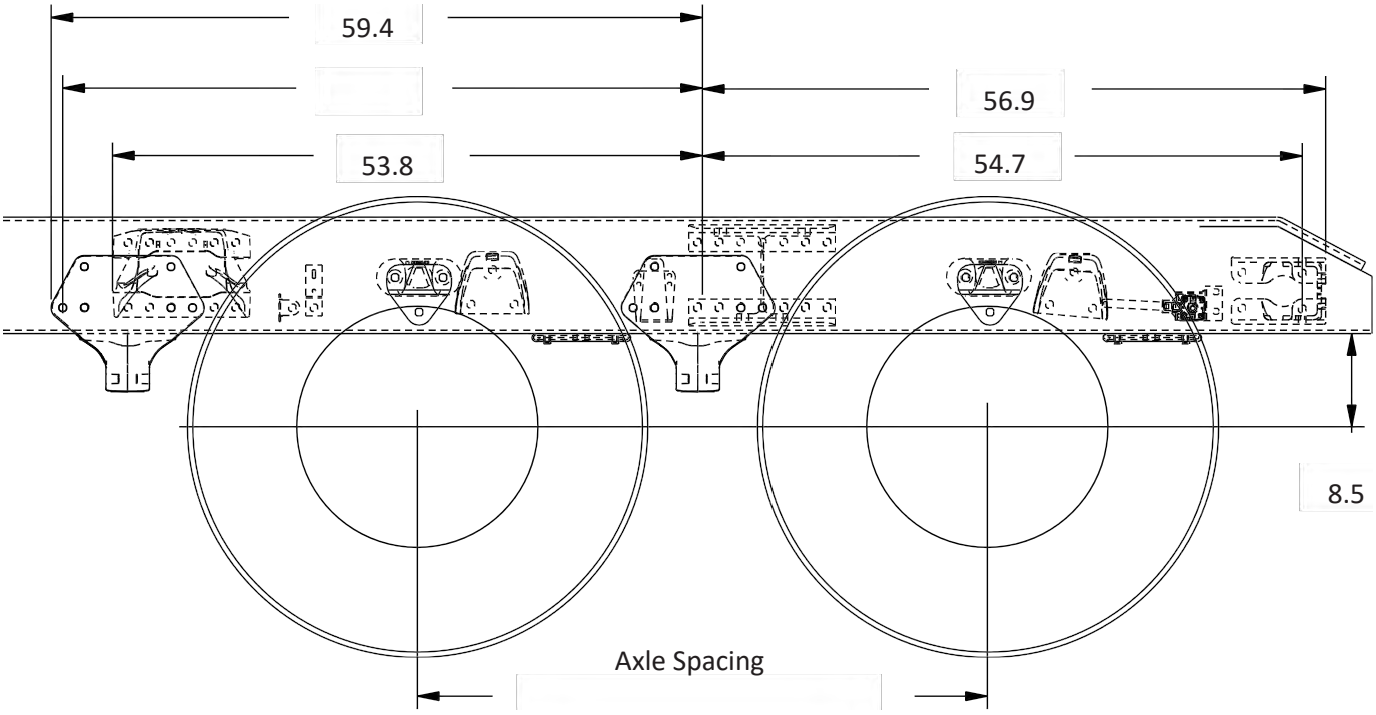
If there are hole locations that are not detailed, please work with your local Kenworth Dealer to request that information.

Additionally, optional axle spacings are shown in the charts below, if you would like details on the frame drilling with optional spacings, please contact your local Kenworth dealer.

NOTE:

Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/Technical Support for assistance.

AG400L TANDEM



AG400L Suspensions

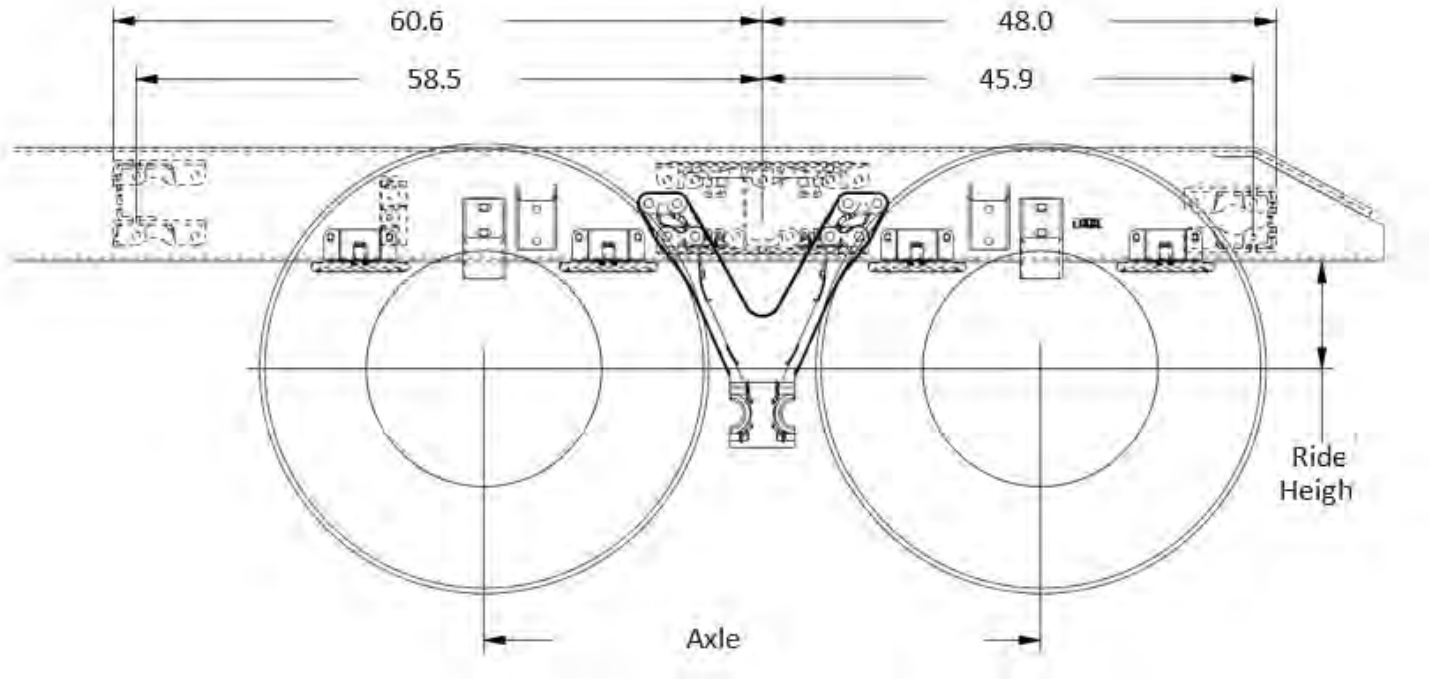
- NOTE: 54” Axle Spacing dimensions shown

Table 23 AG400L Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG400L Tandem	40K	52"	8.5"	8.5"
AG400L Tandem	40K	54"	8.5"	8.5"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

AG400 TANDEM



AG400 Suspensions

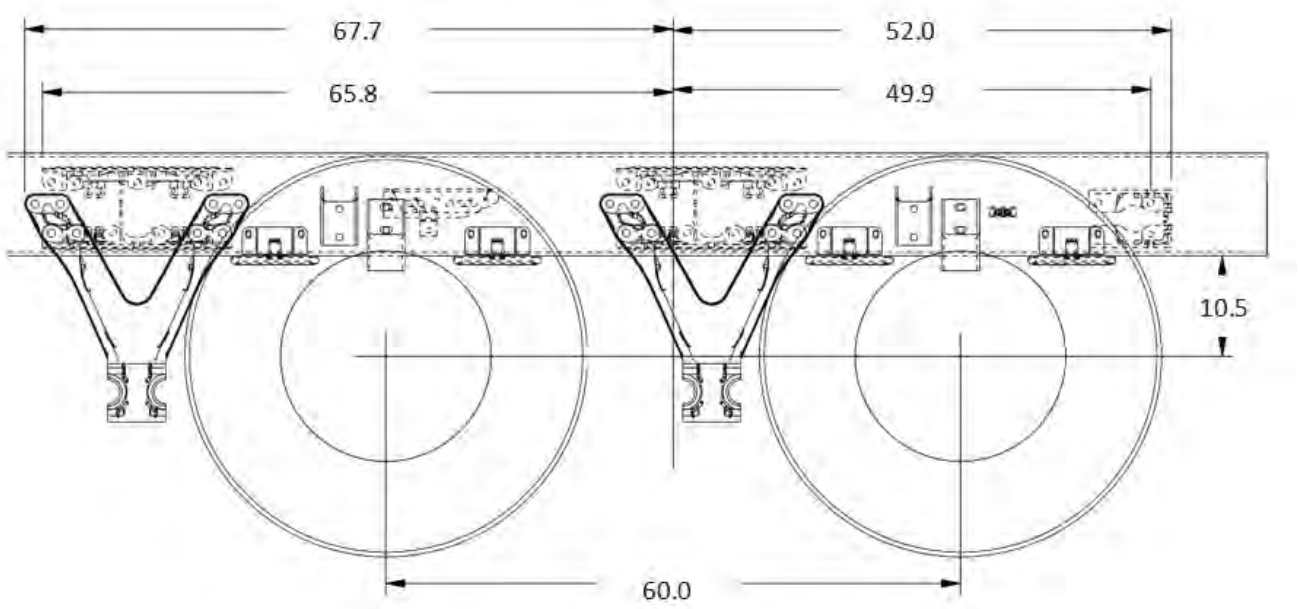
NOTE: 54” Axle Spacing dimensions shown.

Table 24 AG400 Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG400 Tandem	40K	52"	9"	9"
AG400 Tandem	40K	54"	9"	9"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

AG460 TANDEM



AG460 Suspensions

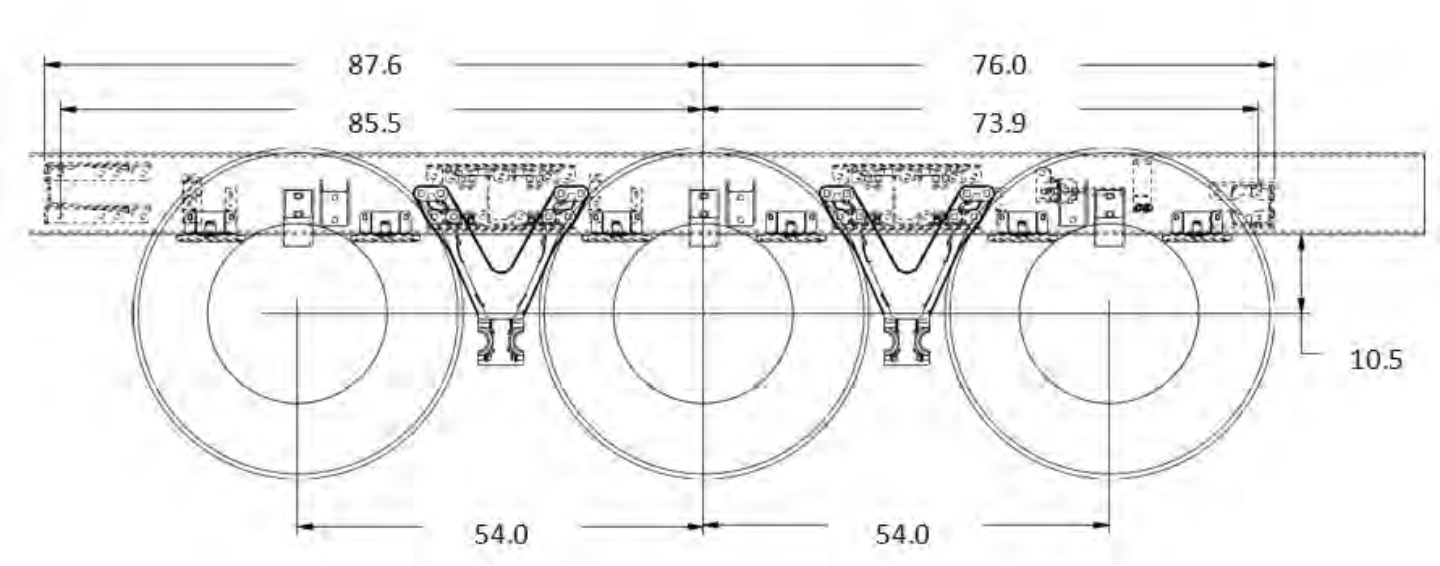
NOTE: 60” Axle Spacing dimensions shown

Table 25 AG460 Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG460 Tandem	46K	54”	10.5”	10.5”
AG460 Tandem	46K	60”	10.5”	10.5”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

AG690 TRIDEM



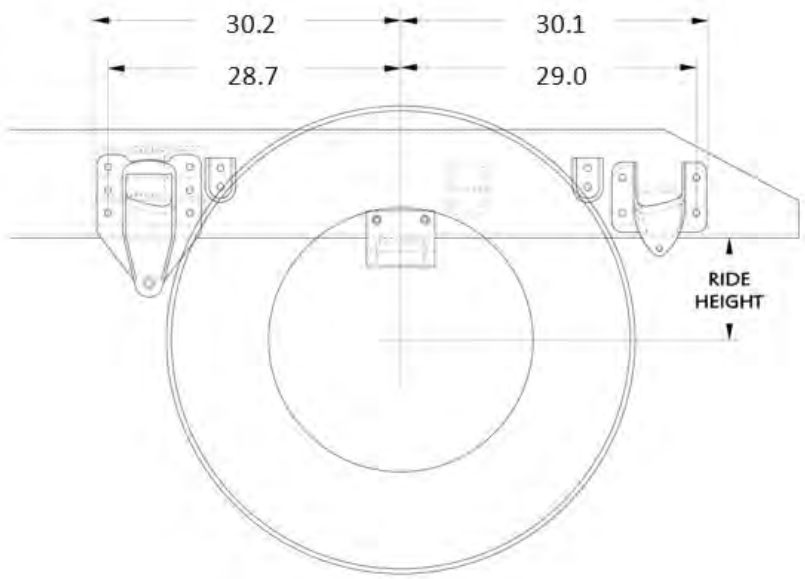
AG690 Tridem Suspension

Table 26 AG690 Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG690 Tridem	69K	54”	10.5”	10.5”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

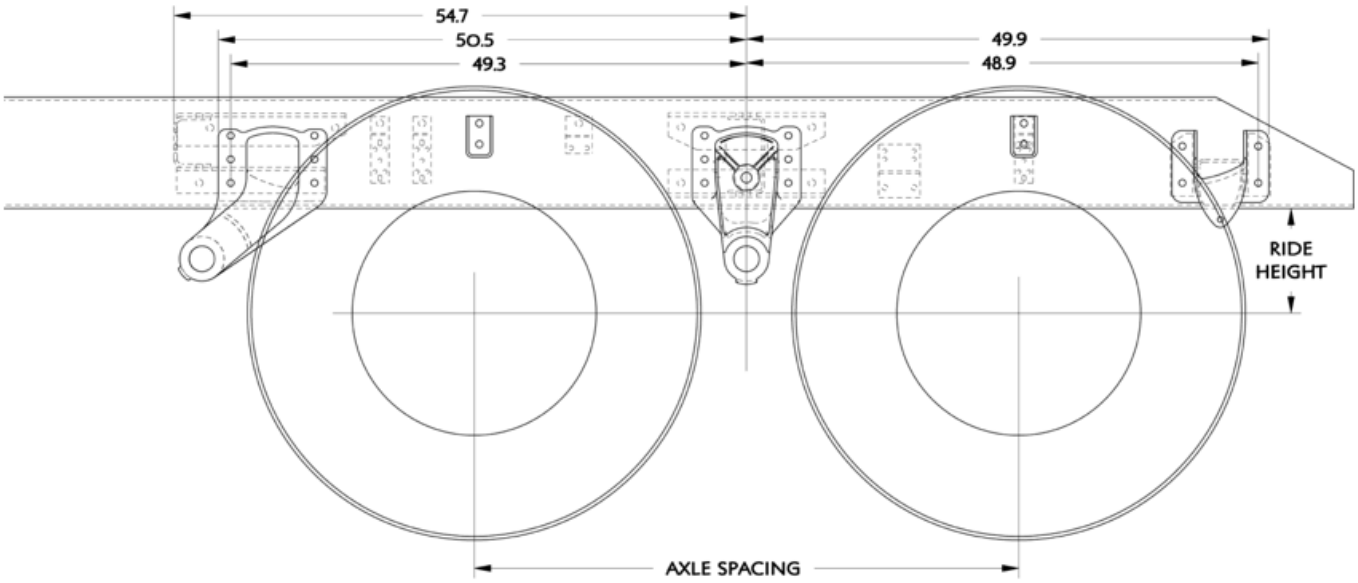
REYCO 79KB SINGLE



Reyco 79KB Suspensions

Suspension Type	Rating	Laden Ride Height	Unladen Ride Height
Reyco 79KB single	20K	8.3”	10.8”
Reyco 79KB single	23K	8.3”	10.8”
Reyco 79KB single	26K	8.2”	11.3”
Reyco 79KB single	31K	9.6”	12.2”

REYCO 102 TANDEM



Reyco 102 Suspensions

NOTE: 52” Axle Spacing dimensions shown.

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Reyco 102 Tandem	38K	52”	9.2”	10.8”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

NEWAY ADZ 123 SINGLE

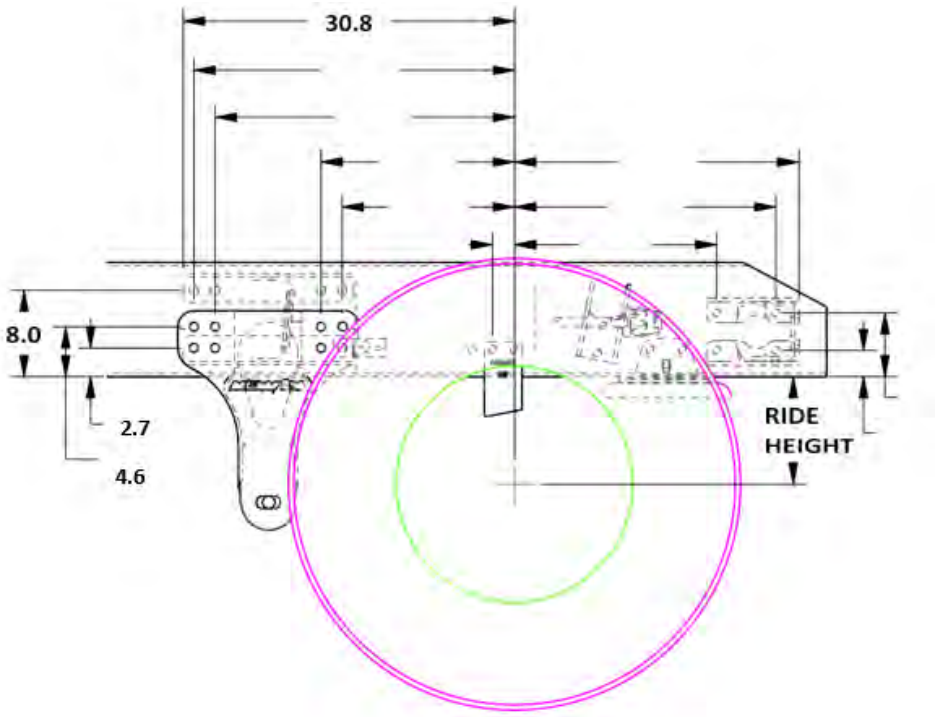
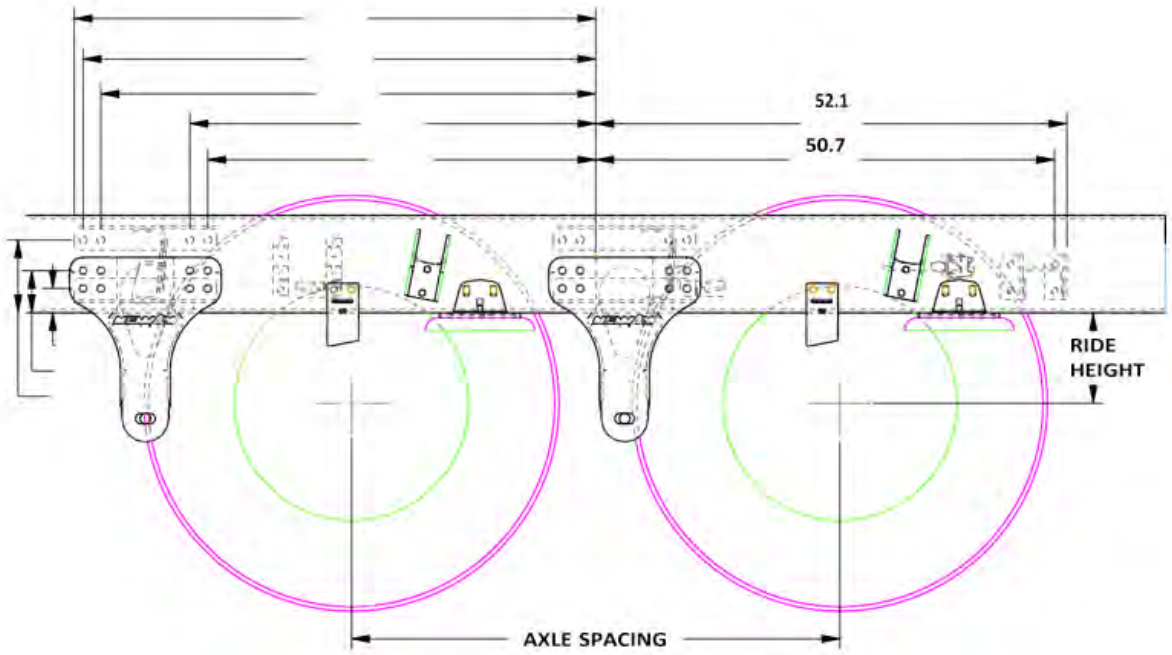


Table 27 Neway ADZ Single Rear Suspension Options

Suspension Type	Rating	Laden Ride Height	Unladen Ride Height
Neway ADZ123	23K	10”	10”
Neway ADZ126	26K	10”	10”

NEWAY ADZ 246 TANDEM

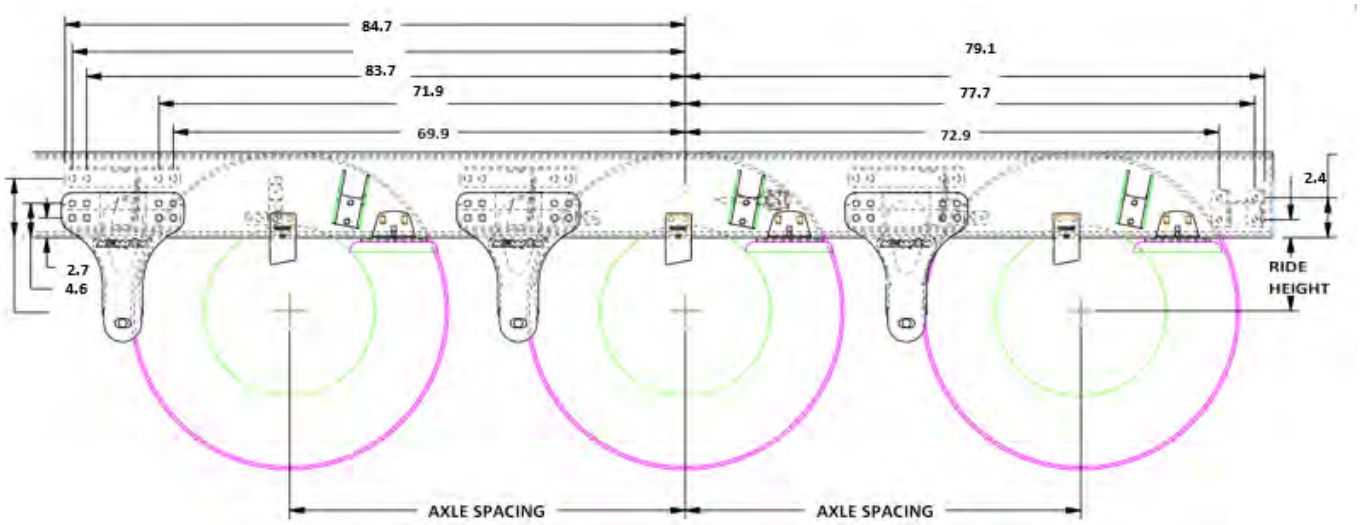


Neway ADZ Tandem Suspensions

NOTE: 54” Axle Spacing dimensions shown.

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Neway ADZ246	46K	54”	10”	10”
Neway ADZ246	46K	60”	10”	10”
Neway ADZ246	46K	72”	10”	10”
Neway ADZ246	52K	54”	10”	10”
Neway ADZ246	52K	54”	12”	12”
Neway ADZ246	52K	60”	10”	10”
Neway ADZ246	52K	60”	12”	12”

NEWAY ADZ 369 TRIDEM



Neway ADZ Tridem Suspensions

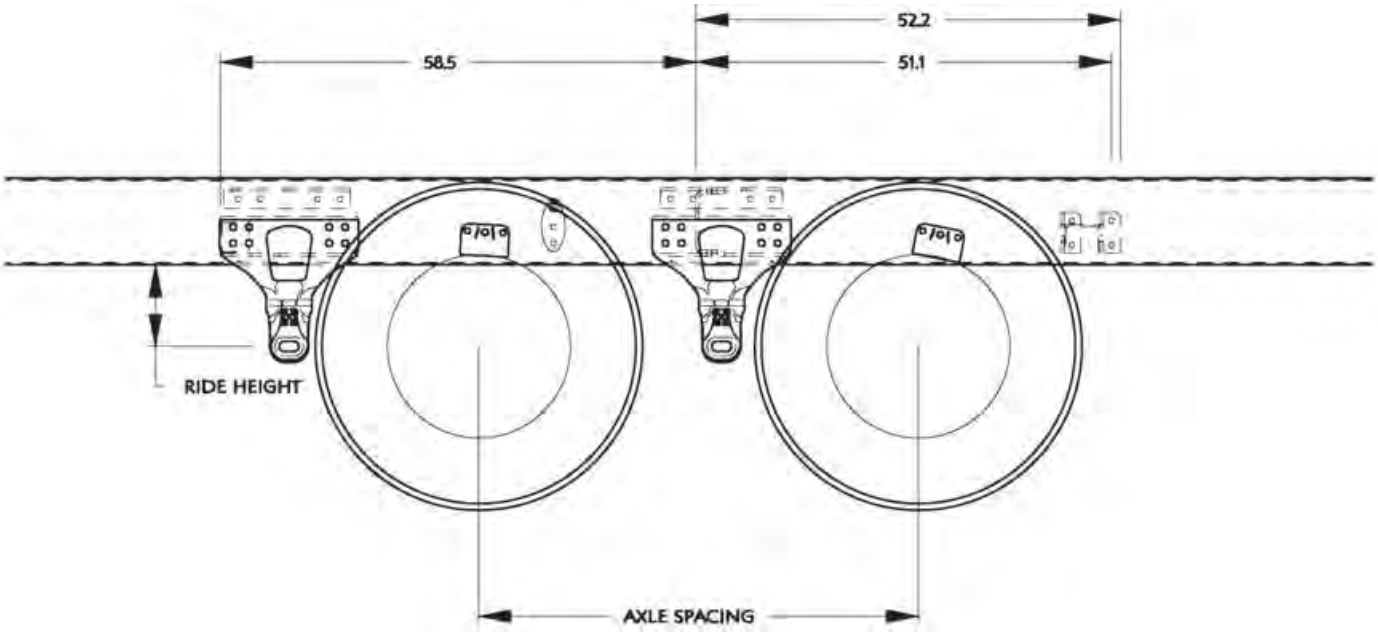
NOTE: 54" Axle Spacing dimensions shown.

Table 28 Neway ADZ Tridem Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Neway ADZ369	69K	54"	10"	10"
Neway ADZ369	69K	54"	12"	12"
Neway ADZ369	69K	60"	12"	12"
Neway ADZ369	78K	54"	10"	10"
Neway ADZ369	78K	60"	10"	10"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

HENDRICKSON PRIMAAX EX TANDEM

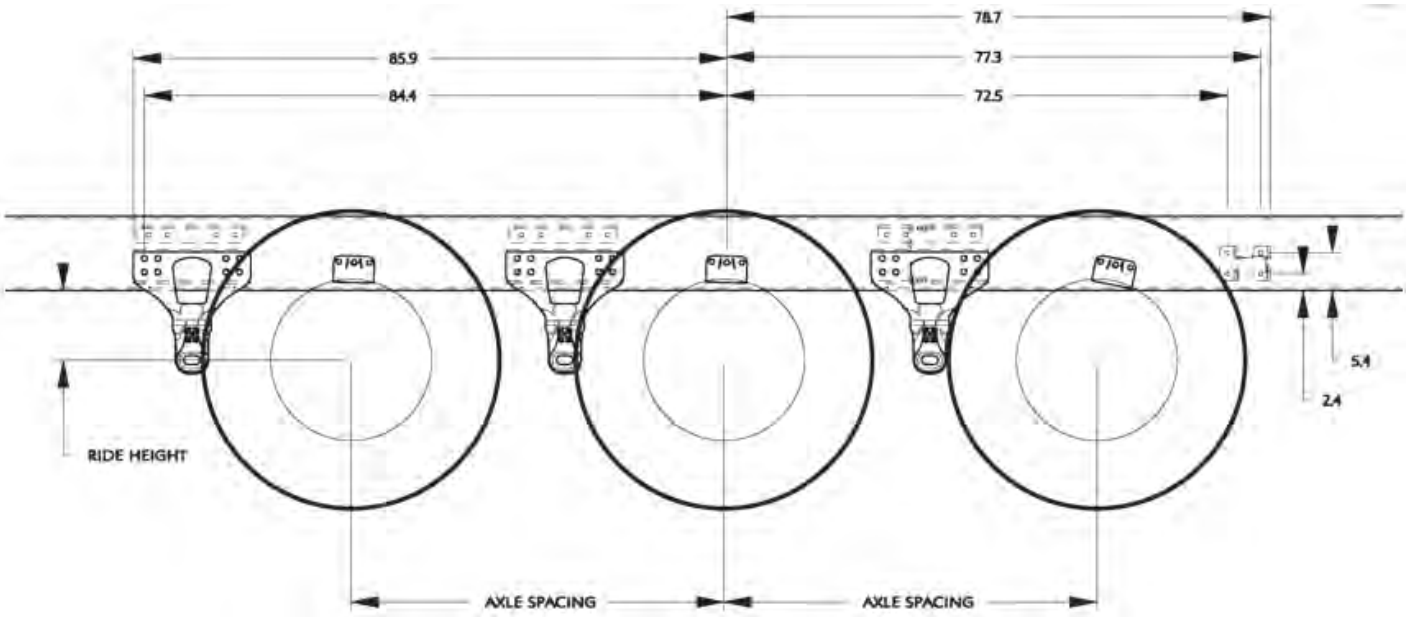


NOTE: 54" Axle Spacing dimensions shown

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson Primaax	46K	54”	10”	10”
Hendrickson Primaax	46K	60”	10”	10”
Hendrickson Primaax	46K	72”	10”	10”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

HENDRICKSON PRIMAAX EX TRIDEM



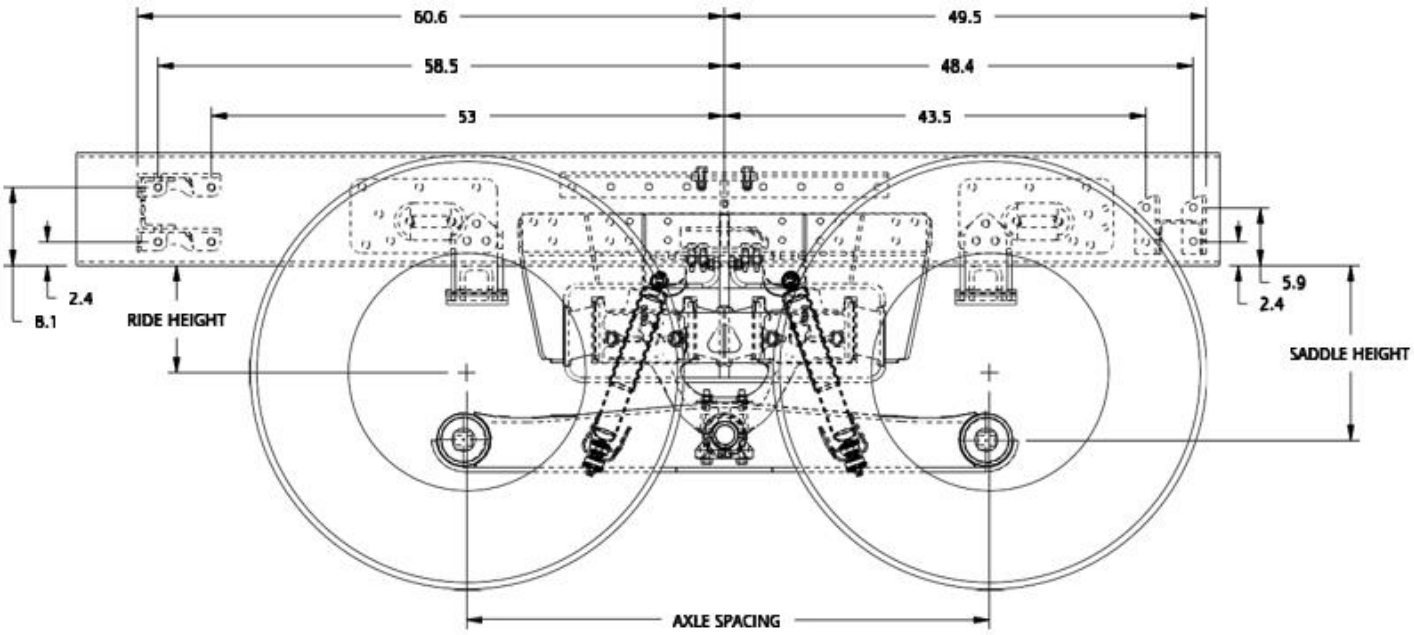
Hendrickson Primaax EX Tridem Suspensions

NOTE: 54” Axle Spacing dimensions shown

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson Primaax	69K	54”	10”	10”
Hendrickson Primaax	69K	60”	10”	10”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

HENDRICKSON ULTIMAAX TANDEM



Hendrickson ULTIMAAX Tandem Suspensions

NOTE: 54” Axle Spacing dimensions shown.

Table 29 Hendrickson Ultimaax Tandem Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson ULTIMAAX 460 17.5”	46K	54”	11”	12.5”
Hendrickson ULTIMAAX 460 18.25”	46K	54”	11”	12.5”
Hendrickson ULTIMAAX 460 17.5”	46K	60”	11”	12.5”
Hendrickson ULTIMAAX 460 18.25”	46K	60”	11”	12.5”
Hendrickson ULTIMAAX 520 17.5”	52K	54”	11”	12.5”
Hendrickson ULTIMAAX 520 18.25”	52K	54”	11”	12.5”
Hendrickson ULTIMAAX 520 17.5”	52K	60”	11”	12.5”
Hendrickson ULTIMAAX 520 18.25”	52K	60”	11”	12.5”
Hendrickson ULTIMAAX 460 17.5”	46K	54”	11”	12.5”
Hendrickson ULTIMAAX 460 18.25”	46K	54”	11”	12.5”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

HENDRICKSON HAULMAAX HMX EX TANDEM

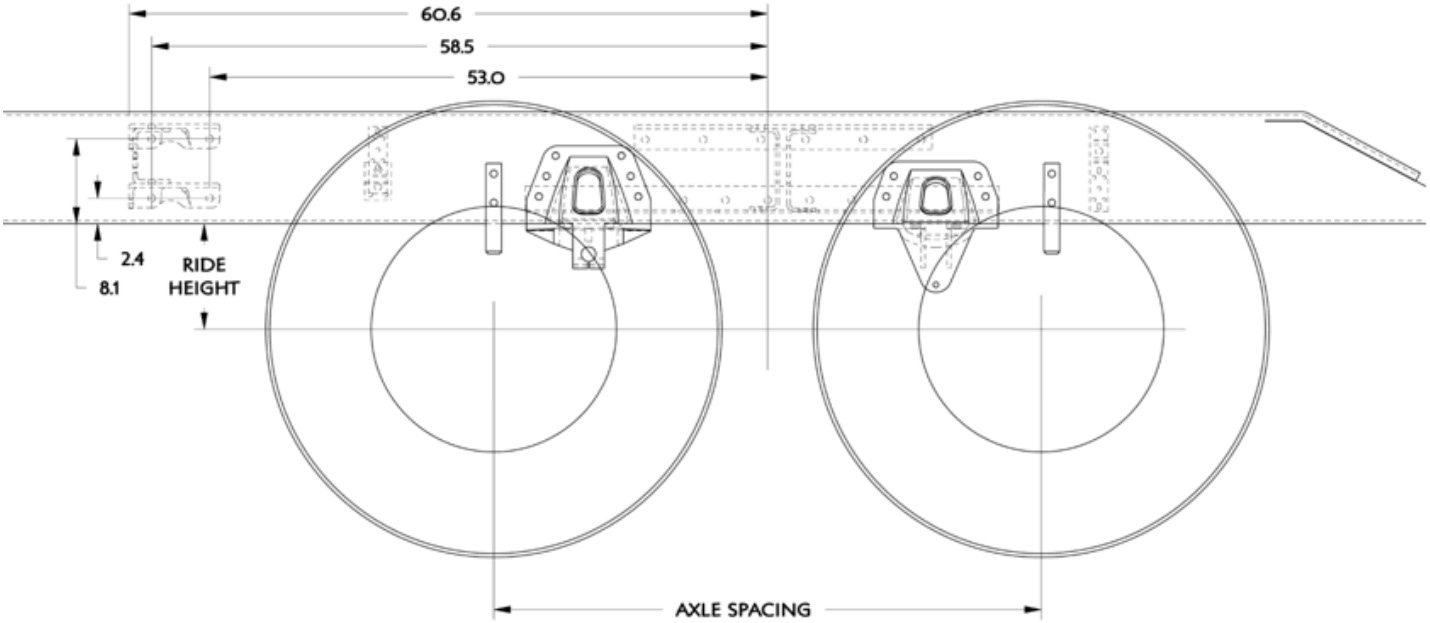
NOTE: 54” Axle Spacing dimensions shown

Table 30 Hendrickson HAULMAAX HMX EX Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson Haulmaax EX 400 16.5"	40K	54"	9.5"	11.5"
Hendrickson Haulmaax EX 400 17.5"	40K	54"	10.5"	12.5"
Hendrickson Haulmaax EX 460 16.5"	46K	54"	9.5"	11.5"
Hendrickson Haulmaax EX 460 17.5"	46K	54"	10.5"	12.5"
Hendrickson Haulmaax EX 460 18.5"	46K	54"	11.5"	13.5"
Hendrickson Haulmaax EX 460 17.5"	46K	60"	10.5"	12.5"
Hendrickson Haulmaax EX 460 18.5"	46K	60"	11.5"	13.5"
Hendrickson Haulmaax EX 520 16.5"	52K	54"	9.5"	11.5"
Hendrickson Haulmaax EX 520 17.5"	52K	54"	10.5"	12.5"
Hendrickson Haulmaax EX 520 18.5"	52K	54"	11.5"	13.5"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements, please contact Kenworth Applications/technical Support for assistance.

HENDRICKSON RT TANDEM



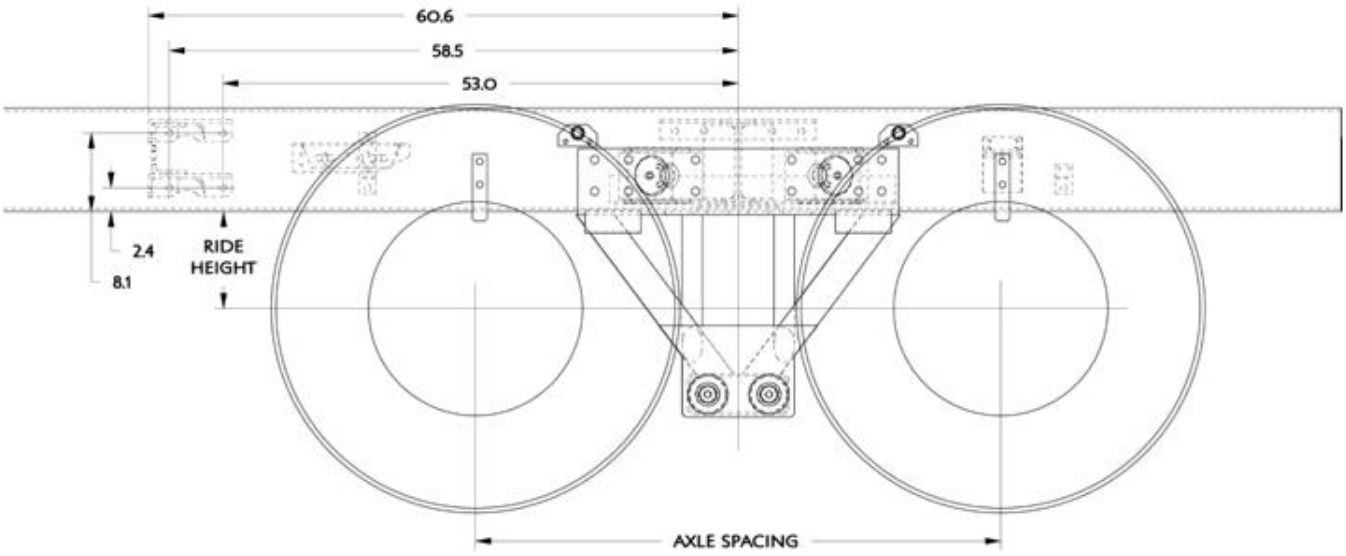
Hendrickson HAULMAAX RT Tandem Suspensions

NOTE: 54” Axle Spacing dimensions shown.

Table 31 Hendrickson RT Tandem Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson RT463 6” saddle	46K	52”	10.0”	11.1”
Hendrickson RT463 6” saddle	46K	54”	10.0”	11.1”
Hendrickson RT463 7.19” saddle	46K	54”	11.2”	12.5”
Hendrickson RT463 7.94” saddle	46K	54”	11.9”	13.3”
Hendrickson RT463 6” saddle	46K	60”	10.0”	11.1”
Hendrickson RT463 7.94” saddle	46K	60”	11.9”	13.0”
Hendrickson RTE463 7.19” saddle	46K	52”	10.5”	11.6”
Hendrickson RT523 6” saddle	52K	52”	9.9”	11.0”
Hendrickson RT523 6” saddle	52K	54”	9.9”	11.0”
Hendrickson RT523 7.19” saddle	52K	54”	11.1”	12.2”
Hendrickson RT523 11” saddle	52K	54”	14.9”	16.0”
Hendrickson RT523 6” saddle	52K	60”	9.9”	11.0”
Hendrickson RT523 7.19” saddle	52K	60”	11.1”	12.2”

CHALMERS 856-46 TANDEM



Chalmers Tandem Suspensions

NOTE: 54” Axle Spacing dimensions shown.

Table 32 Chalmers Tandem Rear Suspension Options

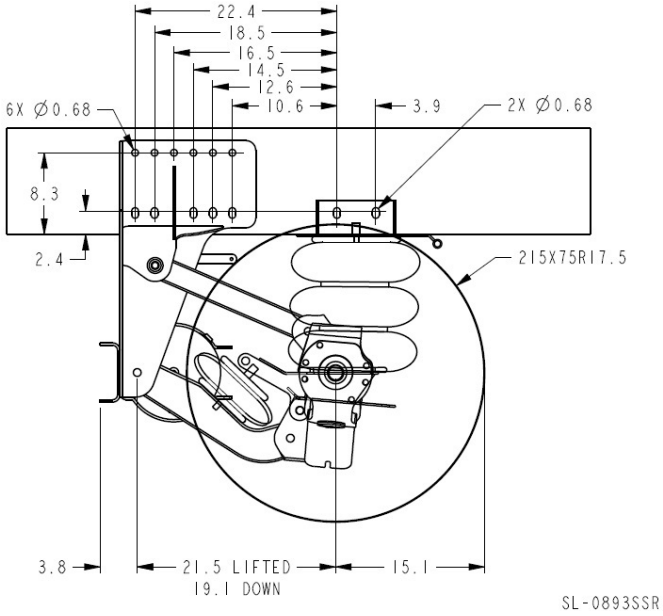
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Chalmers 854-40-L	40K	54”	8.9”	11.1”
Chalmers 854-40-L-HS	40K	54”	9.6”	11.1”
Chalmers 854-40-H	40K	54”	10.2”	12.4”
Chalmers 854-40-H-HS	40K	54”	10.9”	12.4”
Chalmers 854-46-L	46K	54”	8.9”	11.3”
Chalmers 854-46-L-HS	46K	54”	9.6”	11.3”
Chalmers 854-46-H	46K	54”	10.1”	12.5”
Chalmers 854-46-H-HS	46K	54”	10.9”	12.5”
Chalmers 854-50-L	50K	54”	8.9”	11.3”
Chalmers 854-50-L-HS	50K	54”	9.6”	11.3”
Chalmers 854-50-H	50K	54”	10.1”	12.5”
Chalmers 854-50-H-HS	50K	54”	10.9”	12.5”
Chalmers 854-52-L-HS	52K	54”	9.6”	11.3”
Chalmers 854-52-H-HS	52K	54”	10.9”	12.5”
Chalmers 860-40-L	40K	60”	8.9”	11.1”
Chalmers 860-46-L	46K	60”	8.9”	11.3”
Chalmers 860-46-L-HS	46K	60”	9.6”	11.3”
Chalmers 860-46-H	46K	60”	10.1”	12.5”
Chalmers 860-46-H-HS	46K	60”	10.9”	12.5”
Chalmers 860-52-H	52K	60”	10.9”	12.5”
Chalmers 872-46-H-HS	46K	72”	11.0”	12.5”

Lift Axles (Pushers and Tags)

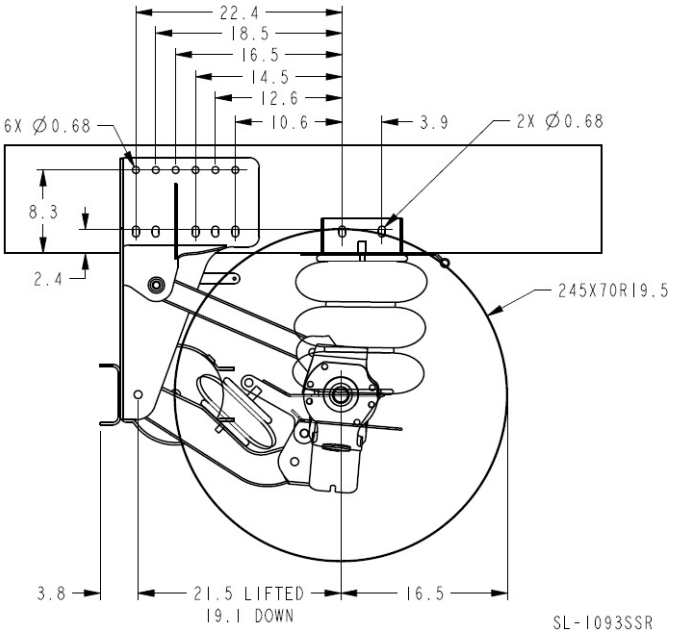
The lift axle layouts are provided as a tool to help layout bodies prior to arrival. The applicable dimensions are shown. When using the lift axle layouts to determine available frame space please be aware that required clearances are not shown. For information that may not be detailed in these drawings, please work with your local Kenworth Dealer to request that information.

Kenworth will automatically install the **highest lift axle kit** as applicable based on chassis frame height and loading conditions. Installing the highest lift axle kit will maximize ground clearance when the axle is in lifted state. If needed, kit may be lowered to clear driveline when in lifted state.

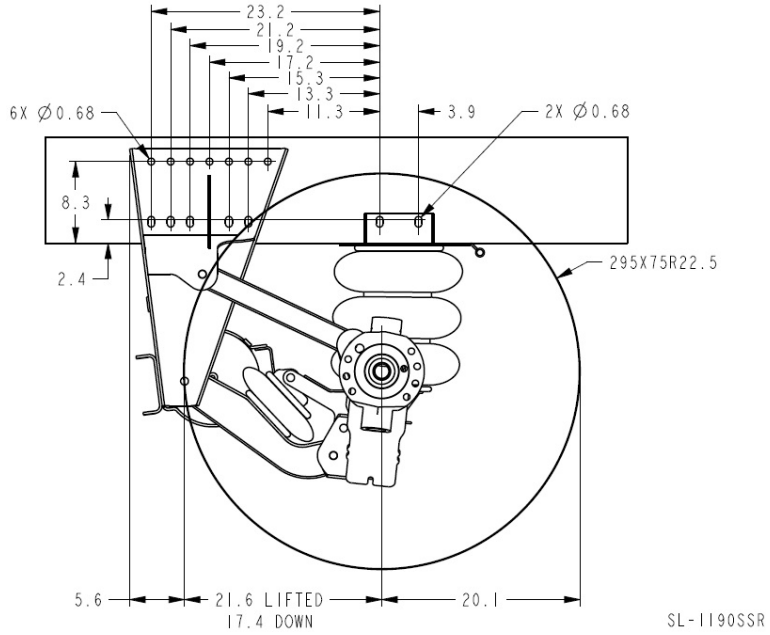
Watson & Chalin 8K Steerable (SL0893SSR)



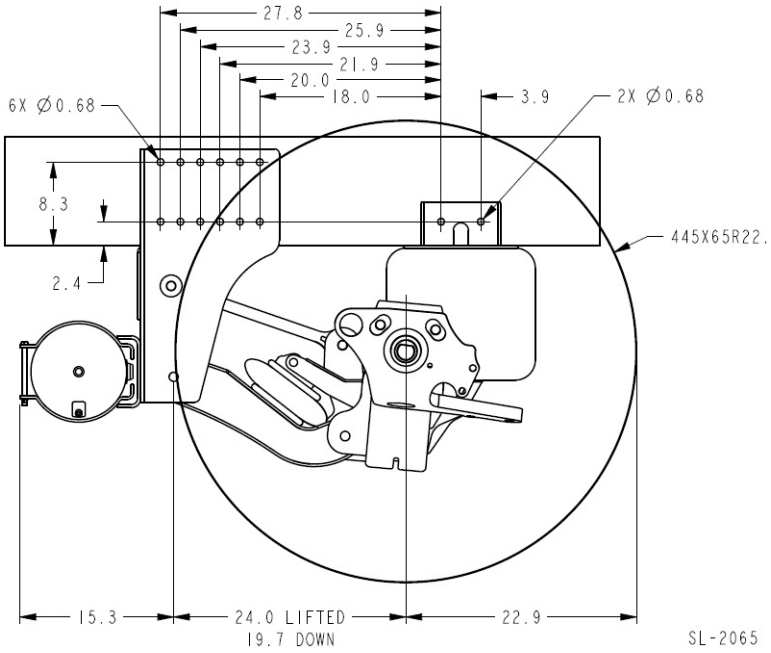
Watson & Chalin 10K Steerable (SL1093SSR)



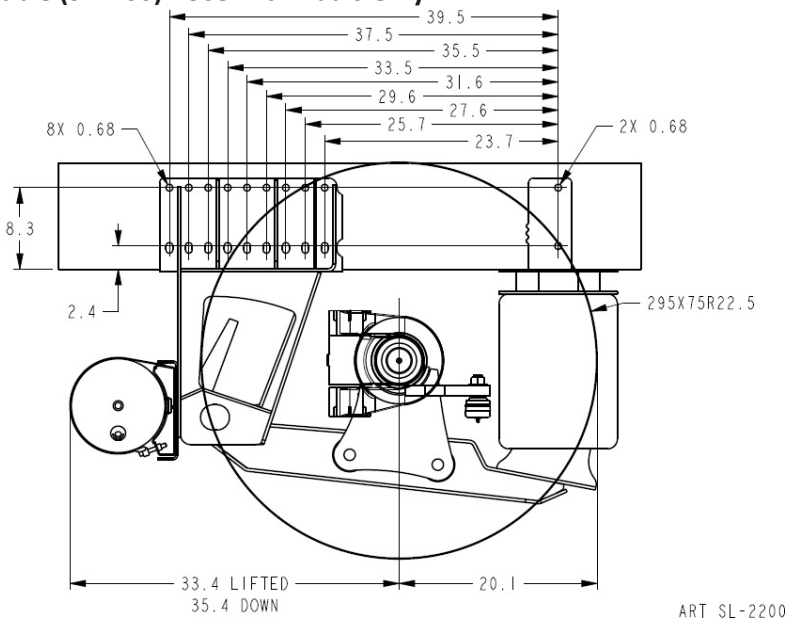
Watson & Chalin Tru-Track Alumilite 13.5K Steerable (SL1190SSR)



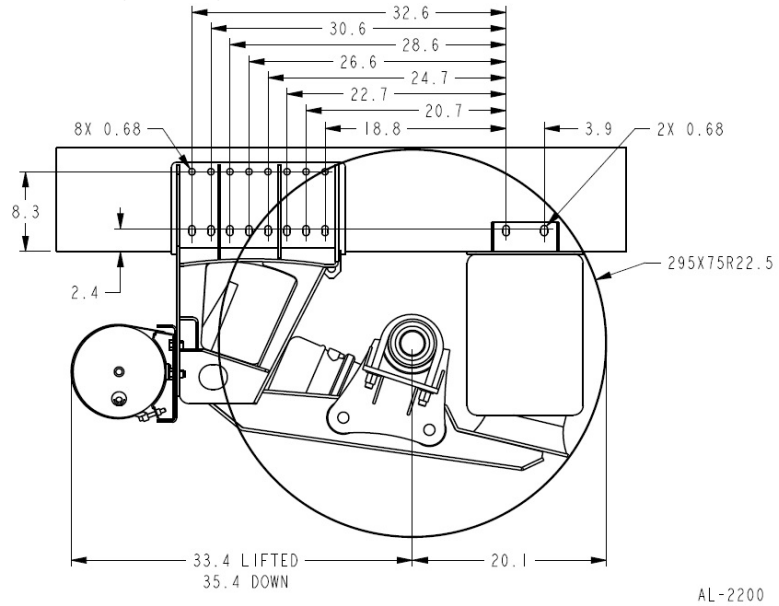
Watson & Chalin Tru-Track 20K Steerable (SL2065)



Watson & Chalin 23K Steerable (SL2200) *Use with Duals Only*



Watson & Chalin 23K Non-Steerable (AL2200)



Axle Track and Tire Width

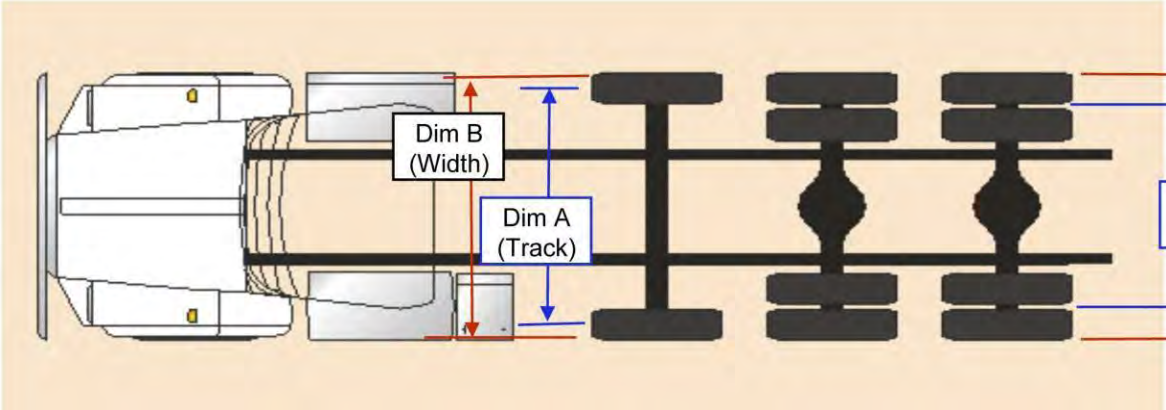


Table 33 Drive Axle Width Calculation

Axle - Drive	Wheel	Tire	Configuration	Track Dim "A"	Overall Width Dim "B:
Meritor RT46-160(P)(EH) 46K Dual Dana Spicer D46-170(H)(P) 46K Dual	Alcoa 88367 22.5X8.25	11R22.5	4-4	73.3"	97.8"
Meritor RT46-160(P)(EH) 46K Dual Dana Spicer D46-170(H)(P) 46K Dual	Alcoa 98363 24.5X8.25	11R24.5	4-4	73.6"	98.0"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 88367 22.5X8.25	11R22.5	4-4	79.2"	103.7"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 98363 24.5X8.25	11R24.5	4-4	79.5"	103.9"
Dana Spicer D46-170(H)(P) 46K Dual Meritor RT46-160(P)(EH) 46K Dual	Alcoa 82262 22.5X12.25	425/65R22.5	2-4	72.7	88.9"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 82262 22.5X12.25	425/65R22.5	2-4	78.7"	94.9"

Table 34 Steer Axle Width Calculation.

Axle - Steer	Wheel	Tire	Brake Drum Type	Track Dim "A"	Overall Width Dim "B:
Meritor MFS13 Std Track Dana Spicer E-1322I 13.2K	Alcoa 98363 24.5X8.25	11R24.5	CAST	80.2"	91.0"
Meritor MFS13 Wide Track Dana Spicer E-1322W 13.2K	Alcoa 98363 24.5X8.25	11R24.5	CAST	82.2"	93.0"
Meritor MFS20 Std Track Dana Spicer D2000 20K	Alcoa 82362 22.5X12.25	425/65R22.5	CAST	86.5"	102.7"

Meritor MFS20 Std Track Dana Spicer D2000 20K	Alcoa 82462 22.5X12.25	425/65R22.5	CAST	82.6"	98.8"

Table 35 Lift Axle Width Calculation.

Lift Axle Model	Wheel	Tire	Wheel Orientation	Track Dim "A"	Overall Width Dim "B"
W&C SL0893SSR 8K Steerable	Alcoa 66480 17.5x6	215/75R17.5	Same as FR	77.3"	85.8"
W&C SL1093SSR Steerable 10K	Alcoa 77349 19.5x7.5	265/70R19.5	Same as FR	78.5"	88.5"
W&C SL1190SSR Steerable 13.5K	Alcoa 88367 22.5x8.25	255/70R22.5	Same as FR	80.4"	90.7"
W&C SL2065 Steerable 20K	Alcoa 82362 22.5x12.25	425/65R22.5	Same as FR	83.6"	99.8"
W&C SL2200 Steerable 23K	Alcoa 88367 22.5x8.25	295/75R22.5	Same as RR, dual	78.2"	102.8"
W&C AL2200-STD Track Non-Steerable 23K	Alcoa 88367 22.5x8.25	11R22.5	Same as RR, dual	72.2"	96.6"
W&C AL2200-STD Track Non-Steerable 23K	Alcoa 82362 22.5x12.25	425/65R22.5	Same as RR, single	78.4"	94.7"
W&C AL2200-Wide Track Non-Steerable 23K	Alcoa 89465 22.5x9	315/80R22.5	Same as FR, single	64.7"	77.3"
W&C AL2200-Wide Track Non-Steerable 23K	Alcoa 84362 22.5x14	445/50R22.5	Same as RR, single	80.6"	97.7"

Ground Clearance

This information is provided as a reference, not all optional equipment is included. To calculate the height on your specific chassis, please use the ride height information provided in, Table 21, Front Suspension Ride Heights. For comparison the FS value shown is 12.5" unladen and 10.5" laden

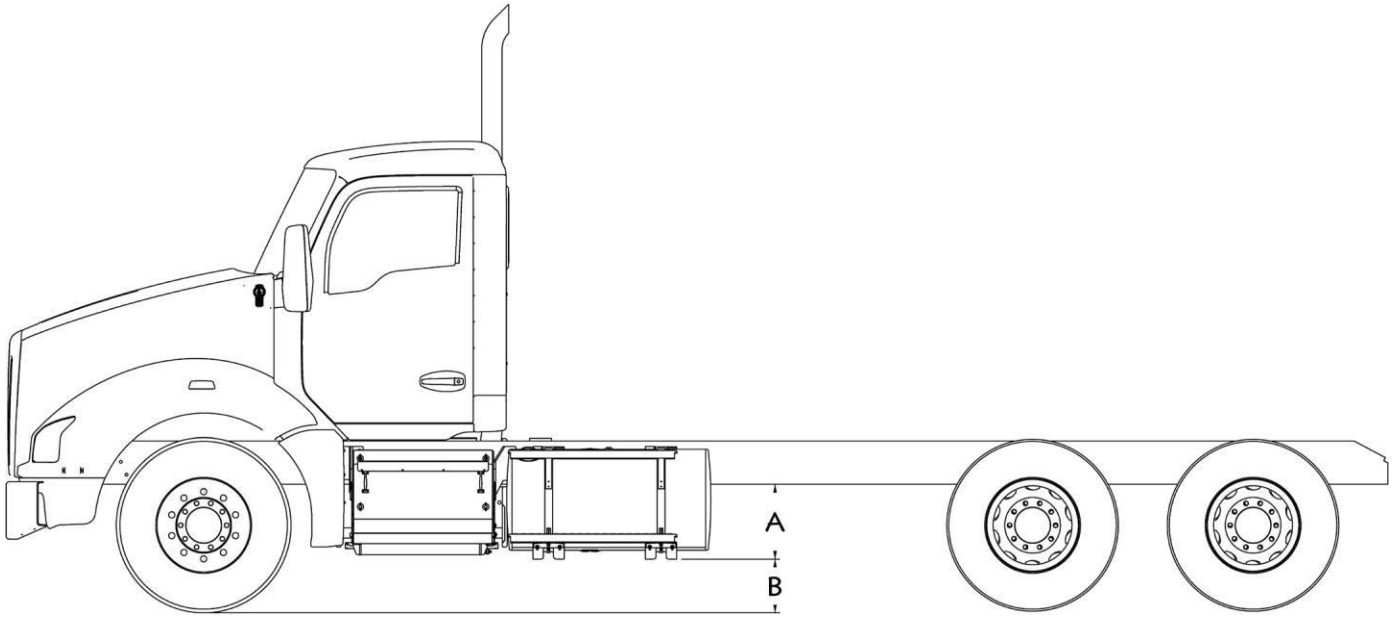


Table 36 Ground Clearance for Fuel Tanks and DEF Tanks

Front Suspension	Front Tires	Rear Suspension	Rear Tires	Fuel Tank Size	Component	Dimension "A" Distance from Bottom of Frame Rail (in)	Dimension "B" Ground Clearance (in)	
							Unladen	Laden
20K Taper leaf Spring	425/65R22.5	Hendrickson HMX 460 17.5" Saddle Height	11R24.5	22" Diameter	Fuel Tank	16.3	17.2	14.9
					DEF Tank	15.3	18.2	15.9
				24.5" Diameter	Fuel Tank	18.2	15.3	13
					DEF Tank	15.8	17.7	15.4
				28.5"	Fuel Tank	21.4	12	9.7
					DEF Tank	17.2	16.2	13.9

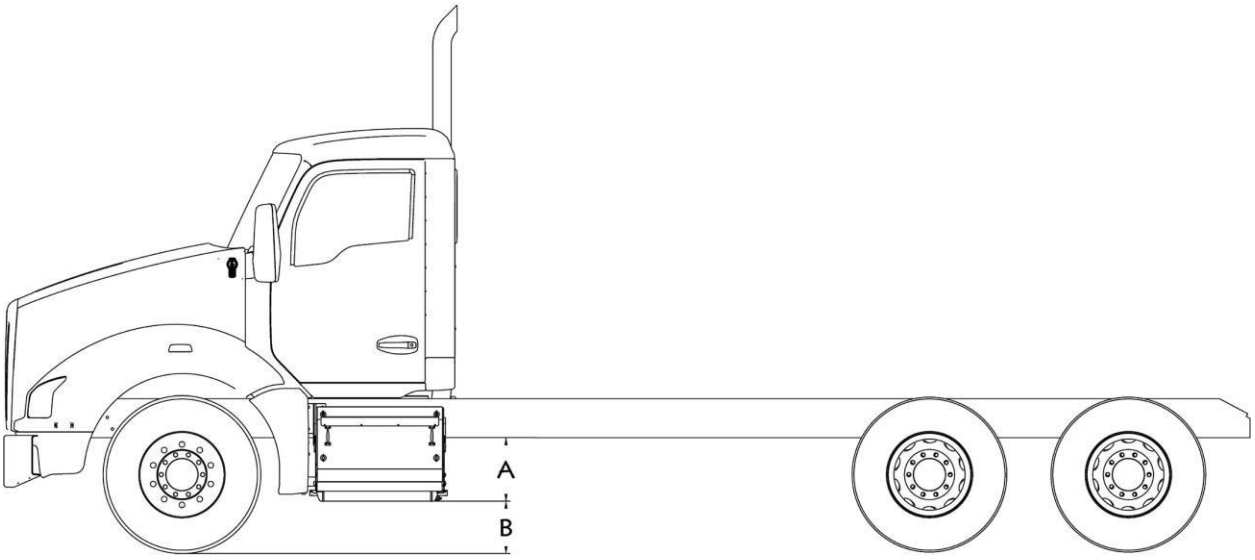


Table 37 Ground Clearance for Bottom of Rail and Cab Step

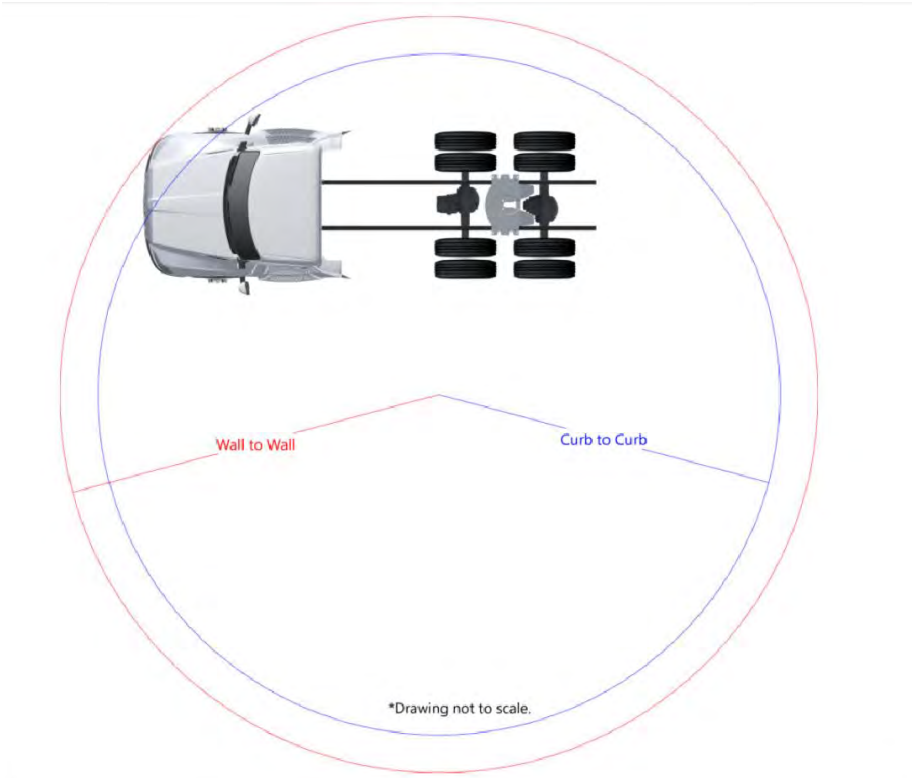
Front Suspension	Front Tires	Rear Suspension	Rear Tires	Fuel Tank Size	Component	Dimension "A" Distance from Bottom of Frame Rail (in)	Dimension "B" Ground Clearance (in)	
							Unladen	Laden
20K Taper leaf Spring	425/65R22.5	Hendrickson HMX 460 17.5"	11R24.5	22" Diameter	Battery Box with Air Tanks	17.3	16.2	13.9

		Saddle Height		24.5” Diameter	Vocational Battery Box with Air Tanks	17.8	15.7	13.4
				28.5” Diameter	DPF[1] Box	15.6	17.8	15.5

[1] Dimensions shown are for daycabs with high route exhaust. Sleeper ground clearance is reduced by 1.3 inches.

Turning Radius

Approximate turning radius specifications are available through the PremierSpec tool. For custom turning radius calculations, please consult with your local dealer.



LEFT TURN RADIUS		RIGHT TURN RADIUS	
Curb to Curb	27.6	**Curb to Curb**	27.6
Wall to Wall	30.0	**Wall to Wall**	30.0

VEHICLE SUMMARY			
Truck	T680 Series Conventional / TRACTOR	**Wheelbase**	188
Axle	Meritor MFS12E PLUS 12.5K 3.5in. drop standard	**Weight**	14,974
Tire	Front Tires: Bridgestone BR R213 ECOPIA 295/75R22		
Wheel	Front Wheel: Accuride 51487 22.5x8.25 steel		

Figure 24 PremierSpec Turning Radius Analysis

SECTION 4 - BODY MOUNTING

INTRODUCTION

This section has been designed to provide guidelines to aid in body mounting. This is not intended as a complete guide, rather as general information. Body mounting strategies are unique to each body type and each body builder must determine the appropriate method. Please note, an alignment adjustment is required after body installation. Front alignment and rear alignment must be performed prior to putting the vehicle into service
Please contact your local Kenworth dealer if more information is desired

FRAME RAILS

Frame rail information is provided per rail.

Table 38 Single Frame Rails

				Per Rail		Per Pair of Rail
Rail Height (in.)	**Flange Width**	**Web Thickness**	**Section Modulus (In.^{3})**	**RBM (in.-lbs.)**	**Weight (lbs./in.)**	**Weight (lbs./in.)**
9-7/8	3-1/2”	1/4”	10.5	1,250,000	1.06	2.12
10-5/8	3-1/2”	5/16”	14.8	1,776,000	1.44	2.88
10-3/4	3-1/2”	3/8”	17.8	2,134,000	1.74	3.48
10-11/16	3-1/2”	1/2”	22.4	2,691,000	2.265	4.53
11-5/8	3-7/8”	3/8”	21.4	2,572,000	1.9	3.8

Table 39 Inserted rails Frame Rails

			Per Rail		Per Pair of Rail
Main Rail Height (in.)	**Insert size**	**Combined Section Modulus (In.^{3})**	**RBM (in.-lbs.)**	**Weight (lbs./in.)**	**Weight (lbs./in.)**
10-5/8	9-7/8”	23.7	2,844,000	2.48	4.96
10-3/4	9-7/8”	26.58	3,190,000	2.75	5.5
11-5/8	10-3/4”	37.93	4,551,000	3.64	7.28

Table 40 Double Inserted rails Frame Rails

				Per Rail		Per Pair of Rail
Main Rail Height (in.)	**First Insert size**	**Second Insert Size**	**Combined Section Modulus (In.^{3})**	**RBM (in.-lbs.)**	**Weight (lbs./in.)**	**Weight (lbs./in.)**
11-5/8	10-3/4”	9-7/8”	46.07	5,528,000	4.7	9.4

CRITICAL CLEARANCES

Tire Clearance

Normal suspension movement could cause contact between the tires and the body. To prevent this, mount the body so that the minimum clearance between the top of the tire and the bottom of the body is 8 inches (203 mm). This should be measured with the body empty. See Figure 25.

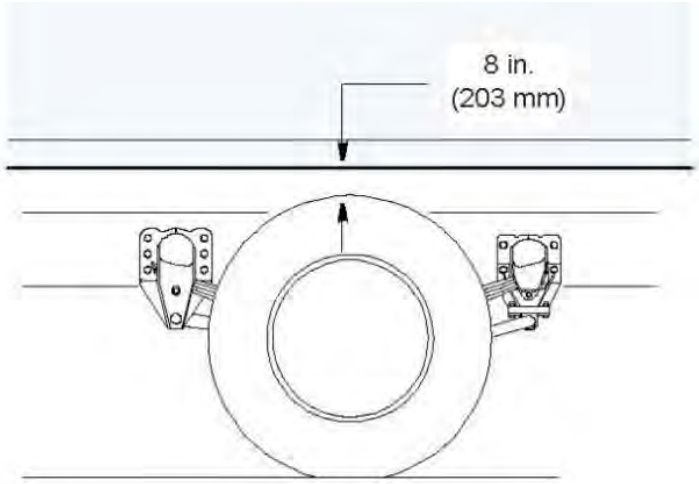


Figure 25 Minimum Clearance between Top of Rear Tires and Body Structure Overhang

CAUTION: Insufficient clearance between rear tires and body structure could cause damage to the body during suspension movement.

Cab Clearance

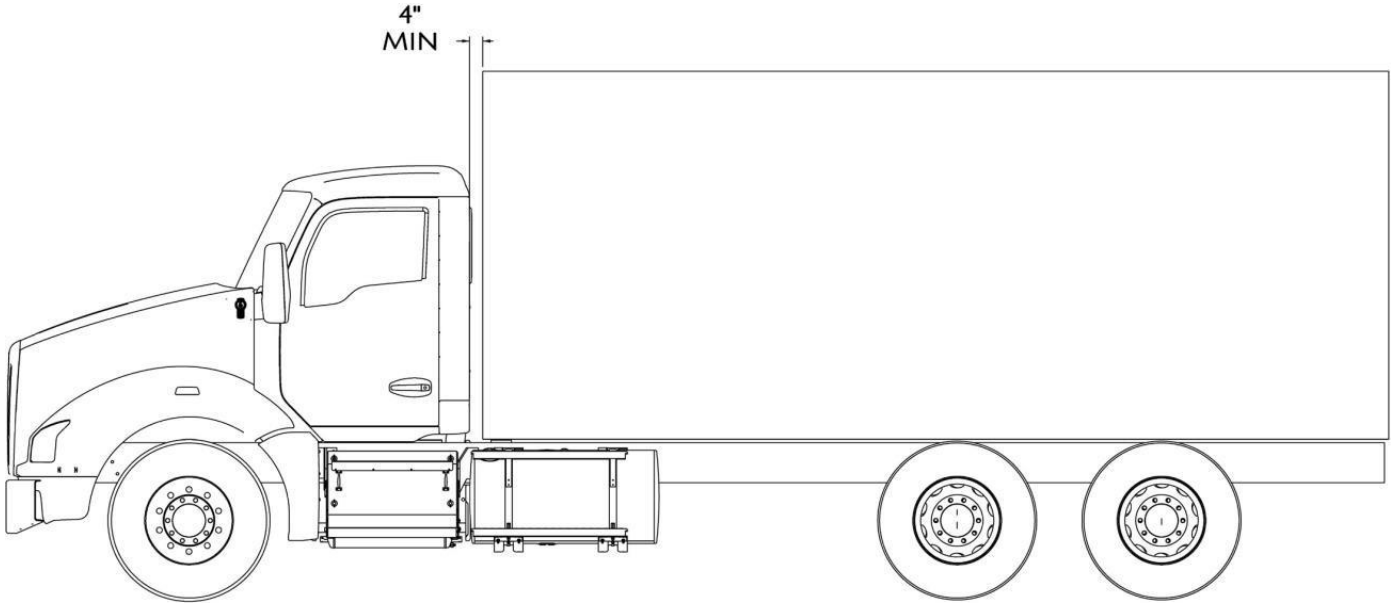


Figure 26 Minimum Back of Cab Clearance

WARNING! When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. Mount the body using body mounting brackets or U–bolts.

CAUTION: Maintain adequate clearance between back of cab and the front (leading edge) of mounted body. It is recommended the body leading edge be mounted 4 in. behind the cab. See **Figure 26 Minimum Back of Cab Clearance**

CAUTION: Always install a spacer between the body subframe and the top flange of the frame rail. Installation of a spacer between the body subframe and the top flange of the frame rail will help prevent premature wear of the components due to chafing or corrosion.

NOTE:

Be sure to provide maintenance access to the battery box and fuel tank fill neck.

FRAME SILL

If the body is mounted to the frame with brackets, we recommend a frame sill spacer made from a strip of rubber or plastic (delrin or nylon). These materials will not undergo large dimensional changes during periods of high or low humidity. The strip will be less likely to fall out during extreme relative motion between body and chassis. See Figure **27**.

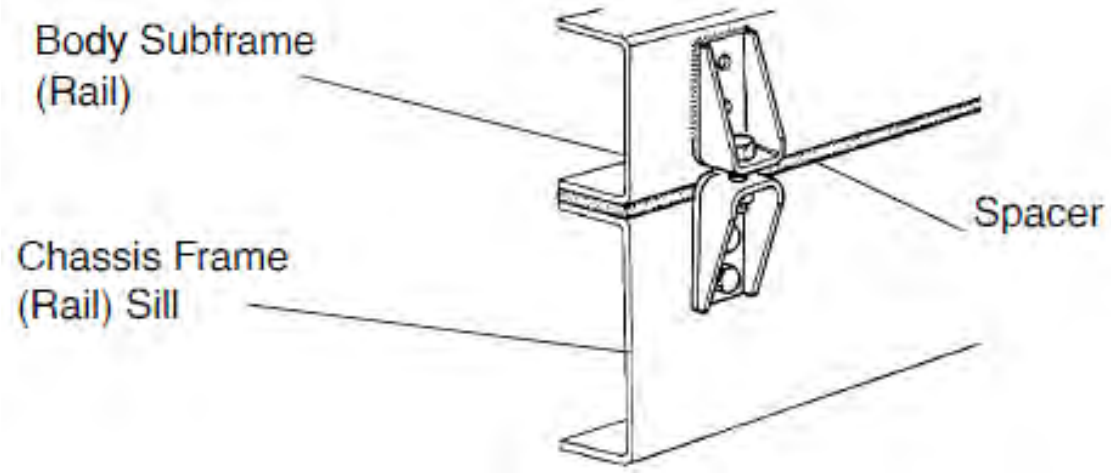


Figure 27 Spacer between Frame Sill and Body Rail – Rubber or Plastic

BRACKETS

When mounting a body to the chassis with brackets, we recommend designs that offer limited relative movement, bolted securely but not too rigid. Brackets should allow for slight movement between the body and the chassis. For instance, **Figure 28** shows a high compression spring between the bolt and the bracket and **Figure 29** shows a rubber spacer between the brackets. These designs will allow relative movement between the body and the chassis during extreme frame racking situations. Mountings that are too rigid could cause damage to the body. This is particularly true with tanker installations.

