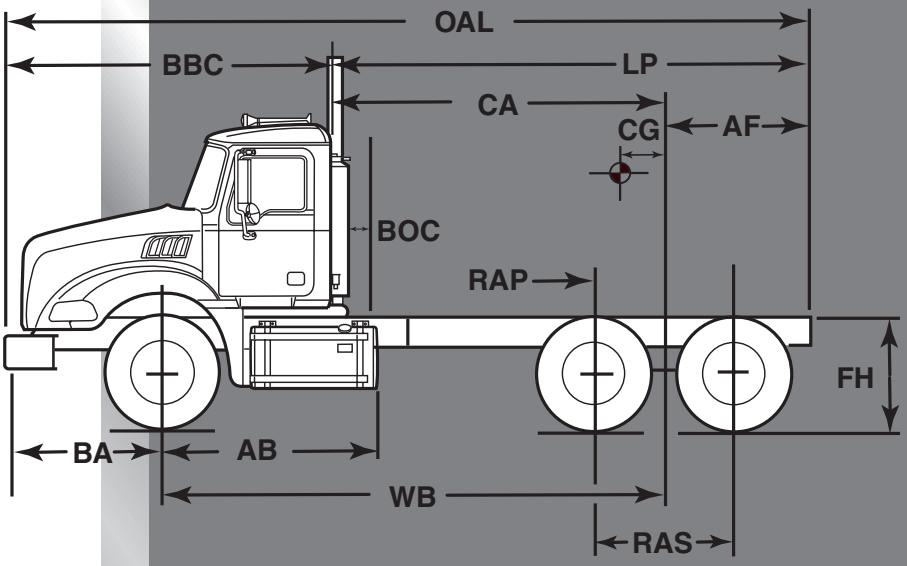

UPFITTER'S GUIDE FOR MACK CLASS 8 CHASSIS

JANUARY 2007
(REVISED)
1-011

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Your comments and suggestions will help
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Please complete and mail this form or FAX
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Do you find procedures properly organized and easy to follow? ☐ Yes ☐ No

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Manual page numbers: _____

Are there any important procedures or other information presently not in this manual that you would like to see included? ☐ Yes ☐ No

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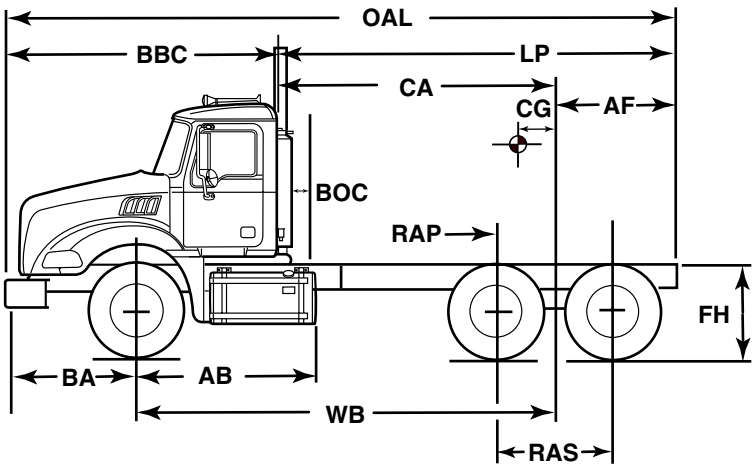

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JANUARY 2007
(REVISED — Replaces issue dated April 2006)

ATTENTION

Before working on a MACK vehicle, please read the following.

The information in this manual does not include each and every unique situation that you may encounter when working on MACK vehicles. Mack Trucks, Inc. cannot possibly know, evaluate, or advise a person on all the types of work that can be done on MACK vehicles, all the appropriate ways to do such work, and all the possible consequences of performing such work in a certain manner. Therefore any situations and/or methods of working on a MACK vehicle that are not addressed in this manual are not necessarily approved by Mack. IN THE EVENT THAT YOU ENCOUNTER A SITUATION NOT ADDRESSED IN THIS MANUAL, PLEASE CONTACT MACK CUSTOMER SERVICE/PRODUCT SUPPORT AT 610-709-3961 FOR POSSIBLE ASSISTANCE.

Unless stated otherwise, following a recommendation listed in this manual does not automatically guarantee compliance with applicable government regulations. Compliance with applicable government regulations is your responsibility as the party making the additions/modifications.

Please be advised that the Mack Trucks, Inc. vehicle warranty does not apply to any MACK vehicle that has been modified in any way, which in Mack's judgment might affect the vehicle's stability or reliability.

The information, specifications, and illustrations in this manual are based on information that was current at the time of publication. Note that some illustrations are typical and may not reflect the exact arrangement of every component installed on a specific vehicle.

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INTRODUCTION

SAFETY INFORMATION

Advisory Labels

Cautionary *signal words* (Danger-Warning-Caution) may appear in various locations throughout this manual. Information accented by one of these signal words must be observed to minimize the risk of personal injury to service personnel, or the possibility of improper service methods which may damage the vehicle or cause it to be unsafe. Additional Notes and Service Hints are used to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these advisory labels as they appear throughout the manual:

⚠ DANGER

Danger *indicates an unsafe practice that could result in death or serious personal injury. Serious personal injury is considered to be permanent injury from which full recovery is NOT expected, resulting in a change in life style.*

⚠ WARNING

***Warning* indicates an unsafe practice that could result in personal injury. Personal injury means that the injury is of a temporary nature and that full recovery is expected.**

⚠ CAUTION

***Caution** indicates an unsafe practice that could result in damage to the product.*

NOTE

Note indicates a procedure, practice, or condition that must be followed in order for the vehicle or component to function in the manner intended.

SERVICE HINT

A helpful suggestion that will make it quicker and/or easier to perform a procedure, while possibly reducing service cost.

Service Procedures and Tool Usage

Anyone using a service procedure or tool not recommended in this manual must first satisfy himself thoroughly that neither his safety nor vehicle safety will be jeopardized by the service method he selects. Individuals deviating in any manner from the instructions provided assume all risks of consequential personal injury or damage to equipment involved.

Also note that particular service procedures may require the use of a special tool(s) designed for a specific purpose. These special tools must be used in the manner described, whenever specified in the instructions.

⚠ DANGER

1. ***Before starting a vehicle, always be seated in the driver's seat, place the transmission in neutral, apply the parking brakes, and push in the clutch pedal. Failure to follow these instructions could produce unexpected vehicle movement, which can result in serious personal injury or death.***
2. ***Before working on a vehicle, place the transmission in neutral, set the parking brakes, and block the wheels. Failure to follow these instructions could produce unexpected vehicle movement, which can result in serious personal injury or death.***

⚠ DANGER

Engine-driven components such as Power Take-Off (PTO) units, fans and fan belts, driveshafts and other related rotating assemblies, can be very dangerous. Do not work on or service engine-driven components unless the engine is shut down. Always keep body parts and loose clothing out of range of these powerful components to prevent serious personal injury. Be aware of PTO engagement or nonengagement status. Always disengage the PTO when not in use.

⚠ DANGER

Do not work under a vehicle that is supported only by a hydraulic jack. The hydraulic jack could fail suddenly and unexpectedly, resulting in severe personal injury or death. Always use jackstands of adequate capacity to support the weight of the vehicle.

⚠ CAUTION

Before towing the vehicle, place the transmission in neutral and lift the rear wheels off the ground, or disconnect the driveline to avoid damage to the transmission during towing.

REMEMBER,
SAFETY . . . IS NO ACCIDENT!

Mack Trucks, Inc. cannot anticipate every possible occurrence that may involve a potential hazard. Accidents can be avoided by recognizing potentially hazardous situations and taking necessary precautions. Performing service procedures correctly is critical to technician safety and safe, reliable vehicle operation.

The following list of general shop safety practices can help technicians avoid potentially hazardous situations and reduce the risk of personal injury. DO NOT perform any services, maintenance procedures or lubrications until this manual has been read and understood.

- Perform all service work on a flat, level surface. Block wheels to prevent vehicle from rolling.
- DO NOT wear loose-fitting or torn clothing. Remove any jewelry before servicing vehicle.
- ALWAYS wear safety glasses and protective shoes. Avoid injury by being aware of sharp corners and jagged edges.
- Use hoists or jacks to lift or move heavy objects.
- NEVER run engine indoors unless exhaust fumes are adequately vented to the outside.
- Be aware of hot surfaces. Allow engine to cool sufficiently before performing any service or tests in the vicinity of the engine.
- Keep work area clean and orderly. Clean up any spilled oil, grease, fuel, hydraulic fluid, etc.
- Only use tools that are in good condition, and always use accurately calibrated torque wrenches to tighten all fasteners to specified torques. In instances where procedures require the use of special tools which are designed for a specific purpose, use only in the manner described in the instructions.
- Do not store natural gas powered vehicles indoors for an extended period of time (overnight) without first removing the fuel.
- Never smoke around a natural gas powered vehicle.

⚠ CAUTION

Aftermarket steering wheels MUST NOT be installed on vehicles equipped with the MACK RSA (Bendix® ABS-6 Advanced with ESP®). Only OEM-supplied replacement steering wheels should be used. During any service procedure that involves reinstallation or replacement of the OEM steering wheel, use care not to crush or damage the steering angle sensor.

CONVERSION CHART

Conversion Units			Multiply By:
Length Calculations			
Inches (in)	to	Millimeters (mm)	25.40
Inches (in)	to	Centimeters (cm)	2.540
Feet (ft)	to	Centimeters (cm)	30.48
Feet (ft)	to	Meters (m)	0.3048
Yards (yd)	to	Centimeters (cm)	91.44
Yards (yd)	to	Meters (m)	0.9144
Miles	to	Kilometers (km)	1.609
Millimeters (mm)	to	Inches (in)	0.03937
Centimeters (cm)	to	Inches (in)	0.3937
Centimeters (cm)	to	Feet (ft)	0.0328
Centimeters (cm)	to	Yards (yd)	0.0109
Meters (m)	to	Feet (ft)	3.281
Meters (m)	to	Yards (yd)	1.094
Kilometers (km)	to	Miles	0.6214
Area Calculations			
Square Inches (sq-in)	to	Square Millimeters (sq-mm)	645.2
Square Inches (sq-in)	to	Square Centimeters (sq-cm)	6.452
Square Feet (sq-ft)	to	Square Centimeters (sq-cm)	929.0
Square Feet (sq-ft)	to	Square Meters (sq-m)	0.0929
Square Yards (sq-yd)	to	Square Meters (sq-m)	0.8361
Square Miles (sq-miles)	to	Square Kilometers (sq-km)	2.590
Square Millimeters (sq-mm)	to	Square Inches (sq-in)	0.00155
Square Centimeters (sq-cm)	to	Square Inches (sq-in)	0.155
Square Centimeters (sq-cm)	to	Square Feet (sq-ft)	0.001076
Square Meters (sq-m)	to	Square Feet (sq-ft)	10.76
Square Meters (sq-m)	to	Square Yards (sq-yd)	1.196
Square Kilometers (sq-km)	to	Square Miles (sq-miles)	0.3861
Volume Calculations			
Cubic Inches (cu-in)	to	Cubic Centimeters (cu-cm)	16.387
Cubic Inches (cu-in)	to	Liters (L)	0.01639
Quarts (qt)	to	Liters (L)	0.9464
Gallons (gal)	to	Liters (L)	3.7854
Cubic Yards (cu-yd)	to	Cubic Meters (cu-m)	0.7646
Cubic Centimeters (cu-cm)	to	Cubic Inches (cu-in)	0.06102
Liters (L)	to	Cubic Inches (cu-in)	61.024
Liters (L)	to	Quarts (qt)	1.0567
Liters (L)	to	Gallons (gal)	0.2642
Cubic Meters (cu-m)	to	Cubic Yards (cu-yd)	1.308

Conversion Units			Multiply By:
Weight Calculations			
Ounces (oz)	to	Grams (g)	28.5714
Pounds (lb)	to	Kilograms (kg)	0.4536
Pounds (lb)	to	Short Tons (US tons)	0.0005
Pounds (lb)	to	Metric Tons (t)	0.00045
Short Tons (US tons)	to	Pounds (lb)	2000
Short Tons (US tons)	to	Kilograms (kg)	907.18486
Short Tons (US tons)	to	Metric Tons (t)	0.90718
Grams (g)	to	Ounces (oz)	0.035
Kilograms (kg)	to	Pounds (lb)	2.205
Kilograms (kg)	to	Short Tons (US tons)	0.001102
Kilograms (kg)	to	Metric Tons (t)	0.001
Metric Tons (t)	to	Pounds (lb)	2205
Metric Tons (t)	to	Short Tons (US tons)	1.1023
Metric Tons (t)	to	Kilograms (kg)	1000
Force Calculations			
Ounces Force (ozf)	to	Newtons (N)	0.2780
Pounds Force (lbf)	to	Newtons (N)	4.448
Pounds Force (lbf)	to	Kilograms Force (kgf)	0.456
Kilograms Force (kgf)	to	Pounds Force (lbf)	2.2046
Kilograms Force (kgf)	to	Newtons (N)	9.807
Newtons (N)	to	Kilograms Force (kgf)	0.10196
Newtons (N)	to	Ounces Force (ozf)	3.597
Newtons (N)	to	Pounds Force (lbf)	0.2248
Torque Calculations			
Pound Inches (lb-in)	to	Newton Meters (N•m)	0.11298
Pound Feet (lb-ft)	to	Newton Meters (N•m)	1.3558
Pound Feet (lb-ft)	to	Kilograms Force per Meter (kgfm)	0.13825
Newton Meters (N•m)	to	Pound Inches (lb-in)	8.851
Newton Meters (N•m)	to	Pound Feet (lb-ft)	0.7376
Newton Meters (N•m)	to	Kilograms Force per Meter (kgfm)	0.10197
Kilograms Force per Meter (kgfm)	to	Pound Feet (lb-ft)	7.233
Kilograms Force per Meter (kgfm)	to	Newton Meters (N•m)	9.807
Radiator Specific Heat Dissipation Calculations			
British Thermal Unit per Hour (BTU/hr)	to	Kilowatt per Degree Celsius (kW/°C)	0.000293
Kilowatt per Degree Celsius (kW/°C)	to	British Thermal Unit per Hour (BTU/hr)	3414.43
Temperature Calculations			
Degrees Fahrenheit (°F)	to	Degrees Celsius (°C)	(°F – 32) x 0.556
Degrees Celsius (°C)	to	Degrees Fahrenheit (°F)	(1.8 x °C) + 32

Conversion Units			Multiply By:
Pressure Calculations			
Atmospheres (atm)	to	Bars (bar)	1.01325
Atmospheres (atm)	to	Kilopascals (kPa)	101.325
Bars (bar)	to	Atmospheres (atm)	0.98692
Bars (bar)	to	Kilopascals (kPa)	100
Bar (bar)	to	Pounds per Square Inch (psi)	14.5037
Inches of Mercury (in Hg)	to	Kilopascals (kPa)	3.377
Inches of Water (in H_2O)	to	Kilopascals (kPa)	0.2491
Pounds per Square Inch (psi)	to	Kilopascals (kPa)	6.895
Pounds per Square Inch (psi)	to	Bar (bar)	0.06895
Kilopascals (kPa)	to	Atmospheres (atm)	0.00987
Kilopascals (kPa)	to	Inches of Mercury (in Hg)	0.29612
Kilopascals (kPa)	to	Inches of Water (in H_2O)	4.01445
Kilopascals (kPa)	to	Pounds per Square Inch (psi)	0.145
Power Calculations			
Horsepower (hp)	to	Kilowatts (kW)	0.74627
Kilowatts (kW)	to	Horsepower (hp)	1.34
Fuel Performance Calculations			
Miles per Gallon (mile/gal)	to	Kilometers per Liter (km/L)	0.4251
Kilometers per Liter (km/L)	to	Miles per Gallon (mile/gal)	2.352
Velocity Calculations			
Miles per Hour (mile/hr)	to	Kilometers per Hour (km/hr)	1.609
Kilometers per Hour (km/hr)	to	Miles per Hour (mile/hr)	0.6214
Volume Flow Calculations			
Cubic Feet per Minute (cu-ft/min)	to	Liters per Minute (L/min)	28.32
Liters per Minute (L/min)	to	Cubic Feet per Minute (cu-ft/min)	0.03531

GENERAL INFORMATION

INTRODUCTION

Properly mounting the body structure or any other type of equipment to a chassis is essential to ensure that both static and dynamic forces are transmitted freely without producing excessive localized loads that may eventually result in damage to the vehicle, or adversely affect vehicle handling characteristics and operation. This guide outlines Mack Trucks, Inc. recommendations for use by body builders when adding equipment to a MACK chassis. In addition to any precautions that must be taken when physically mounting equipment to the frame, precautions must also be taken when connecting accessory components to the vehicle electrical and air systems so that the systems continue to perform as originally intended.

MACK chassis may be used in a variety of applications, such as platform trucks, dump trucks, vans and refuse operations. When selecting a chassis for a particular application, make sure to select the proper chassis specifications. When installed, the weight of the body and intended payload must not exceed the chassis gross vehicle weight rating (GVWR) and gross axle weight ratings (GAWRs). Likewise, the weight of the body and the intended payload must not cause excessive frame rail deflection. Also, when selecting an engine, select the proper horsepower rating to ensure adequate performance and fuel economy.

SERVICE SUPPORT

The following resources are available to the body builder when questions or situations arise that are not covered in this manual.

Service Publications — MACK

A variety of service publications, such as component overhaul manuals, air and brake system manuals (includes air piping diagrams), electrical systems diagrams, V-MAC service, diagnostic and programming manuals, are available through the Service Publications Department. Service literature must be ordered from an authorized MACK dealership. Service information is also available on-line by logging onto the Mack Trucks, Inc. website at www.macktrucks.com.

NOTE

V-MAC® III interface information is no longer published in this manual. This information is now published in a separate manual, *Vendor Application Guide for V-MAC III,* 8-324.

Service Publications — Vendor Engine

For chassis equipped with a Cummins ISC engine, the *Cummins ISC Guide for Body Builders* is available from the Cummins Engine Company, Inc. This guide includes detailed information concerning Cummins ISC engine programming for body installers, and is available by contacting Cummins Engine Company, Inc. directly at 1-800-DIESELS, or visiting its website at www.cummins.com or by e-mail at powermaster@cummins.com.

Customer Service/Product Support — MACK Trucks

For technical assistance, such as obtaining chassis drawings, contact Customer Service/Product Support at 610-709-3961.

Information Resources — Non-MACK

NATIONAL TRUCK EQUIPMENT ASSOCIATION (NTEA)

The National Truck Equipment Association (NTEA) has a reference book, Truck Equipment Handbook, available. This handbook includes such information as formulas necessary for matching chassis and bodies, center of gravity calculations, weights of commodities, as well as basic engineering calculations, component descriptions, application and installation considerations. For additional information, visit the NTEA website at www.ntea.com, or call 1-800-441-NTEA.

CANADIAN TRUCK EQUIPMENT ASSOCIATION (CTEA)

Like the NTEA, the Canadian Truck Equipment Association (CTEA) also offers useful publications for the body installer. For information, visit the CTEA website at www.ctea.on.ca, or call 519-631-0414.

REGULATORY AGENCIES — WEBSITES

The following regulatory agency websites may be a source for useful and helpful information.

- **National Highway Traffic Safety Administration (NHTSA) —** www.nhtsa.dot.gov
- **Federal Motor Carrier Safety Administration (FMCSA) —** www.fmcsa.dot.gov
- **Federal Highway Administration (FHWA) —** www.fhwa.dot.gov
- **Environmental Protection Agency (EPA) —** www.epa.gov
- **State Laws, Codes, Statutes and Regulations —** www.findlaw.com/casecode
- **Transport Canada (TC) —** www.tc.gc.ca

INSPECTION OF CHASSIS

Chassis delivered from the assembly plant directly to the body installer's facility should be inspected for damage, such as paint damage, cab interior and exterior damage, frame damage, etc. The frame should be thoroughly inspected for damage, particularly if the chassis are delivered decked. Frame damage can occur if the saddle used to mount the decked chassis is improperly installed. Additionally, inspect the area around tandem axles for damage if a chain was used to secure an axle in the raised position. Such damage could be detrimental to frame member integrity.

Inspect the chassis promptly upon delivery and note any damage on the Inspection/Vehicle Receipt form, and make sure the delivering driver is aware of the damage and that he signs the delivery documents indicating his knowledge of the damage.

The mirrors used on certain model chassis employ a “break-away” strut that is designed to break away should the mirror hit an object. In many instances, when chassis are shipped from the assembly plant, the strut will be disconnected from the mirror bracket, and the mirror will be folded back against the cab. The strut is reattached to the bracket as follows:

1. Push mirror bracket forward, as far as it will go.
2. Align end of strut with slot in receptacle.
3. Pull bracket rearward to snap strut in place. The strut head should be centered fore-aft in the receptacle.

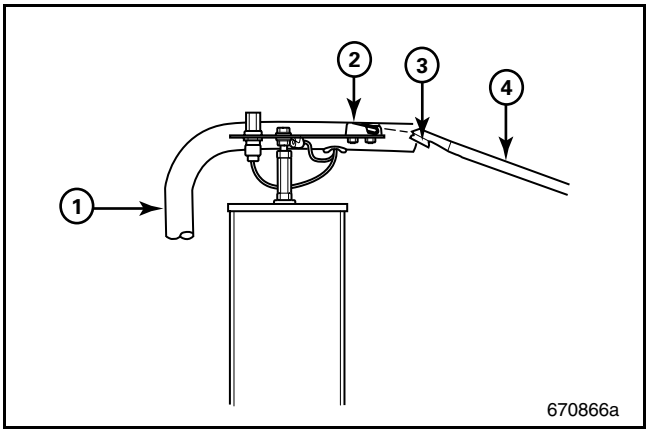


Figure 1 — “Break-Away” Mirror Strut

1. Mirror Bracket	3. Plastic Strut Head
2. Receptacle	4. Mirror Break-Away Strut

BODY INSTALLATION — GENERAL PRECAUTIONS

Unless prior approval has been granted by Mack Trucks, Inc., the following is prohibited:

- Modifications to the chassis frame, brake system, suspension, electrical system (i.e., lights, harness modifications, etc., except for those required to operate the installed body), powertrain, fuel system and exhaust system, beyond the recommendations outlined in this guide.
- Drilling of reinforcement gussets.
- Cutting grooves, notches or slots in the main frame rail flanges, gusset flanges or crossmembers unless specifically authorized to do so by Mack Trucks, Inc.
- Modifications to original-equipment bolts and other fasteners for mounting of a body or sub-frame.
- Methods and procedures for lengthening and shortening the frame not outlined in this guide.
- Relocation of air reservoirs and air valves are not allowed unless approved by Mack Trucks, Inc.
- Using the power steering pump to power accessory hydraulic systems.
- Modifications to the exhaust system unless approved by Mack Trucks, Inc.

NOTE

Diesel particulate filters (DPF) and related components cannot be moved or altered from the OEM location in any fashion. Moving or altering the DPF or related components will result in emission system malfunction or failure.

NOTE

In all cases, safety related systems (brakes, electrical, etc.) must remain in accordance with the Mack Trucks, Inc. specifications. Parties performing modifications not conforming with these standards do so at the risk of assuming all consequential liability.

NOTE

Multiple body component installations, such as a hoist along with a roll-off flat bed, or other similar types of installations, require a single subframe for both units. Using a separate subframe for each component will result in frame damage.

NOTE

Installation of a body and related equipment onto a chassis must not reduce the effectiveness of a component and/or system previously installed on the chassis. Reducing or obstructing the sound path of an audible backup warning device or reducing/obstructing the light path of a lamp or reflective device are examples of reducing the effectiveness of a previously installed component and/or system. Some components and/or systems may require relocation to ensure the intended level of effectiveness.

Compliance with motor vehicle safety standards, motor vehicle safety regulations, motor carrier safety regulations, noise emission control regulations and gaseous and smoke emission regulations must be maintained.

Precautions — Modifications on Anti-Lock Brake- and Rollover Stability System (MACK RSA)-Equipped Vehicles

Connecting electrically powered or electrically controlled equipment on an ABS- or rollover stability system-equipped vehicle may cause interference with these systems. The amount of interference depends upon the operating frequency of any new signals and the degree to which transient signals are coupled into the vehicle electrical system.

NOTE

Whenever new electrical equipment is installed, it is the obligation of the installer to ensure that the new equipment does not interfere with the proper operation of all other electrical systems on the vehicle.

The MACK Road Stability Advantage (RSA) is an available option on certain MACK highway tractors and straight trucks. The RSA system, which is based on the Bendix® ABS-6 Advanced with ESP® (Electronic Stability Program) System, aids the operator in maintaining control of the vehicle during jackknife or rollover events by applying select brakes and reducing engine power as required by the specific situation. This system is integral with the anti-lock brake system and uses the standard ABS components (such as wheel speed sensors and modulator valves). Additionally, a steering angle sensor and a yaw rate/lateral acceleration sensor package provides information concerning vehicle movement to the electronic control unit.

Before delivery to the end user, a “parameter set” tuned for the specific vehicle and the VIN for the chassis is loaded into the ABS electronic control unit. This ensures optimal performance of the MACK RSA system for the specific vehicle.

⚠ DANGER

Alterations and modifications to an RSA-equipped vehicle, such as wheel base changes (either lengthening or shortening), the addition of an auxiliary lift axle or the removal of a factory-installed lift axle, or major body changes such as conversion of a tractor to a truck or an axle, suspension or steering system component modification, are NOT allowed, as these changes will adversely affect performance of the road stability system.

Should such changes be unavoidable, the system must be disabled by having a qualified technician replace the Bendix® Advanced EC-60™ (ABS control unit with ESP®) with a Bendix® Premium EC-60™ ECU (ABS control unit without ESP®).

⚠ DANGER

Failure to disable the RSA system on a vehicle that has been modified or altered will result in serious vehicle braking and performance issues, including unnecessary system interventions. These interventions could lead to a loss of vehicle control.