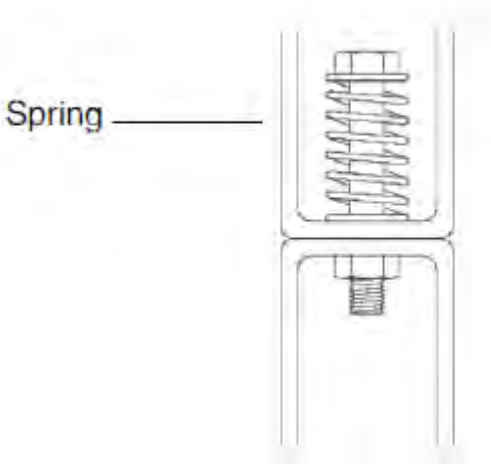


Figure 28 Mounting Brackets with Spring

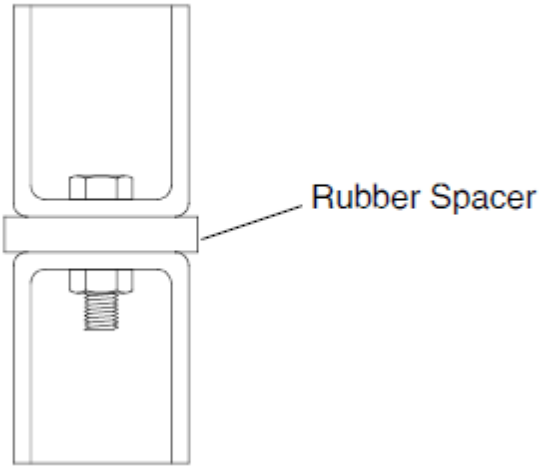


Figure 29 Mounting Brackets with Rubber Spacer

MOUNTING HOLES

When installing brackets on the frame rails, the mounting holes in the chassis frame bracket and frame rail must comply with the general spacing and location guidelines illustrated in **Figure 30.**

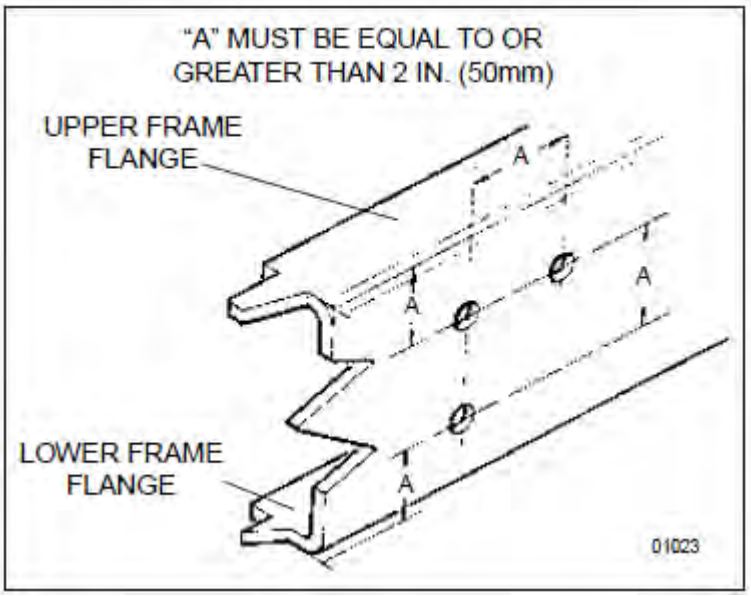


Figure 30 Frame Hole Location Guidelines for Frame Rail and Bracket

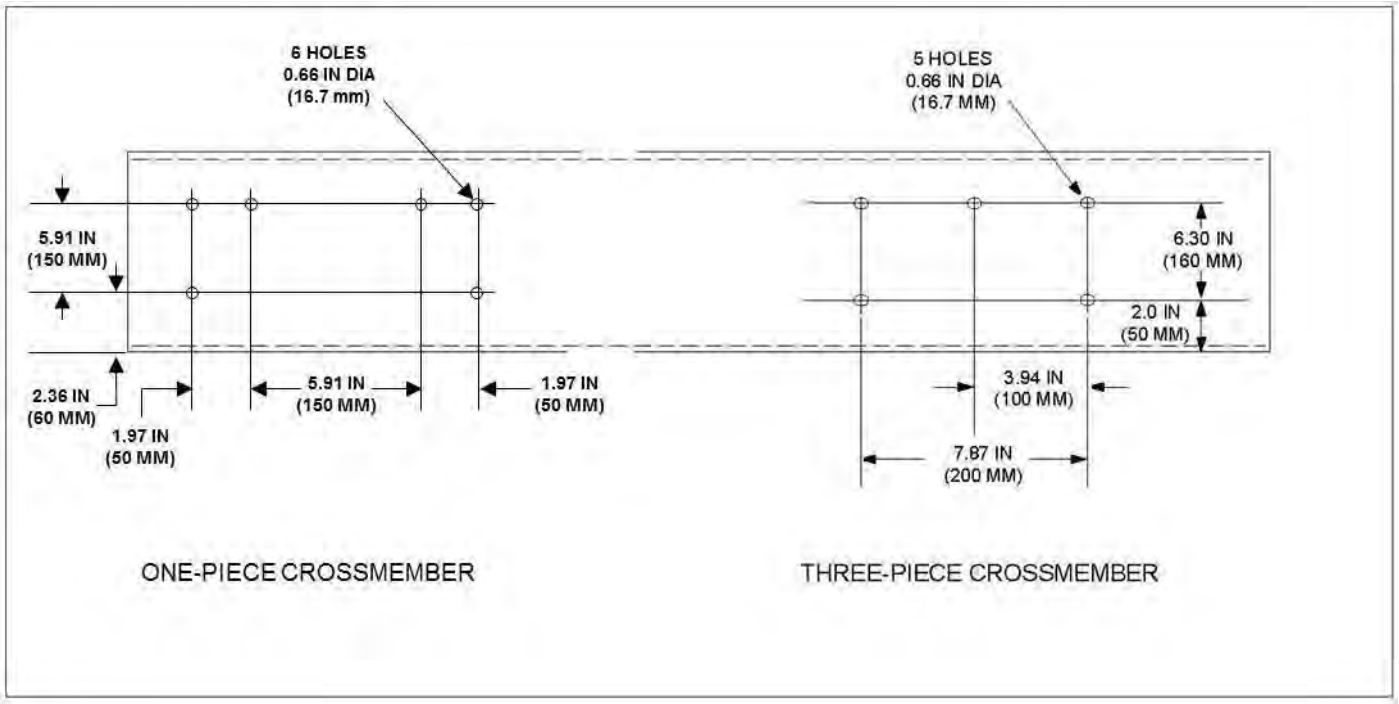


Figure 31 Crossmember Gusset Hole Patterns
(Additional Holes Available in 50 mm Horizontal Increments)

FRAME DRILLING

WARNING! When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. Mount the body using body mounting brackets or U–bolts.

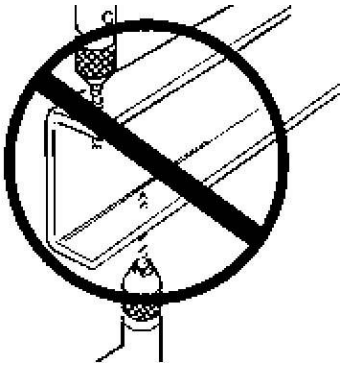


Figure 32 Frame Rail Flange Drilling Prohibited

WARNING! DO NOT drill closely spaced holes in the frame rail. Frame hole centers of two adjacent holes should be spaced no less than twice the diameter of the largest hole. Closer spacing could induce a failure between the two holes.

CAUTION: An appropriately sized bolt and nut must be installed and torqued properly in all unused frame holes. Failure to do so could result in a frame crack initiation around the hole.

CAUTION: Use care when drilling the frame web so the wires and air lines routed inside the rail are not damaged. Failure to do so could cause an inoperable electrical or air system circuit.

CAUTION: Never use a torch to make holes in the rail. Use the appropriate diameter drill bit. Heat from a torch will affect the material properties of the frame rail and could result in frame rail cracks.

CAUTION: The frame hole diameter should not exceed the bolt diameter by more than .060 inches (1.5mm)

BODY MOUNTING USING U–BOLTS

If the body is mounted to the frame with U–bolts, use a hardwood sill (minimum 1/2 inch thick) between the frame rail and body frame to protect the top surface of the rail flange

WARNING! Do not allow the frame rails or flanges to deform when tightening the U–bolts. It will weaken the frame and could cause an accident. Use suitable spacers made of steel or hardwood on the inside of the frame rail to prevent collapse of the frame flanges.

Use a hardwood spacer between the bottom flange and the U–bolt to prevent the U–bolt from notching the frame flange. See Figure **33**

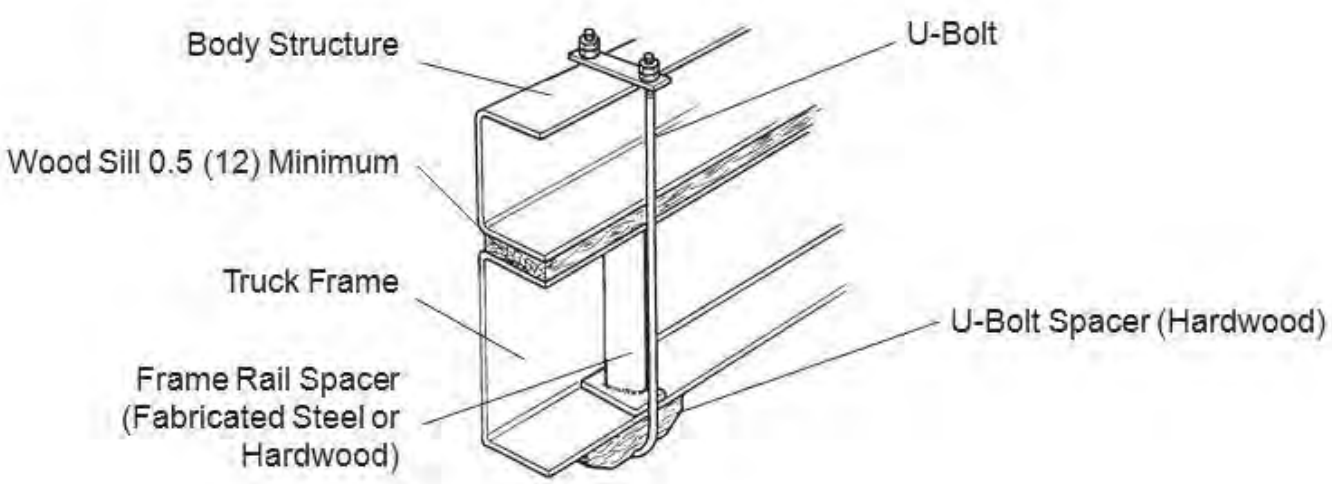


Figure 33 Acceptable U-Bolt Mounting with Wood and Fabricated Spacers

WARNING! Do not allow spacers and other body mounting parts to interfere with brake lines, fuel lines, or wiring harnesses routed inside the frame rail. Crimped or damaged brake lines, fuel lines, or wiring could result in loss of braking, fuel leaks, electrical overload or a fire. Carefully inspect the installation to ensure adequate clearances for air brake lines, fuel lines, and wiring. See **Figure 34**.

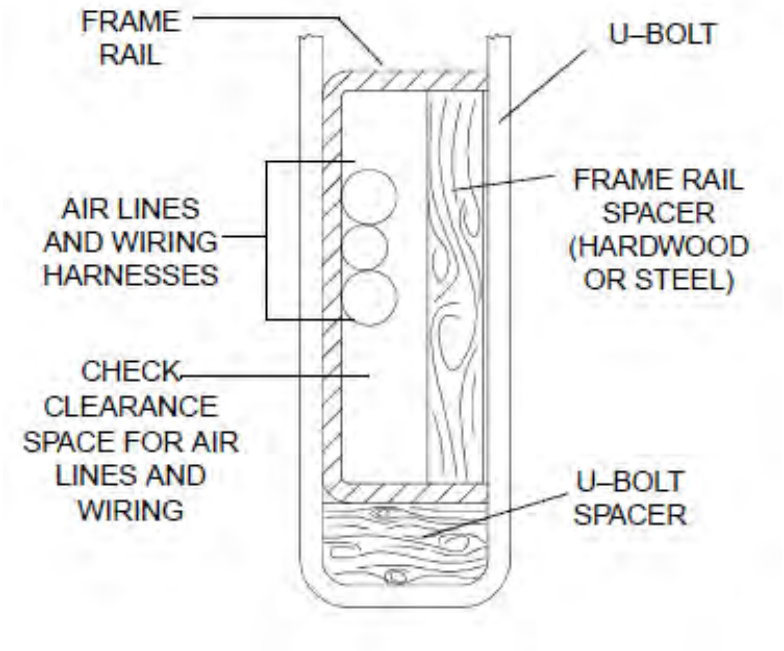


Figure 34 Clearance Space for Air Lines and Cables

WARNING! Do not notch frame rail flanges to force a U–bolt fit. Notched or damaged frame flanges could result in premature frame failure. Use a larger size U-bolt

CAUTION: Mount U–bolts so they do not chafe on frame rail, air, or electric lines.

REAR BODY MOUNT

When U–bolts are used to mount a body we recommend that the last body attachment be made with a “fishplate” bracket. See **Figure 35.** This provides a firm attaching point and helps prevent any relative fore or aft movement between the body and frame. For frame hole location guidelines, see **Figure 30**

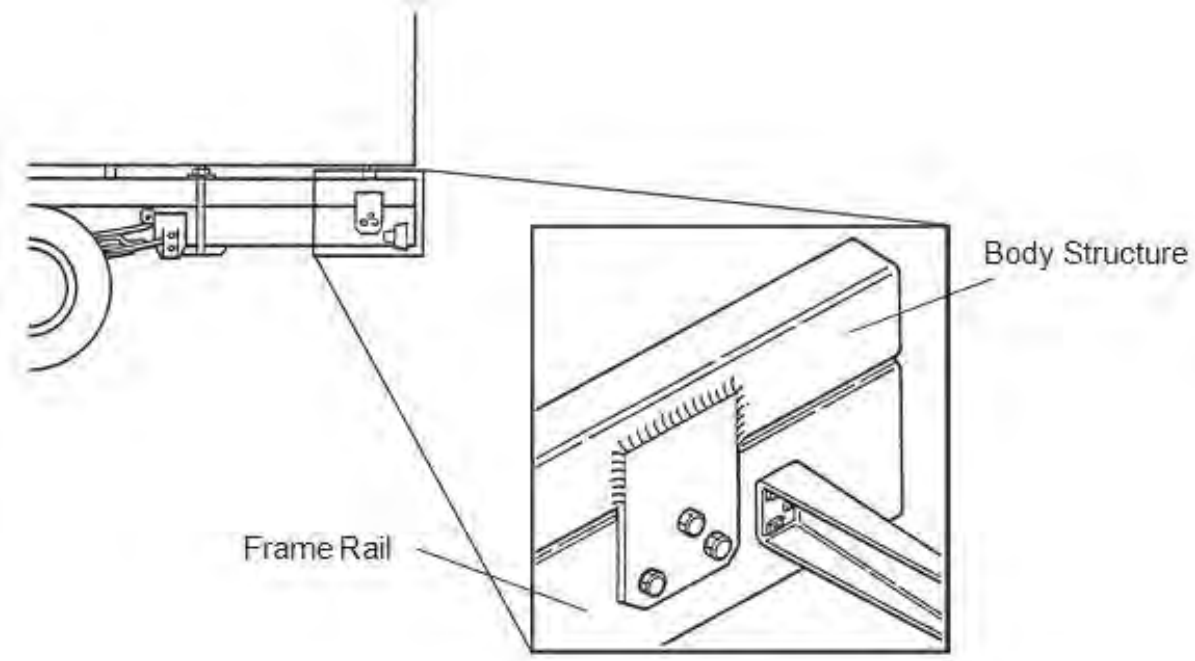


Figure 35 Fishplate Bracket at Rear End of Body

SECTION 5 FRAME MODIFICATIONS

INTRODUCTION

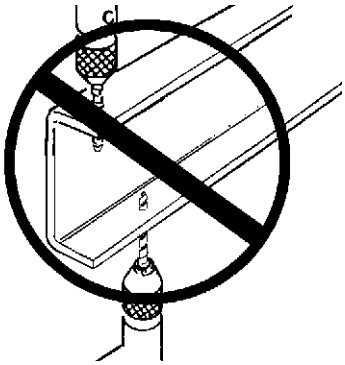
Kenworth offers customer specified wheelbases and frame overhangs. Therefore, in most cases frame modifications should not be necessary.

However, some body installations may require slight modifications, while other installations will require extensive modifications. Sometimes an existing dealer stock chassis may need to have the wheelbase changed to better fit a customer's application. The modifications may be as simple as modifying the frame cutoff, or as complex as modifying the wheelbase.

DRILLING RAILS

If frame holes need to be drilled in the rail, see Section 4 **FRAME DRILLING** for more information.

WARNING! When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. Mount the body using body mounting brackets or U–bolts.



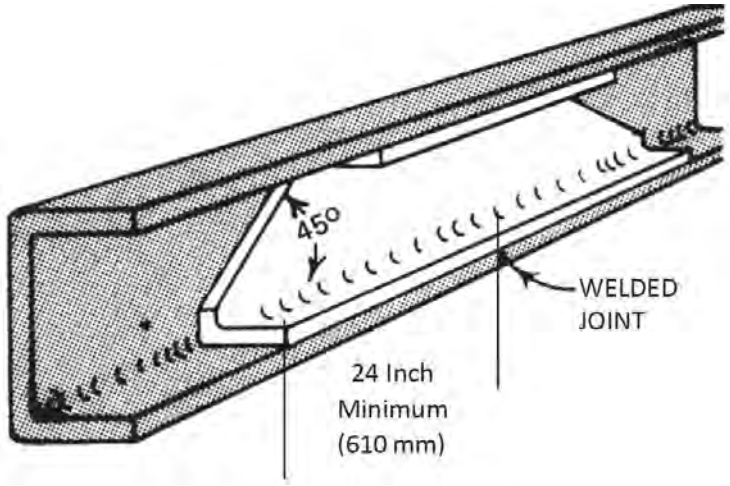
WARNING! Do not drill new holes any closer than 2 inches (50mm) to existing holes. Frame drilling affects the strength of the rails. If the holes are too close together, the rail could fail prematurely and cause an accident

WARNING! Never use a torch to make a hole in the rail. Use the appropriate diameter drill bit. Heat from a torch can change material properties and weaken the frame rail

CAUTION: Use care when drilling the frame web so the wires and air lines routed inside the rail are not damaged

Frame Extensions

A frame insert must be added after welding a frame rail extension to compensate for lost strength. The insert should be of the same material as the frame member, or of steel, and at least equal to the frame rail in thickness. Attachment of the insert to the frame should be made with Ream-Fit heat-treated bolts, 5/8 in. (16 mm) dia. or the next larger size. Both the reinforcement and frame holes should be reamed to provide a fit of from .001 in. to .003 in. (.025 to .076 mm) clearance. Do not weld reinforcing members. The insert should span a distance of at least 24 in. (610 mm) on either side of the joint to insure an even distribution of stresses. Cut the ends of the insert at 45° as shown in Figure 8–2 unless the insert extends to the end of the frame.



Where possible, use existing bolt holes to attach the insert to the frame. Bolt holes must not be located closer to the frame flanges than the present bolt pattern.

If the insert is placed in a section of the main frame where few bolts are located, additional bolts are required. Use the following guideline for locating additional bolt holes.

MODIFYING FRAME LENGTH

The frame overhang after the rear axle can be shortened to match a particular body length. Using a torch is acceptable; however, heat from a torch will affect the material characteristics of the frame rail. The affected material will normally be confined to within 1 to 2 inches (25 to 50mm) of the flame cut and may not adversely affect the strength of the chassis or body installation

CHANGING WHEELBASE

Changing a chassis' wheelbase is not recommended. Occasionally, a chassis' wheelbase will need to be shortened or lengthened. Before this is done there are a few guidelines that need to be considered.

WARNING! When changing the wheelbase, be sure to follow the driveline manufacturer's recommendations for driveline length or angle changes. Incorrectly modified drivelines can fail prematurely due to excessive vibration. This can cause an accident and severe personal injury.

Before changing the wheelbase, the driveline angles of the proposed wheelbase need to be examined to ensure no harmful vibrations are created. Consult with the driveline manufacturer for appropriate recommendations.

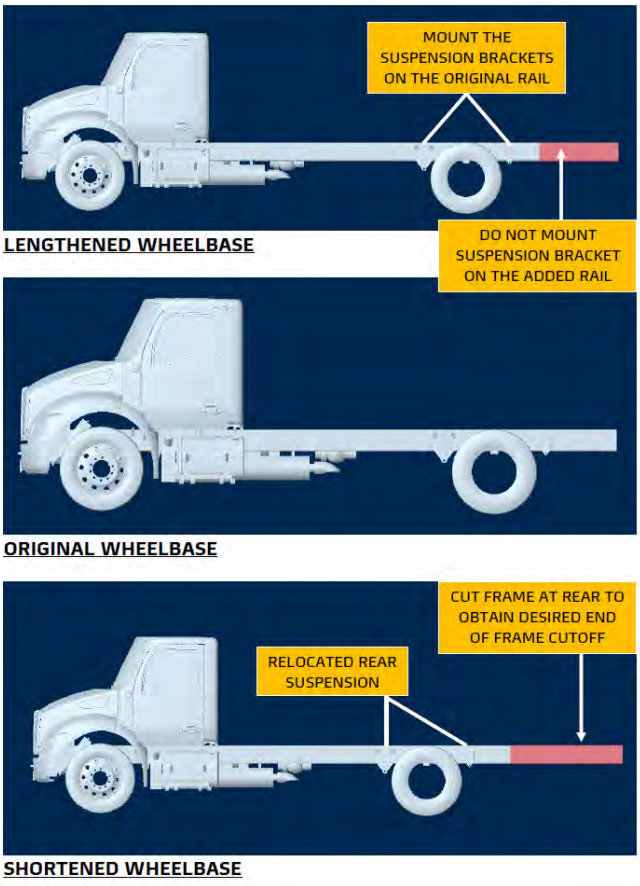


Figure 36 Wheelbase Customization

Before the rear suspension is relocated, check the new location of the spring hanger brackets. The new holes for the spring hanger brackets must not overlap existing holes and should adhere to the guidelines in the "**FRAME DRILLING**" section of this manual.

When shortening the wheelbase, the suspension should be moved forward and relocated on the original rail. The rail behind the suspension can then be cut to achieve the desired frame overhang. See **Figure 36.**

WARNING: When relocating a suspension bracket, do not mount it on the extended (added) section of a frame rail. The suspension loading could result in premature failure of the added section splice. This could cause an accident. Use care when planning the wheelbase so that the rear suspension bracket is always mounted on the original rail section. See Figure 36**.**

CROSSMEMBERS

After changing a wheelbase, an additional crossmember may be required to maintain the original frame strength. The maximum allowable distance between adjacent crossmembers is 60 inches (1524 mm). If the distance between adjacent crossmembers exceeds this dimension, add a crossmember between them.

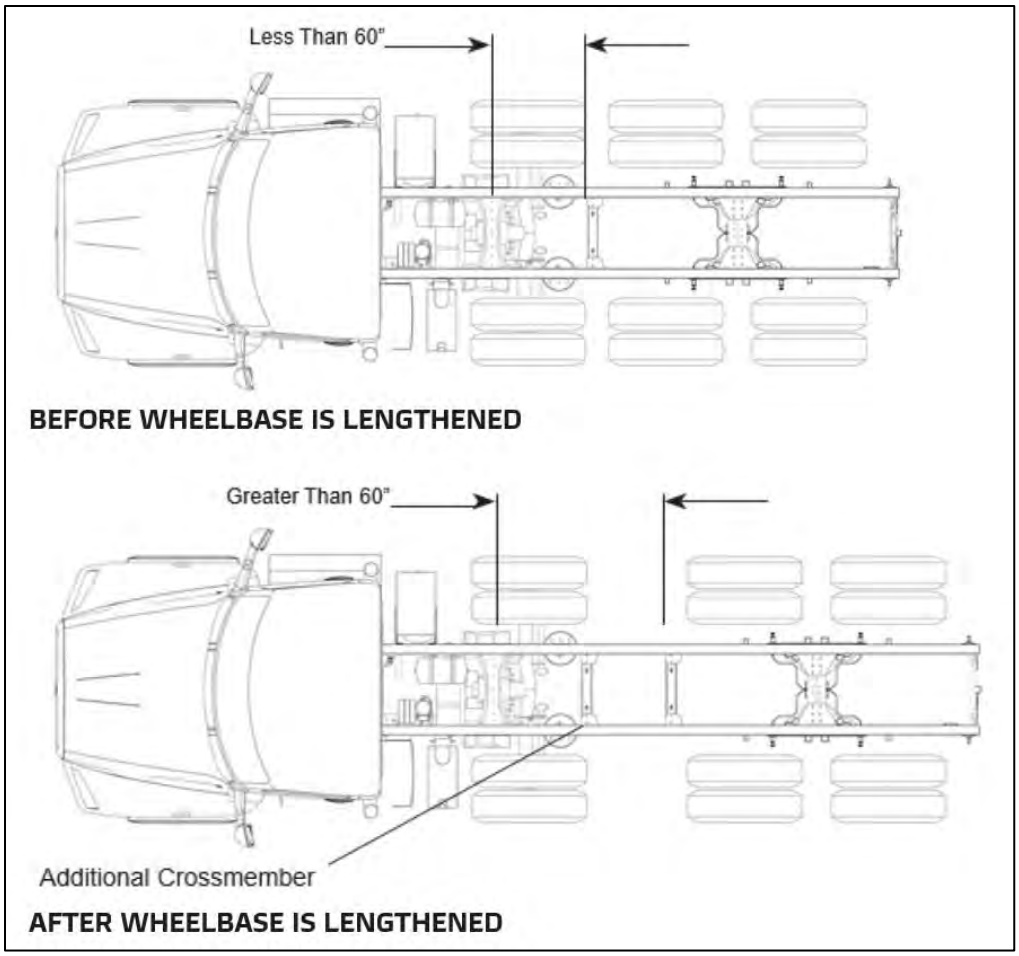


Figure 37 Additional Crossmember with Frame Extension

TORQUE REQUIREMENTS

Torque values apply to fasteners with clean threads, lightly lubricated, with hardened steel washers, and nylon-insert nuts.

Table 41 Customary Grade 8 UNF or UNC

Fastener	Torque	
Size	Nm	lb-ft
5/16	27–34	20–25
3/8	47–60	35–44
7/16	76–96	56–71
1/2	117–148	86–109
9/16	167–214	123-158
5/8	235–296	173–218
3/4	411–523	303–386
7/8	654–846	482–624
1	973–1268	718–935

Table 42 U.S. Customary – Grade 8 Metric Class 10.9

Fastener	Torque	
Size	Nm	lb-ft
M6	9–11	7–8
M8	24–27	18–20
M10	47–54	35–40
M12	83–95	61–70
M14	132–150	97–111
M16	206–235	152–173
M20	403–458	297–338

WELDING

The frame rails are heat treated and should not be welded. The high heat of welding nullifies the special heat treatment of the rails, greatly reducing the tensile strength of the frame rail. If a frame member becomes cracked from overloading, fatigue, surface damage or a collision, the only permanent repair is to replace the damaged frame member with a new part.

The following information is provided for temporary emergency repair. Prior to welding a cracked frame rail, the area should be beveled (V'd out) to allow for a better weld. To prevent spreading of the crack, a 7 to 9 mm (1/4 in. to 3/8 in.) dia. hole should be drilled at the end of the crack. Widen the crack along its full length by using two hack saw blades together. When welding steel frames use the shielded arc method. When welding aluminum frames use either the tungsten inert gas (TIG) or consumable electrode method. Be sure to obtain full weld penetration along the entire length of the crack.

CAUTION: Before welding, disconnect the negative terminal battery cable

CAUTION: Before welding, disconnect the alternator terminals. Failure to do so could result in damage to the voltage regulator and/or alternator.

CAUTION: To prevent damage to electrical equipment, disconnect battery cables before arc-welding on a truck, and be sure that the welding ground lead is connected to the frame. Bearings and other parts will be damaged if current must pass through them to complete the circuit.

WELDING PRECAUTIONS: ALL ELECTRONIC ENGINES

- Before welding on vehicles with electronic engines, the following precautions should be observed

1. Disconnect all electrical connections to the vehicle batteries
2. Disconnect all ECM and VECU connectors
3. Do not use the ECM, VECU or engine ground stud for the ground of the welding probe
4. Ensure that the ground connection for the welder is as close to the weld point as possible. This ensures maximum weld current and minimum risk to damage electrical components on the vehicle
5. Turn off the key.

NOTE:

Bendix ABS and Wabco ABS: Disconnect ECU.

SECTION 6 CAN COMMUNICATIONS

INTRODUCTION

Controller Area Network (CAN) is a serial network technology that was originally designed for the automotive industry but has also become popular in the commercial trucking industry. The CAN bus is primarily used in the embedded systems and network technology that provides fast communication among controllers up to real-time requirements, eliminating the need for the much more expensive and complex technology.

CAN is a two-wire high-speed network system, that is far superior to conventional hardwired technology's functionality and reliability. CAN implementations are also more cost-effective. CAN is designed for real-time requirements which can easily beat hardwired connections when it comes to short reaction times, timely error detection, quick error recovery, and error repair.

Characteristics of the Controller Area Network:

- A serial networking technology for embedded solutions
- Needs only two wires to communicate messages
- Operates at data rates of 250K and 500K
- Supports a maximum of 8 bytes per message frame
- One application can support multiple message IDs
- Supports message priority, i.e. the lower the message ID the higher its priority

CAN bus information is available for VMUX (Vehicle Multiplexed) and EMUX (Ethernet Multiplexed) electrical architectures. Please reference the "Introduction" page of "Section 7 Electrical" to learn about the differences and to determine if your Kenworth vehicle was built from the factory with the VMUX or EMUX electrical architecture.

In addition, a minimum of one additional CAN device with the ability to 'acknowledge' messages will be required to complete the network on S-CAN and K-CAN. An incomplete network will result in the inability to read/ view CAN communication on the S-CAN and K-CAN.

Table 43 VMUX Acronym Library

Acronym	Definition
CAN	Controller Area Network
J1939	SAE CAN Communication Standard
PGN	Parameter Group Number
PTO	Power Take Off

Acronym	Definition
SPN	Suspect Parameter Number
SCR	Selective Catalytic Reduction
DPF	Diesel Particulate Filter
TSC1	Torque Speed Commands

Table 44 EMUX Acronym Library

Acronym	Definition
CAN	Controller Area Network
CMT	Collision Mitigation Technology
CSG2	Central Security Gateway, used for Cyber Security on the truck
Direction	Defines which way the signal is being sent. In the following EMUX CAN message table, “Tx” means transmitted by the ECU being added to the truck and conversely “Rx” means received by the ECU being added to the truck.
ECU	Electronic Control Unit
Hex ID	29-bit CAN identifier in hexadecimal
J1939	SAE CAN Communication Standard
PGN	Parameter Group Number
PropB	PNG Message Name (Prop: Propriety)
RP170	American Trucking Association (ATA) and Technology & Maintenance Council (TMC) standardized connector for vocational/refuse chassis-to-body electrical interface.
RP1226	American Trucking Association (ATA) and Technology & Maintenance Council (TMC) 14-pin standardized connector for in-vehicle data access.
Rx	Receive
SA	Source Address
SAE	Society of Automotive Engineers
SCM	Speed Control Management
SPN	Suspect Parameter Number
TPMS	Tire Pressure Monitoring System
Tx	Transmit

EMUX – ECU Installation Notes

- If adding two or more ECUs per truck that need to communicate with each other, install them on the same CAN network.
- If adding two or more ECUs that need to communicate with each other and some reside in the cab and some reside on the frame, use the optional BCAN network.
- When transmitting messages to other ECUs on the network, only the listed Source Addresses (SA) are accepted.

SAE J1939

The Society of Automotive Engineers (SAE) Communications Subcommittee for Truck and Bus Controls has developed a family of standards concerning the design and use of devices that transmit electronic signals and control information among vehicle components. SAE J1939 and its companion documents are the accepted industry standard for the vehicle network of choice for commercial truck applications. SAE J1939 is used in the commercial vehicle area for communication in the embedded systems of the commercial vehicle.

SAE J1939 uses CAN as physical layer. It is a recommended practice that defines which and how the data is communicated between the Electronic Control Units within a vehicle network. Typical controllers are the Engine, Brake, Transmission, etc. The messages exchanged between these units can be data such as vehicle road speed, torque control message from the transmission to the engine, oil temperature, and many more.

Characteristics of J1939:

- Extended CAN identifier (29-bit)
- Network management
- Definition of parameter groups for commercial vehicles and others
- Manufacturer specific parameter groups
- Diagnostics features
- A standard developed by the Society of Automotive Engineers
- Defines communication for vehicle networks
- A Higher-Layer Protocol using CAN as the physical layer
- Uses unshielded twisted pair wire
- Applies a maximum network length of 120 ft
- Applies a standard baud rate of 250 Kbit/sec or 500 Kbit/sec depending on the network
- Supports peer-to-peer and broadcast communication
- Supports message lengths up to 1785 bytes
- Defines a set of Parameter Group Numbers
- Two 120Ω terminating resistors per CAN

PARAMETER GROUP NUMBER

Parameter Groups contain information on parameter assignments within the 8-byte CAN data field of each message as well as repetition rate and priority. Parameters groups are, for instance, engine temperature, which includes coolant temperature, fuel temperature, oil temperature, etc. Parameter Groups and their numbers are listed in SAE J1939 and defined in SAE J1939/71, a document containing parameter group definitions plus suspect parameter numbers.

SUSPECT PARAMETER NUMBER

A Suspect Parameter Number is a number assigned by the SAE to a specific parameter within a parameter group. It describes the parameter in detail by providing the following information:

- Data Length in bytes
- Data Type
- Resolution
- Offset
- Range
- Reference Tag (Label)

SPNs that share common characteristics are grouped into Parameter Groups and they will be transmitted throughout the network using the Parameter Group Number.

VMUX - CAN MESSAGES AVAILABLE ON BODY CONNECTIONS

Table 45 VMUX CAN Messages Available on Body Connections

SPN	CAN Signal Description	PGN	CAN BUS
38	Fuel Level 2	65276, DD1	SCAN, KCAN
46	Pneumatic Supply Pressure	65198, AIR1	SCAN, KCAN, BCAN
51	Engine Throttle Valve1 Postion1	65266, LFE1	SCAN, KCAN, BCAN
69	Two Speed Axle Switch	65265, CCVS1	SCAN, KCAN
70	Parking Brake Switch	65265, CCVS1	SCAN, KCAN
74	Maximum Vehicle Speed Limit	65261, CCSS	SCAN, KCAN
81	Aftertreatment 1 Diesel Particulate Filter Intake Pressure	65270, IC1	SCAN, KCAN, BCAN
84	Wheel-Based Vehicle Speed	65265, CCVS1	SCAN, KCAN, BCAN
86	Cruise Control Set Speed	65265, CCVS1	SCAN, KCAN, BCAN
86	Cruise Control Set Speed	65265, CCVS1	SCAN, KCAN
90	PTO Oil Temperature	65264, PTO	SCAN, KCAN, BCAN
91	Accelerator Pedal Position1	61443, EEC2	SCAN, KCAN, BCAN
94	Engine fuel Delivery Pressure	65263, EFLP1	SCAN, KCAN, BCAN
96	Fuel Level 1	65276, DD1	SCAN, KCAN
98	Engine Oil Level	65263, EFLP1	SCAN, KCAN, BCAN
101	Engine Crankcase Pressure	65263, EFLP1	SCAN, KCAN, BCAN
105	Engine Intake Manifold 1 Temperature	65270, IC1	SCAN, KCAN, BCAN
106	Engine Intake Air Pressure	65270, IC1	SCAN, KCAN, BCAN
108	Barometric Pressure	65269, AMB	SCAN, KCAN, BCAN
111	Engine Coolant Level 1	65263, EFLP1	SCAN, KCAN, BCAN
117	Brake Primary Pressure	65274, B1	SCAN, KCAN
118	Brake Secondary Pressure	65274, B1	SCAN, KCAN
158	Key Switch Battery Potential	65271, VEP1	SCAN, KCAN
161	Transmission Input Shaft Speed	61442, ETC1	SCAN, KCAN, BCAN
162	Transmission Requested Range	61445, ETC2	SCAN, KCAN, BCAN
163	Transmission Current Gear	61445, ETC2	SCAN, KCAN, BCAN
168	Battery Potential / Power Input 1	65271, VEP1	SCAN, KCAN, BCAN
171	Ambient Air Temperature	65269, AMB	SCAN, KCAN, BCAN
173	Engine Exhaust Temperature	65270, IC1	SCAN, KCAN, BCAN
174	Engine Fuel Temperature 1	65262, ET1	SCAN, KCAN, BCAN
182	Engine Trip Fuel	65257, LFC1	SCAN, KCAN, BCAN
183	Engine Fuel Rate	65266, LFE1	SCAN, KCAN, BCAN
184	Engine Instantaneous Fuel Economy	65266, LFE1	SCAN, KCAN, BCAN
185	Engine Average Fuel Economy	65266, LFE1	SCAN, KCAN
187	Power Takeoff Set Speed	65264, PTO	SCAN, KCAN
187	Power Take Off Set Speed	65264,PTO	SCAN, KCAN, BCAN
187	Power Take Off Set Speed	65264,PTO	SCAN, KCAN, BCAN
190	Engine Speed	61444, EEC1	SCAN, KCAN, BCAN

191	Transmission Output Shaft Speed	61442, ETC1	SCAN, KCAN, BCAN
235	Engine Total Idle Hours	65244, IO	SCAN, KCAN, BCAN
236	Engine Total Idle Fuel Used	65244, IO	SCAN, KCAN, BCAN
237	Vehicle Identification Number	65260, VI	SCAN, KCAN, BCAN
244	Trip Distance	65248, VD	SCAN, KCAN, BCAN
245	Total Vehicle Distance	65248, VD	SCAN, KCAN, BCAN
247	Engine Total Hours of Operation	65253, HOURS	SCAN, KCAN, BCAN
249	Engine Total Revolutions	65253, HOURS	SCAN, KCAN, BCAN
250	Engine Total Fuel Used	65257, LFC1	SCAN, KCAN, BCAN
512	Driver's Demand Engine-Percent Torque	61444, EEC1	SCAN, KCAN, BCAN
513	Actual Engine-Percent Torque	61444, EEC1	SCAN, KCAN, BCAN
518	Engine Requested Torque/Torque Limit	0, TSC1	SCAN, KCAN
518	Engine Requested Torque/Torque Limit	0,TSC1	SCAN, KCAN, BCAN
523	Transmission Current Gear	61445, ETC2	SCAN, KCAN, BCAN
524	Transmission Selected Gear	61445, ETC2	SCAN, KCAN, BCAN
525	Transmission Requested Gear	256, TC1	SCAN, KCAN, BCAN
525	Trans Requested Gear	256, TC1	SCAN, KCAN, BCAN
526	Transmission Actual Gear Ratio	61445, ETC2	SCAN, KCAN, BCAN
527	Cruise Control States	65265, CCVS1	SCAN, KCAN
527	Cruise Control States	65265, CCVS1	SCAN, KCAN
527	Cruise Control States	65265, CCVS1	SCAN, KCAN
558	Accelerator Pedal1 Low Idle Switch	61443, EEC2	SCAN, KCAN, BCAN
559	Accelerator Pedal Kick Down Switch	61443, EEC2	SCAN, KCAN, BCAN
560	Transmission Driveline Engaged	61442, ETC1	SCAN, KCAN, BCAN
573	Transmission Torque Converter Lockup Engaged	61442, ETC1	SCAN, KCAN, BCAN
574	Transmission Shift in Process	61442, ETC1	SCAN, KCAN, BCAN
590	Engine Idle Shutdown Timer State	65252, SHUTDN	SCAN, KCAN, BCAN
590	Engine Idle Shutdown Timer State	65252, SHUTDN	SCAN, KCAN, BCAN
591	Engine Idle Shutdown Timer Function	65252, SHUTDN	SCAN, KCAN, BCAN
591	Engine Idle Shutdown Timer Function	65252, SHUTDN	SCAN, KCAN, BCAN
592	Engine Idle Shutdown Timer Override	65252, SHUTDN	SCAN, KCAN, BCAN
593	Engine Idle Shutdown has Shutdown Engine	65252, SHUTDN	SCAN, KCAN, BCAN
594	Engine Idle Shutdown Driver Alert Mode	65252, SHUTDN	SCAN, KCAN, BCAN
595	Cruise Control Active	65265, CCVS1	SCAN, KCAN
595	Cruise Control Active	65265, CCVS1	SCAN, KCAN
595	Cruise Control Active	65265, CCVS1	SCAN, KCAN, BCAN
596	Cruise Control Enable Switch	65265, CCVS1	SCAN, KCAN
597	Brake Switch	65265, CCVS1	SCAN, KCAN
598	Clutch Switch	65265, CCVS1	SCAN, KCAN
599	Cruise Control Set Switch	65265, CCVS1	SCAN, KCAN
600	Cruise Control Coast (Decelerate) Switch	65265, CCVS1	SCAN, KCAN
601	Cruise Control Resume Switch	65265, CCVS1	SCAN, KCAN
602	Cruise Control Accelerate Switch	65265, CCVS1	SCAN, KCAN

606	Engine Momentary Overspeed Enable	61442, ETC1	SCAN, KCAN, BCAN
607	Progressive Shift Disable	61442, ETC1	SCAN, KCAN, BCAN
684	Requested% Clutch Slip	256, TC1	SCAN, KCAN, BCAN
695	Engine Override Control Mode	0,TSC1	SCAN, KCAN, BCAN
696	Engine Requested Speed Control Conditions	0,TSC1	SCAN, KCAN, BCAN
897	Override Control Mode Priority	0,TSC1	SCAN, KCAN, BCAN
898	Engine Requested Speed/Speed Limit	0,TSC1	SCAN, KCAN, BCAN
917	Total Vehicle Distance (High Resolution)	65217, VDHR	SCAN, KCAN
969	Remote Accelerator Enable Switch	61441, EBC1	SCAN, KCAN, BCAN
974	Remote Accelerator Pedal Position	61443, EEC2	SCAN, KCAN, BCAN
974	Remote Accelerator Pedal Position	61443, EEC2	SCAN, KCAN, BCAN
975	Engine Fan1 Estimated Percent Speed	65213, FD1	SCAN, KCAN, BCAN
976	PTO Governor State	65265, CCVS1	SCAN, KCAN
976	PTO Governor State	65265, CCVS1	SCAN, KCAN, BCAN
976	PTO Governor State	65265, CCVS1	SCAN, KCAN, BCAN
977	Fan Drive State	65213, FD1	SCAN, KCAN, BCAN
979	Engine Remote PTO Governor Preprogrammed Speed Control Switch	65264, PTO	SCAN, KCAN, BCAN
979	Engine Remote PTO Governor Preprogrammed Speed Control Switch	65264, PTO	SCAN, KCAN, BCAN
980	Engine PTO Governor Enable Switch	65264, PTO	SCAN, KCAN, BCAN
980	Engine PTO Governor Enable Switch	65264, PTO	SCAN, KCAN, BCAN
982	Engine PTO Governor Resume Switch	65264, PTO	SCAN, KCAN, BCAN
984	Engine PTO Governor Set Switch	65264, PTO	SCAN, KCAN, BCAN
985	A/C High Pressure Fan Switch	65252, SHUTDN	SCAN, KCAN, BCAN
1040	Total Fuel Used (Gaseous)	65199, GFC	SCAN, KCAN, BCAN
1087	Service Brake Circuit1 Air Pressure	65198, AIR1	SCAN, KCAN, BCAN
1087	Service Brake Circuit1 Air Pressure	65198, AIR1	SCAN, KCAN, BCAN
1107	Engine Protection System Timer State	65252, SHUTDN	SCAN, KCAN, BCAN
1108	Engine Protection System Timer Override	65252, SHUTDN	SCAN, KCAN, BCAN
1110	Engine Protection System Approaching Shutdown	65252, SHUTDN	SCAN, KCAN, BCAN
1111	Engine Protection System Configuration	65252, SHUTDN	SCAN, KCAN, BCAN
1172	Engine Turbocharger1 Compressor Intake Temperature	65178, TCI2	SCAN, KCAN, BCAN
1184	Engine Turbocharger1 Turbine Outlet Temperature	65175, TCI5	SCAN, KCAN, BCAN
1214	Suspect Parameter Number	65226, DM1	SCAN, KCAN
1214	Suspect Parameter Number	65226, DM1	VCAN2
1214	Suspect Parameter Number	65226, DM1	SCAN, KCAN
1215	Failure Mode Identifier	65226, DM1	SCAN, KCAN
1215	Failure Mode Identifier	65226, DM1	VCAN2
1215	Failure Mode Identifier	65226, DM1	SCAN, KCAN
1216	Occurrence Count	65226, DM1	SCAN, KCAN
1437	Road Speed Limit Status	61443, EEC2	SCAN, KCAN, BCAN
1482	Source Address of Controlling Device for Transmission Control	61442, ETC1	SCAN, KCAN, BCAN
1483	Source Address of Controlling Device for Engine Control	61444, EEC1	SCAN, KCAN, BCAN
1487	Illumination Brightness Percent	53248, CL	SCAN, KCAN

1639	Fan Speed	65213, FD1	SCAN, KCAN, BCAN
1675	Engine Starter Mode	61444, EEC1	SCAN, KCAN, BCAN
1706	SPN Conversion Method	65226, DM1	SCAN, KCAN
1807	Steering Wheel Angle	61449, VDC2	SCAN, KCAN, BCAN
1854	TransMode3	256, TC1	SCAN, KCAN, BCAN
1856	Seat Belt Switch	57344, CM1	SCAN, KCAN
2367	Left Turn Signal Lights Command	65089, LCMD	SCAN, KCAN
2369	Right Turn Signal Lights Command	65089, LCMD	SCAN, KCAN
2391	Back Up Light and Alarm Horn Command	65089, LCMD	SCAN, KCAN
2432	Engine Demand–Percent Torque	61444, EEC1	SCAN, KCAN, BCAN
2538	TransMode3Indicator	65098, ETC7	SCAN, KCAN, BCAN
2540	Parameter Group Number (RQST)	59904, RQST	SCAN, KCAN
2609	Cab A/C Refrigerant Compressor Outlet Pressure	64993, CACI	SCAN, KCAN, BCAN
2863	Front Operator Wiper Switch	64973, OWW	SCAN, KCAN
2876	Turn Signal Switch	64972, OEL	SCAN, KCAN
2979	Vehicle Acceleration Rate Limit Status	61443, EEC2	SCAN, KCAN
2979	Vehicle Acceleration Rate Limit Status	61443, EEC2	SCAN, KCAN, BCAN
3026	Transmission Oil Level 1 Measurement Status	65272, TRF1	SCAN, KCAN, BCAN
3027	Transmission Oil Level1 High/Low	65272, TRF1	SCAN, KCAN, BCAN
3028	Transmission Oil Level 1 Countdown Timer	65272, TRF1	SCAN, KCAN, BCAN
3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	65110, AT1T1I	SCAN, KCAN, BCAN
3349	TSC1 Transmission Rate	0,TSC1	SCAN, KCAN, BCAN
3350	TSC1 Control Purpose	0,TSC1	SCAN, KCAN, BCAN
3357	Actual Maximum Available Engine – Percent Torque	61443, EEC2	SCAN, KCAN, BCAN
3363	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater	65110, AT1T1I	SCAN, KCAN, BCAN
3447	Remote PTO Governor Preprogrammed Speed Control Switch 2	65264, PTO	SCAN, KCAN, BCAN
3462	Engagement Status	64932, PTODE	SCAN, BCAN
3543	Engine Operating State	64914, EOI	SCAN, KCAN, BCAN
3606	Engine Controlled Shutdown Request	64914, EOI	SCAN, KCAN, BCAN
3607	Engine Emergency (Immediate) Shutdown Indication	64914, EOI	SCAN, KCAN, BCAN
3673	Engine Throttle Valve2 Position	65266, LFE1	SCAN, KCAN, BCAN
3695	Aftertreatment Regen Inhibit Switch	57344, CM1	SCAN, KCAN
3696	Aftertreatment Regen Force Switch	57344, CM1	SCAN, KCAN
3696	Force Regen	57344,CM1	SCAN, KCAN, BCAN
3696	Force Regen	57344,CM1	SCAN, KCAN, BCAN
3703	Diesel Particulate Filter Active Regen Inhibited Due to Inhibit Switch	64892, DPFC1	SCAN, KCAN, BCAN
3704	Diesel Particulate Filter Active Regen Inhibited Due to Clutch Disengaged	64892, DPFC1	SCAN, KCAN, BCAN
3705	Diesel Particulate Filter Active Regen Inhibited Due to Service Brake Active	64892, DPFC1	SCAN, KCAN, BCAN
3706	Diesel Particulate Filter Active Regen Inhibited Due to PTO Active	64892, DPFC1	SCAN, KCAN, BCAN
3707	Diesel Particulate Filter Active Regen Inhibited Due to Accelerator Pedal Off Idle	64892, DPFC1	SCAN, KCAN, BCAN
3708	Diesel Particulate Filter Active Regen Inhibited Due to Out of Neutral	64892, DPFC1	SCAN, KCAN, BCAN
3709	Diesel Particulate Filter Active Regen Inhibited Due to Vehicle Speed Above Allowed Speed	64892, DPFC1	SCAN, KCAN, BCAN

3711	Diesel Particulate Filter Active Regen Inhibited Due to Low Exhaust Temperature	64892, DPFC1	SCAN, KCAN, BCAN
3712	Diesel Particulate Filter Active Regen Inhibited Due to System Fault	64892, DPFC1	SCAN, KCAN, BCAN
3716	Diesel Particulate Filter Active Regen Inhibited Due to Engine Not Warmed Up	64892, DPFC1	SCAN, KCAN, BCAN
3717	Diesel Particulate Filter Active Regen Inhibited Due to Vehicle Speed Below Allowed Speed	64892, DPFC1	SCAN, KCAN, BCAN
3721	Aftertreatment 1 Diesel Particulate Filter Time Since Last Active Regen	64891, AT1S1	SCAN, KCAN, BCAN
3948	At least one PTO engaged	64932, PTODE	SCAN, KCAN
4154	Actual Engine - Percent Torque (Fractional)	61444, EEC1	SCAN, KCAN, BCAN
4175	Diesel Particulate Filter Active Regen Forced Status	64892, DPFC1	SCAN, KCAN, BCAN
4191	Engine Requested Torque - High Resolution	0,TSC1	SCAN, KCAN, BCAN
4206	Message Counter	0,TSC1	SCAN, KCAN, BCAN
4207	Message Checksum	0,TSC1	SCAN, KCAN, BCAN
4816	Transmission Torque Converter Lockup Transition in Process	61442, ETC1	SCAN, KCAN, BCAN
5082	Engine Oil Pressure Low Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5082	Engine Oil Pressure Low Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5083	Engine Coolant Temperature High Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5083	Engine Coolant Temperature High Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5084	Engine Coolant Level Low Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5084	Engine Coolant Level Low Lamp Command	64775, DLCC1	SCAN, KCAN, BCAN
5088	Vehicle Fuel Level Low Lamp Command	64774, DLCC2	SCAN, KCAN, BCAN
5088	Vehicle Fuel Level Low Lamp Command	64774, DLCC2	SCAN, KCAN, BCAN
5089	Vehicle Air Pressure Low Lamp Command	64774, DLCC2	SCAN, KCAN, BCAN
5091	Vehicle Battery Charging Lamp Command	64774, DLCC2	SCAN, KCAN, BCAN
5246	Aftertreatment SCR Operator Inducement Severity	65110, AT1T1I	SCAN, KCAN, BCAN
5398	Estimated Pumping – Percent Torque	61443, EEC2	SCAN, KCAN, BCAN
5399	DPF Thermal Management Active	61443, EEC2	SCAN, KCAN, BCAN
5400	SCR Thermal Management Active	61443, EEC2	SCAN, KCAN, BCAN
5466	Aftertreatment 1 Diesel Particulate Filter Soot Load Regen Threshold	64891, AT1S1	SCAN, KCAN, BCAN
5676	Forward Collision Advanced Emergency Braking System State	61487, AEBS1	SCAN, KCAN

EMUX - CAN MESSAGES AVAILABLE ON BODY CONNECTIONS (sorted by ascending PGN value)

Table 46 EMUX CAN Messages Available On Body Connections

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	518	Engine Requested Torque/Torque Limit
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	518	Engine Requested Torque/Torque Limit
Rx	0x0C00FF27	0000	Torque/Speed Control 1	SCAN;KCAN	39	518	Engine Requested Torque/Torque Limit
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	695	Engine Override Control Mode
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	695	Engine Override Control Mode
Tx	0x0C000021	0000	Torque/Speed Control 1	KCAN;SCAN	33	696	Engine Requested Speed Control Conditions
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	897	Override Control Mode Priority
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	897	Override Control Mode Priority
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	898	Engine Requested Speed/Speed Limit
Tx	0x0C000021	0000	Torque/Speed Control 1	KCAN;SCAN	33	898	Engine Requested Speed/Speed Limit
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	3349	TSC1 Transmission Rate
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	3349	TSC1 Transmission Rate
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	3350	TSC1 Control Purpose
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	3350	TSC1 Control Purpose
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	4191	Engine Requested Torque (Fractional)
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	4191	Engine Requested Torque (Fractional)
Tx	0x0C000021	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	33	4206	Message Counter
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	4206	Message Counter
Tx	0x0C000007	0000	Torque/Speed Control 1	BCAN;KCAN;SCAN	7	4207	Message Checksum
Tx	0x0C000021	0000	Torque/Speed Control 1	KCAN;SCAN	33	4207	Message Checksum
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	2914	XBR EBI Mode
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	2915	XBR Priority
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	2916	XBR Control Mode
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	2920	External Acceleration Demand
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	3188	XBR Message Checksum
Rx	0x0C04FF2A	01279	External Brake Request	SCAN;KCAN	42	3189	XBR Message Counter
Tx	0x0C01FF21	511	Transmission Control 1	BCAN;KCAN;SCAN	33	525	Transmission Requested Gear
Tx	0x0C01FF07	511	Transmission Control 1	BCAN;KCAN;SCAN	7	525	Transmission Requested Gear
Tx	0x0C01FF21	511	Transmission Control 1	BCAN;KCAN;SCAN	33	684	Requested Percent Clutch Slip
Tx	0x0C01FF07	511	Transmission Control 1	BCAN;KCAN;SCAN	7	684	Requested Percent Clutch Slip
Tx	0x0C01FF21	511	Transmission Control 1	BCAN;KCAN	33	1854	Transmission Mode 3
Tx	0x0C01FF07	511	Transmission Control 1	BCAN;KCAN	7	1854	Transmission Mode 3
Tx	0x0C01FF21	511	Transmission Control 1	SCAN	33	1854	Transmission Mode 3
Tx	0x0C01FF07	511	Transmission Control 1	SCAN	7	1854	Transmission Mode 3
Tx	0x0C01FF07	511	Transmission Control 1	BCAN;KCAN	7	7695	Transmission Auto-Neutral (Manual Return) Request
Rx	0x18D0FF27	53503	Cab Illumination Message	BCAN;KCAN;SCAN	39	1487	Illumination Brightness Percent
Rx	0x1CD3FF00	54271	Calibration Information	KCAN	0	1634	Calibration Verification Number
Rx	0x1CD3FF00	54271	Calibration Information	KCAN	0	1635	Calibration Identification
Rx	0x18DFFFF9	57343	Stop Start Broadcast	KCAN	249	639	J1939 Network #1, Primary Vehicle Network

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18DFFFF9	57343	Stop Start Broadcast	KCAN	249	1230	Current Data Link
Rx	0x18DFFFF9	57343	Stop Start Broadcast	KCAN	249	1236	Hold Signal
Rx	0x18E0FF27	57599	Cab Message 1	SCAN;KCAN	39	986	Engine Fan 1 Requested Percent Speed
Rx	0x18E0FF19	57599	Cab Message 1	SCAN;KCAN	25	1691	Cab Interior Temperature Command
Rx	0x18E0FF27	57599	Cab Message 1	KCAN;SCAN	39	1856	Seat Belt Switch
Tx	0x18E0FF21	57599	Cab Message 1	BCAN;KCAN;SCAN	33	2596	Selected Maximum Vehicle Speed Limit
Tx	0x18E0FF07	57599	Cab Message 1	BCAN;KCAN;SCAN	7	2596	Selected Maximum Vehicle Speed Limit
Tx	0x18E0FFA0	57599	Cab Message 1	KCAN;SCAN;BCAN	160	2596	Selected Maximum Vehicle Speed Limit
Rx	0x18E0FF27	57599	Cab Message 1	BCAN;KCAN;SCAN	39	3695	Aftertreatment Regeneration Inhibit Switch
Tx	0x18E0FF21	57599	Cab Message 1	BCAN;KCAN;SCAN	33	3695	Aftertreatment Regeneration Inhibit Switch
Tx	0x18E0FF07	57599	Cab Message 1	BCAN;KCAN;SCAN	7	3695	Aftertreatment Regeneration Inhibit Switch
Tx	0x18E0FFA0	57599	Cab Message 1	KCAN;SCAN;BCAN	160	3695	Aftertreatment Regeneration Inhibit Switch
Rx	0x18E0FF27	57599	Cab Message 1	BCAN;KCAN;SCAN	39	3696	Aftertreatment Regeneration Force Switch
Tx	0x18E0FF07	57599	Cab Message 1	BCAN;KCAN;SCAN	7	3696	Aftertreatment Regeneration Force Switch
Tx	0x18E0FFA0	57599	Cab Message 1	KCAN;SCAN;BCAN	160	3696	Aftertreatment Regeneration Force Switch
Tx	0x18E0FF21	57599	Cab Message 1	KCAN;SCAN;BCAN	33	3696	Aftertreatment Regeneration Force Switch
Rx	0x18E0FF00	57599	Cab Message 1	KCAN;SCAN	0	3696	Aftertreatment Regeneration Force Switch
Tx	0x18EAFF21	60159	Request	BCAN;SCAN;KCAN	33	2540	Parameter Group Number (RQST)
Tx	0x18EAFF07	60159	Request	BCAN;SCAN;KCAN	7	2540	Parameter Group Number (RQST)
Tx	0x18EAFFA0	60159	Request	BCAN;SCAN;KCAN	160	2540	Parameter Group Number (RQST)
Tx	0x18EAFF4A	60159	Request	KCAN;SCAN	74	2540	Parameter Group Number (RQST)
Tx	0x18EAFFFB	60159	Request	SCAN;KCAN	251	2540	Parameter Group Number (RQST)
Tx	0x18EAFFEE	60159	Request	SCAN;KCAN	238	2540	Parameter Group Number (RQST)
Tx	0x18EAFFF9	60159	Request	SCAN;KCAN	249	2540	Parameter Group Number (RQST)
Tx	0x18EA00FF	60159	Request	SCAN;KCAN	255	2540	Parameter Group Number (RQST)
Tx	0x18EAFF11	60159	Request	SCAN;KCAN	17	2540	Parameter Group Number (RQST)
Tx	0x18EAFFFA	60159	Request	SCAN;KCAN	250	2540	Parameter Group Number (RQST)
Tx	0x18EEFF21	61183	Address Claimed	BCAN;KCAN	33	2848	NAME of Controller Application (for address claimed)
Tx	0x18EEFF07	61183	Address Claimed	BCAN;KCAN	7	2848	NAME of Controller Application (for address claimed)
Tx	0x18EEFFA0	61183	Address Claimed	BCAN;KCAN;SCAN	160	2848	NAME of Controller Application (for address claimed)
Rx	0x18F0005B	61440	Electronic Retarder Controller 1	KCAN;SCAN	91	520	Actual Retarder - Percent Torque
Rx	0x18F00000	61440	Electronic Retarder Controller 1	SCAN;KCAN	0	520	Actual Retarder - Percent Torque
Rx	0x18F0000F	61440	Electronic Retarder Controller 1	SCAN;KCAN	15	571	Retarder Enable - Brake Assist Switch
Rx	0x18F00000	61440	Electronic Retarder Controller 1	SCAN;KCAN	0	900	Retarder Torque Mode
Rx	0x18F00000	61440	Electronic Retarder Controller 1	SCAN;KCAN	0	1715	Drivers Demand Retarder - Percent Torque
Rx	0x18F0000F	61440	Electronic Retarder Controller 1	SCAN;KCAN	15	1715	Drivers Demand Retarder - Percent Torque
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	521	Brake Pedal Position
Rx	0x18F00127	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	39	561	ASR Engine Control Active
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	561	ASR Engine Control Active
Rx	0x18F00127	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	39	562	ASR Brake Control Active
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	562	ASR Brake Control Active
Rx	0x18F00127	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	39	563	Anti-Lock Braking (ABS) Active

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	563	Anti-Lock Braking (ABS) Active
Tx	0x18F00121	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	33	969	Remote Accelerator Enable Switch
Tx	0x18F00107	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	7	969	Remote Accelerator Enable Switch
Tx	0x18F001A0	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	160	969	Remote Accelerator Enable Switch
Rx	0x18F00100	61441	Electronic Brake Controller 1	SCAN;KCAN	0	969	Remote Accelerator Enable Switch
Tx	0x18F00121	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	33	970	Engine Auxiliary Shutdown Switch
Tx	0x18F00107	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	7	970	Engine Auxiliary Shutdown Switch
Tx	0x18F001A0	61441	Electronic Brake Controller 1	BCAN;KCAN;SCAN	160	970	Engine Auxiliary Shutdown Switch
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	1438	ABS/EBS Amber Warning Signal (Powered Vehicle)
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	1793	ATC/ASR Information Signal
Rx	0x18F0010B	61441	Electronic Brake Controller 1	SCAN;KCAN	11	1836	Trailer ABS Status
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN;KCAN	3	161	Transmission Input Shaft Speed
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN;KCAN	3	191	Transmission Output Shaft Speed
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN	3	560	Transmission Driveline Engaged
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN;KCAN	3	573	Transmission Torque Converter Lockup Engaged
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN;KCAN	3	607	Progressive Shift Disable
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	BCAN;KCAN;SCAN	3	1482	Source Address of Controlling Device for Transmission Control
Rx	0x0CF00203	61442	Electronic Transmission Controller 1	SCAN;KCAN	3	4816	Transmission Torque Converter Lockup Transition in Process
Rx	0x0CF00300	61443	Electronic Engine Controller 2	BCAN;KCAN;SCAN	0	91	Accelerator Pedal Position 1
Rx	0x0CF0035B	61443	Electronic Engine Controller 2	KCAN;SCAN	91	91	Accelerator Pedal Position 1
Rx	0x0CF00300	61443	Electronic Engine Controller 2	BCAN;KCAN;SCAN	0	92	Engine Percent Load At Current Speed
Rx	0x0CF00300	61443	Electronic Engine Controller 2	SCAN;KCAN	0	559	Accelerator Pedal Kickdown Switch
Tx	0x0CF00321	61443	Electronic Engine Controller 2	BCAN;KCAN;SCAN	33	974	Remote Accelerator Pedal Position
Tx	0x0CF00307	61443	Electronic Engine Controller 2	BCAN;KCAN;SCAN	7	974	Remote Accelerator Pedal Position
Tx	0x0CF003A0	61443	Electronic Engine Controller 2	BCAN;KCAN;SCAN	160	974	Remote Accelerator Pedal Position
Rx	0x0CF00300	61443	Electronic Engine Controller 2	SCAN;KCAN	0	974	Remote Accelerator Pedal Position
Rx	0x0CF00300	61443	Electronic Engine Controller 2	SCAN;KCAN	0	2979	Vehicle Acceleration Rate Limit Status
Rx	0x0CF00300	61443	Electronic Engine Controller 2	SCAN;KCAN	0	5399	DPF Thermal Management Active
Rx	0x0CF00300	61443	Electronic Engine Controller 2	SCAN;KCAN	0	5400	SCR Thermal Management Active
Rx	0x0CF00400	61444	Electronic Engine Controller 1	BCAN;KCAN;SCAN	0	190	Engine Speed
Rx	0x0CF0045B	61444	Electronic Engine Controller 1	KCAN;SCAN	91	190	Engine Speed
Rx	0x0CF00400	61444	Electronic Engine Controller 1	SCAN;KCAN	0	512	Drivers Demand Engine - Percent Torque
Rx	0x0CF0045B	61444	Electronic Engine Controller 1	KCAN;SCAN	91	513	Actual Engine - Percent Torque
Rx	0x0CF00400	61444	Electronic Engine Controller 1	SCAN;KCAN	0	513	Actual Engine - Percent Torque
Rx	0x0CF00400	61444	Electronic Engine Controller 1	BCAN;KCAN;SCAN	0	899	Engine Torque Mode
Rx	0x0CF00400	61444	Electronic Engine Controller 1	SCAN;KCAN	0	1483	Source Address of Controlling Device for Engine Control
Rx	0x0CF00400	61444	Electronic Engine Controller 1	SCAN;KCAN	0	1675	Engine Starter Mode
Rx	0x0CF00400	61444	Electronic Engine Controller 1	SCAN;KCAN	0	2432	Engine Demand - Percent Torque
Rx	0x0CF0045B	61444	Electronic Engine Controller 1	KCAN;SCAN	91	4154	Actual Engine - Percent Torque (Fractional)
Rx	0x18F00503	61445	Electronic Transmission Controller 2	SCAN;KCAN	3	162	Transmission Requested Range
Rx	0x18F00503	61445	Electronic Transmission Controller 2	SCAN;KCAN	3	163	Transmission Current Range
Rx	0x18F00503	61445	Electronic Transmission Controller 2	BCAN;KCAN;SCAN	3	523	Transmission Current Gear

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18F00503	61445	Electronic Transmission Controller 2	SCAN;KCAN	3	524	Transmission Selected Gear
Rx	0x18F00503	61445	Electronic Transmission Controller 2	SCAN;KCAN	3	526	Transmission Actual Gear Ratio
Rx	0x10F007E8	61447	Forward Lane Image 1	SCAN;KCAN	232	1700	Lane Departure Imminent, Left Side
Rx	0x10F007E8	61447	Forward Lane Image 1	SCAN;KCAN	232	1701	Lane Departure Imminent, Right Side
Rx	0x10F007E8	61447	Forward Lane Image 1	SCAN;KCAN	232	3565	Lane Departure Left
Rx	0x10F007E8	61447	Forward Lane Image 1	SCAN;KCAN	232	3566	Lane Departure Right
Rx	0x18F0090B	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	11	1807	Steering Wheel Angle
Rx	0x18F0093E	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	62	1807	Steering Wheel Angle
Rx	0x18F0090B	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	11	1808	Yaw Rate
Rx	0x18F0093E	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	62	1808	Yaw Rate
Rx	0x18F0090B	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	11	1809	Lateral Acceleration
Rx	0x18F0093E	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	62	1809	Lateral Acceleration
Rx	0x18F00927	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	39	1810	Longitudinal Acceleration
Rx	0x18F0093E	61449	Vehicle Dynamic Stability Control 2	SCAN;KCAN	62	1811	Steering Wheel Turn Counter
Rx	0x0CF00A00	61450	Engine Gas Flow Rate	SCAN;KCAN	0	132	Engine Intake Air Mass Flow Rate
Rx	0x0CF00A00	61450	Engine Gas Flow Rate	SCAN;KCAN	0	2659	Engine Exhaust Gas Recirculation 1 Mass Flow Rate
Rx	0x18F00E00	61454	Aftertreatment 1 Intake Gas 1	SCAN;KCAN	0	3216	Aftertreatment 1 SCR Intake NOx
Rx	0x18F00E00	61454	Aftertreatment 1 Intake Gas 1	SCAN;KCAN	0	3217	Aftertreatment 1 Intake Percent O2
Rx	0x18F00F00	61455	Aftertreatment 1 Outlet Gas 1	SCAN;KCAN	0	3226	Aftertreatment 1 Outlet NOx
Rx	0x0CF02903	61481	Slope Sensor Information 2	SCAN;KCAN	3	4979	Pitch Angle Figure of Merit (Extended Range)
Rx	0x0CF02FA0	61487	Advanced Emergency Braking System 1	SCAN;KCAN	160	5676	Forward Collision Advanced Emergency Braking System State
Rx	0x0CF02F2A	61487	Advanced Emergency Braking System 1	SCAN;KCAN	42	5676	Forward Collision Advanced Emergency Braking System State
Rx	0x0CF02F00	61487	Advanced Emergency Braking System 1	SCAN;KCAN	0	5676	Forward Collision Advanced Emergency Braking System State
Rx	0x08F11027	61712	Brakes 2	BCAN;KCAN;SCAN	39	8484	Demanded Brake Application Pressure
Rx	0x0CF13D13	61757	Active Steering System Controls 1	KCAN;SCAN	19	9755	Lane Keeping Assist Indication Enable Status
Rx	0x0CF13D13	61757	Active Steering System Controls 1	KCAN;SCAN	19	9756	Lane Keeping Assist System State
Rx	0x0CF13D13	61757	Active Steering System Controls 1	KCAN;SCAN	19	12855	Hands Off Detection Status
Rx	0x18F34350	62275	Electric Park Brake Controller 1	KCAN;SCAN	80	21171	Electronic Park Brake Occupancy Anti-Roll-Away Status
Rx	0x18F34350	62275	Electric Park Brake Controller 1	KCAN;SCAN	80	21172	Electronic Park Brake Trailer Brake Release Status
Rx	0x18F34350	62275	Electric Park Brake Controller 1	KCAN;SCAN	80	21174	Electronic Park Brake Operating Mode
Rx	0x18F34350	62275	Electric Park Brake Controller 1	KCAN;SCAN	80	21180	Electronic Park Brake Exhaust-at-Speed Status
Rx	0x18FA6227	64098	Lighting Data 2	BCAN;KCAN;SCAN	39	20800	Tractor Hazard Lights
Tx	0x0CFA6321	64099	Lighting Command 2	BCAN;KCAN;SCAN	33	20798	Lighting Data 2 Request Command
Tx	0x0CFA6307	64099	Lighting Command 2	BCAN;KCAN;SCAN	7	20798	Lighting Data 2 Request Command
Rx	0x0CFA6327	64099	Lighting Command 2	BCAN;KCAN;SCAN	39	20798	Lighting Data 2 Request Command
Tx	0x0CFA63A0	64099	Lighting Command 2	BCAN;KCAN;SCAN	160	20798	Lighting Data 2 Request Command
Tx	0x0CFA6321	64099	Lighting Command 2	BCAN;KCAN;SCAN	33	20799	Tractor Hazard Lights Command
Tx	0x0CFA6307	64099	Lighting Command 2	BCAN;KCAN;SCAN	7	20799	Tractor Hazard Lights Command
Rx	0x0CFA6327	64099	Lighting Command 2	BCAN;KCAN;SCAN	39	20799	Tractor Hazard Lights Command
Tx	0x0CFA63A0	64099	Lighting Command 2	BCAN;KCAN;SCAN	160	20799	Tractor Hazard Lights Command
Rx	0x18FABB17	64187	Direct Lamp Control Command 3	BCAN;KCAN;SCAN	23	13116	Transmission Oil Temperature High Lamp Command
Rx	0x18FAC330	64195	Air Supply Pressure 3	KCAN;SCAN	48	13073	Air Dryer Cartridge Life Remaining

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FAC317	64195	Air Supply Pressure 3	BCAN;KCAN;SCAN	23	13132	Air Suspension Supply Pressure 2
Rx	0x18FB6B5B	64363	High Voltage Bus Information	SCAN	91	20804	High Voltage Bus ePTO Availability
Tx	0x14FC3612	64566	Gaseous Fuel Supply Valve Information	SCAN	18	7081	Gaseous Fuel Supply Shutoff Valve 1 Position
Rx	0x18FCC25B	64706	Hybrid System Status 1	SCAN	91	7895	Stored Energy Source Level
Rx	0x18FCD000	64720	Engine Particulate Sensor Information	SCAN;KCAN	0	5835	Aftertreatment 1 Particulate Sensor
Rx	0x10FCFD00	64765	Electronic Engine Controller 9	SCAN;KCAN	0	5313	Commanded Engine Fuel Rail Pressure
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	5087	Vehicle Battery Voltage Low Lamp Command
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	5088	Vehicle Fuel Level Low Lamp Command
Rx	0x18FD0600	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	0	5088	Vehicle Fuel Level Low Lamp Command
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	5089	Vehicle Air Pressure Low Lamp Command
Rx	0x18FD06A7	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	167	5089	Vehicle Air Pressure Low Lamp Command
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	5091	Vehicle Battery Charging Lamp Command
Rx	0x18FD06A7	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	167	5091	Vehicle Battery Charging Lamp Command
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	13108	Primary Air Pressure Low Lamp Command
Rx	0x18FD0617	64774	Direct Lamp Control Command 2	BCAN;KCAN;SCAN	23	13109	Secondary Air Pressure Low Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	0	5078	Engine Amber Warning Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	0	5079	Engine Red Stop Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	SCAN;KCAN	0	5080	OBD Malfunction Indicator Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	0	5082	Engine Oil Pressure Low Lamp Command
Rx	0x18FD0717	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	23	5082	Engine Oil Pressure Low Lamp Command
Rx	0x18FD07A7	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	167	5082	Engine Oil Pressure Low Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	0	5083	Engine Coolant Temperature High Lamp Command
Rx	0x18FD0717	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	23	5083	Engine Coolant Temperature High Lamp Command
Rx	0x18FD07A7	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	167	5083	Engine Coolant Temperature High Lamp Command
Rx	0x18FD0700	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	0	5084	Engine Coolant Level Low Lamp Command
Rx	0x18FD0717	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	23	5084	Engine Coolant Level Low Lamp Command
Rx	0x18FD07A7	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	167	5084	Engine Coolant Level Low Lamp Command
Rx	0x18FD0717	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	23	5086	Engine Air Filter Restriction Lamp Command
Rx	0x18FD0717	64775	Direct Lamp Control Command 1	BCAN;KCAN;SCAN	23	13105	Engine Oil Temperature High Lamp Command
Rx	0x18FD0900	64777	High Resolution Fuel Consumption (Liquid)	SCAN;KCAN	0	5054	Engine Total Fuel Used (High Resolution)
Rx	0x14FD1727	64791	Beltlock and Airbag Deactivation Switch Information	KCAN;SCAN	39	4952	Driver Beltlock Status
Rx	0x14FD1727	64791	Beltlock and Airbag Deactivation Switch Information	KCAN;SCAN	39	4953	Passenger Beltlock Status
Rx	0x18FD2000	64800	Aftertreatment 1 Diesel Oxidation Catalyst	BCAN;KCAN;SCAN	0	4765	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature
Rx	0x18FD2000	64800	Aftertreatment 1 Diesel Oxidation Catalyst	SCAN;KCAN	0	4766	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Temperature
Rx	0x14FD3E00	64830	Aftertreatment 1 SCR Exhaust Gas Temperature 1	SCAN;KCAN	0	4360	Aftertreatment 1 SCR Intake Temperature
Rx	0x14FD3E00	64830	Aftertreatment 1 SCR Exhaust Gas Temperature 1	SCAN;KCAN	0	4363	Aftertreatment 1 SCR Outlet Temperature
Rx	0x18FD6E00	64878	Aftertreatment 1 SCR Service Information 1	SCAN;KCAN	0	4364	Aftertreatment 1 SCR Conversion Efficiency
Rx	0x18FD6E00	64878	Aftertreatment 1 SCR Service Information 1	SCAN;KCAN	0	5463	Aftertreatment SCR Operator Inducement Active Traveled Distance
Rx	0x18FD7B00	64891	Aftertreatment 1 Service 1	BCAN;KCAN;SCAN	0	3719	Aftertreatment 1 Diesel Particulate Filter Soot Load Percent
Rx	0x18FD7B00	64891	Aftertreatment 1 Service 1	SCAN;KCAN	0	5466	Aftertreatment 1 Diesel Particulate Filter Soot Load Regeneration Threshold
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN;SCAN	0	3697	Diesel Particulate Filter Lamp Command
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN	0	3698	Exhaust System High Temperature Lamp Command

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN	0	3698	Exhaust System High Temperature Lamp Command
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN	0	3698	Exhaust System High Temperature Lamp Command
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	KCAN;SCAN	0	3698	Exhaust System High Temperature Lamp Command
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN;SCAN	0	3700	Aftertreatment Diesel Particulate Filter Active Regeneration Status
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN;SCAN	0	3701	Aftertreatment Diesel Particulate Filter Status
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	BCAN;KCAN;SCAN	0	3702	Diesel Particulate Filter Active Regeneration Inhibited Status
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3703	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3704	Diesel Particulate Filter Active Regeneration Inhibited Due to Clutch Disengaged
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3705	Diesel Particulate Filter Active Regeneration Inhibited Due to Service Brake Active
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3706	Diesel Particulate Filter Active Regeneration Inhibited Due to PTO Active
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3707	Diesel Particulate Filter Active Regeneration Inhibited Due to Accelerator Pedal Off Idle
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3708	Diesel Particulate Filter Active Regeneration Inhibited Due to Out of Neutral
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3709	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Above Allowed Speed
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3710	Diesel Particulate Filter Active Regeneration Inhibited Due to Parking Brake Not Set
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3711	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Temperature
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3712	Diesel Particulate Filter Active Regeneration Inhibited Due to System Fault Active
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3713	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3714	Diesel Particulate Filter Active Regeneration Inhibited Due to Temporary System Lockout
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3716	Diesel Particulate Filter Active Regeneration Inhibited Due to Engine Not Warmed Up
Rx	0x18FD7C00	64892	Diesel Particulate Filter Control 1	SCAN;KCAN	0	3717	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Below Allowed Speed
Rx	0x18FD8C00	64908	Aftertreatment 1 Gas Parameters	BCAN;KCAN;SCAN	0	3609	Aftertreatment 1 Diesel Particulate Filter Intake Pressure
Rx	0x18FD8C00	64908	Aftertreatment 1 Gas Parameters	BCAN;KCAN;SCAN	0	3610	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure
Rx	0x0CFD9200	64914	Engine Operating Information	SCAN;KCAN	0	3543	Engine Operating State
Rx	0x0CFD9200	64914	Engine Operating Information	SCAN;KCAN	0	3544	Time Remaining in Engine Operating State
Rx	0x0CFD9200	64914	Engine Operating Information	SCAN;KCAN	0	3606	Engine Controlled Shutdown Request
Rx	0x0CFD9200	64914	Engine Operating Information	SCAN;KCAN	0	3607	Engine Emergency (Immediate) Shutdown Indication
Rx	0x0CFD9200	64914	Engine Operating Information	SCAN;KCAN	0	6807	Engine Desired Torque Request
Rx	0x18FD9400	64916	Electronic Engine Controller 7	SCAN;KCAN	0	27	Engine Exhaust Gas Recirculation 1 Valve Position
Rx	0x18FD9800	64920	Aftertreatment 1 Historical Information 1	SCAN;KCAN	0	3522	Aftertreatment 1 Total Fuel Used
Rx	0x18FD9B00	64923	Aftertreatment 1 Diesel Exhaust Fluid Information 1	SCAN;KCAN	0	3516	Aftertreatment 1 Diesel Exhaust Fluid Concentration
Rx	0x18FD9B00	64923	Aftertreatment 1 Diesel Exhaust Fluid Information 1	SCAN;KCAN	0	3518	Aftertreatment 1 Diesel Exhaust Fluid Conductivity
Rx	0x18FD9B00	64923	Aftertreatment 1 Diesel Exhaust Fluid Information 1	SCAN;KCAN	0	3519	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Preliminary FMI
Rx	0x18FD9B00	64923	Aftertreatment 1 Diesel Exhaust Fluid Information 1	SCAN;KCAN	0	3520	Aftertreatment 1 Diesel Exhaust Fluid Properties Preliminary FMI
Rx	0x18FD9B00	64923	Aftertreatment 1 Diesel Exhaust Fluid Information 1	SCAN;KCAN	0	3521	Aftertreatment 1 Diesel Exhaust Fluid Property
Rx	0x18FD9F00	64927	Aftertreatment 1 Air Control 1	SCAN;KCAN	0	3490	Aftertreatment 1 Purge Air Actuator
Rx	0x10FDA300	64931	Electronic Engine Controller 6	SCAN;KCAN	0	641	Engine Variable Geometry Turbocharger Actuator #1
Tx	0x18FDA421	64932	PTO Drive Engagement	BCAN;KCAN;SCAN	33	3462	Engagement Status - Transmission output shaft PTO
Tx	0x18FDA407	64932	PTO Drive Engagement	BCAN;KCAN;SCAN	7	3462	Engagement Status - Transmission output shaft PTO
Rx	0x18FDA427	64932	PTO Drive Engagement	SCAN;KCAN	39	3948	At least one PTO engaged
Rx	0x18FDB200	64946	Aftertreatment 1 Intermediate Gas	SCAN;KCAN	0	3251	Aftertreatment 1 Diesel Particulate Filter Differential Pressure
Rx	0x18FDB300	64947	Aftertreatment 1 Outlet Gas 2	BCAN;KCAN;SCAN	0	3246	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature
Rx	0x18FDB400	64948	Aftertreatment 1 Intake Gas 2	SCAN;KCAN	0	3241	Aftertreatment 1 Exhaust Temperature 1

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FDB400	64948	Aftertreatment 1 Intake Gas 2	SCAN;KCAN	0	3242	Aftertreatment 1 Diesel Particulate Filter Intake Temperature
Rx	0x18FDB800	64952	Diagnostic Readiness 3	SCAN;KCAN	0	3301	Time Since Engine Start
Rx	0x18FDB800	64952	Diagnostic Readiness 3	SCAN;KCAN	0	3302	Number of Warm-Ups Since Diagnostic Trouble Codes Cleared
Rx	0x18FDB800	64952	Diagnostic Readiness 3	SCAN;KCAN	0	3303	Continuously Monitored Systems Enabled/Completed Status
Rx	0x18FDB800	64952	Diagnostic Readiness 3	SCAN;KCAN	0	3304	Non-Continuously Monitored Systems Enabled Status
Rx	0x18FDB800	64952	Diagnostic Readiness 3	SCAN;KCAN	0	3305	Non-Continuously Monitored Systems Complete Status
Rx	0x0CFDCC27	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	39	2873	Work Light Switch
Tx	0x0CFDCC21	64972	Operators External Light Controls Message	BCAN;KCAN	33	2873	Work Light Switch
Tx	0x0CFDCC07	64972	Operators External Light Controls Message	BCAN;KCAN	7	2873	Work Light Switch
Tx	0x0CFDCCA0	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	160	2873	Work Light Switch
Tx	0x0CFDCCA0	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	160	2875	Hazard Light Switch
Rx	0x0CFDCC27	64972	Operators External Light Controls Message	KCAN;SCAN	39	2876	Turn Signal Switch
Tx	0x0CFDCC21	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	33	12308	Headlamp Emergency Flash Switch
Tx	0x0CFDCC07	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	7	12308	Headlamp Emergency Flash Switch
Tx	0x0CFDCCA0	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	160	12308	Headlamp Emergency Flash Switch
Tx	0x0CFDCC21	64972	Operators External Light Controls Message	BCAN;KCAN	33	12964	Auxiliary Lamp Group Switch
Tx	0x0CFDCC07	64972	Operators External Light Controls Message	BCAN;KCAN	7	12964	Auxiliary Lamp Group Switch
Rx	0x0CFDCC27	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	39	12964	Auxiliary Lamp Group Switch
Tx	0x0CFDCCA0	64972	Operators External Light Controls Message	BCAN;KCAN;SCAN	160	12964	Auxiliary Lamp Group Switch
Rx	0x18FDCD27	64973	Operator Wiper and Washer Controls Message	BCAN;KCAN;SCAN	39	2863	Front Operator Wiper Switch
Rx	0x18FDCD27	64973	Operator Wiper and Washer Controls Message	BCAN;KCAN;SCAN	39	2866	Front Operator Washer Switch
Rx	0x18FDD000	64976	Intake/Exhaust Conditions 2	SCAN;KCAN	0	3563	Engine Intake Manifold #1 Absolute Pressure
Rx	0x18FDD300	64979	Turbocharger Information 6	SCAN;KCAN	0	2629	Engine Turbocharger 1 Compressor Outlet Temperature
Tx	0x18FDD421	64980	Cab Message 3	BCAN;KCAN;SCAN	33	2641	Horn Switch
Tx	0x18FDD407	64980	Cab Message 3	BCAN;KCAN;SCAN	7	2641	Horn Switch
Tx	0x18FDD4A0	64980	Cab Message 3	BCAN;KCAN;SCAN	160	2641	Horn Switch
Rx	0x18FDD500	64981	Electronic Engine Controller 5	SCAN;KCAN	0	2791	Engine Exhaust Gas Recirculation 1 Valve 1 Control 1
Rx	0x18FDD500	64981	Electronic Engine Controller 5	SCAN;KCAN	0	2795	Engine Variable Geometry Turbocharger (VGT) 1 Actuator Position
Rx	0x18FDD500	64981	Electronic Engine Controller 5	SCAN;KCAN	0	5323	Engine Fuel Control Mode
Rx	0x18FDD500	64981	Electronic Engine Controller 5	SCAN;KCAN	0	5457	Engine Variable Geometry Turbocharger 1 Control Mode
Rx	0x18FE4027	65088	Lighting Data	BCAN;KCAN;SCAN	39	2360	Tractor Rear Low Mounted Work Lights
Rx	0x18FE4027	65088	Lighting Data	BCAN;KCAN;SCAN	39	2362	Tractor Rear High Mounted Work Lights
Rx	0x18FE4027	65088	Lighting Data	BCAN;KCAN;SCAN	39	2378	Tractor Marker Light
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2347	High Beam Head Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2347	High Beam Head Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2347	High Beam Head Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2347	High Beam Head Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2349	Low Beam Head Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2349	Low Beam Head Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2349	Low Beam Head Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2349	Low Beam Head Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2359	Tractor Rear Low Mounted Work Lights Command

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2359	Tractor Rear Low Mounted Work Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2359	Tractor Rear Low Mounted Work Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2359	Tractor Rear Low Mounted Work Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN	39	2361	Tractor Rear High Mounted Work Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN	7	2361	Tractor Rear High Mounted Work Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2363	Tractor Side Low Mounted Work Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2363	Tractor Side Low Mounted Work Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2363	Tractor Side Low Mounted Work Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2363	Tractor Side Low Mounted Work Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2365	Tractor Side High Mounted Work Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2365	Tractor Side High Mounted Work Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2365	Tractor Side High Mounted Work Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2365	Tractor Side High Mounted Work Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2367	Left Turn Signal Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2367	Left Turn Signal Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2367	Left Turn Signal Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2367	Left Turn Signal Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2369	Right Turn Signal Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2369	Right Turn Signal Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2369	Right Turn Signal Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2369	Right Turn Signal Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2371	Left Stop Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2371	Left Stop Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2371	Left Stop Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2371	Left Stop Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2373	Right Stop Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2373	Right Stop Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2373	Right Stop Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2373	Right Stop Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2377	Tractor Marker Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2377	Tractor Marker Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2377	Tractor Marker Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2377	Tractor Marker Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2385	Rotating Beacon Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2385	Rotating Beacon Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2385	Rotating Beacon Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2385	Rotating Beacon Light Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2387	Tractor Front Fog Lights Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2387	Tractor Front Fog Lights Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2387	Tractor Front Fog Lights Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2387	Tractor Front Fog Lights Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2391	Back Up Light and Alarm Horn Command

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2391	Back Up Light and Alarm Horn Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2391	Back Up Light and Alarm Horn Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2391	Back Up Light and Alarm Horn Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2393	Lighting Data Request Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2393	Lighting Data Request Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2393	Lighting Data Request Command
Tx	0x0CFE4121	65089	Lighting Command	BCAN;KCAN;SCAN	33	2403	Running Light Command
Tx	0x0CFE4107	65089	Lighting Command	BCAN;KCAN;SCAN	7	2403	Running Light Command
Rx	0x0CFE4127	65089	Lighting Command	BCAN;KCAN;SCAN	39	2403	Running Light Command
Tx	0x0CFE41A0	65089	Lighting Command	BCAN;KCAN;SCAN	160	2403	Running Light Command
Rx	0x18FE4A03	65098	Electronic Transmission Controller 7	BCAN;KCAN;SCAN	3	2538	Transmission Mode 3 Indicator
Rx	0x18FE4B03	65099	Transmission Configuration 2	SCAN;KCAN	3	1845	Transmission Torque Limit
Rx	0x18FE4F3E	65103	Vehicle Dynamic Stability Control 1	SCAN;KCAN	62	1814	VDC Fully Operational
Rx	0x18FE5600	65110	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information 1	BCAN;KCAN;SCAN	0	1761	Aftertreatment 1 Diesel Exhaust Fluid Tank Volume
Rx	0x18FE5600	65110	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information 1	SCAN;KCAN	0	3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature 1
Rx	0x18FE5600	65110	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information 1	SCAN;KCAN	0	3363	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater
Rx	0x18FE5600	65110	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information 1	BCAN;KCAN;SCAN	0	5245	Aftertreatment Diesel Exhaust Fluid Tank Low Level Indicator
Rx	0x18FE5600	65110	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information 1	SCAN;KCAN	0	5246	Aftertreatment SCR Operator Inducement Severity
Rx	0x18FE5BE8	65115	Forward Lane Image 2	SCAN;KCAN	232	1702	Lane Departure Indication Enable Status
Rx	0x18FE5BE8	65115	Forward Lane Image 2	SCAN;KCAN	232	1710	Lane Tracking Status Left Side
Rx	0x18FE5BE8	65115	Forward Lane Image 2	SCAN;KCAN	232	1711	Lane Tracking Status Right Side
Rx	0x18FE6900	65129	Engine Temperature 3	SCAN;KCAN	0	1637	Engine Coolant Temperature (High Resolution)
Rx	0x18FE6900	65129	Engine Temperature 3	SCAN;KCAN	0	2630	Engine Charge Air Cooler 1 Outlet Temperature
Rx	0x10FE6F2A	65135	Adaptive Cruise Control 1	SCAN;KCAN	42	1586	Speed of forward vehicle
Rx	0x10FE6F2A	65135	Adaptive Cruise Control 1	SCAN;KCAN	42	1587	Distance to forward vehicle
Rx	0x10FE6F2A	65135	Adaptive Cruise Control 1	SCAN;KCAN	42	1590	Adaptive Cruise Control Mode
Rx	0x10FE6F2A	65135	Adaptive Cruise Control 1	SCAN;KCAN	42	1796	ACC Distance Alert Signal
Rx	0x10FE6F2A	65135	Adaptive Cruise Control 1	SCAN;KCAN	42	5022	Forward Collision Warning
Rx	0x18FE700B	65136	Combination Vehicle Weight	SCAN;KCAN	11	1760	Gross Combination Vehicle Weight
Rx	0x1CFE8C00	65164	Auxiliary Analog Information	SCAN;KCAN	0	354	Relative Humidity
Rx	0x1CFE9200	65170	Engine Information 1	SCAN;KCAN	0	1209	Engine Exhaust Pressure 1
Rx	0x18FE9700	65175	Turbocharger Information 5	SCAN;KCAN	0	1184	Engine Turbocharger 1 Turbine Outlet Temperature
Rx	0x18FE9800	65176	Turbocharger Information 4	SCAN;KCAN	0	1180	Engine Turbocharger 1 Turbine Intake Temperature
Rx	0x18FE9900	65177	Turbocharger Information 3	SCAN;KCAN	0	1176	Engine Turbocharger 1 Compressor Intake Pressure
Rx	0x18FE9A00	65178	Turbocharger Information 2	SCAN;KCAN	0	1172	Engine Turbocharger 1 Compressor Intake Temperature
Rx	0x18FEA400	65188	Engine Temperature 2	SCAN;KCAN	0	412	Engine Exhaust Gas Recirculation 1 Temperature
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1099	Brake Lining Remaining, Front Axle, Left Wheel
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1100	Brake Lining Remaining, Front Axle, Right Wheel
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1101	Brake Lining Remaining, Rear Axle #1, Left Wheel
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1102	Brake Lining Remaining, Rear Axle #1, Right Wheel
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1103	Brake Lining Remaining, Rear Axle #2, Left Wheel
Rx	0x1CFEAC9A	65196	Wheel Brake Lining Remaining Information	SCAN;KCAN	154	1104	Brake Lining Remaining, Rear Axle #2, Right Wheel

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Tx	0x18FEAE21	65198	Air Supply Pressure	BCAN;KCAN	33	1087	Service Brake Circuit 1 Air Pressure
Rx	0x18FEAE27	65198	Air Supply Pressure	BCAN;KCAN;SCAN	39	1087	Service Brake Circuit 1 Air Pressure
Tx	0x18FEAE21	65198	Air Supply Pressure	BCAN;KCAN	33	1088	Service Brake Circuit 2 Air Pressure
Rx	0x18FEAE27	65198	Air Supply Pressure	BCAN;KCAN;SCAN	39	1088	Service Brake Circuit 2 Air Pressure
Rx	0x18FEAE17	65198	Air Supply Pressure	BCAN;KCAN;SCAN	23	1090	Air Suspension Supply Pressure
Rx	0x18FEAE30	65198	Air Supply Pressure	KCAN;SCAN	48	1351	Air Compressor Status
Rx	0x1CFEAF00	65199	Fuel Consumption (Gaseous)	SCAN;KCAN	0	1039	Trip Fuel (Gaseous)
Rx	0x1CFEAF00	65199	Fuel Consumption (Gaseous)	SCAN;KCAN	0	1040	Total Fuel Used (Gaseous)
Rx	0x1CFEB100	65201	ECU History	SCAN;KCAN	0	1033	Total ECU Run Time
Rx	0x1CFEB300	65203	Fuel Information 1 (Liquid)	BCAN;KCAN;SCAN	0	1028	Total Engine PTO Governor Fuel Used
Rx	0x1CFEB300	65203	Fuel Information 1 (Liquid)	SCAN;KCAN	0	1029	Trip Average Fuel Rate
Rx	0x18FEBD00	65213	Fan Drive #1	SCAN;KCAN	0	975	Engine Fan 1 Estimated Percent Speed
Rx	0x18FEBD00	65213	Fan Drive #1	SCAN;KCAN	0	977	Fan Drive State
Rx	0x18FEBD00	65213	Fan Drive #1	SCAN;KCAN	0	1639	Fan Speed
Rx	0x18FEBF0B	65215	Wheel Speed Information	SCAN;KCAN	11	904	Front Axle Speed
Rx	0x18FEC000	65216	Service Information	SCAN;KCAN	0	911	Service Component Identification
Rx	0x18FEC000	65216	Service Information	SCAN;KCAN	0	912	Service Component Identification
Rx	0x18FEC000	65216	Service Information	SCAN;KCAN	0	914	Service Distance
Rx	0x18FEC127	65217	High Resolution Vehicle Distance	SCAN;KCAN	39	917	Total Vehicle Distance (High Resolution)
Rx	0x18FEC100	65217	High Resolution Vehicle Distance	SCAN;KCAN	0	918	Trip Distance (High Resolution)
Rx	0x1CFEC203	65218	Electronic Retarder Controller 2	KCAN;SCAN	3	4055	Transmission Retarder Enable Switch
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	623	Red Stop Lamp
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	623	Red Stop Lamp
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	623	Red Stop Lamp
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	623	Red Stop Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	623	Red Stop Lamp
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	623	Red Stop Lamp
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	624	Amber Warning Lamp
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	624	Amber Warning Lamp
Rx	0x18FECAE8	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	232	624	Amber Warning Lamp
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	624	Amber Warning Lamp
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	624	Amber Warning Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	624	Amber Warning Lamp
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	624	Amber Warning Lamp
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	987	Protect Lamp
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	987	Protect Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	987	Protect Lamp
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	987	Protect Lamp
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	1213	Malfunction Indicator Lamp
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	1213	Malfunction Indicator Lamp
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	1213	Malfunction Indicator Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	1213	Malfunction Indicator Lamp

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	1213	Malfunction Indicator Lamp
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	1214	Suspect Parameter Number
Rx	0x18FECAE8	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	232	1214	Suspect Parameter Number
Rx	0x18FECA27	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	39	1214	Suspect Parameter Number
Rx	0x18FECA17	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	23	1214	Suspect Parameter Number
Rx	0x18FECAA0	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	160	1214	Suspect Parameter Number
Rx	0x18FECA2A	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	42	1214	Suspect Parameter Number
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	1215	Failure Mode Identifier
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	1215	Failure Mode Identifier
Rx	0x18FECAE8	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	232	1215	Failure Mode Identifier
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	1215	Failure Mode Identifier
Rx	0x18FECA27	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	39	1215	Failure Mode Identifier
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	1215	Failure Mode Identifier
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	1215	Failure Mode Identifier
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	1215	Failure Mode Identifier
Rx	0x18FECA17	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	23	1215	Failure Mode Identifier
Rx	0x18FECAA0	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	160	1215	Failure Mode Identifier
Rx	0x18FECA2A	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	42	1215	Failure Mode Identifier
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	1216	Occurrence Count
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	1216	Occurrence Count
Rx	0x18FECAE8	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	232	1216	Occurrence Count
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	1216	Occurrence Count
Rx	0x18FECA27	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	39	1216	Occurrence Count
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	1216	Occurrence Count
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	1216	Occurrence Count
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	1216	Occurrence Count
Rx	0x18FECA17	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	23	1216	Occurrence Count
Rx	0x18FECA33	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	51	1706	SPN Conversion Method
Rx	0x18FECA0B	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	11	1706	SPN Conversion Method
Rx	0x18FECAE8	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	232	1706	SPN Conversion Method
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	1706	SPN Conversion Method
Rx	0x18FECA27	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	39	1706	SPN Conversion Method
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	1706	SPN Conversion Method
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	1706	SPN Conversion Method
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	3038	Flash Malfunction Indicator Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	3038	Flash Malfunction Indicator Lamp
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	3039	Flash Red Stop Lamp (RSL)
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	3039	Flash Red Stop Lamp (RSL)
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	3039	Flash Red Stop Lamp (RSL)
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	3039	Flash Red Stop Lamp (RSL)
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	3039	Flash Red Stop Lamp (RSL)
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	3040	Flash Amber Warning Lamp (AWL)

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FECA03	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	3	3040	Flash Amber Warning Lamp (AWL)
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	3040	Flash Amber Warning Lamp (AWL)
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	3040	Flash Amber Warning Lamp (AWL)
Rx	0x18FECA00	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	0	3041	Flash Protect Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	3041	Flash Protect Lamp
Rx	0x18FECA47	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	71	3041	Flash Protect Lamp
Rx	0x18FECA50	65226	Active Diagnostic Trouble Codes	SCAN;KCAN	80	3041	Flash Protect Lamp
Rx	0x18FEDA27	65242	Software Identification	SCAN;KCAN	39	234	Software Identification
Rx	0x18FEDA03	65242	Software Identification	SCAN;KCAN	3	234	Software Identification
Rx	0x18FEDA00	65242	Software Identification	SCAN;KCAN	0	234	Software Identification
Rx	0x18FEDA27	65242	Software Identification	SCAN;KCAN	39	965	Number of Software Identification Fields
Rx	0x18FEDA03	65242	Software Identification	SCAN;KCAN	3	965	Number of Software Identification Fields
Rx	0x18FEDA00	65242	Software Identification	SCAN;KCAN	0	965	Number of Software Identification Fields
Rx	0x18FEDB00	65243	Engine Fluid Level/Pressure 2	SCAN;KCAN	0	157	Engine Injector Metering Rail 1 Pressure
Rx	0x18FEDC00	65244	Idle Operation	SCAN;KCAN	0	235	Engine Total Idle Hours
Rx	0x18FEDC00	65244	Idle Operation	SCAN;KCAN	0	236	Engine Total Idle Fuel Used
Rx	0x18FEDD00	65245	Turbocharger	SCAN;KCAN	0	103	Engine Turbocharger 1 Speed
Rx	0x18FEDF00	65247	Electronic Engine Controller 3	SCAN;KCAN	0	514	Nominal Friction - Percent Torque
Rx	0x18FEDF00	65247	Electronic Engine Controller 3	SCAN;KCAN	0	2978	Estimated Engine Parasitic Losses - Percent Torque
Rx	0x18FEDF00	65247	Electronic Engine Controller 3	SCAN;KCAN	0	3236	Aftertreatment 1 Exhaust Gas Mass Flow Rate
Rx	0x18FEDF00	65247	Electronic Engine Controller 3	SCAN;KCAN	0	3237	Aftertreatment 1 Intake Dew Point
Rx	0x18FEDF00	65247	Electronic Engine Controller 3	SCAN;KCAN	0	3238	Aftertreatment 1 Exhaust Dew Point
Rx	0x18FEE000	65248	Vehicle Distance	SCAN;KCAN	0	244	Trip Distance
Rx	0x18FEE000	65248	Vehicle Distance	SCAN;KCAN	0	245	Total Vehicle Distance
Rx	0x18FEE203	65250	Transmission Configuration	SCAN;KCAN	3	581	Transmission Gear Ratio
Rx	0x18FEE203	65250	Transmission Configuration	SCAN;KCAN	3	957	Number of Forward Gear Ratios
Rx	0x18FEE203	65250	Transmission Configuration	SCAN;KCAN	3	958	Number of Reverse Gear Ratios
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	188	Engine Speed At Idle, Point 1
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	528	Engine Speed At Point 2
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	529	Engine Speed At Point 3
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	530	Engine Speed At Point 4
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	531	Engine Speed At Point 5
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	532	Engine Speed At High Idle, Point 6
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	539	Engine Percent Torque At Idle, Point 1
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	540	Engine Percent Torque At Point 2
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	541	Engine Percent Torque At Point 3
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	542	Engine Percent Torque At Point 4
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	543	Engine Percent Torque At Point 5
Rx	0x18FEE35B	65251	Engine Configuration 1	KCAN;SCAN	91	544	Engine Reference Torque
Rx	0x18FEE300	65251	Engine Configuration 1	SCAN;KCAN	0	544	Engine Reference Torque
Rx	0x18FEE300	65251	Engine Configuration 1	SCAN;KCAN	0	1846	Engine Default Torque Limit
Rx	0x18FEE400	65252	Shutdown	SCAN;KCAN	0	592	Engine Idle Shutdown Timer Override

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FEE400	65252	Shutdown	SCAN;KCAN	0	593	Engine Idle Shutdown has Shutdown Engine
Rx	0x18FEE400	65252	Shutdown	SCAN;KCAN	0	985	A/C High Pressure Fan Switch
Rx	0x18FEE400	65252	Shutdown	BCAN;KCAN;SCAN	0	1109	Engine Protection System Approaching Shutdown
Rx	0x18FEE400	65252	Shutdown	SCAN;KCAN	0	1110	Engine Protection System has Shutdown Engine
Rx	0x18FEE500	65253	Engine Hours, Revolutions	BCAN;KCAN;SCAN	0	247	Engine Total Hours of Operation
Rx	0x18FEE500	65253	Engine Hours, Revolutions	SCAN;KCAN	0	249	Engine Total Revolutions
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	959	Seconds
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	960	Minutes
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	961	Hours
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	962	Day
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	963	Month
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	964	Year
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	1601	Local minute offset
Rx	0x18FEE6FF	65254	Time/Date	KCAN	255	1602	Local hour offset
Rx	0x18FEE700	65255	Vehicle Hours	SCAN;KCAN	0	246	Total Vehicle Hours
Rx	0x18FEE700	65255	Vehicle Hours	BCAN;KCAN;SCAN	0	248	Total Power Takeoff Hours
Rx	0x18FEE900	65257	Fuel Consumption (Liquid)	SCAN;KCAN	0	182	Engine Trip Fuel
Rx	0x18FEE900	65257	Fuel Consumption (Liquid)	SCAN;KCAN	0	250	Engine Total Fuel Used
Rx	0x18FEEB00	65259	Component Identification	KCAN	0	233	Unit Number (Power Unit)
Rx	0x18FEEB00	65259	Component Identification	KCAN	0	586	Make
Rx	0x18FEEB00	65259	Component Identification	KCAN	0	587	Model
Rx	0x18FEEB00	65259	Component Identification	KCAN	0	588	Serial Number
Rx	0x18FEEB03	65259	Component Identification	SCAN;KCAN	3	588	Serial Number
Rx	0x18FEEC00	65260	Vehicle Identification	SCAN;KCAN	0	237	Vehicle Identification Number
Rx	0x18FEED27	65261	Cruise Control/Vehicle Speed Setup	KCAN;SCAN	39	74	Maximum Vehicle Speed Limit
Rx	0x18FEED00	65261	Cruise Control/Vehicle Speed Setup	SCAN;KCAN	0	74	Maximum Vehicle Speed Limit
Rx	0x18FEEE00	65262	Engine Temperature 1	BCAN;KCAN;SCAN	0	110	Engine Coolant Temperature
Rx	0x18FEEE00	65262	Engine Temperature 1	SCAN;KCAN	0	174	Engine Fuel Temperature 1
Rx	0x18FEEE00	65262	Engine Temperature 1	SCAN;KCAN	0	175	Engine Oil Temperature 1
Rx	0x18FEEF00	65263	Engine Fluid Level/Pressure 1	SCAN;KCAN	0	94	Engine Fuel Delivery Pressure
Rx	0x18FEEF00	65263	Engine Fluid Level/Pressure 1	SCAN;KCAN	0	98	Engine Oil Level
Rx	0x18FEEF00	65263	Engine Fluid Level/Pressure 1	BCAN;KCAN;SCAN	0	100	Engine Oil Pressure
Rx	0x18FEEF00	65263	Engine Fluid Level/Pressure 1	SCAN;KCAN	0	101	Engine Crankcase Pressure 1
Rx	0x18FEEF00	65263	Engine Fluid Level/Pressure 1	SCAN;KCAN	0	111	Engine Coolant Level 1
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN	33	90	Power Takeoff Oil Temperature
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN	7	90	Power Takeoff Oil Temperature
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN	33	187	Power Takeoff Set Speed
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN	7	187	Power Takeoff Set Speed
Rx	0x18FEF027	65264	Power Takeoff Information	BCAN;KCAN;SCAN	39	187	Power Takeoff Set Speed
Rx	0x18FEF000	65264	Power Takeoff Information	SCAN;KCAN	0	187	Power Takeoff Set Speed
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	979	Engine Remote PTO Governor Preprogrammed Speed Control Switch

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Tx	0x18FEF0A0	65264	Power Takeoff Information	BCAN;KCAN;SCAN	160	979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
Rx	0x18FEF000	65264	Power Takeoff Information	SCAN;KCAN	0	979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	980	Engine PTO Governor Enable Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	980	Engine PTO Governor Enable Switch
Rx	0x18FEF000	65264	Power Takeoff Information	SCAN;KCAN	0	980	Engine PTO Governor Enable Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	981	Engine PTO Governor Accelerate Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	981	Engine PTO Governor Accelerate Switch
Tx	0x18FEF0A0	65264	Power Takeoff Information	BCAN;KCAN;SCAN	160	981	Engine PTO Governor Accelerate Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	982	Engine PTO Governor Resume Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	982	Engine PTO Governor Resume Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	983	Engine PTO Governor Coast/Decelerate Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	983	Engine PTO Governor Coast/Decelerate Switch
Tx	0x18FEF0A0	65264	Power Takeoff Information	BCAN;KCAN;SCAN	160	983	Engine PTO Governor Coast/Decelerate Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	984	Engine PTO Governor Set Switch
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	984	Engine PTO Governor Set Switch
Tx	0x18FEF021	65264	Power Takeoff Information	BCAN;KCAN;SCAN	33	3447	Remote PTO Governor Preprogrammed Speed Control Switch #2
Tx	0x18FEF007	65264	Power Takeoff Information	BCAN;KCAN;SCAN	7	3447	Remote PTO Governor Preprogrammed Speed Control Switch #2
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	BCAN;KCAN;SCAN	39	70	Parking Brake Switch
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	BCAN;KCAN;SCAN	0	84	Wheel-Based Vehicle Speed
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	0	86	Cruise Control Set Speed
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	86	Cruise Control Set Speed
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	0	527	Cruise Control States
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	527	Cruise Control States
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	595	Cruise Control Active
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	0	595	Cruise Control Active
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	596	Cruise Control Enable Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	KCAN;SCAN	39	597	Brake Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	598	Clutch Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	599	Cruise Control Set Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	600	Cruise Control Coast (Decelerate) Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	601	Cruise Control Resume Switch
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	39	602	Cruise Control Accelerate Switch
Tx	0x18FEF121	65265	Cruise Control/Vehicle Speed 1	BCAN;KCAN;SCAN	33	976	PTO Governor State
Tx	0x18FEF107	65265	Cruise Control/Vehicle Speed 1	BCAN;KCAN;SCAN	7	976	PTO Governor State
Rx	0x18FEF127	65265	Cruise Control/Vehicle Speed 1	BCAN;KCAN;SCAN	39	976	PTO Governor State
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	0	976	PTO Governor State
Rx	0x18FEF100	65265	Cruise Control/Vehicle Speed 1	SCAN;KCAN	0	1237	Engine Shutdown Override Switch
Rx	0x18FEF200	65266	Fuel Economy (Liquid)	SCAN;KCAN	0	51	Engine Throttle Valve 1 Position 1
Rx	0x18FEF200	65266	Fuel Economy (Liquid)	SCAN;KCAN	0	183	Engine Fuel Rate
Rx	0x18FEF200	65266	Fuel Economy (Liquid)	BCAN;KCAN;SCAN	0	184	Engine Instantaneous Fuel Economy
Rx	0x18FEF200	65266	Fuel Economy (Liquid)	BCAN;KCAN;SCAN	0	185	Engine Average Fuel Economy
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	241	Tire Pressure

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	242	Tire Temperature
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	929	Tire Location
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	1697	Tire Sensor Electrical Fault
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	1698	Tire Status
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	1699	Tire Sensor Enable Status
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	2586	Tire Air Leakage Rate
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	2587	Tire Pressure Threshold Detection
Rx	0x18FEF433	65268	Tire Condition Message 1	SCAN;KCAN	51	6990	Extended Tire Pressure Support
Rx	0x18FEF500	65269	Ambient Conditions	SCAN;KCAN	0	108	Barometric Pressure
Rx	0x18FEF519	65269	Ambient Conditions	SCAN;KCAN	25	170	Cab Interior Temperature
Rx	0x18FEF500	65269	Ambient Conditions	SCAN;KCAN	0	171	Ambient Air Temperature
Rx	0x18FEF600	65270	Intake/Exhaust Conditions 1	BCAN;KCAN;SCAN	0	102	Engine Intake Manifold #1 Pressure
Rx	0x18FEF600	65270	Intake/Exhaust Conditions 1	SCAN;KCAN	0	105	Engine Intake Manifold 1 Temperature
Rx	0x18FEF600	65270	Intake/Exhaust Conditions 1	SCAN;KCAN	0	106	Engine Intake Air Pressure
Rx	0x18FEF600	65270	Intake/Exhaust Conditions 1	SCAN;KCAN	0	173	Engine Exhaust Temperature
Rx	0x18FEF727	65271	Vehicle Electrical Power 1	SCAN;KCAN	39	158	Key Switch Battery Potential
Rx	0x18FEF727	65271	Vehicle Electrical Power 1	BCAN;KCAN;SCAN	39	168	Battery Potential / Power Input 1
Rx	0x18FEF700	65271	Vehicle Electrical Power 1	SCAN;KCAN	0	168	Battery Potential / Power Input 1
Rx	0x18FEF803	65272	Transmission Fluids 1	BCAN;KCAN;SCAN	3	177	Transmission Oil Temperature 1
Rx	0x18FEFA0B	65274	Brakes	SCAN;KCAN	11	116	Brake Application Pressure
Rx	0x18FEFA27	65274	Brakes	BCAN;KCAN;SCAN	39	117	Brake Primary Pressure
Rx	0x18FEFA27	65274	Brakes	BCAN;KCAN;SCAN	39	118	Brake Secondary Pressure
Rx	0x18FEFC27	65276	Dash Display 1	BCAN;KCAN;SCAN	39	38	Fuel Level 2
Rx	0x18FEFC27	65276	Dash Display 1	BCAN;KCAN;SCAN	39	96	Fuel Level 1
Tx	0x18FEFD12	65277	Alternate Fuel 1	SCAN	18	159	Engine Gaseous Fuel Supply Pressure 1
Rx	0x18FEFD00	65277	Alternate Fuel 1	SCAN;KCAN	0	159	Engine Gaseous Fuel Supply Pressure 1
Rx	0x18FEFF00	65279	Operator indicators	SCAN;KCAN	0	97	Water In Fuel Indicator 1
Rx	0x18FEFF00	65279	Operator indicators	BCAN;KCAN;SCAN	0	5825	Driver Warning System Indicator Status
Rx	0x18FF0E27	65294	PropB_VECU_03	BCAN;KCAN;SCAN	39	520910	PTOActiveTelltale
Rx	0x18FF0E27	65294	PropB_VECU_03	BCAN;KCAN;SCAN	39	521279	PTO Mode Active Telltale
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521098	Net Following Distance Interval
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521099	Audible Following Distance Alerts
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521100	Visual Following Distance Alerts
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521101	ACB Disabled Due to Excessive Brake Use
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521102	Vehicle Following Distance
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521103	Vehicle Following Interval
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521104	Vehicle Cruise Control Set Speed
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521106	Wingman Target Detect Lamp
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521107	Wingman Sensor Blocked or No Objects Detected
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521108	Fusion Available Flag
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521162	Bendix Power On Self Test
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521164	CMT Intervention Status

Direction	HexID	PGN	Message Name	Network	SA	SPN	Signal Name
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521165	CMT Foundation Brake Request
Rx	0x18FF102A	65296	PropB_FLR_Warn	SCAN;KCAN	42	521167	CMT Installed and Enabled
Rx	0x18FF9147	65425	PropB_SCM_AI1	BCAN;KCAN	71	520561	Secondary Fuel Level Sensor
Rx	0x18FF9147	65425	PropB_SCM_AI1	BCAN;KCAN	71	520562	Primary Fuel Level Sensor
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524149	TPMS Tire / wheel identification
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524150	TPMS Tire Temperature
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524151	TPMS Tire Pressure
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524152	TPMS Wheel Unit Battery Status
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524153	TPMS Fast Pressure Loss Status Flag
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524154	TPMS Temperature Compensated Target Nominal Pressure
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524155	TPMS Tire Pressure Status
Rx	0x18FFE633	65510	Truck High Line TPMS data message	SCAN;KCAN	51	524157	TPMS Tire Over Temperature Status

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SECTION 7 ELECTRICAL T680/T880/W990

INTRODUCTION

This section is written to provide information to the body builder when installing equipment into vehicles built with multiplexed instrumentation. The technology presented by VECU level instrumentation integrates J1939 CAN data communications between controllers and equipment on the vehicle. This section is intended to address how to work in aftermarket equipment while still maintaining full functionality of the OEM vehicle.

These topics apply to 2.1m HD chassis built with Vehicle Multiplexed (VMUX) or Ethernet Multiplexed (EMUX) architecture. VMUX replaced CVMUX in 2020 and EMUX replaced VMUX in September 2024. VMUX architecture eliminated the original cab ECU required for CVMUX (the CECU) and updated the VECU from VECU1 to VECU2. The major change going into EMUX architecture is the integration of an Ethernet connected system to support the network capacity and enhanced communication for today's advanced technology. The VECU has been updated again from VECU2 to VECU3 with EMUX among other changes to increase the security of vehicle data. In addition to the dates mentioned, please check the option codes on the sales order for the truck to see which electrical architecture was installed on the vehicle from the factory.

Option Codes:
9491659 VMUX ELECTRONICS ARCHITECTURE
9491652 EMUX ELECTRONICS ARCHITECTURE

Table 47 Electrical Acronym Library

Acronym	Definition
AI	Analog Input
BOC	Back of Cab
BOS	Back of Sleeper
CAN	Controller Area Network
DI	Digital Input
DO	Digital Output
DTC	Diagnostics Trouble Code
ECM	Engine Control Module
ECU	Electronic Control Unit
EOA	Electric Over Air
EOF	End of Frame
EOH	Electric Over Hydraulic
FOF	Front of Frame
J1939	SAE CAN Communication Standard
LIN	Local Interconnect Network
MSB	Multiplexed Solenoid Bank
MSM	Master Switch Module
MUX	Multiplexed
OBD	On-Board Diagnostics
OEM	Original Equipment Manufacture
PCC	Predictive Cruise Control
PDC	Power Distribution Center
PGN	Parameter Group Number
PTO	Power Take Off
RP1226	TMC Messaging Standard
SPN	Suspect Parameter Number
TCM	Transmission Control Module
VECU	Vehicle Electronic Control Unit

ELECTRICAL WIRING CIRCUIT CODES

The wire system uses 11 different colors with only one striped wire color. Each wire has a minimum of seven characters, with the first three characters as the wire color. The remaining four characters are related to the wire services. The colors determine the circuits function as follows:

Table 48 Electrical Wire Circuit Codes

PACCAR Electrical Color Codes		
Insulation Color	Color Code	Electrical Function
~~Red w/ White Stripe~~	R-WXXXX	Direct Battery Power
Red	REDXXXX	Protected Battery Power
Orange	ORNXXXX	Ignition/Accessory/Start Bus Power
Yellow	YELXXXX	Activated Power
Brown	BRNXXXX	Control/Indicator/Backlighting Illumination
Black	BLKXXXX	Load Return
Gray	GRAXXXX	Control
Violet	VIOXXXX	Reference Voltage
Blue	BLUXXXX	Sensor Signal
Green	GRNXXXX	Sensor Common
White	WHTXXXX	Ground
Pink	PNKXXXX	High Voltage Interlock Loop (HVIL)

PACCAR Electrical Circuit Codes			
Number			Category
XXX**0000**	through	XXX**0999**	General
XXX**1000**	through	XXX**1999**	Power Supply
XXX**2000**	through	XXX**2999**	Lighting
XXX**3000**	through	XXX**3999**	Powertrain
XXX**4000**	through	XXX**4999**	Instrumentation
XXX**5000**	through	XXX**5999**	Safety Systems
XXX**6000**	through	XXX**6999**	Convenience/Security
XXX**7000**	through	XXX**7999**	HVAC
XXX**8000**	through	XXX**8999**	Undefined
XXX**9000**	through	XXX**9999**	Trailer/Customer/Bodybuilder

MULTIPLEXED SYSTEM

The VMUX and EMUX electrical architectures utilize a multiplexed system. Multiplexing can be defined as the process of sending multiple digital signals on the same shared medium at the same time. These signals are introduced into the multiplexed system through data connection points which are defined by the J1939 backbone.

CAN BUS SPEEDS AND CIRCUIT DESIGNATION

Table 49 CAN BUS Speeds and Circuit Designation

VMUX ARCHITECURE	
J1939-14 (500 kbps)	**J1939-15 (250 kbps)**
B-CAN – 0813 Body Builder	K-CAN – 0829 Customer Installed Devices
S-CAN – 0827 Sleeper	

EMUX ARCHITECURE	
J1939-14 (500 kbps)	**J1939-15 (250 kbps)**
B-CAN – 0813 Body Builder	K-CAN – 0829 Customer Installed Devices
S-CAN – 0827 Customer Installed Devices	

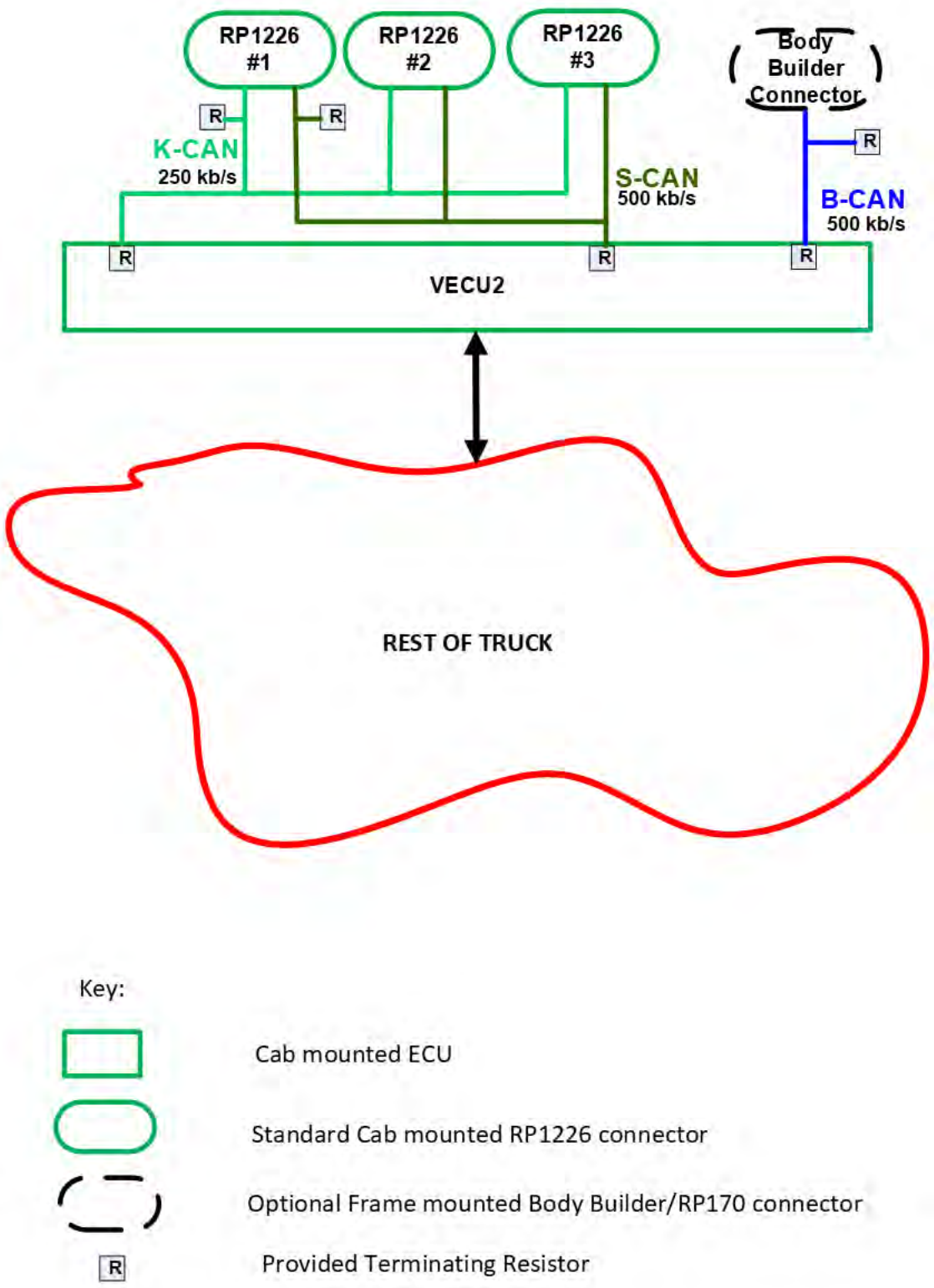


Figure 38 VMUX Customer Connector Databus Diagram

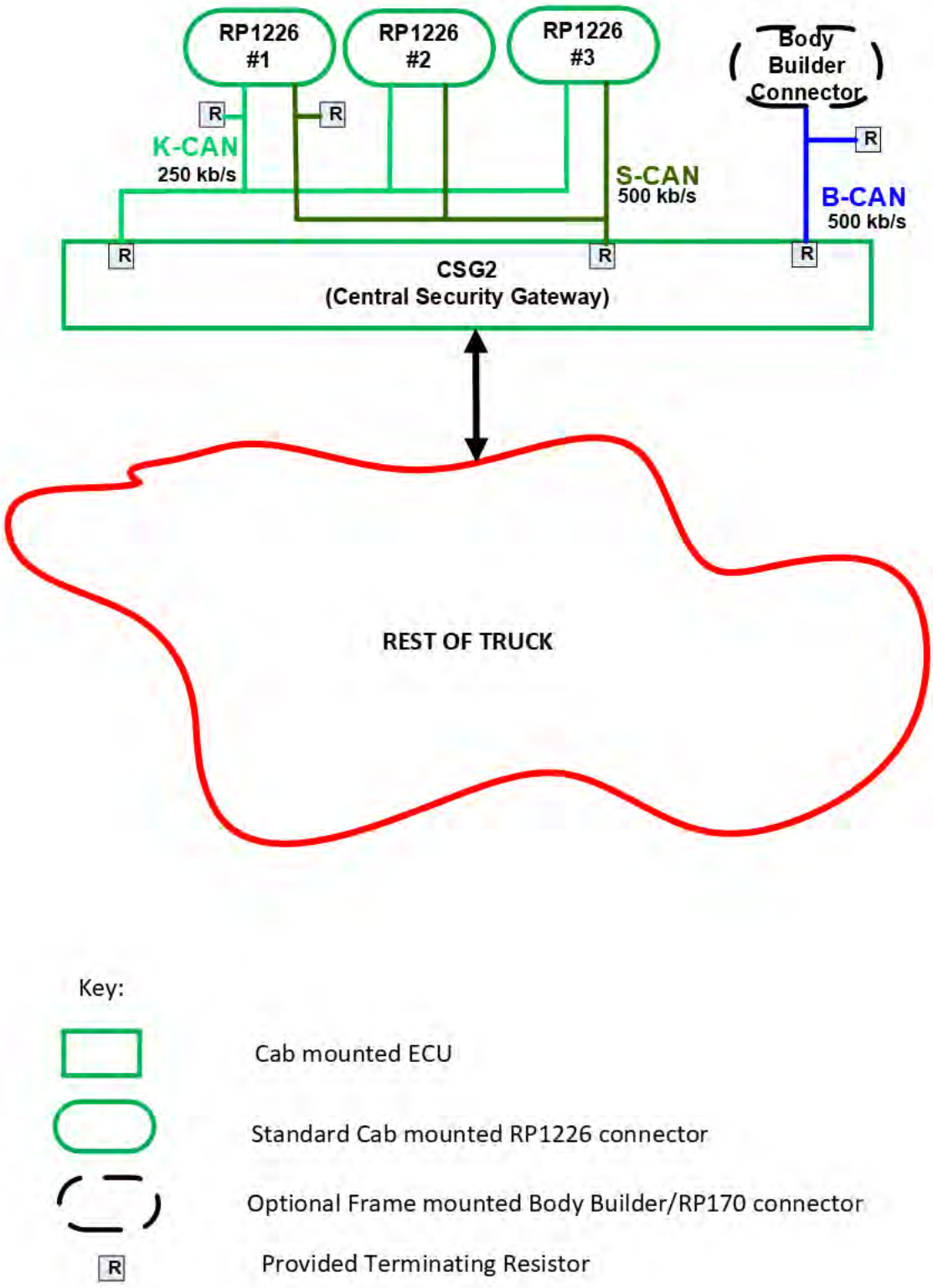


Figure 39 EMUX Customer Connector Databus Diagram

ELECTRICAL COMPONENT OVERVIEW

(component locations may vary by truck model)

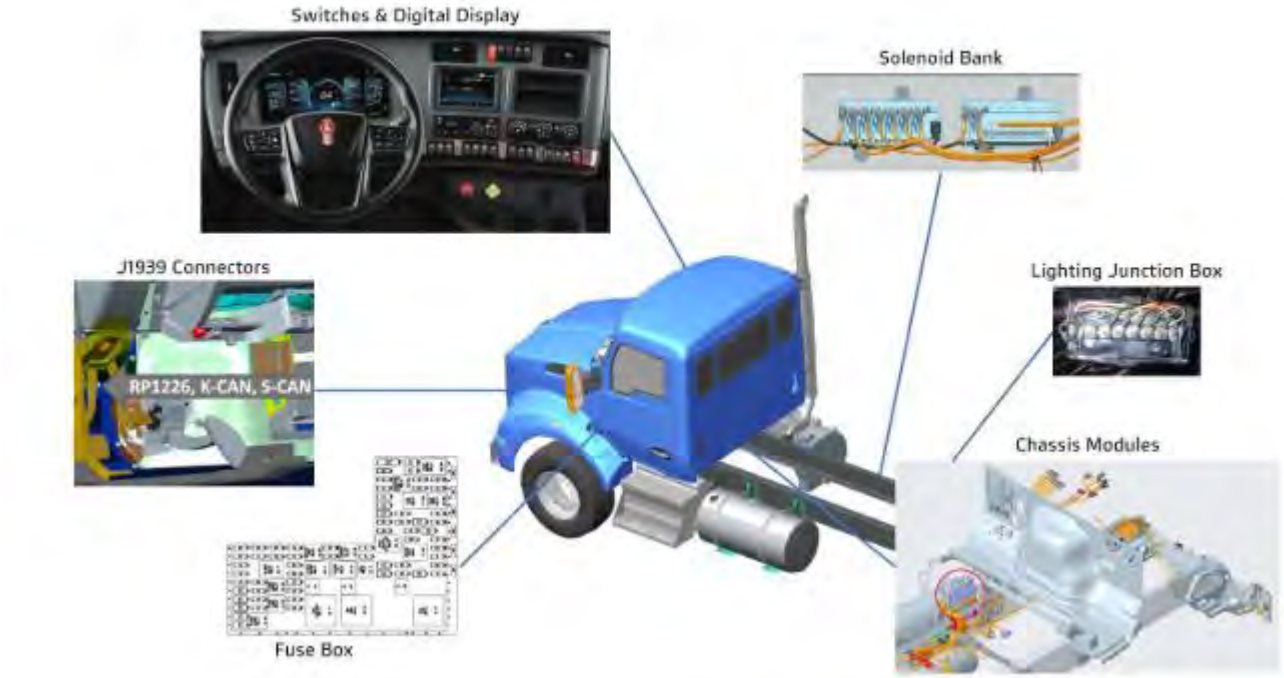


Figure 40 Overview Diagram of Electrical Component Locations

ELECTRICAL HARNESS OVERVIEW

(harnesses may vary by truck model)

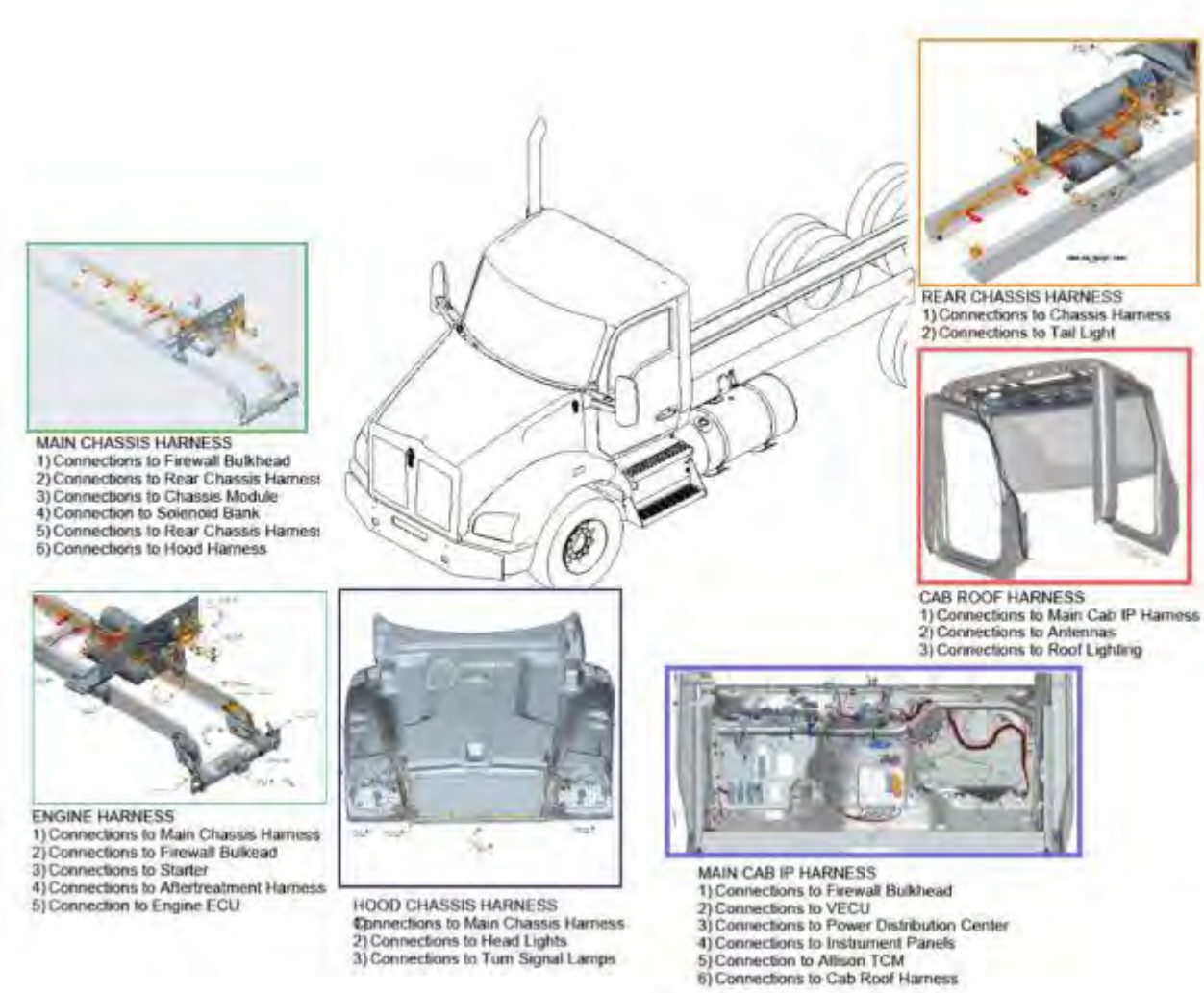


Figure 41 Electrical Harness Overview

IN-CAB CAN BASED MESSAGING CONNECTOR

RP1226 CONNECTOR

There are three RP1226 connectors located inside the cab. The first RP1226 connector is located to the left of the steering wheel behind the dash near the OBD connector. The remaining two RP1226 connectors are located behind the center dash kickpanel. Each RP1226 connector provides battery and ignition power, ground, and CAN bus speeds of 250kbps (K-CAN) and 500kbps (S-CAN) for customer use. The RP1226 connectors can be used for after-market telematics, ELD, body controllers, and/or PTO controls.

Note: Please refer to the TMC RP1226 recommended practice for additional information.

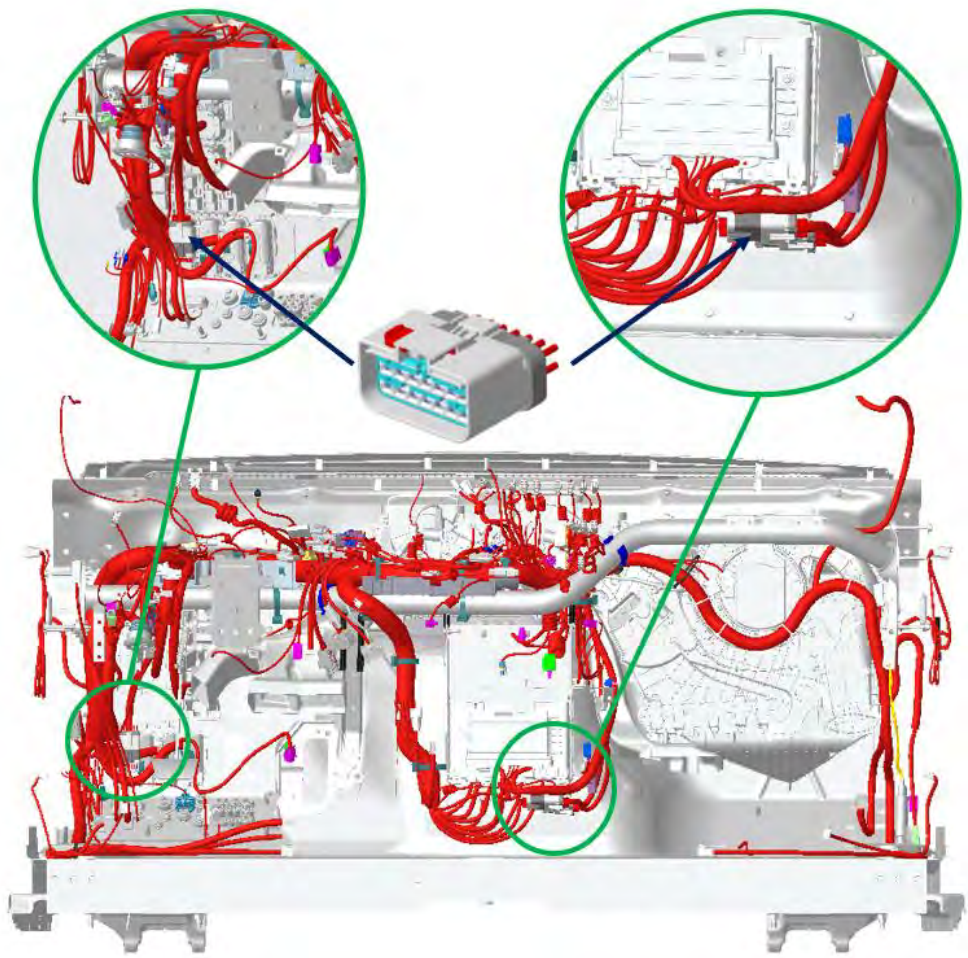
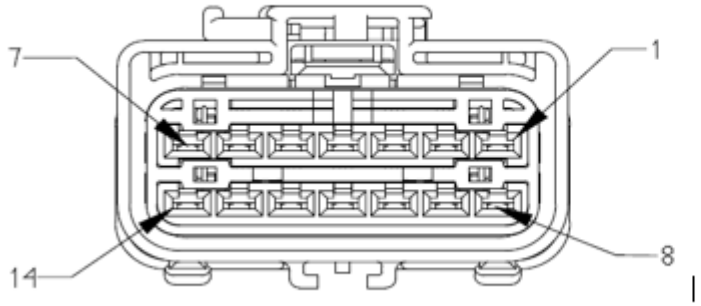


Figure 42 RP1226 Connector Behind Dash



Pin	Description
1	PROTECTED POWER
2	J1939 S-CAN (+)
4	J1939 K-CAN (+)
7	IGNITION POWER
8	GROUND
9	J1939 S-CAN (-)
11	J1939 K-CAN (-)

Figure 43 RP1226 Pinouts

BODY CONNECTION POINTS – MODEL T680/T880/W990

LOCATION DIAGRAMS FOR BODY CONNECTIONS ON THE MAIN CHASSIS HARNESS

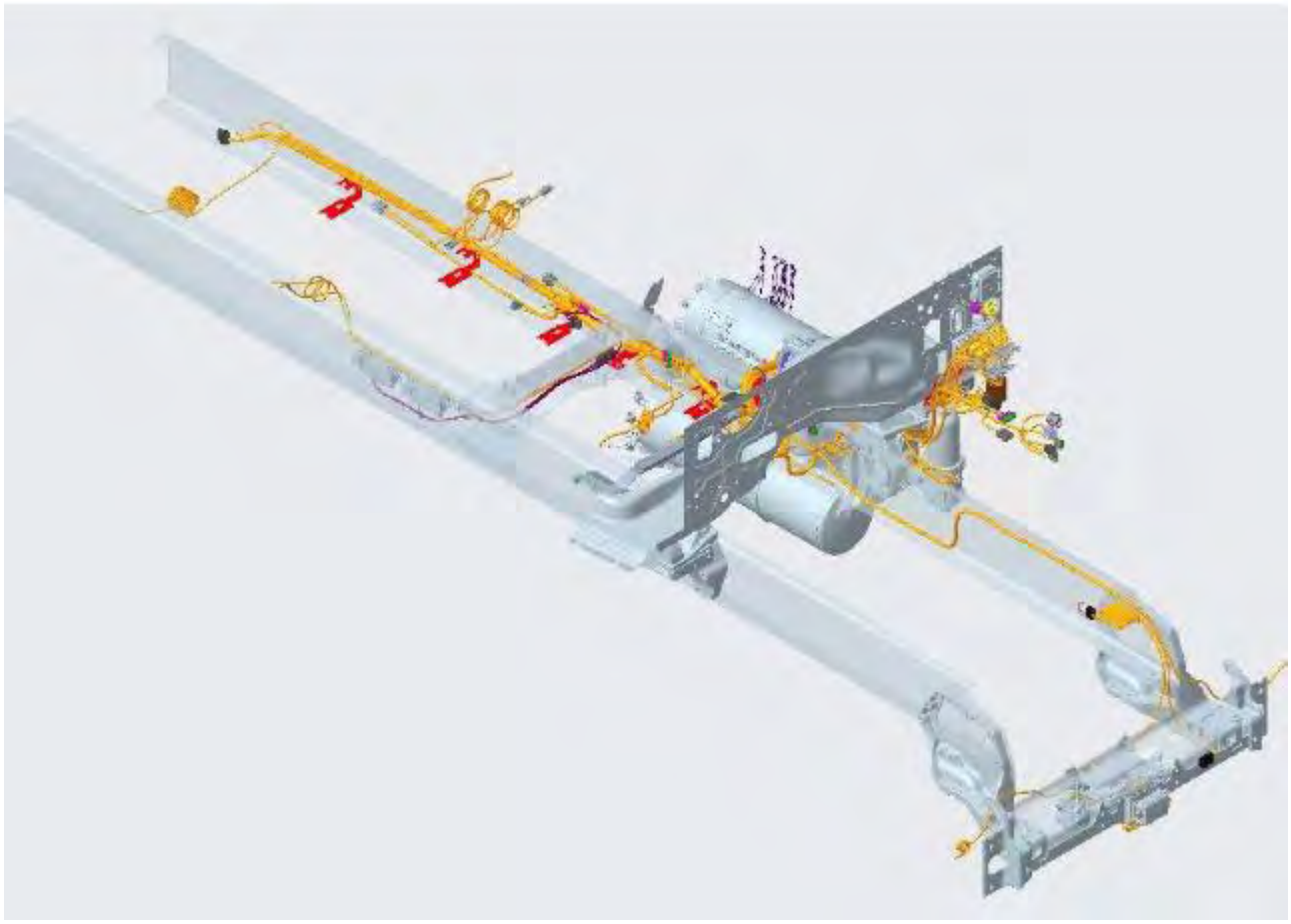


Figure 44 Main Chassis Harness, Isometric View

DETAIL VIEW OF ENGINE COMPARTMENT BODY CONNECTIONS

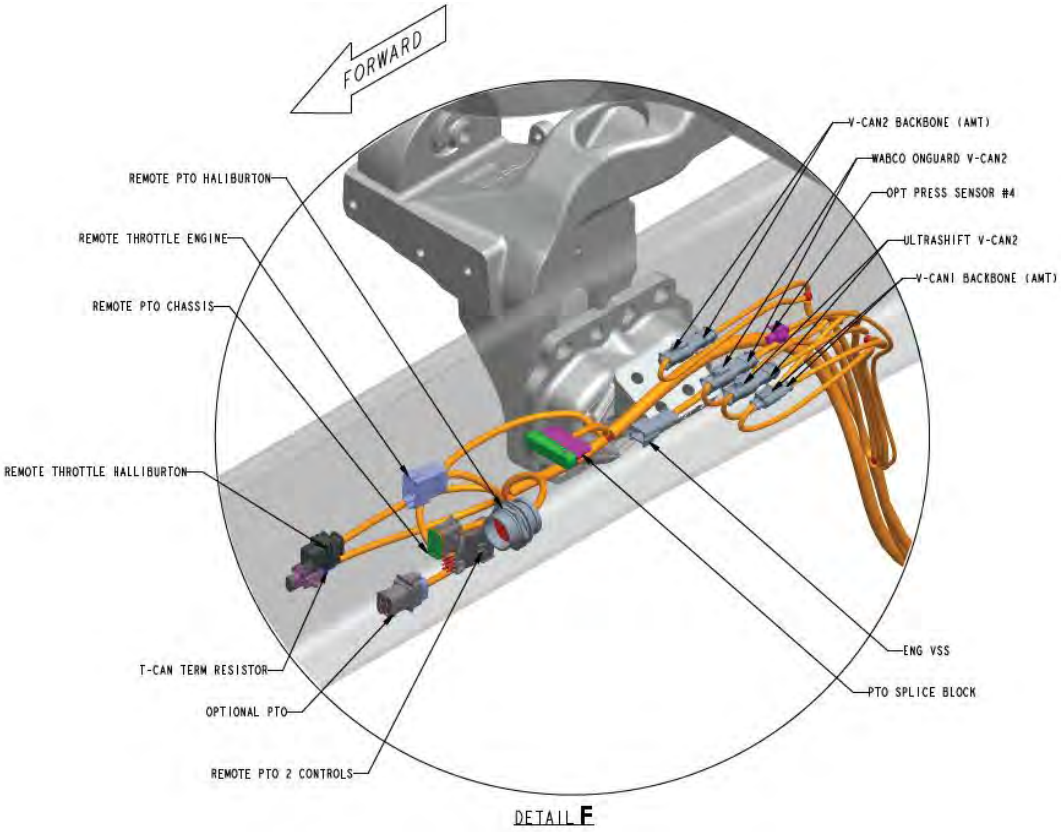


Figure 45 Engine Compartment Body Connections

DETAIL VIEW OF FOF (FRONT OF FRAME) BODY CONNECTIONS

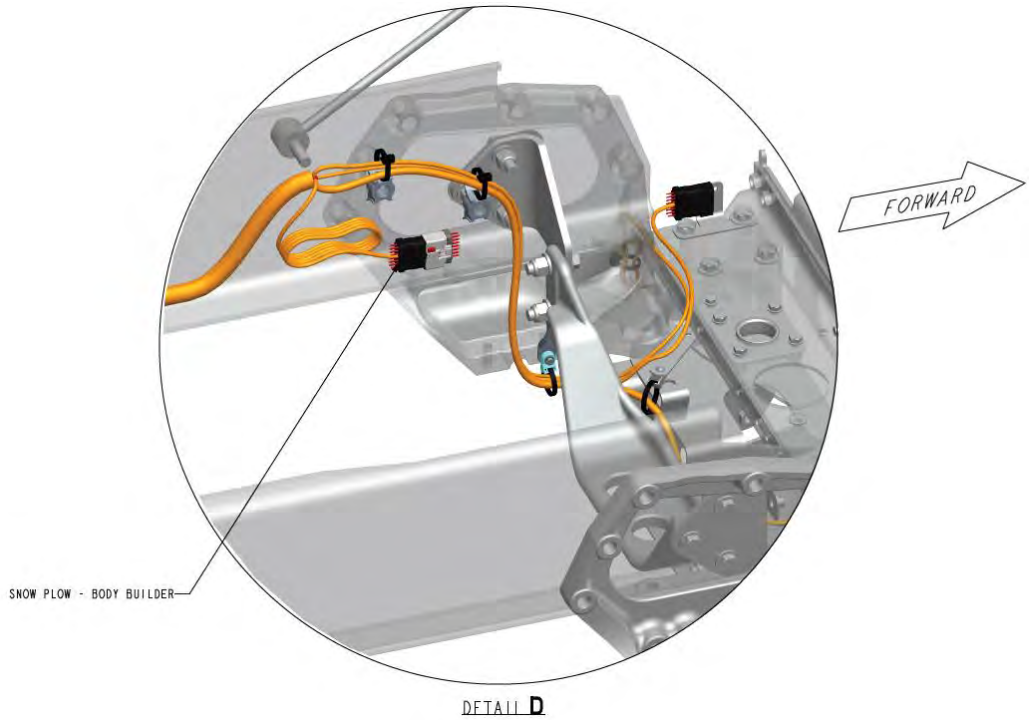


Figure 46 Front of Frame Body COnnections

DETAIL VIEW OF EOF (END OF FRAME) BODY CONNECTIONS

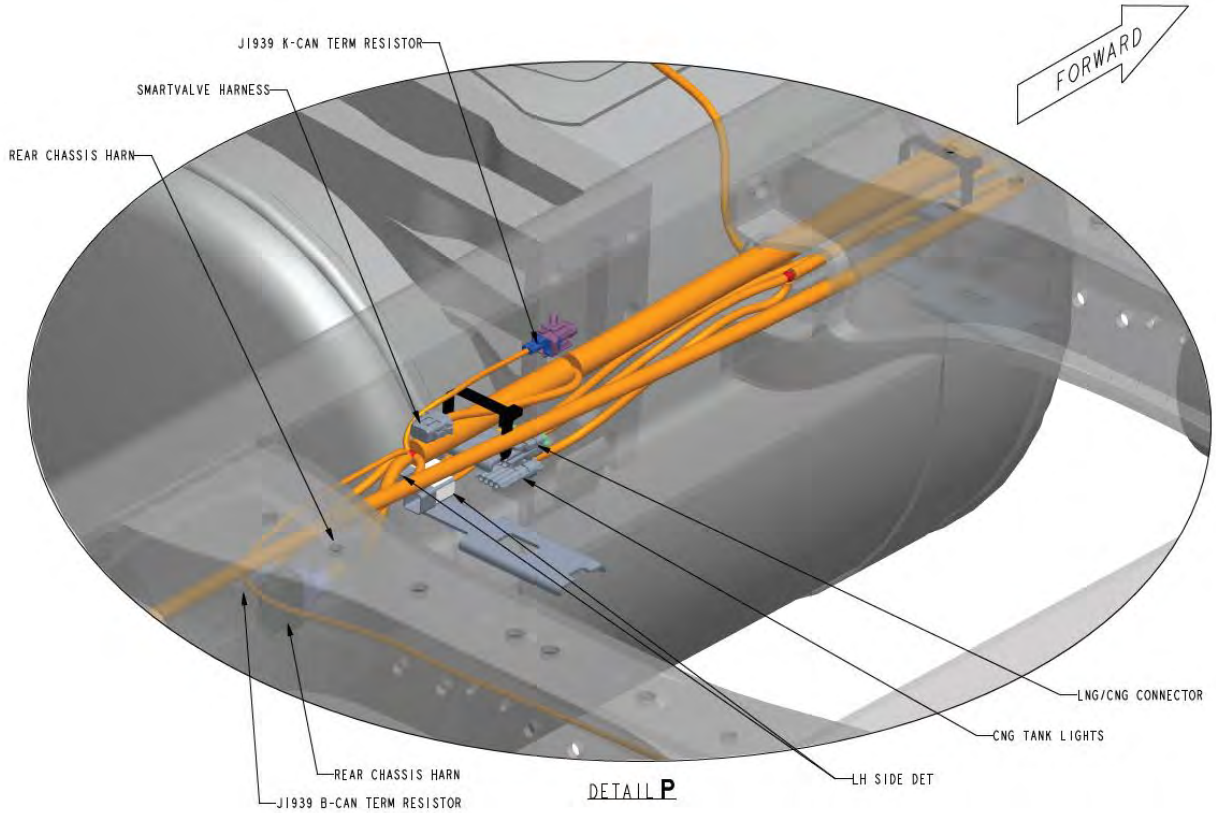


Figure 47 End Of Frame (EOF) Body Connections

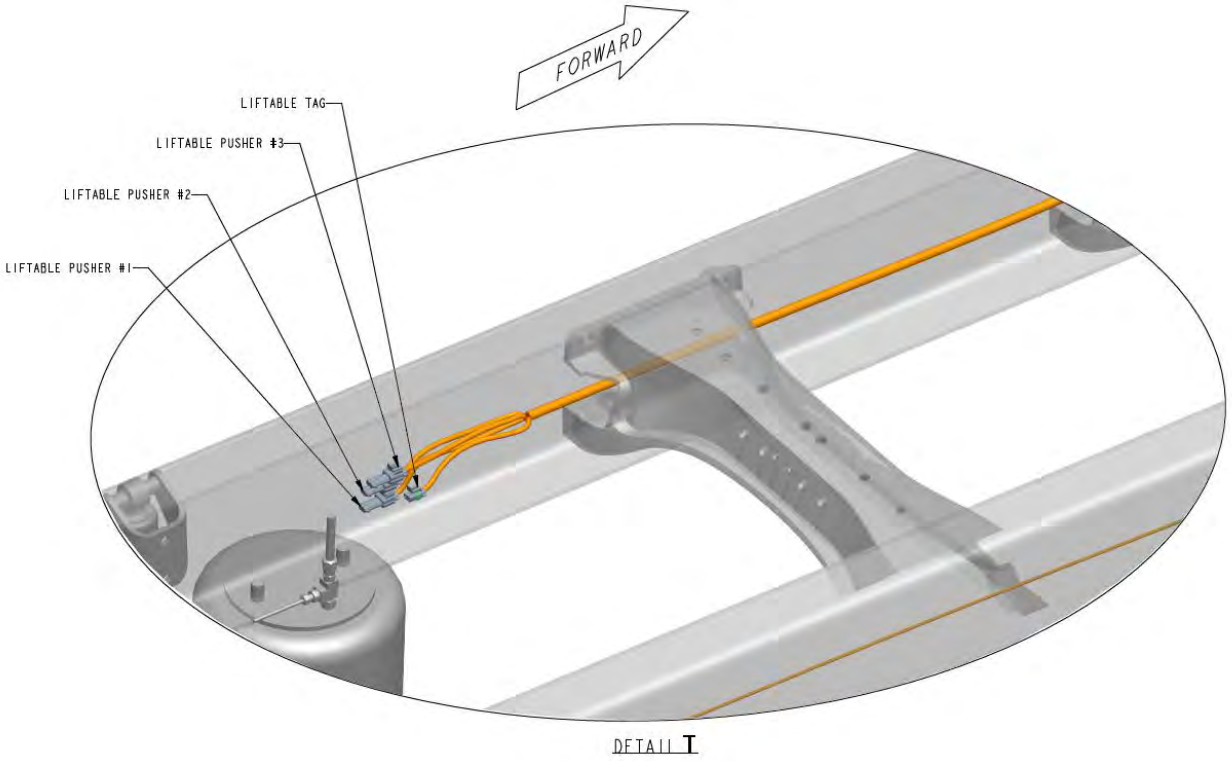


Figure 48 Pusher Connections

BODY CONNECTION POINTS – MODEL T680

LOCATION DIAGRAMS FOR BODY CONNECTIONS ON THE MAIN CHASSIS HARNESS

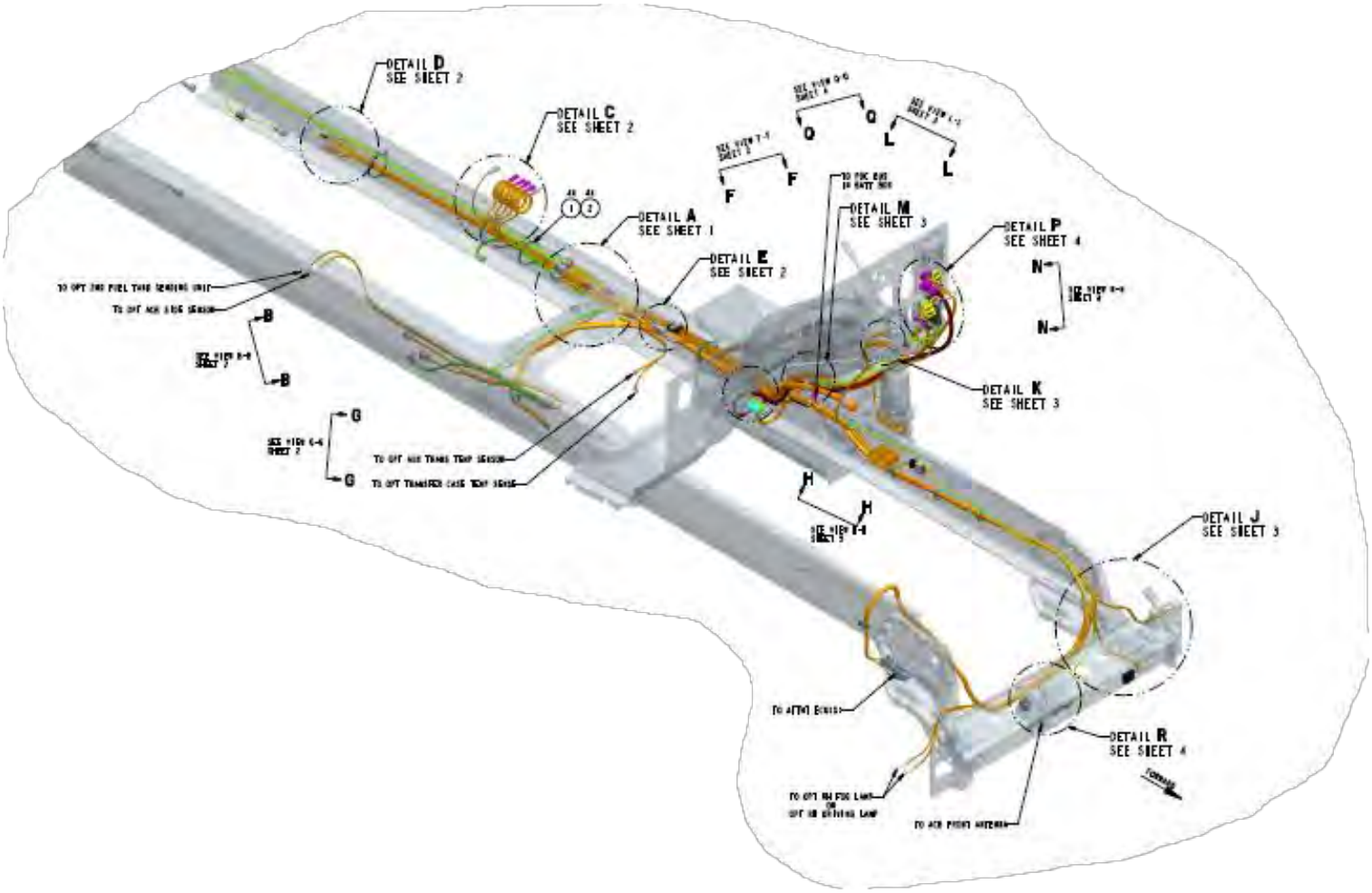


Figure 49 Location of Body Connections on Main Chassis Harness (T680)