In addition to disabling the system, any cab labels, such as warning and caution labels relating to the Bendix® ABS-6 Advanced with ESP® system located on the sun visor must be removed, and notations must be made in the operator's manuals so that the vehicle operator has a clear understanding as to which ABS options are installed on the vehicle.

The location of the yaw rate/lateral acceleration sensor must not be altered. If the sensor must be removed and reinstalled, the original equipment mounting bracket must be used and the mounting hardware must be tightened to 15 lb-ft (20 N•m).

Aftermarket steering wheels must not be used. Only OEM-supplied replacement steering wheels should be used. During any procedure that involves removal and reinstallation or replacement of the OEM steering wheel, care must be used not to crush or damage the steering angle sensor which is mounted on the steering column.

⚠ DANGER

The following changes MUST NOT be made to an “as-built” RSA-equipped vehicle:

- ***Changes to maximum steering angle (to the left or right)***
- ***Changes to steer axle and/or drive axle track width***
- ***Changing front and/or rear brake drums to drums having a different flange thickness (thus changing the track width of the vehicle)***

The ABS with ESP® ECU requires a precise rolling circumference ratio between the front steer axle and the rear drive axles for optimum performance of the system. For this reason, the system continuously calculates the precise ratio and stores the information in the ECU memory.

⚠ DANGER

Effectiveness of the RSA system relies on the accuracy of the reported vehicle speed. If major changes to tire sizes are made, such that changes to the vehicle speedometer/ odometer settings are required, the ABS with ESP® ECU must be reprogrammed with the new values by a qualified technician.

UNDERRIDE PROTECTION

Depending upon the final configuration of the rear of the vehicle, U.S. Federal or state regulations may require the addition of an appropriate rear impact guard for underride protection. Installation of the rear impact guard is the responsibility of the manufacturer who is responsible for the final certification of the vehicle.

CLEARANCES — CHASSIS AND COMPONENT

Minimum clearance should be maintained around the engine, transmission, driveshafts, carriers and tires to allow for ease of service, component removal, maximum air flow and vertical, horizontal and lateral movement.

Clearance — Engine

A minimum of 1.6 inches of clearance should be maintained around the engine. Additionally, no equipment should be installed that would restrict air flow through the radiator or to the engine air intake.

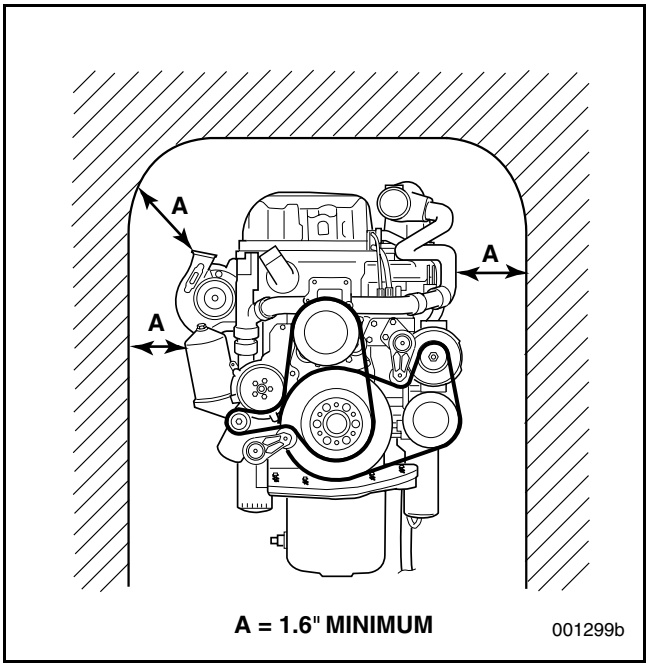


Figure 2 — Allow Sufficient Clearance Around Engine

Clearance — Diesel Particulate Filter

For emission compliance, all MACK chassis are equipped with a Diesel Particulate Filter (DPF) unit which is designed to reduce soot-related emissions, particularly on vehicles used in metropolitan areas. The DPF unit replaces the standard muffler.

The outer skin of the DPF unit reaches a temperature of approximately 572°F (300°C), and exhaust outlet temperatures can reach approximately 1,200°F (648.9°C) during regeneration cycles. Outlet temperatures may be lowered as much as 480°F (250°C), measured 6" (152.4 mm) from the outlet, by the installation of an exhaust gas diffuser (EGD). Intermediate and final stage manufacturers must evaluate the effect these elevated temperatures can have on the equipment being installed, as well as the impact of any exhaust system modifications that may be performed.

Sufficient clearance away from the DPF unit must be maintained for any temperature-sensitive components such as hydraulic lines, air lines, wire harnesses, electronic control units, etc. If sufficient clearance cannot be maintained, shields must be installed to prevent heat-related damage to any temperature-sensitive components. On the DPF unit, the areas around the clamps are the hottest. Shields should be installed around the clamps to provide protection for any heat-sensitive components that may be located in close proximity to the DPF clamps.

Exhaust system modifications, including modification or removal of an exhaust gas diffuser, can result in heat-related damage to vehicle equipment or other property. Intermediate and final-stage manufacturers are responsible for any damage due to exhaust system modification or removal.

In addition to maintaining proper clearances for any heat-sensitive components, the exhaust stack outlet must be positioned in such a way to prevent rain ingestion.

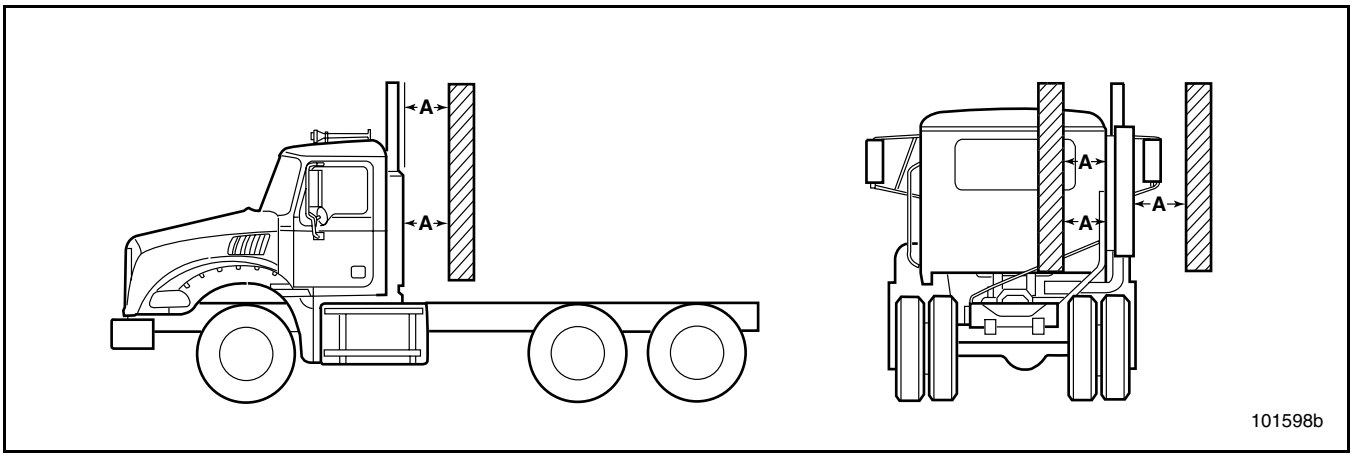


Figure 3 — Allow Sufficient Clearance Between Body Installation and Diesel Particulate Filter

Clearance — Transmission

Sufficient clearance, approximately 10 inches (254 mm), should be maintained to the rear of the transmission to allow its removal.

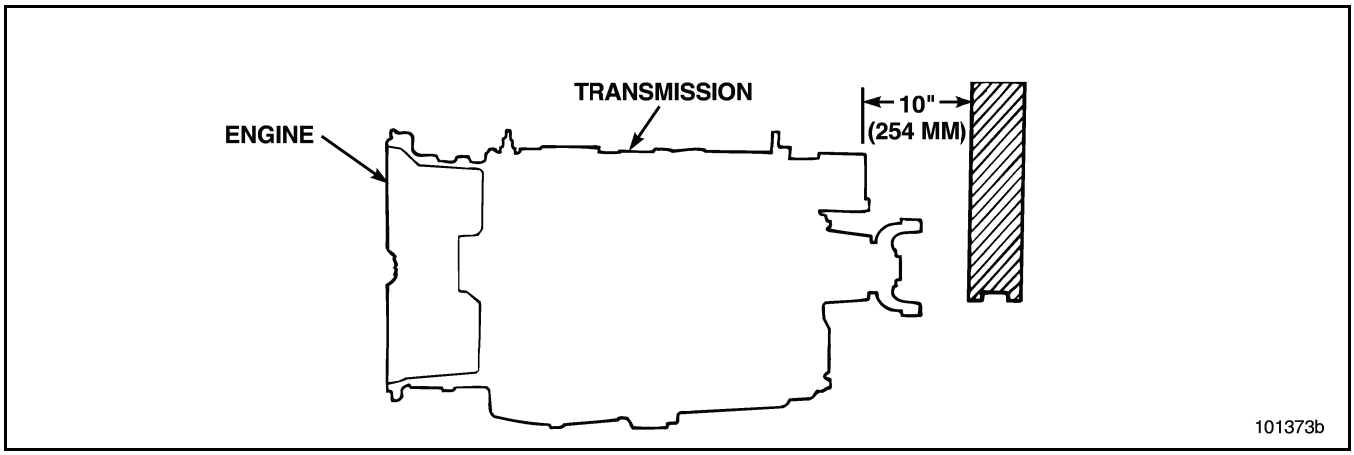


Figure 4 — Allow Sufficient Clearance at Rear of Transmission

Approximately 5 inches (127 mm) of clearance above the transmission is necessary to access the top transmission covers, rear compound covers, shift towers and range shift valves.

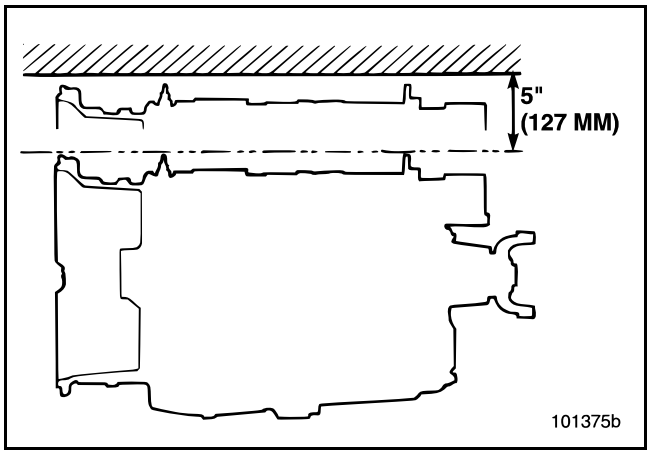


Figure 5 — Allow Sufficient Clearance Above Transmission

Clearance — Driveshafts

FRONT DRIVESHAFTS

At least 1.25 inches (31.75 mm) clearance must be maintained around the driveshaft.

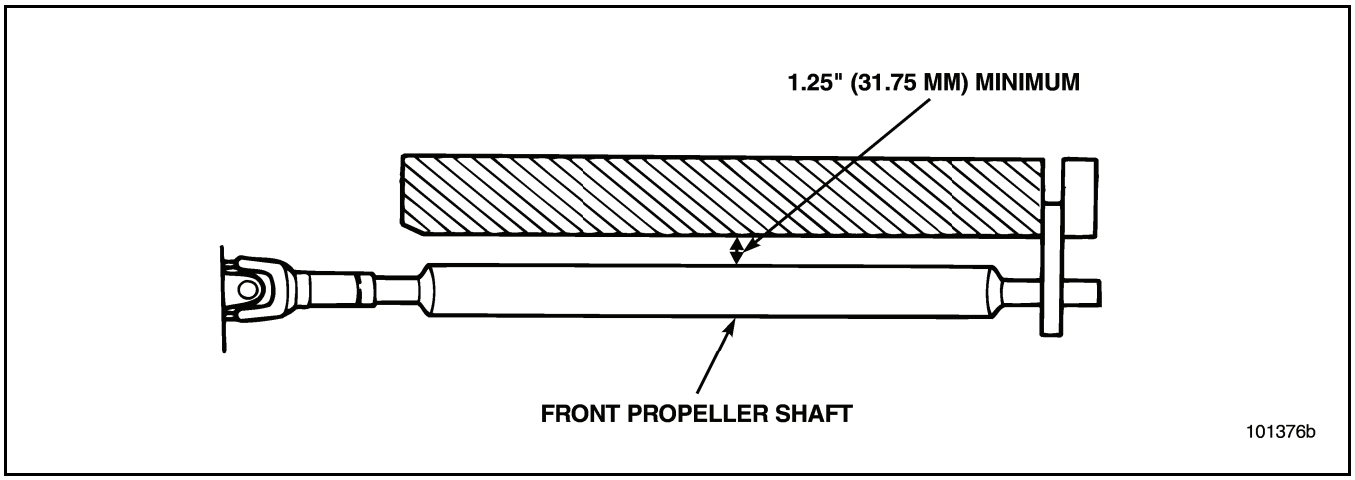


Figure 6 — Allow Sufficient Clearance Around Front Driveshaft

REAR DRIVESHAFT

A minimum of 1.25 inches (31.75 mm) clearance must be maintained around the rear driveshaft.

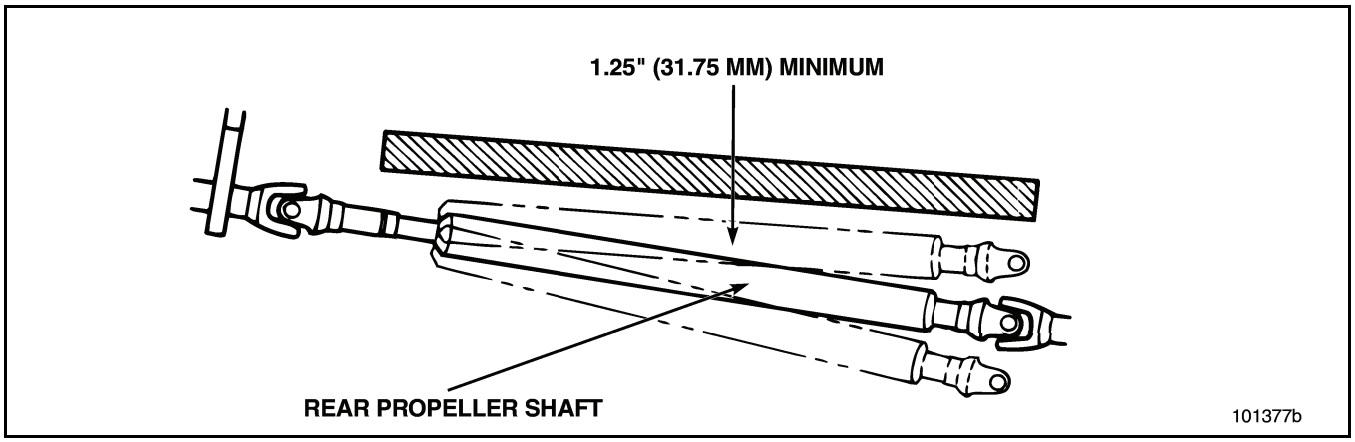


Figure 7 — Allow Clearance for Rear Driveshaft

Clearance — Rear Wheels and Axles

Sufficient clearance must be maintained to allow full vertical movement of the rear axles and tires as the vehicle travels over rough terrain or uneven surfaces.

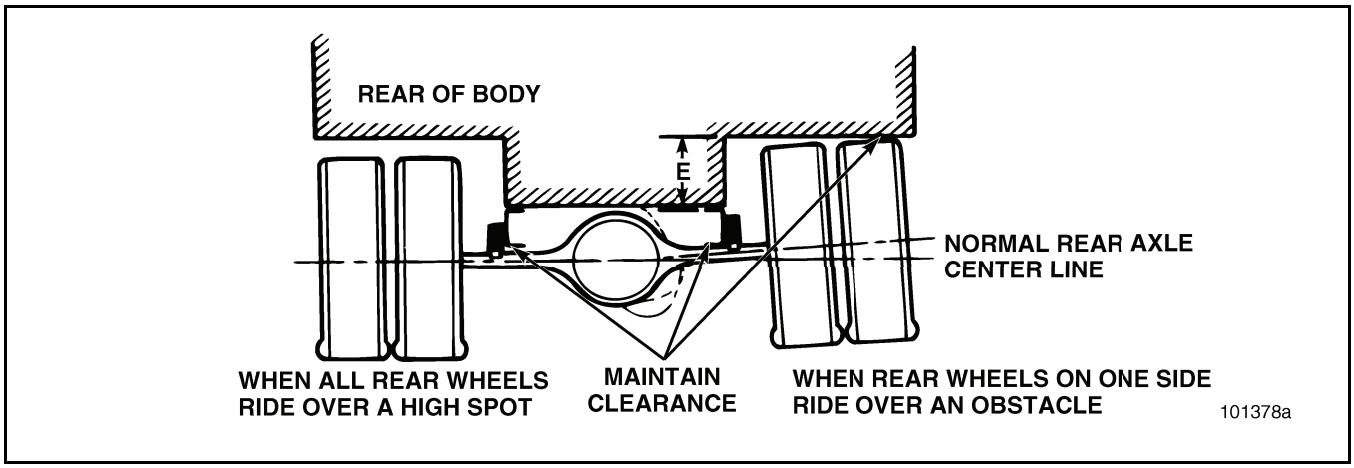


Figure 8 — Allow Clearance for Vertical Movement of Rear Axles and Tires

POWER TAKE-OFF DRIVEN EQUIPMENT

When mounting pumps and other types of PTO-driven equipment, follow the manufacturer's location and mounting recommendations. Components, such as pumps and hydraulic tanks, must be mounted so that weight distribution, both front to rear and side to side, will be equal. Avoid concentrating weight on one side of the chassis.

PTO driveshafts for equipment must meet angularity specifications to prevent premature driveline failure or harmonic noise. The center line of the PTO drive yoke and the centerline of the pump shaft yoke must be parallel, the driveshaft angles must be equal and driveshaft yokes must be in phase.

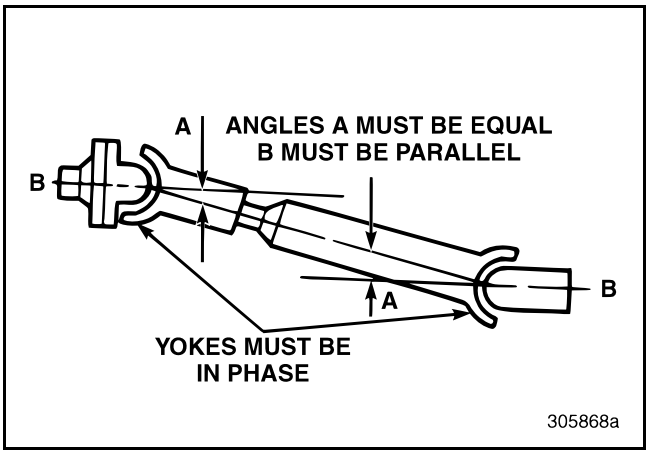


Figure 9 — PTO Driveshaft Angle Requirements

Driveshaft angle versus speed is important. For example, at 3 degrees, a driveshaft may satisfactorily run at 3500 rpm, whereas at 5 degrees, it may satisfactorily run only at 2500 rpm. As driveshaft angle increases, driveshaft speed must decrease. Consult the driveshaft manufacturer's literature for complete details on driveshaft angle, length and speed limitations.

Power Take-Off — Front Engine (FEPTO) — MACK Engines

NOTE

For MACK MP7 engines, the output torque capacity for FEPTO applications is 284 lb-ft (385 N•m).

To attach the FEPTO driveshaft to the engine front hub, an adapter is available.

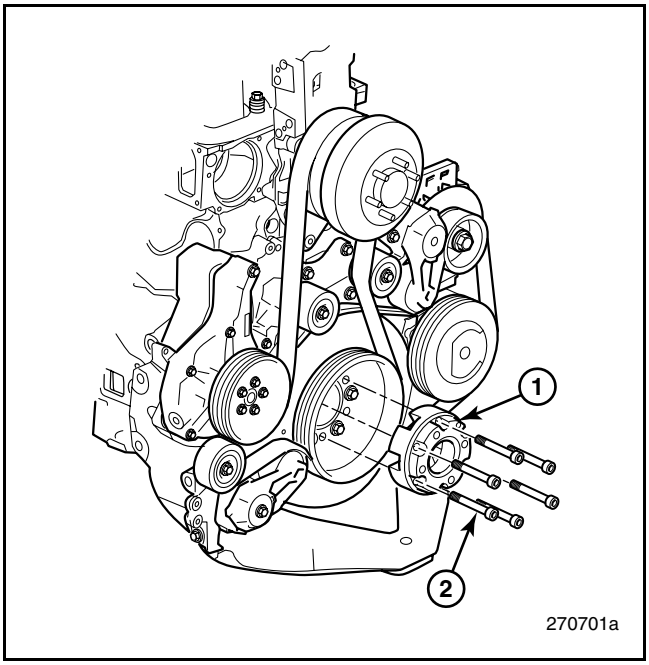


Figure 10 — FEPTO Driveshaft Mounting Adapter (MACK MP7 Engines)

1. 20564213, adapter	2. 959249, bolts (6)

To install the adapter, remove six of the crankshaft front hub mounting bolts (every other bolt), and then position the adapter on the hub with the cut-outs over the existing crankshaft mounting bolts. Install the six mounting bolts and tighten as follows:

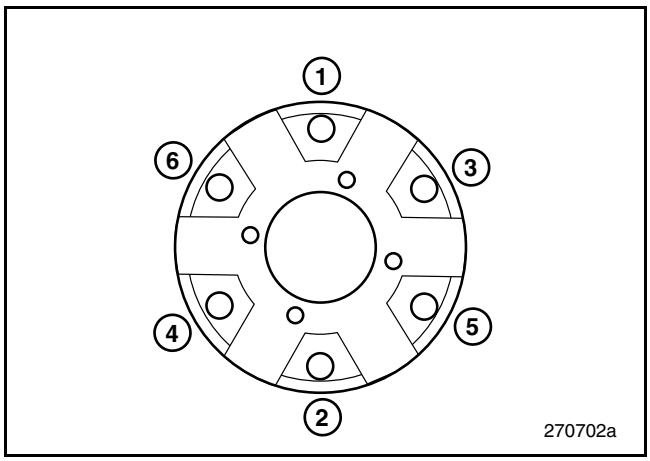


Figure 11 — Hub Adapter Mounting Bolt Tightening Sequence

In an alternating criss-cross pattern as shown above, tighten the six mounting bolts to 30 lb-ft (40 N•m), and then again, in the same sequence, to 66 lb-ft (90 N•m).

Power Take-Off — Countershaft-Driven, EATON Ultrashift DM Transmission

For any countershaft-driven PTO unit mounted on an Eaton Ultrashift DM transmission, an electrical interface with the transmission must be provided. The standard PTO-mounted switch can be used to activate the PTO operating mode of the transmission. This feature uses pin F1 of the 18-pin transmission connector.

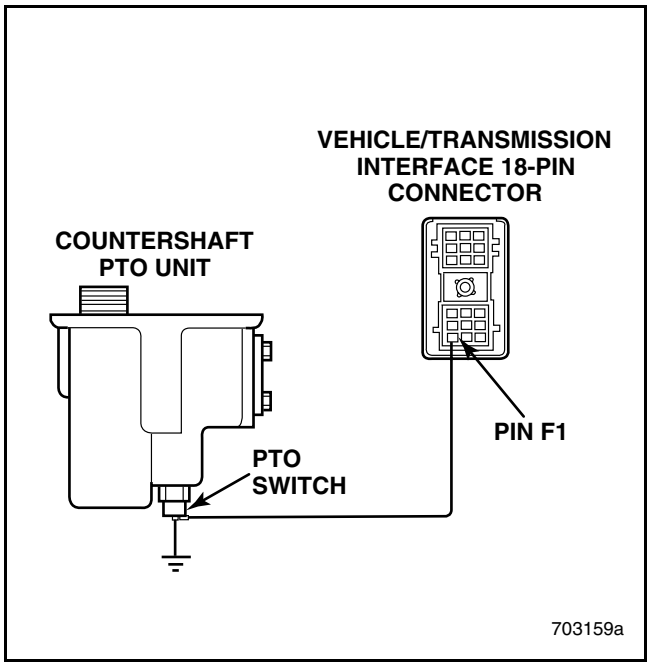


Figure 12 — Vehicle-to-Transmission PTO Interface

The Eaton Ultrashift DM transmission must receive an input signal from the countershaft-driven PTO unit when it is active. In the active state, clutch engagement is controlled when engine speed is increased to engage the clutch and drive the transmission main box countershaft. Incorrect or no PTO interface signal to the transmission will result in uncontrolled engagement of the clutch during PTO operation. The PTO active signal will illuminate the MODE indicator lamp on the transmission push button console.

NOTE

The input signal wire for the PTO must be isolated from all other PTO-related circuits.

POWER TAKE-OFF — REAR ENGINE (REPTO)

MACK engines are available with an optional rear engine power take-off (REPTO) unit. These units are well suited for driving accessory hydraulic pumps, or other types of driven equipment used in mixer, fire pump, refuse and other applications.

DRIVESHAFT SIZING

Several factors, such as continuous operating torque, slip torque, maximum low gear ratio and the presence of an auxiliary transmission, are used to determine driveshaft size, length, rpm and angle. If engine horsepower, transmission model, rear axle model or gear ratios are modified, or tire size changes significantly, verify the driveshaft size to be sure that the original specification driveshaft will still perform satisfactorily.

HOOD-MOUNTED ACCESSORIES

When mounting accessories such as lights, mirrors, bug deflectors, splash guards, handles, etc., to the hood, the following guidelines should be followed to prevent damaging the hood:

- Hoods rarely have flat surfaces for the attachment of large flat brackets or plates, so attachment of such should be avoided. Components should be mounted with multiple brackets having small contact areas. Large brackets or plates can be used if they are contoured to match the surface of the hood.
- Do not use large flat washers on a curved surface of the hood. Doing so can cause hood cracks.
- To reduce vibration and the possibility of hood cracking, components such as mirrors and lights should be mounted with a three-point brace configuration.

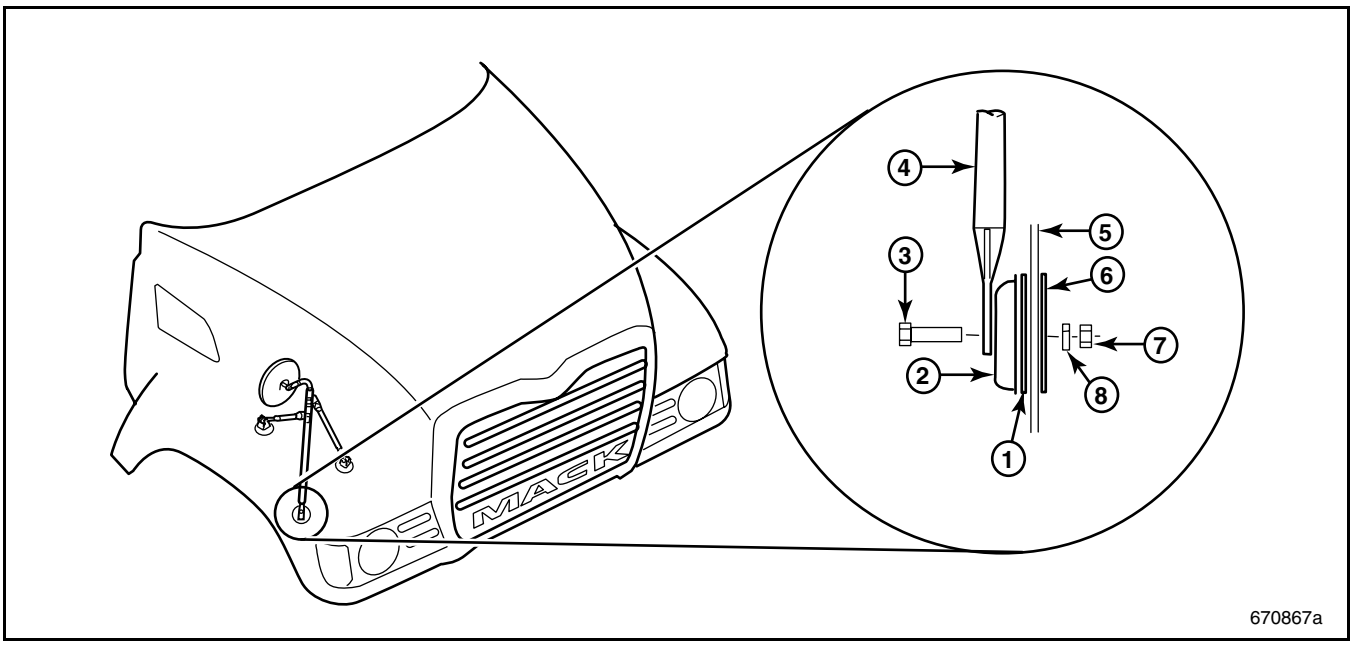


Figure 13 — Typical Fender-Mounted Mirror Arrangement

1. Vinyl-Coated Washer	5. Fender Material
2. Mounting Cup	6. Steel Washer
3. Bolt	7. Nut
4. Mirror Bracket	8. Washer

Heated Dump Bodies

US07 emission compliant MACK chassis are equipped with a diesel particulate filter (DPF) which reduces soot and particulate emissions into the atmosphere. For chassis being used with heated dump body, exhaust flow cannot be diverted from the exhaust system ahead of the DPF unit. Exhaust flow must come from the DPF outlet, and exhaust back pressure specifications (18 kPa [2.6 psi] for MACK MP7 engines and 21 kPa [3.1 psi] for MACK MP8 engines) cannot be exceeded. The ONLY diesel particulate filter that is approved for heated dump body applications is the MACK-Cap DPF system. The MACK-Cap DPF is a space saver unit that is mounted inside the frame. The vertical back-of-cab DPF unit is NOT approved for use with a heated dump body.

PAINT CODES

A paint code label is affixed to the cab of all MACK chassis to provide an easy reference for the different color paints that were used to paint a particular chassis. The label is located on the driver-side door hinge pillar, door latch post, door edge that meets the door latch post, an inward-facing surface of the door or the outboard side of the instrument panel. If it is necessary to match paint, refer to the paint code label to obtain the appropriate paint code.

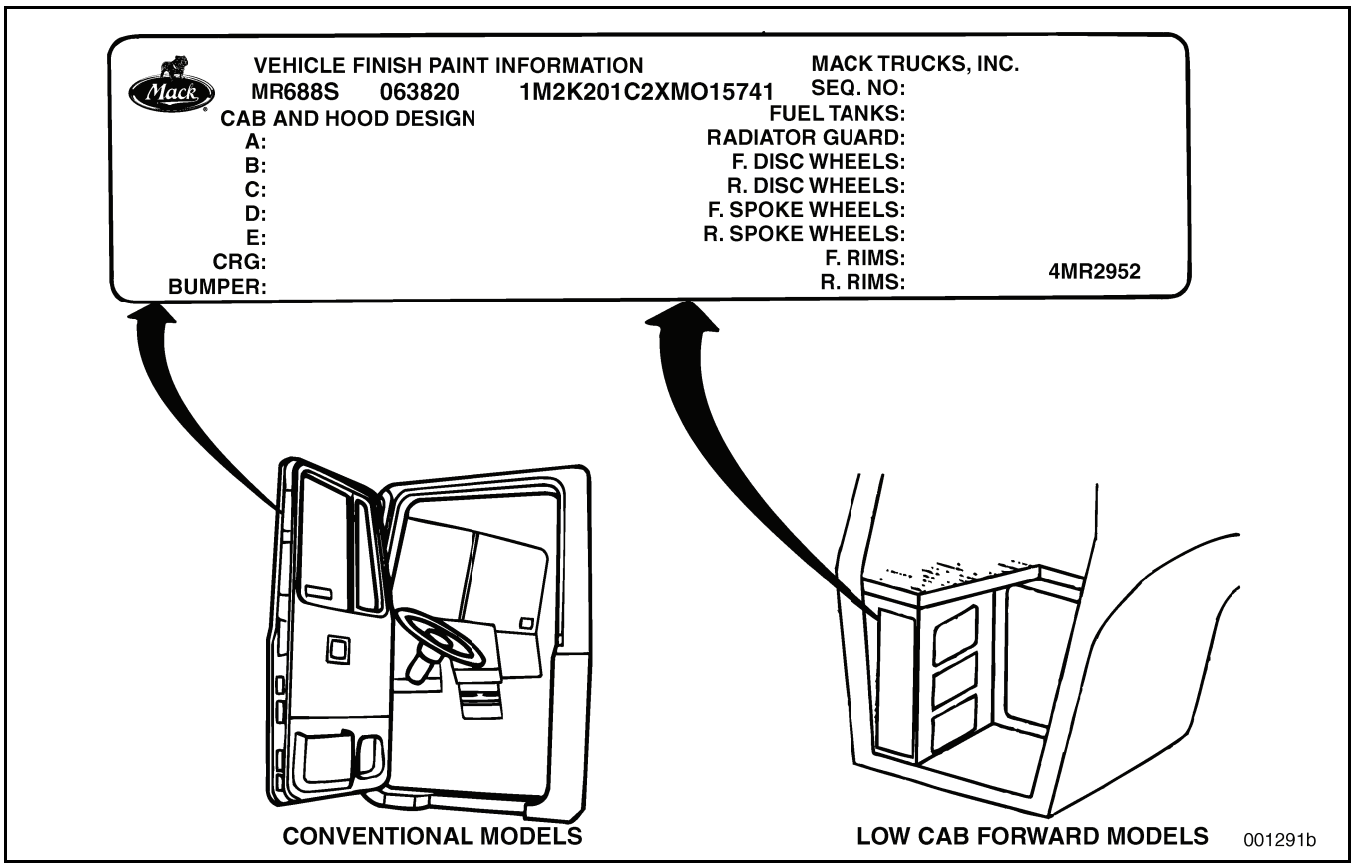


Figure 14 — Paint Code Label and Typical Locations

ALUMINUM PART PROTECTION

Aluminum parts must be protected when brought into direct contact with other metals, as corrosion may be accelerated due to this contact and exposure to moisture and air.

Aluminum parts to be joined to parts of dissimilar metal, without benefit of paint or other surface covering, must have all mating surfaces coated with Alumalastic® compound, or equivalent.

Alumalastic

Caulking Compound Grade C B

The Parr Paint and Color Company

Syracuse and Brussels Road

Cleveland, Ohio 44110

Aluminum parts to be press fitted to parts of dissimilar metal must have contacting surfaces coated with one of the following protective agents:

Grafo 253

Grafo Colloids Corporation

Sharon, Pennsylvania 16146

Tower 3364

Tower Chemical Corp.

2703 Freemansburg Avenue

Easton, Pennsylvania 18042

Mailing Address:

P.O. Box 3070

Palmer, Pennsylvania 18043

Alodine Coating

Kaiser Aluminum and Chemical Corp.

1015 East 12th Street

Erie, Pennsylvania 16503

⚠ CAUTION

When protective coatings are used between aluminum and ferrous surfaces, the threads on bolts and nuts used must be wiped clean before assembly. These coatings act as lubricants, and incorrect torque values will be obtained, with the possibility of thread stripping, if this procedure is not followed.

SAFETY REGULATIONS AND STANDARDS

SAFETY REGULATIONS AND STANDARDS

Safety Regulations and Standards — General

All motor vehicles must conform to the motor vehicle safety regulations/standards mandated by the U.S. and Canadian Governments. Motor vehicle safety standards address the manufacture and sale of a new motor vehicle, not its use. U.S. Federal Motor Vehicle Safety Standards and Safety Regulations are issued and enforced by the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (USDOT). In Canada, motor vehicle safety regulations/standards are issued and enforced by the Ministry of Transport (Transport Canada). Standards and regulations apply to newly manufactured motor vehicles and certain motor vehicle equipment offered for sale, or placed into operation in the United States, its territories (which include the District of Columbia, the Northern Mariana Islands, Puerto Rico, Guam, the Virgin Islands and American Samoa) and Canada. These safety standards and regulations are applicable to motor vehicles and motor vehicle equipment manufactured on and after the effective date of each standard/regulation.

Some type of vehicle certification label(s) must be affixed to motor vehicles to certify that the vehicle conforms to all applicable U.S. Federal or Canada Motor Vehicle Safety Standards (FMVSS and CMVSS) at the time of manufacture. For a vehicle manufactured in two or more stages, the party that completes an “incomplete vehicle,” e.g., by the addition of a load-carrying body, is the “final-stage manufacturer” and is responsible for certifying (by labeling) that the completed vehicle complies with all applicable FMVSS or CMVSS. Additionally, if a new vehicle that has been certified as a completed vehicle is altered in such a manner that its compliance with any FMVSS or CMVSS is affected, or its weight ratings are changed before its first purchase by a customer, the party performing the alteration must re-certify (re-label) the vehicle's compliance with applicable FMVSS or CMVSS. For more information on *vehicle certification*, refer to VEHICLE CERTIFICATION in this guide.

Safety Regulations and Standards — Penalties for Violation

Penalties for noncompliance with U.S. Federal and Canada Motor Vehicle Safety Standards and Regulations are severe. In the U.S., a single violation of the requirements may be subject to a fine of up to $6,000, and for a series of related violations, the maximum possible fine is $16,375,000.

In Canada, a fine may reach $1,000,000.

The above penalties may apply to any party that:

- Manufactures a vehicle for sale that does not comply with all applicable Motor Vehicle Safety Standards in effect at the time the vehicle was manufactured.
- Offers a vehicle for sale that does not comply with all applicable Motor Vehicle Safety Standards in effect at the time the vehicle was manufactured.
- Sells a vehicle that does not comply with all applicable Motor Vehicle Safety Standards in effect at the time the vehicle was manufactured.
- Fails to provide the proper certification labels and documents for a vehicle in the manner required.
- Provides the required certification labels and documents in spite of knowing that the vehicle does not comply with all applicable Motor Vehicle Safety Standards.

Both the National Highway Traffic Safety Administration and Transport Canada may periodically inspect new vehicles subject to the standards and regulations in order to find vehicles that do not comply with the requirements. It is mandatory that all personnel involved with the following know the requirements of the standards and regulations.

- Sales
- Modification or conversion
- Installation of bodies and/or equipment
- Intermediate/final manufacture
- Preparation for delivery
- Maintenance and/or repair

Many public libraries keep a complete, up-to-date copy of the U.S. Code of the Federal Regulations. In Canada, the Motor Vehicle Safety Standards/Regulations may be obtained at Federal government bookstores and many law libraries. The regulations/standards of both countries are also available on the Internet.

The U.S. Code of Federal Regulations (CFR), of which the FMVSS are contained in Title 49, Code of Federal Regulations, Part 571 (i.e., FMVSS 101 is Section 571.101), may currently be found at:

www.gpoaccess.gov/cfr/index.html

The Canada Motor Vehicle Safety Standards (CMVSS), Canadian Motor Vehicle Safety Regulations (CMVSR), Motor Vehicle Tire Safety Regulations (CMVTSR), Technical Standards Documents (TSD) and Test Methods (TM) can currently be found at:

www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/menu.htm

Safety Standards — Lists and Tables

The following table lists U.S. Federal and Canada Motor Vehicle Safety Standards applicable to all MACK Class 6, 7 and 8 trucks and truck tractors, or related equipment, sold in the United States and Canada.

U.S. AND CANADA MOTOR VEHICLE SAFETY STANDARDS

U.S. Standard No. (1)	Canada Standard No. (2)	Title of Standard
FMVSS 101	CMVSS 101	Location and Identification of Controls and Displays
FMVSS 102	CMVSS 102	Transmission Shift Lever Sequence, Starter Interlock and Transmission Braking Effect
FMVSS 103	CMVSS 103	Windshield Defrosting and Defogging Systems
FMVSS 104	CMVSS 104	Windshield Wiping and Washing Systems
FMVSS 106	CMVSS 106	Brake Hoses
FMVSS 108	CMVSS 108 and 108.1	Lamps, Reflective Devices and Associated Equipment Alternative Requirements for Headlamps
FMVSS 111	CMVSS 111	Rear-View Mirrors
FMVSS 113	CMVSS 113	Hood Latch System
(3)	CMVSS 115	Vehicle Identification Number
FMVSS 119	(4)	New Pneumatic Tires for Vehicles Other Than Passenger Cars
FMVSS 120	CMVSS 120	Tire and Rim Selection for Motor Vehicles Other Than Passenger Cars
FMVSS 121	CMVSS 121	Air Brake Systems
FMVSS 124	CMVSS 124	Accelerator Control Systems
FMVSS 125	N/A	Warning Devices
FMVSS 205	CMVSS 205	Glazing Materials
FMVSS 206	CMVSS 206	Door Locks and Door Retention Components
FMVSS 207	CMVSS 207	Seating and Seat Anchorage Systems
FMVSS 208	CMVSS 208	Occupant Crash Protection
FMVSS 209	CMVSS 209	Seat Belt Assemblies
FMVSS 210	CMVSS 210	Seat Belt Assembly Anchorages
N/A	CMVSS 301.2	CNG Fuel System Integrity
FMVSS 302	CMVSS 302	Flammability of Interior Materials
FMVSS 304	N/A	CNG Fuel Container Integrity
(7)	CMVSS 1100	Vehicle Emissions (8)
(5)	CMVSS 1106	Noise Emissions (6)

(1) Found in Title 49, Code of Federal Regulations, Part 571, i.e., FMVSS 101 is 49 CFR 571.101. In addition to the definitions found in the individual Safety Standards, definitions can also be found in 49 CFR 571.3.

(2) Found in Part II of Schedule IV of the Canadian Motor Vehicle Safety Regulations. In addition to the definitions found in the individual Safety Standards, definitions can also be found in Section 2 and Part I of Schedule IV (CMVSS100) of the Canadian Motor Vehicle Safety Regulations.

(3) See 49 CFR Part 565 found on next page.

(4) See MVTSR found on next page.

(5) See EPA Noise Emissions Regulations.

(6) Found in Section 5 of Schedule V.1 of the Canadian Motor Vehicle Safety Regulations.

(7) See EPA Gaseous and Smoke Regulations.

(8) Administered by Environment Canada.

Safety Standards — Lamps and Reflective Devices

U.S. Federal and Canada Motor Vehicle Safety Standards (FMVSS 108 and CMVSS 108) specify requirements for lamps and reflective devices on new vehicles. Lamps and reflective devices installed on MACK vehicles at the assembly plant are installed in compliance with applicable requirements of these Standards. The installation of a body or other equipment must not cause these lamps and/or reflective devices to no longer comply with the angular visibility requirements of these Standards. Also, an increase in the height of a vehicle must not cause the lamps and/or reflective devices to exceed the height limitations of these Standards. Intermediate manufacturers, final-stage manufacturers and vehicle alterers must ensure that equipment installed by the incomplete vehicle manufacturer continues to meet the applicable requirements of these Standards. To maintain compliance, lamps and/or reflective devices may have to be relocated. Reorienting a lamp from its installed position, however, may result in the lamp no longer conforming to Standard 108.

Safety Standards — Trailer ABS Indicator Lamp Requirements

U.S. Federal and Canada Motor Vehicle Safety Standards (FMVSS 121 and CMVSS 121) require that combination vehicles (any vehicle pulling an air brake-equipped trailer) must have an ABS indicator lamp mounted on the instrument panel to alert the operator of a trailer ABS malfunction. This requirement includes all straight trucks having full trailer connections.

To comply with this requirement, communication between the towing vehicle and trailer anti-lock brake system is necessary. Communication between these two systems has been accomplished with Power Line Carrier (PLC) technology. This technology allows data to be transmitted over the same line that supplies power. With this technology, the center pin of the standard 7-pin trailer electrical connector has become the standardized source of uninterrupted power as well as data transmission for the trailer ABS. This pin cannot be used to power any other trailer auxiliary equipment.

Any straight truck intended to pull an air brake-equipped trailer should be ordered from the factory with a full trailer package to ensure that the vehicle electrical system is PLC compatible and complies with applicable requirements. If the vehicle is not PLC compatible, modification of the electrical system for PLC compatibility, along with installation of a trailer ABS indicator lamp on the dashboard will be necessary. In many instances, however, converting a non-PLC compatible vehicle may not be feasible. Contact Customer Service/Product Support for information concerning converting a vehicle to be PLC compatible.

Safety Regulations — Lists and Tables

Parts 501 through 595 of Title 49 of the Code of Federal Regulations (CFR) contain various additional vehicle safety regulations addressing such subjects as procedural rules, petitions for rulemaking, defect and noncompliance orders, standards enforcement and defects investigation, exemption for inconsequential defect or noncompliance, manufacturer identification, defect and noncompliance reports, definitions, record retention, defect and noncompliance responsibility, etc., some of which are listed below. Sections 1 through 17, Schedules I, II, III and VII of the Canada Motor Vehicle Safety Regulations address additional subjects such as definitions, national safety mark, classes of vehicles, records, test methods and technical standards documents, etc., some of which are listed below. The Canada Motor Vehicle Tire Safety Regulations (MVTSR) address tire requirements.

MOTOR VEHICLE SAFETY REGULATIONS

U.S. Regulation CFR Title 49	Canada Regulation	Title of Regulation
Part 565	(See CMVSS 115)	Vehicle Identification Number Requirements
Part 566	N/A	Manufacturer Identification
Part 567	MVSR 6 and 7	Certification
		Compliance Label
Part 568		Vehicles Manufactured in Two or More Stages
	MVSR 9	Altered Vehicles
Part 571.3	MVSR 2, CMVSS 100	Definitions
Part 576	MVSR 10	Record Retention
Part 577	MVSR 15	Defect and Noncompliance Notification
		Defect Information
Part 579	N/A	Defect and Noncompliance Responsibilities
(See FMVSS 119)	MVTSR	Motor Vehicle Tire Safety Regulations

Safety Regulations — In-Use Motor Vehicles Sold in U.S.

The Federal Motor Carrier Safety Administration (FMCSA) of the U.S. Department of Transportation establishes and enforces the Federal Motor Carrier Safety Regulations (FMCSR) found in Title 49, Code of Federal Regulations, Parts 350 through 399. While generally applicable to “motor carriers,” some of these regulations (Parts 393 and 399 in particular) do address design aspects of a vehicle, and, therefore, manufacturers must be aware that compliance with these regulations may be affected by their designs. Most, if not all, of the States have adopted and enforce at least some of these regulations. A list of the titles of the subparts of Parts 393 and 399 follows.

Part 393	Subpart A, General
	Subpart B, Lighting Devices, Reflectors, and Electrical Equipment
	Subpart C, Brakes
	Subpart D, Glazing and Window Construction
	Subpart E, Fuel Systems
	Subpart F, Coupling Devices and Towing Methods
	Subpart G, Miscellaneous Parts (includes sleeper berths, exhaust systems, rear end protection, interior noise levels, and other items)
	Subpart H, Emergency Equipment
	Subpart I, Protection Against Shifting or Falling Cargo
	Subpart J, Frames, Cab and Body Components, Wheels, Steering and Suspension Systems
Part 399	Subpart L, Step, Handhold and Deck Requirements for Commercial Motor Vehicles

The Federal Motor Carrier Safety Regulations can be found on the FMCSR website at www.fmcsa.dot.gov/rulesregs/fmcsr/fmcsrguide.htm.

Safety Regulations — Glider Kits and Service Cabs

Compliance with current U.S. Federal Motor Vehicle Safety Standards (FMVSS), Canada Motor Vehicle Safety Standards (CMVSS) and vehicle safety certification regulations may be required depending on the manner in which a glider kit or service cab is used in the assembly of a truck or truck/tractor. Paragraph 571.7(e) of Title 49 of the U.S. Code of Federal Regulations (titled “Combining new and used components”) states that when a new cab is used in the assembly of a truck or truck tractor, the whole truck or truck/tractor will be considered newly manufactured and must, therefore, comply with current applicable FMVSS and vehicle certification regulations in effect on the date of the vehicle’s completion, unless the engine, transmission and drive axle(s) (at a minimum) of the assembled vehicle are not new, (meaning that they are used), and at least two of these components were taken from the same used vehicle. Transport Canada has adopted a similar position.

Stated another way, if a glider kit or service cab is used in the assembly of a truck or truck/tractor, and the completed vehicle does contain a used engine, used transmission and used rear axle(s), and if at least “two of these three” used components came from the same used vehicle, then the requirements of the FMVSS or CMVSS that exist at the time that the glider kit or service cab is assembled into a vehicle do not apply (because the glider kit or service cab is then considered a replacement part for an existing, used vehicle, as opposed to a new part of a new vehicle). The used vehicle should be completed so that it is still in compliance with the FMVSS or CMVSS applicable at the time of its (meaning the vehicle from which the “two of the three” components were taken) original manufacture as a new vehicle. As a U.S. example, if the “two of these three” vehicle was originally manufactured on or after October 20, 1994, and, therefore, was required to be equipped with automatic slack adjusters, then a glider kit must be ordered with automatic slack adjusters or converted to include automatic slack adjusters. (Please note that the same logic would apply to a U.S. truck/tractor originally manufactured on or after March 1, 1997, or a U.S. truck originally manufactured on and after March 1, 1998, or a Canadian truck or truck/tractor originally manufactured on or after April 1, 2000, relative to the required antilock brake system [ABS]).

On the other hand, if a glider kit or service cab is used in the assembly of a truck or truck/tractor, and the completed vehicle does not contain a used engine, used transmission and used rear axle(s), or if at least “two of these three” used components did not come from the same used vehicle, then the requirements of the FMVSS or CMVSS, as applicable, that exist at the time that the glider kit or service cab is assembled into the vehicle do apply (because the glider kit or service cab is then considered part of a new vehicle). As a U.S. example, if today a used engine and used rear axle(s) from the same used vehicle is combined with a new transmission in the completion of a glider kit, and the used components came from a truck manufactured before October 20, 1994, the completed vehicle would have to be equipped with automatic slack adjusters and ABS, among other things, in order to comply with all of the requirements of the current FMVSS.

The specific language of the requirements relative to combining new and used parts (as well as existing FMVSS) can be found in Part 571 of Title 49 of the U.S. Code of Federal Regulations (CFR). The specific language of U.S. vehicle safety certification requirements can be found in Parts 567 and 568 of Title 49 of the CFR. Transport Canada’s official position on combining new and used components is not contained in a regulation.

Weight Regulations

BRIDGE GROSS WEIGHT FORMULA — U.S.

The U.S. Federal Bridge Gross Weight Formula was established to provide a standard for controlling the spacing of axles on trucks that use highway bridges. The purpose is to spread the load over a greater area of the highway surface by spacing the axles over a longer length of the vehicle, or combination vehicle. This prevents highway damage caused by high concentrations of load.

The U.S. Federal Government established the following formula for determining the allowable weight limits and axle spacings for trucks:

$$W = 500 \left(\frac{LN}{N-1} + 12N + 36 \right)$$

001265a

Figure 15 — U.S. Federal Bridge Gross Weight Formula

Where:

W =	The total gross weight that may be carried on any group of two or more consecutive axles to the nearest 500 pounds
L =	The distance in feet between the extreme of any group of two or more consecutive axles
N =	The number of axles in the group under consideration

U.S. FEDERAL BRIDGE FORMULA TABLES

The following tables list the U.S. Federal bridge axle distance/weight combinations.