DETAIL VIEW OF ENGINE COMPARTMENT BODY CONNECTIONS

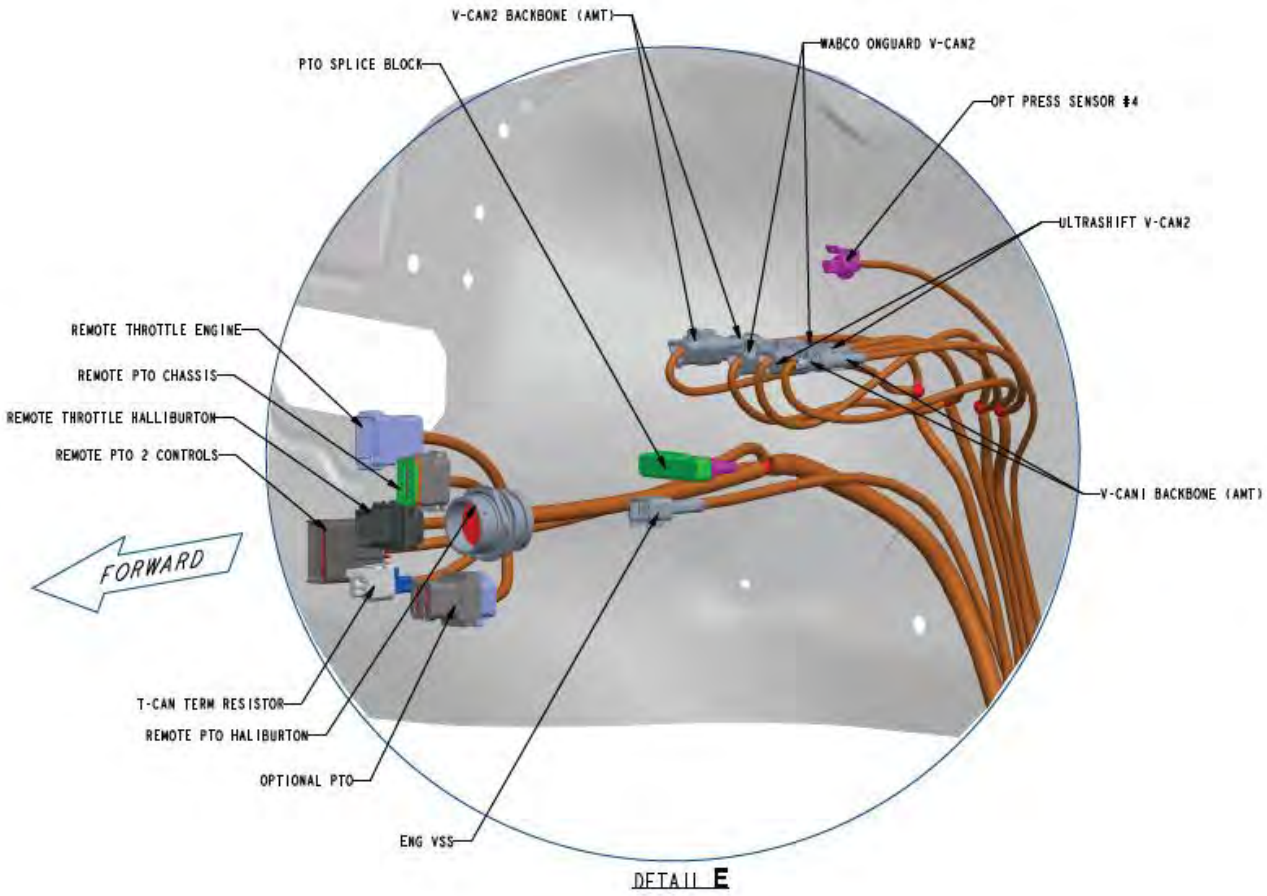


Figure 50 Engine Compartment Body Connections (T680)

DETAIL VIEW OF FOF (FRONT OF FRAME) BODY CONNECTIONS

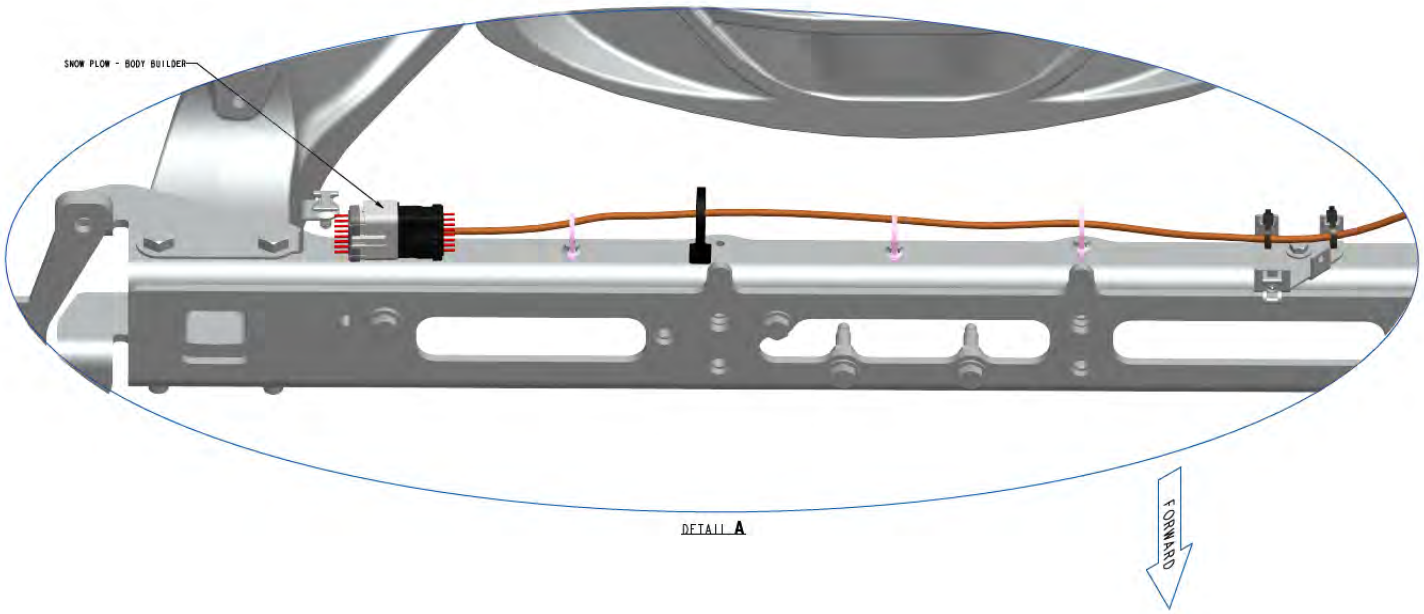


Figure 51 Front of Frame Body Connections (T680)

DETAIL VIEW OF EOF (END OF FRAME) BODY CONNECTIONS

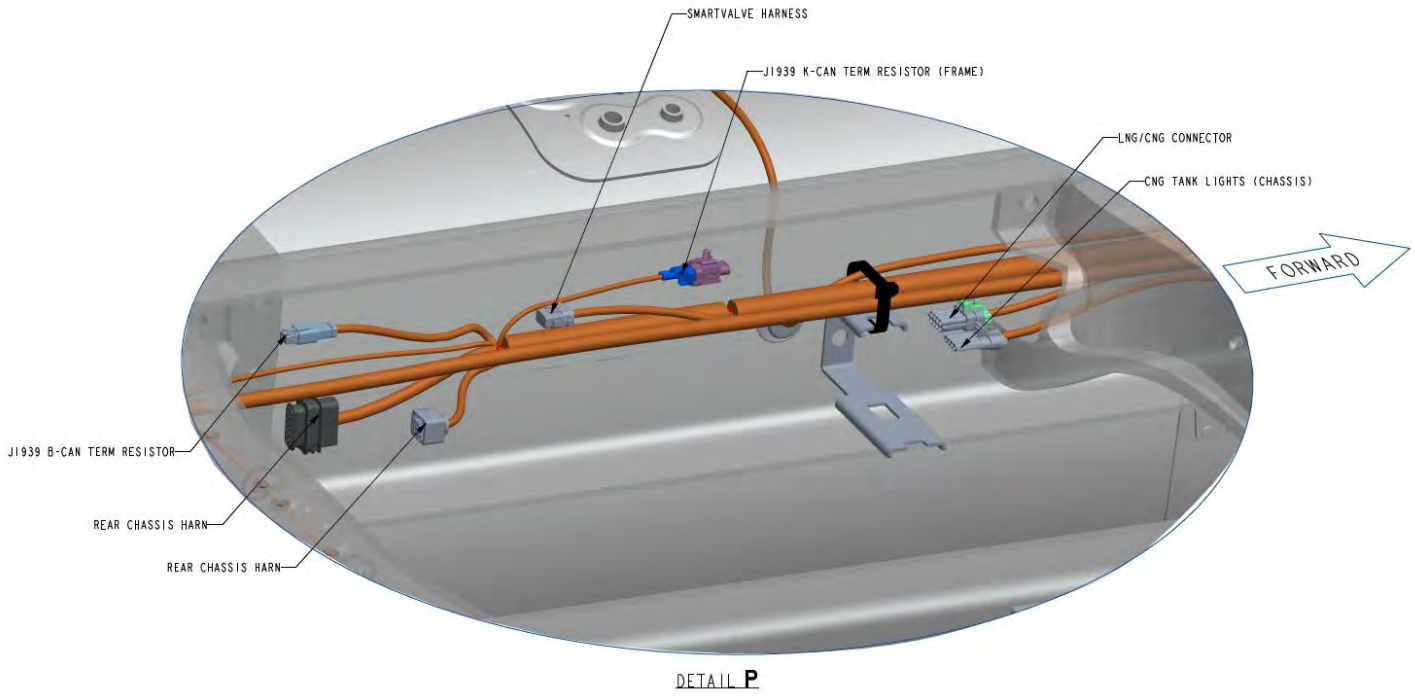
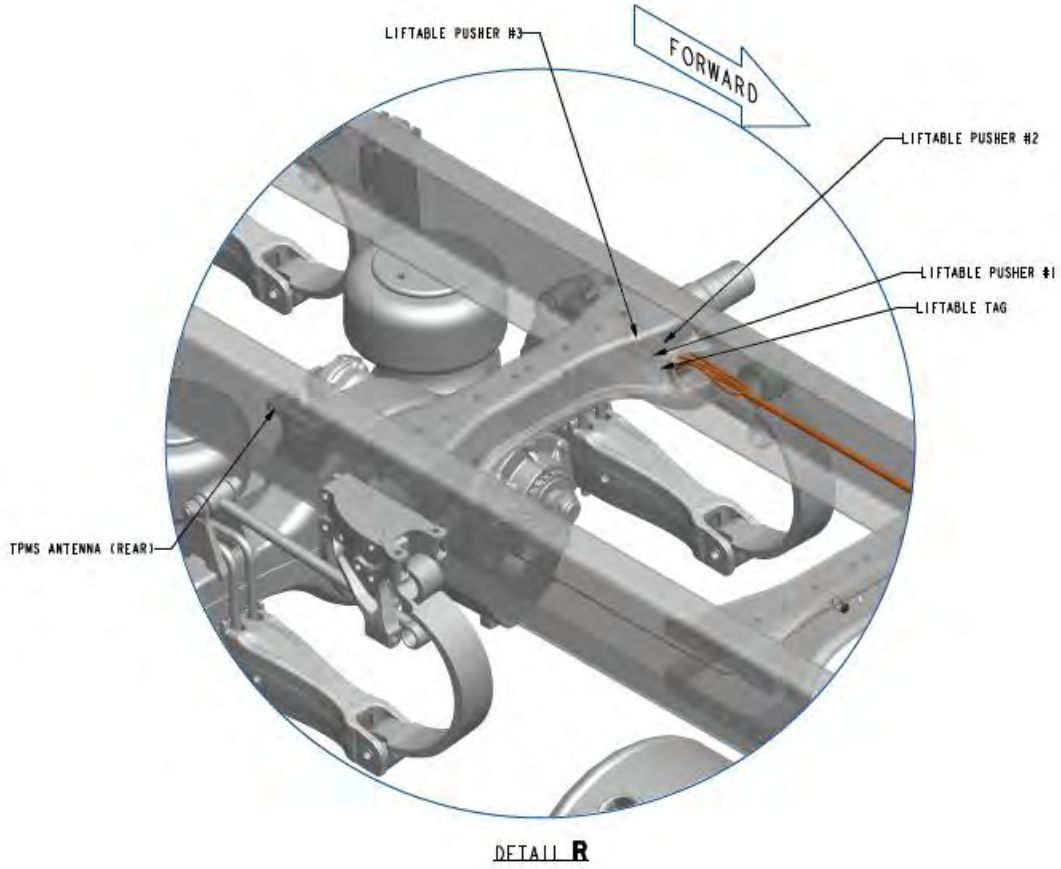


Figure 52 End Of Frame (EOF) Body Connections


LIFTABLE PUSHER #3
FORWARD
LIFTABLE PUSHER #2
LIFTABLE PUSHER #1
LIFTABLE TAG
TPMS ANTENNA (REAR)

DETAIL **R**

BODY CONNECTION POINTS – MODEL W990

LOCATION DIAGRAMS FOR BODY CONNECTIONS ON THE MAIN CHASSIS HARNESS

Isometric View

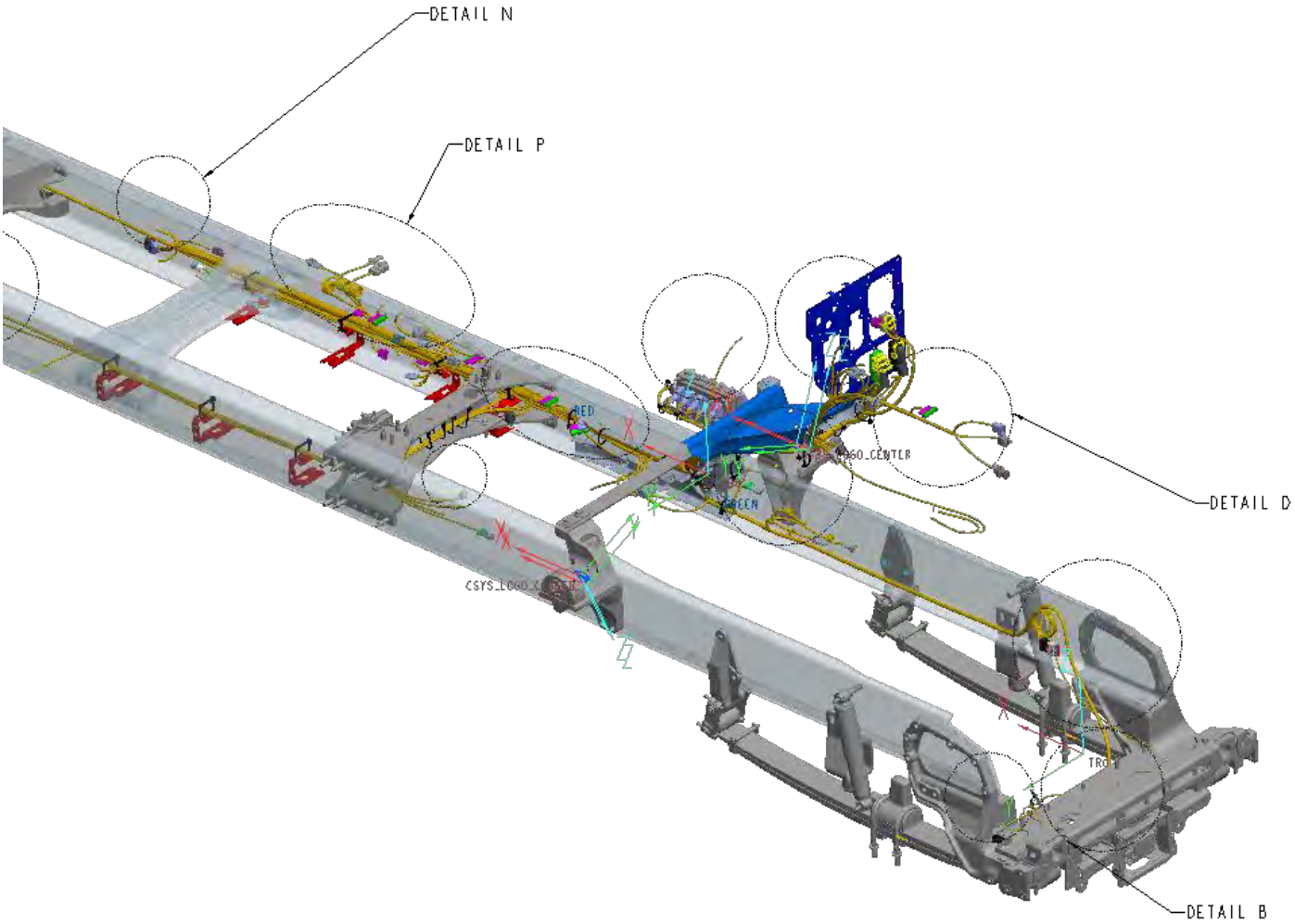


Figure 53 Location of Body Connections on Main Chassis Harness (W990)

DETAIL VIEW OF ENGINE COMPARTMENT BODY CONNECTIONS

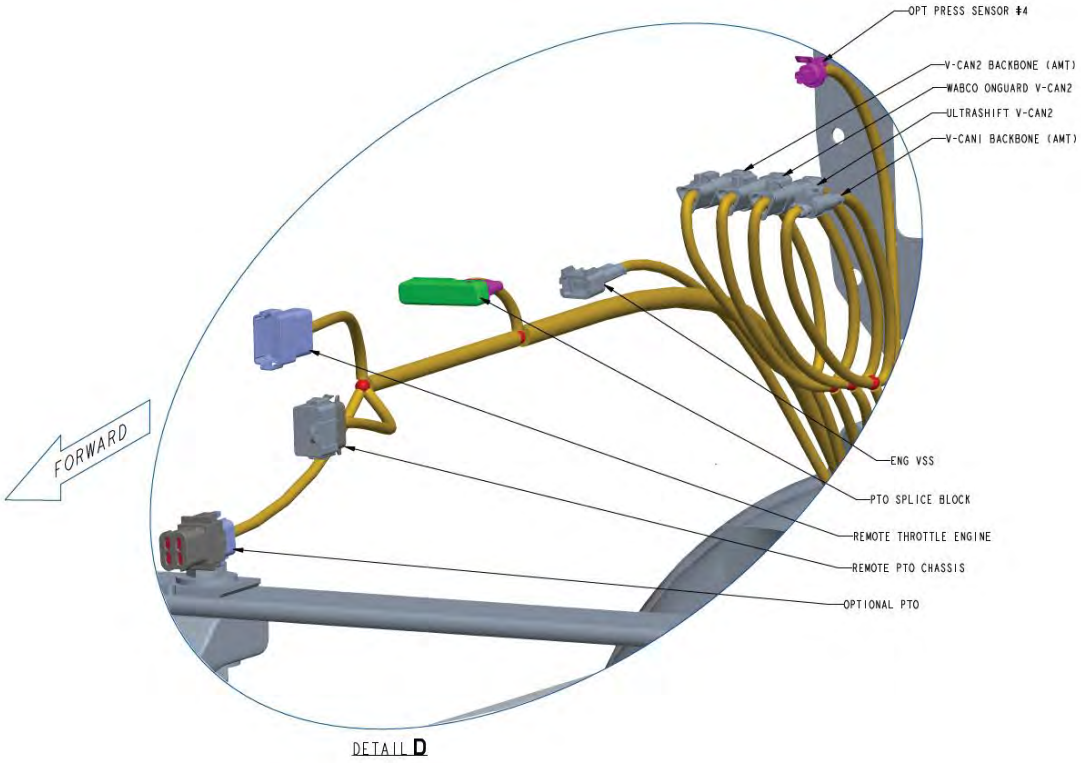


Figure 54 Engine Compartment Body Connections (W990)

DETAIL VIEW OF FOF (FRONT OF FRAME) BODY CONNECTIONS

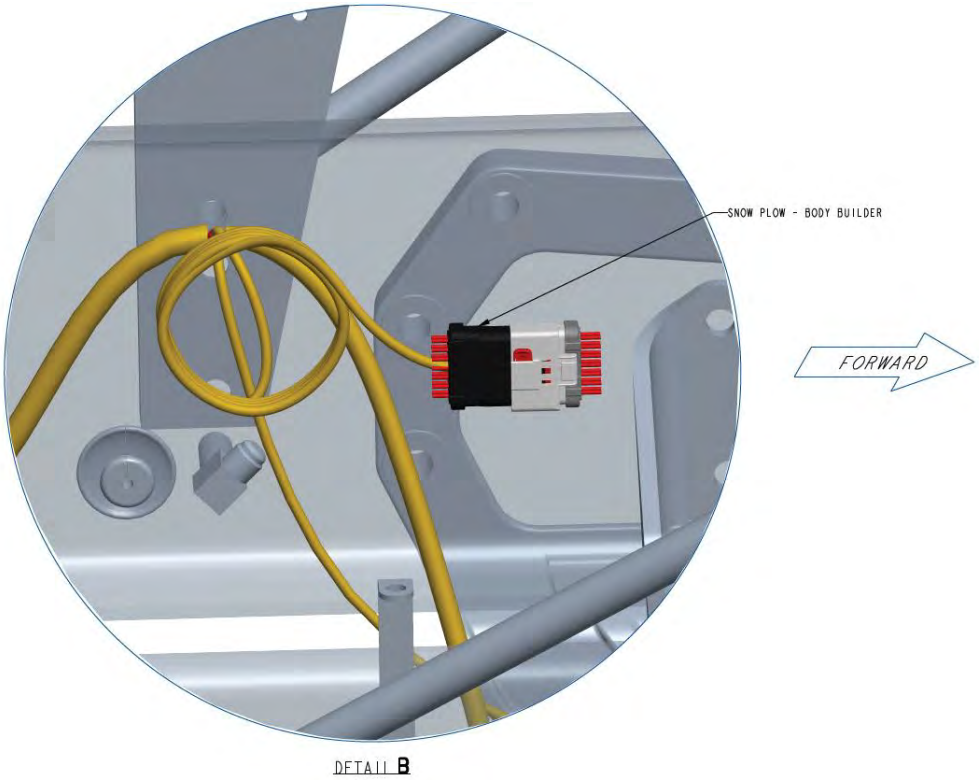


Figure 55 Front of Frame Body Connections (W990)

DETAIL VIEW EOF (END OF FRAME) BODY CONNECTIONS

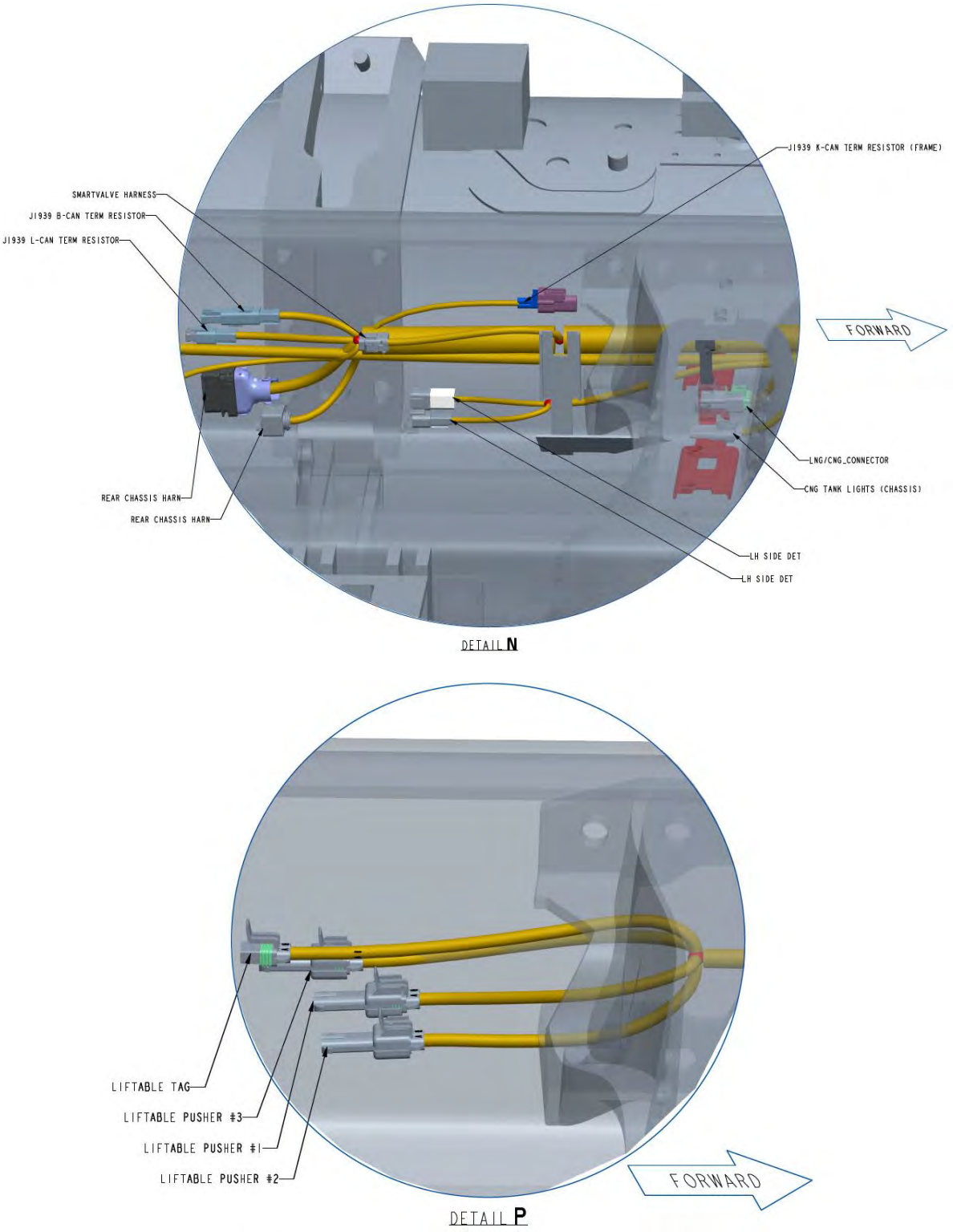
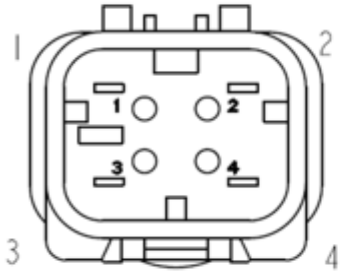


Figure 56 Location of Body Connections on Main Chassis Harness (W990)

ELECTRIC ENGAGED EQUIPMENT

OPTIONAL 4-PIN PTO INPUT CONNECTOR

The 4-pin PTO connector (P198) is only present when the chassis is ordered with the appropriate PTO option(s). When equipped, the 4-pin PTO connector will be located at the left hand forward cab mount.
Note: This 4-pin PTO connector is available for both PACCAR MX and Cummins engines.

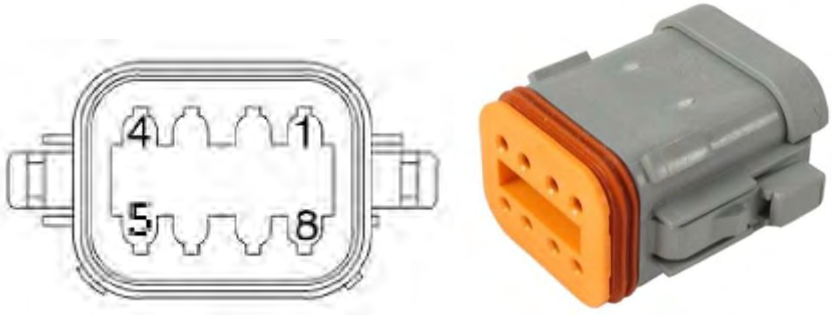


Pin	Description	Input/Output
1	Vehicle Ground	GND (Chassis)
2	#1 PTO ON/OFF	DI, Dual Active
3	PTO Pump Mode Signal	DI, Dual Active
4	#2 PTO ON/OFF	DI, Dual Active

Figure 57 PTO Connector Pinouts (4-Pin)

OPTIONAL 8-PIN PTO INPUT CONNECTOR

The 8-pin PTO connector is only present when the chassis is ordered with the appropriate PTO option(s). When equipped, the 8-pin PTO connector will be located either in the engine bay, BOC/BOS, or EOF. This optional PTO connector is equipped with various input signals to provide remote PTO interlock and presets.
Note: This 8-pin PTO body connector is only available with PACCAR MX engines.



Pin	Description	Input/Output	Notes
1	+12V Body Ignition	IGN Bus, +12V	Fuse C_A6 (10 A)
2	PTO Interlock	DI, Active Low	
3	Remote PTO Preset 3	DI, Active High	
4	Remote PTO Preset 2	DI, Active High	
5	Remote PTO Preset 1	DI, Active High	
6	Remote PTO Preset Increment (+)	DI, Active High	
7	Remote PTO Preset Decrement (-)	DI, Active High	
8	Vehicle Ground	GND (Chassis)	

Figure 58 PTO Connector Pinouts (8-Pin, MX Only)

REMOTE THROTTLE AND REMOTE PTO CONTROLS

OPTIONAL 12-PIN PTO CONNECTOR - PACCAR MX Engines

The 12-pin PTO connector (P197C) is only present when the chassis is ordered with the appropriate PTO option(s). When equipped with MX engines, the 12-pin PTO connector will be located either in the engine bay, BOC/BOS, or EOF.

Wiring Function Description:
Connect pin 5 and pin 6 to pin 8 to activate PTO Mode Control (PMC) and Enable PTO Speed Control (PSC).
WARNING: DO NOT install a permanent jumper wire between pin 5 and pin 6.

- "Bump up" Engine Speed: connect pin 2 to pin 8 momentarily
- "Accelerate" Engine Speed: connect pin 2 to pin 8 until desired RPM is reached, then disconnect
- "Bump down" Engine Speed: connect pin 1 to pin 8 momentarily
- "Decelerate" Engine Speed: connect pin 1 to pin 8 until desired RPM is reached, then disconnect
- “0-5v Variable Voltage Remote Throttle (VVRT)”: see PTO section

P197C-Remote PTO Chassis

Equipped: Optional
Available Locations: Firewall, BOC/BOS, EOF
Supplier: Deutsch-DT Series

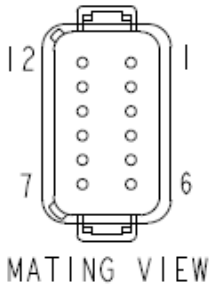
TRUCK CONNECTOR

Mating Connector:
PACCAR P/N: P20-1372-1112H
TE P/N: DT04-12PA-CE02)
Terminals:
16-20 awg: 0460-202-16141
14 awg : 0460-215-16141
Plugs: 0413-217-1605

Note: Cap installed from Factory

MATING CONNECTOR

Figure 59 12-Pin PTO Connectors (MX-only)

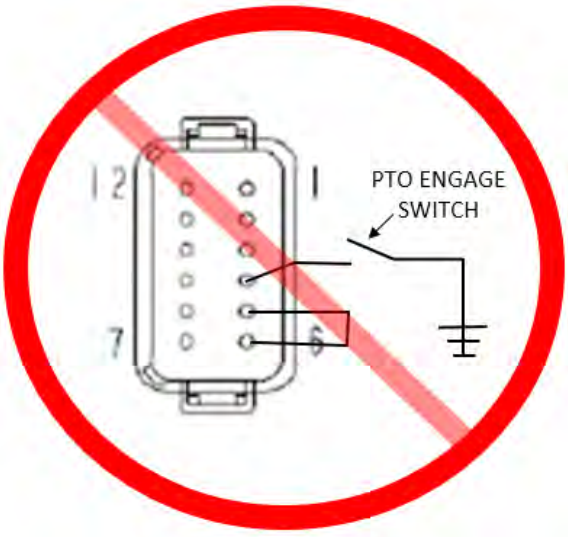


Pin	Description	Input/Output	Notes
1	Resume/Decelerate	DI, Active Low	
2	Set/Accelerate	DI, Active Low	
3	Return (VVRT)	GND (Sensor)	Twisted Triplet
4	Sensor (VVRT)	AI, +0-5V	Twisted Triplet
5	PTO Engaged	DI, Dual Active	Low = Engaged
6	Cruise Control On/Off	DI, Active Low	
7	+12V Body Ignition	IGN Bus, +12V	Fuse C_A6 (10 A)
8	Vehicle Ground	GND (Chassis)	Recommended source for all ground signals on this connector
9	Speed Limiter	DI, Dual Active	Low = Engaged
10	+5V Supply (VVRT)	DO, +5V	Twisted Triplet
11	+12V Body Ignition	IGN Bus, +12V	Fuse C_A6 (10 A)
12	Not Used, Cummins Only	N/A	

Figure 60 12-Pin Connector Pinouts (MX Only)

WARNING!

DO NOT install a permanent jumper wire between pin 5 and pin 6. May cause unexpected vehicle behavior.



12-PIN PTO CONNECTOR LOCATION IN ENGINE BAY – PACCAR MX ENGINES

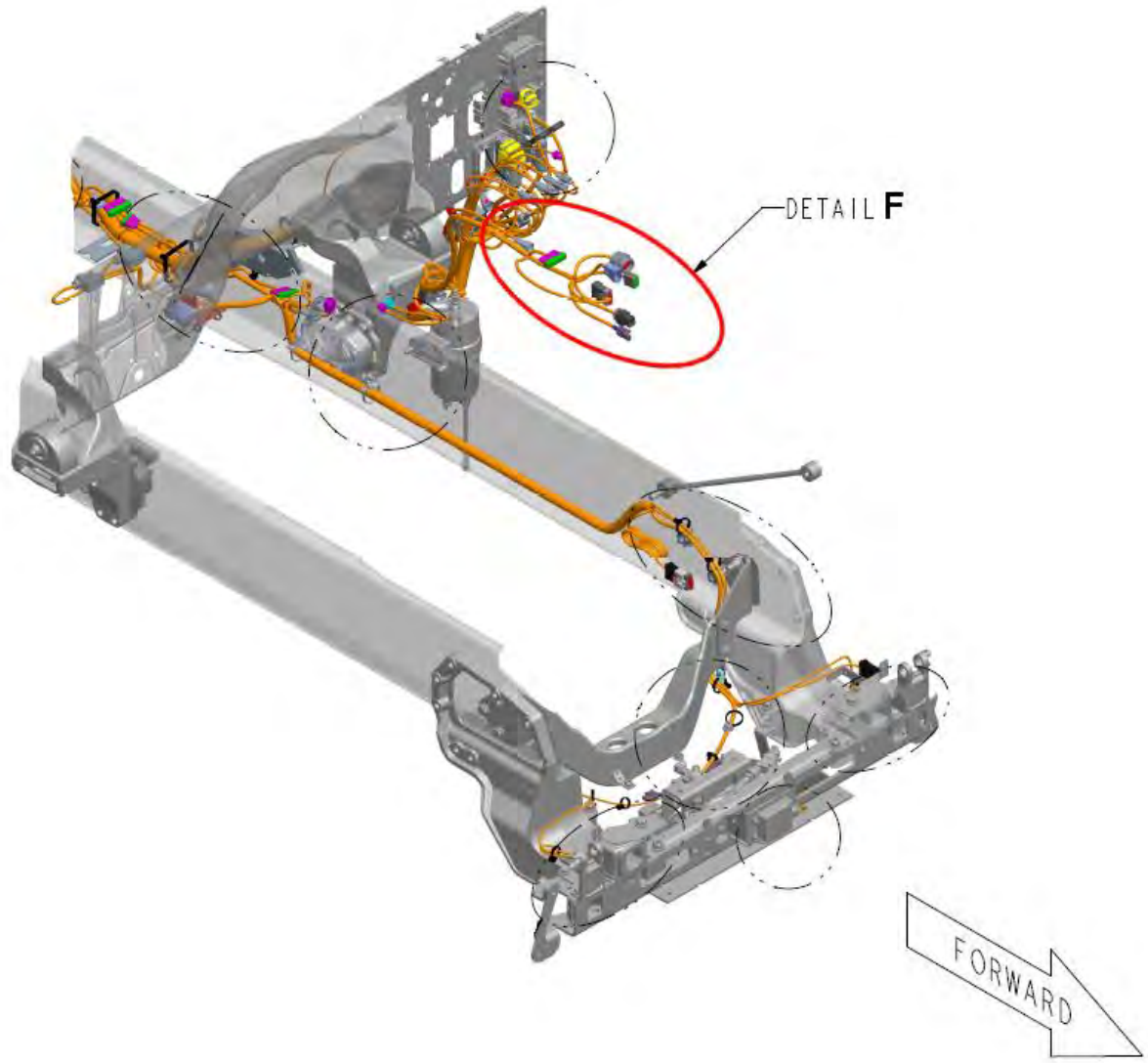
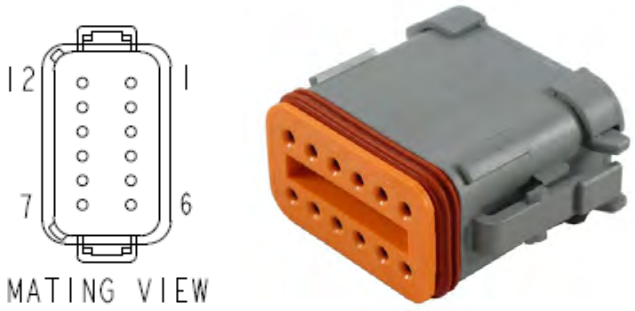


Figure 61 12-Pin PTO Connector in Engine Bay (MX Engines)

REMOTE THROTTLE AND REMOTE PTO CONTROLS (CONTINUED)

OPTIONAL 12-PIN PTO CONNECTOR - CUMMINS Engines

The 12-pin PTO connector is only present when the chassis is ordered with the appropriate PTO option(s). When equipped with Cummins engines, the 12-pin PTO connector will be located in the engine bay on the Cummins Engine harness. The Body IGN signal was moved off the engine harness connector, so for Cummins, the Chassis Harness will include the PTO layer to insert the Body IGN signal back into the 12-pin connector. Signals that feed directly to the engine ECM typically will be active low signals. Connect pin 3 and pin 5 for simple PTO ON/OFF signal. For remote throttle bump, you must connect pin 3 & pin 6. Having a momentary switch to signal ground on pin 2 and pin 1 will then increase/decrease engine speed. Engine speed will depend on how the engine is programmed. Unless otherwise specified, the engine is set by default for incremental speed increase. Full remote throttle control can be achieved with a twisted triple to pin 4, pin 10, and pin 11.



Pin	Description	Input/Output	Notes
1	Remote PTO Resume	DI, Active Low	
2	Remote PTO Set	DI, Active Low	
3	Switch Return	GND (Switch)	
4	Remote Throttle Sensor	AI, Ratio	Twisted Triplet, Continuous Variable Voltage
5	Remote PTO On/Off	DI, Active Low	
6	Cruise Control On/Off	DI, Active Low	
7	+12V Body Ignition	IGN Bus, +12V	Fuse C_A6 (10 A)
8	Vehicle Ground	GND (Chassis)	Recommended source for all ground signals on this connector
9	Unused	N/A	
10	+5V Sensor Supply	DO, +5V	Twisted Triplet
11	Sensor Return	GND (Sensor)	Twisted Triplet
12	Remote Throttle On/Off	DI, Active Low	

Figure 62 12-Pin Connector Pinouts (Cummins Engines)

12-PIN PTO CONNECTOR LOCATION IN ENGINE BAY – CUMMINS ENGINES

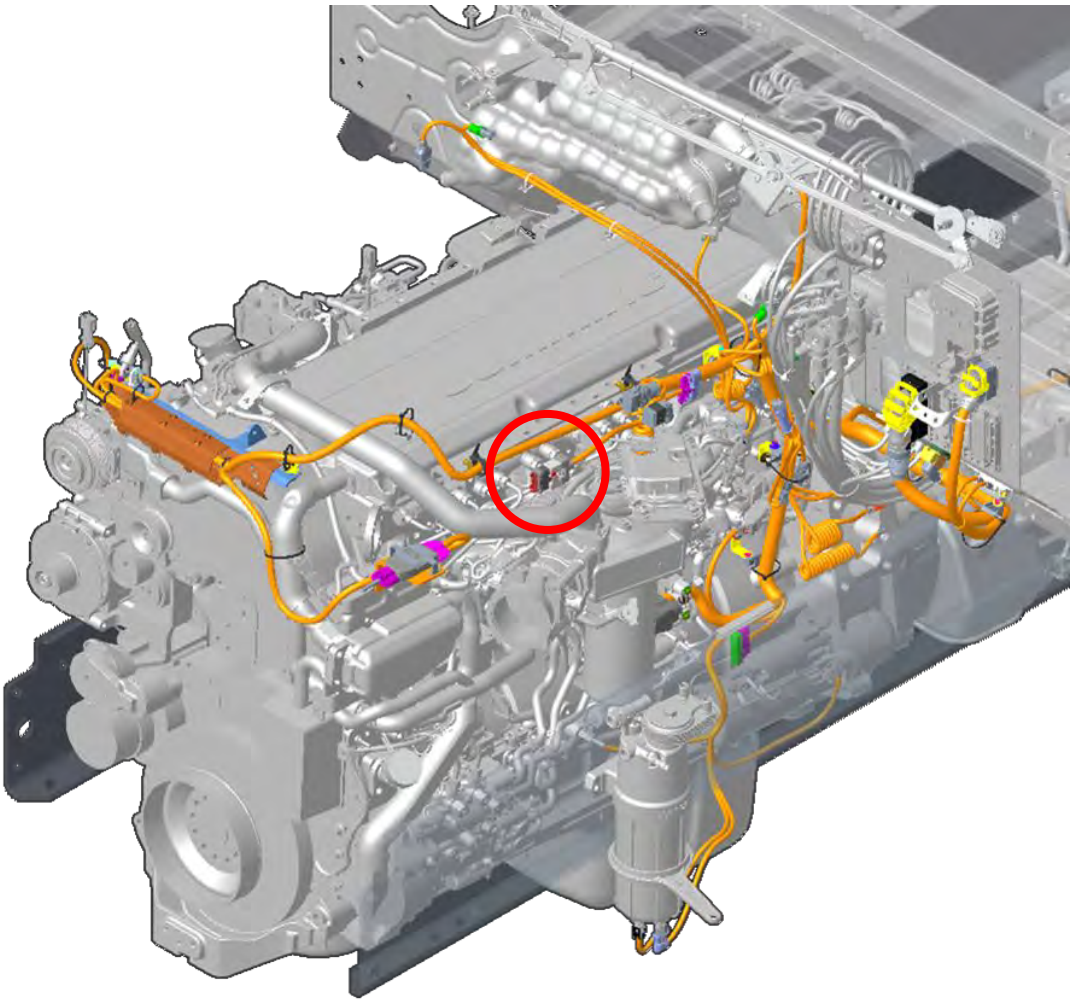


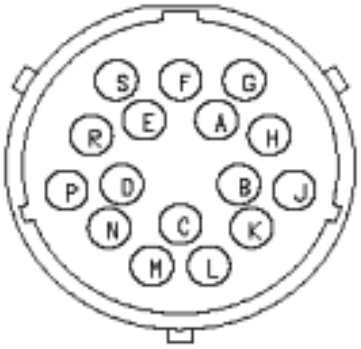
Figure 63 12-Pin Connector Location (Cummins Engine)

DUAL STATION CONTROLS

When equipped, dual station controls provide extra controls from a remote station outside of the cab. The option will include either a 16-pin or 23-pin connector. When the in-cab PTO control switch is switched to the “ON” position and the parking brake is applied, the engine will turn off unless the dual station remote run input is properly powered via the 16-pin or 23-pin connector. To power the remote run input, terminal “L” of the 16-pin connector or terminal “X” of the 23-pin connector will be powered with a +12V input which will power terminal 87 of the remote run relay. To operate the remote start input, terminal “F” of the 23-pin connector will be powered with a +12V input which will power terminal 85 of the remote run and remote start relays.

The following is a list of pin descriptions, and the required input or supplied output signal type for both the 16-pin and 23-pin connectors for both PACCAR MX and Cummins engines. Also following are examples of wiring connections for common items used.

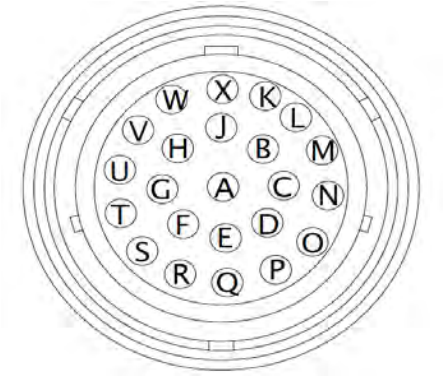
PACCAR MX ENGINES 16-PIN CONNECTOR



Pin	Description	Input/Output	Destination/Source
A	External Regeneration Notification	Output, Active High	External Regen Relay, Controlled by Pin C7 of Optional Chassis Module
B	Remote Run	Input 12V (+)	Pin 87A Remote Run Relay
C	Remote Start	Input 12V (+)	Pin 87 of Remote Start Relay.
D	Remote Throttle Sensor Supply	Output, 5V (+) Supply	Pin E2 of Standard Chassis Module
E	Remote Throttle Position	Input Variable 0-5V	Pin A18 of Standard Chassis Module
F	Remote Throttle Return	Analog Sensor Ground	Pin E1 of Standard Chassis Module
G	DEF Lamp Return	Not Used, Cummins ONLY	
H	Regeneration Lamp Return	Not Used, Cummins ONLY	
J	Tachometer (+)	Tachometer Output (+)	Body Builder Supplied sensor, Input on P669 Pin 1
K	Tachometer (-)	Tachometer Output (-)	Body Builder Supplied sensor, Input on P669 Pin 2
L	Remote ECM Power Engine Run	Input 12V (+)	Pin 87 Remote Run relay, supplies Pin 63 Engine ECM When Relay Active.
M	Engine oil Pressure	Output	Body Builder Supplied sensor, Input on J668
N	NOT USED	NOT USED	
P	Water Temp	Output	Body Builder Supplied sensor, Input on J667
R	J1939 K-CAN (+)	K-CAN (+)	Pin C42 of VECU
S	J1939 K-CAN (-)	K-CAN (-)	Pin C43 of VECU

Figure 64 16-Pin PTO Connector Pinouts (MX Engines)

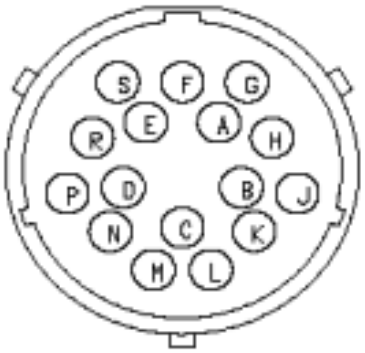
PACCAR MX ENGINES 23-PIN CONNECTOR



Pin	Description	Input/Output	Destination/Source
A	12 VDC IGN Power	Output 12V (+)	Tied To Pin L of 23 Way Conn. Dash PDC Fuse A6. 10A Fused
B	City Horn	Input 12V (+)	Pin 85 of Horn Relay
C	Check Engine Lamp	Output Active Low	Pin J2-60 of Engine ECM
D	Remote Start	Input 12V (+)	Pin 87 of Remote Start Relay
E	Remote Throttle Return	Analog Sensor Ground	Standard Chassis Module Pin E1
F	Remote Enable	Input 12V (+)	Pin 85 of Remote Start Relay. Pin 85 of Remote Run Relay
G	Remote Resume	Input Active Ground	Pin A6 of Standard Chassis Module
H	Remote Set	Input Active Ground	Pin A5 of Standard Chassis Module
J	Remote Throttle Position	Input, Variable 0-5V	Pin A18 of Standard Chassis Module
K	Remote Run	Input 12V (+)	Pin 87A Remote Run relay
L	12 VDC IGN Power	Output 12V (+)	Tied To Pin A of 23 Way Connector. Dash PDC Fuse A6. 10A Fused
M	J1939 K-CAN (-)	K-CAN (-)	Pin C43 of VECU
N	J1939 K-CAN (+)	K-CAN (+)	Pin C42 of VECU
O	Common Return (General)	Common Ground	Firewall Ground
P	Engine Oil Pressure	Output	Body Builder Supplied sensor, Input on J668
Q	Remote PTO ON/OFF	Input, Active low - 567 only Input 12V(+) - Legacy	Pin A9 of Standard Chassis Module - 567 only Pin 21 on engine ECM on Legacy
R	DEF Lamp Return	Not Used, Cummins ONLY	
S	Regeneration Lamp Return	Not Used, Cummins ONLY	
T	External Regeneration Notif	Output, Active High	External Regen Relay, Controlled by Pin C7 of Optional Chassis Module
U	Common Return (Switch)	Common Switch Ground	Firewall Ground
V	Cruise On/Off	Input Active Low	Pin A8 of Standard Chassis Module
W	Remote Throttle Sensor	Output, 5V (+)	Pin E2 of Standard Chassis Module
X	Remote ECM Power Engine	Input 12V (+)	Pin 87 Remote Run relay

Figure 65 23-Pin PTO Connector Pinouts (MX Engines)

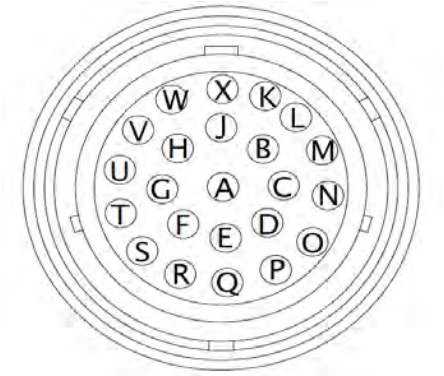
CUMMINS ENGINES 16-PIN CONNECTOR



Pin	Description	Input/Output	Destination/Source
A	External Regeneration Notification	Output, Active	Pin C7 From Chassis Module
B	Remote Run	Input 12V (+)	Pin 87A of Remote Run Relay
C	Remote Start	Input 12V (+)	Pin 87 of Remote Start Relay.
D	Remote Throttle Sensor Supply	Output, 5V (+) Supply	Pin 8 Engine ECM
E	Remote Throttle Position	Input Variable 0-5V	Pin 63 of Engine ECM
F	Remote Throttle Return	Analog Sensor Ground	Pin 32 of Engine ECM
G	DEF Lamp Return	Output Active Low	Pin 2 of Engine ECM
H	Regeneration Lamp Return	Output Active Low	Pin 23 of Engine ECM.
J	Tachometer (+)	Tachometer Output (+)	Body Builder Supplied Sensor, Input on P669 Pin 1
K	Tachometer (-)	Tachometer Output (-)	Body Builder Supplied Sensor, Input on P669 Pin 2
L	Remote ECM Power Engine Run	Input 12V (+)	Pin 87 of Remote Run Relay
M	Engine oil Pressure	Output	Body Builder Supplied Sensor, Input on J668
N	NOT USED	NOT USED	
P	Water Temp	Output	Body Builder Supplied Sensor, Input on J667
R	J1939 K-CAN (+)	K-CAN (+)	Pin 42 of VECU C
S	J1939 K-CAN (-)	K-CAN (-)	Pin 43 of VECU C

Figure 66 16-Pin PTO Connector Pinouts (Cummins Engines)

CUMMINS ENGINES 23-PIN CONNECTOR



Pin	Description	Input/Output	Destination/Source
A	IGN (Switch) Power	Output 12V (+)	Tied To Pin L of 23-Way Connector. Cab PDC Fuse A9 10A Fused
B	City Horn	Input 12V (+)	Pin 85 of Horn Relay
C	Check Engine Lamp	Output Active Low	Pin 72 of Engine ECM
D	Remote Start	Input 12V (+)	Pin 87 of Remote Start Relay.
E	Remote Throttle Return	Analog Sensor Ground	Pin 32 of Engine ECM
F	Remote Enable	Input 12V (+)	Pin 85 of Remote Start Relay. Pin 85 of Remote Run Relay
G	Remote Resume	Input Active Ground	Pin 19 of Engine ECM
H	Remote Set	Input Active Ground	Pin 12 of Engine ECM
J	Remote Throttle Position	Input, Variable 0-5V	Pin 63 of Engine ECM
K	Remote Run	Input 12V (+)	Pin 87A of Remote Run Relay
L	IGN (Switch) Power	Output 12V (+)	Tied To Pin A of 23-Way Connector. Cab PDC Fuse A9 10A Fused
M	J1939 K-CAN (-)	K-CAN (-)	Pin 43 of VECU C
N	J1939 K-CAN (+)	K-CAN (+)	Pin 42 of VECU C
O	Common Return (General)	Common Ground	Pin 57 of Engine ECM
P	Engine Oil Pressure	Output	Body Builder Supplied sensor, Input on J668
Q	Remote PTO ON/OFF	Input, Active Low	Pin 94 Engine ECM. Pin 85 of Eaton PTO Relay. Pin 85 of PTO Hour Meter Relay
R	DEF Lamp Return	Output, Active Low	Pin 2 of Engine ECM
S	Regeneration Lamp Return	Output, Active Low	Pin 23 of Engine ECM.
T	External Regeneration Notification	Output, Active	Pin C7 of Chassis Module
U	Common Return (Switch)	Common Switch Ground	Pin 62 of Engine ECM
V	Torque Limit Switch	Input Ground	Pin 93 Engine ECM
W	Remote Throttle Sensor Supply (+5V)	Output 5V (+)	Pin 8 Engine ECM
X	Remote ECM Power Engine Run	Input 12V (+)	Pin 87 Remote Run relay

Figure 67 23-Pin PTO Connector Pinouts (Cummins Engines)

CAB - POWER DISTRIBUTION CENTER

Power Distribution Box Assembly

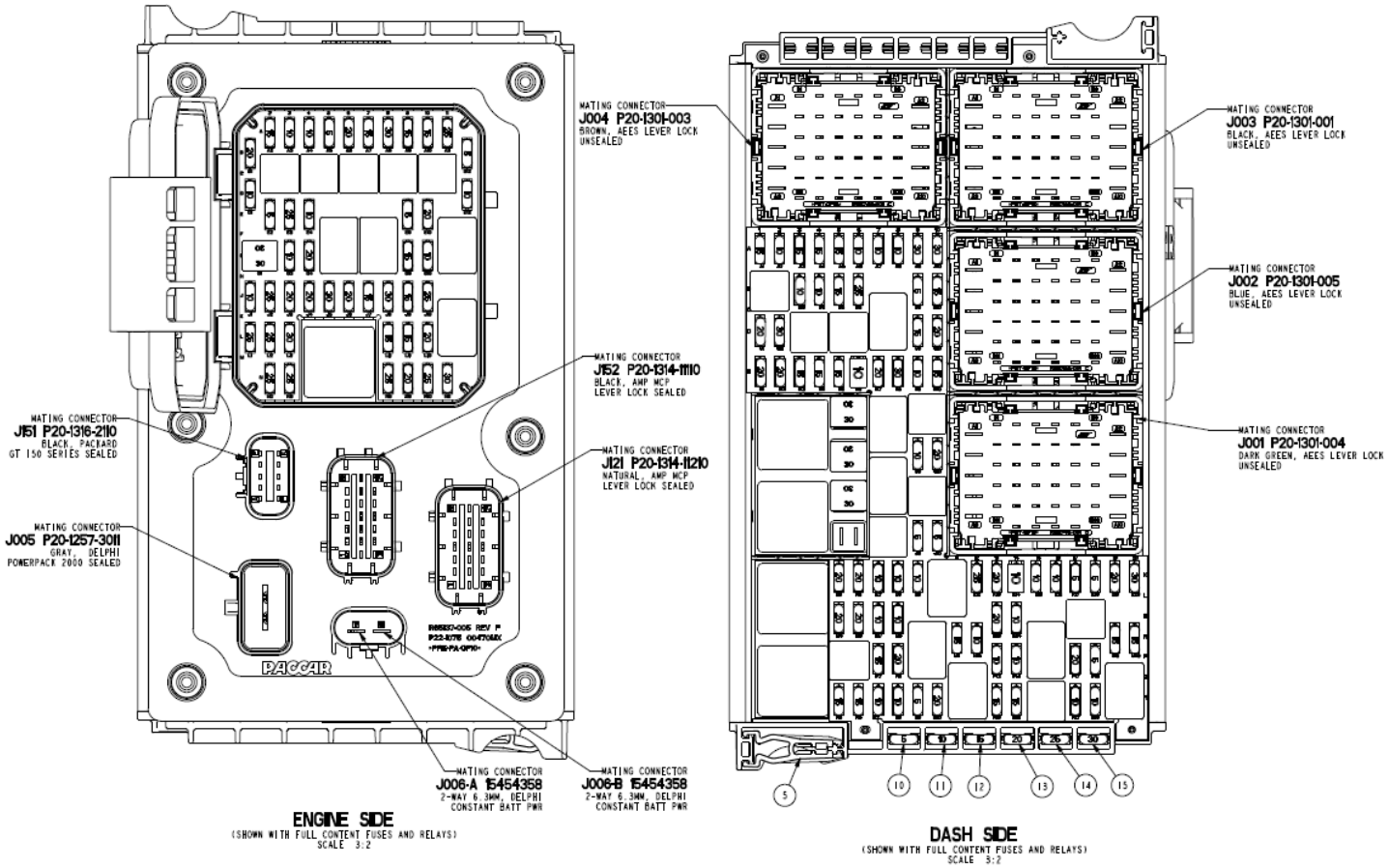
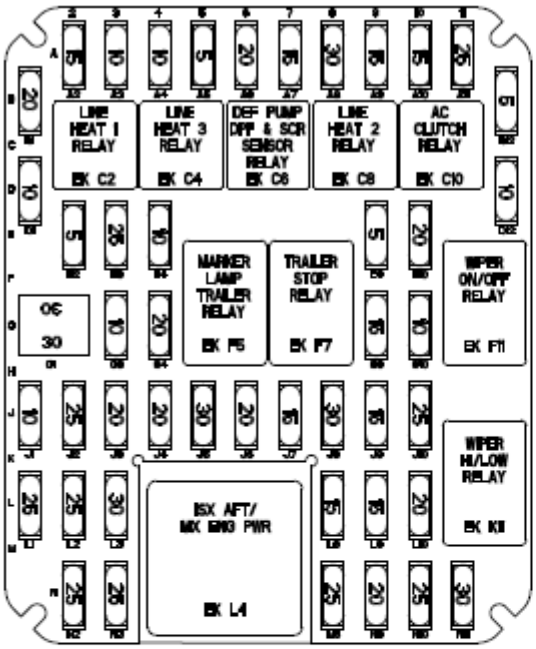


Figure 68 Power Distribution Box Assembly (PDC)
IMAGE SHOWN FOR REFERENCE ONLY, SEE THE CHASSIS SPECIFIC CAB PDC FUSE LABEL

Engine Side Fuse Box - Full Content Population

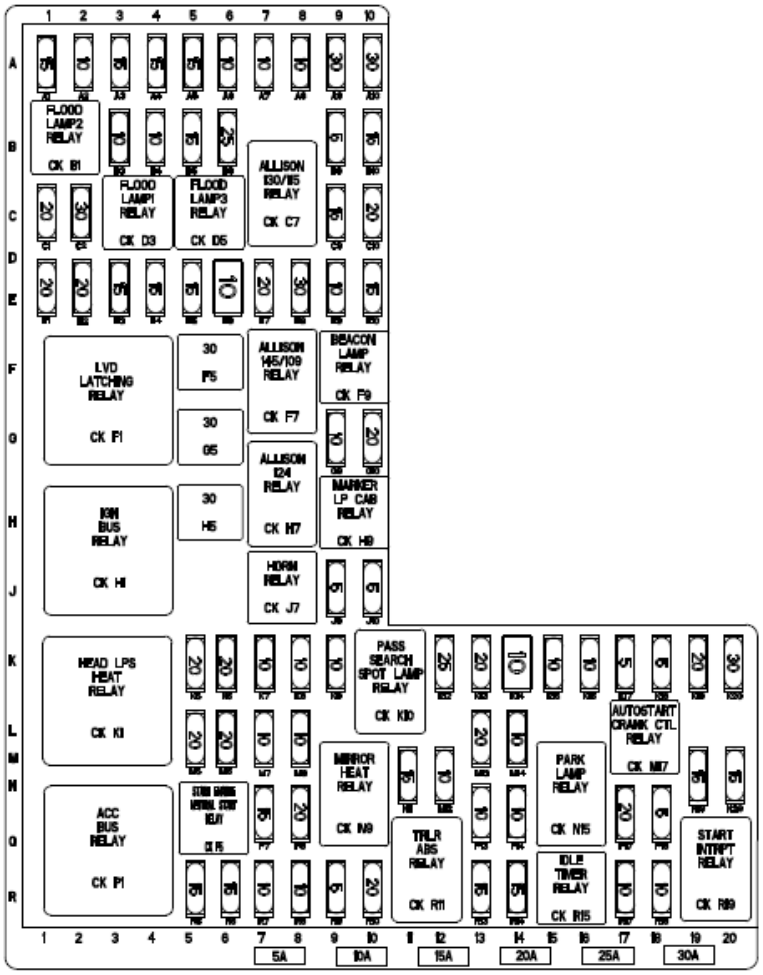


FUSE ID	FUSE AMP	TRACE RATING	DESCRIPTION
A2	15A	20A	LINE HEAT 1 (PRESSURE) -PWR
A3	10A	10A	ALLISON/AUTO/ULTRASHIFT
A4	10A	10A	CHASSIS MODULE
A5	5A	5A	LINE HEAT 3 (SUCTION)
A6	20A	20A	HDLP LH HI/BRAKE
A7	15A	15A	DEF PUMP/DPF/SCR
A8	30A	30A	CAB ABS
A9	15A	15A	LINE HEAT 2 (BACKFLOW) -PWR
A10	15A	15A	AUX TRAN/LIFT PUMP
A11	25A	25A	WIPER MOTOR
B1	20A	20A	EXT REGEN / SPARE IGN
B12	5A	5A	HVAC HEAD PWR / DOOR AJAR
D1	10A	10A	ACC RADAR/TPMS
D12	10A	10A	AC CLUTCH RELAY - PWR
E2	2A	5A	MX ENG ECU WAKE (ENG SD)
E3	25A	25A	OCM F6
E4	10A	10A	MUX SOL BANK 2
E9	5A	15A	MX LPC/CUM ICM PWR
E10	20A	20A	CCV PWR - 20A BATT
G1	30A JCASE	30A JCASE	HVAC BLDC MOTOR
G3	10A	10A	MUX SOL BNK 1
G4	20A	20A	OCM F4
G9	15A	15A	ISX AFT / MX ENGINE PWR
G10	10A	10A	VECU BATT PWR 1
J1	10A	10A	CAB ABS PWR -10A IGN
J2	25A	25A	RH HDLP LO/DRL/PRK
J3	20A	20A	LH HDLP LO/DRL/PRK
J4	20A	20A	SCM F7
J5	30A	30A	TRLR MARKER RELAY-PWR
J6	20A	20A	OCM F5
J7	15A	15A	BACKUP LAMP
J8	30A	30A	TRAILER STOP RELAY-PWR
J9	15A	15A	VTG
J10	25A	25A	WIPER ON CTL
L1	25A	25A	QUALCOMM TRLR TRACKS
L2	25A	25A	HDLP RH HI/FOG/DRL
L3	30A	30A	AUTO TRANS
L8	15A	15A	AFT/NOX/VSFD
L9	15A	15A	MX ENG ACC PWR
L10	20A	20A	TRICAN/DEF CTL/DOSER
N2	25A	25A	SCM F5
N3	25A	25A	SCM F6
N8	25A	25A	FRAME FUEL HEATER
N9	20A	20A	MX ENGINE PWR 1
N10	25A	25A	MX ECM
N11	30A	30A	MX PC12/CUM ECM

Figure 69 Engine Side Fuse Box

IMAGE SHOWN FOR REFERENCE ONLY, SEE THE CHASSIS SPECIFIC CAB PDC FUSE LABEL

Dash Side Fuse Box - Full Content Population



FUSE ID	FUSE AMP	TRACE RATING	DESCRIPTION
A1	15A	15A	FLOOD LAMP 2
A2	15A	20A	SPOT LAMP
A3	15A	15A	FLOOD LAMP 1
A4	15A	15A	FLOOD LAMP 3
A5	15A	15A	FLOOD BEACON PWR
A6	10A	10A	BODY IGN
A7	10A	20A	RP1226 IGN
A8	10A	20A	RP1226 BATT
A9	30A	30A	SLEEPER PDC 1
A10	30A	30A	SLEEPER PDC 2
B3	10A	10A	GAUGE CLUSTER
B4	10A	10A	VECU BATT PWR 2
B5	15A	15A	SPARE BATT 4
B6	25A	25A	PACCAR AMT/SPARE BATT
B9	5A	5A	WSM/SMARTWHEEL
B10	15A	15A	SPARE BATT 5
C1	20A	20A	DRIVE CAM BATT PWR
C2	30A	30A	SPARE ACC 7
C9	15A	15A	CB/RADIO POWER
C10	20A	20A	OCM F1
E1	20A	20A	DRIVE CAM IGN PWR
E2	20A	20A	CAMERA MIRRORS BATT PWR
E3	15A	15A	SPARE LVD 2
E4	15A	15A	POWER PORT 1
E5	15A	15A	POWER PORT 2
E6	10A	10A	CAB DOME LP +
E7	20A	20A	SPARE LVD 1
E8	30A	30A	RADIO AMPLIFIER
E9	10A	10A	QUALCOMM-BATT
E10	15A	15A	OCM F2
F5	30A JCASE	30A JCASE	RH DOOR MOD
G5	30A JCASE	30A JCASE	SLEEPER PDC 3
G9	10A	10A	EOAS
G10	20A	20A	TELEMATICS
H5	30A JCASE	30A JCASE	LH DOOR MOD
J9	5A	5A	DIAGNOSTIC POWER
J10	5A	5A	VECU LVD V SENSE
K5	20A	20A	LH HEADLAMP HEATER
K6	20A	20A	SPARE BATT 2
K7	10A	10A	HORN RELAY - PWR
K8	10A	10A	CAB MARKER PWR 1
K9	10A	10A	HADLEY BATT PWR
B12	25A	25A	WX ON ENG FUEL HT
B13	20A	20A	SPARE IGN 1
B14	10A	10A	ETRAC VALVE +
B15	10A	10A	VECU STOP LAMP SW
B16	10A	10A	PARK LAMP CAB PWR 1
B17	5A	5A	VECU / DIGITAL DISPLAY IGN PWR
B18	5A	5A	RH STALK SHIFTER
B19	20A	20A	OCM F3
N20	30A	30A	TRAILER HOT LINE
M5	20A	20A	RH HEADLAMP HEATER
M6	20A	20A	SPARE BATT 3
M7	10A	10A	SPLICE FEED IGN
M8	10A	10A	RH HEATED SEAT
M13	20A	20A	SPARE IGN 2
M14	10A	10A	SIGN LAMP SW
N11	15A	15A	RH MIRROR HEAT
N12	10A	10A	LH HEATED SEAT
N19	15A	15A	LH MIRROR HEAT
N20	15A	15A	PARK LAMP TRLR PWR
R5	15A	15A	DIGITAL MIRRORS BACKUP
R6	15A	15A	DIGITAL MIRRORS
P7	15A	15A	AIR DRYER
P8	20A	20A	LED FOG/DR COMBO LTS
P13	10A	10A	GAUGE CLUSTER
P14	10A	10A	DIGITAL DISPLAY BATT PWR 2
P17	20A	20A	SPARE BATT 1
P18	5A	5A	HVAC HEAD ACC
R7	10A	10A	SPARE ACC 6
R8	10A	10A	REMOTE DIAG
R9	5A	5A	VECU ACC PWR
R10	20A	20A	SPARE ACC 1
R13	15A	15A	SPARE ACC SW 3,4&5
R14	15A	15A	SPARE ACC SW 1&2
R17	10A	10A	SPARE ACC 4
R18	10A	10A	RADIO WAKE UP

* DENOTES OPTIONAL POLYSWITCH

Figure 70 Dash Side Fuse Box

IMAGE SHOWN FOR REFERENCE ONLY, SEE THE CHASSIS SPECIFIC CAB PDC FUSE LABEL

CHASSIS MODULE – MODELS T880/W990

There are two chassis modules available, with one primary chassis module standard on all trucks and a secondary chassis module for optional content. The primary chassis module will be mounted under the cab on the left hand side of the over-bell mounting bracket. The secondary optional chassis module will be located above the rail on the left hand side on the back of cab (BOC) crossmember. There are hardware and software based protections to prevent damage to the chassis modules. The chassis modules will generate and store faults to free up space for the VECU. The chassis modules can be diagnosed through the DAVIE service tool.

Chassis Module Locations

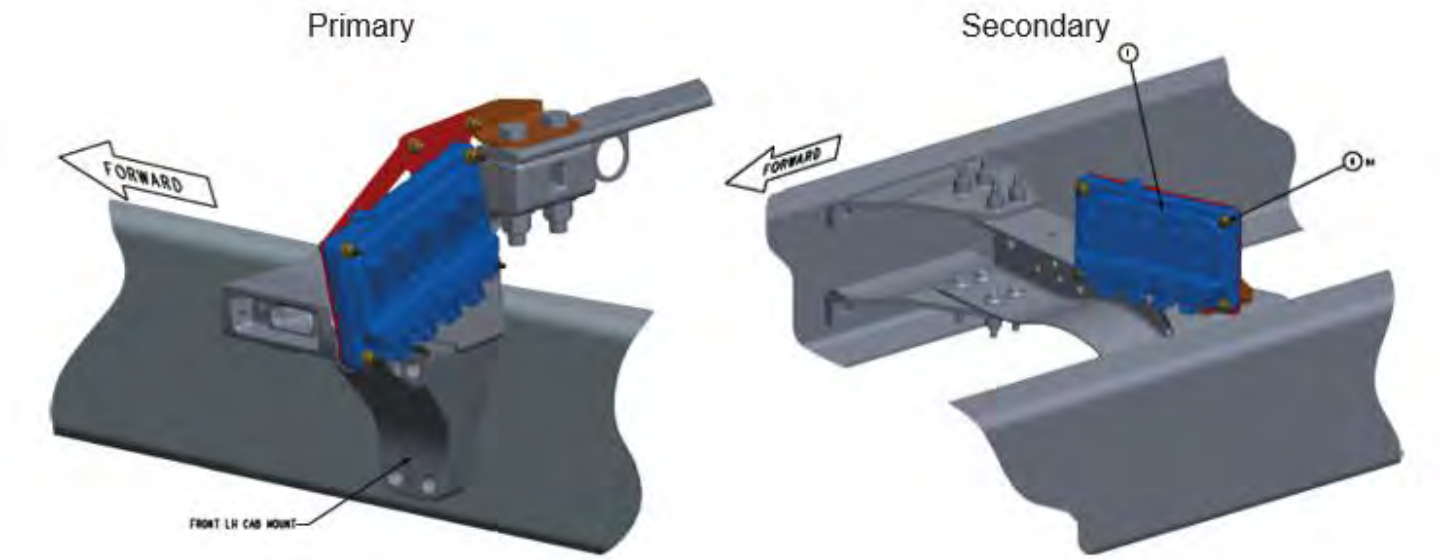


Figure 71 Chassis Module Locations

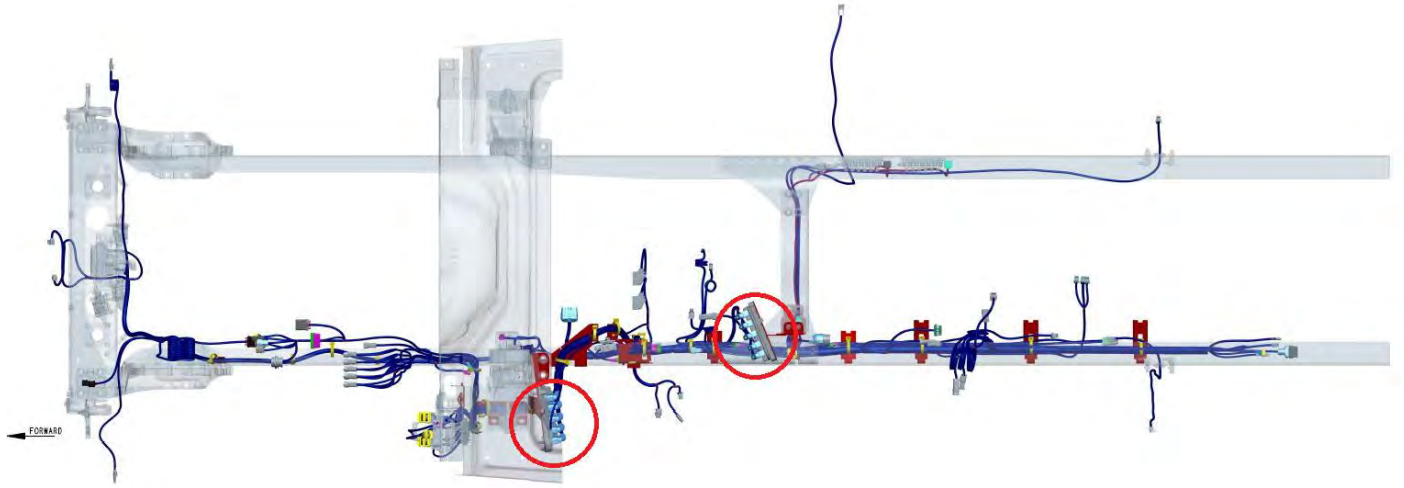


Figure 72 Chassis Module Locations (Plan View)

CHASSIS MODULE FUNCTION DESIGNATION

Primary Chassis Module

- Exterior Lighting: Headlamps, Park/Tail, Turn, Brake, DRL, Reverse etc.
- Axle Temperature Sensor Inputs Front Rear and Rear
- Ammeter Sensor Input
- Secondary Kingpin Release Solenoid Control
- Primary/Secondary Fuel Level Sensors
- Lift Axle Air Solenoid Controls 1st, 2nd
- Primary Transmission Neutral Position Switch
- Remote PTO/Throttle Control Inputs
- J-CAN Multiplexed EOA Solenoid Bank Control
- Fuel Filter Gauges
- Main Transmission Oil Temp
- PTO 1 Activation
- City Horn

Secondary Chassis Module

- External Notification of DPF Regeneration
- AT1202 Aux Trans Neutral Switch
- Axle Temperature Gauges Center Rear
- Lift Axle Air Solenoid Controls 3rd , Tag (Rocker Panel Controls)
- NAMCO/FABCO Splitshaft PTO/Transfer Case Sensors
- Aux Transmission Temperature Sensor
- Split Shaft PTO Temperature Sensor
- Fuel Temp Sensor (Auto Start)
- Snow Plow Lamp
- ISO 3731 Spare Outputs
- B-CAN (only on VMUX Electrical Architecture)
- Auto-Start/Stop Hood Tilt Switch
- PTO 2, 3, & 4 Activation

FUSE GROUPS

Table 50 Primary Chassis Module Fuse Group (EMUX)

Fuse Group	Function
F1	Electric Over Air Solenoid Kingpin Release
	Main Beam (aka High Beam) - LH
	Tractor Direction Indication and Hazard Lights - RH Rear (Brake Lamps Also)
F2	Tractor Direction Indication/Hazard/DRL Lights - LH Front
	Front Tractor Position lights (Park Lamps)
	Tractor Direction Indication Hazard Side Turn Indicator LH Front
	Dipped Beam (aka Low Beam) - LH
F3	Lift Axle #2 Solenoid
	Daytime Running Lights (DRL) Kenworth - LH
	Tractor Direction Indication/Hazard/DRL Lights - RH Front
	Tractor Direction Indication Hazard Side Turn Indicator RH Front
	Dipped Beam (aka Low Beam) - RH
F4	Daytime Running Lights (DRL) Kenworth - RH
	Main Beam (aka High Beam) - RH
	Fog/Driving Lights (Front) 1st Set
F5	Reverse Warning (aka Backup Alarm)
	(Rear) Direction Indication and Hazard Lights - LH Trailer
F6	Rear Tractor Position lights (Park Lamps)
	Reverse Lamps
	Tractor Direction Indication and Hazard Lights LH Rear (Brake Lamps Also)
F7	LVD Bipolar Output 1
	LVD Bipolar Output 2
	Lift Axle #1 Solenoid
	(Rear) Direction Indication and Hazard Lights - RH Trailer

Table 51 Secondary Chassis Module Fuse Group (EMUX)

Fuse Group	Function
F1	Work Lights 1st Set (Frame mounted Flood Light Options without pass-through grommet)
F2	Aftertreatment External Notification
F3	Sky/Auxiliary lights
	Snowplow Lamps OR Dual Station
F4	Lift Axle #3 Solenoid
	Trailer Options - ISO 3731/Spare OR Additional 4/6/7-Way Trailer Connections OR Berg Box
F5	Lift Axle #4 (Tag) Solenoid
	Trailer Options - ISO 3731/Spare OR Additional 4/6/7-Way Trailer Connections OR Berg Box
F6	Trailer Options - Trailer Dump Gate Coiled BOC OR Configurable Output
	Trailer Options - ISO 3731/Spare OR Additional 4/6/7-Way Trailer Connections OR Berg Box

Table 52 VECU Fuse Groups

Fuse Group	Function
F1	Kenworth Driving Lights
	Inside/Outside Air Filter Control
	Starter Interrupt / Start Enable Relay Control
	Mirror Heat Relay
	Cab Dome Lamp
	Sleeper Dome Lamp
	Trailer Marker/Clearance Lamps
	Supply KL-30
F2	Recirculating Header Fan - Low Speed
	Trailer Hotline Relay
	Work Lights (Flood Lamps) 2
	Work Lights (Flood Lamps) 3
	Allison MTD PTO Controls - PTO 2
	Allison MTD PTO Controls - PTO 1
	Passenger Spot Lamp
	Work Lights (Flood Lamps) 1
	Beacon/Strobe
	Trailer Brake Lamps
	Trailer/Cab Park Lamps
	Recirculating Header Fan - High Speed
	Digital Vision System – Mirrors (DVS-M)
	Start Signal
	Right Hand Steer
	LED Headlamps Heater
	PTO Engaged Output for PTO Hour Meter and PTO Telltale
	Footwell Lamp
	Supply KL-30
	Sensor Supply 5V
F3	Cab Marker/Clearance Lamps Relay Output
	Washer Pump Control
	Auxiliary Lamps/ Chicken Panel Lamps
	MCS (Power)
	Windshield Wiper Control
	Supply KL-30
F4	Dash PWM Backlighting
	Dash Illumination 2
	Ignition Timer Relay Control

ELECTRIC OVER AIR SOLENOIDS

Air solenoids are devices that translate the electrical signal into physical functions that controls the air pressure in various circuits. The air solenoids are mounted to a bracket outside the cab. The solenoids are designed to stack on each other so that they share a common air supply which reduces the amount of air lines on the vehicle.