U.S. FEDERAL BRIDGE FORMULA TABLES

Distance in feet (meters) between the extremes of any group of 2 or more consecutive axles	Maximum Load in Pounds (Kilograms) on Any Group of 2 or More Consecutive Axles							
	2 Axles	3 Axles	4 Axles	5 Axles	6 Axles	7 Axles	8 Axles	9 Axles
4 (1.22)	34,000• (15 422)							
5 (1.52)	34,000• (15 422)							
6 (1.83)	34,000• (15 422)							
7 (2.13)	34,000• (15 422)							
8 and less (2.44)	34,000• (15 422)	34,000 (15 422)						
• Tandem axle by definition								
8 and more (2.44)	38,000 (17 237)	42,000 (19 051)						
9 (2.74)	39,000 (17 690)	42,500 (19 278)						
10 (3.05)	40,000 (18 144)	43,500 (19 731)						
11 (3.35)		44,000 (19 958)						
12 (3.66)		45,000 (20 412)	50,000 (22 680)					
13 (3.96)		45,500 (20 639)	50,500 (23 028)					
14 (4.27)		46,500 (21 092)	51,500 (23 360)					
15 (4.57)		47,000 (21 319)	52,000 (23 587)					
16 (4.88)		48,000 (21 773)	52,500 (23 814)	58,000 (26 309)				
17 (5.18)		48,500 (22 000)	53,500 (24 268)	58,500 (26 536)				
18 (5.49)		49,500 (22 453)	54,000 (24 494)	59,000 (26 762)				
19 (5.79)		50,000 (22 680)	54,500 (24 721)	60,000 (27 216)				
20 (6.10)		51,000 (23 134)	55,500 (25 197)	60,500 (27 443)	66,000 (29 938)			

Distance in feet (meters) between the extremes of any group of 2 or more consecutive axles	Maximum Load in Pounds (Kilograms) on Any Group of 2 or More Consecutive Axles							
	2 Axles	3 Axles	4 Axles	5 Axles	6 Axles	7 Axles	8 Axles	9 Axles
21 (6.40)		51,500 (23 360)	56,000 (25 402)	61,000 (27 670)	66,500 (30 164)			
22 (6.71)		52,500 (23 814)	56,500 (25 628)	61,500 (27 896)	67,000 (30 391)			
23 (7.01)		53,000 (24 041)	57,500 (26 082)	62,500 (28 350)	68,000 (30 845)			
24 (7.32)		54,000 (24 494)	58,000 (26 309)	63,000 (28 577)	68,500 (31 072)	74,000 (33 566)	74,000 (33 566)	74,000 (33 566)
25 (7.62)		54,500 (24 721)	58,500 (26 536)	63,500 (28 804)	69,000 (31 298)	74,500 (33 793)		
26 (7.93)		55,500 (25 197)	59,500 (26 989)	64,000 (29 030)	69,500 (31 525)	75,000 (34 020)		
27 (8.23)		56,000 (25 402)	60,000 (27 216)	65,000 (29 484)	70,000 (31 752)	75,500 (34 247)		
28 (8.53)		57,000 (25 855)	60,500 (27 443)	65,500 (29 711)	71,000 (32 206)	76,500 (34 700)	**82,000 (37 195)**	
29 (8.84)		57,500 (26 082)	61,500 (27 896)	66,000 (29 938)	71,500 (32 432)	77,000 (34 927)	**82,500 (37 422)**	
30 (9.14)		58,500 (26 536)	62,000 (28 123)	66,500 (30 164)	72,000 (32 659)	77,500 (35 154)	**83,000 (37 649)**	
31 (9.45)		59,000 (26 762)	62,500 (28 350)	67,500 (30 618)	72,500 (32 886)	78,000 (35 381)	**83,500 (37 876)**	**90,000 (40 824)**
32 (9.75)		60,000 (27 216)	63,500 (28 804)	68,000 (30 845)	73,000 (33 113)	78,500 (35 608)	**84,500 (38 329)**	**90,500 (41 051)**
33 (10.06)			64,000 (29 030)	68,500 (31 072)	74,000 (33 566)	79,000 (35 834)	**85,000 (38 556)**	**91,000 (41 278)**
34 (10.36)			64,500 (29 257)	69,000 (31 298)	74,500 (33 793)	80,000 (36 288)	**85,500 (38 783)**	**91,500 (41 504)**
35 (10.67)			65,500 (29 711)	70,000 (31 752)	75,000 (34 020)	**80,500 (36 515)**	**86,000 (39 010)**	**92,000 (41 731)**
36 (10.97)			66,000+ (29 938)	70,500 (31 979)	75,500 (34 247)	**81,000 (36 742)**	**86,500 (39 236)**	**93,000 (42 185)**
37 (11.28)			66,500+ (30 164)	71,000 (32 206)	76,000 (34 474)	**81,500 (36 968)**	**87,000 (39 463)**	**93,500 (42 411)**
38 (11.58)			67,500+ (30 618)	72,000 (32 659)	77,000 (34 927)	**82,000 (37 195)**	**87,500 (39 690)**	**94,000 (42 638)**
39 (11.88)			68,000 (30 845)	72,500 (32 886)	77,500 (35 154)	**82,500 (37 422)**	**88,500 (40 144)**	**94,500 (42 865)**
40 (12.19)			68,500 (31 072)	73,000 (33 113)	78,000 (35 381)	**83,500 (37 876)**	**89,000 (40 370)**	**94,500 (42 865)**
41 (12.50)			69,500 (31 525)	73,500 (33 340)	78,500 (35 608)	**84,000 (38 102)**	**89,500 (40 597)**	**95,000 (43 092)**

Distance in feet (meters) between the extremes of any group of 2 or more consecutive axles	Maximum Load in Pounds (Kilograms) on Any Group of 2 or More Consecutive Axles							
	2 Axles	3 Axles	4 Axles	5 Axles	6 Axles	7 Axles	8 Axles	9 Axles
42 (12.80)			70,000 (31 752)	74,000 (33 566)	79,000 (35 834)	**84,500 (38 329)**	**90,000 (40 824)**	**95,500 (43 319)**
43 (13.11)			70,500 (31 979)	75,000 (34 020)	80,000 (36 288)	**85,000 (38 556)**	**90,500 (41 051)**	**96,000 (43 546)**
44 (13.41)			71,500 (32 432)	75,500 (34 247)	**80,500 (36 515)**	**85,500 (38 783)**	**91,000 (41 278)**	**96,500 (43 772)**
45 (13.72)			72,000 (32 659)	76,000 (34 474)	**81,000 (36 742)**	**86,000 (39 010)**	**91,500 (41 504)**	**97,500 (44 226)**
46 (14.02)			72,500 (32 886)	76,500 (34 700)	**81,500 (36 968)**	**87,000 (39 463)**	**92,500 (41 958)**	**98,000 (44 453)**
47 (14.33)			73,500 (33 340)	77,500 (35 154)	**82,000 (37 195)**	**87,500 (39 690)**	**93,000 (42 185)**	**98,500 (44 680)**
48 (14.63)			74,000 (33 566)	78,000 (35 381)	**83,000 (37 649)**	**88,000 (39 917)**	**93,500 (42 411)**	**99,000 (44 906)**
49 (14.93)			74,500 (33 793)	78,500 (35 608)	**83,500 (37 876)**	**88,500 (40 144)**	**94,000 (42 638)**	**99,500 (45 133)**
50 (15.24)			75,500 (34 247)	79,000 (35 834)	**84,000 (38 102)**	**89,000 (40 370)**	**94,500 (42 865)**	**100,000 (45 360)**
51 (15.55)			76,000 (34 474)	80,000 (36 288)	**84,500 (38 329)**	**89,500 (40 597)**	**95,000 (43 092)**	**100,500 (45 587)**
52 (15.85)			76,500 (34 700)	**80,500 (36 515)**	**85,000 (38 556)**	**90,500 (41 051)**	**95,500 (43 319)**	**101,000 (45 814)**
53 (16.15)			77,500 (35 154)	**81,000 (36 742)**	**86,000 (39 010)**	**91,000 (41 278)**	**96,500 (43 772)**	**102,000 (46 267)**
54 (16.46)			78,000 (35 381)	**81,500 (36 968)**	**86,500 (39 236)**	**91,500 (41 504)**	**97,000 (43 910)**	**102,500 (46 494)**
55 (16.76)			78,500 (35 608)	**82,500 (37 422)**	**87,000 (39 463)**	**92,000 (41 731)**	**97,500 (44 226)**	**103,000 (46 720)**
56 (17.07)			79,500 (36 061)	**83,000 (37 649)**	**87,500 (39 690)**	**92,500 (41 958)**	**98,000 (44 453)**	**103,500 (46 948)**
57 (17.37)			80,000 (36 288)	**83,500 (37 876)**	**88,000 (39 917)**	**93,000 (42 185)**	**98,500 (44 680)**	**104,000 (47 174)**
58 (17.68)				**84,000 (38 102)**	**89,000 (40 370)**	**94,000 (42 638)**	**99,000 (44 906)**	**104,500 (47 401)**
59 (17.98)				**85,000 (38 556)**	**89,500 (40 597)**	**94,500 (42 865)**	**99,500 (45 133)**	**105,000 (47 628)**
60 (18.29)				**85,500 (38 783)**	**90,000 (40 824)**	**95,000 (43 092)**	**100,500 (45 587)**	**105,500 (47 855)**

+ Exception to Federal Bridge Formula Table and Law.

Note: All permissible load calculations are to the nearest 500-lb (227 kg) maximum load on any single axle. **Weights over 80,000 lbs (38 102 kg) are in excess of the maximum allowed Federal GVW on the National Highway Network.**

Size Regulations

Maximum overall vehicle width is regulated by the Federal Highway Administration (FHWA) in Title 23, Code of Federal Regulations (CFR), Part 658, TRUCK SIZE AND WEIGHT, ROUTE DESIGNATIONS — LENGTH, WIDTH AND WEIGHT LIMITATIONS. No state shall impose a width limitation of more or less than 102 inches, or its approximate metric equivalent, 2.6 meters (102.36 inches) on a vehicle operating on the National Network (NN), except the State of Hawaii, which is allowed to keep the State's 108-inch width maximum.

- Maximum Width — 102 inches
- Length — Limitations on length for straight trucks are regulated by states.

The above applies to truck tractors and trailers operating on the National Network, i.e., the Interstate Highway System and designated Federal-aid highways. Some States have more restrictive width limitations applicable to State highways. Overall width of straight trucks is regulated by individual states.

To ensure that the most current regulatory information is available, a subscription to a service that provides updated information on a regular basis should be considered.

J. J. Keller & Associates, Inc., is the preferred supplier of safety compliance publications, training videos and software, forms, supplies, and training workshops. Contact Keller at 800-327-6868, or visit its web site at: www.jjkeller.com.

Truck Tractor Conspicuity

To make a truck tractor more conspicuous when approached from the rear at nighttime when being operated without a semi-trailer, federal regulations require reflective devices be applied to the rear of the cab and to the mudflaps or mudflap hanger brackets if mudflaps or mudflap hanger brackets were supplied by the vehicle assembly plant. If mudflaps or mudflap hanger brackets were not supplied from the vehicle assembly plant, reflective devices must be applied to the rear, lower portion of the cab. Refer to the illustration. Locations of these reflective devices may vary from this illustration, depending on the cab model and/or equipment at the rear of the cab. Detailed requirements can be found in FMVSS 108.

If installed equipment obstructs the view of any installed reflectors, the reflectors must be relocated, in accordance with FMVSS 108, to a location where they will be visible.

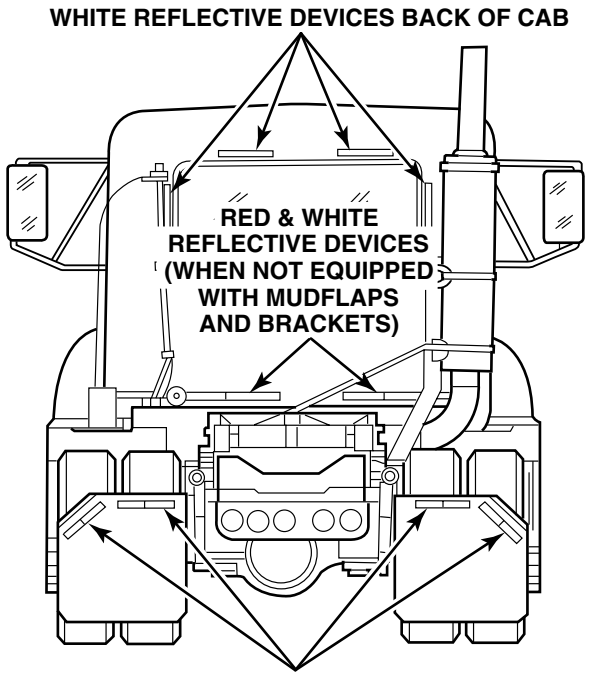


Figure 16 — Back of Cab Reflective Devices

GASEOUS AND NOISE EMISSIONS

EMISSIONS — GASEOUS AND NOISE

NOTE

Modification of the chassis exhaust system may affect compliance with noise emission regulations, gaseous emission regulations and/or overall vehicle width regulations. Therefore, such modifications should be avoided, as it is the responsibility of the body/equipment installer/alterer to ensure that the MACK vehicle remains in compliance with all applicable regulations. Examples of modifications that could affect compliance with the various regulations are as follows:

- Replacing a muffler with a section of exhaust pipe will result in non-compliance with applicable noise regulations.
- Replacing a catalytic muffler and/or Diesel Particulate Filter (DPF) with a section of exhaust pipe will result in non-compliance with applicable noise and gaseous emission regulations.
- Installing an exhaust diverter valve (such as a valve used to divert exhaust gases into a dump body to provide heat to the cargo) between the engine and a catalytic muffler and/or Diesel Particulate Filter (DPF) will result in non-compliance with applicable gaseous emission regulations.
- Re-orienting the end of the exhaust pipe (such as moving the exhaust outlet so that it exits in a different direction than originally intended) may result in non-compliance with applicable noise emission regulations.
- Re-configuring the end of a vertical exhaust pipe (i.e., installing an offset vertical pipe to go around a dump body cab protector) may result in the vehicle exceeding applicable overall width regulations.

Gaseous and Smoke Emissions — U.S.

Engines in motor vehicles must comply with the regulations established and enforced by the U.S. Environmental Protection Agency (EPA) contained in Title 40, Code of Federal Regulations (CFR), Parts 85 and 86, relative to gaseous and smoke emissions. These regulations were authorized by the U.S. Clean Air Act (CAA). The CAA is codified as Title 42, United States Code (U.S.C.), CHAPTER 85, Air Pollution Prevention and Control. The CAA prohibits the removal or rendering inoperative of any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with Federal emissions regulations by any person prior to the sale and delivery to the ultimate purchaser, or by any manufacturer or distributor after its sale and delivery to the ultimate purchaser, or by any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines following its sale and delivery to the ultimate purchaser, or by any person who operates a fleet of motor vehicles following its sale and delivery to the ultimate purchaser. Fines for violations of the Act can be as much as $25,000 per day of violation. As an example, if a MACK vehicle was originally equipped with a catalytic muffler and/or Diesel Particulate Filter (DPF) in order to comply with Federal emissions regulations, removal of the muffler and/or filter or replacement of the muffler with a non-equivalent muffler and/or filter is prohibited and possibly subject to a fine. A list of gaseous emission control systems and components may be found in the *Emission Control Systems for MACK Class 8 Diesel Engines* manual, or similar manual for non-MACK engines provided in the cab of each MACK vehicle. Environmental Protection Agency regulations can be found on the EPA website at www.epa.gov/epahome/cfr40.htm.

Gaseous and Smoke Emissions — California

The engines in motor vehicles to be registered in the State of California must comply with applicable regulations established and enforced by the California Air Resources Board (CARB) contained in Title 13 of the California Code of Regulations (CCR), relative to gaseous and smoke emissions. These regulations prohibit disconnecting, modifying or altering a certified emission control system. Fines for violation of these prohibitions may be as much as $1,500 per violation. As an example, if a MACK vehicle was originally equipped with a catalytic muffler and/or Diesel Particulate Filter (DPF) in order to comply with CARB emissions regulations, removal of the muffler and/or filter or replacement of the muffler with a non-equivalent muffler and/or filter is prohibited and possibly subject to a fine. A list of emission control system components may be found in the *Emission Control Systems for MACK Class 8 Diesel Engines* manual, TS505, or similar manual for non-MACK engines provided in the cab of each MACK vehicle. Title 13 of the California Code of Regulations can be found on the CCR website at www.calregs.com.

Gaseous and Smoke Emissions — Canada

Engines in motor vehicles must comply with the regulations established and enforced by Environment Canada contained in Schedule V of the Canada Motor Vehicle Safety Regulations, relative to gaseous and smoke emissions. These regulations (Standard 1100) were authorized by the Canadian Motor Vehicle Safety Act. The Act is codified as Statutes of Canada, 1993 Chapter 16. Tampering regulations are promulgated and enforced by the Provinces. If a MACK vehicle was originally equipped with a catalytic muffler and/or Diesel Particulate Filter (DPF) in order to comply with Federal emissions regulations, removal of the muffler and/or filter or replacement of the muffler with a non-equivalent muffler and/or filter is prohibited and possibly subject to a fine. A list of gaseous emission control systems and components may be found in the *Emission Control Systems for MACK Class 8 Diesel Engines* manual, TS505, or similar manual for non-MACK engines provided in the cab of each MACK vehicle. Standard 1100 (CMVSS 1100) can be found under “Motor Vehicle Safety Regulations” on the Transport Canada website at www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/menu.htm.

Noise Emissions — U.S.

Motor vehicles must also comply with the regulations established and enforced by the U.S. Environmental Protection Agency (EPA) contained in Title 40, Code of Federal Regulations (CFR), Part 205, relative to noise emissions. These regulations were authorized by the U.S. Noise Control Act of 1972. This Act is codified as Title 42, United States Code (U.S.C.), CHAPTER 65, Noise Control. The Act prohibits tampering with a vehicle's noise control system. A list of those acts presumed to constitute tampering on MACK vehicles (such as removal of a muffler, or removal of sound deadening material from the hood) may be found in the Noise Emission Control section of the MACK *Maintenance and Lubrication* manual provided in the cab of each MACK vehicle. Fines for violations of the Act can be as much as $50,000 per day of violation. Environmental Protection Agency regulations can be found on the EPA website at www.epa.gov/epahome/cfr40.htm.

Noise Emissions — Canada

Requirements are a part of the Canada Motor Vehicle Safety Standards (CMVSS), specifically CMVSS 1106, Noise Emissions. Standard 1106 can be found under “Motor Vehicle Safety Regulations” on the Transport Canada website at www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/menu.htm.

VEHICLE CERTIFICATION

VEHICLE CERTIFICATION

U.S. Federal Motor Vehicle Safety Regulations (Title 49, Code of Federal Regulations, Part 567 and Part 568) and Canadian Motor Vehicle Safety Regulations (Sections 6, 7 and 8) require that one or more certification labels be affixed to all new vehicles, depending on the country and how many stages of manufacture the vehicle goes through. These regulations require that the certification label be of a specified form and that it be located on the vehicle in one of several specific locations. All companies that install components on newly manufactured vehicles before delivery to the end user should become totally familiar with these regulations.

New U.S. requirements become effective September 1, 2006. These new regulations align U.S. regulations more closely with Canadian regulations.

Many public libraries keep a complete, up-to-date copy of the Codes of Federal Regulations. In Canada, the regulations may be obtained at Federal government bookstores and many law libraries. The regulations of both countries are also available on the Internet at the following addresses:

- United States — www.gpoaccess.gov/cfr/index.html
- Canada — www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/menu.htm

Certification — Incomplete and Completed Vehicles

Mack Trucks, Inc. manufactures both incomplete vehicles (chassis-cabs) and completed vehicles. Until September 1, 2006, an incomplete vehicle is defined by a U.S. regulation as an assemblage consisting, as a minimum, of frame and chassis structure, powertrain, steering system, suspension system and braking system, to the extent that those systems are part of the completed vehicle, that requires further manufacturing operations, other than the addition of readily attachable components, such as mirrors or tire and rim assemblies, or minor finishing operations such as painting, to become a completed vehicle.

Beginning September 1, 2006, a revised U.S. regulation will define an incomplete vehicle as

- an assemblage consisting, at minimum, of chassis (including the frame) structure, powertrain, steering system, suspension system and braking system, in the state that those systems are to be part of the completed vehicle, but requires further manufacturing operations to become a completed vehicle,

  OR

- an incomplete trailer.

The Canadian regulation defines an incomplete vehicle as

- a vehicle imported for special purposes that is capable of being driven and that consists, at a minimum, of chassis structure, powertrain, steering system, suspension system and braking system in the state in which those are to be part of the completed vehicle, but requires further manufacturing operations to become a completed vehicle,

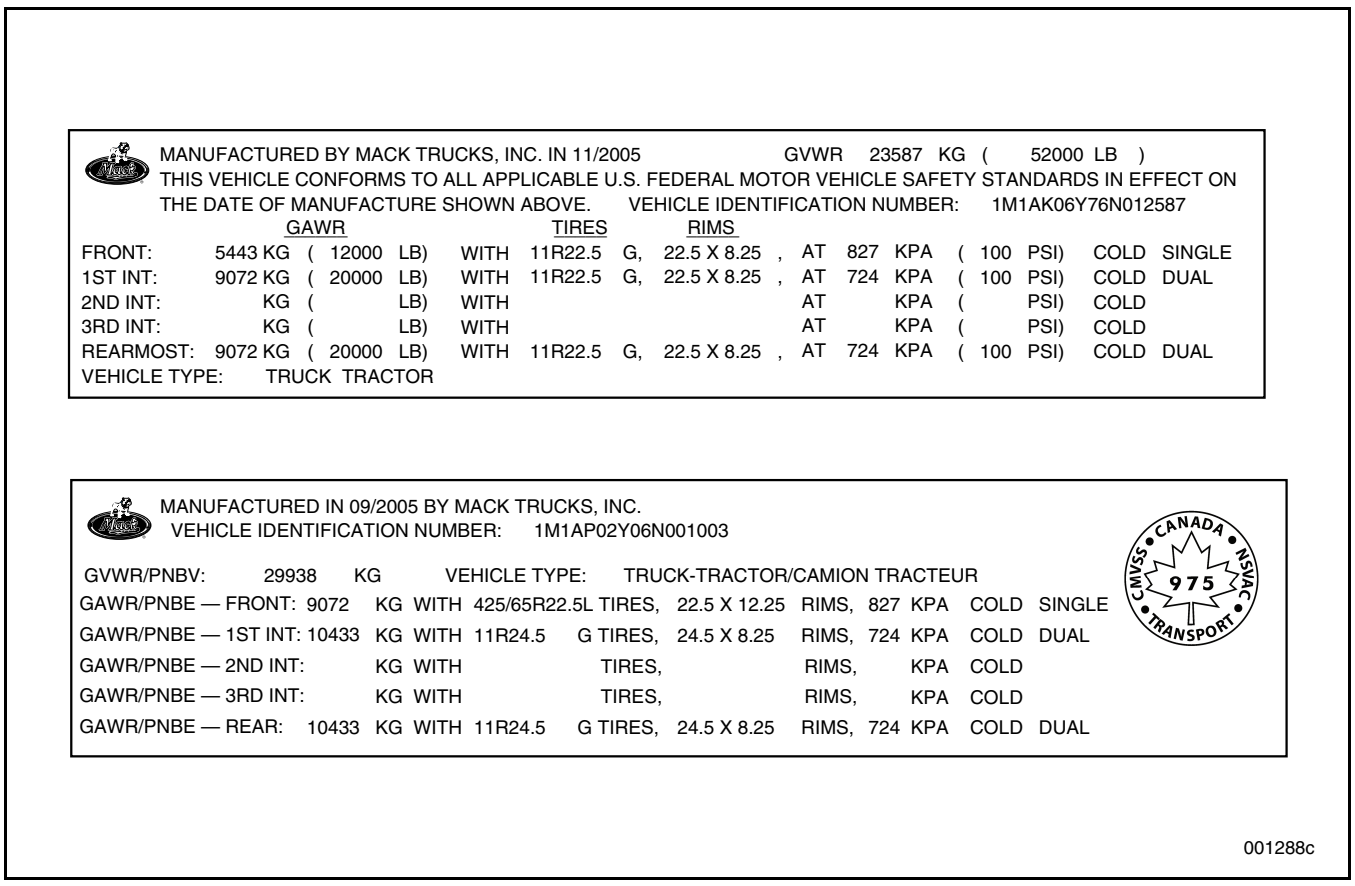
  OR

- as an incomplete trailer.

Until September 1, 2006, a chassis-cab is defined by a U.S. regulation as an incomplete vehicle, with a completed occupants compartment, that requires only the addition of cargo-carrying, work-performing or load-bearing components to perform its intended function.

Until September 1, 2006, a completed vehicle is defined by a U.S. regulation as a vehicle that requires no further manufacturing operations to perform its intended function, other than the addition of readily attachable components such as mirrors or tire and rim assemblies, or minor finishing operations such as painting. The Canadian regulation uses a very similar definition. However, beginning September 1, 2006, a revised U.S. regulation will define a completed vehicle as a vehicle that requires no further manufacturing operations to perform its intended function.

Mack Trucks, Inc. affixes some type of vehicle safety certification label or information label to each completed vehicle and incomplete vehicle destined for sale in the U.S. or in Canada. Typical examples are shown in Figure 17 and Figure 18. Please note that the U.S. Chassis-Cab Certification Label shown in Figure 18 is not required after August 31, 2006.