The aftermarket installer/final vehicle manufacturer needs to decide what type of valve to install and ensure that the documentation to the operator provides them with enough understanding of how the customized switches work.

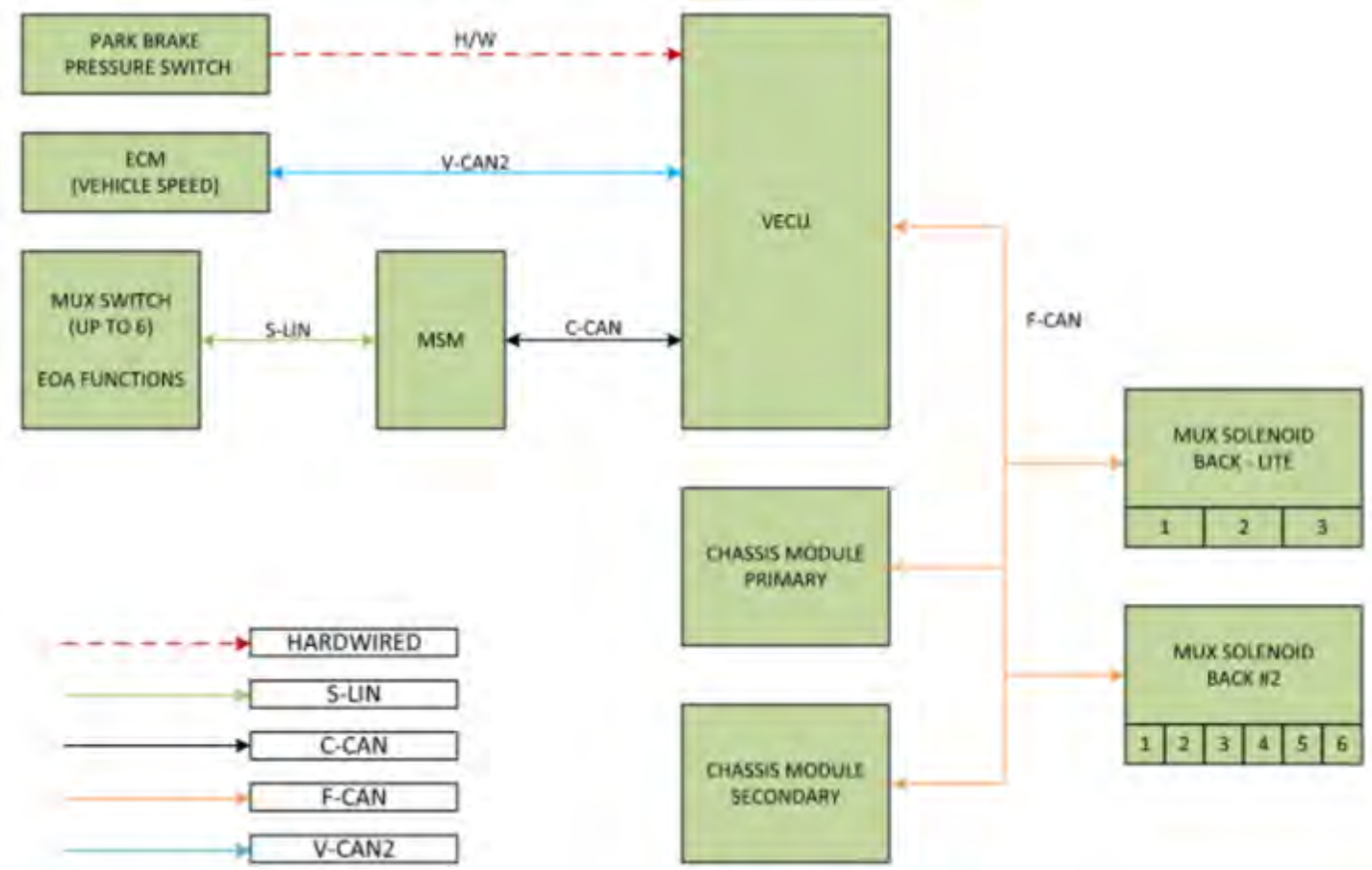
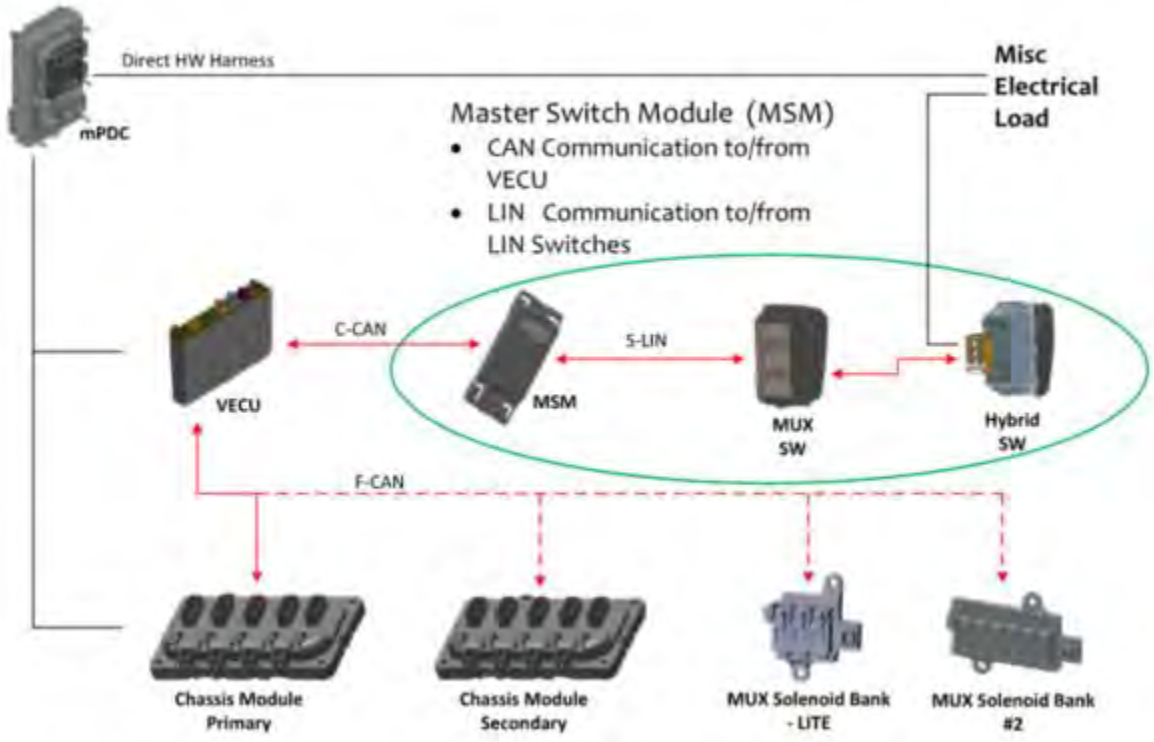
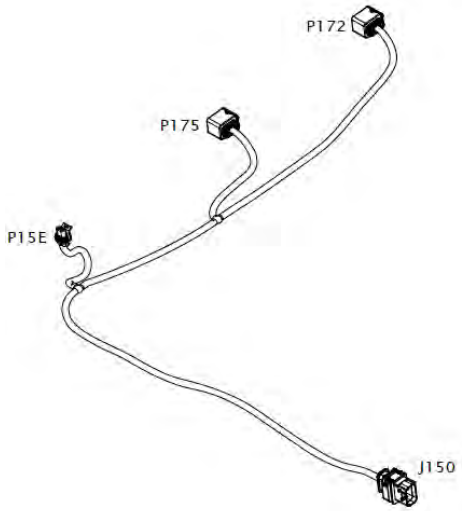


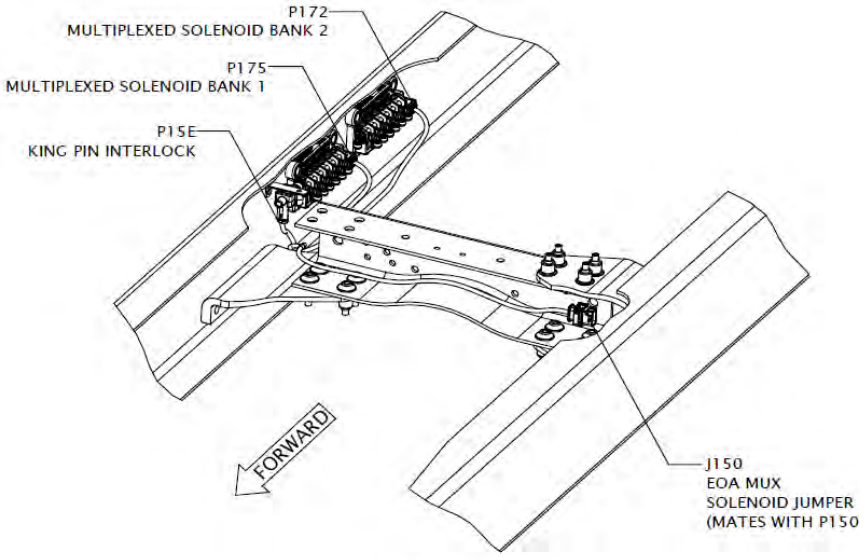
Figure 73 Electric Over Air Solenoid Bank Diagram

Overview Layout





HARNESS VIEW



ROUTING VIEW
(COPONENTS HIDDEN AND CUT FOR CLARITY)
(VIEW ROTATED)

SWITCHES

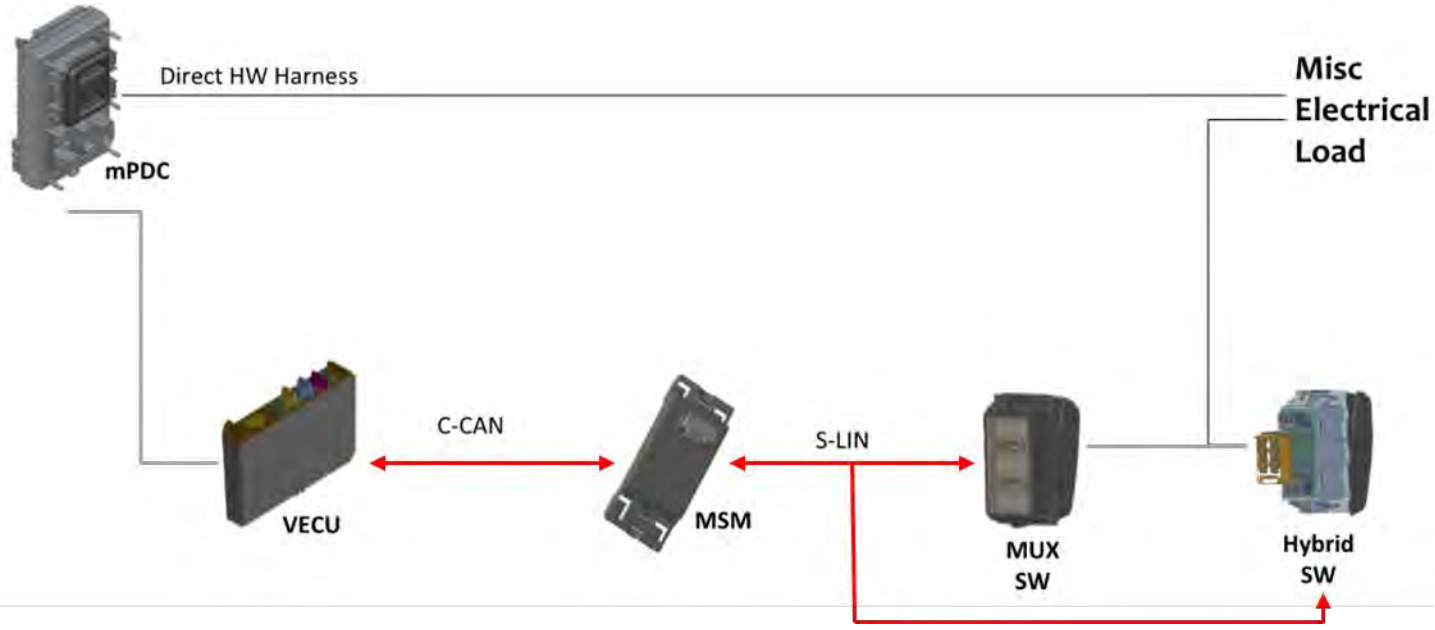


Figure 74 EOA Switch Function Overview

Multiplexing = shorter wire bundles, improved diagnostics, and greater driver feedback. Safety critical switches use hybrid switch with hardwire for redundancy. The switches are less expensive with fewer wires behind the dash and on the chassis. The switches are self-diagnosable to improve troubleshooting with DAVIE.
Master Switch Module (MSM)
LIN Communication to/from Switches
CAN Communication to/from VECU

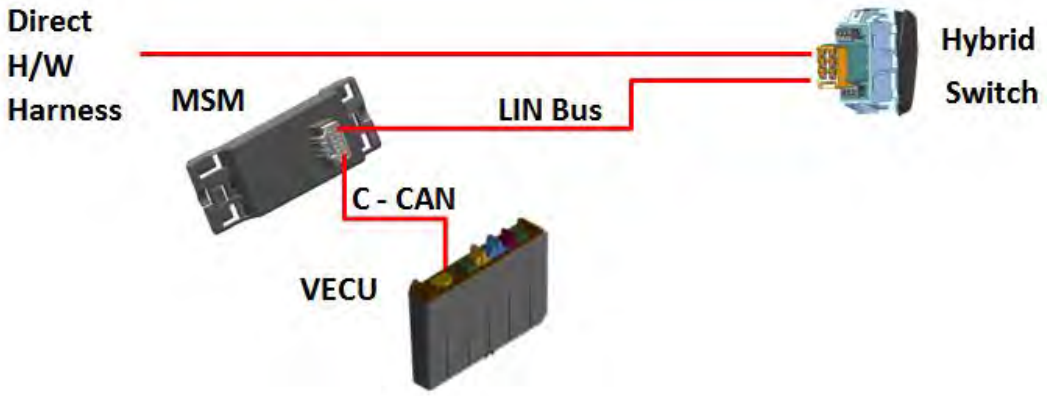
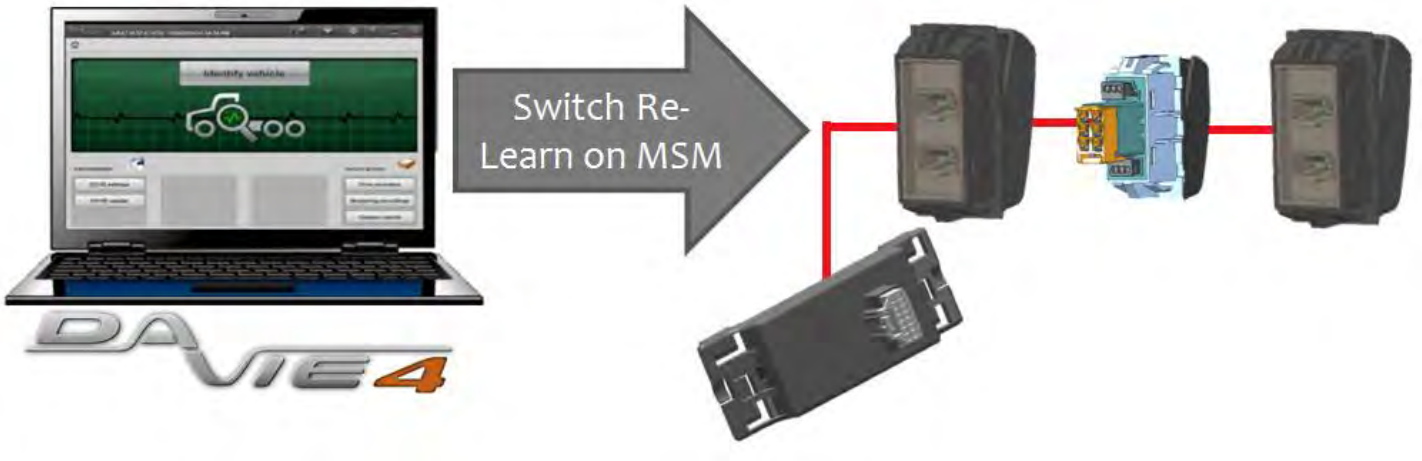


Figure 75 Spare Switch Function Overivew

Spare switches offer customers and body builders a convenient way to control power and air to various sources, like a body or trailer. They should be flexible and easily configurable to meet the vast and unique needs of body builders.

SWITCH RELEARN PROCESS



Switch replacement installation instructions:

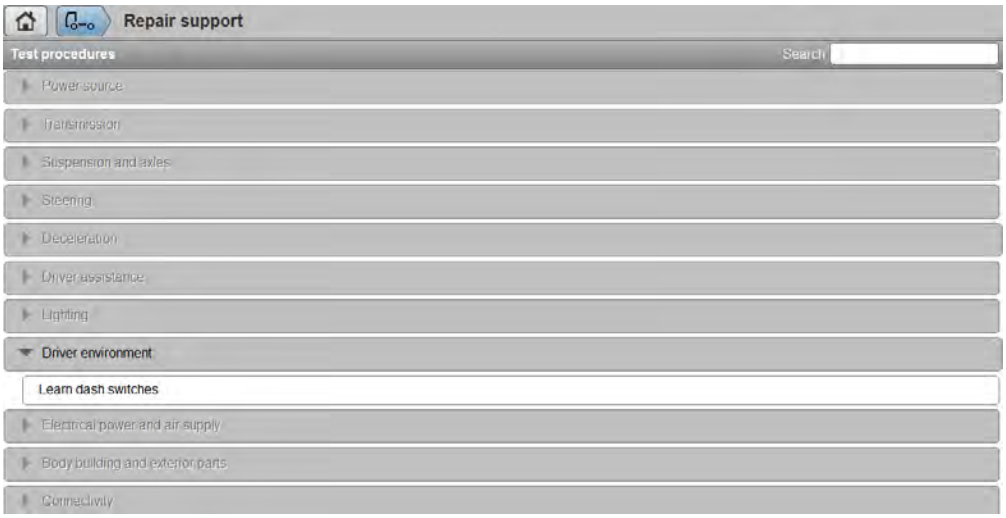
1. Turn off the engine and all switches
2. Remove dash panel
3. Unplug LIN jumpers from the original existing switch
4. Remove original switch
5. Replace the old switch with the new switch
6. Reconnect LIN jumpers into the replacement switch
7. Reinstall the dash panel
8. Open the DAVIE4 application and connect to the truck and identify the vehicle
9. Select the “Repair Support” tab.
10. Select the “Driver Environment” tab
11. Select the “Learn Dash Switches”
12. When prompted by DAVIE Cycle the key on and then off
13. Run “Quick Check”
14. Clear Inactive DTCs (Diagnostics trouble code) from MSM
15. Finished

New switch installation instructions:

1. Turn off the engine and put all switches into the off position
2. Remove the dash panels
3. Remove the switch blank
4. Add the new switch into the dash panel
5. Connect the LIN jumper between the last open switch to the newly installed switch
    a. Part Number S92-1127-0125
6. Reinstall the dash panel
7. Open the DAVIE4 application and connect to the truck and identify the vehicle
8. Select the “Repair Support” tab

9. Select the “Driver Environment” tab
10. Select the “Learn Dash Switches”
11. Cycle the key on and then off
12. Run “Quick Check”
13. Clear Inactive DTCs (Diagnostics trouble code) on the MSM
14. Finished

DAVIE Switch Relearn Screen View



Switch Location

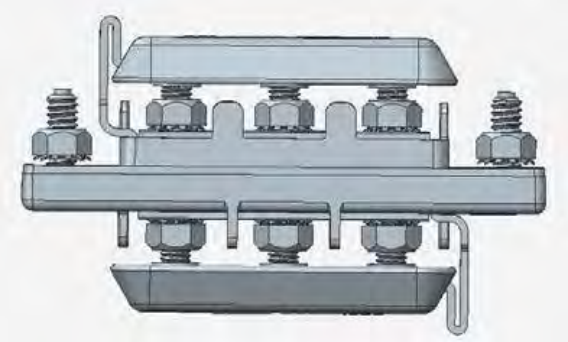
Switches on the same LIN bus can be reordered in any configuration without the need to run a relearn process with DAVIE4. Switches that are swapped across LIN busses will need to be relearned with DAVIE4. LIN bus 1 consists of all of the switches on the dash D-panel and B-panel. LIN bus 2 consists of all of the switches on the dash C-panel.

Dash Layout

GROUNDING

Grounding any post-OEM component/device/apparatus/etc. to the metal cab structure or frame is not acceptable. Failure to properly ground add-on components can result in vehicle damage and possibly bodily injury.

Ground all post-OEM components/devices/apparatus/etc. with combined current draw of less than 30A to the firewall ground buss bar with appropriately sized wire/cable for the load required.



Grounding Buss Bar Design

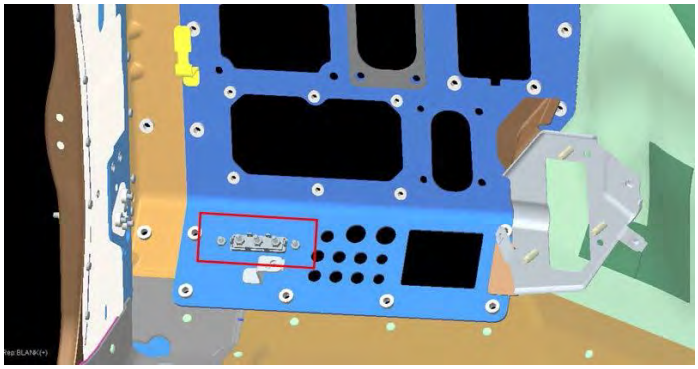


Figure 76 Grounding Point - Cab Interior Behind Driver's Side Kick Panel

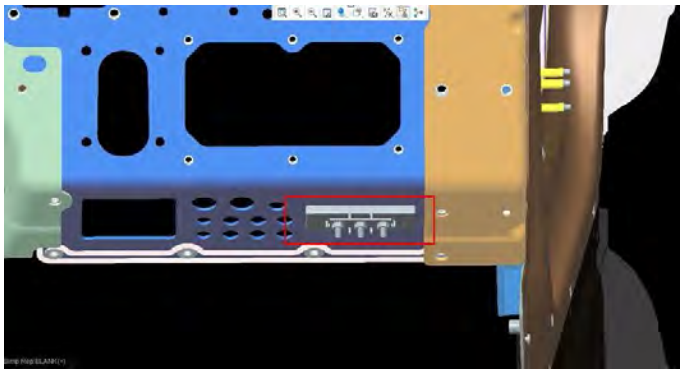
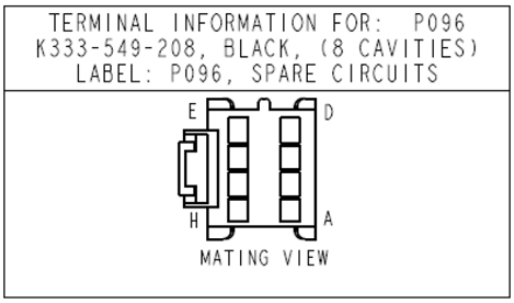


Figure 77 Grounding Point - Cab Exterior LH Side of Firewall

For all post-OEM components/devices/apparatus/etc. with combined current draw in excess of 30A, ground must be attained from vehicle batteries directly with appropriately sized wire/cable for the load required.

SPARE POWER

Spare power connector P096 is located on the lower left hand/driver side of the dash behind the kick panels. The mating harness is available from PACCAR parts with pre-labeled pigtails, part number S92-1250-1000.
NOTE: Any spare power requiring more than 20A must go directly to the battery box, not this spare circuit.



Pin	Description	Notes
A	Spare BATT #1	Fuse C_P17 (20A)
B	Spare BATT #2	Fuse C_G10 (20A)
C	Spare ACC #1	Fuse C_R10 (20A)
D	Spare GND	
E	Spare IGN #1	Fuse C_K13 (20A)
F	Spare IGN #2	Fuse C_M13 (20A)
G	Spare LVD #1	Fuse C_E7 (20A)
H	Spare Switch Backlight	

Figure 78 Spare Circuits Connector Part Number and Pinout Information

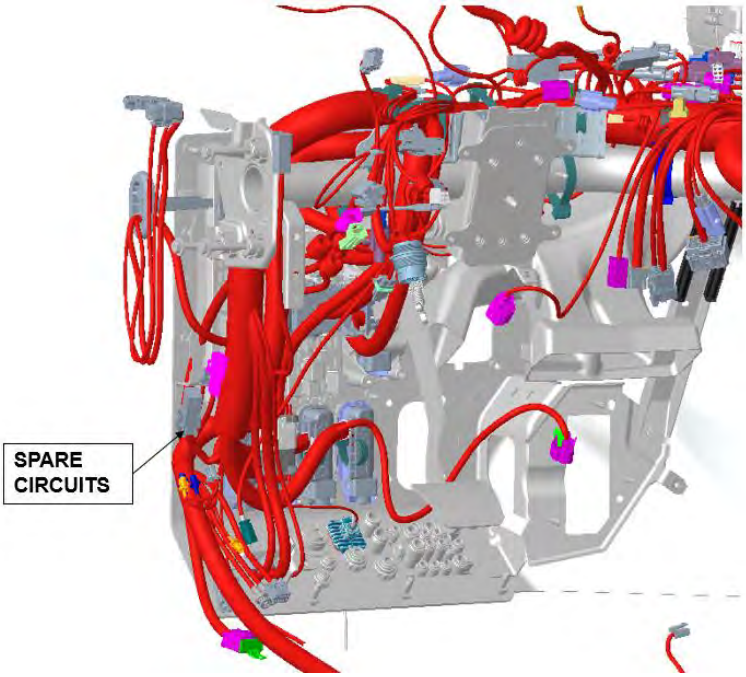


Figure 79 Connector Location – P096 SPARE CIRCUITS

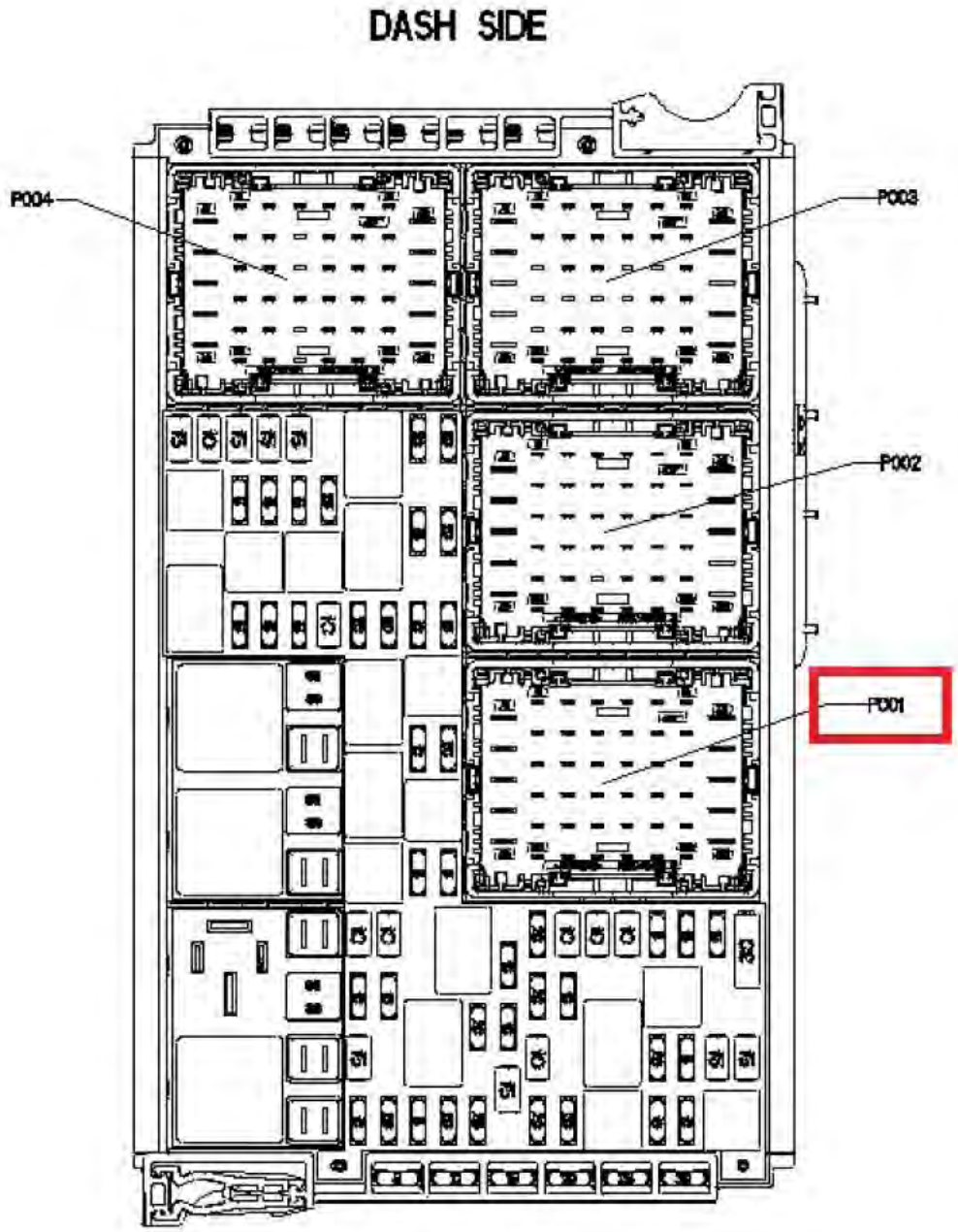


Figure 80 Spare Circuit Location on Power Distribution Center (Dash-Side, P001)

OPTIONAL JUNCTION BOX

The junction box provides access to lighting signals. The standard wiring for this code is as follows: park terminal, marker lamp, stop, ground, turn RH, turn LH & a trailer ABS line. Trailer hot line is fused for 25A. Wiring of the junction box contains the same circuits that are included in a J560 receptacle.

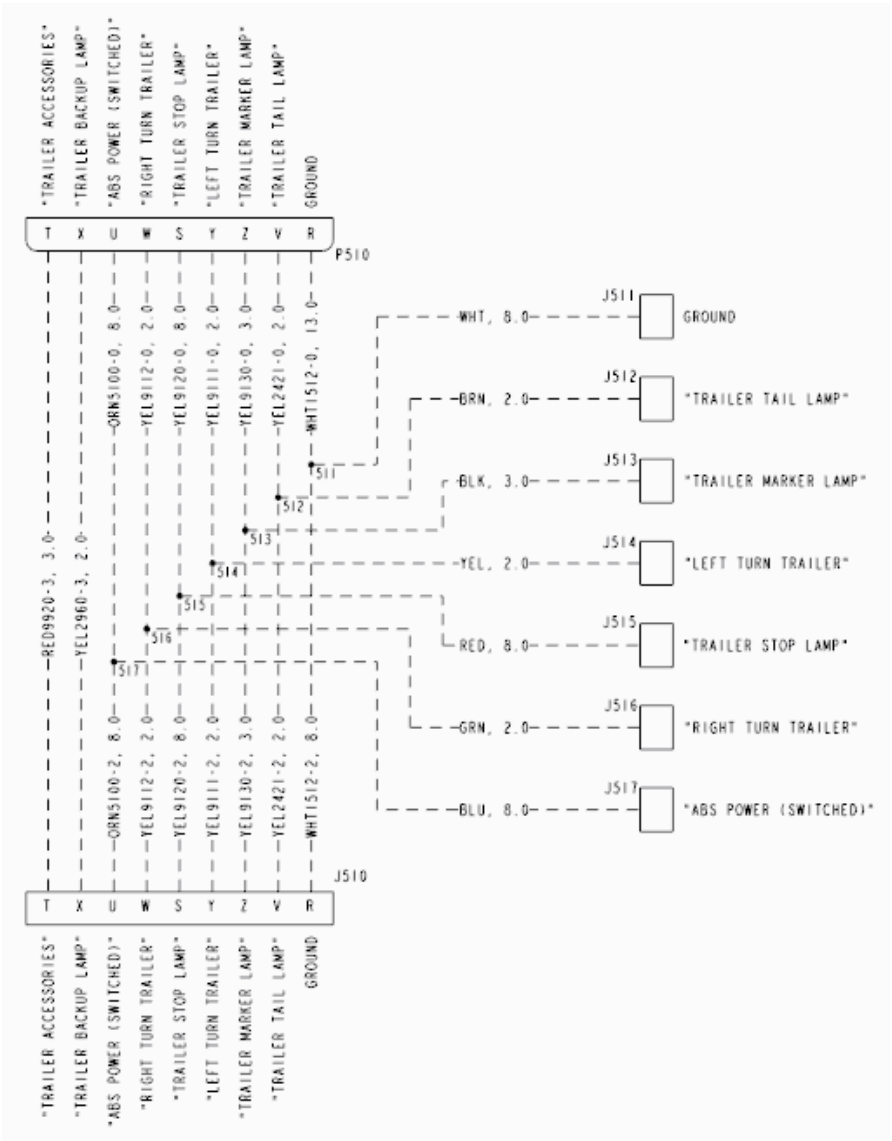
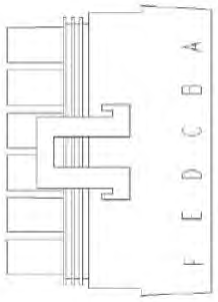


Figure 81 Junction Box Wiring at BOC or EOF

TRANSMISSION BACK-UP SIGNALS

The transmission back-up signal can be accessed from pin D of the 6-pin taillight connector located in the chassis harness at the end of frame. It will either be connected to a taillight, a jumper harness, or tied up in the frame rail if no taillights are provided from the factory.

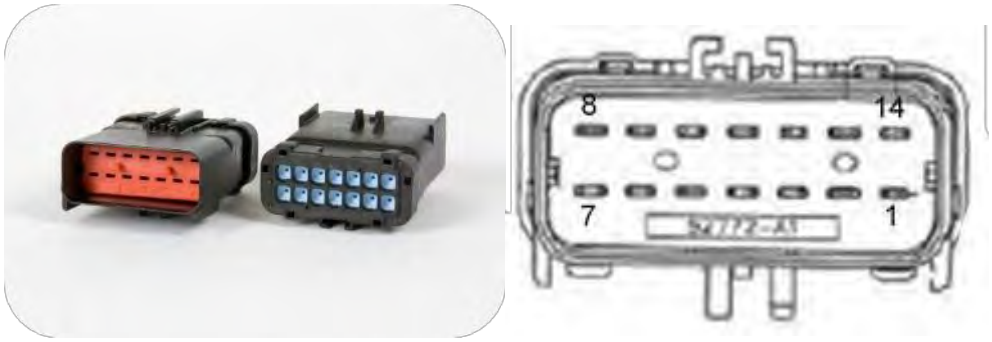


PIN	CIRCUIT DESCRIPTION
A	Park Lamp
B	Left Turn/Stop Lamp
C	Right Turn/Stop Lamp
D	Backup Lamp
E	Aux Chassis
F	Ground

Figure 82 Mating Connectoe For Transmission Back Up Signals: Packard Part Number 12020786

OPTIONAL SNOWPLOW LIGHTING

When the optional switch and wiring for snowplow lights are ordered, the truck will include a switch on the dash to control the snowplow lights and a 14-pin connector for the body builder at the front of the chassis.



Pin	Description
1	LOW BEAM LH
2	LOW BEAM RH
3	HIGH BEAM LH
4	HIGH BEAM RH
5	TURN INDICATOR LH
6	TURN INDICATOR RH
7	MARKER LAMPS
8	NOT USED
9	SNOWPLOW GROUND
10	SNOWPLOW GROUND
11	TURN INDICATOR, LH DRL
12	TURN INDICATOR, RH DRL

Figure 83 Snowplow Lighting Pinouts

LIFT AXLES (PUSHERS & TAG)

All truck lift axles (pushers and tag) are direct wire Electric-Only. The wiring comes from the Primary Chassis Module or Secondary Chassis Module and goes directly to the axle mounted solenoid. This does not come from the EOA Solenoid Bank. The activation signal comes from either a dash mounted MUX switch or a hardwired switch that is mounted outside of the cab. There is a maximum total of four lift axle controls available: 3 pushers and 1 tag axle, or 4 pushers and no tag axle. These are controlled with separate switches by default, but it is possible to have a single switch control all axles if they are the same type. The customer can order the following configurations: steerable, non-steerable, with auto-reverse, and with park brake interlock. A lift axle comes with a control switch (single or separate), a gauge, and a pressure regulator valve.

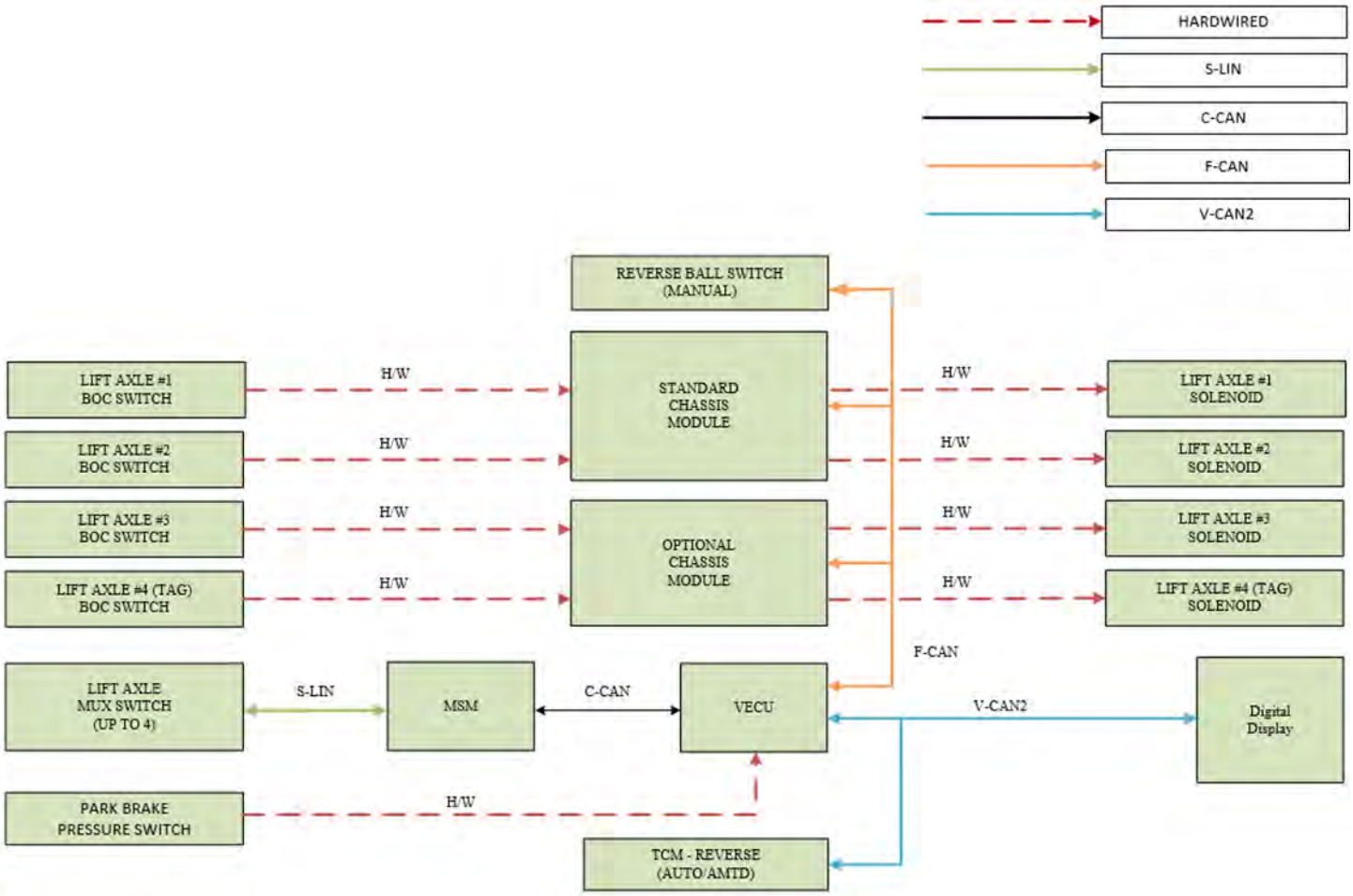


Figure 84 Lift Axle Communication Diagram

Table 53 Lift Axle Logic

Lift Axle Type	"Raise" Condition Logic	"Lower" Condition Logic
Steerable Lift Axle w/o Auto-Reverse	- Lift Switch is Inactive OR - Park Brake Active OR - Trans in Reverse	- Lift Switch is Active AND - Park Brake Inactive AND - Trans Not in Reverse
Steerable Lift Axle with Auto-Reverse OR Non-Steerable Lift Axle w/o Park Brake	- Lift Switch is Inactive OR - Park Brake Active	- Lift Switch is Active AND - Park Brake Inactive
Non-Steerable Lift Axle with Park Brake	- Lift Switch is Inactive AND - Park Brake Inactive	- Lift Switch is Active OR - Park Brake Active

Trailer Lift Axles

Trailer lift axles can be either EOA or Electric-Only type. There are two available EOA trailer lift axle controls using latching solenoids. If one axle is ordered, the customer will receive a switch labeled "Trailer Lift Axle". If two axles are ordered, the customer can have a single switch that controls both axles or two switches to control them separately. If two switches are present, they are labeled "Forward Trailer Lift Axle" and "Rear Trailer Lift Axle".

15-INCH DIGITAL DISPLAY IN DASH

Figure 85 Kenworth Digital Display

PHYSICAL 52MM ROUND GAUGES

Gauges and switches are fastened directly to the dash panels. Once the panel is removed from the dash, the gauge or switch can be installed. Gauges are held by a screwed-on collar while switches have a plastic tab.

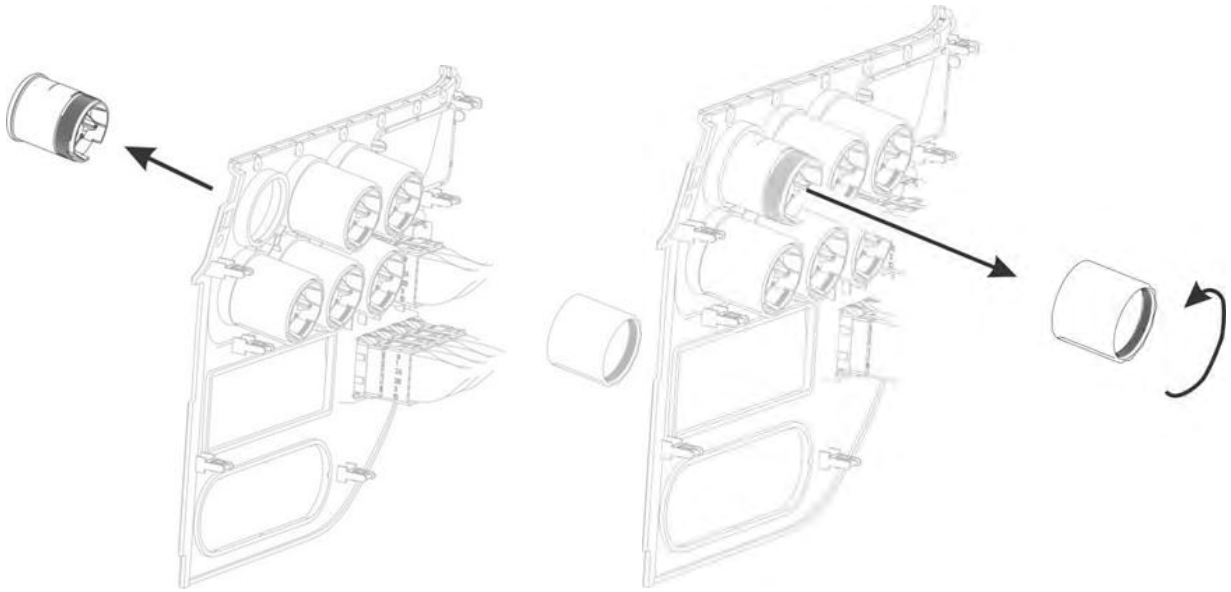


Figure 86 Gauge Removal

Optional gauges may be installed and connected to the Digital Display via a jumper harness.

TELLTALE ICONS

Custom Telltales are no longer available with a physical card inserted into the dash cluster. Instead, the body builder telltales will populate on the digital portion of the display from a limited list and can be reconfigured using PVP (PACCAR Vehicle Pro) at your local Kenworth dealership. The location of the telltale icon will be dependent on the configuration of the vehicle and what other telltale icons are present on the digital display.

TELLTALE CONNECTOR LOCATIONS BEHIND THE DASH

Remove the center kick panel under the dash cupholders to access the wiring for the telltale connectors.

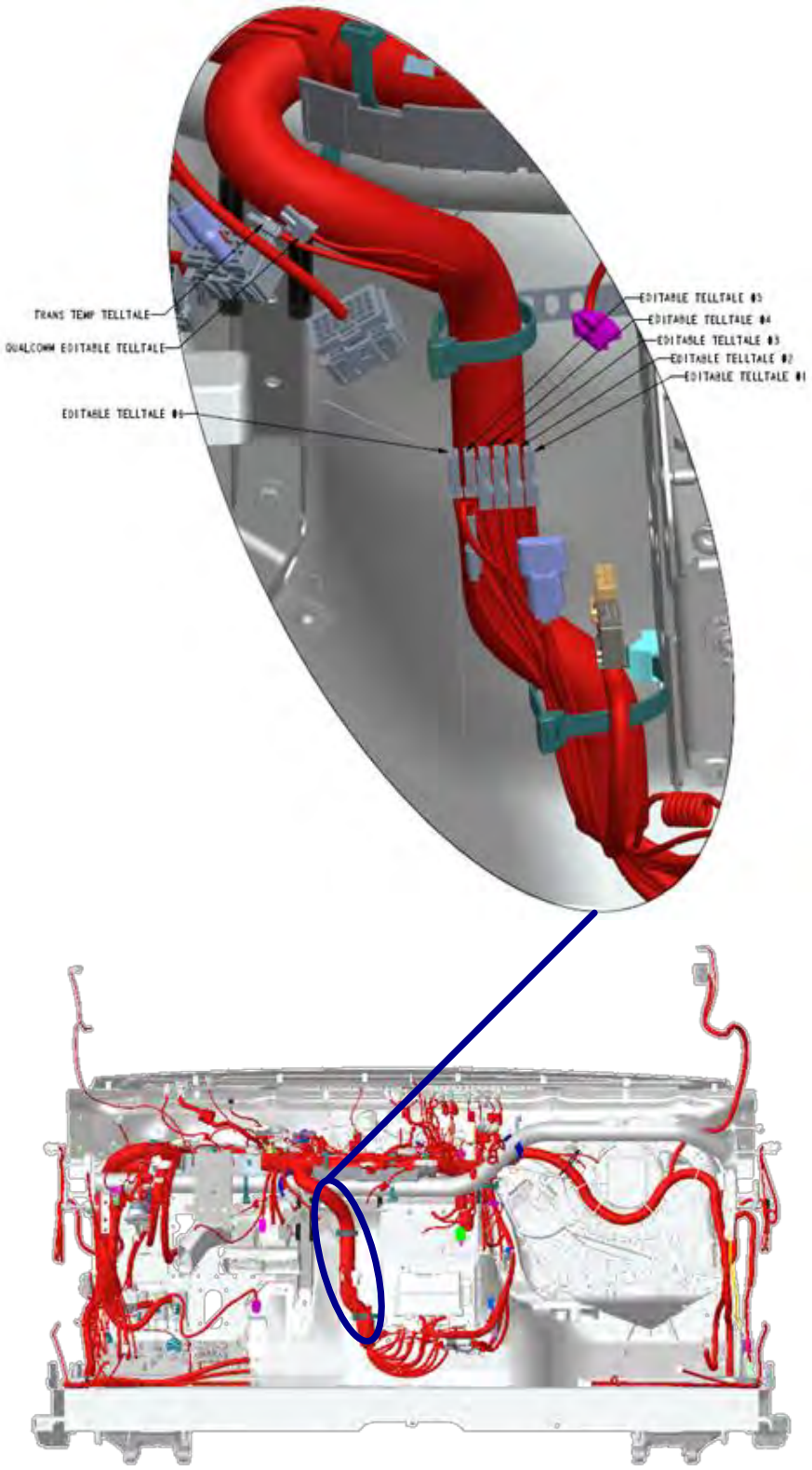


Figure 87 Telltail Harness Connections (Behind Dash)

SECTION 8 POWER TAKE-OFF (PTO)

INTRODUCTION

A Power Take Off (PTO) provides a way to divert some or all of the truck's engine power to another component. There are a wide variety of PTO options available.

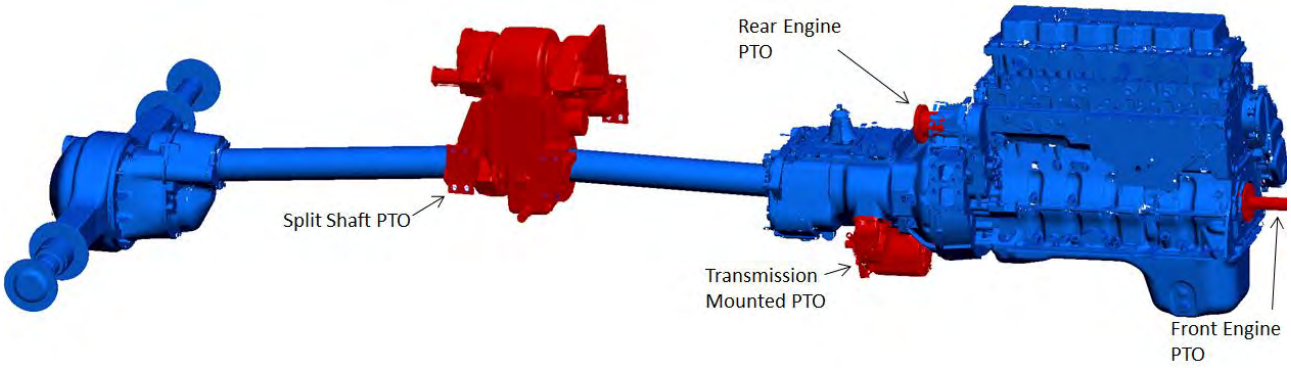


Table 54 PTO Acronym Library

Acronym	Definition	Acronym	Definition
ABS	Anti-Lock Braking System	PDC	Power Distribution Center
CAN	Controller Area Network	PGN	Parameter Group Number
CC	Cruise Control	PMC	PTO Mode Control
DEF	Diesel Exhaust Fluid	PSC	PTO Speed Control
DTC	Diagnostics Trouble Code	PTO	Power Take Off
ECM	Engine Control Module	PVP	PACCAR Vehicle Pro
ECU	Electronic Control Unit	RP1226	TMC Messaging Standard
EIST	Engine Idle Shutdown Timer	SCM	Standard Control Module
EOA	Electric Over Air	SCR	Selective Catalyst Reduction
EOH	Electric Over Hydraulic	SPN	Suspect Parameter Number
FIC	Fast Idle Control	TCM	Transmission Control Module
J1939	SAE CAN Communication Standard	TSC1	Torque Speed Control (request)
LIN	Local Interconnect Network	VECU	Vehicle Electronic Control Unit
MSB	Multiplexed Solenoid Bank		
MSM	Master Switch Module		
MUX	Multiplexed		
OBD	On-Board Diagnostics		
OCM	Optional Control Module		
OEM	Original Equipment Manufacture		
PCC	Predictive Cruise Control		

TRANSMISSION MOUNTED PTO

MANUAL TRANSMISSIONS

On a manual transmission, there are two locations for PTO's, with a potential for a third location depending on model. There is a 6-bolt PTO on the right and an 8-bolt PTO on the bottom left. When a third PTO location is available, it will be a 4-bolt thru shaft or extended countershaft PTO on the rear side of the transmission. When using a thru shaft PTO, the vehicle must be spec'd with the correct option as not all transmissions will be set up for use with thru shaft PTO's. For more information, go to www.roadranger.com and enter "PTO Installation Guide" in the search bar in the upper right corner.

Regarding packaging and clearance, a 6-bolt PTO on the right will typically clear most components when the DPF/SCR are located right hand side under the cab. This is also true when 30° and 45° adapters are used.

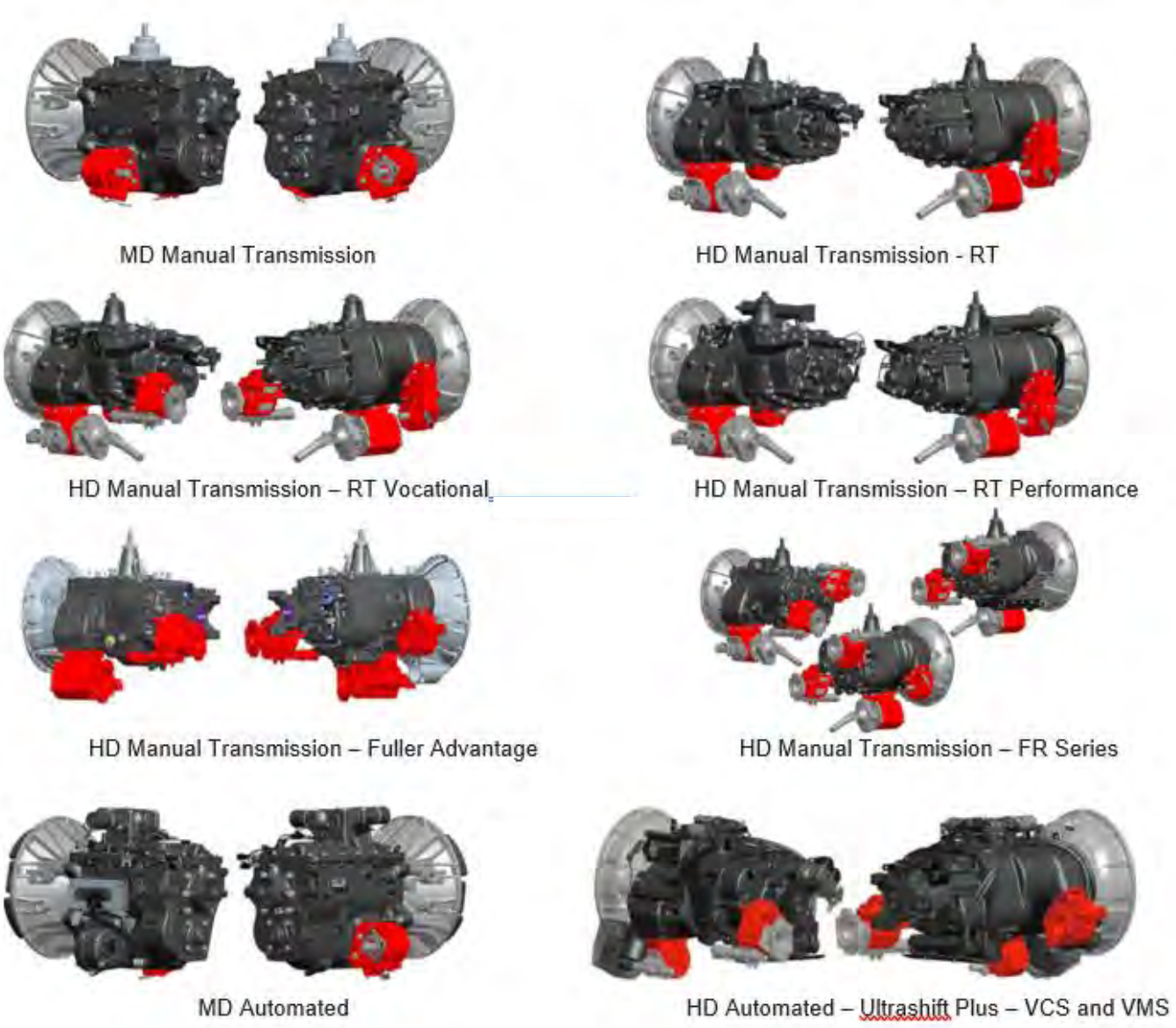


Figure 88 Typical Manual and Legacy Automated Transmission PTO Locations

AUTOMATIC TRANSMISSIONS

On Allison automatic transmissions, there can be no more than two PTO's at once. The Allison 4000RDS with PTO Provision series has PTO locations at 1 o'clock and 8 o'clock, when viewed from the back of the transmission. The Allison 4000HS transmissions do not have any PTO locations. The Allison 3000RDS with PTO Provision series transmissions have PTO locations at 4 o'clock and 8 o'clock. For more information on using PTO's with an Allison transmission, go to www.allisontransmission.com and refer to the "Rugged Duty Series Brochure" and "PTO Request Flyer" which is available in a 1000/2000 version and a 3000/4000 version.

On Allison 4000RDS with PTO Provision series transmissions, most PTO's will fit in the 1 o'clock position without interfering with the cab. If a wet kit is used here, the dipstick housing will most likely need to be modified as it runs over the top of the transmission to the driver side of the vehicle. The PTO in the 8 o'clock position is typically ok. There are some scenarios where the PTO will be very close to or could interfere with the rear spring shackle on the front suspension. This problem can occur on vehicles with a set-back front axle and the problem is amplified on the short hood truck models.

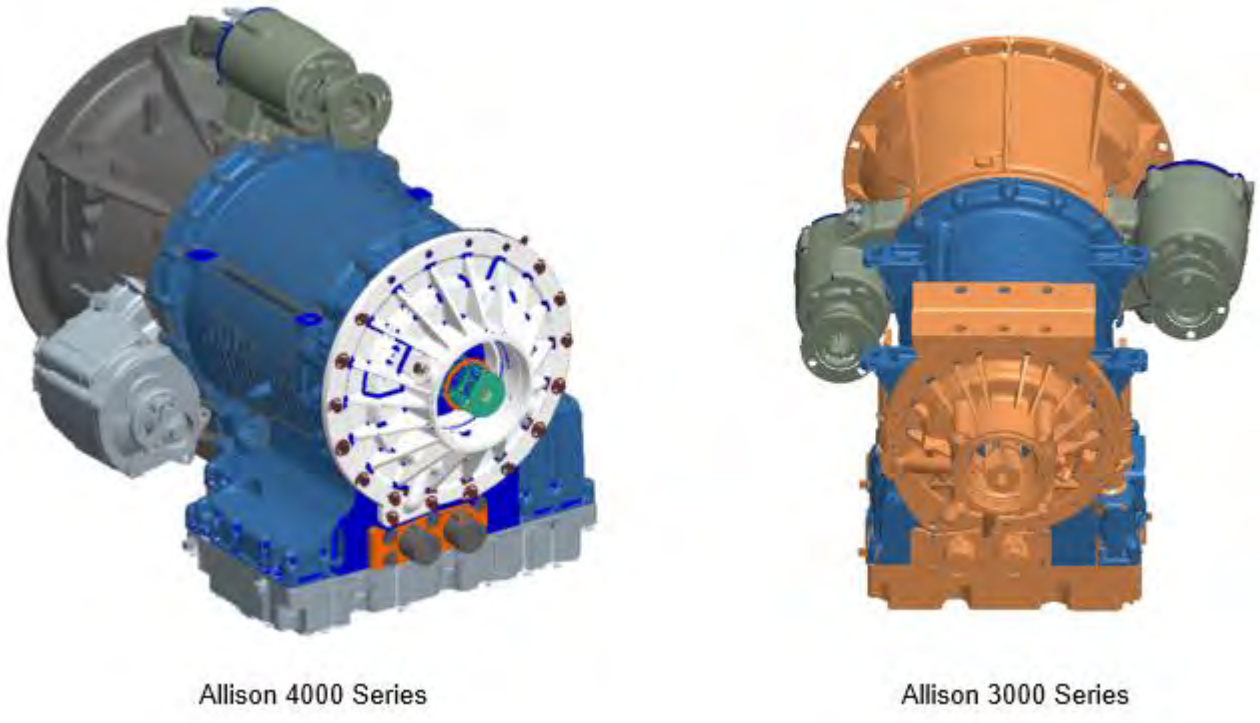


Figure 89 Allison Transmission PTO Locations

AUTOMATED TRANSMISSIONS

PACCAR TX-12 and Endurant HD Transmission

The automated mechanical transmission (AMT) is ideal for highway fleets interested in a light-weight fuel efficient transmission. The AMT also offers broad torque coverage of 1450 to 1850 lb-ft without the use of an oil cooler.

The PACCAR 12-Speed (used with PACCAR MX and PX-9 engines) and Endurant HD Transmissions (used with Cummins engines) requires a different type of PTO because previous PTO models are not compatible. Contact the PTO manufacturer to verify the correct PTO for the AMT. Failure to use the correct PTO could result in damage to the transmission.

PTO Capabilities are 8-bolt, bottom-mount, 95 HP available while stationary and at low speeds in gears 2, 4, and R2.

Figure 90 Endurant HD Transmission

Figure 90 PACCAR 12-Speed

AUTOMATED MECHANICAL TRANSMISSIONS (CONTINUED)

PACCAR 18-Speed and Endurant Transmission

The PACCAR TX-18 and TX-18 PRO, & Endurant XD and Endurant XD PRO Transmission include standard dual PTO accommodations, including an 8-bolt bottom mount, and a 4-bolt rear mount. Both power take-offs operate at 111% of engine speed with a total combined PTO capacity of 160 horsepower or 610 lb-ft of torque.

Like the PACCAR 12-Speed and Endurant Transmission, the PACCAR 18-Speed and Endurant XD transmissions require a different type of PTO, and previous PTO models are not compatible. Contact the PTO manufacturer to verify the correct PTO for the AMT. Failure to use the correct PTO could result in damage to the transmission.

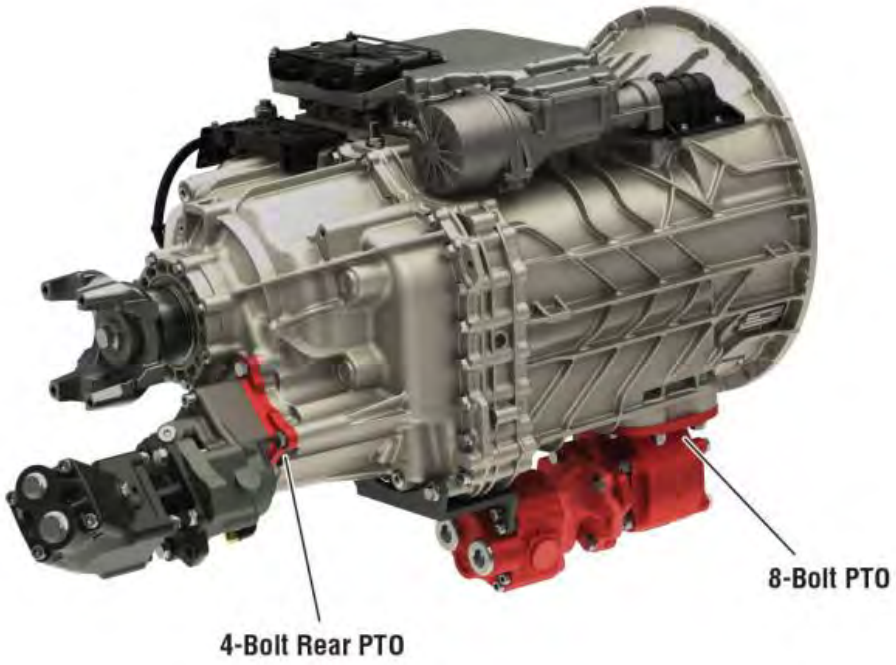
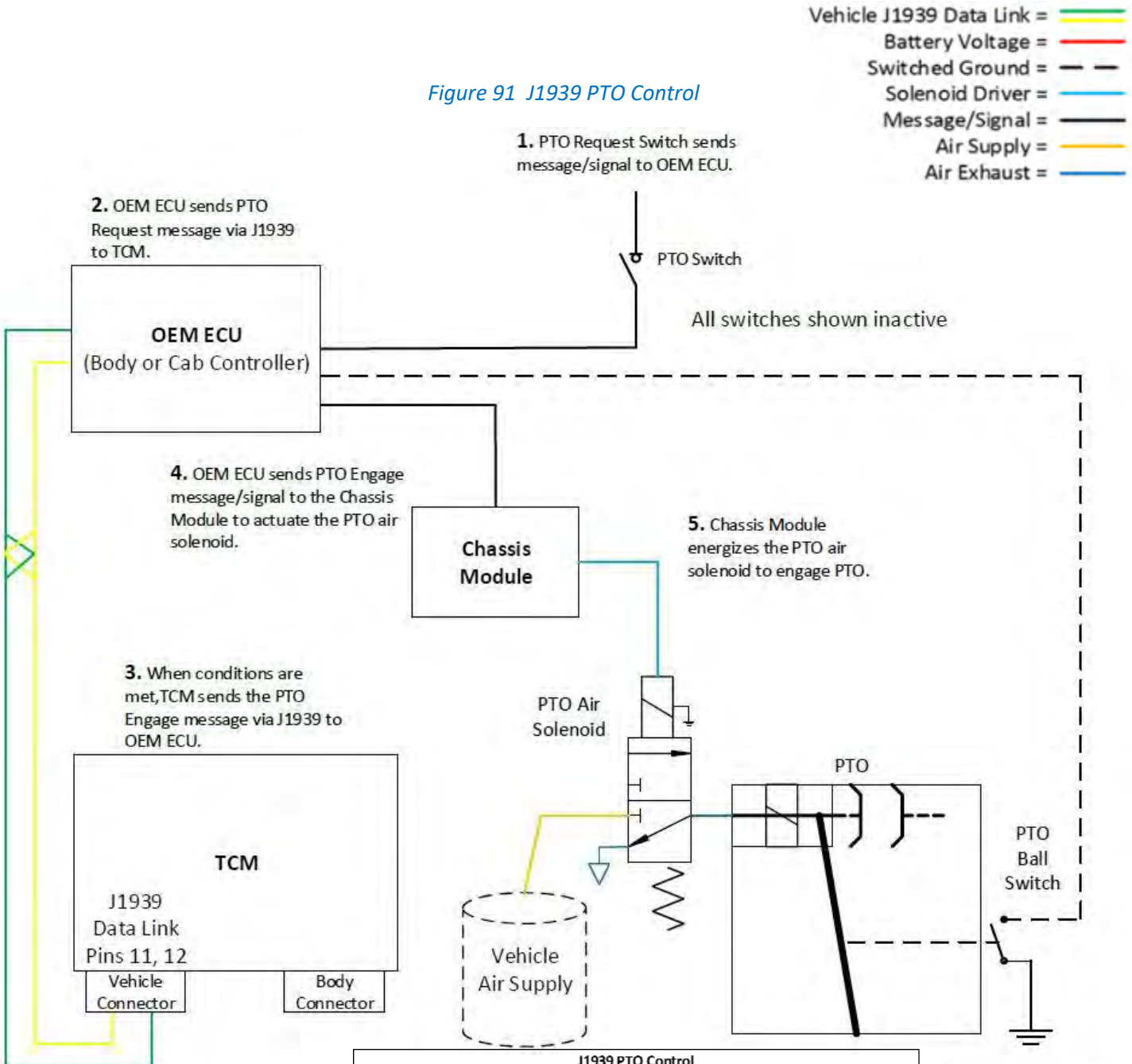


Figure 92 Endurant XD Transmission

PTO INTERFACE

The following information shows the different types of PTO wiring setup diagrams for the automated transmission.

Figure 91 J1939 PTO Control



J1939 PTO Control		
From	**To**	**Description**
PTO Request Switch	OEM ECU	Request
OEM ECU J1939	TCM J1939	Request
TCM J1939	OEM ECU J1939	Engage
OEM ECU J1939	Chassis Module	Engage
Chassis Module	PTO Air Solenoid	Engage
PTO Ball Switch (Ground)	OEM ECU	Confirm
OEM ECU J1939	TCM J1939	Confirm

7. OEM ECU sends Confirmation message via J1939 to TCM. PTO ready for operation.

6. PTO Ball Switch closes and provides a ground (Confirmation) to the OEM ECU indicating PTO is engaged.

Figure 92 J1939 Request and Engage with Hardwire Confirmation PTO Control

J1939 Request and Engage with Hardwire Confirmation PTO Control		
From	**To**	**Description**
PTO Request Switch	OEM ECU	Request
OEM ECU J1939	TCM J1939	Request
TCM J1939	OEM ECU J1939	Engage
OEM ECU J1939	Chassis Module	Engage
Chassis Module	PTO Air Solenoid	Engage
PTO Ball Switch (Ground)	Pin 16 - TCM Body Conn. (Voltage)	Confirm
TCM J1939	OEM ECU J1939	Confirm

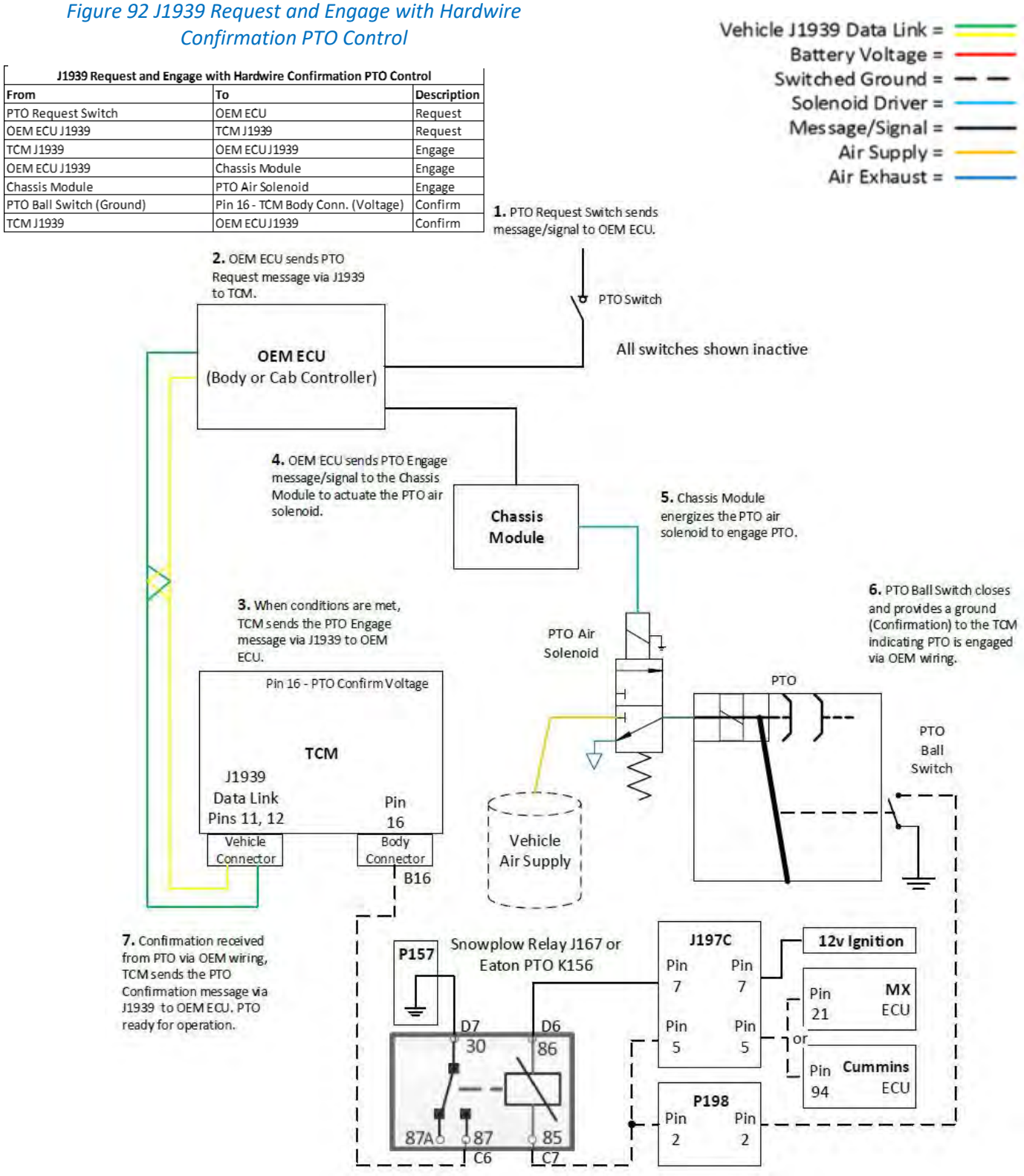


Figure 93 Hardwire PTO Control with Ground Switched Confirmation

Hardwire PTO Control with Confirm Switched to Ground		
From	**To**	**Description**
SW01 - PTO Switch	Pin 14 - TCM Body Conn. (Return)	Request
Pin 15 - TCM Body Conn. (Voltage)	SW02 - PTO Switch	Request
Batt Voltage (Fuse Protected)	SW03 - PTO Switch	Request
SW04 - PTO Switch	Pin 30 - PTO Engage Relay	Request
Pin 2 - TCM Body Conn. (Voltage)	Pin 86 - PTO Engage Relay	Engage
Pin 85 - PTO Engage Relay	Pin 5 - TCM Body Conn. (Return)	Engage
Pin 87 - PTO Engage Relay	PTO Air Solenoid	Engage
PTO Ball Switch (Ground)	Pin 16 - TCM Body Conn. (Voltage)	Confirm
	PTO Lamp (-)	Confirm
Batt Voltage (Fuse Protected)	PTO Lamp (+)	Confirm

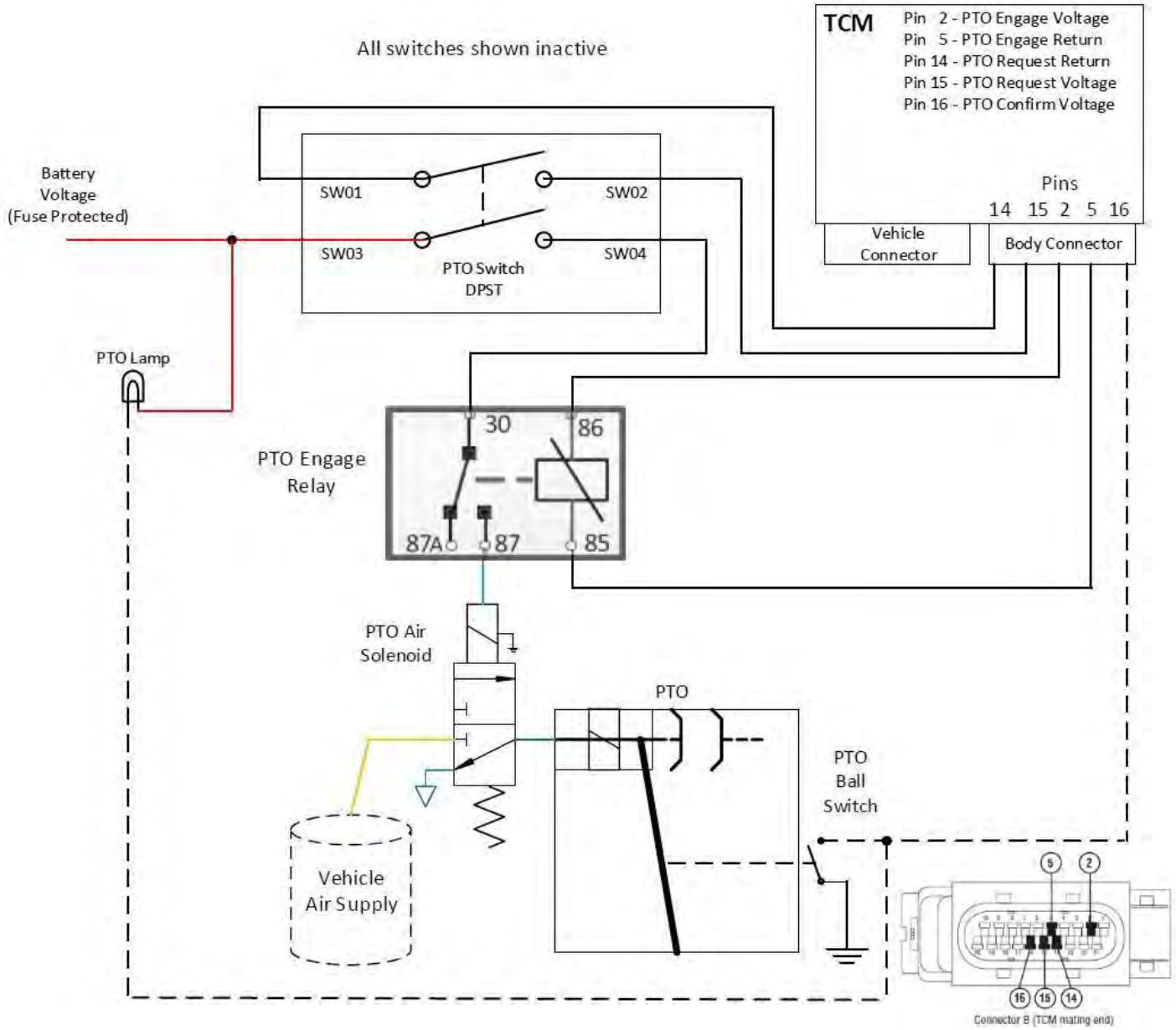
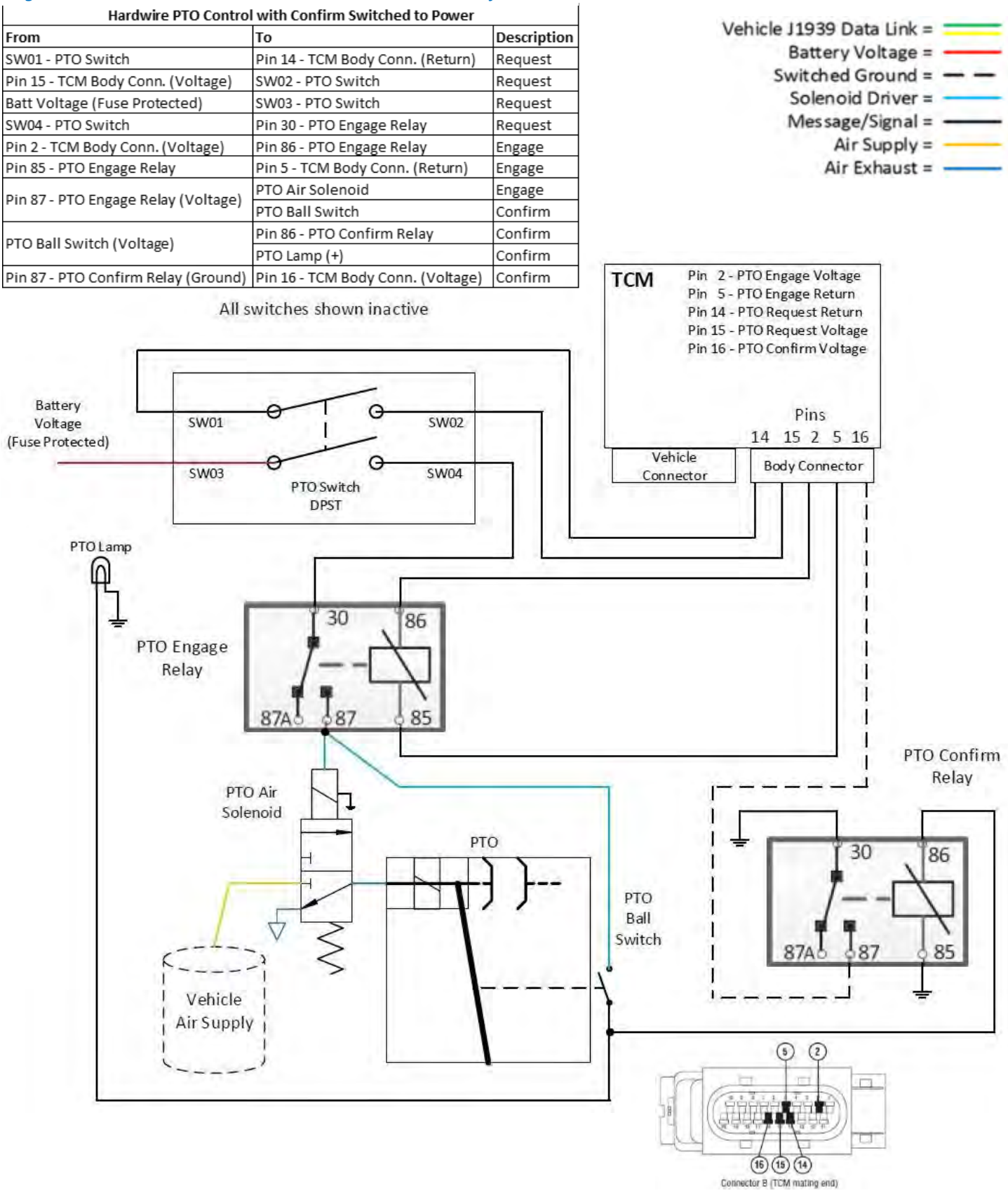


Figure 94 Hardwire PTO Control with Power Switched Confirmation

Hardwire PTO Control with Confirm Switched to Power		
From	**To**	**Description**
SW01 - PTO Switch	Pin 14 - TCM Body Conn. (Return)	Request
Pin 15 - TCM Body Conn. (Voltage)	SW02 - PTO Switch	Request
Batt Voltage (Fuse Protected)	SW03 - PTO Switch	Request
SW04 - PTO Switch	Pin 30 - PTO Engage Relay	Request
Pin 2 - TCM Body Conn. (Voltage)	Pin 86 - PTO Engage Relay	Engage
Pin 85 - PTO Engage Relay	Pin 5 - TCM Body Conn. (Return)	Engage
Pin 87 - PTO Engage Relay (Voltage)	PTO Air Solenoid	Engage
	PTO Ball Switch	Confirm
PTO Ball Switch (Voltage)	Pin 86 - PTO Confirm Relay	Confirm
	PTO Lamp (+)	Confirm
Pin 87 - PTO Confirm Relay (Ground)	Pin 16 - TCM Body Conn. (Voltage)	Confirm



REAR ENGINE PTO

Rear Engine PTO (REPTO) is commonly used in cement mixer and feed lot applications. The REPTO is driven off the rear gear train on the engine. There is a 1350/1410 flange on the bell housing in the 1 o'clock position that can be used to attach a hydraulic pump or driveshaft.

The REPTO flange will always be turning when the engine is running, and the output rotation is the same as the engine.

Table 55 REPTO ratio

Engine	REPTO Ratio (vs Engine Speed)
PACCAR PX-9	1.15:1 RATIO
PACCAR MX-13	1.2:1 RATIO
CUMMINS ISX12N	1.32:1 RATIO
PACCAR MX-11	1.3:1 RATIO

Figure 95 REPTO Illustration (Typical)

PTO QUICK EXHAUST VALVE

Depending on the PTO being used, it may be beneficial to include a quick exhaust valve onto the air fitting of the air-shift cover. The quick exhaust valve will prevent any backflow of air experienced by the PTO, preventing any oil contamination that may enter the EOA solenoid air line. It is recommended to install a quick exhaust valve if there is any notice of oil present in the solenoid or if there is evidence of oil making its way in the air line. Oil intrusion into the solenoid may cause improper actuation of the internal armature, preventing the PTO from turning on.

Usage Notes:
1. This application guide is only applicable to PTOs with an air shift option.
2. Inspection of the EOA solenoid and corresponding air line should be made before installation of the quick exhaust valve. If there is evidence of oil contamination, the air line should be flushed and the solenoid should be replaced before installation of the valve.
3. Orientation of the valve does not have a defined angle.
4. The suggested quick exhaust valve for this application is Humphrey SQE2VAI. Other valves might not have the same properties and may not operate as intended.
5. Depending on location of the PTO, a breather vent may need to be added onto the exhaust port of the quick exhaust valve. This will prevent any road contaminants from entering the exhaust side.
6. It is suggested to only use a quick exhaust valve within its normal operating temperature range of -25°F to 180°F.

Figure 96 REPTO Quick Exhaust Valve (Customer Installed)

PTO MOUNTING CLEARANCE

This application guide indicates if a PTO has sufficient clearance to truck components in various mounting configurations. A green "ok" indicates that there is sufficient clearance to other truck components. A red "x" indicates that there minimal or no clearance and the application is not recommended. The truck components investigated in this guide include frame rails, Set Back Front Axle (SBFA) rear shackle, SBFA Front Air Suspension (FAS) rear shackle, coolant return manifold, transmission clutch actuator, and exhaust system components.

Usage Notes:

1. This application guide is only applicable to 2.1M trucks.
2. Only the specified PTO configurations have been analyzed.
3. Underframe exhaust limits access behind PTO's for shaft drives and other PTO attachments.
4. Eaton FR transmissions require the use of a 30° adapter when installing Chelsea or Muncie transmission PTO's in the right hand position.
5. Eaton RT transmissions require the use of a 49° adapter when installing Chelsea transmission PTO’s in the right hand position.
6. Eaton RT transmissions require the use of a 55° adapter when installing Muncie transmission PTO’s in the right hand position.
7. Eaton transmissions require the use of a 6-Bolt to 8-Bolt adapter when installing a 6-bolt PTO in the bottom position.

2.1M PTO MOUNTING CLEARANCE CHARTS

Table 56 10-Bolt PTO's for Allison Transmissions

10-Bolt PTO's for Allison Transmissions			4000 Series		3000 Series - 1 & 8 Housing		3000 Series - 4 & 8 Housing	
Brand	PTO	Truck Model	1 o'clock	8 o'clock	1 o'clock	8 o'clock	4 o'clock	8 o'clock
Chelsea	267-M3XK	All HD	x	x	ok	x	x	x
	267-M5XK	All HD	ok[1]	ok	ok	x	ok	ok
	280-B5RK	2.1 HD MH	ok[1]	ok	ok	x	ok	ok
		2.1 HD SH	ok[1]	x	ok	x	ok	ok
	870X-B3RS	All HD	ok[1]	x	ok	x	x	x
	870X-B5RS	All HD	ok[1]	x	ok	x	x	x
	890-B5SX	All HD	ok[1]	x	ok	x	x	ok
Muncie	CD05-M3CX	All HD	ok[1]	ok	ok	ok	ok	ok
	CD10-M1CX	2.1 HD MH	ok[1]	x	ok	x	ok	ok
		2.1 HD SH	ok[1]	x	ok	x	x	ok
	CD10-M3CX	2.1 HD MH	ok[1]	x	ok	x	ok	ok
		2.1 HD SH	ok[1]	x	ok	x	x	ok
	CS10-H1CX	All HD	x	x	x	x	x	x
	CS10-H3CX	All HD	x	x	x	x	x	x
	A20-HX3	2.1 HD MH	ok[1]	ok	ok	x	ok	ok
		2.1 HD SH	ok[1]	ok	ok	x	x	ok
	A20-HX1	All HD	ok[1]	ok	ok	x	x	x
	CS41-H1EX	All HD	ok[1]	x	x	x	x	x
	CS41-H3CX	All HD	ok[1]	x	x	x	x	x

Table 57 6-Bolt and 8-Bolt PTO's for Eaton Transmissions

6 & 8 Bolt PTOs for Eaton			FR		RT	
Brand	Style	PTO	Bottom	Right	Bottom	Right
Chelsea	6-Bolt	340-V5XD	ok	ok	ok	ok
		442-V3RK	x	ok	x	ok
	8-Bolt	489-V3RK	ok	n/a	ok	n/a
		489-V5RK	ok	n/a	ok	n/a
		680-V3RK	ok	n/a	ok	n/a
		680-V5RK	ok	n/a	ok	n/a
		880-V3XV	ok	n/a	ok	n/a
Muncie	6-Bolt	CS6-P1KX	x	ok	x	ok
		SH6-P1KX	x	ok	x	ok
		TG6-P1KX	x	ok	x	ok
	8-Bolt	CS8-P1KX	ok	n/a	ok	n/a
		SH8-P1KX	ok	n/a	ok	n/a
		TG8-P1KX	ok	n/a	ok	n/a

Table 58 Dual PTO Compatibility for Eaton Transmissions

	Chelsea								Muncie						
	RH (6-Bolt) PTO's														
	Model	RT			FR			Ultrashift+		Model	RT		FR		Ultrashift+	
		230/236-V3	340X-A5	442/660-V3	230/236-V3	340X-A5	442/660-V3	340X-A5	442/660-V3		CS/SH6-A1	TG6-A1	CS/SH6-A1	TG6-A1	CS/SH6-A1	TG6-A1
LH (6 & 8-Bolt) PTO's	230/236-V3	S	S	S	S	S	S	ok	ok	828S-Q1	S	S	S	S	ok	ok
	238-V3	S	S	S	S	S	S	ok	ok	CS/SH8-A1	S	S	S	S	ok	ok
	340X-A5	S	S	S	S	S	S	ok	ok	TG8S-A1	S	S	S	S	ok	ok
	442/660-V3	S	S	S	S	S	S	ok	ok							
	489/680-V3	S	S	S	S	S	S	ok	ok							
	823-V3	S	S	S	S	S	S	ok	ok							
	880-V3	x	x	O	x	O	x	ok	ok							
	885-V3	x	x	O	x	O	x	ok	ok							

S = Standard Hydraulic Clutch Actuator Configuration
O = Optional Hydraulic Clutch Actuator Configuration

Note:
The actuator should not be flipped upside down to achieve PTO clearance.

1. Bleed nipple should always be above centerline.
2. Drain should always be below centerline.

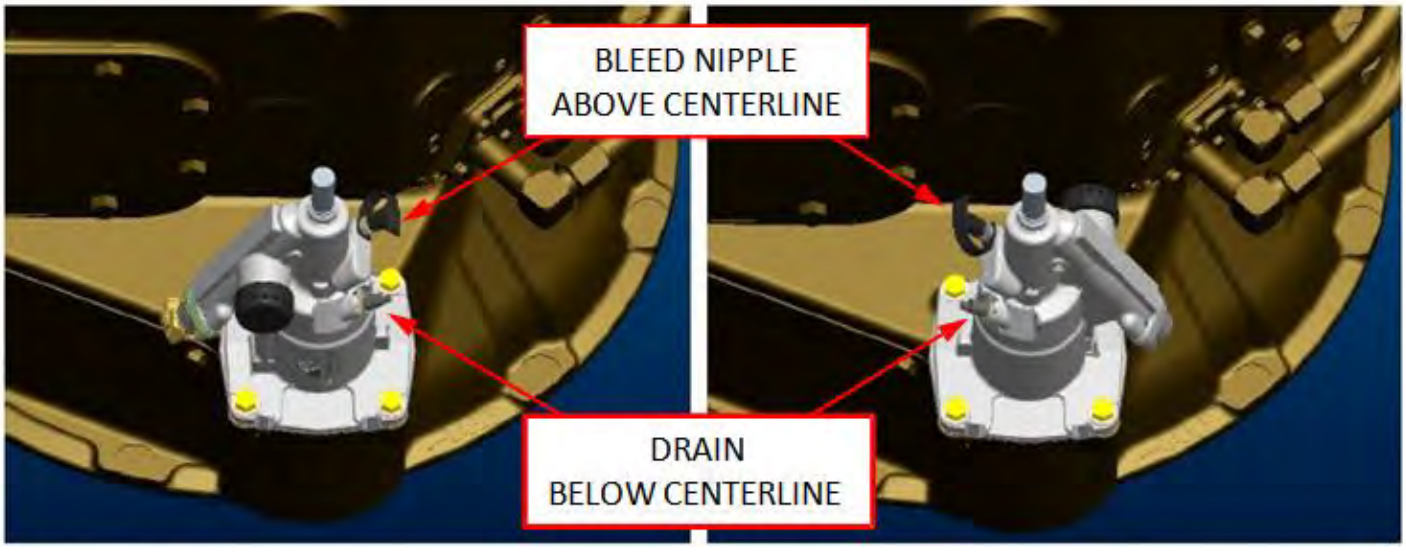


Figure 97 Dual PTO Compatibility for Eaton Manual Transmissions

Standard Configuration
Air assist connection faces driver's side
Used with all but Chelsea 880 and 885 PTOs

Bottom Mount PTO Provisions
Air assist connection faces passenger's side
Used with Chelsea 880 and 885 PTOs

MX PTO MODE CONTROL (PMC)

MX PTO Mode Control (PMC) includes features, limits, and protections that are active in PTO Mode. It also includes PTO Speed Control (PSC) functionality that includes a variety of useful ways to control engine speed during PTO operation.

Reference the VECU Programming Guide for detailed information on PTO Mode Control configuration, functionality and usage.

MX PTO MODE ACTIVATION

There are three ways to activate PTO Mode. PMC parameter(s) must be enabled on the vehicle in order for PTO Mode to activate.

- Active feedback of physical PTO engagement
  - Trucks with factory installed PTOs or that are coded for Customer Installed PTOs will come prewired to receive the PTO engaged signal.
- Active PTO Mode Switch
  - The PTO Mode Switch can be configured at the time of order or in the aftermarket. The PTO Mode switch can be used to activate PTO Mode independent of PTO engagement and may be useful for trucks with FEPTOs or REPTOs that need the ability to use PMC features.
- PTO Mode Request over the CAN bus

PTO Mode Switch

MX PTO MODE CONTROL LOCATION

Vehicles can be configured to control PTO functionality from a cab location and/or a remote location (outside the cab). Most PTO Mode Features and Interlocks have a cab station option and a remote station option. This allows a vehicle to be configured for two unique jobs. For example a vehicle could be configured for mobile cab station operation with one set of limits and stationary remote station operation with a different set of limits.

If a vehicle is configured for both cab and remote PTO control, a PMC Location Switch must be installed on the dash. This switch will determine which set of PTO Mode Features to apply and which control location to use.

PMC Location Switch

MX PTO MODE FEATURES

The following features and configurations are available when PTO Mode is active.

- Cab Accelerator Configurations
  - Disable in PTO Mode
  - Torque Control (Automotive Style)
  - Speed Control
  - Enable in Remote PTO Mode
- Log Time and Fuel in PTO Mode
- Disable Engine Idle Shutdown Timer (EIST) in PTO Mode
- PTO Mode Specific Engine Idle Shutdown Timer (EIST)
- Fan On in PTO Mode
- Adjustable PTO Engine Speed Governor Responsiveness (for light or heavy varying loads)

MX PTO MODE PROTECTIONS AND LIMITS

The following protections and limits are available when PTO Mode is active. Protections and limits are active when PTO Mode is active and will continue to be active until PTO Mode is no longer active.

- Max Vehicle Speed
- Max Engine Torque
- Max Engine Speed – Accelerator Controlled
- Max Engine Speed – Switch Controlled
- Min Engine Speed
- Max Rate of Engine Speed Change

MX PTO SPEED CONTROL (PSC) FEATURES

PTO Mode must be active prior to using PTO Speed Control (PSC) to control engine speed. PSC is available from both the cab station and remote station (see PTO Mode Control Location Section above). In the cab location, cruise control switches and PSC specific switches are used to control engine speed. Equivalent remote station inputs are available (Reference Remote PMC Connections section below).

- \+ / -
  - Configurable to either command one unique preset when "+" is pressed and a second unique preset when "-" is pressed OR toggle through up to 6 presets.

Dash Switches

- Preset 1, 2 & 3
  - 3 Dedicated Presets with the following configuration options.
    - Latch: Hold Preset Speed When Switch is Released
    - Cancel: Cancel PSC When Switch is Released
  - The Remote PTO Inputs for Presets 1, 2 & 3 can be configured to function when Cab PTO Mode is active.
  - In some applications, it may be useful to connect the Remote PTO Inputs for Presets 1, 2 & 3 to something other than a hand-operated switch. For example, the inputs can be configured to activate based off PTO engagement, hydraulic pressure or equipment movement.

Dedicated Preset Switches

MX PTO SPEED CONTROL INTERLOCKS

PTO Speed Control Interlocks cancel PSC when active. There is an option to disable the accelerator when a PSC interlock is active. When a PSC interlock is active the engine speed will return to the Minimum Engine Speed in PTO Mode, or the engine speed commanded by the accelerator if applicable. An active PSC interlock does not disable PMC protections and limits.

The configurable PSC interlocks are listed below.

- Clutch Pressed
- Park Brake NOT Set
- Transmission NOT in Neutral
- Service Brake (Configurable for Pressed or NOT Pressed)
- Custom Hardwired Interlock (Configurable Polarity)

A custom hardwired interlock input is available that will allow a body builder to create a customized interlock for their specific application. This interlock functions for both Cab and Remote Station PSC. Many types of switches such as hand-operated switches, hydraulic pressure switches, equipment position switches, or pressure plate switches can activate the interlock. The switch polarity is configurable which allows the body builder to choose the interlock state if the circuit fails.

PTO SPEED CONTROL ICONS

During PSC operation there will be icons on the digital display that indicate:

- PSC Enabled (white icon) or Active (green icon)
- PSC Control Location (designed by “Cab” or “Remote”)
- PSC target engine speed when active

Figure 98 PTO Speed Control Icons

REMOTE PMC CONNECTIONS

There are options to control PTO functionality from the following locations.

- Engine Bay – Hardwired option only
- RP1226 Connection in the Cab – CAN bus connection only
- BOC/BOS – Hardwired and CAN bus connections
- EOF – Hardwired and CAN bus connections

There are options available for the body builder to specify controller speeds of 250 kbps or 500 kbps.

Figure 99 RP1226 Connector Inside the Cab

MX PTO CAN functionality may be accessed in the cab through the RP1226 connector and remotely through the body connectors K-CAN (E-3375-021) and B-CAN (DTM06-2S-EP10) Connectors.

MX PTO hardwired functionality may be accessed in the engine bay or on the frame through optional 12-Way and 8-Way connectors.

12-Way Deutsch Connector

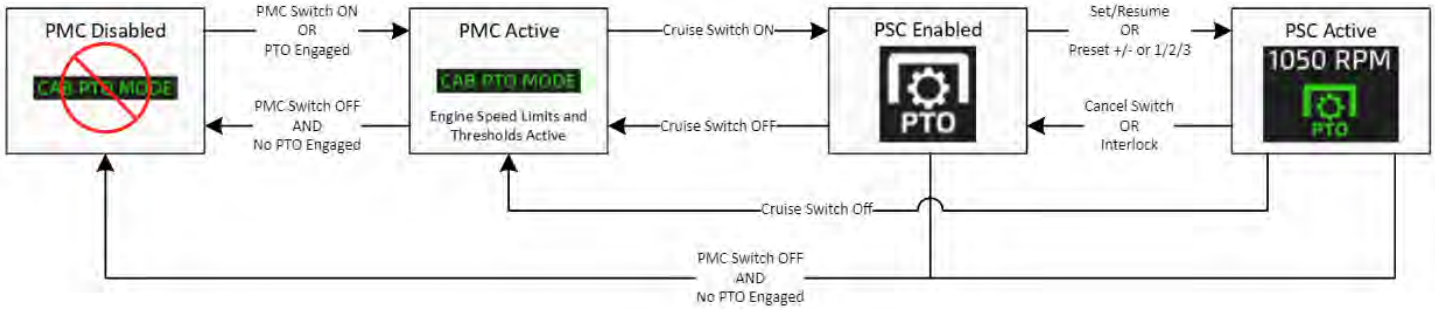
8-Way Deutsch Connector

RP1226 Delphi Connector

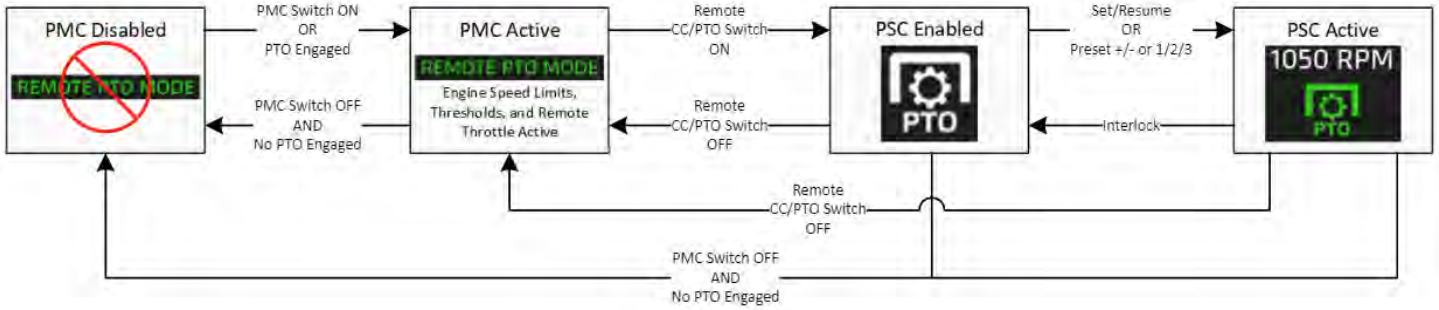
Pin-out information for the PTO connectors can be found in “Section 7 Electrical”.

PTO MODE CONTROL FLOW CHARTS

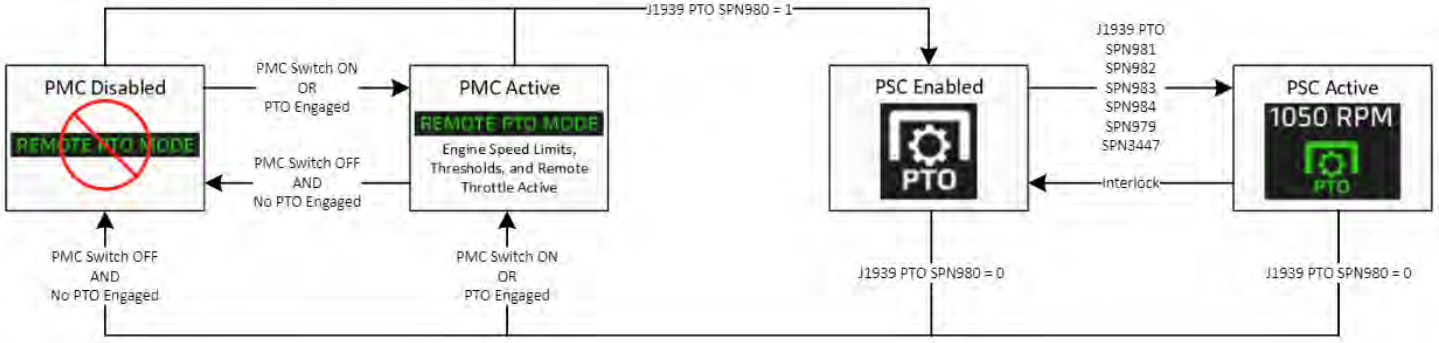
Cab Controls



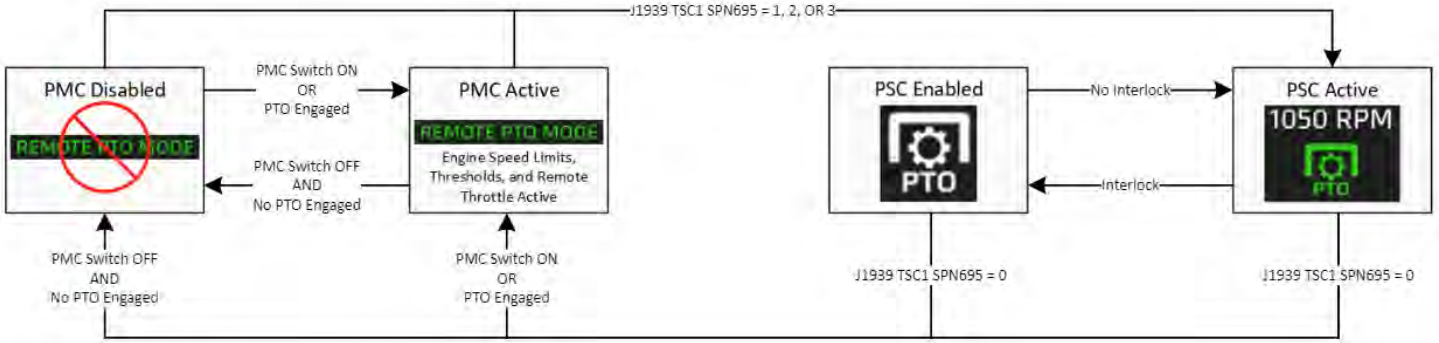
Remote Hardwire Controls



Remote CAN Controls

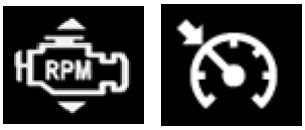


Remote TSC1 CAN Controls



MX PTO TROUBLESHOOTING GUIDE

Table 59 Ttrouble Shooting Guide for MX PTO functionality.

SYMPTOM	POSSIBLE CAUSE	SOLUTION
No PTO Active Indication (PMC is not active) 	PTO Mode Switch is not installed	Install and apply PTO Mode Switch
	PTO engagement feedback is not provided to standard/optional chassis module	Provide PTO engagement feedback to SCM (PTO#1) and/or OCM (PTO#2)
	PTO ball switch is faulty	Check that PTO ball switch is providing power or ground
	PTO device is not engaging due to air supply solenoid or electric signal not active	*Check EOA parameter settings in PVP *EOH PTOs are configured with parameter P816 *Check popups on driver display for interlock conditions (PTO engagements may be configured with park brake or PTO interlocks dependent on EOA parameter settings, these will result in popups on driver display)
PTO Active Indication blinks intermittently 	PTO engagement feedback connection is faulty	Check PTO engagement feedback to SCM/OCM
	PMC switch connection is intermittent	Verify PMC switch connection (LIN jumper)
FIC or Cruise Control appears instead of PTO Speed Control on driver display  (when PTO Engaged Indication is present) 	Both Cab and Remote control locations are configured in PVP, but PMC location switch is not installed	Install PMC location switch, or select Cab or Remote control location in PVP
	CAB and/or Remote PMC is not configured	Enable CAB and/or Remote PMC in PVP and re-flash the VECU (PMC location switch is required if both control locations are configured)

White PTO icon appears, but no green PTO Speed Control icon on driver display 	PTO Speed Control is not active	Activate PTO Speed Control using cab or remote Set/Resume, +/-, Dedicated Preset, or J1939 PTO inputs. See PTO Mode Control Flowcharts in this section.
	PTO Speed Control switches are not enabled	Enabled PTO Speed Control switches P543 (Cab +/-), P610 (Cab Set/Resume), PXXX (Cab Dedicated Preset), P576 (Remote +/-), P611 (Remote Set/Resume, or P568/P569 (Remote Dedicated Preset)
	PTO Speed Control interlock is violated	Check that enabled PTO Speed Control interlocks are satisfied for cab and/or remote controls: *Park brake *Service brake active or inactive *Neutral position *Custom interlock *SCR/DEF Level Inducement *Adaptive Cruise Control fault *ABS Braking Event *Stop Engine Lamp
	Current PTO Speed Control location is not selected (when configured for Cab AND Remote control)	Select CAB or REMOTE control location using PMC location switch
Green PTO Speed Control icon on driver display appears, but engine speed will not change 	PMC engine speed slew rates are zero	Change engine speed slew rates to non-zero values
	PMC engine torque limit is too low	Increase engine torque limit
	PSC Increment and/or decrement intervals are zero	Configure increment and/or decrement to non-zero values
	PSC Presets are not enabled or are programmed to the Min Engine Speed in PTO Mode	Enable PSC Presets and program preset values greater than the Min Engine Speed in PTO Mode
Cab accelerator pedal does not control engine speed	Cab accelerator control is not enabled	Enable the accelerator in Cab Control (P545), and/or Remote Control (P577) in PVP and re-flash the VECU

Remote accelerator pedal does not control engine speed	PTO Mode Control is not active	Activate PTO Mode Control using PMC switch, provide PTO engagement feedback, or over the CAN bus
	Remote accelerator control is not enabled	Enable the remote accelerator control (P578) in PVP and re-flash the VECU
	PTO Speed Control interlock is violated	Check that enabled PTO Speed Control interlocks are satisfied: *Park brake *Service brake *Neutral position *Clutch position *Custom interlock *SCR/DEF Level Inducement *Adaptive Cruise Control *ABS Braking Event *Stop Engine Lamp
	Remote accelerator pedal has not returned to the fully released/zero position after entering PTO Mode Control	Calibrate/release remote accelerator to zero position
J1939 PTO CAN message does not affect PTO Speed Control	Remote controls are not configured and/or selected	Configure Remote PTO Mode Control and ensure it is selected using PMC Location switch (if Cab and Remote are both enabled)
	Body controller source address is not equal to 7d or 33d (0x21)	Configure body controller source address equal to 7d or 33d (0x21)
	J1939 PTO SPN980 (PTO Governor Enable Switch) is not equal to 1 (enabled)	Send J1939 PTO SPN 980 equal to 1
J1939 TSC1 CAN message does not affect PTO Speed Control	Remote controls are not configured and/or selected	Configure Remote PTO Mode Control and ensure it is selected using PMC Location switch (if Cab and Remote are both enabled)
	Body controller source address is not equal to 7d or 33d (0x21)	Configure body controller source address equal to 7d or 33d (0x21)
	J1939 TSC1 SPN695 (Override Control Mode) is equal to zero	Send J1939 TSC1 SPN695 equal to 1, 2 or 3
	J1939 TSC1 SPN3350 (TSC1 Control Purpose) is not 2 (PTO Governor)	Send J1939 TSC1 SPN3350 equal to 2

SECTION 9 AFTERTREAMENT

INTRODUCTION

The following section is designed to give you information regarding the aftertreatment systems on Kenworth chassis. All Kenworth's equipped with 2021 emission level engines will utilize Selective Catalyst Reduction (SCR). SCR is a process in which Diesel Exhaust Fluid (DEF) is injected into the exhaust downstream of the engine. DEF is converted to ammonia by the heat of the exhaust system. Inside of the SCR canister a catalyst causes a chemical reaction to occur between the ammonia and NOx, turning it into water and nitrogen. For more information on the specific details of how SCR works, please contact your local Kenworth dealer.

GENERAL GUIDELINES FOR DEF SYSTEM

The installation of the DEF tank is a critical component of the aftertreatment system. While Kenworth does not recommend relocating the DEF tank, there are applications and body installations that will require it. The guidelines below must be strictly followed by any entity relocating the tank. Failure to follow the guidelines completely and accurately may result in engine shut-down situations.

PACCAR-approved DEF hoses are required when retrofitting for system to function properly. The use of unapproved hoses for DEF lines will void warranty and may cause engine shut-down situations. The DEF pump (or Supply Module) cannot be relocated from the DEF tank.

Kenworth offers a variety of DEF tank sizes to meet every application. The DEF tank volume is regulated by the E.P.A. Kenworth advises against modifying the tank volume after the truck has been delivered from the factory. These are estimated nominal (published) maximum fuel capacities for various DEF tanks, engines, and fill ratios. Dosing rates for these calculations are also shown.

Table 60 Nominal Allowable Fuel (Gallons) per DEF Tank

DEF Tank	Standard DEF Fuel Ratio (2:1)		Minimum Recommended DEF Fuel Ratio (1:25-1:99)		Minimum Required DEF Fuel Ratio (1:1)	
	X15	*MX13/MX11/PX9*	*X15*	*MX13/MX11/PX9*	*X15*	*MX13/MX11/PX9*
Small	121	145	150	180	206	248
Medium	203	244	250	300	345	414
Large	257	308	317	380	436	524
Medium Aero	172	207	213	256	293	352
Large Aero	230	276	285	340	388	466
Rectangular	68	82	85	102	166	140
Clear BOC	62	74	0	0	98	118

INSTALLATION REQUIREMENTS AND DIMENSIONS FOR DEF SYSTEM

When relocating any DEF system components, the locations must meet the guidelines below. Failure to comply may result in non-conformance to EPA standards and engine shutdown.

With all relocating procedures, general clearances and routing guidelines must be followed. See Section 9 of this manual for general routing guidelines.

When relocating the components, the maximum pressure DEF hose length, from Supply module to Dosing Module, is 5.5 meters (216.5").

Maintain a minimum of 3" clearance to shielded exhaust components when routing DEF lines to prevent possible melting.

If the DEF tank is relocated, the coolant lines will need to be modified. During this process if the tank is moved forward on the chassis (i.e. closer to the engine) it is necessary to remove excess coolant lines and maintain the original routing

path. If the tank is moved rearward on the chassis the additional length of cooling line required to complete the installation must be installed in a straight section of the existing coolant routing lines. This process minimizes the change in coolant flow by mitigating changes in restrictions. Changes in restriction are added with excessive line length and bends. Work with your local Kenworth dealer if you are unsure about the coolant line modifications.

Routing to the Dosing Module (Injector)

A DEF pressure line “trap” is no longer required after EPA 2013 emissions level engine. The dosing module (injector) no longer needs to be purged and relative heights of components is no longer critical. See Figure 5-3 below for typical routing with RHUC exhaust and LH DEF tank shown. Also shown in this figure is the coolant line routing for T680, T880, and W990 models.

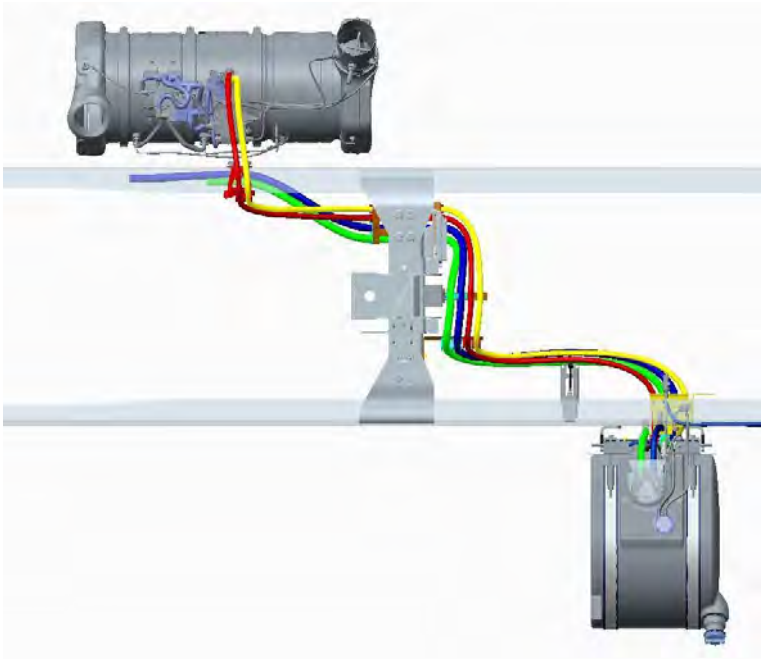


Figure 100 DEF and Coolant Line Routings

DEF Supply Module Mounting Requirements

The Supply Module (or Pump) standard mounting location is on the DEF tank assembly. Body builders may need to relocate this component and should follow the location and length restrictions above. Additionally, the mounting and the orientation of the Supply Module must not exceed 45° from vertical in any direction.

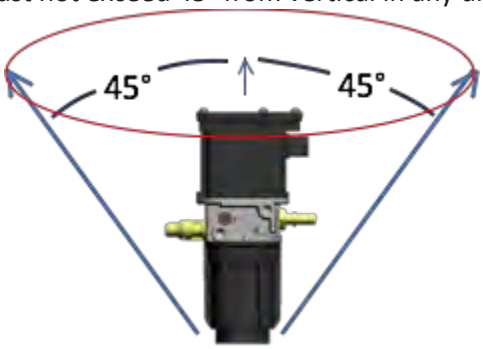


Figure 101 DEF Supply Module Allowed Clocking Angle Limit

GENERAL EXHAUST INFORMATION

Kenworth will offer three main DPF and SCR exhaust systems on heavy duty chassis in 2024. A Right Hand Under DPF and SCR system, in which both canisters are located underneath the cab access step. A horizontal system with both the DPF and SCR located horizontally with a cross over pipe in the frame, and an Independent/Transverse DPF and SCR located vertically back of cab on stanchion brackets.

Table 61 Exhaust DPF/SCR Options

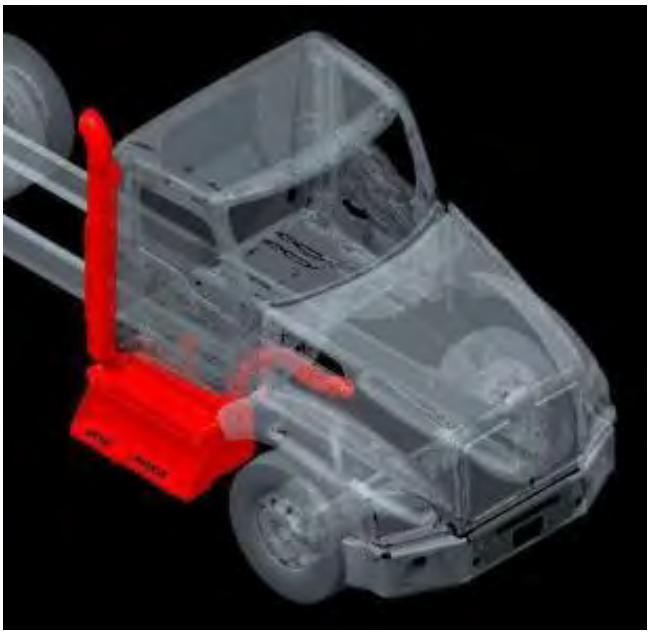


Figure 102 RHUC DPF/SCR

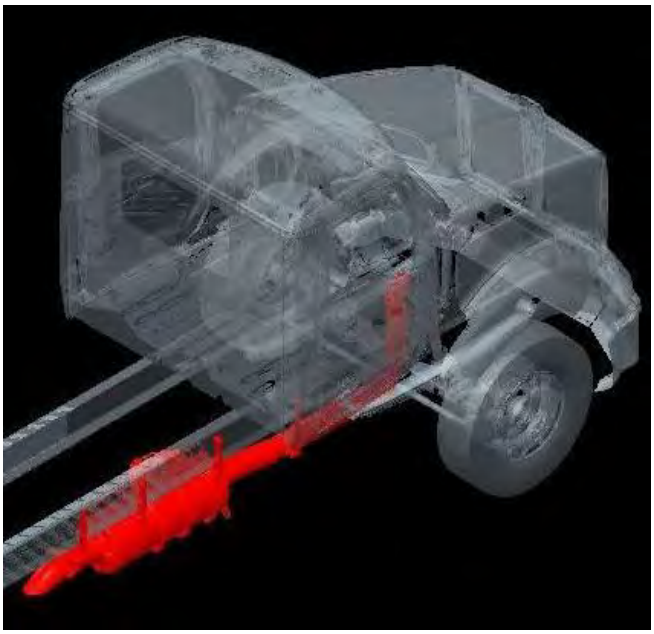


Figure 103 RH UNDER FRAME

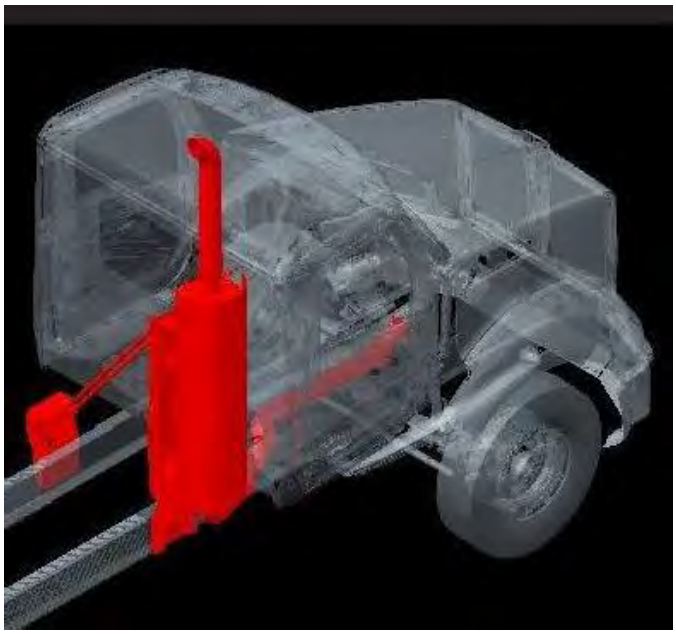


Figure 104 INDEPENDENT BOC

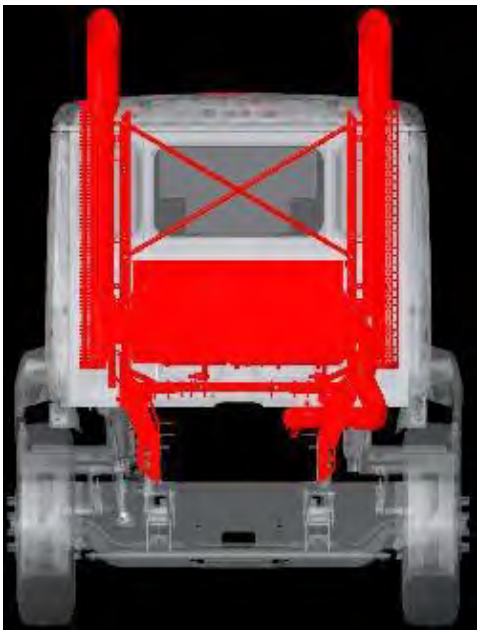
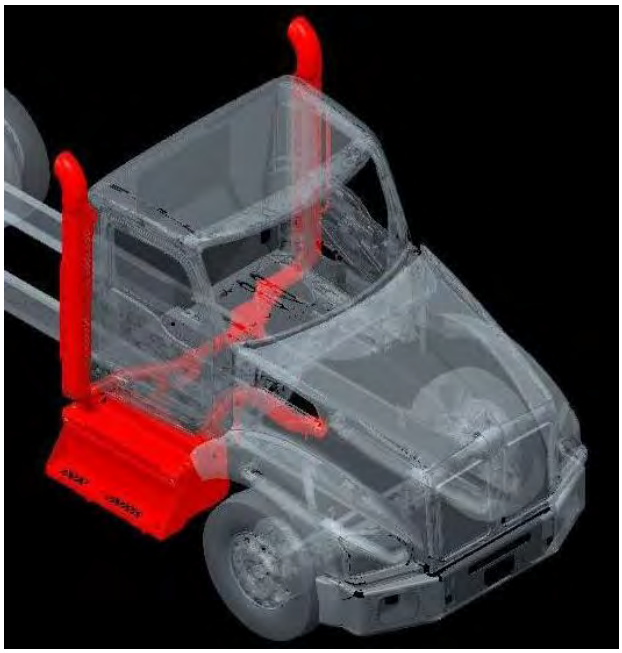
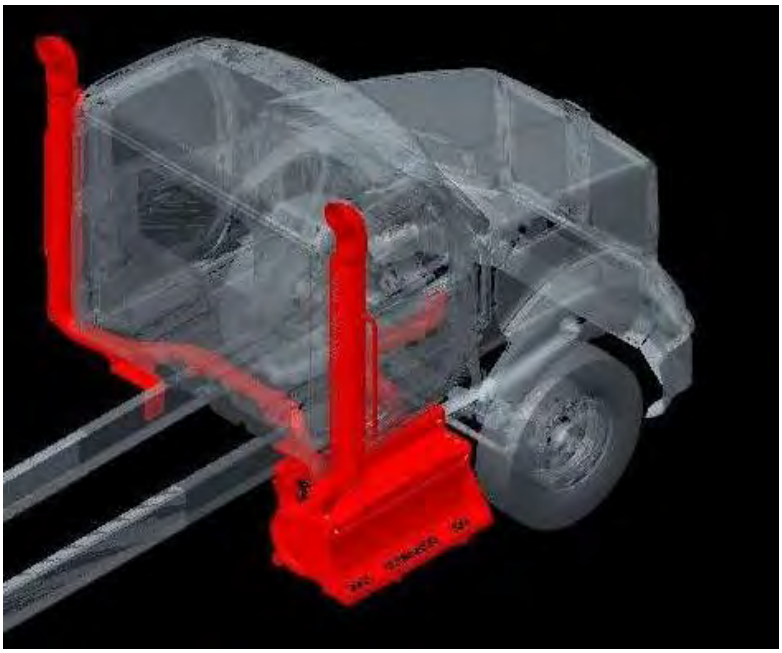


Figure 105 TRANSVERSE BOC

2024 Exhaust Configurations

Figure 106 Right Hand Under DPF/SCR on Daycab with Single Side of Cab Tailpipe





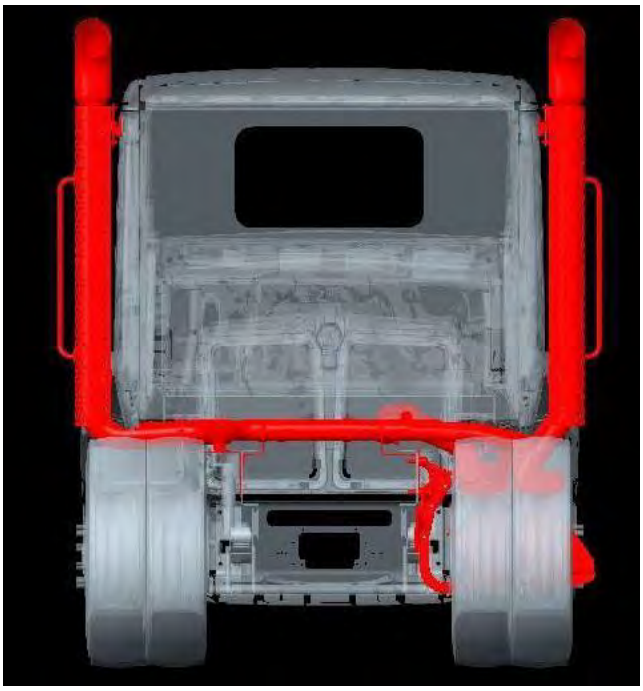


Figure 107 Right Hand Under DPF/SCR on Daycab with Dual Side of Cab Tailpipes

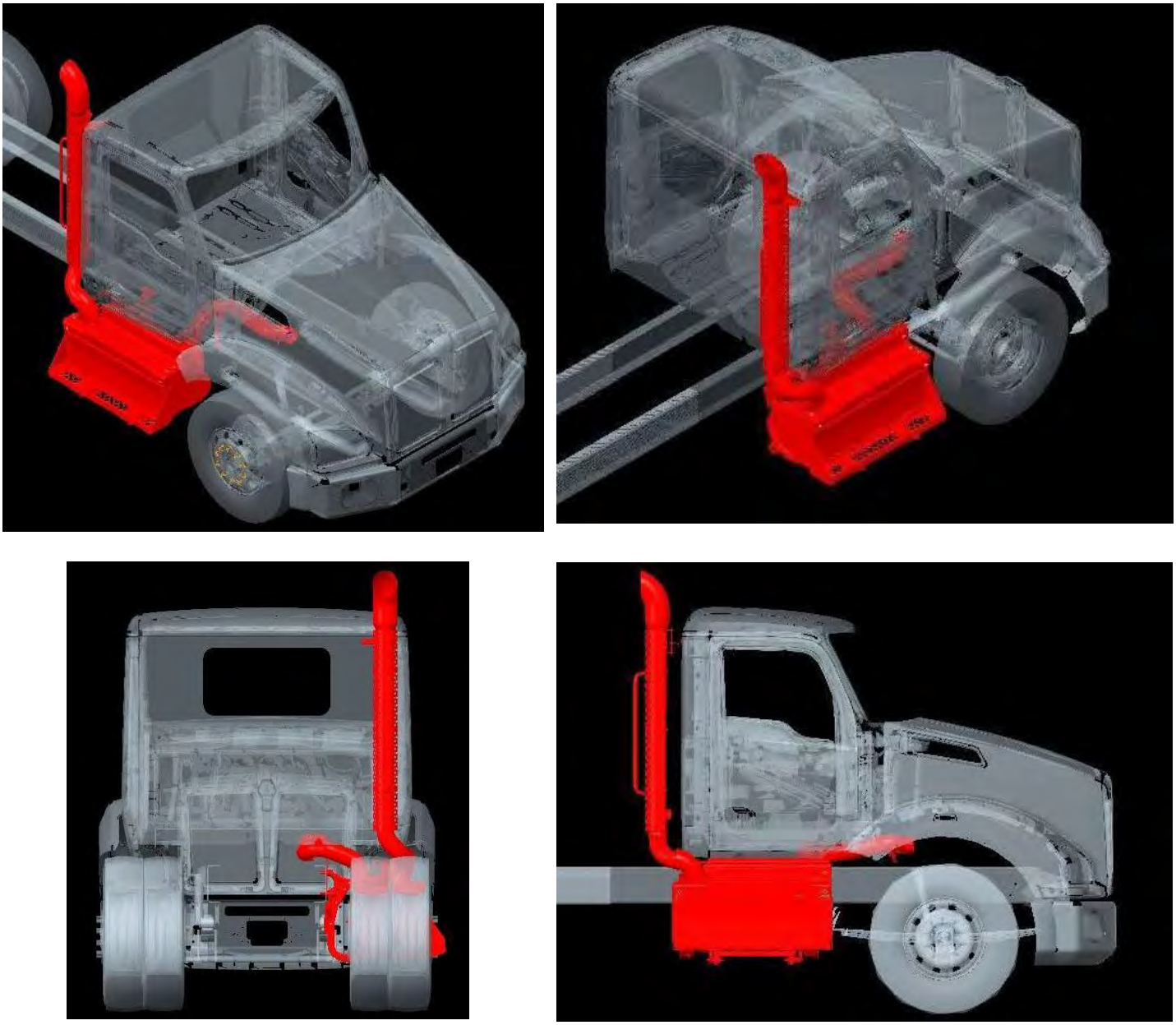


Figure 108 Right Hand Under DPF/SCR on Daycab with Back of Cab Tailpipe

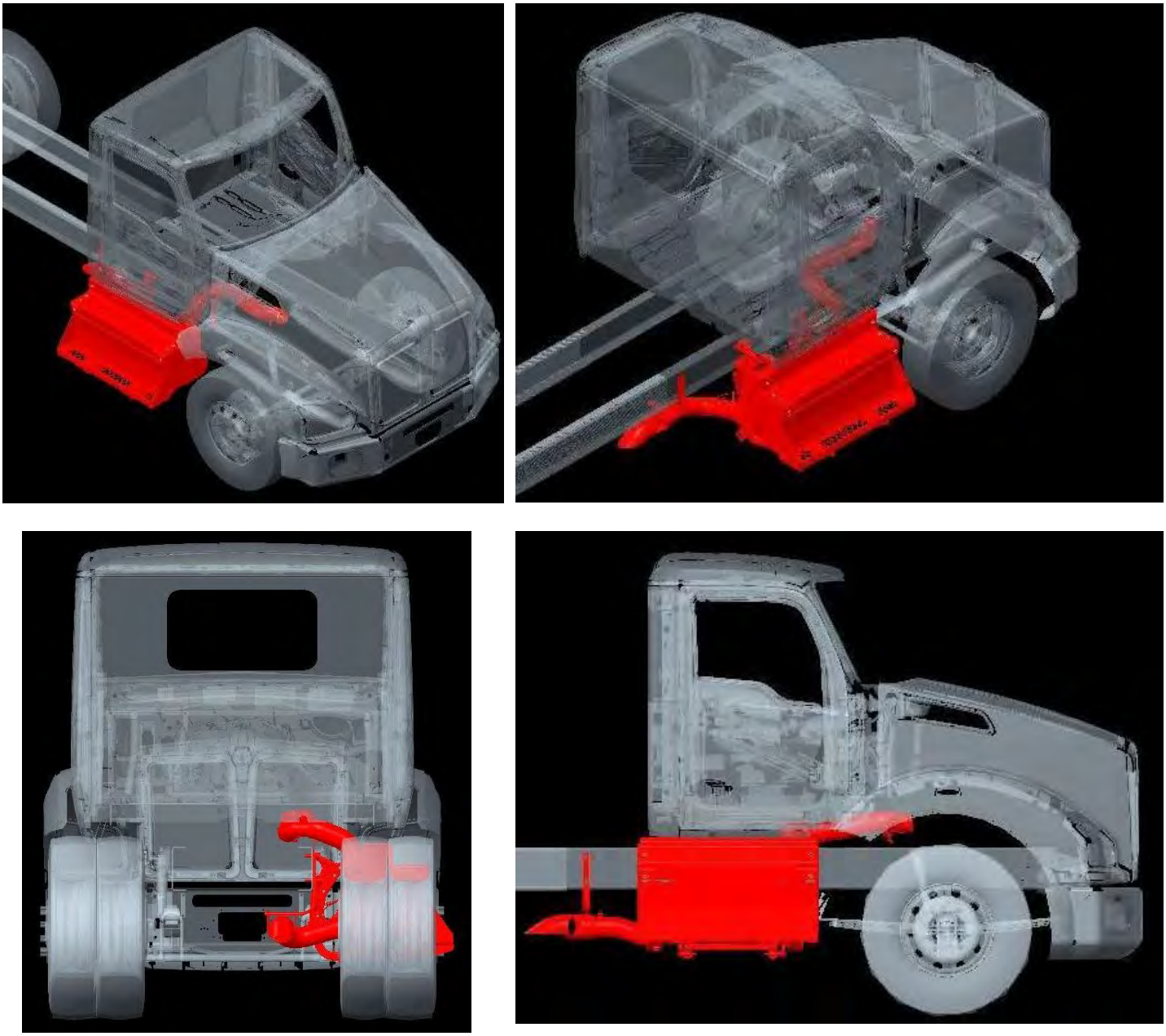


Figure 109 Right Hand Under DPF/SCR on Daycab with Ground-Dump Tailpipe

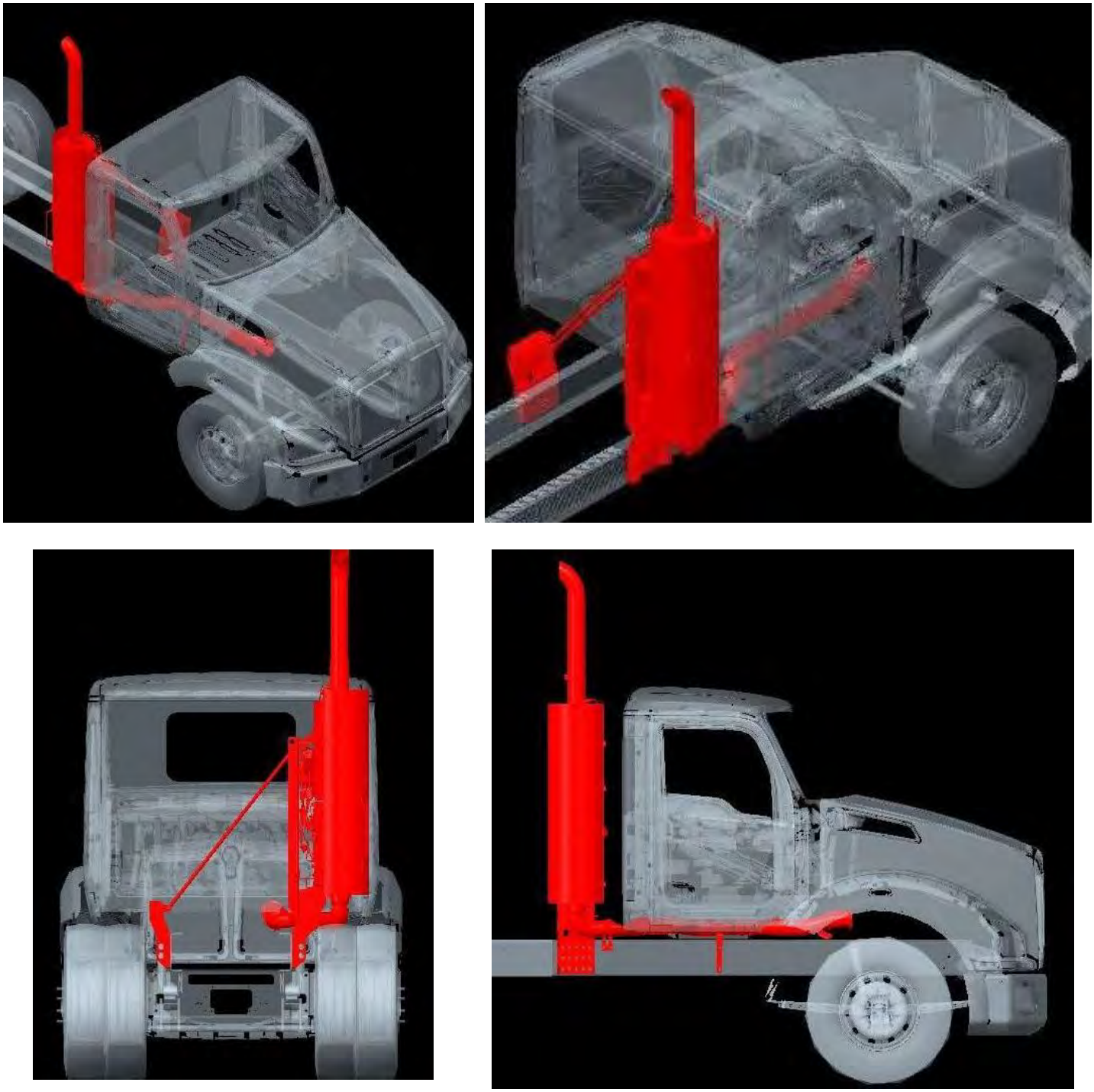


Figure 110 Independent Back of Cab DPF/SCR on Daycab with Back of Cab Tailpipe

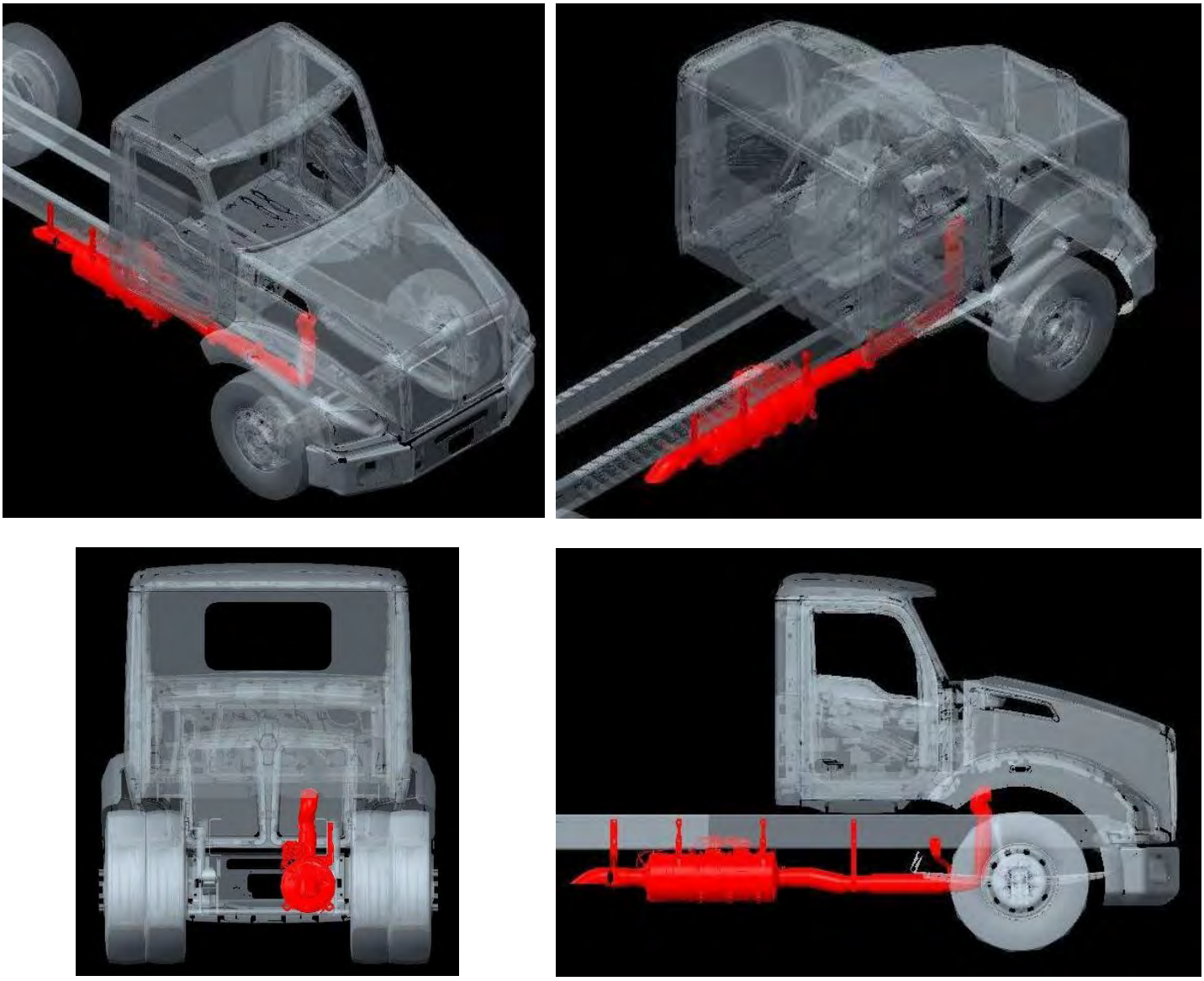


Figure 111 Horizontal DPF/SCR on Daycab with Ground-Dump Tailpipe

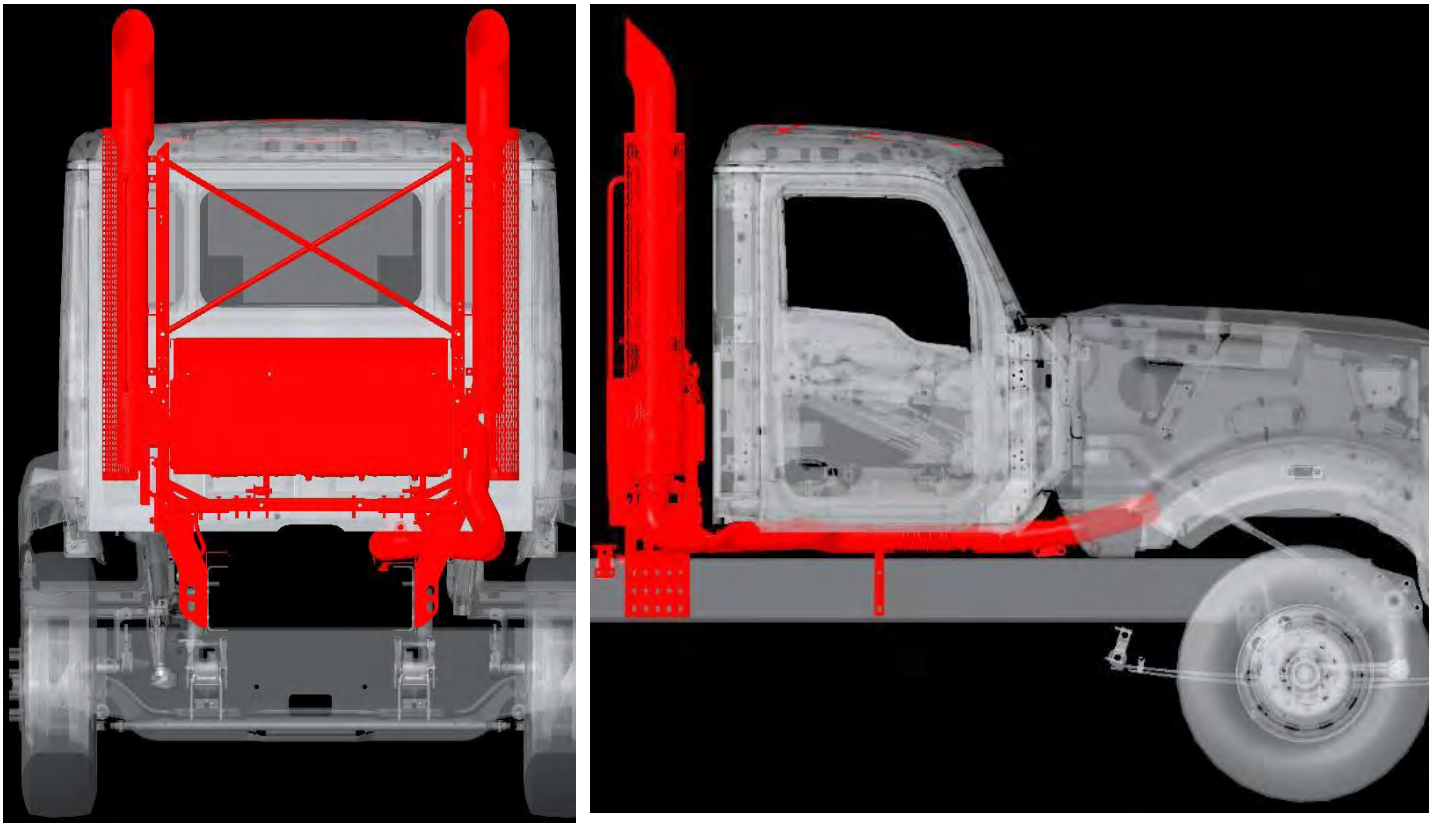


Figure 112 Transverse Back of Cab DPF/SCR on Daycab with Back of Cab Tailpipe

T880 MH SBFA 2024 Exhaust Configurations

T880 SBFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

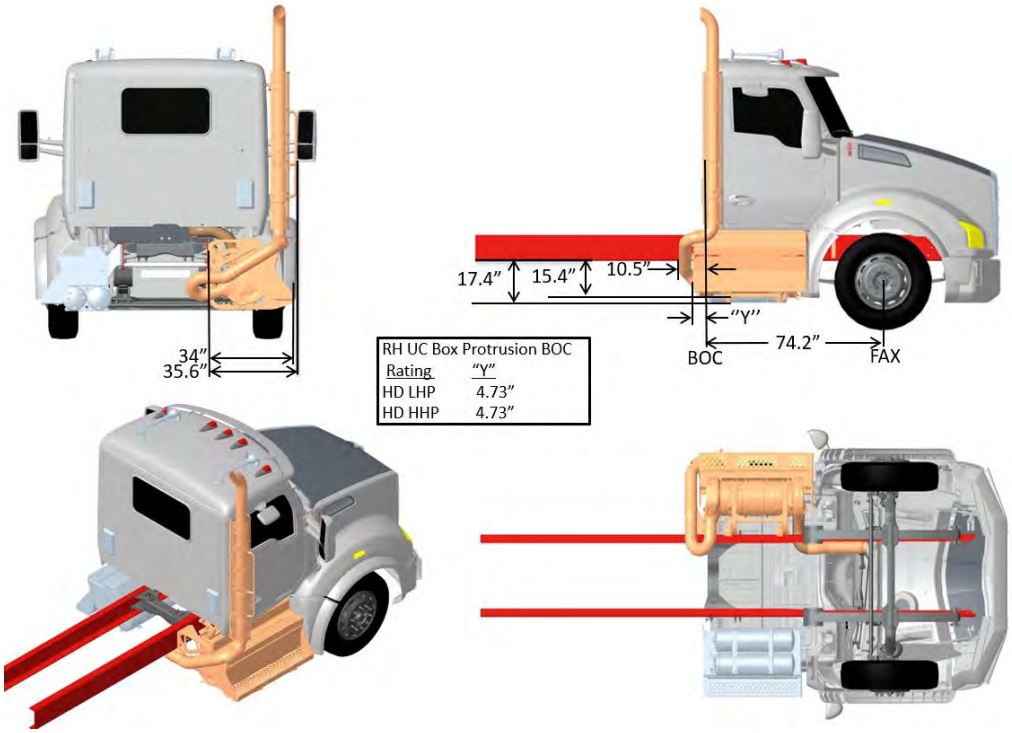


Figure 113 T880 SBFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

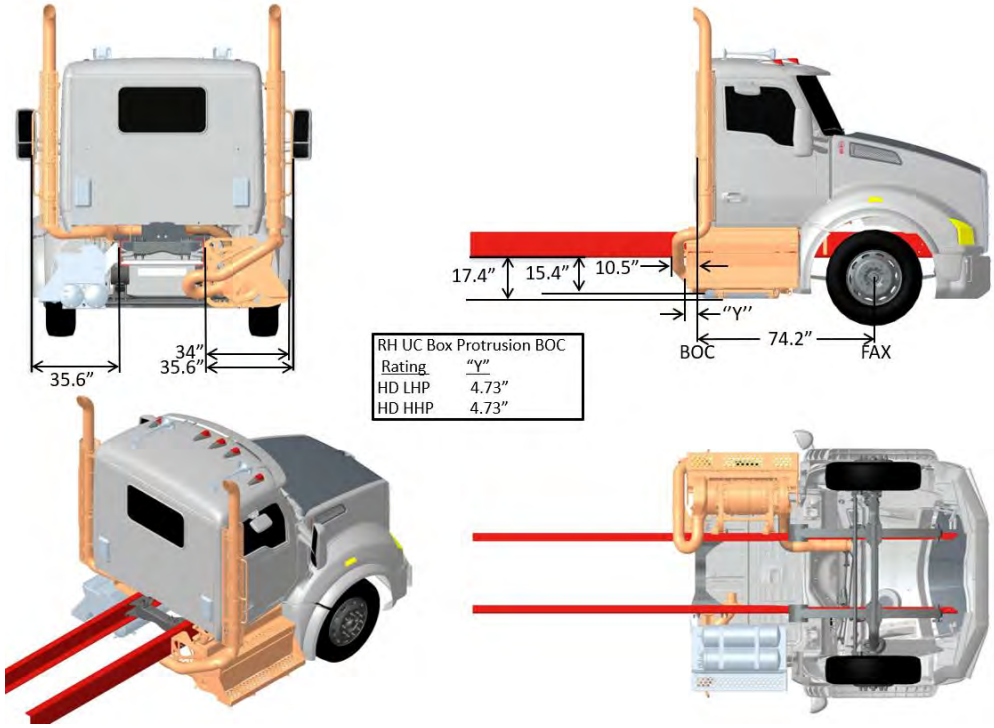


Figure 114 T880 SBFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

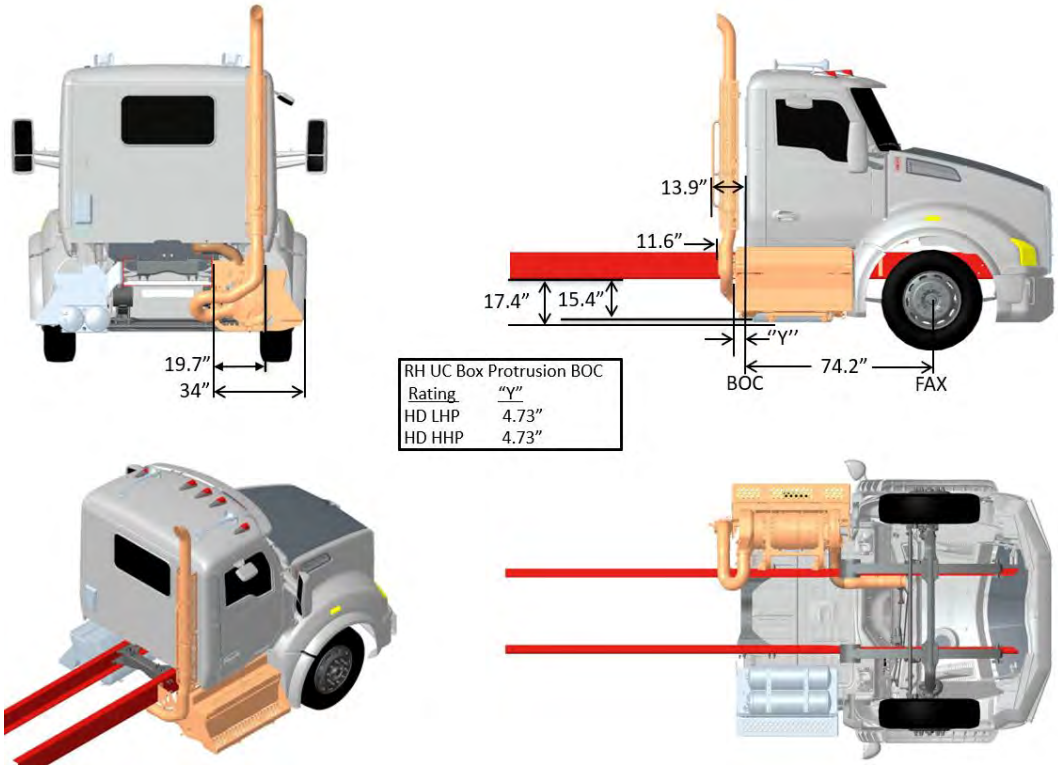


Figure 115 T880 SBFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024 EMISSIONS