MANUFACTURED BY MACK TRUCKS, INC. IN 11/2005 GVWR 23587 KG (52000 LB)
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE. VEHICLE IDENTIFICATION NUMBER: 1M1AK06Y76N012587

	GAWR	TIRES	RIMS						
FRONT:	5443 KG (12000 LB)	WITH 11R22.5 G,	22.5 X 8.25 ,	AT 827 KPA	(100 PSI)	COLD	SINGLE
1ST INT:	9072 KG (20000 LB)	WITH 11R22.5 G,	22.5 X 8.25 ,	AT 724 KPA	(100 PSI)	COLD	DUAL
2ND INT:	KG (LB)	WITH		AT KPA	(PSI)	COLD	
3RD INT:	KG (LB)	WITH		AT KPA	(PSI)	COLD	
REARMOST:	9072 KG (20000 LB)	WITH 11R22.5 G,	22.5 X 8.25 ,	AT 724 KPA	(100 PSI)	COLD	DUAL

VEHICLE TYPE: TRUCK TRACTOR

MANUFACTURED IN 09/2005 BY MACK TRUCKS, INC.
VEHICLE IDENTIFICATION NUMBER: 1M1AP02Y06N001003

GVWR/PNBV: 29938 KG VEHICLE TYPE: TRUCK-TRACTOR/CAMION TRACTEUR

GAWR/PNBE — FRONT:	9072 KG WITH	425/65R22.5L TIRES,	22.5 X 12.25	RIMS,	827 KPA	COLD	SINGLE
GAWR/PNBE — 1ST INT:	10433 KG WITH	11R24.5 G TIRES,	24.5 X 8.25	RIMS,	724 KPA	COLD	DUAL
GAWR/PNBE — 2ND INT:	KG WITH	TIRES,		RIMS,	KPA	COLD	
GAWR/PNBE — 3RD INT:	KG WITH	TIRES,		RIMS,	KPA	COLD	
GAWR/PNBE — REAR:	10433 KG WITH	11R24.5 G TIRES,	24.5 X 8.25	RIMS,	724 KPA	COLD	DUAL

CANADA CMVSS NSVAC 975 TRANSPORT

001288c

Figure 17 — Typical Completed Vehicle Certification Label

Since February 2003, a Canadian regulation has required that an incomplete vehicle manufacturer's information label be affixed to incomplete vehicles destined for sale in Canada.

Beginning September 1, 2006, a revised U.S. regulation will require a similar label. Typical labels are shown in Figure 18.

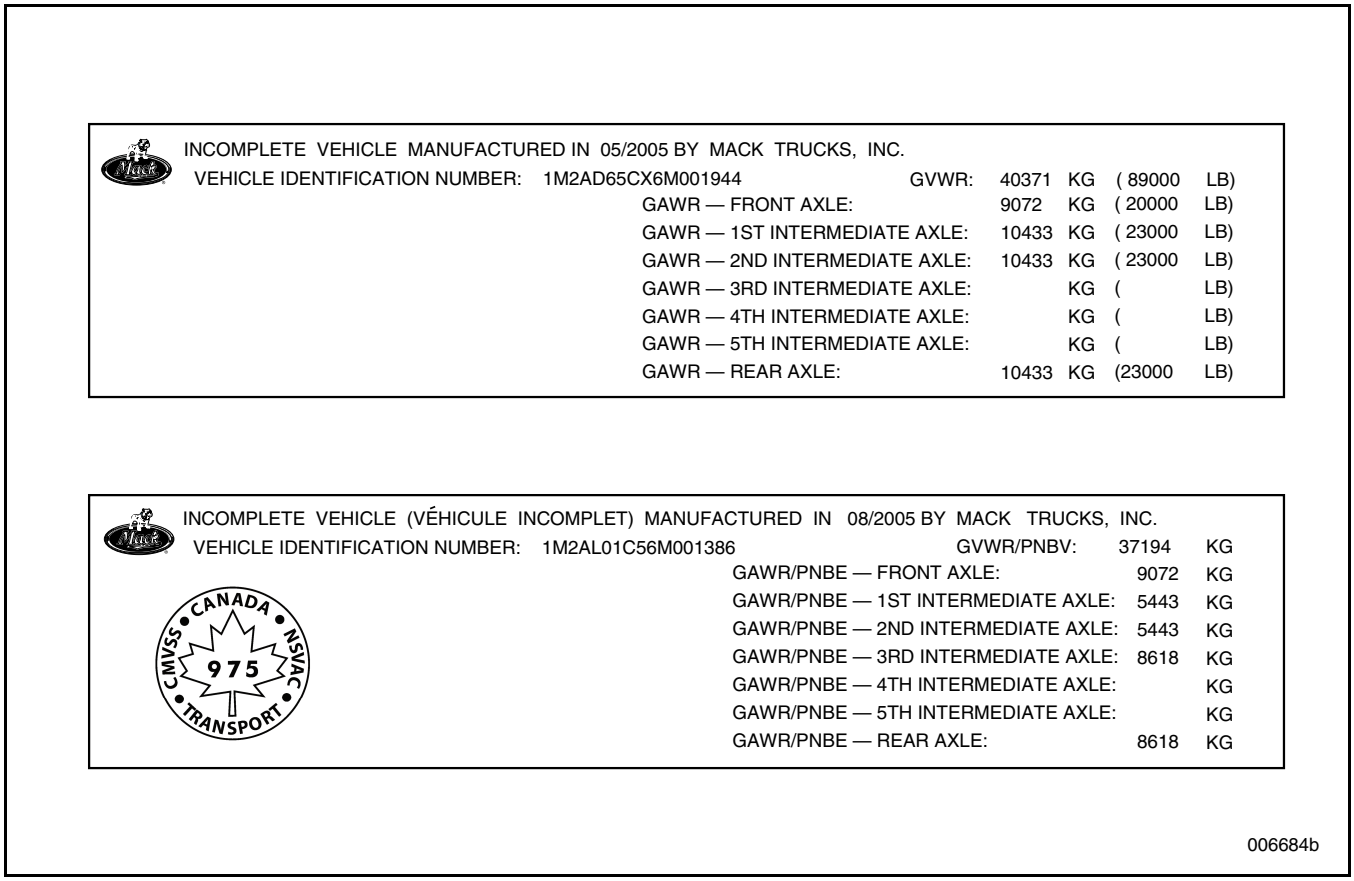


Figure 18 — Typical Incomplete Vehicle Manufacturer's Information Label

All MACK incomplete vehicles (chassis-cabs) are supplied with an Incomplete Vehicle Document (IVD) inside the cab. The IVD contains specific statements about the certification status of the vehicle as it left the vehicle assembly plant. The information in the IVD is to be used by intermediate and/or final-stage manufacturers during the completion of further certification procedures. This document should remain with the vehicle until the vehicle is certified as a completed vehicle. The final-stage manufacturer should file the IVD with the records it retains relative to the vehicle.

Certification — Canada — National Safety Mark

A Canadian regulation requires manufacturers to obtain a unique authorization number from Transport Canada that must be incorporated into each manufacturer's National Safety Mark used on labels. Additional information is available at the Canadian Truck Equipment Association (CTEA) website, www.ctea.on.ca. The regulation specifies requirements for the form, wording and location of the National Safety Mark.

Certification — Intermediate Manufacturers

An intermediate manufacturer is defined by a Canadian regulation as a company, other than the incomplete vehicle manufacturer or the final-stage manufacturer, that performs manufacturing operations on an incomplete vehicle. U.S. regulations use a somewhat similar definition.

Until September 1, 2006, depending on the type of manufacturing done to the incomplete vehicle, intermediate manufacturers of vehicles destined for sale in the U.S. may have to affix an intermediate manufacturer's certification label, and attach an addendum to the IVD. The regulations have specific requirements for the form, wording and location of the label.

A partially printed U.S. intermediate manufacturer's certification label (see Figure 19) is available through the MACK Parts System.

Beginning September 1, 2006, a revised U.S. regulation requires all intermediate manufacturers to affix an intermediate manufacturer's information label to the incomplete vehicle and attach an addendum to the Incomplete Vehicle Document (IVD). This is similar to the Canadian requirement that began during 2003. Figure 19 illustrates typical labels.

NOTE

The Canadian version of the label must also contain the intermediate manufacturer's unique National Safety Mark.

A new partially printed U.S. intermediate manufacturer's information label will be available through the MACK Parts System. For the label required by Canadian regulations, please see the information published on the Canadian Truck Equipment Association (CTEA) website at www.ctea.on.ca. Both regulations have specific requirements for form, wording and location of the label.

Certification — Final-Stage Manufacturer

A final-stage manufacturer is defined by a Canadian regulation as a company that performs manufacturing operations on an incomplete vehicle so that it becomes a completed vehicle. A U.S. regulation uses a somewhat similar definition.

The final-stage manufacturer must ensure that the vehicle complies with all applicable Motor Vehicle Safety Standards and must affix a final-stage manufacturer's certification label of the specific form and wording, and in a specific location as required by the applicable regulation. The final-stage manufacturer should file the IVD with the records it retains relative to the vehicle.

Figure 20 illustrates typical labels.

NOTE

The Canadian version must also contain the final-stage manufacturer's unique National Safety Mark.

A partially printed U.S. final-stage manufacturer's certification label is available through the MACK Parts System. For the label required by Canadian regulations, please see the information published on the Canadian Truck Equipment Association (CTEA) website, www.ctea.on.ca.

INTERMEDIATE MANUFACTURE BY _____ IN _____
VEHICLE IDENTIFICATION NUMBER: _____ ___ GVWR: _____ KG (_____ LB)
GAWR — FRONT AXLE: _____ KG (_____ LB)
GAWR — 1ST INTERMEDIATE AXLE: _____ KG (_____ LB)
GAWR — 2ND INTERMEDIATE AXLE: _____ KG (_____ LB)
GAWR — 3RD INTERMEDIATE AXLE: _____ KG (_____ LB)
GAWR — 4TH INTERMEDIATE AXLE: _____ KG (_____ LB)
GAWR — 5TH INTERMEDIATE AXLE: _____ KG (_____ LB)
GAWR — REAR AXLE: _____ KG (_____ LB)

INCOMPLETE VEHICLE (VÉHICULE INCOMPLET) DATE: _____
INTERMEDIATE MANUFACTURER (FABRICANT INTERMÉDIAIRE): _____
GVWR/PNBV: _____ KG
GAWR/PNBE — FRONT AXLE: _____ KG
GAWR/PNBE — 1ST INTERMEDIATE AXLE: _____ KG
GAWR/PNBE — 2ND INTERMEDIATE AXLE: _____ KG
GAWR/PNBE — 3RD INTERMEDIATE AXLE: _____ KG
GAWR/PNBE — 4TH INTERMEDIATE AXLE: _____ KG
GAWR/PNBE — 5TH INTERMEDIATE AXLE: _____ KG
GAWR/PNBE — REARMOST AXLE: _____ KG

006815a

Figure 19 — Typical Intermediate Manufacturer's Information Label

MANUFACTURED BY _____ IN _____
INC. VEH. MFD. BY _____ IN _____ VEHICLE TYPE: _____
GVWR _____ KG (_____ LB) VEHICLE IDENTIFICATION NUMBER: _____

	GAWR			TIRES	RIMS					
FRONT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	SINGLE
1ST INT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____
2ND INT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____
3RD INT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____
4TH INT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____
5TH INT:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____
REARMOST:	_____ KG	(_____ LB)	WITH	_____ ,	_____ ,	AT	_____ KPA	(_____ PSI)	COLD	_____

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN _____

MANUFACTURED BY _____ IN _____
INC. VEH. MFD. BY _____ IN _____ VEHICLE TYPE: _____
GVWR/PNBV: _____ KG VEHICLE IDENTIFICATION NUMBER: _____

GAWR/PNBE — FRONT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	SINGLE
GAWR/PNBE — 1ST INT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____
GAWR/PNBE — 2ND INT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____
GAWR/PNBE — 3RD INT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____
GAWR/PNBE — 4TH INT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____
GAWR/PNBE — 5TH INT:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____
GAWR/PNBE — REARMOST:	_____	KG WITH	_____	TIRES, _____	RIMS, _____	KPA	COLD	_____

006688b

Figure 20 — Typical Final-Stage Manufacturer's Certification Label

Certification — Vehicle Alterer

Although not specifically defined in current U.S. or Canadian regulations, a vehicle alterer is any person who modifies, adds to or alters a previously certified completed vehicle in a way that affects its compliance with applicable safety standards, its vehicle type or its gross axle weight ratings or gross vehicle weight rating, prior to the sale of the completed vehicle, or placing the vehicle in service. An example of a vehicle alterer would be a person who installs, prior to delivery of the vehicle to the final customer, a lift axle on a previously certified completed vehicle.

Beginning September 1, 2006, a revised U.S. regulation defines an altered vehicle as a completed vehicle previously certified that has been altered other than by the addition, substitution or removal of readily attachable components, such as mirrors or tire and rim assemblies, or by minor finishing operations such as painting, before the first purchase of the vehicle other than for resale, in such a manner as may affect the conformity of the vehicle with one or more Federal Motor Vehicle Safety Standard(s) or the validity of the vehicle's stated weight ratings or vehicle type classification. The revised U.S. regulation also defines an alterer as a person who alters by addition, substitution, or removal of components (other than readily attachable components) a certified vehicle before the first purchase of the vehicle other than for resale.

Upon completion of the alterations, both U.S. and Canadian vehicle certification regulations require that the vehicle alterer ensure and certify that the vehicle still complies with all applicable Motor Vehicle Safety Standards and Regulations, and attach to the vehicle label of a specific form and wording in a specific location. Typical examples of a vehicle alterer's certification labels are shown in Figure 21.

NOTE

The Canadian version must also contain the alterer's unique National Safety Mark.

A partially printed U.S. vehicle alterer's certification label is available through the MACK Parts System. For the label required by Canadian regulations, please see the information published on the Canadian Truck Equipment Association (CTEA) website, www.ctea.on.ca.

THIS VEHICLE WAS ALTERED BY _____ IN _____
AND AS ALTERED IT CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS AFFECTED BY THE ALTERATION AND IN EFFECT IN _____ .
GVWR _____ KG (_____ LB) VEHICLE IDENTIFICATION NUMBER: _____ VEHICLE TYPE: _____

	GAWR		TIRES	RIMS			
FRONT:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	SINGLE
1ST INT:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____
2ND INT:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____
3RD INT:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____
4TH INT:	_____ KG (	_____ LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____
5HT INT:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____
REARMOST:	_____ KG (	_____LB) WITH	_____,	_____ , AT	_____ KPA (	_____ PSI) COLD	_____

THIS VEHICLE ALTERED BY/
CE VÉHICULE A ÉTÉ MODIFIÉ PAR _____ IN _____
GVWR/PNBV: _____ KG VEHICLE IDENTIFICATION NUMBER: _____ VEHICLE TYPE: _____

GAWR/PNBE — FRONT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	SINGLE
GAWR/PNBE — 1ST INT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____
GAWR/PNBE — 2ND INT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____
GAWR/PNBE — 3RD INT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____
GAWR/PNBE — 4TH INT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____
GAWR/PNBE — 5TH INT:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____
GAWR/PNBE — REAR:	_____ KG	WITH	_____TIRES,	_____ RIMS, AT	_____	KPA COLD	_____

006686c

Figure 21 — Typical Vehicle Alterer's Certification Label

Vehicle Identification Number Label

All motor vehicles are required to be identified by a 17-digit Vehicle Identification Number (VIN). U.S. and Canadian regulations dictate the format of the number. The VIN gives specific information about the vehicle as manufactured by MACK, such as type of vehicle, model, type of brake system, gross vehicle weight range and model year.

The VIN can be found at several different locations on a MACK vehicle. Locations include a stamping on the vertical face of the right-hand frame rail (somewhere between the front spring hanger brackets), a VIN label inside the cab (on the door edge, the door opening area or the seat riser) and on the vehicle safety certification labels and other labels on the door edge or door opening area. When the vehicle is received, check the VIN at each location on the vehicle and verify that they are identical. The vehicle identification number must not be changed, covered or obliterated.

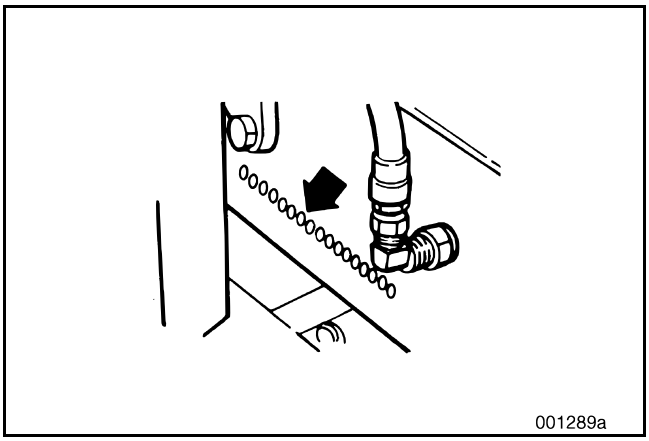


Figure 22 — VIN Frame Stamping

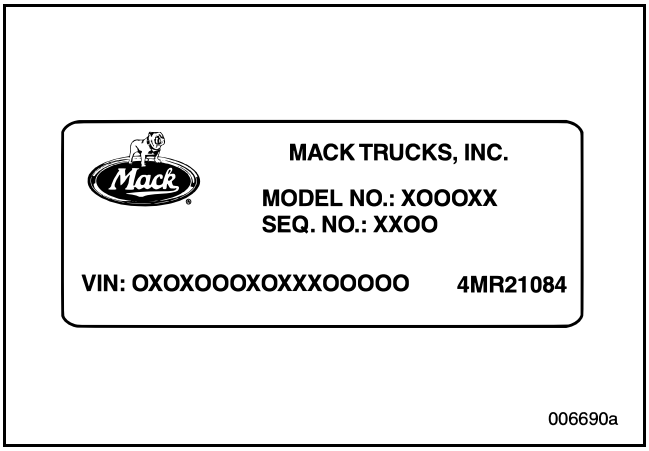


Figure 23 — VIN Label on Driver's Seat Riser

Regulatory Labels

In addition to, or in place of the previously mentioned labels, Mack Trucks, Inc. may affix one or more of the following labels to the cab.

HEATER/DEFROSTER OMISSION LABEL

A windshield defroster, as required by FMVSS 103, *Windshield Defrosting and Defogging*, is not required for vehicles destined for sale in the State of Hawaii, Puerto Rico, the Northern Mariana Islands, Guam, the Virgin Islands and American Samoa. Vehicles destined for sale in these areas must, however, conform to all other applicable FMVSS regulations. If a vehicle destined for sale in one of these areas does not have a factory-installed defroster, a label is affixed to the cab near the vehicle certification label (see illustration below).

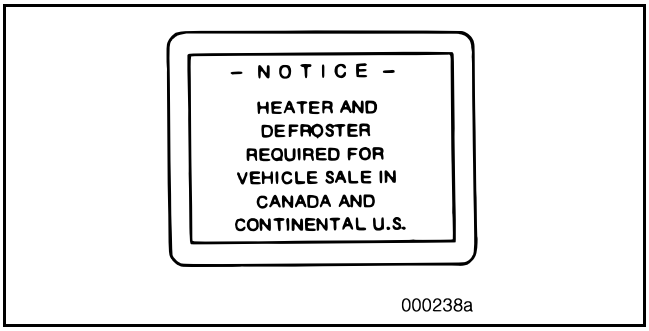


Figure 24 — Omission of Heater/Defroster Label

EXPORT LABEL

In order to comply with U.S. regulations, all MACK vehicles intended for export from the United States (including export to Canada) will have an Export Label, similar to the label shown below, affixed to the inside of the windshield.

Figure 25 — Typical Export Label (Including Export to Canada)

EXPORT/SPECIAL APPLICATION LABEL

Export (excluding export to Canada) or special application vehicles supplied from the assembly plant are not necessarily designed to conform to applicable Federal and Canadian motor vehicle safety standards. On these vehicles, an Export/Special Application Label, similar to the label shown in the illustration below, is affixed to the cab.

Figure 26 — Export/Special Application Label

Export vehicles (other than those intended for sale in Canada) also have an Export Label, similar to the label shown below, affixed to the door area.

Figure 27 — Typical Export Label (Other Than Export to Canada)

OFF-HIGHWAY IDENTIFICATION LABEL

In addition to the Export/Special Application Label, vehicles designed strictly for off-highway operations will have an Off-Highway Identification Label, similar to the label shown in the illustration below, affixed to the cab.

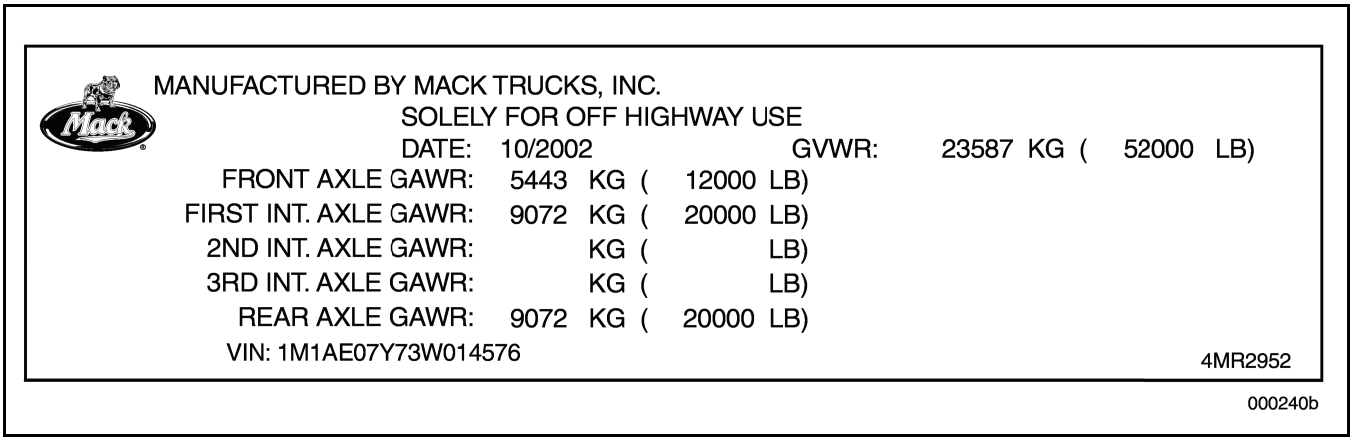


Figure 28 — Off-Highway Identification Label

WEIGHT RATINGS AND WEIGHT DISTRIBUTION

WEIGHT RATINGS AND WEIGHT DISTRIBUTION

Weight Ratings

U.S. Federal Motor Vehicle Safety Regulations require vehicle manufacturers to provide a certification label on completed vehicles that includes specific statements as to the amount of weight (vehicle plus payload) that can be carried on each axle system of the vehicle. Similarly, Canadian Motor Vehicle Safety Regulations require vehicle manufacturers to provide both an information label(s) on incomplete vehicles, and a certification label on completed vehicles. These labels include the same type of weight information as required by U.S. Federal Motor Vehicle Safety Standards. This information is necessary for determining vehicle application. Specific weight rating nomenclature is explained below.

GROSS AXLE WEIGHT RATING (GAWR)

The Gross Axle Weight Rating is the value of the load-carrying capacity of a single-axle system (comprised of the axle, suspension, rims/tires and possibly other components such as the frame rails and transmission) as measured at the tire-ground interface. The actual rating is determined by the lowest rated component. In other words, if an axle and its suspension system are rated at 38,000 lbs, but the load rating of the tires and rims is less than 38,000 lbs, the load rating of the tires and rims would be used as the GAWR.

GROSS VEHICLE WEIGHT RATING (GVWR)

The Gross Vehicle Weight Rating is (usually, but not necessarily) the sum of the GAWRs. This weight rating is the specified loaded weight of the vehicle as measured at the tire-ground interface. The GVWR could be limited by the frame or transmission.

Weight Distribution

Proper weight distribution is essential for vehicle safety, performance, reliability and functionality. The weight, location and/or load carrying capacity of a body and its related equipment, must not cause the GAWRs and/or GVWR to be exceeded. Improper weight distribution may result in the following:

- Hard and imprecise steering and lack of directional stability
- Rough, erratic ride
- Longer than normal stopping distances
- Rapid tire wear and possible sudden tire failure
- Excessive tie rod and kingpin wear, and possible front axle failure
- High maintenance costs

Improper weight distribution and overloading cause excessive wear and premature failure of various components of the vehicle. The additional stresses placed on the frame by misapplication of wheelbases may cause frame rail cracks or breakage. These conditions could result in an accident and personal injury.

Weight Distribution — Formulas and Analysis

Distributing weight properly involves determining the vehicle's center of gravity (CG). The distance between the CG and the centerline of the axle(s) determines the amount of load distributed between the front and rear axles.

The proper position for the body in relation to the wheelbase of the chassis is calculated using the formulas found on the following pages. Before these calculations can be made, however, it is necessary to become familiar with the various vehicle dimensions. The following figure aids in understanding these dimensions.

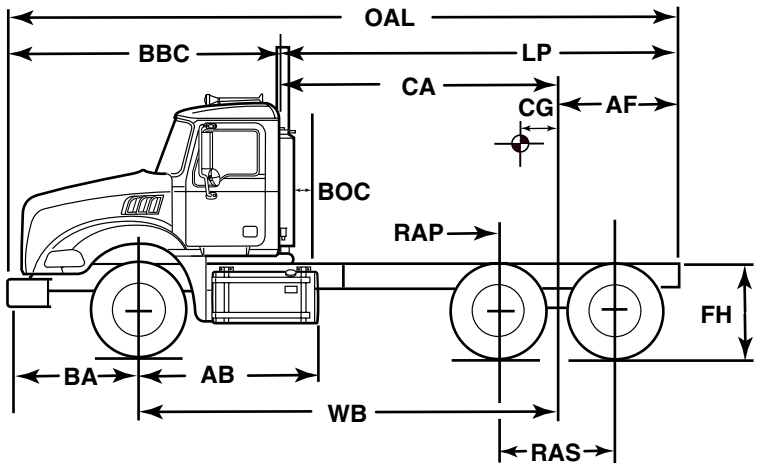


Figure 29 — Vehicle Dimensions

BBC	Bumper to Back of Cab
BA	Bumper to Steer Axle Centerline
AB	Centerline of Steer Axle to Back of Cab
WB	Wheelbase
FH	Frame Height
AF	Centerline of Rear Axle or Tandem to End of Frame
CG	Center of Gravity
BOC	Back of Cab Clearance
CA	Back of Cab to Centerline of Rear Axle or Tandem
LP	Length of Platform
OAL	Overall Frame Length
RAP	Rear Axle Position
RAS	Rear Axle Spacing

Formulas — Vertical Center of Gravity

These formulas are used to estimate the vertical center of gravity of a completed vehicle in order to determine whether maximum allowable limits have been exceeded. This formula should be used when encountering high center of gravity loads.

Wv x (Vv) = Mv
Wb x (Vb) = Mb
Wp x (Vp) = Mp
We x (Ve) = Me

$$VCg = \frac{(Mv + Mb + Mp + Me)}{(Wv + Wb + Wp + We)}$$

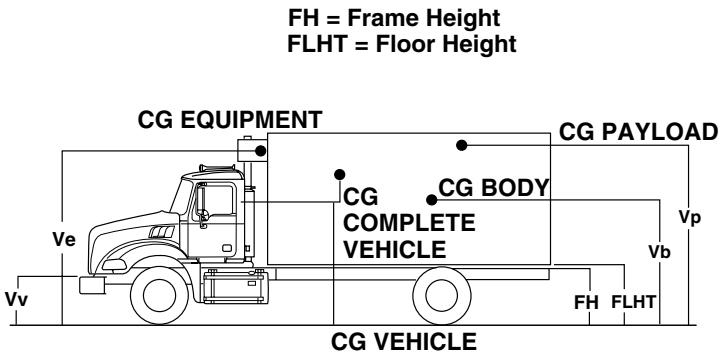


Figure 30 — Formula for Calculating Vertical Center of Gravity

Definitions in formula:	
VCg	The total average vertical center of gravity of the completed vehicle (vehicle, body, payload and equipment)
Wv	Weight of vehicle
Wb	Weight of body
Wp	Weight of payload
We	Weight of equipment
Vv	Distance from ground to center of gravity of the vehicle (measured from top of frame rail directly behind cab to ground)
Vb	Distance from ground to center of gravity of the body
Vp	Distance from ground to center of gravity of the payload
Ve	Distance from ground to center of gravity of the equipment
Mv	Moment of vehicle
Mb	Moment of body
Mp	Moment of payload
Me	Moment of equipment

Formulas — Horizontal Center of Gravity

These formulas are used to estimate the horizontal center of gravity of a completed vehicle in order to determine whether it exists between the center lines of the front and rear axles. This formula should be used when a load and/or permanent equipment (liftgate, reefer unit, snow plow, etc.) is installed on either extremes along the completed vehicle overall length.

Wv x (Hv) = Mv
Wb x (Hb) = Mb
Wp x (Hp) = Mp
We x (He) = Me

$$HCg = \frac{(Mv + Mb + Mp + Me)}{(Wv + Wb + Wp + We)}$$

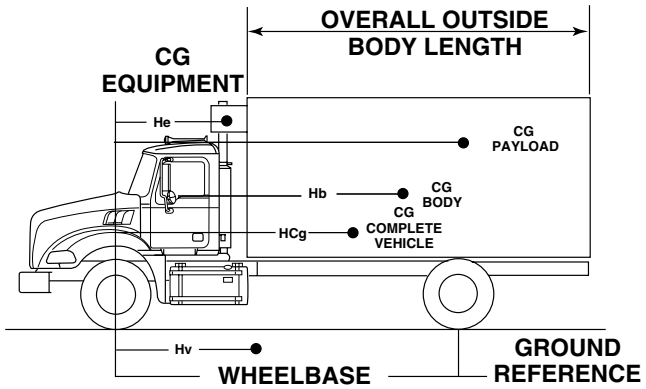
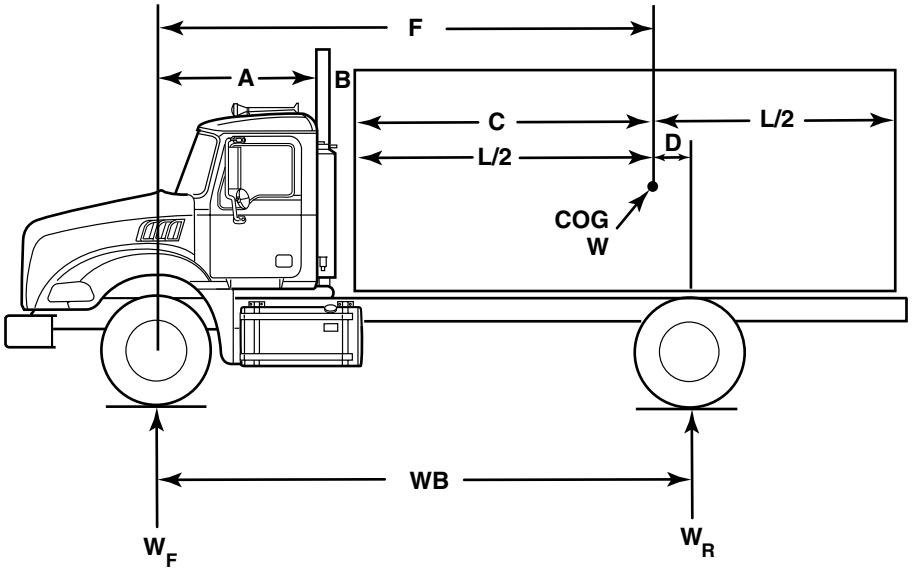


Figure 31 — Formula for Calculating Horizontal Center of Gravity

Definitions in formula:	
HCg	The total average horizontal center of gravity of the completed vehicle (vehicle, body, payload and equipment)
Wv	Weight of vehicle
Wb	Weight of body
Wp	Weight of payload
We	Weight of equipment
Hv	Distance from front axle to center of gravity of the vehicle
Hb	Distance from front axle to center of gravity of the body
Hp	Distance from front axle to center of gravity of the payload
He	Distance from front axle to center of gravity of the equipment
Mv	Moment of vehicle
Mb	Moment of body
Mp	Moment of payload
Me	Moment of equipment

Formulas — Weight Distribution



Basic Formulas:

(a) $W_F \times D = W_F \times WB$

(b) $W \times F = W_R \times WB$

OR

(c) $WB = (A + B + C + D) = (F + D)$

(d) $W = W_F + W_R$

1. $W_F = \frac{W \times D}{WB}$
2. $D = \frac{W_F \times WB}{W}$
3. $WB = \frac{W \times D}{W_F}$
4. $W = \frac{W_F \times WB}{D}$
5. $W_R = \frac{W \times F}{WB}$
6. $F = \frac{W_R \times WB}{W}$
7. $WB = \frac{W \times F}{W_R}$
8. $W = \frac{W_R \times WB}{F}$

001294b

Figure 32 — Formula for Calculating Weight Distribution

Definitions in formula:	
A (AB) =	Front axle to back of cab
B =	Distance between cab and body or trailer (back of cab clearance BOC)
C =	Front of body to CoG of body or front of trailer to kingpin
D =	Distance CoG of body or fifth wheel is ahead of rear axle
F =	(A or AB + B + C) or distance CoG of weight of fifth wheel is behind front axle
WB =	Wheelbase
W =	Weight of body plus payload, or kingpin load
W_F	Portion of W transferred to front axle
W_R	Portion of W transferred to rear axle

Refer to Figure 33 to calculate various weight distributions.

To find:

1. **Weight transferred to front axle =** $\frac{\text{(Total weight) x (Distance C.G. is ahead of the rear axle)}}{\text{(Wheelbase)}}$

2. **Distance C.G. must be placed ahead of rear axle =** $\frac{\text{(Weight transferred to the front axle) x (Wheelbase)}}{\text{(Total weight)}}$

3. **Wheelbase =** $\frac{\text{(Total weight) x (Distance C.G. is ahead of the rear axle)}}{\text{(Weight to be transferred to the front axle)}}$

4. **Total weight =** $\frac{\text{(Weight to be transferred to the front axle) x (Wheelbase)}}{\text{(Distance C.G. is ahead of the rear axle)}}$

5. **Weight transferred to the rear axle =** $\frac{\text{(Total weight) x (Distance C.G. is behind the front axle)}}{\text{(Wheelbase)}}$

6. **Distance C.G. must be placed behind the front axle =** $\frac{\text{(Weight transferred to the rear axle) x (Wheelbase)}}{\text{(Total weight)}}$

7. **Wheelbase =** $\frac{\text{(Total weight) x (Distance C.G. is behind the front axle)}}{\text{(Weight to be transferred to the rear axle)}}$

8. **Total weight =** $\frac{\text{(Weight to be transferred to the rear axle) x (Wheelbase)}}{\text{(Distance C.G. is behind the front axle)}}$

NOTE: Total weight must always equal weight transferred to the rear axle plus the weight transferred to the front axle.

001298a

Figure 33 — Weight Distribution Formulas in Words

MACK INCOMPLETE VEHICLES

VEHICLE CONFIGURATIONS, APPLICATIONS AND DIMENSIONS

The following charts outline the vehicle models/configurations available in the MACK Bulldog line, along with typical applications, wheelbase dimensions, front and rear axle weight ratings. If additional information is required, contact your local MACK dealer, or the Mack Trucks, Inc. Sales Engineering Department.

Model CXU602 (4x2) — Pinnacle Axle Back Dimensions/Configurations

Acceptable vehicle applications include: on-highway and local pick-up and delivery.

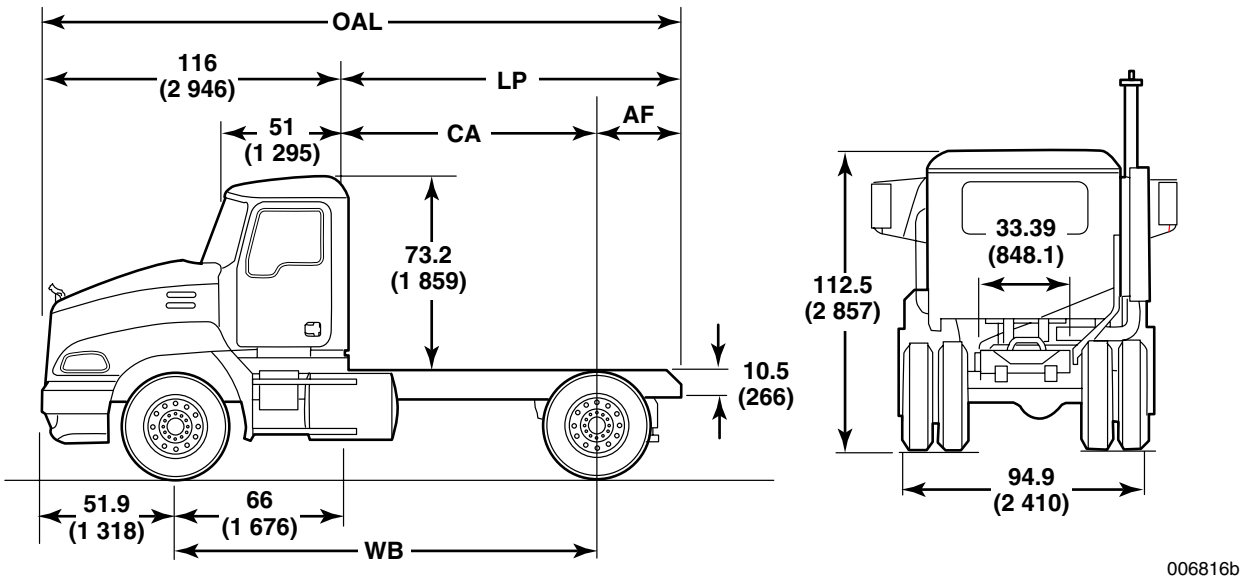


Figure 34 — CXU602 (4x2)

CXU602 (4X2)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
138 (3 500)	105 (2 667)	72 (1 837)	33 (830)	221 (5 613)
138 (3 500)	111 (2 817)	72 (1 837)	39 (980)	227 (5 763)
138 (3 500)	113 (2 867)	72 (1 837)	41 (1 030)	229 (5 813)
138 (3 500)	164 (4 167)	72 (1 837)	92 (2 330)	280 (7 113)
144 (3 650)	111 (2 817)	78 (1 987)	33 (830)	227 (5 763)
144 (3 650)	117 (2 967)	78 (1 987)	39 (980)	233 (5 913)
144 (3 650)	119 (3 017)	78 (1 987)	41 (1 030)	235 (5 963)
144 (3 650)	170 (4 317)	78 (1 987)	92 (2 330)	286 (7 263)
150 (3 800)	117 (2 967)	84 (2 137)	33 (830)	233 (5 913)
150 (3 800)	123 (3 117)	84 (2 137)	39 (980)	239 (6 063)
150 (3 800)	125 (3 167)	84 (2 137)	41 (1 030)	241 (6 113)
150 (3 800)	176 (4 467)	84 (2 137)	92 (2 330)	292 (7 413)
156 (3 950)	123 (3 117)	90 (2 287)	33 (830)	239 (6 063)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
156 (3 950)	129 (3 267)	90 (2 287)	39 (980)	245 (6 213)
156 (3 950)	131 (3 317)	90 (2 287)	41 (1 030)	247 (6 263)
156 (3 950)	182 (4 617)	90 (2 287)	92 (2 330)	298 (7 563)
161 (4 100)	129 (3 267)	96 (2 437)	33 (830)	245 (6 213)
161 (4 100)	135 (3 417)	96 (2 437)	39 (980)	251 (6 363)
161 (4 100)	136 (3 467)	96 (2 437)	41 (1 030)	252 (6 413)
161 (4 100)	188 (4 767)	96 (2 437)	92 (2 330)	304 (7 713)
167 (4 250)	135 (3 417)	102 (2 587)	33 (830)	251 (6 363)
167 (4 250)	140 (3 567)	102 (2 587)	39 (980)	256 (6 513)
167 (4 250)	142 (3 617)	102 (2 587)	41 (1 030)	258 (6 563)
167 (4 250)	194 (4 917)	102 (2 587)	92 (2 330)	310 (7 863)
173 (4 400)	140 (3 567)	108 (2 737)	33 (830)	256 (6 513)
173 (4 400)	146 (3 717)	108 (2 737)	39 (980)	262 (6 663)
173 (4 400)	148 (3 767)	108 (2 737)	41 (1 030)	264 (6 713)
173 (4 400)	199 (5 067)	108 (2 737)	92 (2 330)	315 (8 013)
179 (4 550)	146 (3 717)	114 (2 887)	33 (830)	262 (6 663)
179 (4 550)	152 (3 867)	114 (2 887)	39 (980)	268 (6 813)
179 (4 550)	154 (3 917)	114 (2 887)	41 (1 030)	270 (6 863)
179 (4 550)	205 (5 217)	114 (2 887)	92 (2 330)	321 (8 163)
185 (4 700)	152 (3 867)	120 (3 037)	33 (830)	268 (6 813)
185 (4 700)	158 (4 017)	120 (3 037)	39 (980)	274 (6 963)
185 (4 700)	160 (4 067)	120 (3 037)	41 (1 030)	276 (7 013)
185 (4 700)	211 (5 367)	120 (3 037)	92 (2 330)	327 (8 313)
191 (4 850)	158 (4 017)	125 (3 187)	33 (830)	274 (6 963)
191 (4 850)	164 (4 167)	125 (3 187)	39 (980)	280 (7 113)
191 (4 850)	166 (4 217)	125 (3 187)	41 (1 030)	282 (7 163)
191 (4 850)	217 (5 517)	125 (3 187)	92 (2 330)	333 (8 463)
197 (5 000)	164 (4 167)	131 (3 337)	33 (830)	280 (7 113)
197 (5 000)	170 (4 317)	131 (3 337)	39 (980)	286 (7 263)
197 (5 000)	172 (4 367)	131 (3 337)	41 (1 030)	288 (7 313)
203 (5 150)	170 (4 317)	137 (3 487)	33 (830)	286 (7 263)
203 (5 150)	176 (4 467)	137 (3 487)	39 (980)	292 (7 413)
203 (5 150)	178 (4 517)	137 (3 487)	41 (1 030)	294 (7 463)
209 (5 300)	176 (4 467)	143 (3 637)	33 (830)	292 (7 413)
209 (5 300)	182 (4 617)	143 (3 637)	39 (980)	298 (7 563)
209 (5 300)	184 (4 667)	143 (3 637)	41 (1 030)	300 (7 613)
215 (5 450)	182 (4 617)	149 (3 787)	33 (830)	298 (7 563)
215 (5 450)	188 (4 767)	149 (3 787)	39 (980)	304 (7 713)
215 (5 450)	190 (4 817)	149 (3 787)	41 (1 030)	306 (7 763)
220 (5 600)	188 (4 767)	155 (3 937)	33 (830)	304 (7 713)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
220 (5 600)	194 (4 917)	155 (3 937)	39 (980)	310 (7 863)
220 (5 600)	196 (4 967)	155 (3 937)	41 (1 030)	312 (7 913)
226 (5 750)	194 (4 917)	161 (4 087)	33 (830)	310 (7 863)
226 (5 750)	199 (5 067)	161 (4 087)	39 (980)	315 (8 013)
226 (5 750)	201 (5 117)	161 (4 087)	41 (1 030)	317 (8 063)
232 (5 900)	199 (5 067)	167 (4 237)	33 (830)	315 (8 013)
232 (5 900)	205 (5 217)	167 (4 237)	39 (980)	321 (8 163)
232 (5 900)	207 (5 267)	167 (4 237)	41 (1 030)	323 (8 213)
238 (6 050)	205 (5 217)	173 (4 387)	33 (830)	321 (8 163)
238 (6 050)	211 (5 367)	173 (4 387)	39 (980)	327 (8 313)
238 (6 050)	213 (5 417)	173 (4 387)	41 (1 030)	329 (8 363)
244 (6 200)	211 (5 367)	179 (4 537)	33 (830)	327 (8 313)
244 (6 200)	217 (5 517)	179 (4 537)	39 (980)	333 (8 463)
244 (6 200)	219 (5 567)	179 (4 537)	41 (1 030)	335 (8 513)
250 (6 350)	217 (5 517)	185 (4 687)	33 (830)	333 (8 463)
250 (6 350)	223 (5 667)	185 (4 687)	39 (980)	339 (8 613)
250 (6 350)	225 (5 717)	185 (4 687)	41 (1 030)	341 (8 663)
256 (6 500)	223 (5 667)	190 (4 837)	33 (830)	339 (8 613)
256 (6 500)	229 (5 817)	190 (4 837)	39 (980)	345 (8 763)
256 (6 500)	231 (5 867)	190 (4 837)	41 (1 030)	347 (8 813)
262 (6 650)	229 (5 817)	196 (4 987)	33 (830)	345 (8 763)
262 (6 650)	235 (5 967)	196 (4 987)	39 (980)	351 (8 913)
262 (6 650)	237 (6 017)	196 (4 987)	41 (1 030)	353 (8 963)
268 (6 800)	235 (5 967)	202 (5 137)	33 (830)	351 (8 913)
268 (6 800)	241 (6 117)	202 (5 137)	39 (980)	357 (9 063)
268 (6 800)	243 (6 167)	202 (5 137)	41 (1 030)	359 (9 113)
274 (6 950)	241 (6 117)	208 (5 287)	33 (830)	357 (9 063)
274 (6 950)	247 (6 267)	208 (5 287)	39 (980)	363 (9 213)
274 (6 950)	249 (6 317)	208 (5 287)	41 (1 030)	365 (9 263)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,600 lb (6 623 kg)

Available Single Rear Axle Weight Rating:

- 23,000 lb (10 433 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model CXU603 (6x4) — Pinnacle
Axle Back
Dimensions/Configurations

Acceptable vehicle applications include:
on-highway, local pick-up and delivery, tanker and refuse.

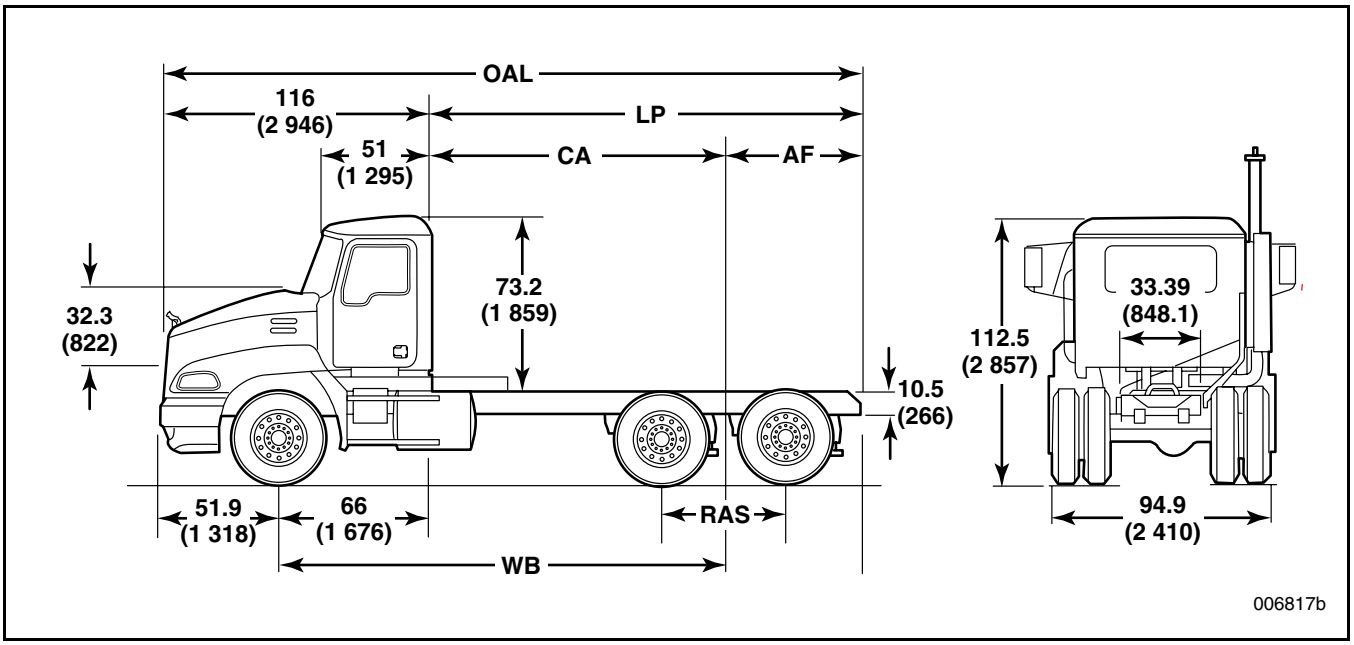


Figure 35 — CXU603 (6x4)