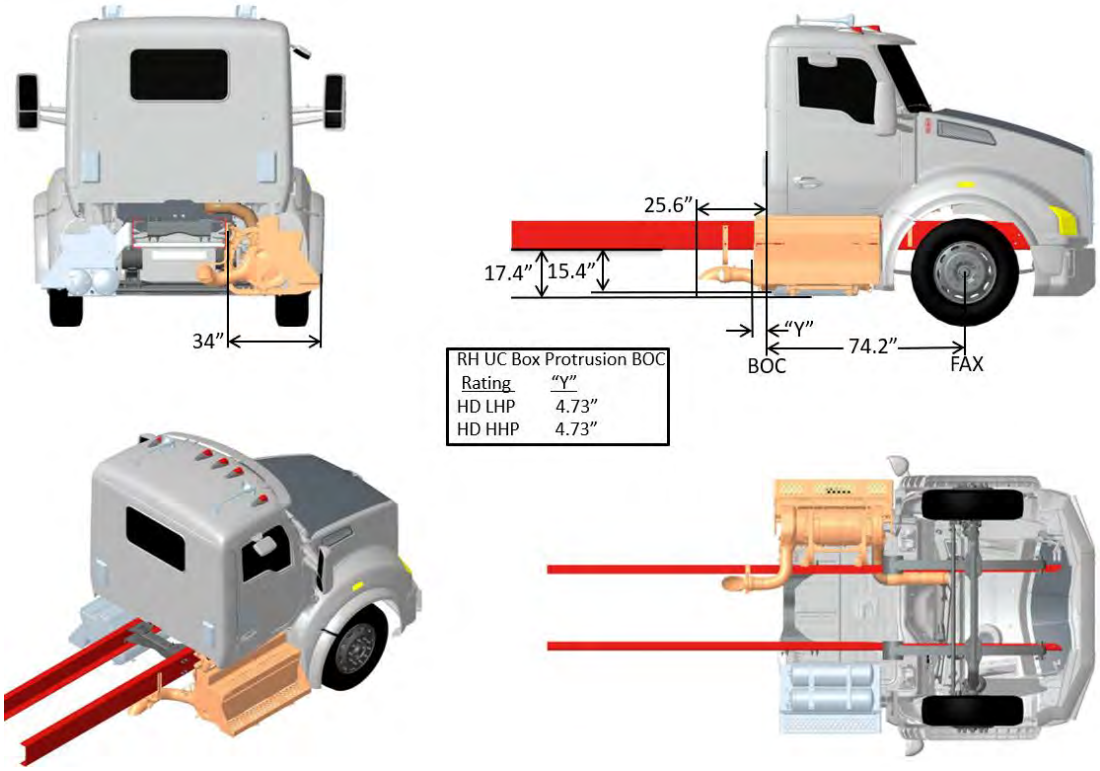


Figure 116 T880 SBFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

T880 SBFA EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024 EMISSIONS

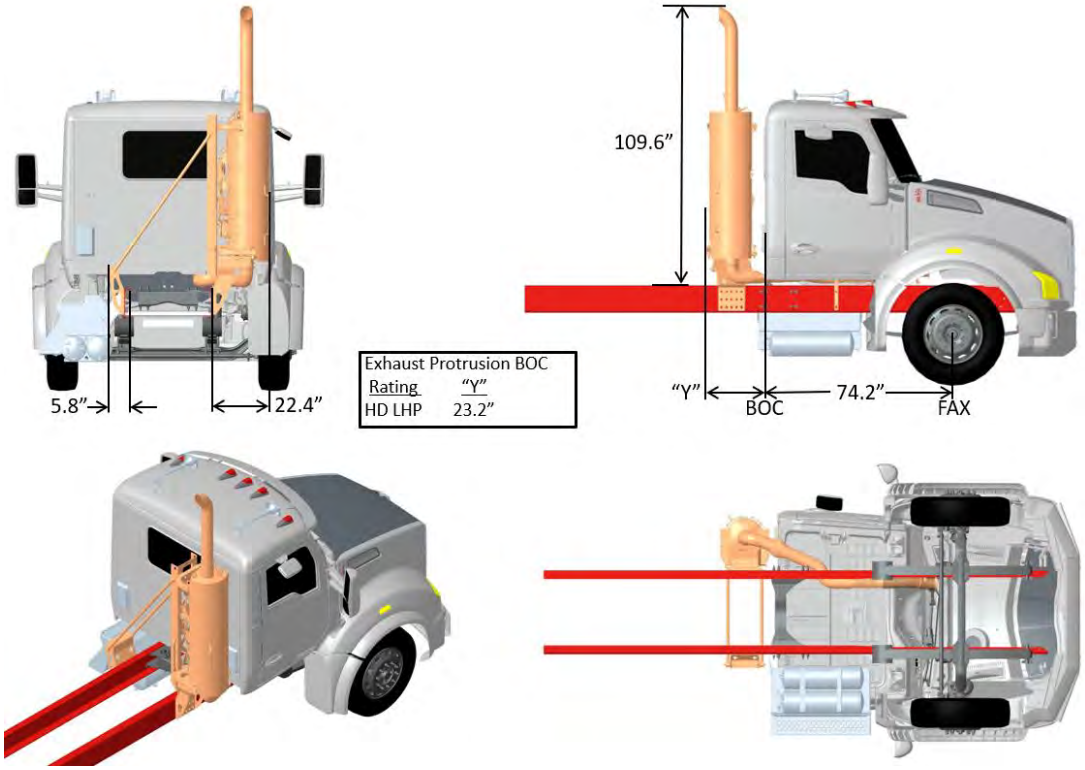


Figure 117 T880 SBFA EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024

T880 SBFA EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024 EMISSIONS

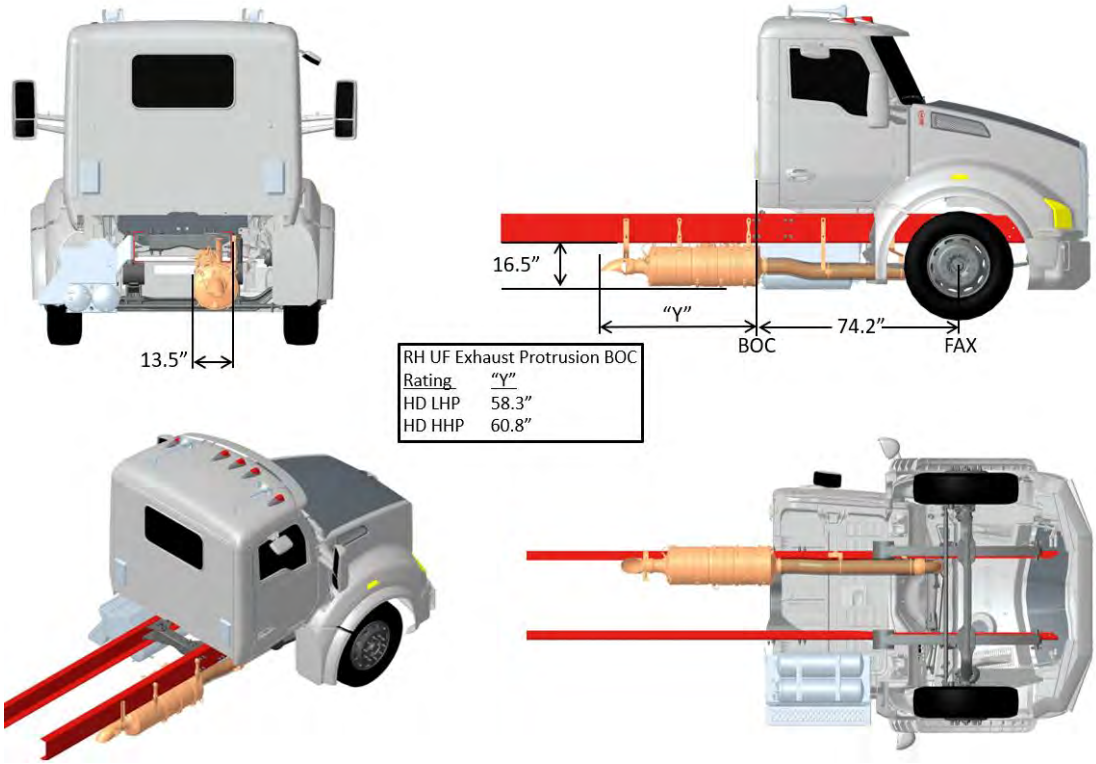


Figure 118 T880 SBFA EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024

T880 SBFA EXHAUST DUAL BACK OF CAB TRANSVERSE DPF/SCR 2024 EMISSIONS

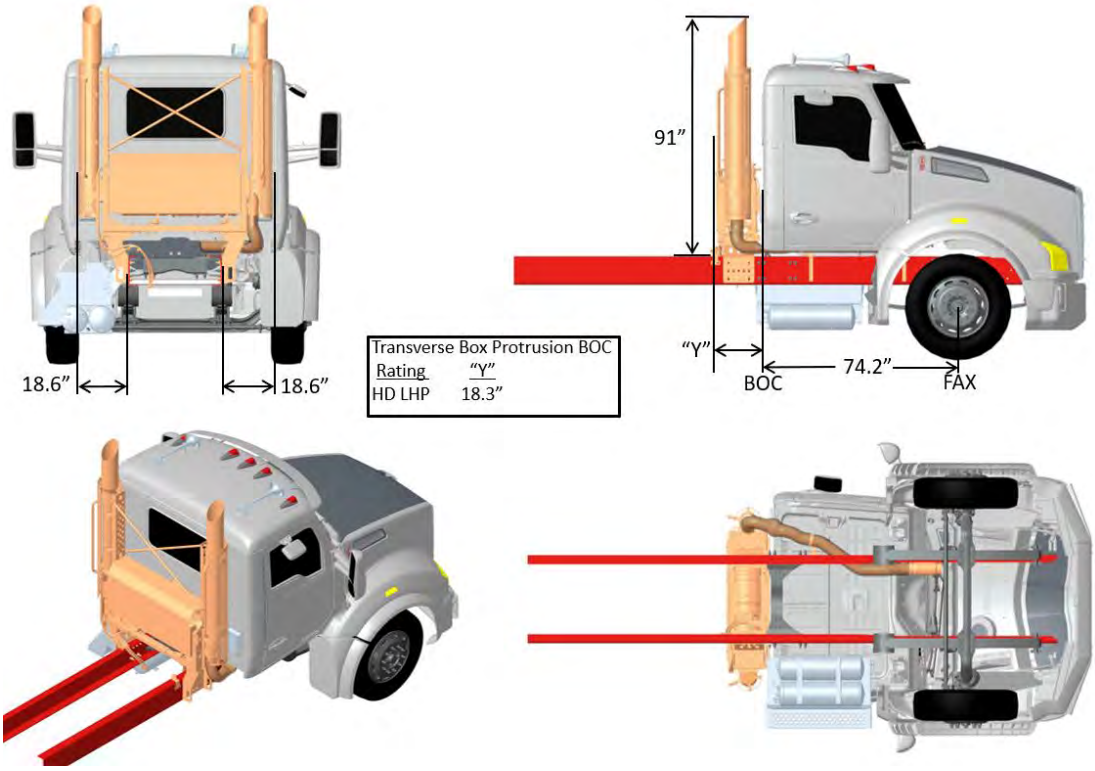


Figure 119 T880 SBFA EXHAUST DUAL BACK OF CAB TRANSVERSE DPF/SCR 2024

T880 SBFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

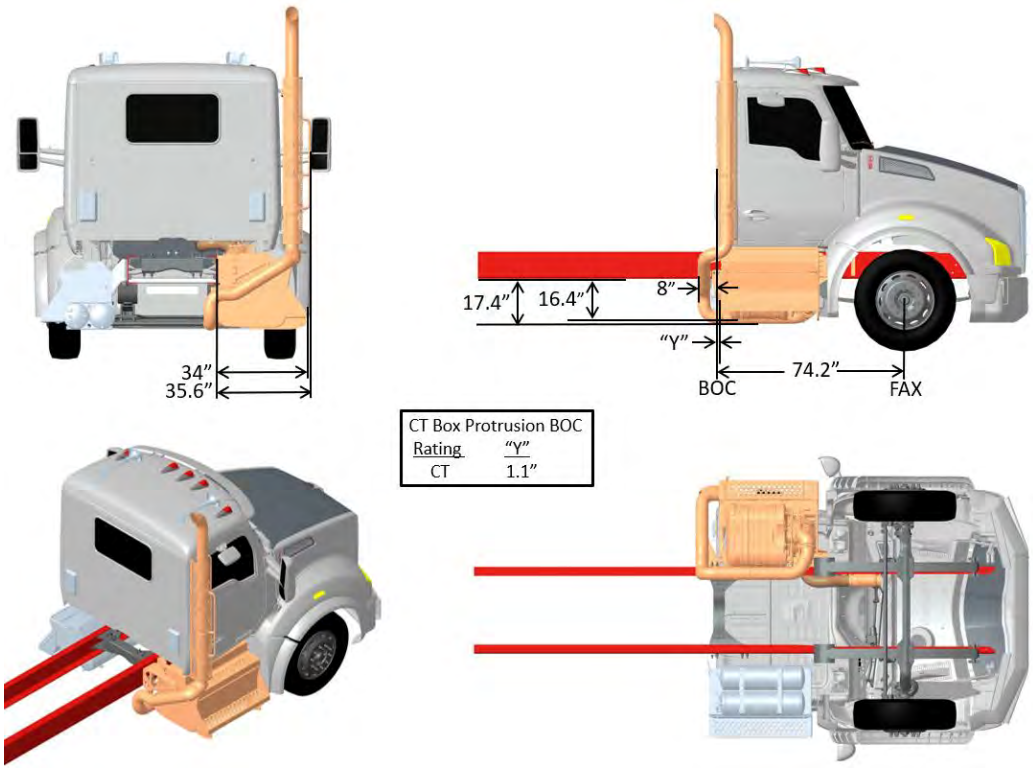


Figure 120 T880 SBFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

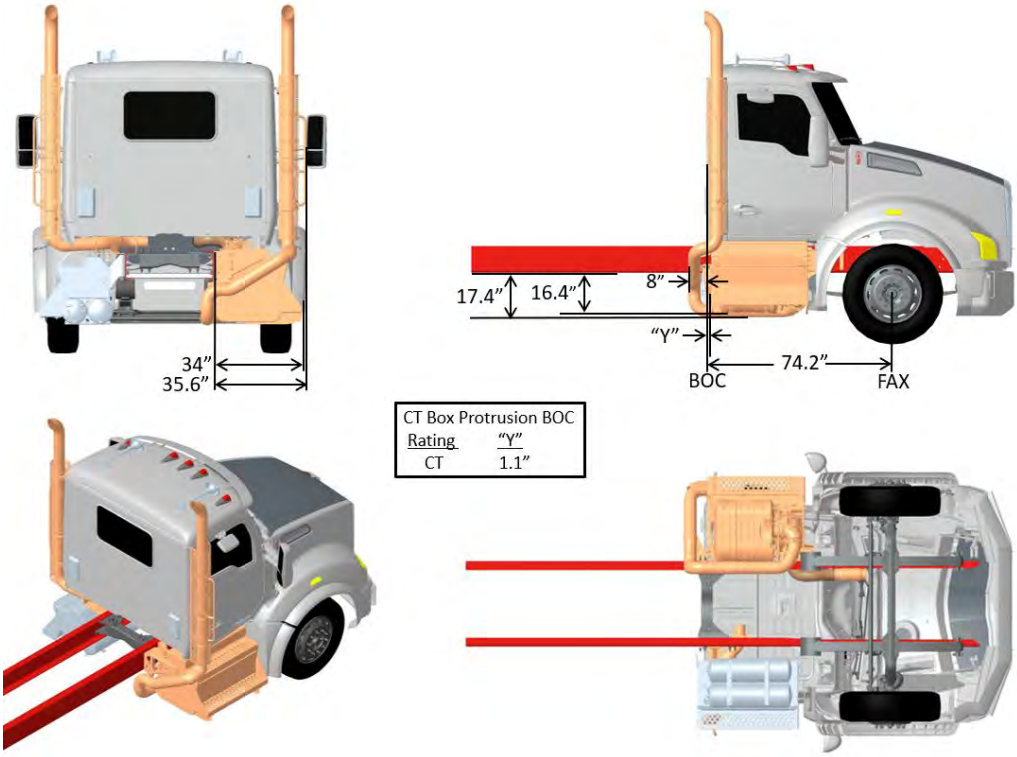


Figure 121 T880 SBFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA CT EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

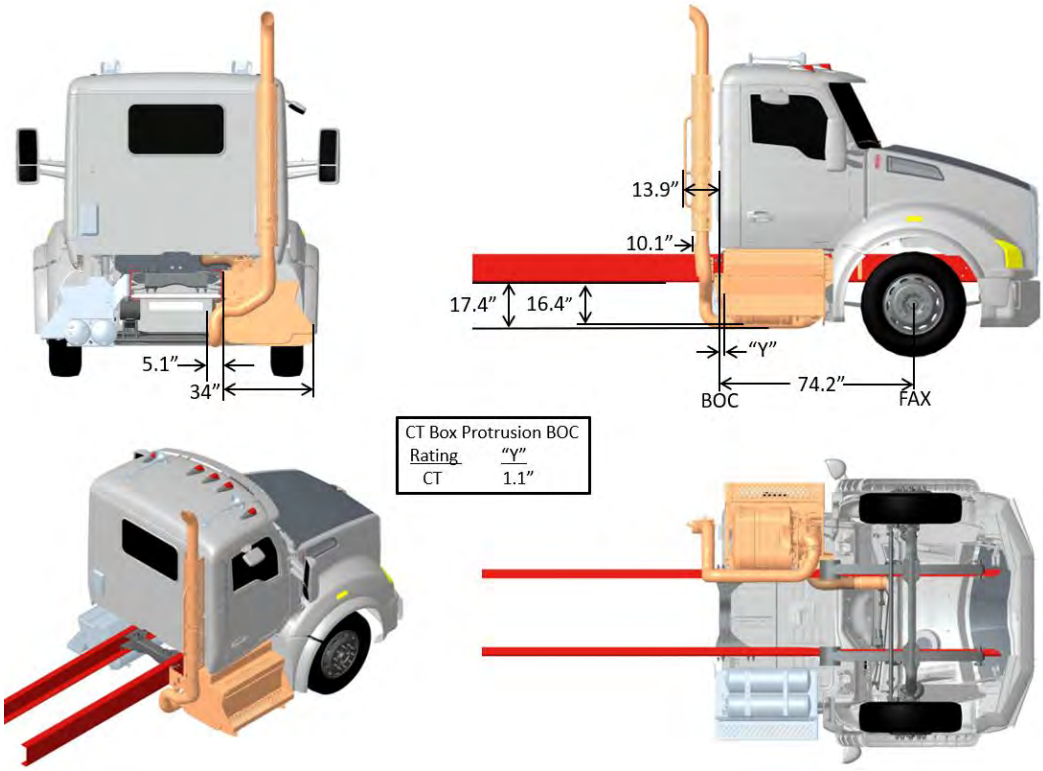


Figure 122 T880 SBFA CT EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880 SBFA CT EXHAUST SINGLE RH Horizontal DPF/SCR RH Under Cab 2024 EMISSIONS

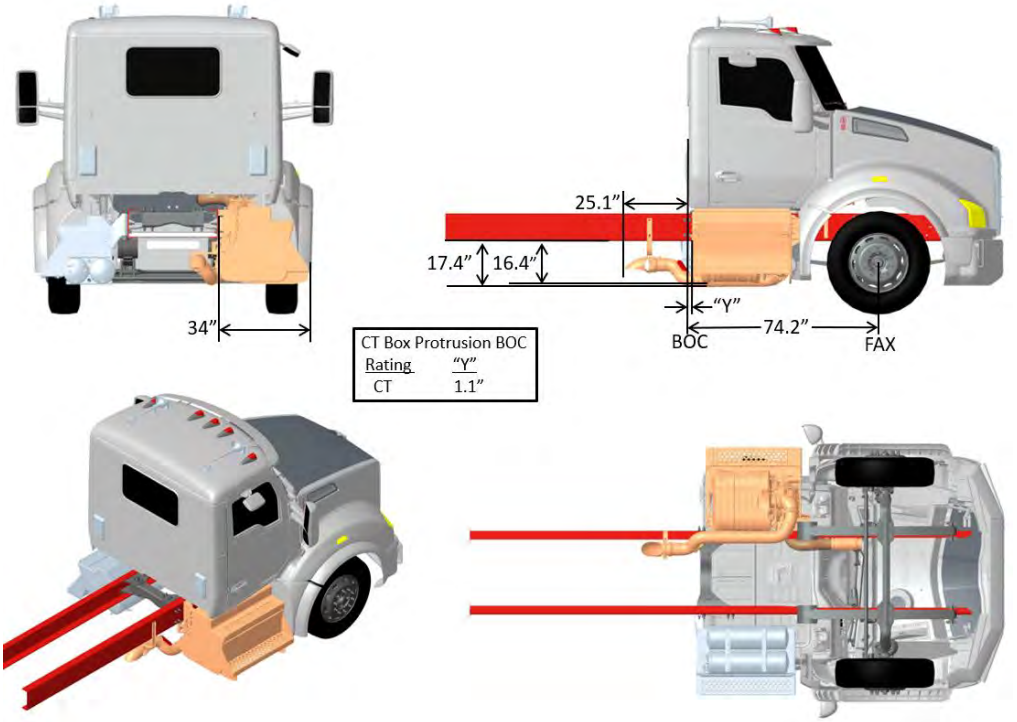


Figure 123 T880 SBFA CT EXHAUST SINGLE RH Horizontal DPF/SCR RH Under Cab 2024

T880 SH SBFA 2024 Exhaust Configurations

T880-SH SBFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

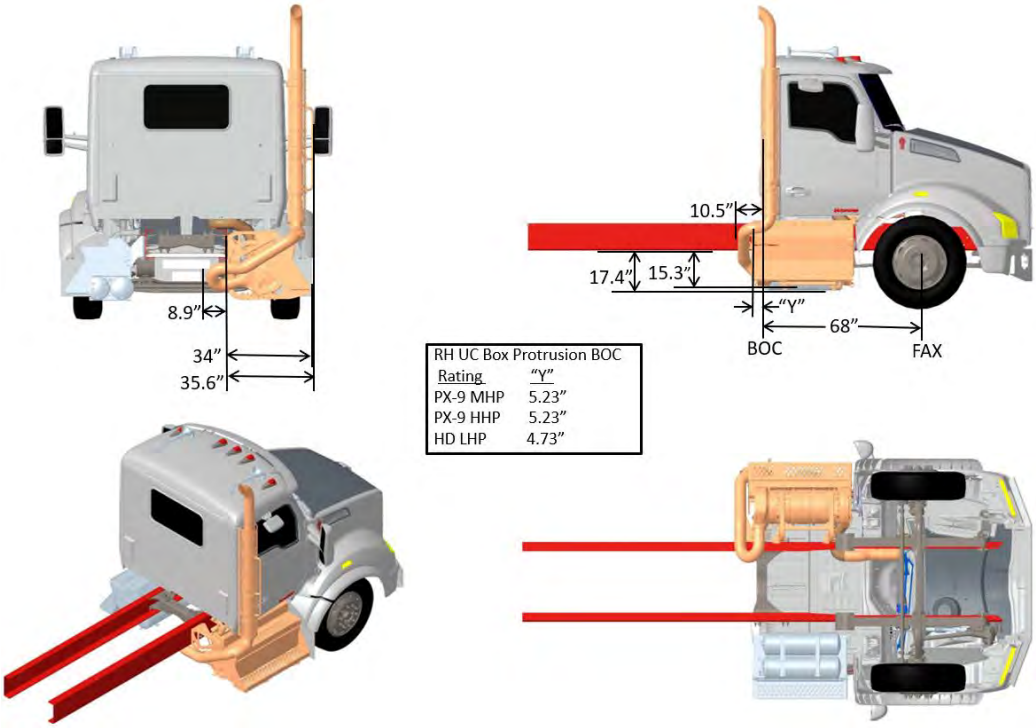


Figure 124 T880-SH SBFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

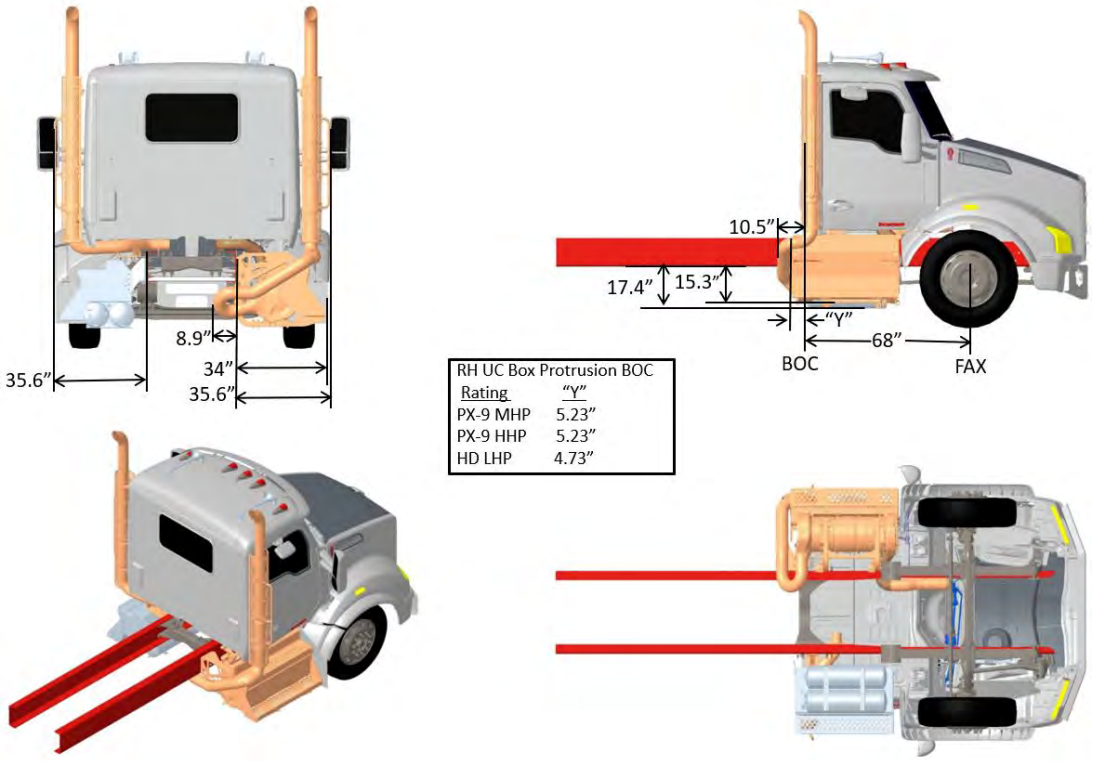


Figure 125 T880-SH SBFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

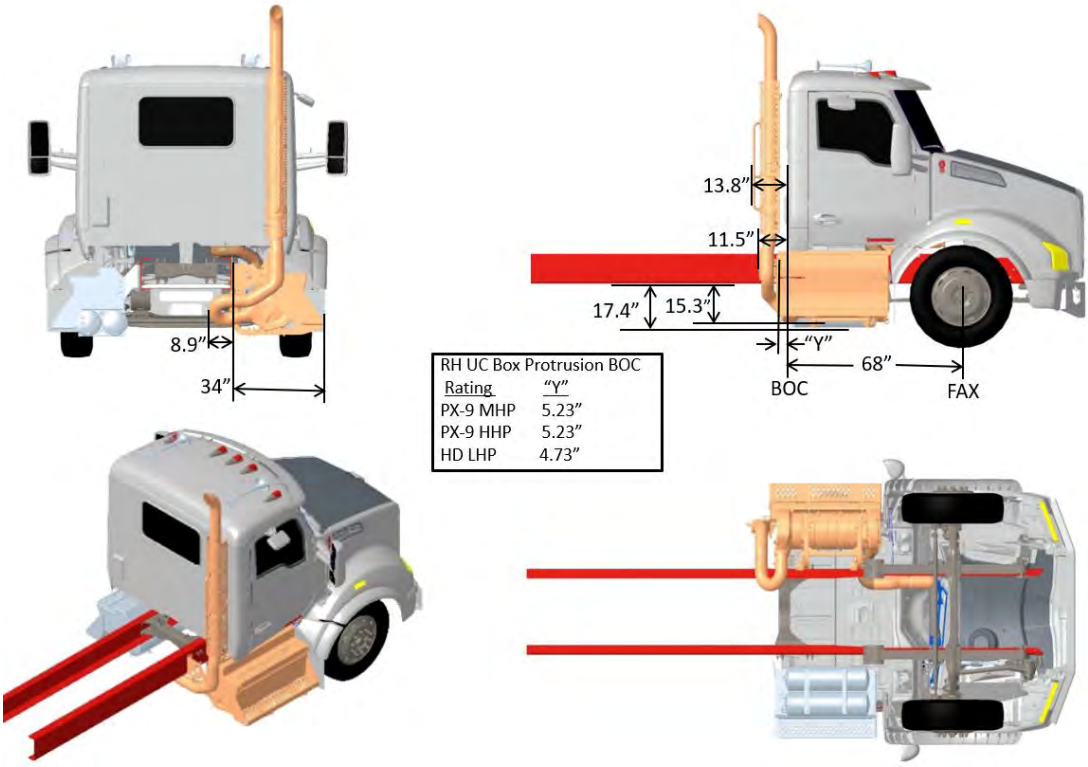


Figure 126 T880-SH SBFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

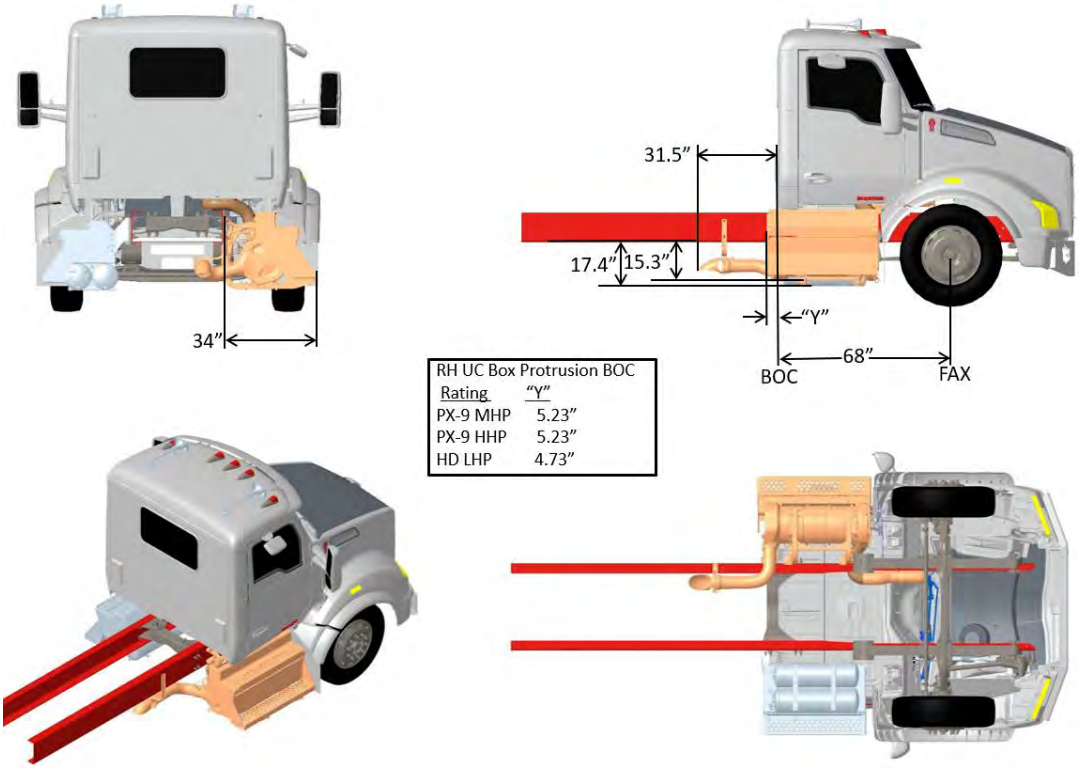


Figure 127 T880-SH SBFA SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

T880-SH SBFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024

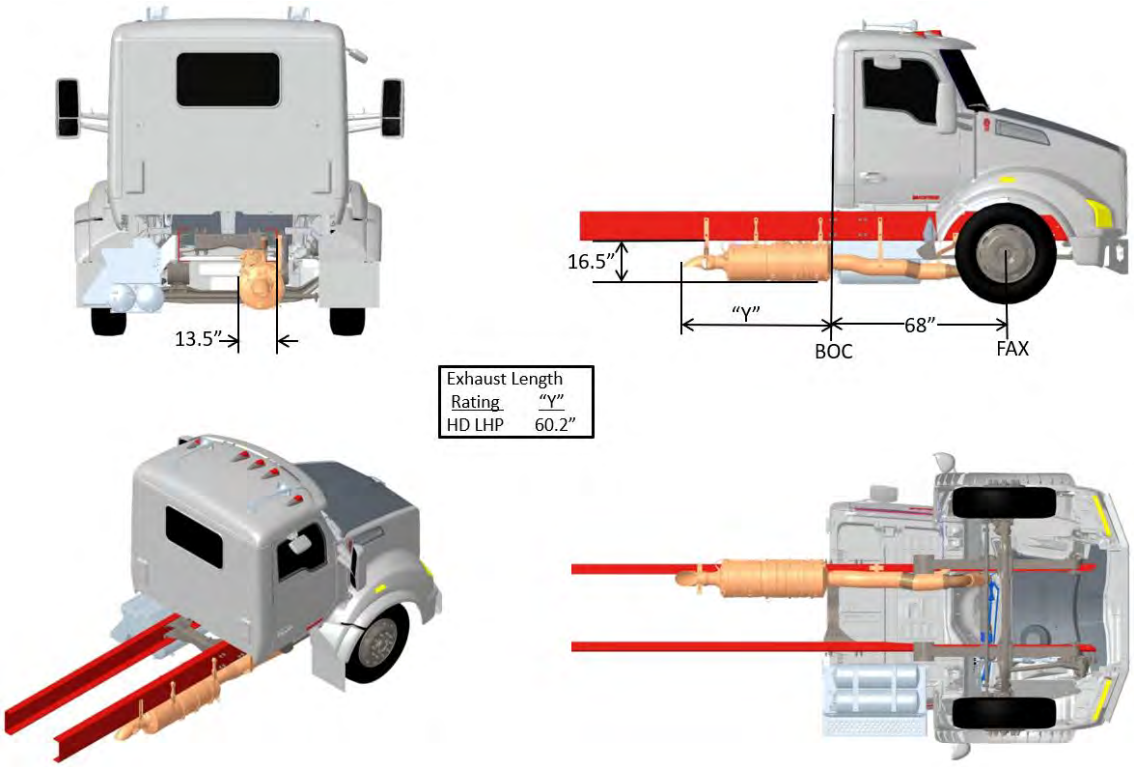


Figure 128 T880-SH SBFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024

T880-SH SBFA SM EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024 EMISSIONS

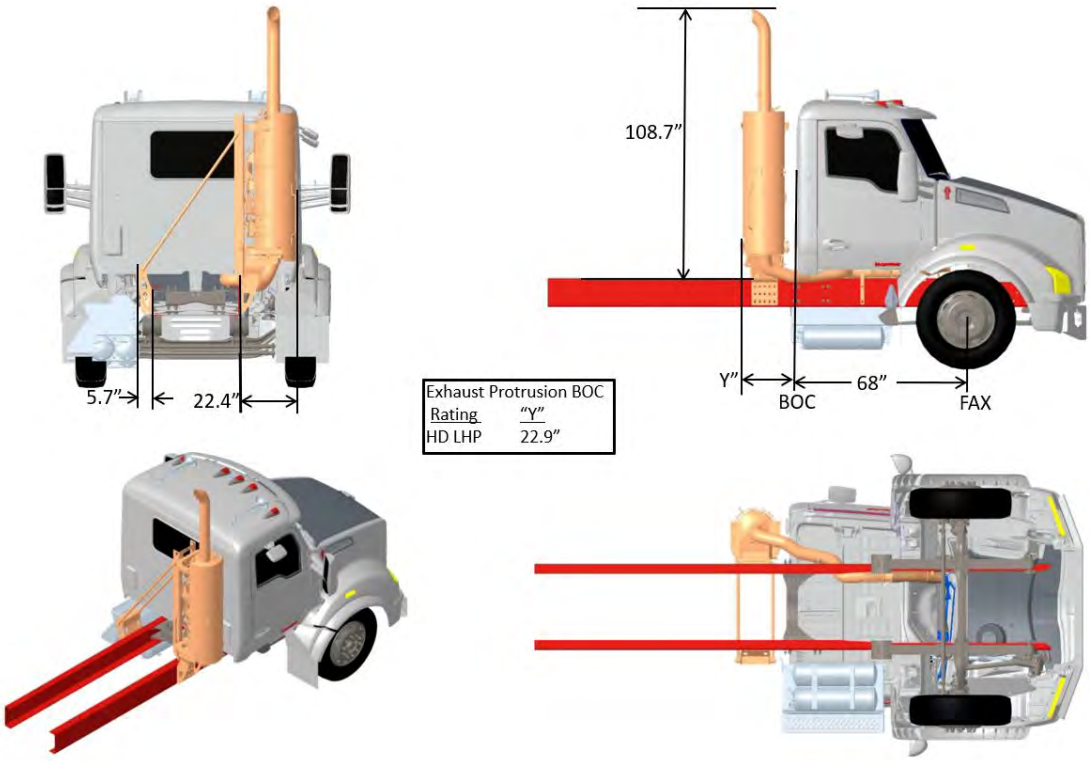


Figure 129 T880-SH SBFA SM EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024

T880-SH SBFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

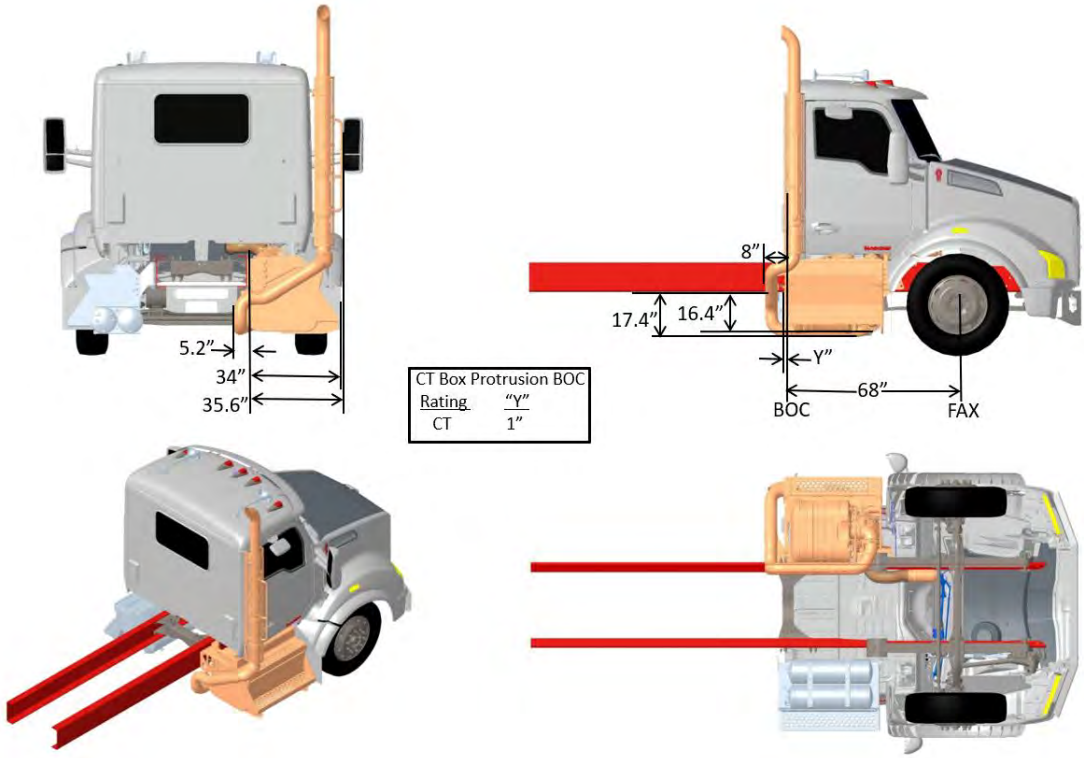


Figure 130 T880-SH SBFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

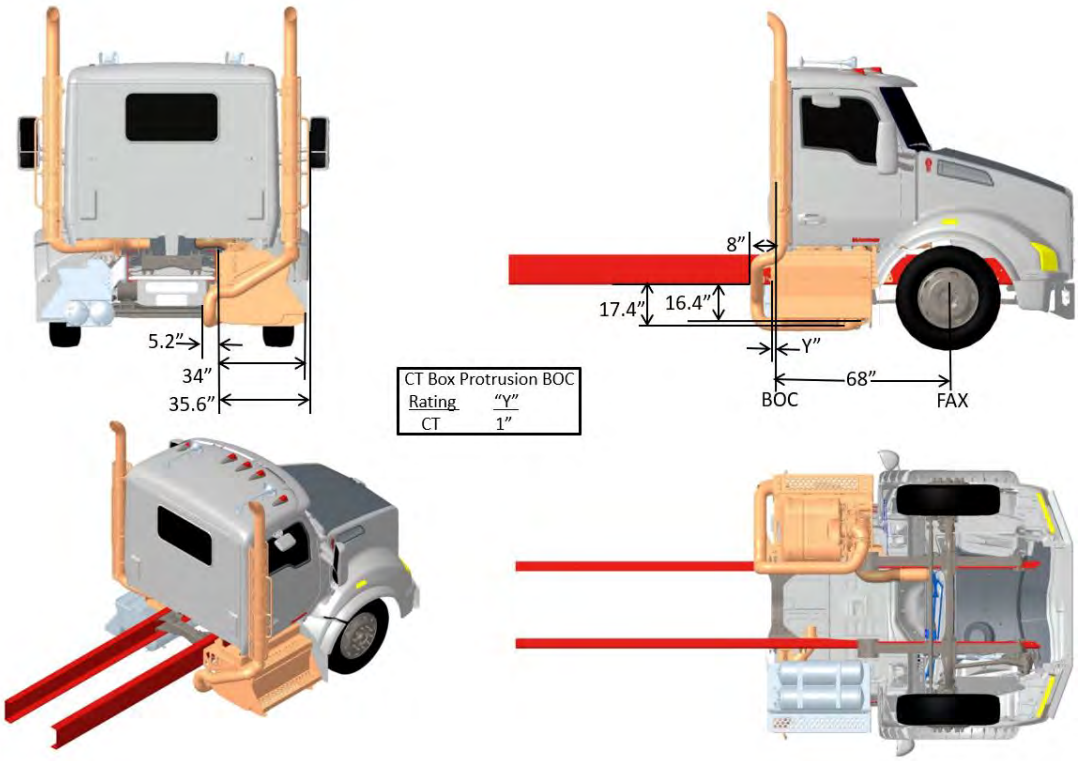


Figure 131 T880-SH SBFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA CT EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024 EMISSIONS

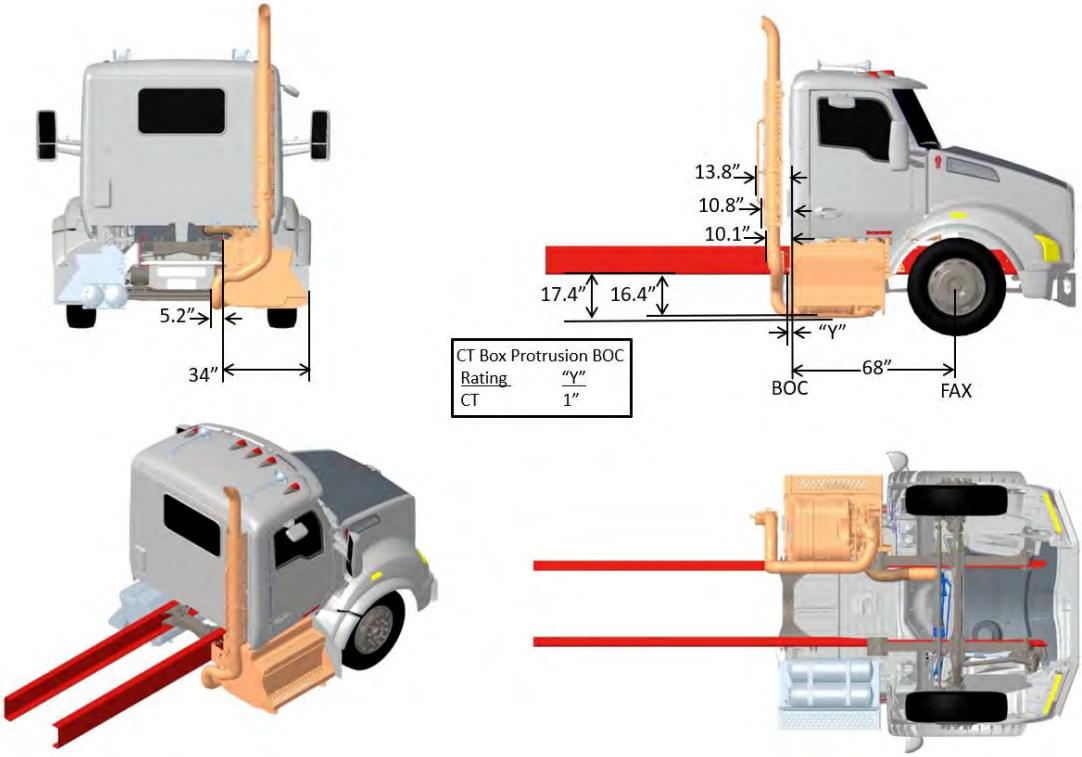


Figure 132 T880-SH SBFA CT EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SBFA CT EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024 EMISSIONS

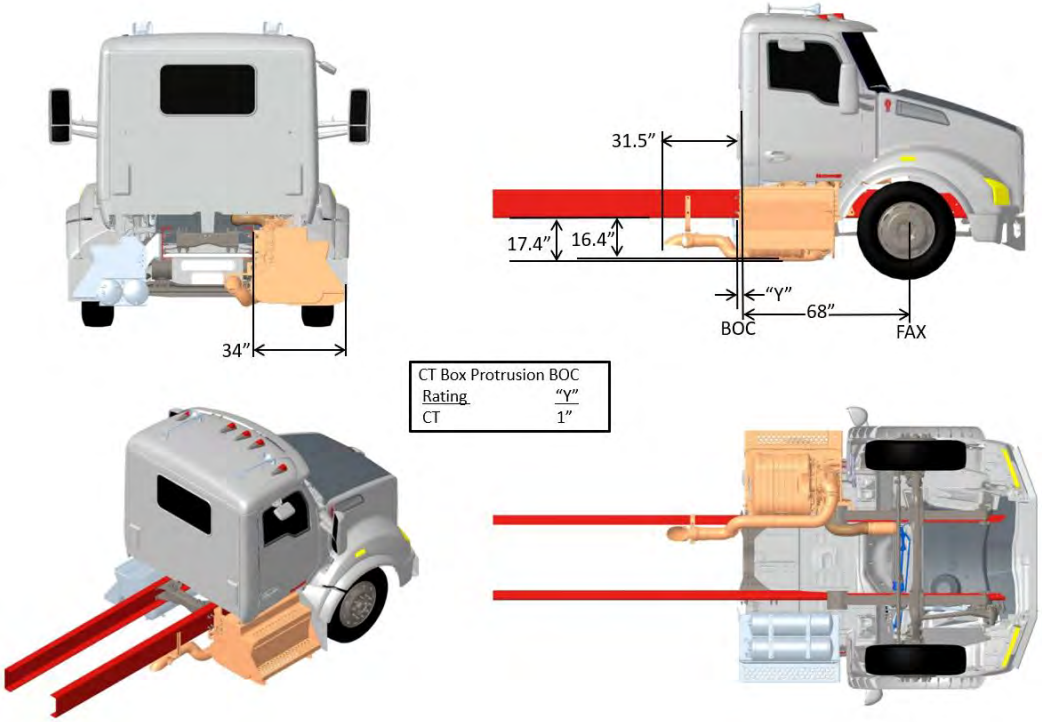


Figure 133 T880-SH SBFA CT EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

T880 SH SFFA 2024 Exhaust Configurations

T880-SH SFFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

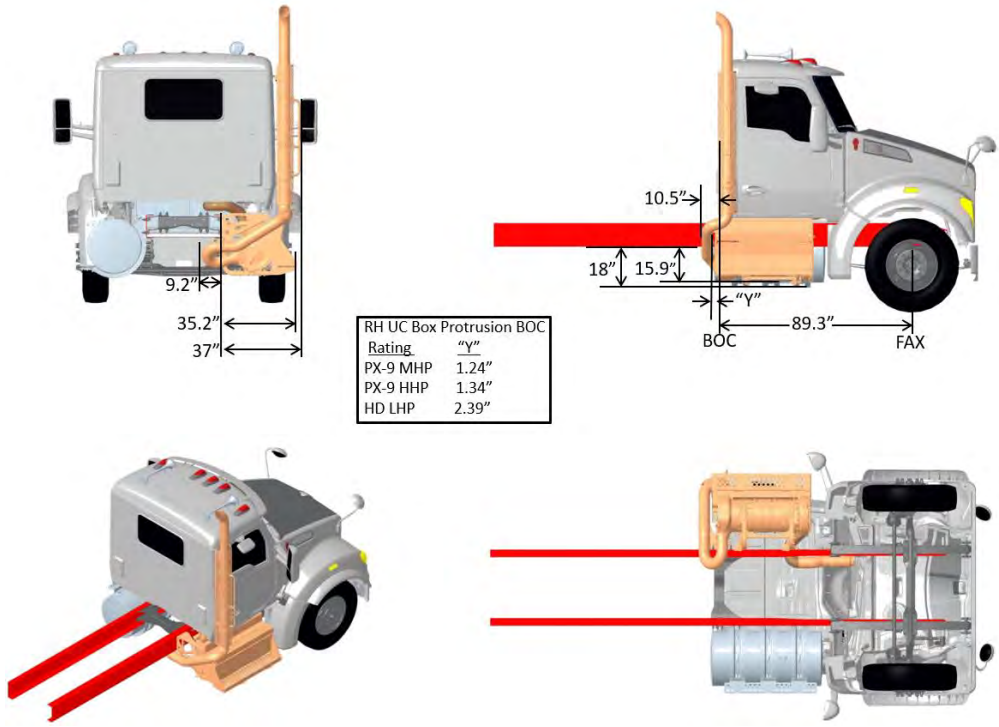


Figure 134 T880-SH SFFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SFFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

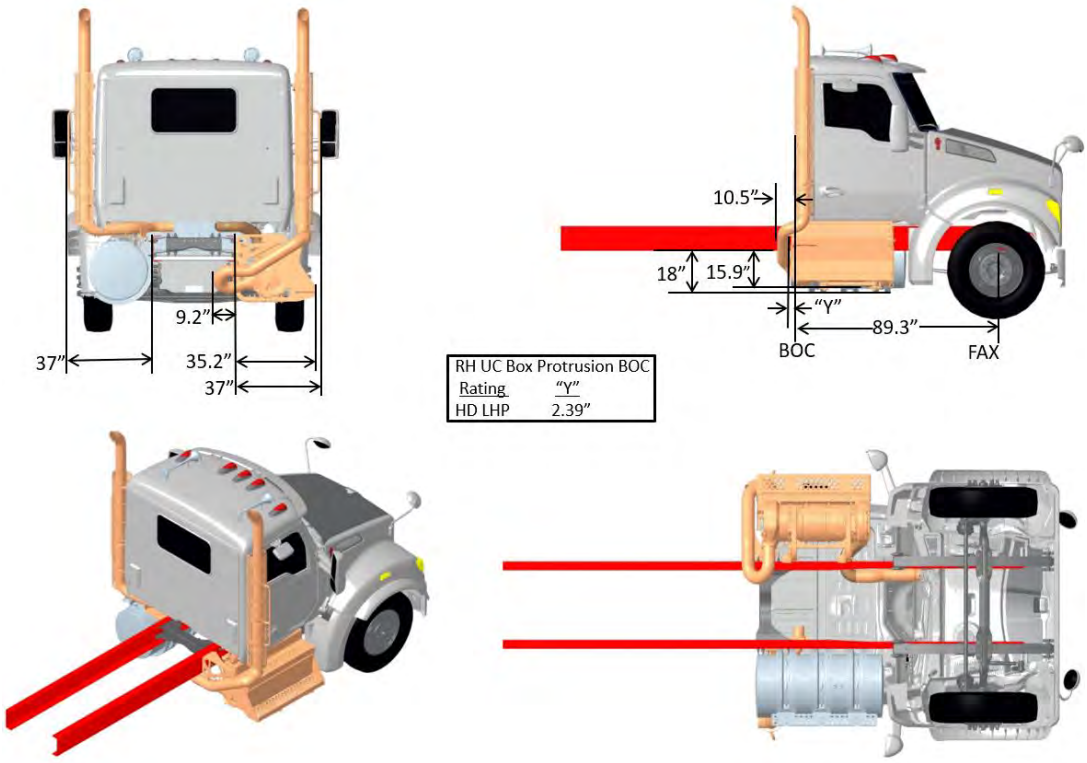


Figure 135 T880-SH SFFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SFFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

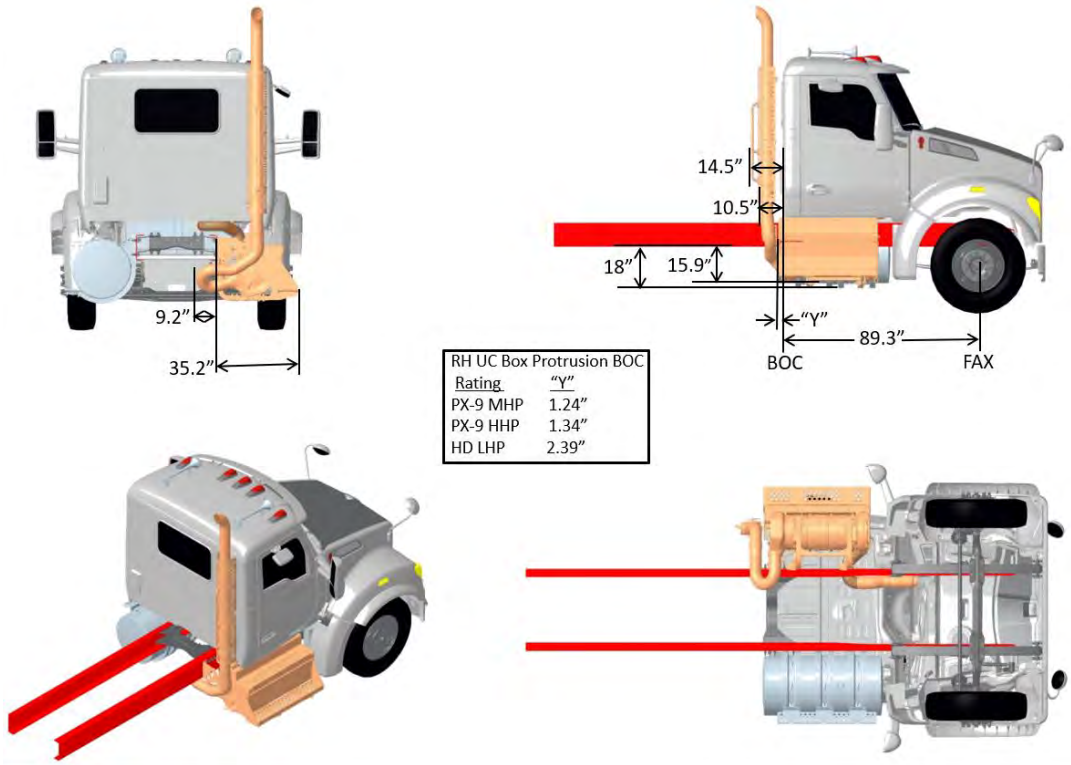


Figure 136 T880-SH SFFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

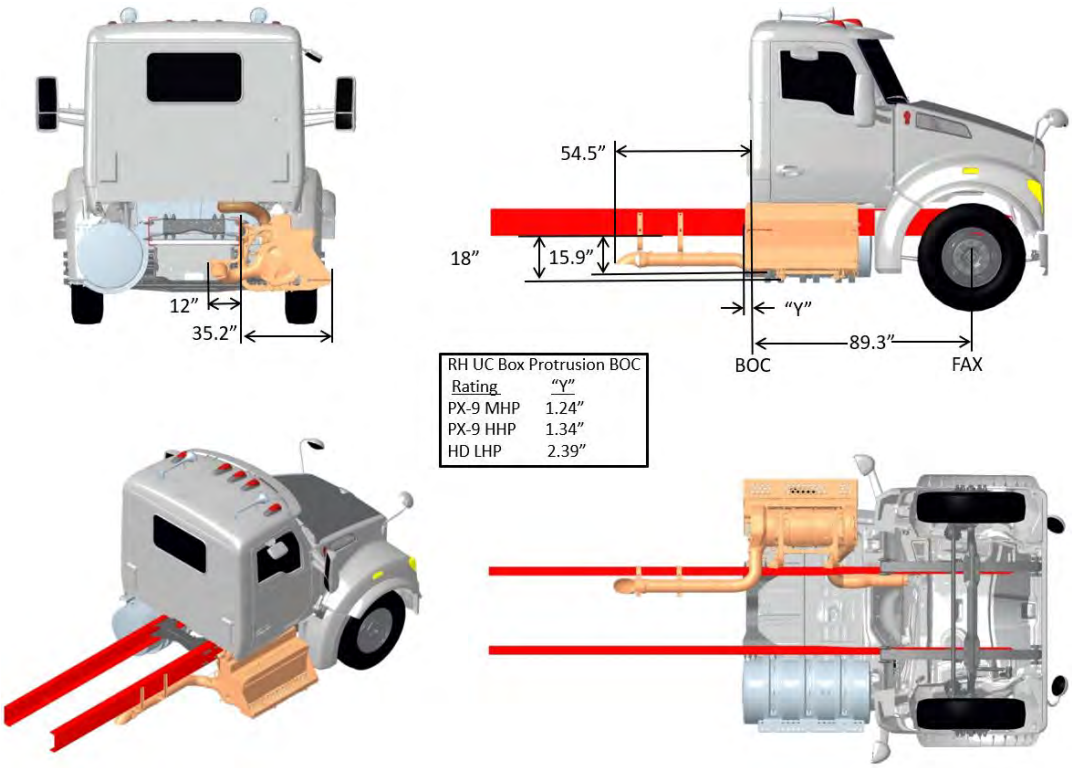


Figure 137 T880-SH SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

T880-SH SFFA SM EXHAUST SINGLE RH BOC VERTICAL DPF/SCR 2024

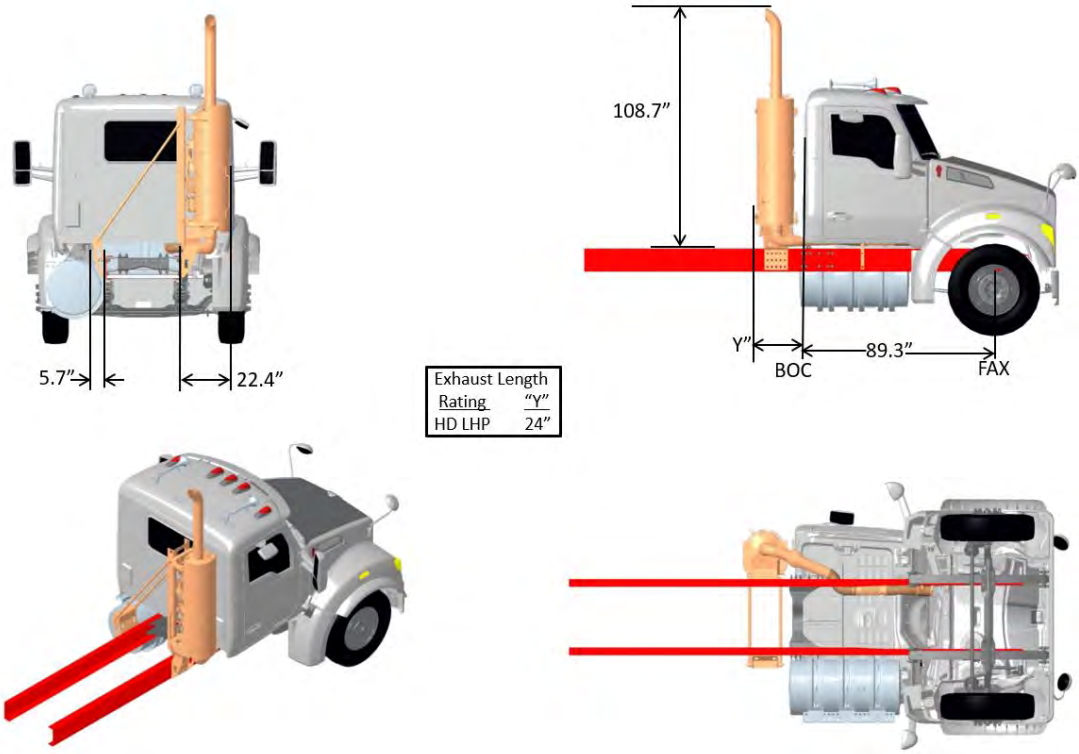


Figure 138 T880-SH SFFA SM EXHAUST SINGLE RH BOC VERTICAL DPF/SCR 2024

T880-SH SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024

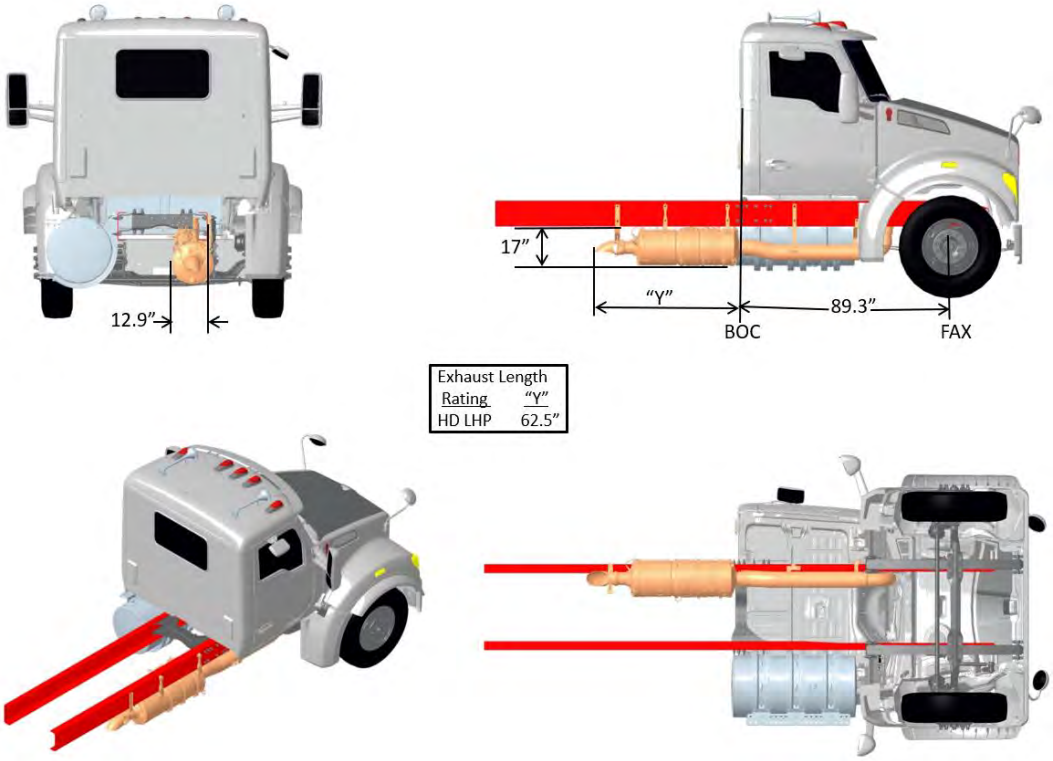


Figure 139 T880-SH SFFA SM EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER FRAME 2024

T880-SH SFFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

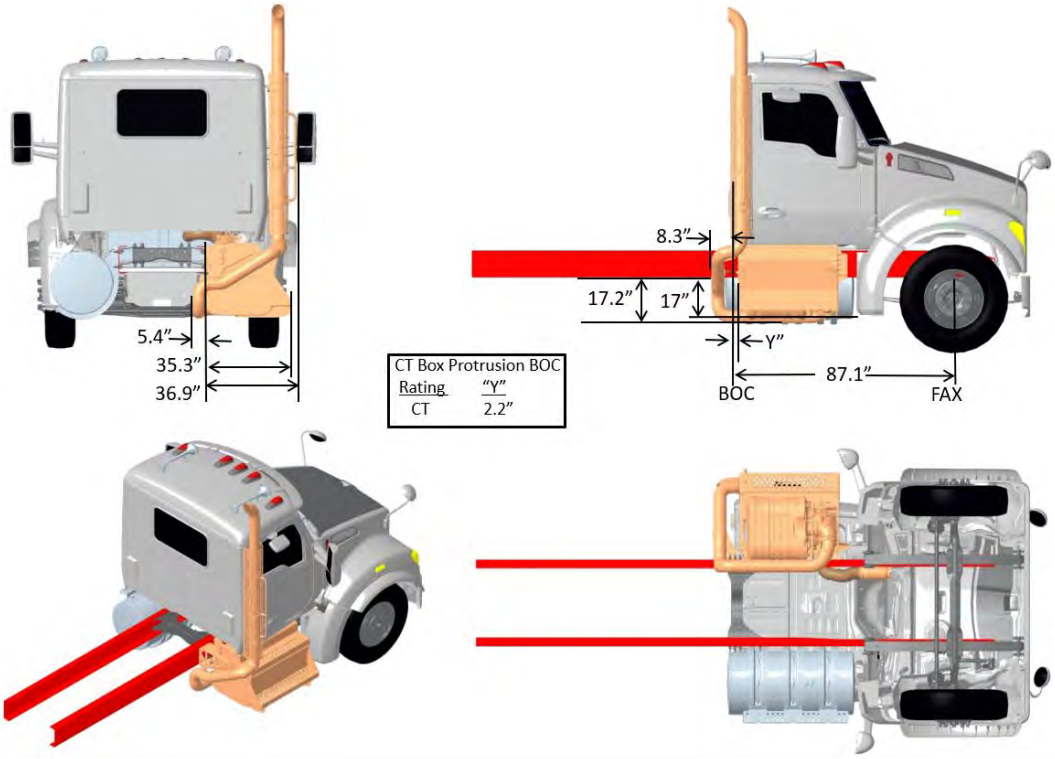


Figure 140 T880-SH SFFA CT EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

MODEL T880-SH SFFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

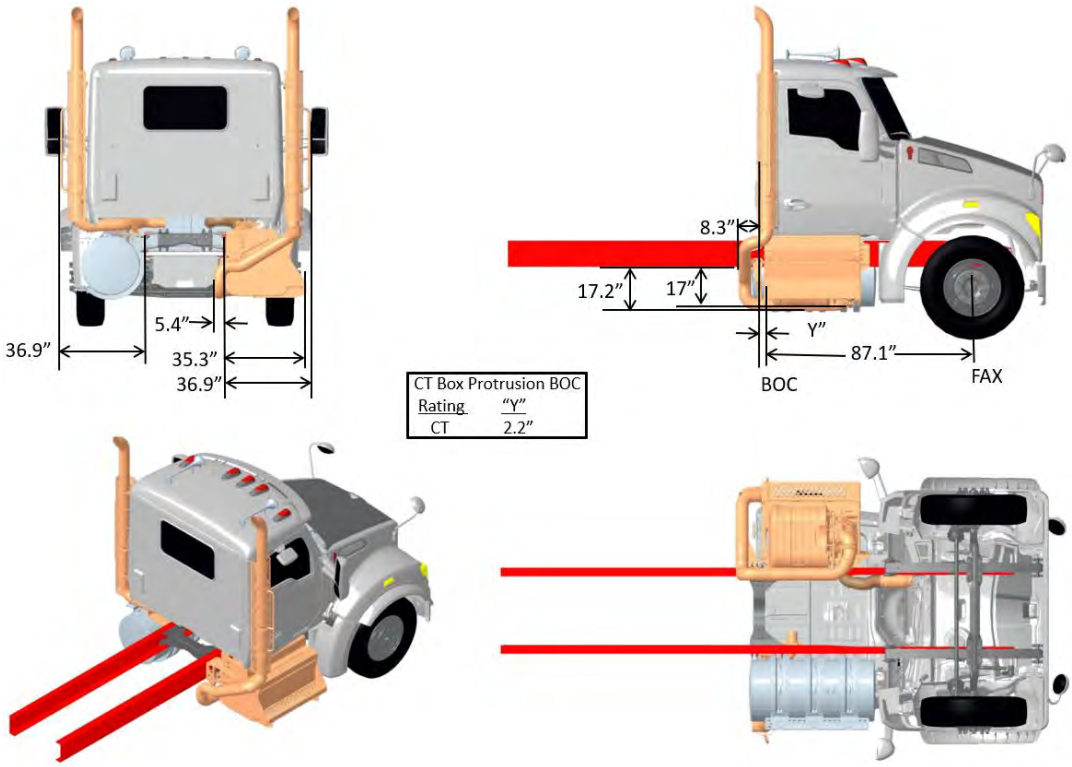


Figure 141 MODEL T880-SH SFFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SFFA CT EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

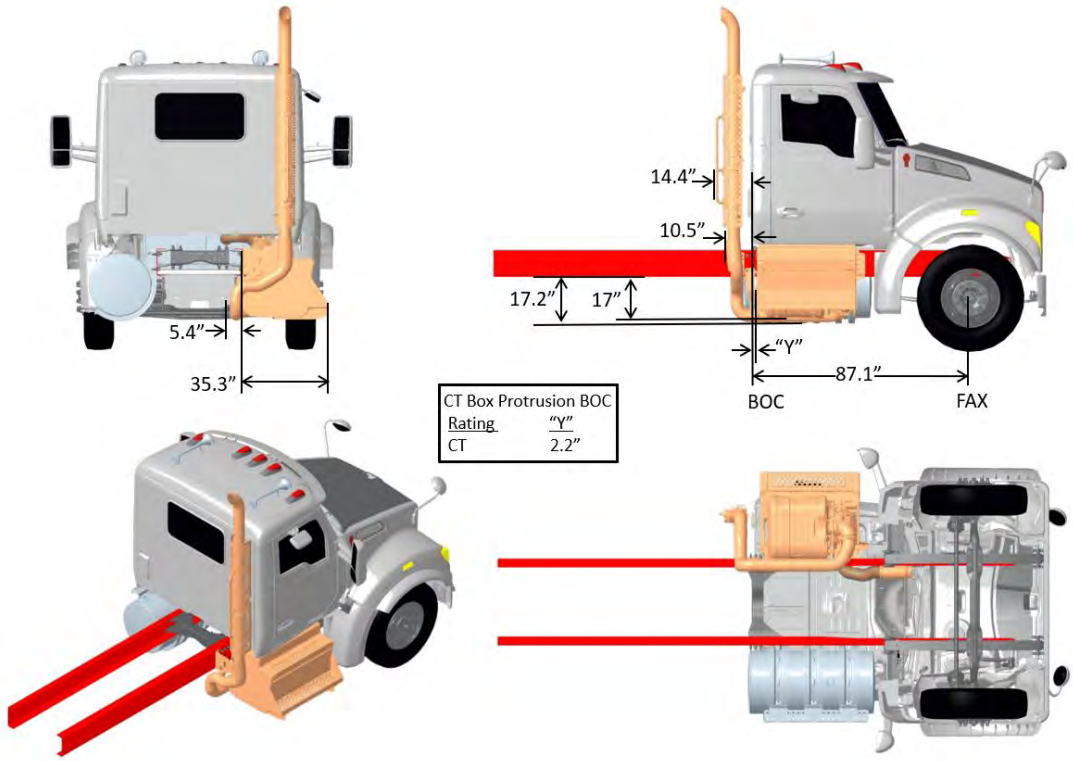


Figure 142 T880-SH SFFA CT EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

T880-SH SFFA CT EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

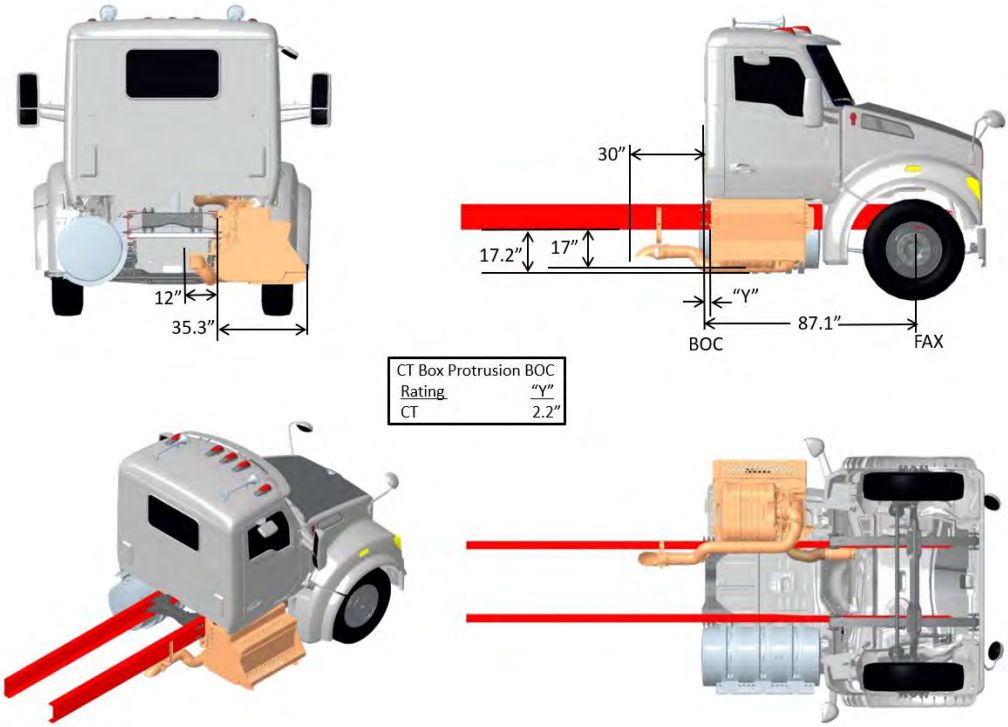


Figure 143 T880-SH SFFA CT EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

T880 TWIN STEER (TS) 2024 Exhaust Configurations

T880-SH TWIN STEER SBFA SM EXHAUST SINGLE RHBOC DPF/SCR RH UNDER CAB 2024

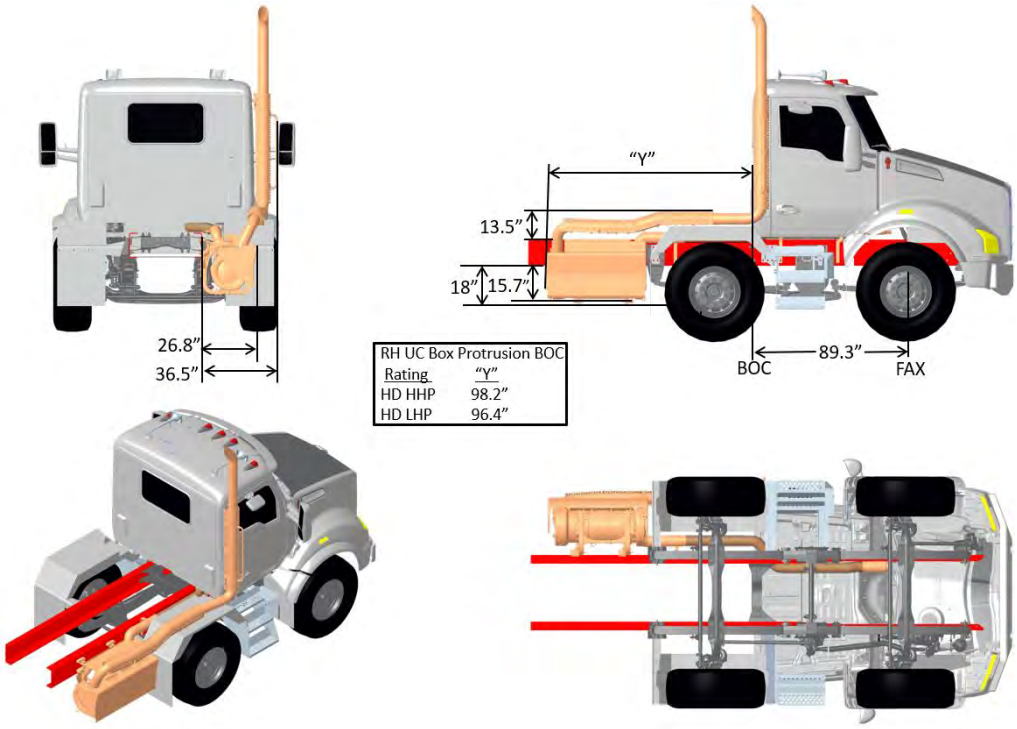


Figure 144 T880-SH TWIN STEER SBFA SM EXHAUST SINGLE RHBOC DPF/SCR RH UNDER CAB 2024

T880-SH TWIN STEER SFFA SM EXHAUST SINGLE RHBOC DPF/SCR RH UNDER CAB 2024

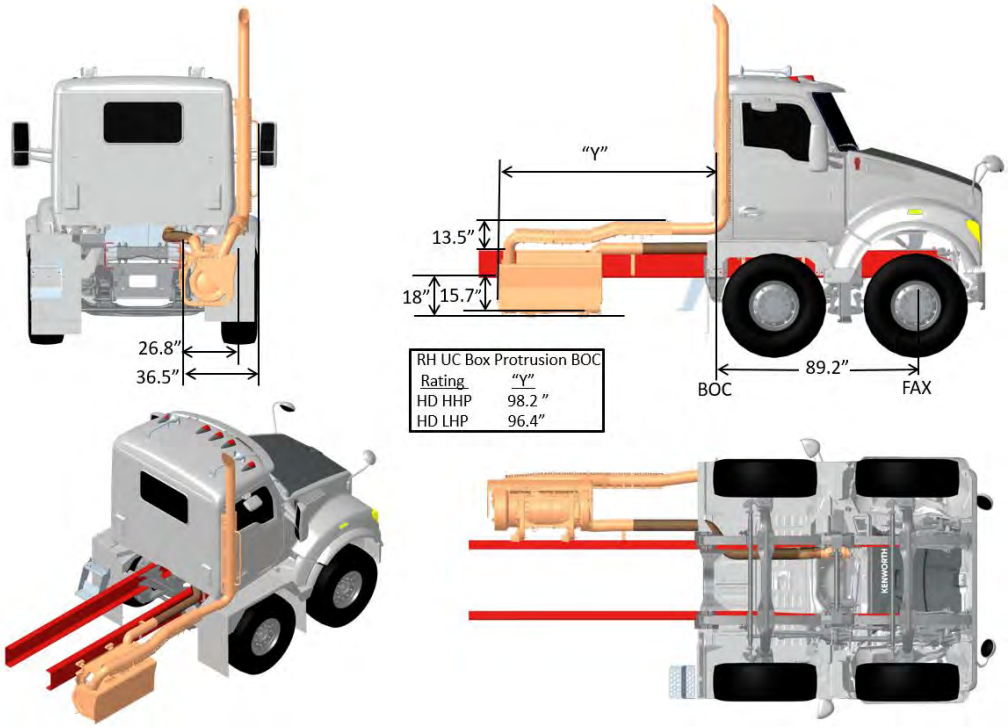


Figure 145 T880-SH TWIN STEER SFFA SM EXHAUST SINGLE RHBOC DPF/SCR RH UNDER CAB 2024

W990 SFFA 2024 Exhaust Configurations

W990 SFFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

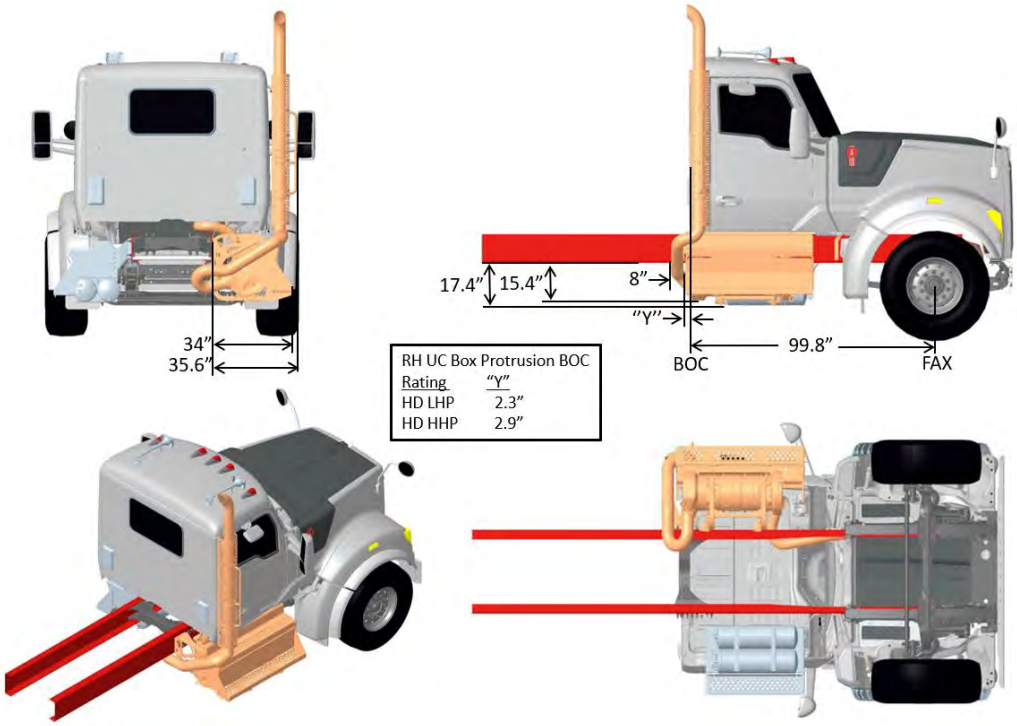


Figure 146 W990 SFFA SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W990 SFFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