CXU603 (6X4)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
138 (3 510)	52 (1 321)	129 (3 277)	73 (1 847)	56 (1 430)	245 (6 223)
138 (3 510)	52 (1 321)	135 (3 427)	73 (1 847)	62 (1 580)	251 (6 373)
138 (3 510)	52 (1 321)	141 (3 577)	73 (1 847)	68 (1 730)	257 (7 154)
144 (3 660)	52 (1 321)	135 (3 427)	79 (1 997)	56 (1 430)	251 (6 373)
144 (3 660)	52 (1 321)	141 (3 577)	79 (1 997)	62 (1 580)	257 (7 154)
150 (3 810)	52 (1 321)	141 (3 577)	85 (2 147)	56 (1 430)	257 (7 154)
150 (3 810)	52 (1 321)	147 (3 727)	85 (2 147)	62 (1 580)	263 (6 673)
156 (3 960)	52 (1 321)	147 (3 727)	90 (2 297)	56 (1 430)	263 (6 673)
156 (3 960)	52 (1 321)	153 (3 877)	90 (2 297)	62 (1 580)	269 (6 823)
162 (4 110)	52 (1 321)	153 (3 877)	96 (2 447)	56 (1 430)	269 (6 823)
162 (4 110)	52 (1 321)	159 (4 027)	96 (2 447)	62 (1 580)	275 (6 973)
168 (4 260)	52 (1 321)	159 (4 027)	102 (2 597)	56 (1 430)	275 (6 973)
168 (4 260)	52 (1 321)	164 (4 177)	102 (2 597)	62 (1 580)	280 (7 123)
168 (4 260)	52 (1 321)	170 (4 327)	102 (2 597)	68 (1 730)	286 (7 273)
174 (4 410)	52 (1 321)	164 (4 177)	108 (2 747)	56 (1 430)	280 (7 123)
174 (4 410)	52 (1 321)	170 (4 327)	108 (2 747)	62 (1 580)	286 (7 273)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
174 (4 410)	52 (1 321)	176 (4 477)	108 (2 747)	68 (1 730)	292 (7 423)
180 (4 560)	52 (1 321)	170 (4 327)	114 (2 897)	56 (1 430)	286 (7 273)
180 (4 560)	52 (1 321)	176 (4 477)	114 (2 897)	62 (1 580)	292 (7 423)
180 (4 560)	52 (1 321)	182 (4 627)	114 (2 897)	68 (1 730)	298 (7 573)
180 (4 560)	52 (1 321)	200 (5 077)	114 (2 897)	86 (2 180)	316 (8 023)
185 (4 710)	52 (1 321)	176 (4 477)	120 (3 047)	56 (1 430)	292 (7 423)
185 (4 710)	52 (1 321)	182 (4 627)	120 (3 047)	62 (1 580)	298 (7 573)
185 (4 710)	52 (1 321)	188 (4 777)	120 (3 047)	68 (1 730)	304 (7 723)
185 (4 710)	52 (1 321)	212 (5 377)	120 (3 047)	92 (2 330)	328 (8 323)
191 (4 860)	52 (1 321)	182 (4 627)	126 (3 197)	56 (1 430)	298 (7 573)
191 (4 860)	52 (1 321)	188 (4 777)	126 (3 197)	62 (1 580)	304 (7 723)
191 (4 860)	52 (1 321)	194 (4 927)	126 (3 197)	68 (1 730)	310 (7 873)
191 (4 860)	52 (1 321)	200 (5 077)	126 (3 197)	74 (1 880)	316 (8 023)
197 (5 010)	52 (1 321)	188 (4 777)	132 (3 347)	56 (1 430)	304 (7 723)
197 (5 010)	52 (1 321)	194 (4 927)	132 (3 347)	62 (1 580)	310 (7 873)
197 (5 010)	52 (1 321)	200 (5 077)	132 (3 347)	68 (1 730)	316 (8 023)
203 (5 160)	52 (1 321)	194 (4 927)	138 (3 497)	56 (1 430)	310 (7 873)
203 (5 160)	52 (1 321)	200 (5 077)	138 (3 497)	62 (1 580)	316 (8 023)
203 (5 160)	52 (1 321)	206 (5 227)	138 (3 497)	68 (1 730)	322 (8 173)
209 (5 310)	52 (1 321)	200 (5 077)	144 (3 647)	56 (1 430)	316 (8 023)
209 (5 310)	52 (1 321)	206 (5 227)	144 (3 647)	62 (1 580)	322 (8 173)
209 (5 310)	52 (1 321)	212 (5 377)	144 (3 647)	68 (1 730)	328 (8 323)
209 (5 310)	52 (1 321)	247 (6 277)	144 (3 647)	104 (2 630)	363 (9 223)
215 (5 460)	52 (1 321)	206 (5 227)	149 (3 797)	56 (1 430)	322 (8 173)
215 (5 460)	52 (1 321)	212 (5 377)	149 (3 797)	62 (1 580)	328 (8 323)
215 (5 460)	52 (1 321)	218 (5 527)	149 (3 797)	68 (1 730)	334 (8 473)
221 (5 610)	52 (1 321)	212 (5 377)	155 (3 947)	56 (1 430)	328 (8 323)
221 (5 610)	52 (1 321)	218 (5 527)	155 (3 947)	62 (1 580)	334 (8 473)
221 (5 610)	52 (1 321)	224 (5 677)	155 (3 947)	68 (1 730)	340 (8 623)
221 (5 610)	52 (1 321)	253 (6 427)	155 (3 947)	98 (2 480)	369 (9 373)
227 (5 760)	52 (1 321)	218 (5 527)	161 (4 097)	56 (1 430)	334 (8 473)
227 (5 760)	52 (1 321)	224 (5 677)	161 (4 097)	62 (1 580)	340 (8 623)
227 (5 760)	52 (1 321)	259 (6 577)	161 (4 097)	98 (2 480)	375 (9 523)
233 (5 910)	52 (1 321)	224 (5 677)	167 (4 247)	56 (1 430)	340 (8 623)
233 (5 910)	52 (1 321)	229 (5827)	167 (4 247)	62 (1 580)	345 (8 773)
239 (6 060)	52 (1 321)	229 (5827)	173 (4 397)	56 (1 430)	345 (8 773)
239 (6 060)	52 (1 321)	235 (5 977)	173 (4 397)	62 (1 580)	351 (8 923)
239 (6 060)	52 (1 321)	241 (6 127)	173 (4 397)	68 (1 730)	357 (9 073)
239 (6 060)	52 (1 321)	253 (6 427)	173 (4 397)	80 (2 030)	369 (9 373)
239 (6 060)	52 (1 321)	318 (8 077)	173 (4 397)	139 (3530)	434 (11 023)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
244 (6 210)	52 (1 321)	235 (5 977)	179 (4 547)	56 (1 430)	351 (8 923)
244 (6 210)	52 (1 321)	241 (6 127)	179 (4 547)	62 (1 580)	357 (9 073)
244 (6 210)	52 (1 321)	247 (6 277)	179 (4 547)	68 (1 730)	363 (9 223)
250 (6 360)	52 (1 321)	241 (6 127)	185 (4 697)	56 (1 430)	357 (9 073)
250 (6 360)	52 (1 321)	247 (6 277)	185 (4 697)	62 (1 580)	363 (9 223)
250 (6 360)	52 (1 321)	253 (6 427)	185 (4 697)	68 (1 730)	369 (9 373)
256 (6 510)	52 (1 321)	247 (6 277)	191 (4 847)	56 (1 430)	363 (9 223)
256 (6 510)	52 (1 321)	253 (6 427)	191 (4 847)	62 (1 580)	369 (9 373)
256 (6 510)	52 (1 321)	259 (6 577)	191 (4 847)	68 (1 730)	375 (9 523)
262 (6 660)	52 (1 321)	253 (6 427)	197 (4 997)	56 (1 430)	369 (9 373)
262 (6 660)	52 (1 321)	259 (6 577)	197 (4 997)	62 (1 580)	375 (9 523)
262 (6 660)	52 (1 321)	265 (6 727)	197 (4 997)	68 (1 730)	381 (9 673)
268 (6 810)	52 (1 321)	259 (6 577)	203 (5 147)	56 (1 430)	375 (9 523)
268 (6 810)	52 (1 321)	265 (6 727)	203 (5 147)	62 (1 580)	381 (9 673)
268 (6 810)	52 (1 321)	271 (6 877)	203 (5 147)	68 (1 730)	387 (9 823)
274 (6 960)	52 (1 321)	265 (6 727)	209 (5 297)	56 (1 430)	381 (9 673)
274 (6 960)	52 (1 321)	271 (6 877)	209 (5 297)	62 (1 580)	387 (9 823)
274 (6 960)	52 (1 321)	277 (7 027)	209 (5 297)	68 (1 730)	393 (9 973)
280 (7 110)	52 (1 321)	271 (6 877)	214 (5 447)	56 (1 430)	387 (9 823)
280 (7 110)	52 (1 321)	277 (7 027)	214 (5 447)	62 (1 580)	393 (9 973)
280 (7 110)	52 (1 321)	283 (7 177)	214 (5 447)	68 (1 730)	399 (10 123)
286 (7 260)	52 (1 321)	277 (7 027)	220 (5 597)	56 (1 430)	393 (9 973)
286 (7 260)	52 (1 321)	283 (7 177)	220 (5 597)	62 (1 580)	399 (10 123)
286 (7 260)	52 (1 321)	288 (7 327)	220 (5 597)	68 (1 730)	404 (10 273)
292 (7 410)	52 (1 321)	283 (7 177)	226 (5 747)	56 (1 430)	399 (10 123)
292 (7 410)	52 (1 321)	288 (7 327)	226 (5 747)	62 (1 580)	404 (10 273)
292 (7 410)	52 (1 321)	294 (7 477)	226 (5 747)	68 (1 730)	410 (10 423)
298 (7 560)	52 (1 321)	288 (7 327)	232 (5 897)	56 (1 430)	404 (10 273)
298 (7 560)	52 (1 321)	294 (7 477)	232 (5 897)	62 (1 580)	410 (10 423)
298 (7 560)	52 (1 321)	300 (7 627)	232 (5 897)	68 (1 730)	416 (10 573)
140 (3 550)	55 (1 397)	131 (3 317)	74 (1 887)	56 (1 430)	247 (6 263)
140 (3 550)	55 (1 397)	136 (3 467)	74 (1 887)	62 (1 580)	252 (6 413)
140 (3 550)	55 (1 397)	142 (3 617)	74 (1 887)	68 (1 730)	258 (6 563)
146 (3 700)	55 (1 397)	136 (3 467)	80 (2 037)	56 (1 430)	252 (6 413)
146 (3 700)	55 (1 397)	142 (3 617)	80 (2 037)	62 (1 580)	258 (6 563)
152 (3 850)	55 (1 397)	142 (3 617)	86 (2 187)	56 (1 430)	258 (6 563)
152 (3 850)	55 (1 397)	148 (3 767)	86 (2 187)	62 (1 580)	264 (6 713)
157 (4 000)	55 (1 397)	148 (3 767)	92 (2 337)	56 (1 430)	264 (6 713)
157 (4 000)	55 (1 397)	154 (3 917)	92 (2 337)	62 (1 580)	270 (6 863)
163 (4 150)	55 (1 397)	154 (3 917)	98 (2 487)	56 (1 430)	270 (6 863)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
163 (4 150)	55 (1 397)	160 (4 067)	98 (2 487)	62 (1 580)	276 (7 013)
169 (4 300)	55 (1 397)	160 (4 067)	104 (2 637)	56 (1 430)	276 (7 013)
169 (4 300)	55 (1 397)	166 (4 217)	104 (2 637)	62 (1 580)	282 (7 163)
169 (4 300)	55 (1 397)	172 (4 367)	104 (2 637)	68 (1 730)	288 (7 313)
175 (4 450)	55 (1 397)	166 (4 217)	110 (2 787)	56 (1 430)	282 (7 163)
175 (4 450)	55 (1 397)	172 (4 367)	110 (2 787)	62 (1 580)	288 (7 313)
175 (4 450)	55 (1 397)	178 (4 517)	110 (2 787)	68 (1 730)	294 (7 463)
181 (4 600)	55 (1 397)	172 (4 367)	116 (2 937)	56 (1 430)	288 (7 313)
181 (4 600)	55 (1 397)	178 (4 517)	116 (2 937)	62 (1 580)	294 (7 463)
181 (4 600)	55 (1 397)	184 (4 667)	116 (2 937)	68 (1 730)	300 (7 613)
181 (4 600)	55 (1 397)	201 (5 117)	116 (2 937)	86 (2 180)	317 (8 063)
187 (4 750)	55 (1 397)	178 (4 517)	122 (3 087)	56 (1 430)	294 (7 463)
187 (4 750)	55 (1 397)	184 (4 667)	122 (3 087)	62 (1 580)	300 (7 613)
187 (4 750)	55 (1 397)	190 (4 817)	122 (3 087)	68 (1 730)	306 (7 763)
187 (4 750)	55 (1 397)	213 (5 417)	122 (3 087)	92 (2 330)	329 (8 363)
193 (4 900)	55 (1 397)	184 (4 667)	127 (3 237)	56 (1 430)	300 (7 613)
193 (4 900)	55 (1 397)	190 (4 817)	127 (3 237)	62 (1 580)	306 (7 763)
193 (4 900)	55 (1 397)	196 (4 967)	127 (3 237)	68 (1 730)	312 (7 913)
199 (5 050)	55 (1 397)	190 (4 817)	133 (3 387)	56 (1 430)	306 (7 763)
199 (5 050)	55 (1 397)	196 (4 967)	133 (3 387)	62 (1 580)	312 (7 913)
199 (5 050)	55 (1 397)	201 (5 117)	133 (3 387)	68 (1 730)	317 (8 063)
205 (5 200)	55 (1 397)	196 (4 967)	139 (3 537)	56 (1 430)	312 (7 913)
205 (5 200)	55 (1 397)	201 (5 117)	139 (3 537)	62 (1 580)	317 (8 063)
205 (5 200)	55 (1 397)	207 (5 267)	139 (3 537)	68 (1 730)	323 (8 213)
211 (5 350)	55 (1 397)	201 (5 117)	145 (3 687)	56 (1 430)	317 (8 063)
211 (5 350)	55 (1 397)	207 (5 267)	145 (3 687)	62 (1 580)	323 (8 213)
211 (5 350)	55 (1 397)	213 (5 417)	145 (3 687)	68 (1 730)	329 (8 363)
211 (5 350)	55 (1 397)	249 (6 317)	145 (3 687)	104 (2 630)	365 (9 263)
217 (5 500)	55 (1 397)	207 (5 267)	151 (3 837)	56 (1 430)	323 (8 213)
217 (5 500)	55 (1 397)	213 (5 417)	151 (3 837)	62 (1 580)	329 (8 363)
217 (5 500)	55 (1 397)	219 (5 567)	151 (3 837)	68 (1 730)	335 (8 513)
222 (5 650)	55 (1 397)	213 (5 417)	157 (3 987)	56 (1 430)	329 (8 363)
222 (5 650)	55 (1 397)	219 (5 567)	157 (3 987)	62 (1 580)	335 (8 513)
222 (5 650)	55 (1 397)	225 (5 717)	157 (3 987)	68 (1 730)	341 (8 663)
222 (5 650)	55 (1 397)	255 (6 467)	157 (3 987)	98 (2 480)	371 (9 413)
228 (5 800)	55 (1 397)	219 (5 567)	163 (4 137)	56 (1 430)	335 (8 513)
228 (5 800)	55 (1 397)	225 (5 717)	163 (4 137)	62 (1 580)	341 (8 663)
228 (5 800)	55 (1 397)	261 (6 617)	163 (4 137)	98 (2 480)	377 9 563)
234 (5 950)	55 (1 397)	225 (5 717)	169 (4 287)	56 (1 430)	341 (8 663)
234 (5 950)	55 (1 397)	231 (5 867)	169 (4 287)	62 (1 580)	347 (8 813)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
240 (6 100)	55 (1 397)	231 (5 867)	175 (4 437)	56 (1 430)	347 (8 813)
240 (6 100)	55 (1 397)	237 (6 017)	175 (4 437)	62 (1 580)	353 (8 963)
240 (6 100)	55 (1 397)	243 (6 167)	175 (4 437)	68 (1 730)	359 (9 113)
246 (6 250)	55 (1 397)	237 (6 017)	181 (4 587)	56 (1 430)	353 (8 963)
246 (6 250)	55 (1 397)	243 (6 167)	181 (4 587)	62 (1 580)	359 (9 113)
246 (6 250)	55 (1 397)	249 (6 317)	181 (4 587)	68 (1 730)	365 (9 263)
252 (6 400)	55 (1 397)	243 (6 167)	186 (4 737)	56 (1 430)	359 (9 113)
252 (6 400)	55 (1 397)	249 (6 317)	186 (4 737)	62 (1 580)	365 (9 263)
252 (6 400)	55 (1 397)	255 (6 467)	186 (4 737)	68 (1 730)	371 (9 413)
258 (6 550)	55 (1 397)	249 (6 317)	192 (4 887)	56 (1 430)	365 (9 263)
258 (6 550)	55 (1 397)	255 (6 467)	192 (4 887)	62 (1 580)	371 (9 413)
258 (6 550)	55 (1 397)	261 (6 617)	192 (4 887)	68 (1 730)	377 (9 563)
264 (6 700)	55 (1 397)	255 (6 467)	198 (5 037)	56 (1 430)	371 (9 413)
264 (6 700)	55 (1 397)	261 (6 617)	198 (5 037)	62 (1 580)	377 (9 563)
264 (6 700)	55 (1 397)	266 (6 767)	198 (5 037)	68 (1 730)	382 (9 713)
270 (6 850)	55 (1 397)	261 (6 617)	204 (5 187)	56 (1 430)	377 (9 563)
270 (6 850)	55 (1 397)	266 (6 767)	204 (5 187)	62 (1 580)	382 (9 713)
270 (6 850)	55 (1 397)	272 (6 917)	204 (5 187)	68 (1 730)	388 (9 863)
276 (7 000)	55 (1 397)	266 (6 767)	210 (5 337)	56 (1 430)	382 (9 713)
276 (7 000)	55 (1 397)	272 (6 917)	210 (5 337)	62 (1 580)	388 (9 863)
276 (7 000)	55 (1 397)	278 (7 067)	210 (5 337)	68 (1 730)	394 (7 183)
281 (7 150)	55 (1 397)	272 (6 917)	216 (5 487)	56 (1 430)	388 (9 863)
281 (7 150)	55 (1 397)	278 (7 067)	216 (5 487)	62 (1 580)	394 (7 183)
281 (7 150)	55 (1 397)	284 (7 217)	216 (5 487)	68 (1 730)	400 (10 163)
287 (7 300)	55 (1 397)	278 (7 067)	222 (5 637)	56 (1 430)	394 (7 183)
287 (7 300)	55 (1 397)	284 (7 217)	222 (5 637)	62 (1 580)	400 (10 163)
287 (7 300)	55 (1 397)	290 (7 367)	222 (5 637)	68 (1 730)	406 (10 313)
293 (7 450)	55 (1 397)	284 (7 217)	228 (5 787)	56 (1 430)	400 (10 163)
293 (7 450)	55 (1 397)	290 (7 367)	228 (5 787)	62 (1 580)	406 (10 313)
293 (7 450)	55 (1 397)	296 (7 517)	228 (5 787)	68 (1 730)	412 (10 463)
299 (7 600)	55 (1 397)	290 (7 367)	234 (5 937)	56 (1 430)	406 (10 313)
299 (7 600)	55 (1 397)	296 (7 517)	234 (5 937)	62 (1 580)	412 (10 463)
299 (7 600)	55 (1 397)	302 (7 667)	234 (5 937)	68 (1 730)	418 (10 613)
142 (3 610)	60 (1 524)	139 (3 527)	77 (1 947)	62 (1 580)	255 (6 473)
142 (3 610)	60 (1 524)	145 (3 677)	77 (1 947)	68 (1 730)	261 (6 623)
148 (3 760)	60 (1 524)	145 (3 677)	83 (2 097)	62 (1 580)	261 (6 623)
154 (3 910)	60 (1 524)	151 (3 827)	88 (2 247)	62 (1 580)	267 (6 773)
160 (4 060)	60 (1 524)	157 (3 977)	94 (2 397)	62 (1 580)	273 (6 923)
166 (4 210)	60 (1 524)	162 (4 127)	100 (2 547)	62 (1 580)	278 (7 073)
172 (4 360)	60 (1 524)	168 (4 277)	106 (2 697)	62 (1 580)	284 (7 223)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
172 (4 360)	60 (1 524)	174 (4 427)	106 (2 697)	68 (1 730)	290 (7 373)
178 (4 510)	60 (1 524)	174 (4 427)	112 (2 847)	62 (1 580)	290 (7 373)
178 (4 510)	60 (1 524)	180 (4 577)	112 (2 847)	68 (1 730)	296 (7 523)
183 (4 660)	60 (1 524)	180 (4 577)	118 (2 997)	62 (1 580)	296 (7 523)
183 (4 660)	60 (1 524)	186 (4 727)	118 (2 997)	68 (1 730)	302 (7 673)
183 (4 660)	60 (1 524)	204 (5 177)	118 (2 997)	86 (2 180)	320 (8 123)
189 (4 810)	60 (1 524)	186 (4 727)	124 (3 147)	62 (1 580)	302 (7 673)
189 (4 810)	60 (1 524)	192 (4 877)	124 (3 147)	68 (1 730)	308 (7 823)
189 (4 810)	60 (1 524)	216 (5 477)	124 (3 147)	92 (2 330)	332 (8 423)
195 (4 960)	60 (1 524)	192 (4 877)	130 (3 297)	62 (1 580)	308 (7 823)
195 (4 960)	60 (1 524)	198 (5 027)	130 (3 297)	68 (1 730)	314 (7 973)
195 (4 960)	60 (1 524)	204 (5 177)	130 (3 297)	74 (1 880)	320 (8 123)
201 (5 110)	60 (1 524)	198 (5 027)	136 (3 447)	62 (1 580)	314 (7 973)
201 (5 110)	60 (1 524)	204 (5 177)	136 (3 447)	68 (1 730)	320 (8 123)
207 (5 260)	60 (1 524)	204 (5 177)	142 (3 597)	62 (1 580)	320 (8 123)
207 (5 260)	60 (1 524)	210 (5 327)	142 (3 597)	68 (1 730)	326 (8 273)
213 (5 410)	60 (1 524)	210 (5 327)	148 (3 747)	62 (1 580)	326 (8 273)
213 (5 410)	60 (1 524)	216 (5 477)	148 (3 747)	68 (1 730)	332 (8 423)
213 (5 410)	60 (1 524)	251 (6 377)	148 (3 747)	104 (2 630)	367 (9 323)
219 (5 560)	60 (1 524)	216 (5 477)	153 (3 897)	62 (1 580)	332 (8 423)
219 (5 560)	60 (1 524)	222 (5 627)	153 (3 897)	68 (1 730)	338 (8 573)
225 (5 710)	60 (1 524)	222 (5 627)	159 (4 047)	62 (1 580)	338 (8 573)
225 (5 710)	60 (1 524)	227 (5 777)	159 (4 047)	68 (1 730)	343 (8 723)
225 (5 710)	60 (1 524)	257 (6 527)	159 (4 047)	98 (2 480)	373 (9 473)
231 (5 860)	60 (1 524)	227 (5 777)	165 (4 197)	62 (1 580)	343 (8 723)
231 (5 860)	60 (1 524)	263 (6 677)	165 (4 197)	98 (2 480)	379 (9 623)
237 (6 010)	60 (1 524)	233 (5 927)	171 (4 347)	62 (1 580)	349 (8 873)
243 (6 160)	60 (1 524)	239 (6 077)	177 (4 497)	62 (1 580)	355 (9 023)
243 (6 160)	60 (1 524)	245 (6 227)	177 (4 497)	68 (1 730)	361 (9 173)
243 (6 160)	60 (1 524)	257 (6 527)	177 (4 497)	80 (2 030)	373 (9 473)
243 (6 160)	60 (1 524)	322 (8 177)	177 (4 497)	109.45 (2 780)	438 (11 123)
246 (6 260)	60 (1 524)	243 (6 177)	181 (4 597)	62 (1 580)	359 (9 123)
246 (6 260)	60 (1 524)	249 (6 327)	181 (4 597)	68 (1 730)	365 (9 273)
246 (6 260)	60 (1 524)	261 (6 627)	181 (4 597)	80 (2 030)	377 (9 623)
246 (6 260)	60 (1 524)	326 (8 277)	181 (4 597)	109.45 (2 780)	442 (11 223)
248 (6 310)	60 (1 524)	245 (6 227)	183 (4 647)	62 (1 580)	361 (9 173)
248 (6 310)	60 (1 524)	251 (6 377)	183 (4 647)	68 (1 730)	367 (9 323)
248 (6 310)	60 (1 524)	263 (6 677)	183 (4 647)	80 (2 030)	379 (9 623)
248 (6 310)	60 (1 524)	328 (8 327)	183 (4 647)	109.45 (2 780)	444 (11 273)
254 (6 460)	60 (1 524)	251 (6 377)	189 (4 797)	62 (1 580)	367 (9 323)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	RAS	LP	CA	AF	OAL
254 (6 460)	60 (1 524)	257 (6 527)	189 (4 797)	68 (1 730)	373 (9 473)
254 (6 460)	60 (1 524)	263 (6 677)	189 (4 797)	74 (1 880)	379 (9 623)
260 (6 610)	60 (1 524)	257 (6 527)	195 (4 947)	62 (1 580)	373 (9 473)
260 (6 610)	60 (1 524)	263 (6 677)	195 (4 947)	68 (1 730)	379 (9 623)
260 (6 610)	60 (1 524)	269 (6 827)	195 (4 947)	74 (1 880)	385 (9 773)
266 (6 760)	60 (1 524)	263 (6 677)	201 (5 097)	62 (1 580)	379 (9 623)
266 (6 760)	60 (1 524)	269 (6 827)	201 (5 097)	68 (1 730)	385 (9 773)
266 (6 760)	60 (1 524)	275 (6 977)	201 (5 097)	74 (1 880)	391 (9 923)
272 (6 910)	60 (1 524)	269 (6 827)	207 (5 247)	62 (1 580)	385 (9 773)
272 (6 910)	60 (1 524)	275 (6 977)	207 (5 247)	68 (1 730)	391 (9 923)
272 (6 910)	60 (1 524)	281 (7 127)	207 (5 247)	74 (1 880)	397 (10 073)
278 (7 060)	60 (1 524)	275 (6 977)	212 (5 397)	62 (1 580)	391 (9 923)
278 (7 060)	60 (1 524)	281 (7 127)	212 (5 397)	68 (1 730)	397 (10 073)
278 (7 060)	60 (1 524)	286 (7 277)	212 (5 397)	74 (1 880)	402 (10 233)
284 (7 210)	60 (1 524)	281 (7 127)	218 (5 547)	62 (1 580)	397 (10 073)
284 (7 210)	60 (1 524)	286 (7 277)	218 (5 547)	68 (1 730)	402 (10 233)
284 (7 210)	60 (1 524)	292 (7 427)	218 (5 547)	74 (1 880)	408 (10 373)
290 (7 360)	60 (1 524)	286 (7 277)	224 (5 697)	62 (1 580)	402 (10 223)
290 (7 360)	60 (1 524)	292 (7 427)	224 (5 697)	68 (1 730)	408 (10 373)
290 (7 360)	60 (1 524)	298 (7 577)	224 (5 697)	74 (1 880)	414 (10 523)
296 (7 510)	60 (1 524)	292 (7 427)	230 (5 847)	62 (1 580)	408 (10 373)
296 (7 510)	60 (1 524)	298 (7 577)	230 (5 847)	68 (1 730)	414 (10 523)
296 (7 510)	60 (1 524)	304 (7 727)	230 (5 847)	74 (1 880)	420 (10 673)
302 (7 660)	60 (1 524)	298 (7 577)	236 (5 997)	62 (1 580)	414 (10 523)
302 (7 660)	60 (1 524)	304 (7 727)	236 (5 997)	68 (1 730)	420 (10 673)
302 (7 660)	60 (1 524)	310 (7 877)	236 (5 997)	74 (1 880)	426 (10 823)
307 (7 810)	60 (1 524)	304 (7 727)	242 (6 147)	62 (1 580)	420 (10 673)
307 (7 810)	60 (1 524)	310 (7 877)	242 (6 147)	68 (1 730)	426 (10 823)
307 (7 810)	60 (1 524)	316 (8 027)	242 (6 147)	74 (1 880)	432 (10 973)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,600 lb (6 623 kg)

Available Rear Tandem Axle Weight Ratings:

- 38,000 lb (17 237 kg)
- 40,000 lb (18 414 kg)
- 46,000 lb (20 900 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model CHU602 (4x2) — Pinnacle
Axle Forward
Dimensions/Configurations

Acceptable vehicle applications include:
on-highway and local pick-up and delivery.