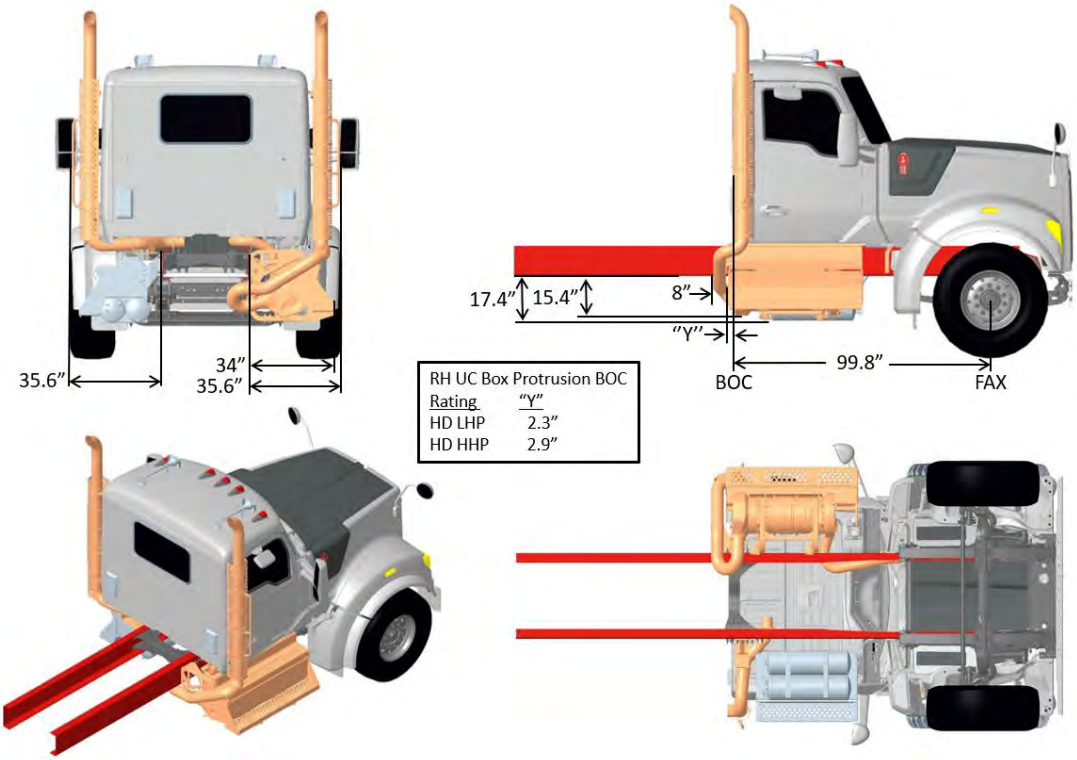


Figure 147 W990 SFFA SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W990 SFFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

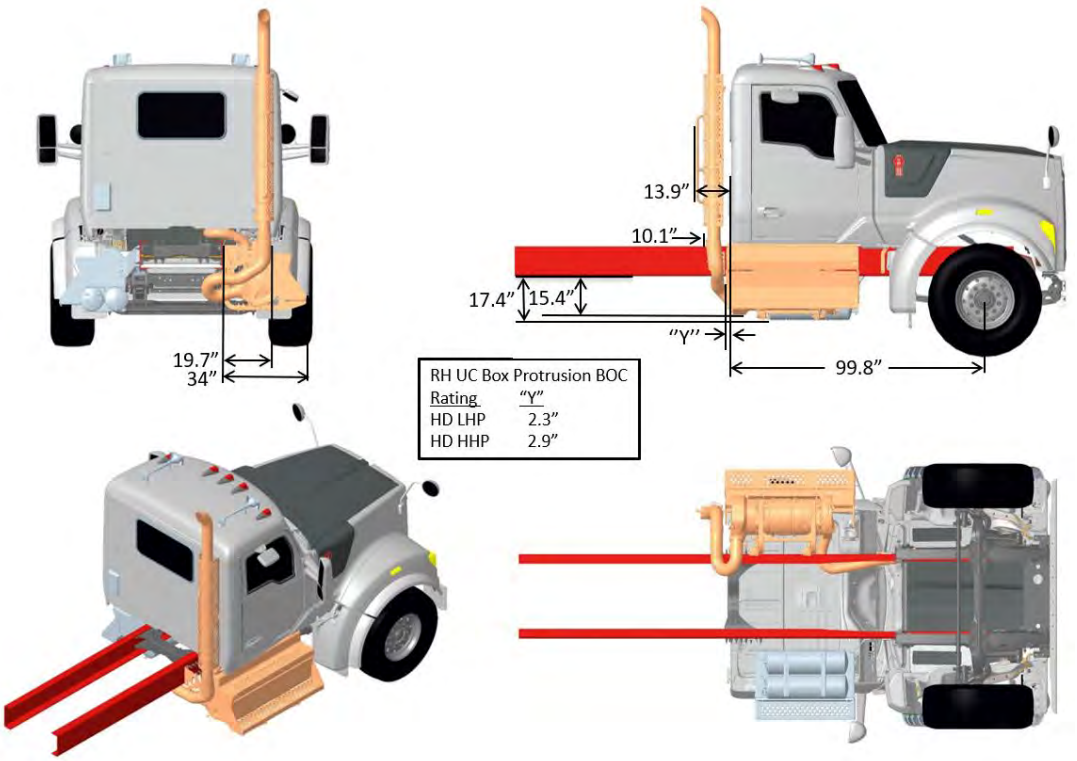


Figure 148 W990 SFFA SM EXHAUST SINGLE RH BACK OF CAB DPF/SCR RH UNDER CAB 2024

W990 SFFA EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

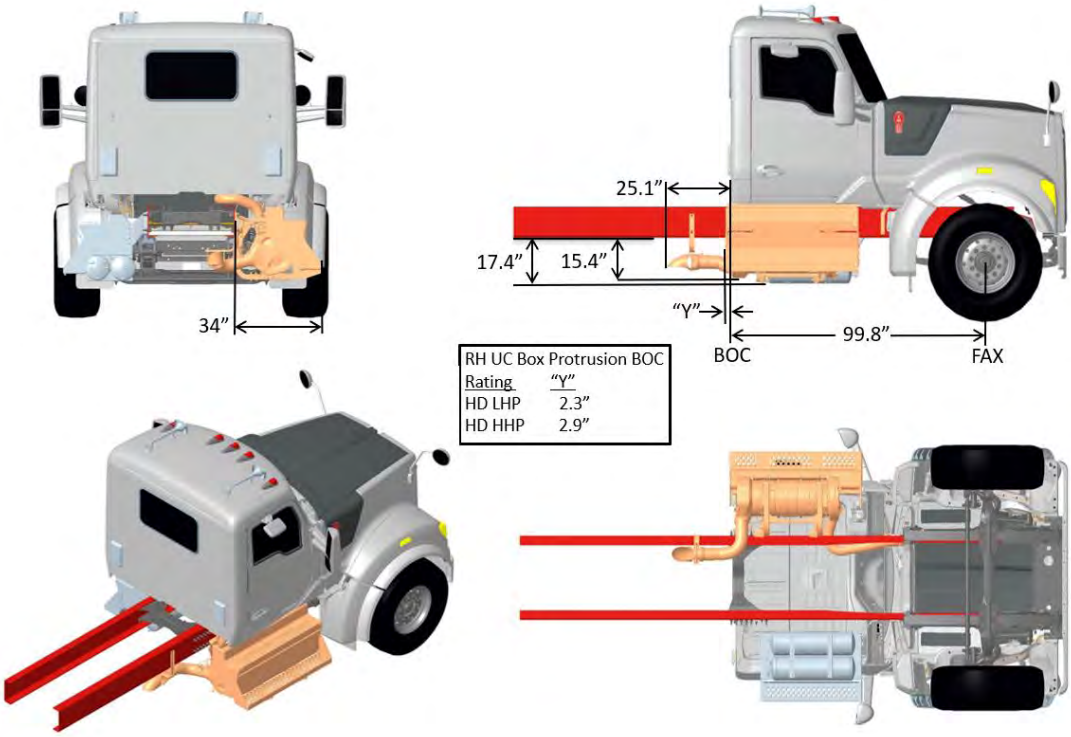


Figure 149 W990 SFFA EXHAUST SINGLE RH HORIZONTAL DPF/SCR RH UNDER CAB 2024

W990 SFFA EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024

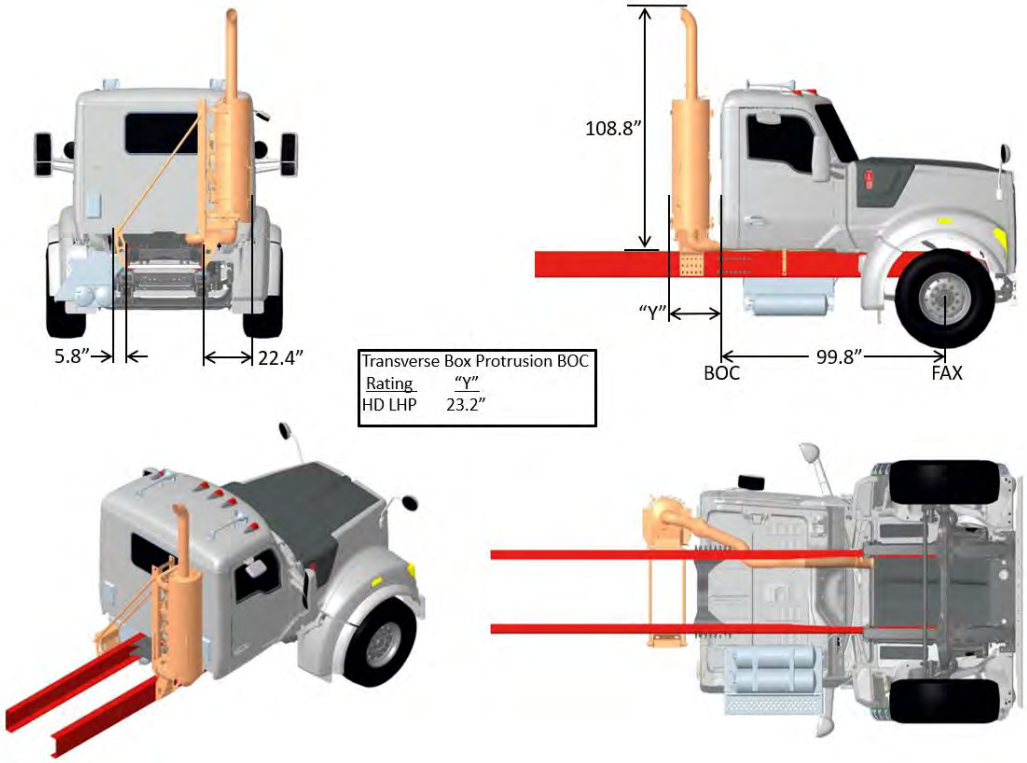


Figure 150 W990 SFFA EXHAUST SINGLE RH BACK OF CAB VERTICAL DPF/SCR 2024

W990 SFFA EXHAUST DUAL BACK OF CAB TRANSVERSE DPF/SCR 2024

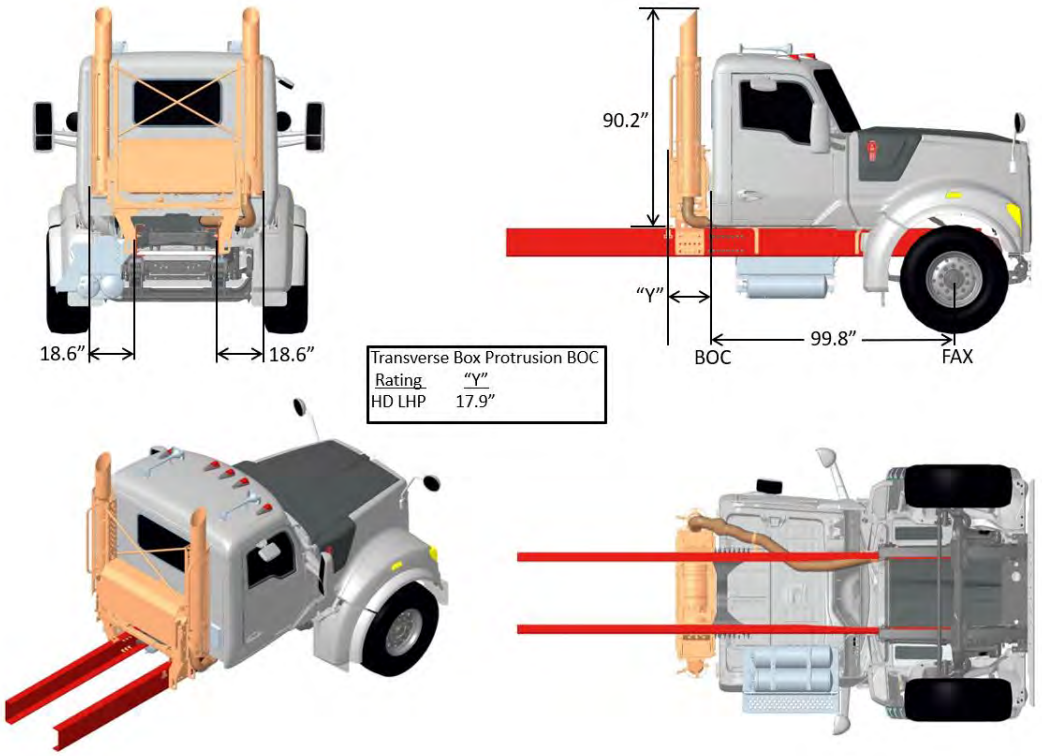


Figure 151 W990 SFFA EXHAUST DUAL BACK OF CAB TRANSVERSE DPF/SCR 2024

W990 SFFA CT EXHAUST BACK OF CAB DPF/SCR RH UNDER CAB 2024

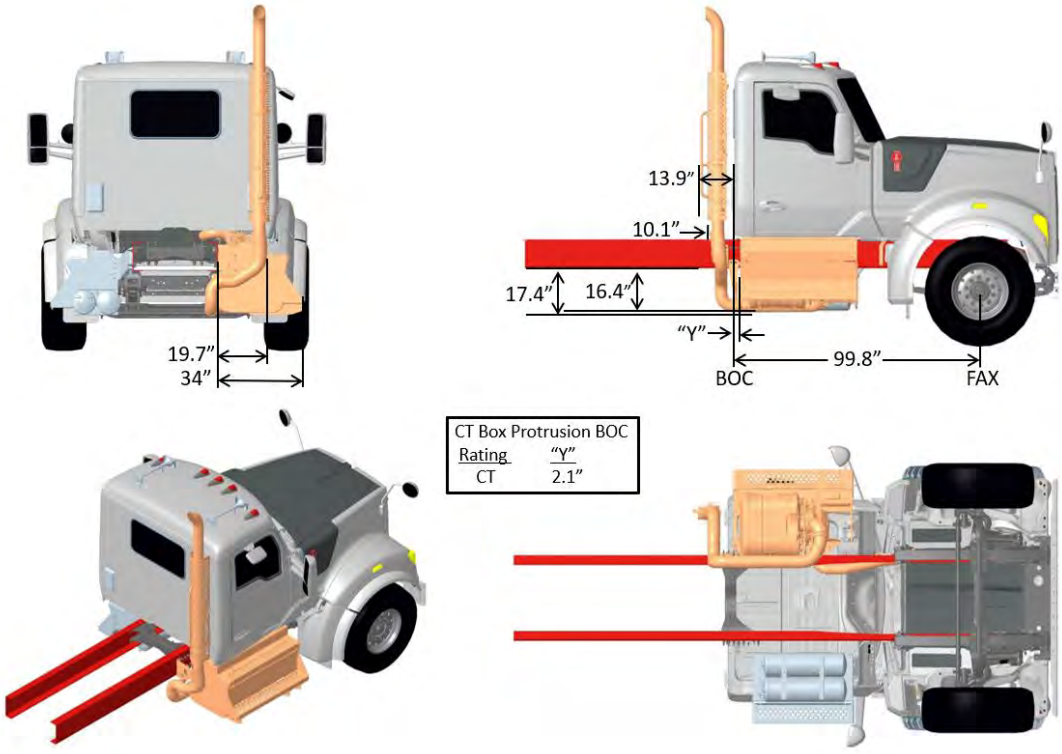


Figure 152 W990 SFFA CT EXHAUST BACK OF CAB DPF/SCR RH UNDER CAB 2024

W990 SFFA CT EXHAUST SIDE OF CAB DPF/SCR RH UNDER CAB 2024

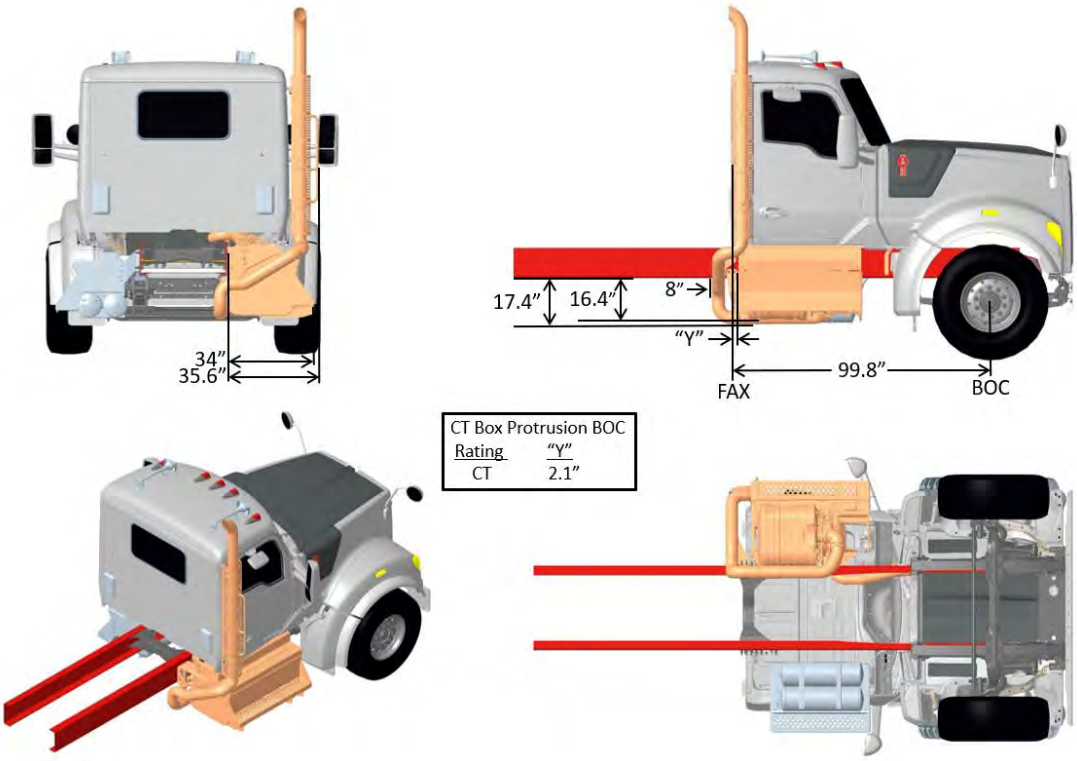


Figure 153 W990 SFFA CT EXHAUST SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W990 SFFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

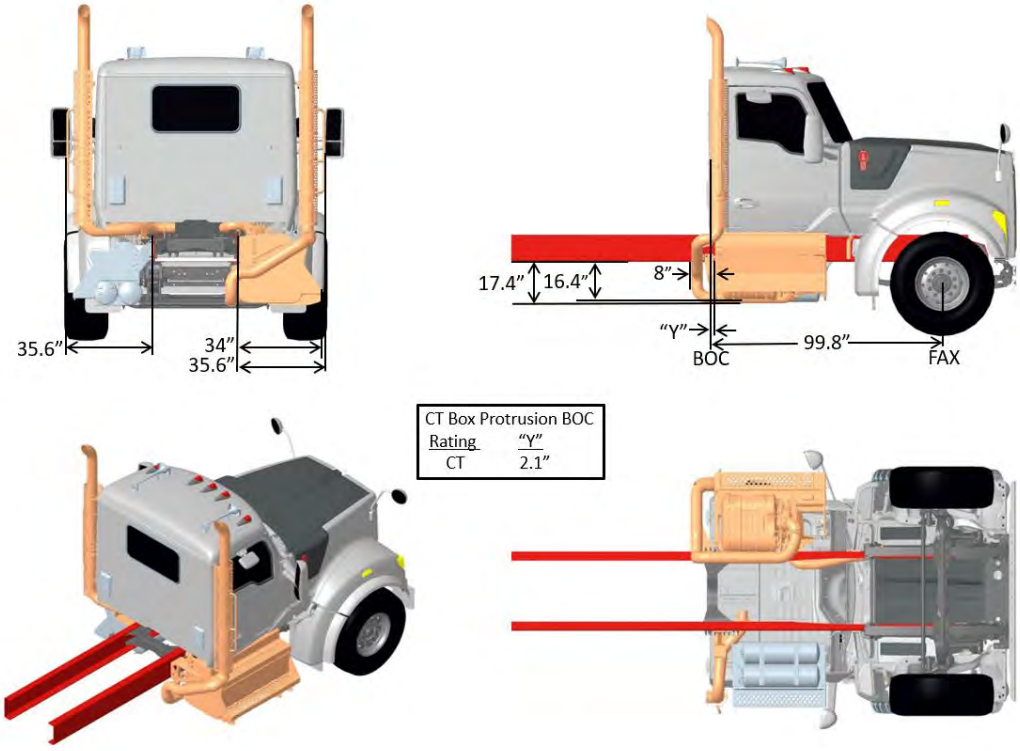


Figure 154 W990 SFFA CT EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W900B 2024 Exhaust Configurations

W900B SM EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024

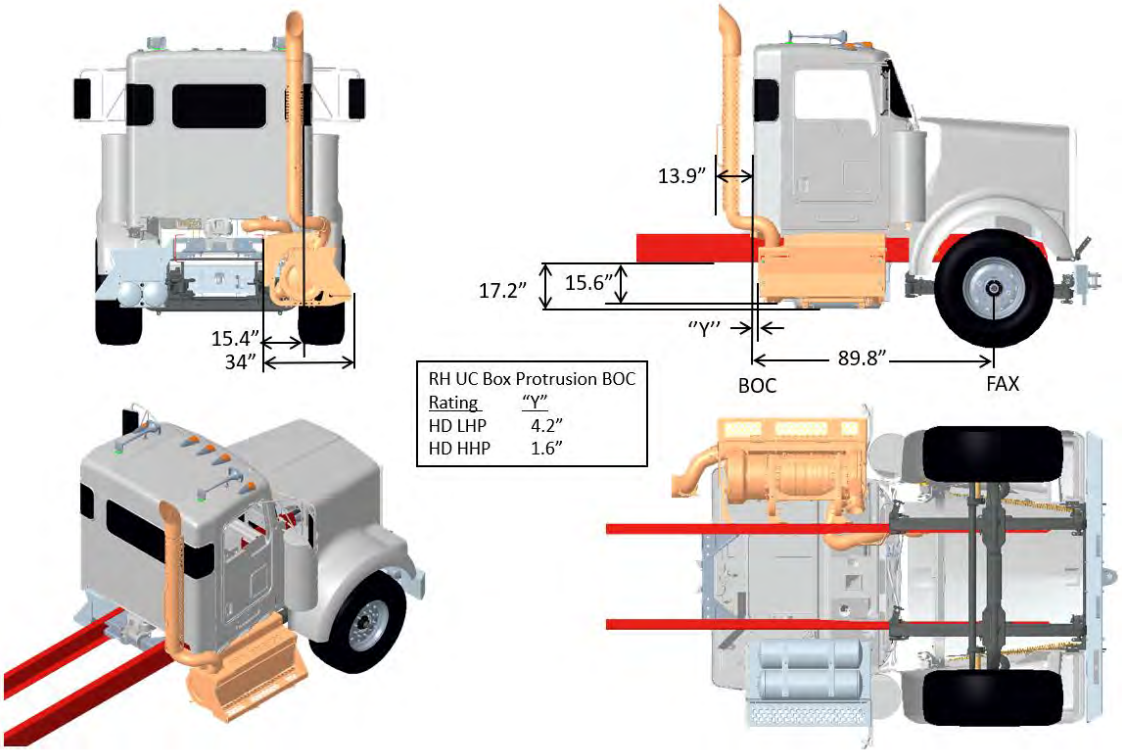


Figure 155 W900B SM EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024

W900B SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

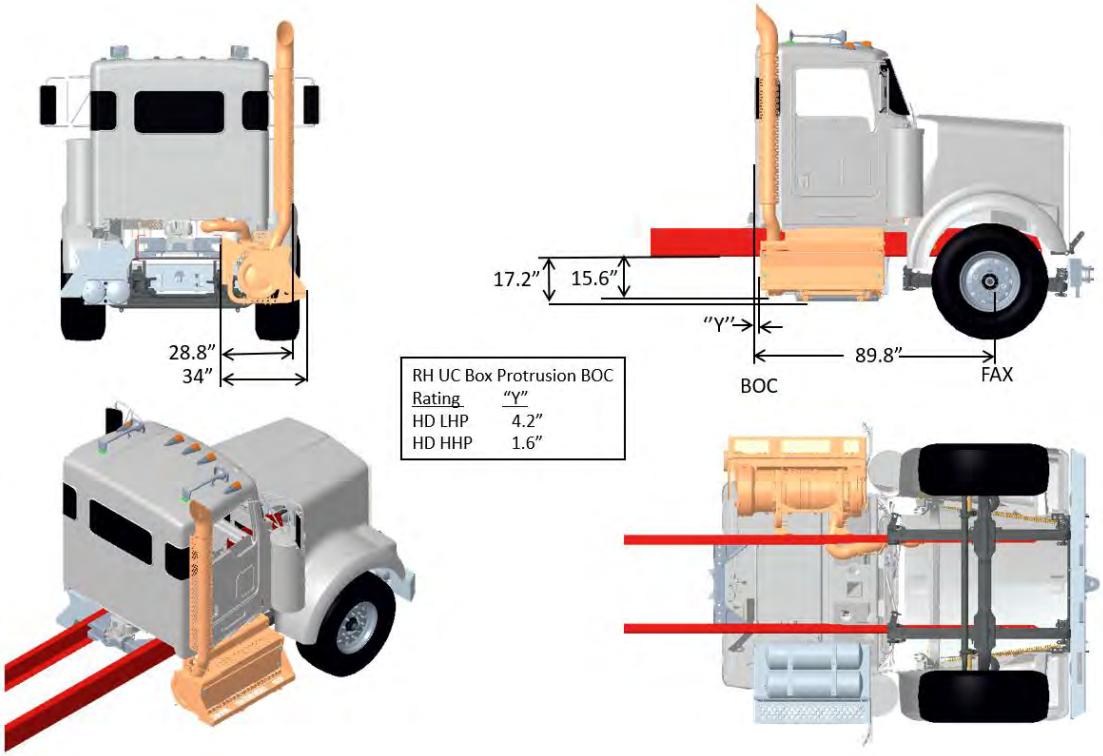


Figure 156 W900B SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W900B SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

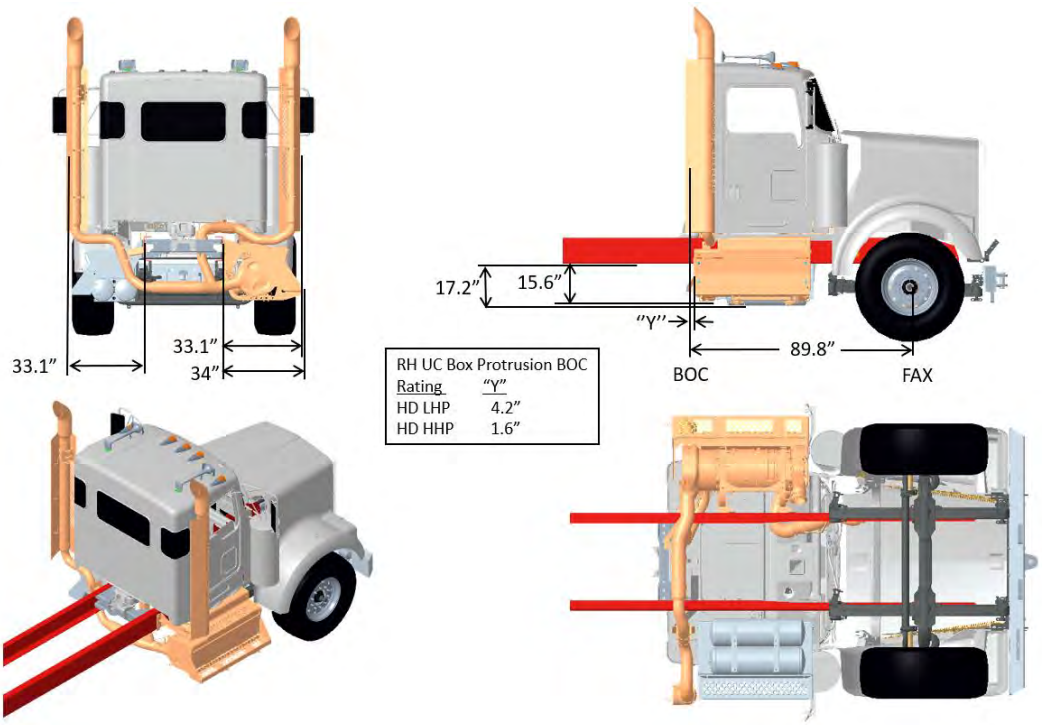


Figure 157 W900B SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W900B 2024 Exhaust Configurations

W900L SM EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024

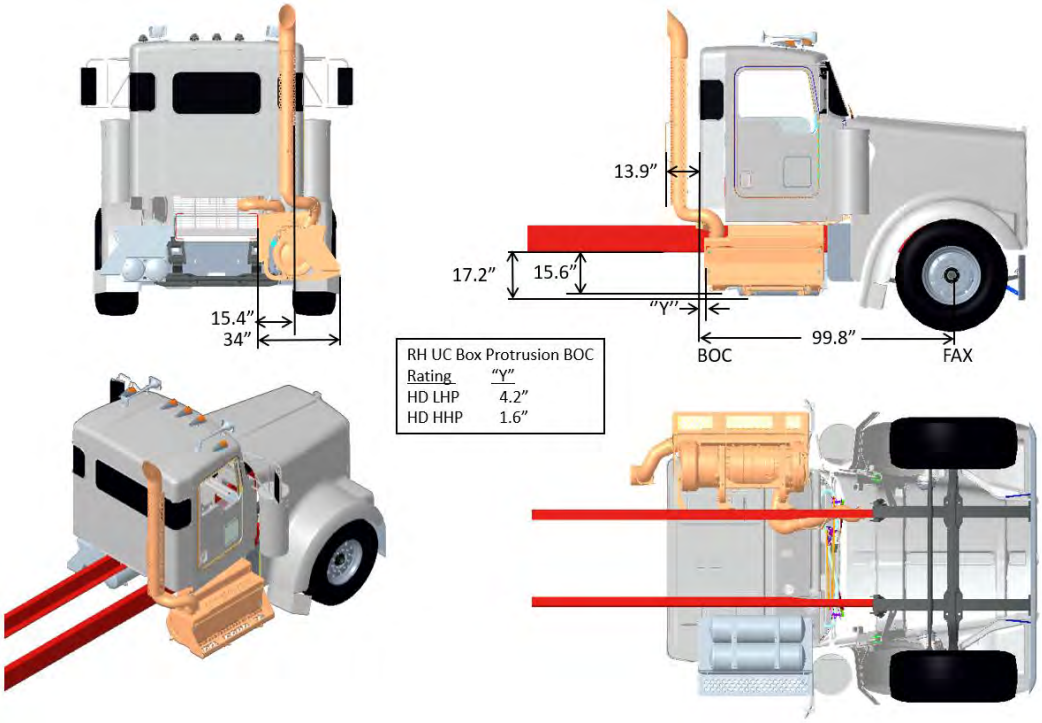


Figure 158 W900L SM EXHAUST SINGLE BACK OF CAB DPF/SCR RH UNDER CAB 2024

W900L SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

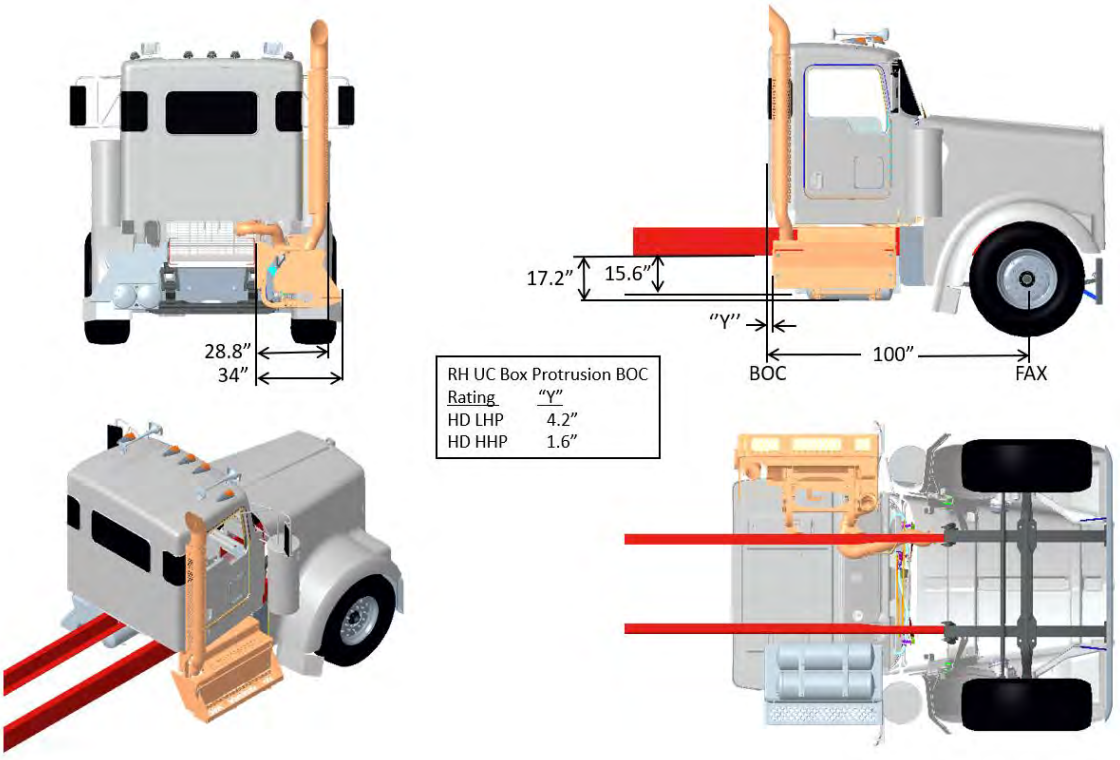


Figure 159 W900L SM EXHAUST SINGLE RH SIDE OF CAB DPF/SCR RH UNDER CAB 2024

W900L SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

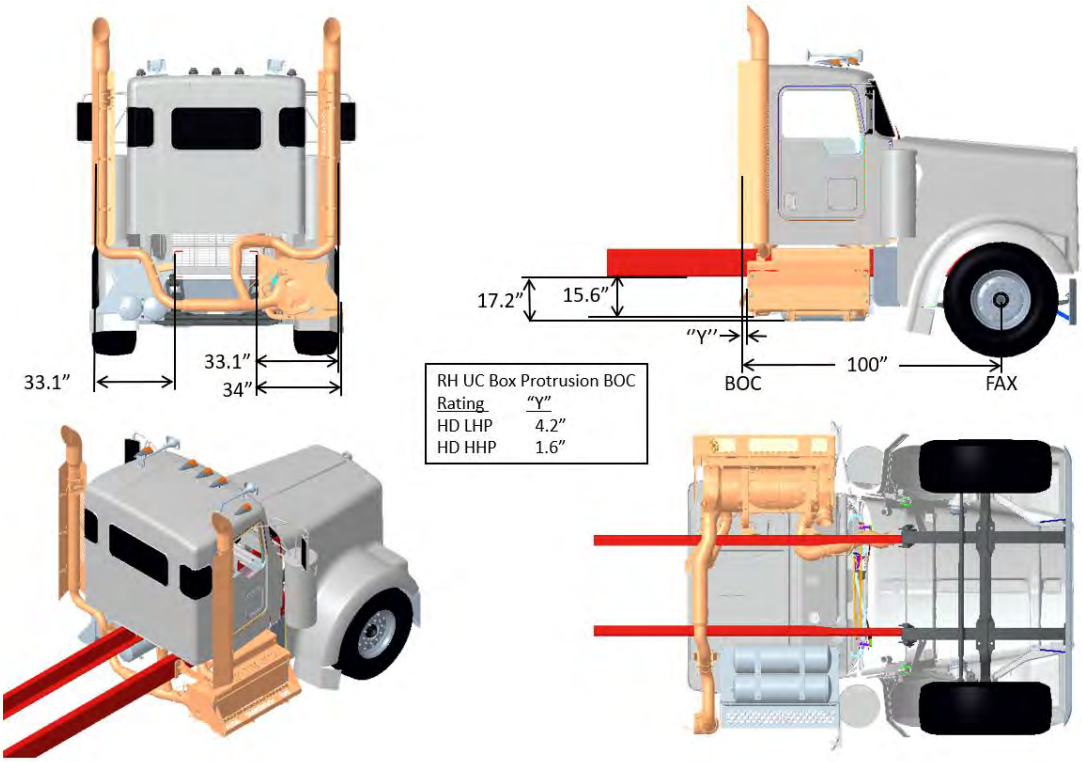


Figure 160 W900L SM EXHAUST DUAL SIDE OF CAB DPF/SCR RH UNDER CAB 2024

EXHAUST INFORMATION

This section includes information on how to calculate tailpipe heights.

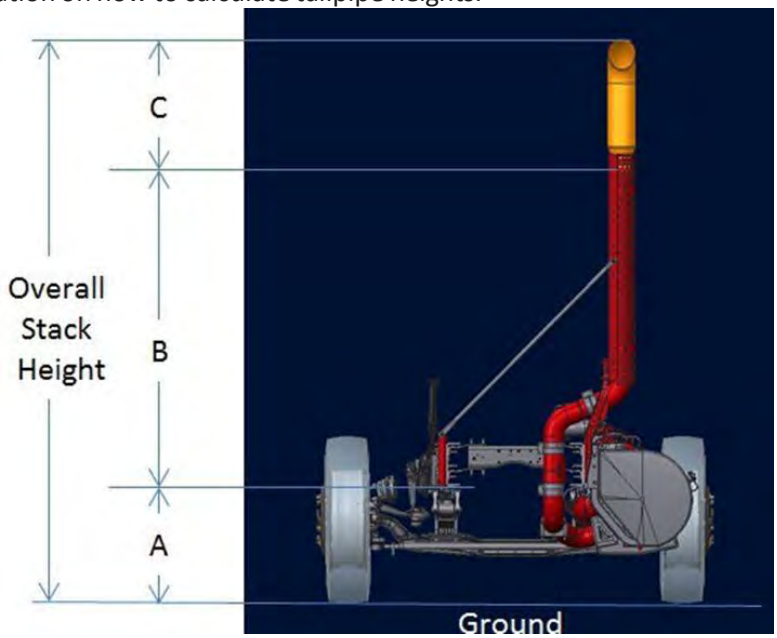


Table 62 Exhaust Height Calculation

		Dimension "B"	Min. Tailpipe Length Dimension "C" (Daycab)	Min. Tailpipe Length Dimension "C" (40" Sleeper)	Min. Tailpipe Length Dimension "C" (52" Sleeper)
Diesel	Tailpipes Side of Cab (RHUC DPF/SCR)	69.2"	18"	N/A	N/A
	Tailpipes Side of Sleeper (RHUC DPF/SCR)	69.2"	N/A	30"	42"
	Tailpipes Back of Cab (RHUC DPF/SCR)	70.3"	24"	N/A	N/A
	Tailpipes Back of Sleeper (RHUC DPF/SCR)	86"	N/A	24"	36"
	Tailpipes Back of Cab (Independent DPF/SCR Back of Cab)	77.5"	24"	N/A	N/A
Natural Gas	Tailpipes Side of Cab (RHUC DPF/SCR)	69.2"	18"	N/A	N/A
	Tailpipes Back of Cab (Independent DPF/SCR Back of Cab)	74"	24"	N/A	N/A

Utilize PremierSpec frame heights (or calculated knowing tire size and suspension height) to accurately calculate Dimension “A” from ground to the bottom of the frame rail.
When utilizing PremierSpec, remember that heights shown are calculated to top of frame rail, and frame section height needs to be subtracted from PremierSpec height to get overall frame height from ground to bottom of frame flange Dimension A).

FRAME RAKE

The listed heights should be considered approximations due to variations which may occur in component manufacturing processes, spring set, and the way in which the vehicle is loaded.

Component	Sales Code	Description	Laden	Unladen
Frame	6056400	Frame Rails: 10-3/4 x 3-1/2 x 3/8in, Steel 285in.	10.8	10.8
Front Spring	2864019	Front Springs: Taperleaf 14.6K w/shock absorbers	10.5	12.0
Front Axle Drop 3.5"	2513025	Meritor MFS14 14.6K 5in. drop wide track.	-1.5	-1.5
Height Adj.	2790015	Front End Lowered: 1 in. Not available W9B/L.	-1.0	-1.0
Front Tires	4070008	Front tires: Bridgestone R268 ECOPIA 295/80R22.5	19.4	20.0
		Front Frame Height	**38.2**	**40.2**
Frame	6056400	Frame Rails: 10-3/4 x 3-1/2 x 3/8in, Steel 285in.	10.8	10.8
Subframe	0000000	No sub frame	0	0
Suspension	3740130	Rear suspension: Tandem Kenworth Airglide 460 46K	10.5	10.5
Rear Tires	4270013	Front Tires: Bridgestone M749 295/60R22.5 18 PR	17.3	18.1
		Rear Frame Height	**38.6**	**39.4**
		Frame Rake	**0.4**	**-0.8**
		Frame Rake Slope (%)	**0.2**	**-0.3**

Figure 161 Top of Frame Rail Height from PremierSpec

- Frame Depth is given by the Frame line item.
- The Top of the Frame Height is given by the Front Frame Height line item.

DEF SYSTEM SCHEMATICS

On most Kenworth chassis, the DEF Supply Module (or pump) is integrated into the DEF tank assembly. See page 9-3 for assembly relocation requirements.

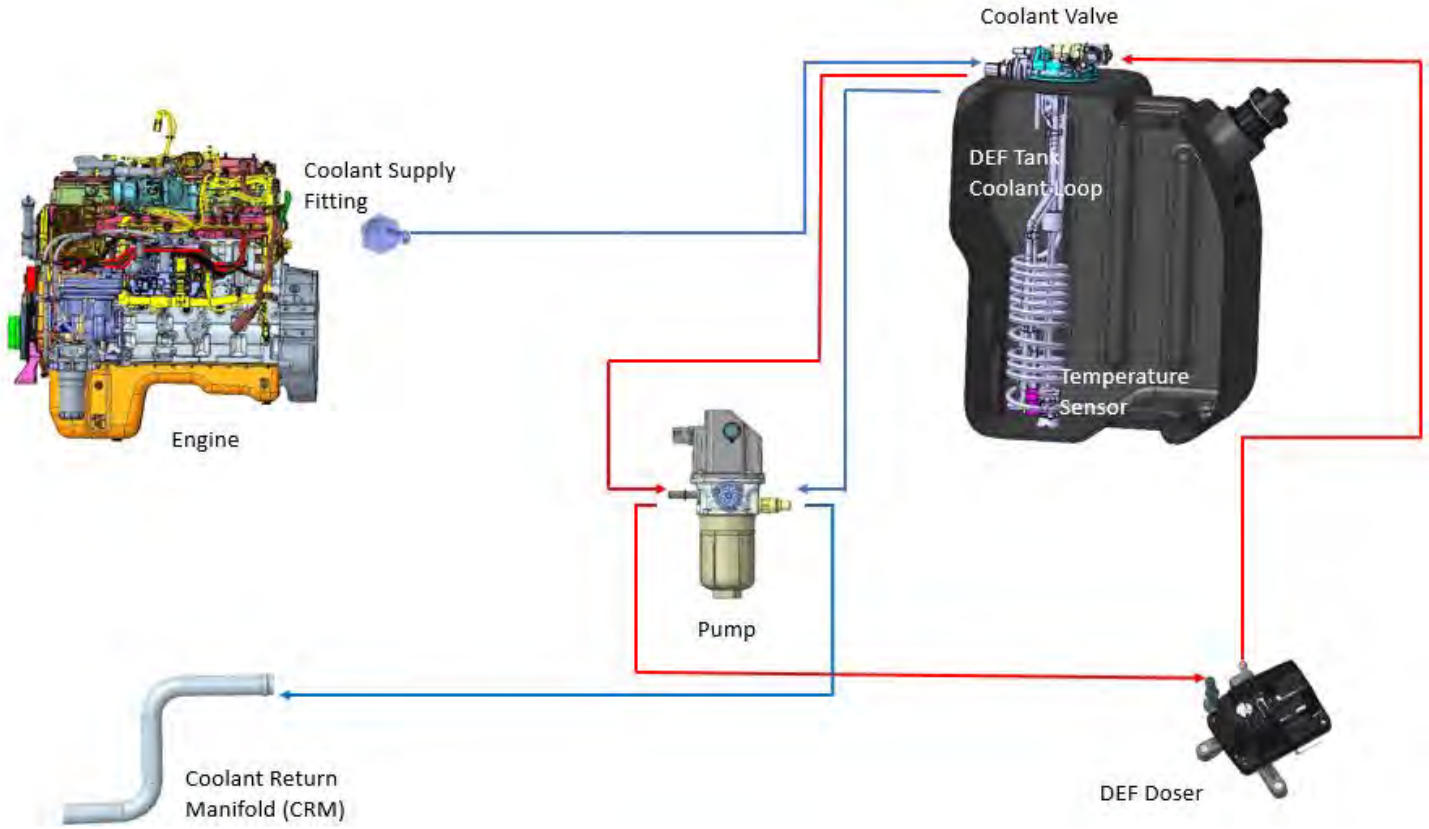


Figure 162 DEF System Schematic

DEF will freeze at approximately 11° F. In order to keep DEF from freezing, all tanks will be heated with engine coolant. The following schematic shows the routing of these lines. It is critical that the system is not compromised in any manner.

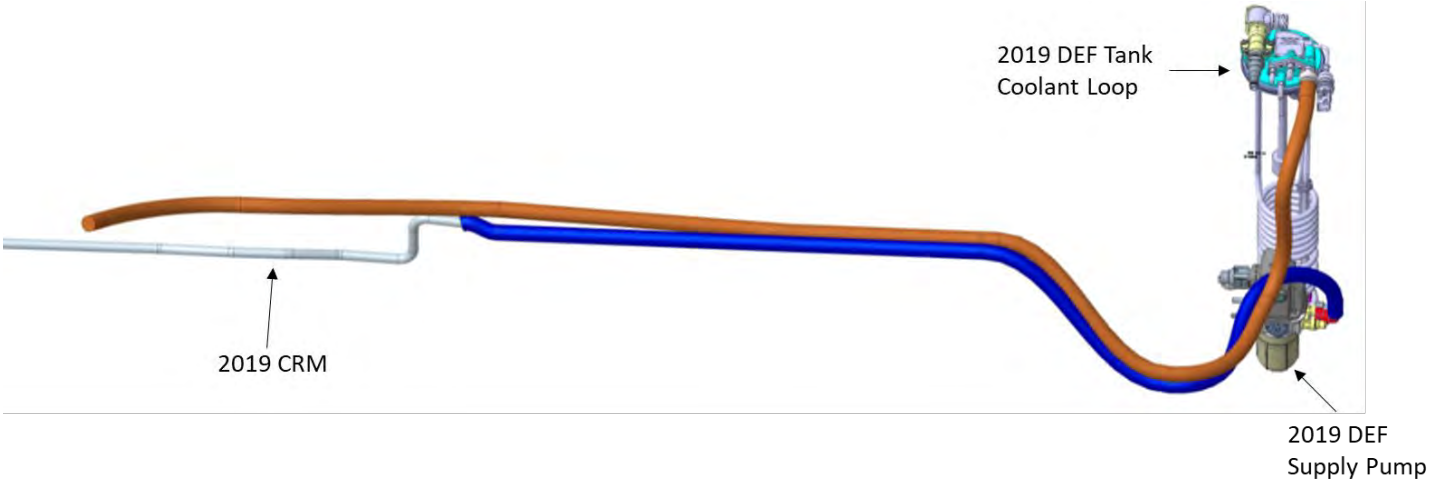


Figure 163 DEF Coolant Routing Schematic

INSTALLATION REQUIREMENTS AND DIMENSIONS FOR DEF SYSTEM

When relocating any DEF system component, the locations must meet all guidelines described below. Failure to comply may result in non-conformance to EPA standards and engine shutdown.
General clearances, routing guidelines, and installation requirements must be followed. See **SECTION 10 ROUTING** of this manual for general routing guidelines and clearances. The maximum DEF hose line length is 5.5 meters (216.5").

If the DEF tank is relocated the coolant lines will need to be modified. During this process if the tank is moved forward on the chassis (closer to the engine) it is necessary to remove excess coolant lines and maintain the original routing path. If the tank is moved rearward on the chassis the additional length of cooling line required to complete the installation must be installed in a straight section of the existing coolant routing lines. This process minimizes the change in coolant flow and mitigates the risk of increased flow restriction. Changes in flow restriction are added with excessive line length and hose bends. Work with your local Kenworth dealer if you are unsure about coolant line modifications.

DEF ASSEMBLY RELOCATION - SUPPLY MODULE REQUIREMENTS

The Supply Module (or Pump) standard mounting location is on the DEF tank assembly. The pump cannot be removed from the DEF tank assembly. However, the assembly as a whole may be relocated. Body builders should follow the location and length restrictions above. Additionally, the supply module must be mounted with the filter cap oriented downwards within +/-45° of vertical (or a 90° inverted cone as shown in Figure **164**). The supply module should be located in a space that will minimize its vulnerability to road debris. Serviceability of the supply module filter should be considered, and adequate space for filter access and removal should be given (at least 5”).

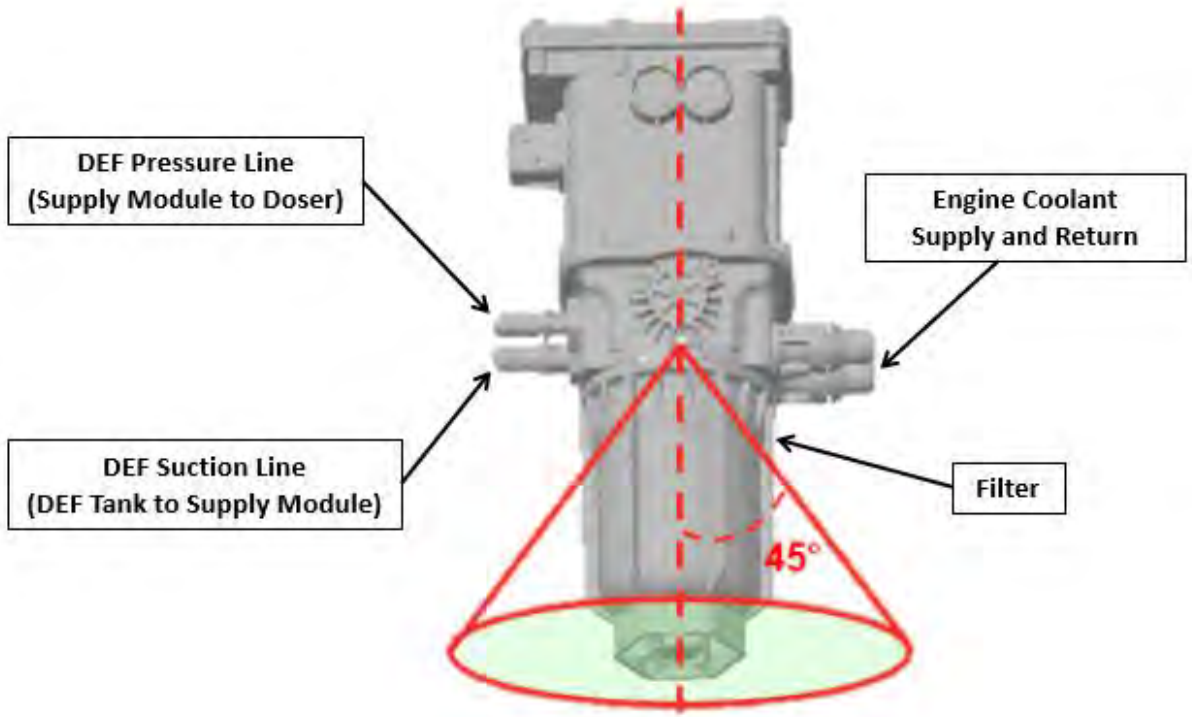


Figure 164 Supply Module Mounting Angle Limits

ROUTING TO THE DOSING MODULE (INJECTOR)

A DEF pressure line “trap” is no longer required after EPA 2013 emissions level engine. The dosing module (injector) no longer needs to be purged and relative heights of components are no longer critical. See Figure 9-4 below for typical routing with RHUC exhaust and LH DEF tank shown. The figure below shows a typical coolant line routing.

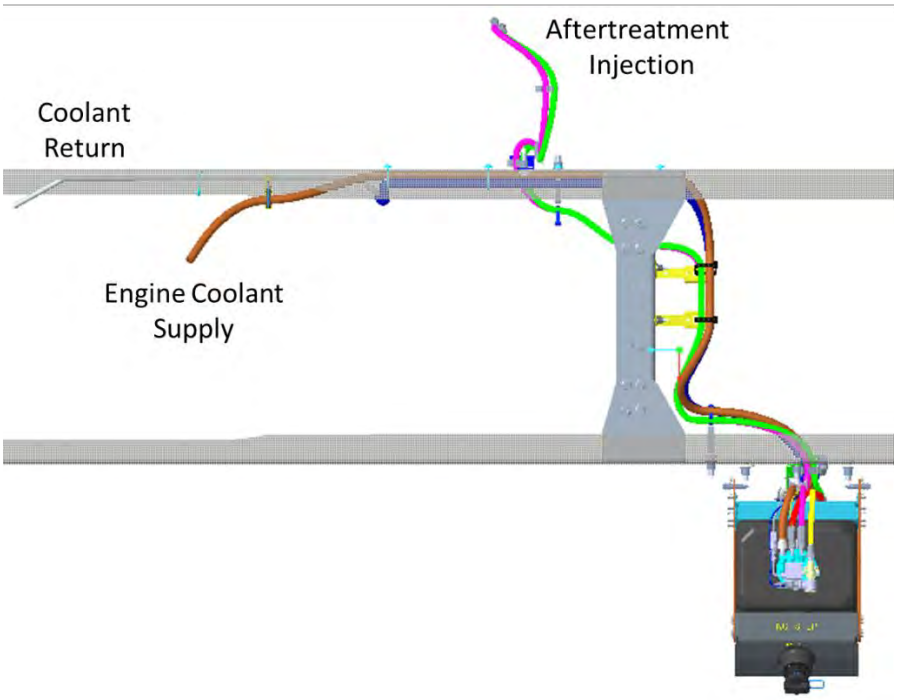


Figure 165 Routing for DEF and Coolant Lines

SECTION 10 ROUTING

INTRODUCTION

This section specifies the general requirements for securing hoses and electrical wires to present an orderly appearance, facilitate inspection and maintenance, and prevent potential damage to these lines.

DEFINITIONS

Bundle: Two or more air, electrical, fuel, or other lines tied together to form a unitized assembly.

Clamp: A cushioned rigid or semi-rigid, anti-chafing device for containing the bundle and securing it to the frame or other structural support. Standard clamps have a black elastomer lining. High temperature clamps (e.g., those used with compressor discharge hose) have a white or red elastomer lining (most applications for these are called out in the bills of material). An assembly of two clamps fastened together to separate components is referred to as a “butterfly” clamp.

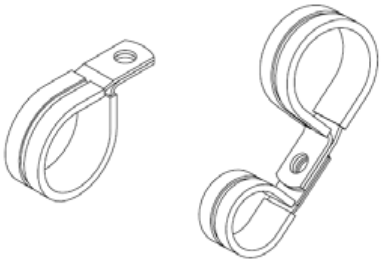


Figure 166 Clamp and Butterfly Clamp

NOTE:

The metal portion of clamps shall be stainless steel or otherwise made capable, through plating or other means, of passing a 200 hour salt spray test per ASTM B117 without rusting.

Butterfly Tie: A tough plastic (nylon or equivalent) locking dual clamp tie strap used to separate bundles or single lines, hoses, etc. These straps must be UV stable. (Tyton DCT11)

Figure 167 Butterfly Tie

Tie Strap: A tough plastic (nylon, or equivalent) locking strap used to tie the lines in a bundle together between clamps or to otherwise secure hoses and wires as noted below. Straps must be UV stable.

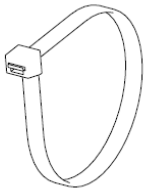


Figure 168 Tie Strap

Button Tie Strap: A tough plastic (nylon, or equivalent) locking strap used to secure lines to the frame or other structural support. Straps must be UV stable.

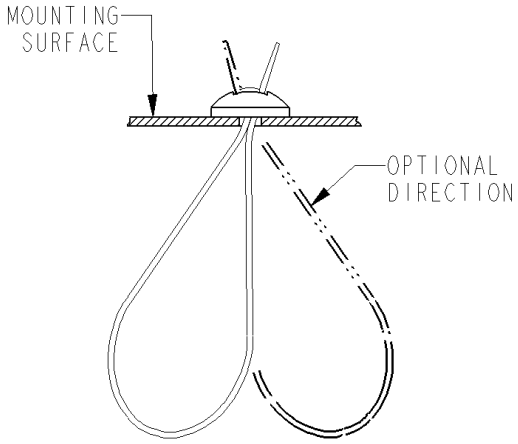


Figure 169 Button Tie Mount

Fir Tree Mount: A tough plastic mount, inserted into a bracket or other intended support structure, used for securing routed bundles via a tie strap. Mounts must be UV stable.

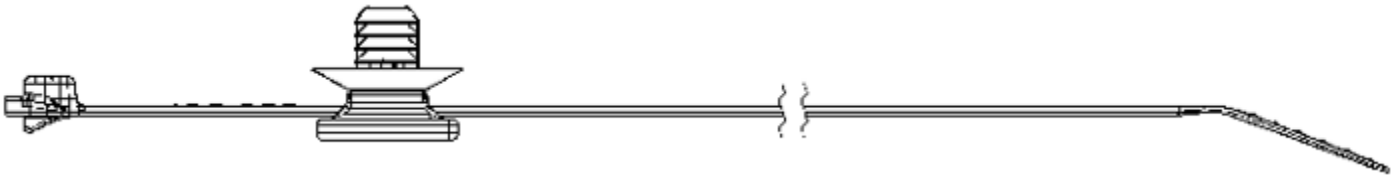


Figure 170 Fir Tree Mount

Heavy Duty (HD) Mount: A black rigid device used for securing a tie strap to the frame or other structural support. Mounts are made of impact modified, heat stabilized UV resistant nylon capable of continuous operation between temperatures 220°F (150°) and -40°F (-40°).

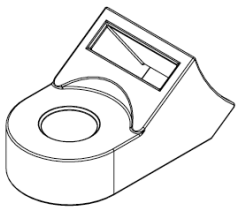


Figure 171 Heavy Duty (HD) Mount

NOTE:

Heavy duty tie straps 0.50in (12.7mm) wide (Tyton T255ROHIR or similar) shall be used whenever HD mounts are specified, although 0.25in (6.4mm) tie straps may be used in some specified applications.

Excess of material: More than 3 inches of slack for every 18 inch section of hose routing, except for air conditioner hoses.

Shortness of material: Less than 1 inch of slack on an 18 inch section of hose routing.

ROUTING REQUIREMENTS

Electrical Wiring

- Electrical ground wire terminals must be securely attached and the complete terminal surface must contact a clean bare metal surface. See R414-558 for grounding wire connection practice. Apply electrical contact corrosion inhibitor Nyogel 759G grease (made by William F. Nye, Inc., New Bedford, MA) per R414-558.
- Don't bend wires or use tie straps within 75 mm (3 inches) of (connected) wire connectors or plugs.
- Electrical wiring must be routed so that other components do not interfere with it
- Electrical wiring must be routed away from moving components so that at least 13.0 mm (0.5 in.) of clearance exists when the component is in operation and at maximum limits of the component's travel
- Electrical wiring must be protected in the locations they are routed
- Electrical wiring must be routed to avoid heat sources
- Electrical wiring must be secured to a crossmember when going from one frame rail to the other
- When crossing other components, electrical wiring must have a covering of convoluted tubing, PSA tape, or must be separated from the component with a standoff or butterfly clamp
- Electrical wiring must not be routed directly over a sharp edge unless separated from the edge by a clip, standoff bracket, or similar spacing feature that prevents any risk of chafing or cutting
- Alternatively, the installation of windlace applied to the edge along with PSA tape or convoluted tubing on the harness is acceptable
- Electrical wiring must be routed in a way that will not place strain on connectors.

Wires in Bundles

Electrical wires (other than the exceptions covered below) running parallel with air or coolant hose bundles, may be included in the bundle if they are isolated from the hoses with a covering of convoluted plastic tubing.

Exceptions:

Battery cables (including jump start cables) may be bundled with or tied to the charging wire harness. They shall not be bundled with or tied directly to any other components, including hoses, wires, or bundles. They shall be separated from other routed components using butterfly ties at intervals not exceeding 18 inches (356 mm). Battery strap (W84-1000) tie down shall be used without exception to secure battery cables to frame mounted or other major component (e.g. engine, transmission, etc.) mounted standoffs at intervals not exceeding 18 inches (356 mm). The (positive) battery cable shall be covered with convoluted plastic tubing from terminal to terminal.

110/220 volt wires for engine heaters, oil pan heaters, transmission oil heaters and battery pad warmers, shall not be included in any hose/wire bundle with a fuel hose. Individual heater wires not in a bundle shall be separated from other components by using butterfly clamps or butterfly ties at intervals not exceeding 18 inches (356 mm). Heater wires with a secondary covering shall be covered with convoluted tubing whether they are in bundles or not.

Wires Crossing Other Components

Electrical wires crossing over other components, such as lines, bolt heads, fittings, engine components lifting eyes, engine block, cylinder head, etc., close enough to rub shall be isolated with a covering of convoluted tubing and separated from the component by using butterfly clamps, butterfly ties, or plastic sheathing. 110/220 volt engine heater wiring shall be installed with butterfly ties or butterfly clamps

Piping

Use no street elbows in air brake, water, fuel, or hydraulic systems unless specified on the piping diagram and the build instructions.

Use no elbows in the air brake system unless specified on the air piping diagram and the build instructions.

Hoses Crossing Components

Hoses crossing over other components close enough to rub shall be protected with a secured covering of convoluted plastic tubing (part number K344-813), another section of hose, or plastic sheathing (part number K213-1312). The usage of butterfly ties, or butterfly clamps are also recommended.

Air Compressor Discharge Hoses

Wires or hoses shall not be tied to the high temperature air compressor discharge hose. Hoses and wires may be routed across the air compressor discharge hose at a distance of 18 inches (457 mm) or greater from the compressor discharge port. In this case the crossing hoses and wires shall be “butterfly” clamped to the air compressor discharge hose and covered with convoluted tubing at the clamp point (use high temperature clamps on the compressor hose).

Bundles

HD mount and tie strap, or clamp shall be located at intervals not to exceed 18 inches (356 mm) along the bundle. Regular tie straps shall be located at intervals not to exceed 7 inches (178 mm) between HD mount or clamps. Extra tie straps may be used as needed to contain the hoses and wires in the bundle.

Routing of Wires and Hoses near Moving Components

Wires and Hoses shall be routed away from moving components, such as fans, shackle links, drivelines, steering linkages, etc. so that there is at least 0.5 inches (12.7 mm) clearance when the component is operating at its maximum travel limits.

A minimum clearance of 1.0 inches (25.4 mm) shall be maintained between steering axle tires (and associated rotating parts) in all positions and routed components, such as hoses, oil lines, wires, pipes, etc.

ROUTING OF WIRES AND HOSES NEAR EXHAUST SYSTEM

Table 63 Exhaust – System Clearance

Description	Minimum Clearance Shielded	Minimum Clearance Unshielded
Coolant hoses (Silicone, colored)	1”	2”
HVAC hoses, tubing, and hard lines	5”	7”
Electrical wires	6”	8”
Fuel Hoses		
within 15” of the turbo	N/A	4”
over 15” from the turbo	2”	3”
Fuel Tanks and Hydraulic Tanks		
Crossing Tank	N/A	2”
Parallel to Tank	N/A	2”
End of Tank	N/A	1”
Aluminum/Ceramic-coated exhaust crossing tank	N/A	1.5”
Air Hose		
Nylon	3”	10”
Wire Braid	5”	7.5”

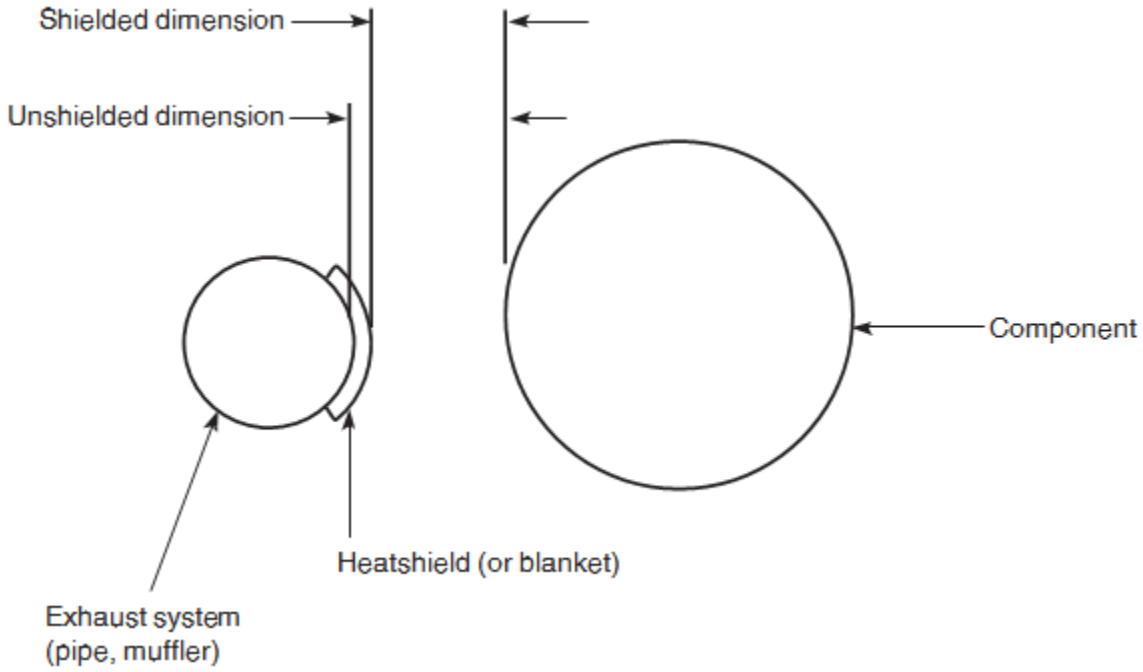


Figure 172 Definition of measurements

Appendix

Tire and Rim Weight Rating Data Label

The Tire and Rim Weight Rating Data Label is used in conjunction with the Incomplete Vehicle Certification Label on Incomplete Vehicles. It contains the chassis serial number and the following information:

- GVWR — Gross Vehicle Weight Rating
- GAWR FRONT and REAR — Gross Axle Weight Ratings for Front and Rear Axle
- TIRE/RIM SIZES AND INFLATION PRESSURES — Tire/Rim Sizes and Cold Pressure Minimums

NOTE:

GVWR is the TOTAL WEIGHT the vehicle is designed to carry. This includes the weight of the empty vehicle, loading platform, occupants, fuel, and any load.

Incomplete Vehicle Certification Label

The Incomplete Vehicle Certification Label contains the chassis VIN, date of manufacture, and listing of applicable motor vehicle safety standards.

Components and Weights Label

The Major Components and Weights Label includes chassis weight and gross weight information, as well as model and serial numbers for the vehicle, engine, transmission, and axles.

Noise Emission Label

The Noise Emission Label contains the chassis serial number, date of manufacture, and information regarding US noise emission regulations. This label is not provided on Canadian registered vehicles.

Paint Identification Label

The Paint Identification Label contains the paint colors used by the factory to paint the truck. It lists frame, wheels, cab interior and exterior colors. This label is located either underneath the dash to the left of the steering column support, inside the glovebox, or on the passenger's door frame.

COMPONENT IDENTIFICATION

Each of the following components has their own identification label.

VEHICLE IDENTIFICATION

A 17–character number (numeral and letter combination) forms the Vehicle Identification Number (VIN) which includes the Chassis Number. It contains among other information, the model year (4),assembly plant (5), and vehicle serial number (6). See Figure A–1.

The model year (4) is designated by an alphanumeric code in the tenth character position in the VIN. See Table A-1 and Figure A–1.

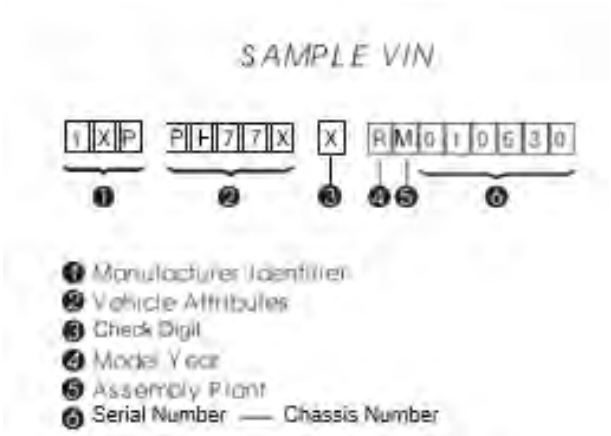


Figure 173 Vehicle Identification Number (VIN)

Table 64 Model Year (Code) Designation

Code	Year
5	2005
6	2006
7	2007
8	2008
9	2009
A	2010
B	2011
C	2012
D	2013
E	2014
F	2015
G	2016
H	2017
J	2018
K	2019
L	2021
M	2022

VIN Location

The VIN is marked on the Incomplete Vehicle Certification Label (on trucks). It is located either on the driver's door edge or door frame. See Figure 174.

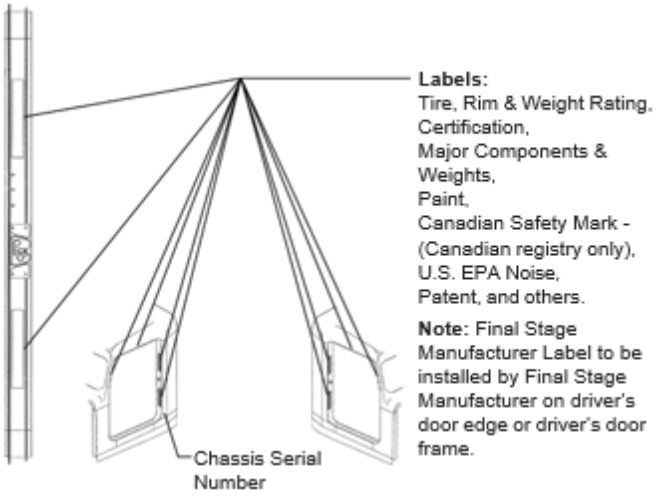


Figure 174 VIN Label Locations

Chassis Number Locations

The Chassis Number comprises the last six characters of the VIN and is shown in multiple locations on the vehicle.

- Left side of cab, back wall of cab: stamped plate. (Daycab)
- Left side of cab, back wall of sleeper: stamped plate. (Sleeper)
- Tire, Rim, and Weight Rating Data label.
- Major Components and Weights label.
- Noise Emission label.
- Paint Identification label.

VEHICLE IDENTIFICATION LABELS

Vehicle Identification Labels are located on the driver's side door edge or on either the driver's or passenger's side door frames. See Figure A-2. Labels include Vehicle Certification, Components and Weights, Tire/Rim and Weight Rating Data, Noise Emissions, and Paint Identification. Quantity and location of labels may differ based on Complete/Incomplete vehicle, and Single/Dual certification.

Figure A-2. Driver's Door and Door Frame Labels

Engine Identification

The engine serial number is stamped on a plate located on the left front of the engine. For further information, please refer to the Engine Operation and Maintenance Manual (included in the glove compartment of each vehicle).

Transmission Identification

The transmission identification number is stamped on a tag affixed to the right forward side of the transmission case. It includes the transmission model, serial, and part number among other specifications.

Front Axle Identification

The front axle has an identification tag located on the front axle beam. It includes the axle model, part number and serial number.

Figure 175 Front Axle Identification

Rear Axle Identification

The rear axle identification numbering system includes two labels or stamps.

1. **Axle Housing Number Tag** located on the left forward side of the housing arm. This tag identifies the axle housing.
2. **Axle Differential Carrier Identification** located on the top side of the differential carrier. The following information is either stamped, or marked with a metal tag: Model No., Carrier Production Assembly No., Carrier Assembly Serial No., Gear Ratio, Axle Specifications Number and OEM part number and country of origin.

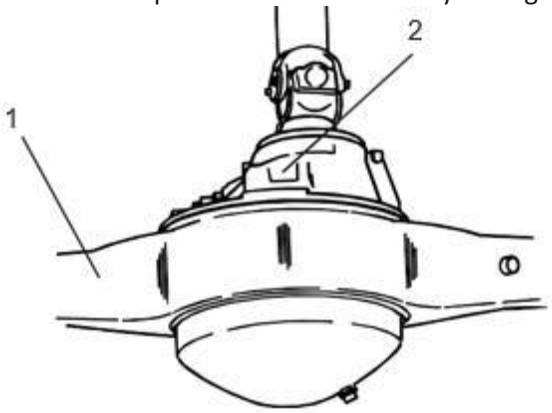


Figure 176 Rear Axle Identification

NOTE:

Illustrated identification tag locations are typical. Actual locations may vary by axle manufacturer and with single versus tandem axles.

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