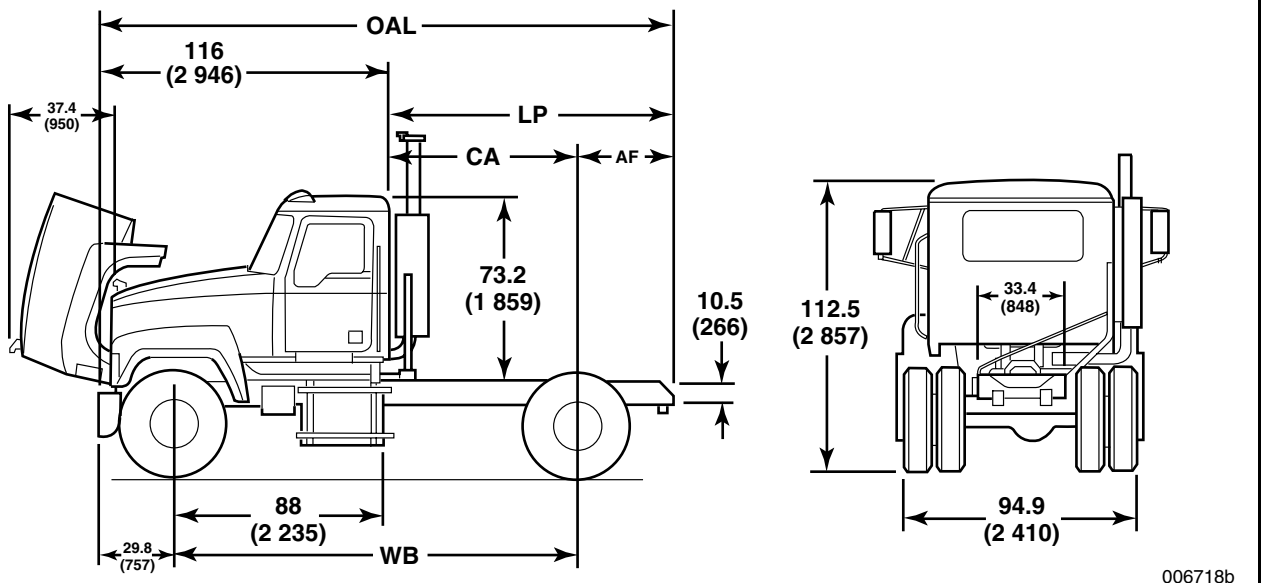


Figure 36 — CHU602 (4x2)

CHU602 (4X2)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
154 (3 910)	99 (2 517)	66 (1 687)	33 (830)	215 (5 463)
154 (3 910)	105 (2 667)	66 (1 687)	39 (980)	221 (5 613)
154 (3 910)	107 (2 717)	66 (1 687)	41 (1 030)	223 (5 663)
154 (3 910)	158 (4 017)	66 (1 687)	92 (2 330)	274 (6 963)
160 (4 060)	105 (2 667)	72 (1 837)	33 (830)	221 (5 613)
160 (4 060)	111 (2 817)	72 (1 837)	39 (980)	227 (5 763)
160 (4 060)	113 (2 867)	72 (1 837)	41 (1 030)	229 (5 813)
160 (4 060)	164 (4 167)	72 (1 837)	92 (2 330)	280 (7 113)
166 (4 210)	111 (2 817)	78 (1 987)	33 (830)	227 (5 763)
166 (4 210)	117 (2 967)	78 (1 987)	39 (980)	233 (5 913)
166 (4 210)	119 (3 017)	78 (1 987)	41 (1 030)	235 (5 963)
166 (4 210)	170 (4 317)	78 (1 987)	92 (2 330)	286 (7 263)
172 (4 360)	117 (2 967)	84 (2 137)	33 (830)	233 (5 913)
172 (4 360)	123 (3 117)	84 (2 137)	39 (980)	239 (6 063)
172 (4 360)	125 (3 167)	84 (2 137)	41 (1 030)	241 (6 113)
172 (4 360)	176 (4 467)	84 (2 137)	92 (2 330)	292 (7 413)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
178 (4 510)	123 (3 117)	90 (2 287)	33 (830)	239 (6 063)
178 (4 510)	129 (3 267)	90 (2 287)	39 (980)	245 (6 213)
178 (4 510)	131 (3 317)	90 (2 287)	41 (1 030)	247 (6 263)
178 (4 510)	182 (4 617)	90 (2 287)	92 (2 330)	298 (7 563)
183 (4 660)	129 (3 267)	96 (2 437)	33 (830)	245 (6 213)
183 (4 660)	135 (3 417)	96 (2 437)	39 (980)	251 (6 363)
183 (4 660)	136 (3 467)	96 (2 437)	41 (1 030)	252 (6 413)
183 (4 660)	188 (4 767)	96 (2 437)	92 (2 330)	304 (7 713)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model CHU603 (6x4) — Pinnacle
Axle Forward
Dimensions/Configurations

Acceptable vehicle applications include:
on-highway, local pick-up and delivery, tanker, and refuse.

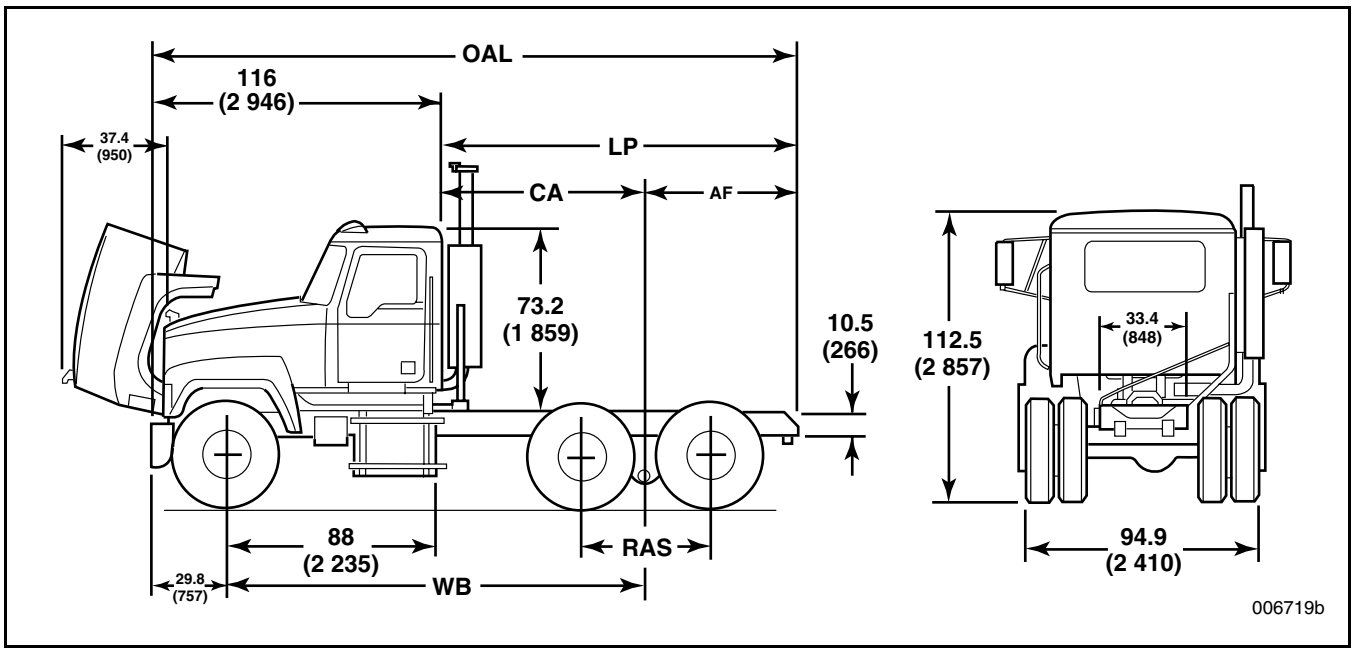


Figure 37 — CHU603 (6x4)

CHU603 (6X4)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
171 (4 345)	50 (1 270)	140 (3 552)	84 (2 122)	56 (1 430)	256 (6 498)
171 (4 345)	50 (1 270)	146 (3 702)	84 (2 122)	62 (1 580)	262 (6 648)
177 (4 495)	50 (1 270)	146 (3 702)	89 (2 272)	56 (1 430)	262 (6 648)
177 (4 495)	50 (1 270)	152 (3 852)	89 (2 272)	62 (1 580)	268 (6 798)
183 (4 645)	50 (1 270)	152 (3 852)	95 (2 422)	56 (1 430)	268 (6 798)
183 (4 645)	50 (1 270)	158 (4 002)	95 (2 422)	62 (1 580)	274 (6 948)
189 (4 795)	50 (1 270)	158 (4 002)	101 (2 572)	56 (1 430)	274 (6 948)
189 (4 795)	50 (1 270)	163 (4 152)	101 (2 572)	62 (1 580)	279 (7 098)
195 (4 945)	50 (1 270)	163 (4 152)	107 (2 722)	56 (1 430)	279 (7 098)
195 (4 945)	50 (1 270)	169 (4 302)	107 (2 722)	62 (1 580)	285 (7 248)
195 (4 945)	50 (1 270)	175 (4 452)	107 (2 722)	68 (1 730)	291 (7 398)
201 (5 095)	50 (1 270)	169 (4 302)	113 (2 872)	56 (1 430)	285 (7 248)
201 (5 095)	50 (1 270)	175 (4 452)	113 (2 872)	62 (1 580)	291 (7 398)
201 (5 095)	50 (1 270)	181 (4 602)	113 (2 872)	68 (1 730)	297 (7 548)
201 (5 095)	50 (1 270)	199 (5 052)	113 (2 872)	86 (2 180)	315 (7 998)
206 (5 245)	50 (1 270)	175 (4 452)	119 (3 022)	56 (1 430)	291 (7 398)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
206 (5 245)	50 (1 270)	181 (4 602)	119 (3 022)	62 (1 580)	297 (7 548)
206 (5 245)	50 (1 270)	187 (4 752)	119 (3 022)	68 (1 730)	303 (7 698)
206 (5 245)	50 (1 270)	211 (5 352)	119 (3 022)	92 (2 330)	327 (8 298)
212 (5 395)	50 (1 270)	181 (4 602)	125 (3 172)	56 (1 430)	297 (7 548)
212 (5 395)	50 (1 270)	187 (4 752)	125 (3 172)	62 (1 580)	303 (7 698)
212 (5 395)	50 (1 270)	193 (4 902)	125 (3 172)	68 (1 730)	309 (7 848)
212 (5 395)	50 (1 270)	199 (5 052)	125 (3 172)	74 (1 880)	315 (7 998)
218 (5 545)	50 (1 270)	187 (4 752)	131 (3 322)	56 (1 430)	303 (7 698)
218 (5 545)	50 (1 270)	193 (4 902)	131 (3 322)	62 (1 580)	309 (7 848)
218 (5 545)	50 (1 270)	199 (5 052)	131 (3 322)	68 (1 730)	315 (7 998)
224 (5 695)	50 (1 270)	193 (4 902)	137 (3 472)	56 (1 430)	309 (7 848)
224 (5 695)	50 (1 270)	199 (5 052)	137 (3 472)	62 (1 580)	315 (7 998)
224 (5 695)	50 (1 270)	205 (5 202)	137 (3 472)	68 (1 730)	321 (8 148)
154 (3 920)	52 (1 321)	123 (3 127)	67 (1 697)	56 (1 430)	239 (6 073)
154 (3 920)	52 (1 321)	129 (3 277)	67 (1 697)	62 (1 580)	245 (6 223)
160 (4 070)	52 (1 321)	129 (3 277)	73 (1 847)	56 (1 430)	245 (6 223)
160 (4 070)	52 (1 321)	135 (3 427)	73 (1 847)	62 (1 580)	251 (6 373)
166 (4 220)	52 (1 321)	135 (3 427)	79 (1 997)	56 (1 430)	251 (6 373)
166 (4 220)	52 (1 321)	141 (3 577)	79 (1 997)	62 (1 580)	257 (6 523)
172 (4 370)	52 (1 321)	141 (3 577)	85 (2 147)	56 (1 430)	257 (6 523)
172 (4 370)	52 (1 321)	147 (3 727)	85 (2 147)	62 (1 580)	263 (6 673)
178 (4 520)	52 (1 321)	147 (3 727)	90 (2 297)	56 (1 430)	263 (6 673)
178 (4 520)	52 (1 321)	153 (3 877)	90 (2 297)	62 (1 580)	269 (6 823)
184 (4 670)	52 (1 321)	153 (3 877)	96 (2 447)	56 (1 430)	269 (6 823)
184 (4 670)	52 (1 321)	159 (4 027)	96 (2 447)	62 (1 580)	275 (6 973)
190 (4 820)	52 (1 321)	159 (4 027)	102 (2 597)	56 (1 430)	275 (6 973)
190 (4 820)	52 (1 321)	164 (4 177)	102 (2 597)	62 (1 580)	280 (7 123)
196 (4 970)	52 (1 321)	164 (4 177)	108 (2 747)	56 (1 430)	280 (7 123)
196 (4 970)	52 (1 321)	170 (4 327)	108 (2 747)	62 (1 580)	286 (7 273)
196 (4 970)	52 (1 321)	176 (4 477)	108 (2 747)	68 (1 730)	292 (7 423)
202 (5 120)	52 (1 321)	170 (4 327)	114 (2 897)	56 (1 430)	286 (7 273)
202 (5 120)	52 (1 321)	176 (4 477)	114 (2 897)	62 (1 580)	292 (7 423)
202 (5 120)	52 (1 321)	182 (4 627)	114 (2 897)	68 (1 730)	298 (7 573)
202 (5 120)	52 (1 321)	200 (5 077)	114 (2 897)	86 (2 180)	316 (8 023)
207 (5 270)	52 (1 321)	176 (4 477)	120 (3 047)	56 (1 430)	292 (7 423)
207 (5 270)	52 (1 321)	182 (4 627)	120 (3 047)	62 (1 580)	298 (7 573)
207 (5 270)	52 (1 321)	188 (4 777)	120 (3 047)	68 (1 730)	304 (7 723)
207 (5 270)	52 (1 321)	212 (5 377)	120 (3 047)	92 (2 330)	328 (8 323)
213 (5 420)	52 (1 321)	182 (4 627)	126 (3 197)	56 (1 430)	298 (7 573)
213 (5 420)	52 (1 321)	188 (4 777)	126 (3 197)	62 (1 580)	304 (7 723)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
213 (5 420)	52 (1 321)	194 (4 927)	126 (3 197)	68 (1 730)	310 (7 873)
213 (5 420)	52 (1 321)	200 (5 077)	126 (3 197)	74 (1 880)	316 (8 023)
219 (5 570)	52 (1 321)	188 (4 777)	132 (3 347)	56 (1 430)	304 (7 723)
219 (5 570)	52 (1 321)	194 (4 927)	132 (3 347)	62 (1 580)	310 (7 873)
219 (5 570)	52 (1 321)	200 (5 077)	132 (3 347)	68 (1 730)	316 (8 023)
225 (5 720)	52 (1 321)	194 (4 927)	138 (3 497)	56 (1 430)	310 (7 873)
225 (5 720)	52 (1 321)	200 (5 077)	138 (3 497)	62 (1 580)	316 (8 023)
225 (5 720)	52 (1 321)	206 (5 277)	138 (3 497)	68 (1 730)	322 (8 223)
174 (4 410)	55 (1 397)	142 (3 617)	86 (2 187)	56 (1 430)	258 (6 563)
174 (4 410)	55 (1 397)	148 (3 767)	86 (2 187)	62 (1 580)	264 (6 713)
180 (4 560)	55 (1 397)	148 (3 767)	92 (2 337)	56 (1 430)	264 (6 713)
180 (4 560)	55 (1 397)	154 (3 917)	92 (2 337)	62 (1 580)	270 (6 863)
185 (4 710)	55 (1 397)	154 (3 917)	98 (2 487)	56 (1 430)	270 (6 863)
185 (4 710)	55 (1 397)	160 (4 067)	98 (2 487)	62 (1 580)	276 (7 013)
191 (4 860)	55 (1 397)	160 (4 067)	104 (2 637)	56 (1 430)	276 (7 013)
191 (4 860)	55 (1 397)	166 (4 217)	104 (2 637)	62 (1 580)	282 (7 163)
197 (5 010)	55 (1 397)	166 (4 217)	110 (2 787)	56 (1 430)	282 (7 163)
197 (5 010)	55 (1 397)	172 (4 367)	110 (2 787)	62 (1 580)	288 (7 313)
197 (5 010)	55 (1 397)	178 (4 517)	110 (2 787)	68 (1 730)	294 (7 463)
203 (5 160)	55 (1 397)	172 (4 367)	116 (2 937)	56 (1 430)	288 (7 313)
203 (5 160)	55 (1 397)	178 (4 517)	116 (2 937)	62 (1 580)	294 (7 463)
203 (5 160)	55 (1 397)	184 (4 667)	116 (2 937)	68 (1 730)	300 (7 613)
203 (5 160)	55 (1 397)	201 (5 117)	116 (2 937)	86 (2 180)	317 (8 063)
209 (5 310)	55 (1 397)	178 (4 517)	122 (3 087)	56 (1 430)	294 (7 463)
209 (5 310)	55 (1 397)	184 (4 667)	122 (3 087)	62 (1 580)	300 (7 613)
209 (5 310)	55 (1 397)	190 (4 817)	122 (3 087)	68 (1 730)	306 (7 763)
209 (5 310)	55 (1 397)	213 (5 417)	122 (3 087)	92 (2 330)	329 (8 363)
215 (5 460)	55 (1 397)	184 (4 667)	127 (3 237)	56 (1 430)	300 (7 613)
215 (5 460)	55 (1 397)	190 (4 817)	127 (3 237)	62 (1 580)	306 (7 763)
215 (5 460)	55 (1 397)	196 (4 967)	127 (3 237)	68 (1 730)	312 (7 913)
215 (5 460)	55 (1 397)	201 (5 117)	127 (3 237)	74 (1 880)	317 (8 063)
221 (5 610)	55 (1 397)	190 (4 817)	133 (3 387)	56 (1 430)	306 (7 763)
221 (5 610)	55 (1 397)	196 (4 967)	133 (3 387)	62 (1 580)	312 (7 913)
221 (5 610)	55 (1 397)	201 (5 117)	133 (3 387)	68 (1 730)	317 (8 063)
227 (5 760)	55 (1 397)	196 (4 967)	139 (3 537)	56 (1 430)	312 (7 913)
227 (5 760)	55 (1 397)	201 (5 117)	139 (3 537)	62 (1 580)	317 (8 063)
227 (5 760)	55 (1 397)	207 (5 267)	139 (3 537)	68 (1 730)	323 (8 213)
235 (5 970)	60 (1 524)	210 (5 327)	148 (3 747)	62 (1 580)	326 (8 273)
235 (5 970)	60 (1 524)	216 (5 477)	148 (3 747)	68 (1 730)	332 (8 423)
241 (6 120)	60 (1 524)	216 (5 477)	153 (3 897)	62 (1 580)	332 (8 423)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
241 (6 120)	60 (1 524)	222 (5 627)	153 (3 897)	68 (1 730)	338 (8 573)
247 (6 270)	60 (1 524)	222 (5 627)	159 (4 047)	62 (1 580)	338 (8 573)
247 (6 270)	60 (1 524)	227 (5 777)	159 (4 047)	68 (1 730)	343 (8 723)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model GU7 (6x4) — Granite Axle Forward Dimensions/Configurations

Acceptable vehicle applications include: on-highway, local pick-up and delivery, dump, mixer, refuse, municipal snow plow and equipment hauler.

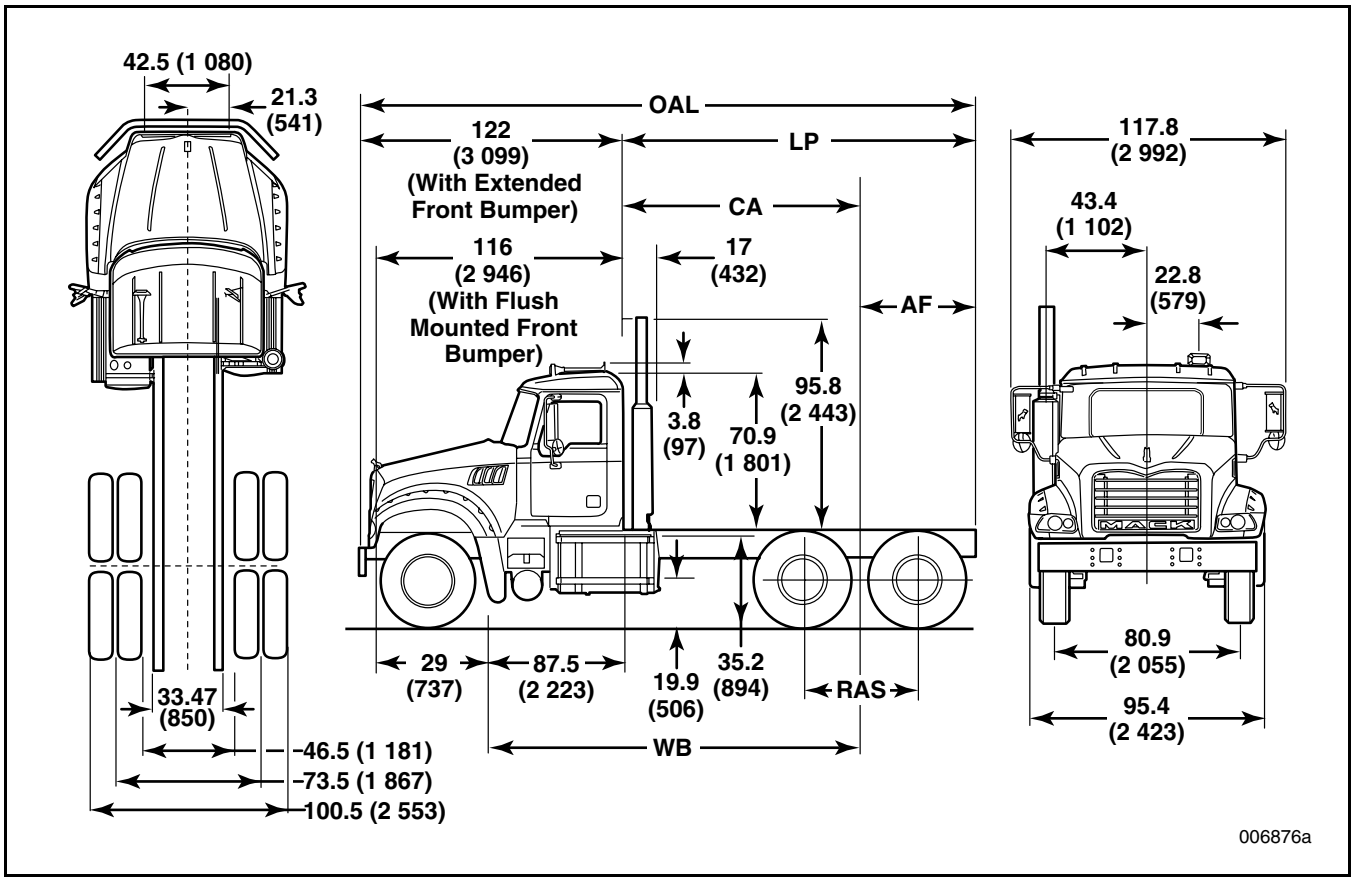


Figure 38 — GU7 (6x4)

GU7 (6X4) AXLE FORWARD

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
175 (4 445)	50 (1 270)	144 (3 652)	87 (2 222)	56 (1 430)	261 (6 611)
175 (4 445)	50 (1 270)	150 (3 802)	87 (2 222)	62 (1 580)	267 (6 761)
179 (4 545)	50 (1 270)	148 (3 752)	91 (2 322)	56 (1 430)	265 (6 711)
179 (4 545)	50 (1 270)	154 (3 902)	91 (2 322)	62 (1 580)	271 (6 861)
183 (4 645)	50 (1 270)	152 (3 852)	95 (2 422)	56 (1 430)	269 (6 811)
183 (4 645)	50 (1 270)	158 (4 002)	95 (2 422)	62 (1 580)	275 (6 961)
187 (4 745)	50 (1 270)	156 (3 952)	99 (2 522)	56 (1 430)	273 (6 911)
187 (4 745)	50 (1 270)	161 (4 102)	99 (2 522)	62 (1 580)	278 (7 061)
191 (4 845)	50 (1 270)	160 (4 052)	103 (2 622)	56 (1 430)	277 (7 011)
191 (4 845)	50 (1 270)	165 (4 202)	103 (2 622)	62 (1 580)	282 (7 161)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
195 (4 945)	50 (1 270)	163 (4 152)	107 (2 722)	56 (1 430)	280 (7 111)
195 (4 945)	50 (1 270)	169 (4 302)	107 (2 722)	62 (1 580)	286 (7 261)
199 (5 045)	50 (1 270)	167 (4 252)	111 (2 822)	56 (1 430)	284 (7 211)
199 (5 045)	50 (1 270)	173 (4 402)	111 (2 822)	62 (1 580)	290 (7 361)
203 (5 145)	50 (1 270)	171 (4 352)	115 (2 922)	56 (1 430)	288 (7 311)
203 (5 145)	50 (1 270)	177 (4 502)	115 (2 922)	62 (1 580)	294 (7 461)
203 (5 145)	50 (1 270)	193 (4 902)	115 (2 922)	78 (1 980)	310 (7 861)
206 (5 145)	50 (1 270)	175 (4 452)	119 (3 022)	56 (1 430)	292 (7 411)
206 (5 145)	50 (1 270)	181 (4 602)	119 (3 022)	62 (1 580)	298 (7 561)
206 (5 145)	50 (1 270)	193 (4 902)	119 (3 022)	74 (1 880)	310 (7 861)
206 (5 145)	50 (1 270)	205 (5 202)	119 (3 022)	86 (2 180)	322 (8 161)
210 (5 345)	50 (1 270)	179 (4 552)	123 (3 122)	56 (1 430)	296 (7 511)
210 (5 345)	50 (1 270)	185 (4 702)	123 (3 122)	62 (1 580)	302 (7 661)
210 (5 345)	50 (1 270)	205 (5 202)	123 (3 122)	82 (2 080)	322 (8 161)
214 (5 445)	50 (1 270)	183 (4 652)	127 (3 222)	56 (1 430)	300 (5 918)
214 (5 445)	50 (1 270)	189 (4 802)	127 (3 222)	62 (1 580)	306 (7 761)
214 (5 445)	50 (1 270)	205 (5 202)	127 (3 222)	78 (1 880)	322 (8 161)
214 (5 445)	50 (1 270)	221 (5 602)	127 (3 222)	94 (2 380)	338 (8 561)
218 (5 545)	50 (1 270)	189 (4 752)	131 (3 322)	56 (1 430)	304 (7 711)
218 (5 545)	50 (1 270)	193 (4 902)	131 (3 322)	62 (1 580)	310 (7 861)
218 (5 545)	50 (1 270)	221 (5 602)	131 (3 322)	90 (2 280)	338 (8 561)
222 (5 645)	50 (1 270)	191 (4 852)	135 (3 422)	56 (1 430)	308 (7 811)
222 (5 645)	50 (1 270)	197 (5 002)	135 (3 422)	62 (1 580)	314 (7 961)
222 (5 645)	50 (1 270)	205 (5 202)	135 (3 422)	70 (1 780)	322 (8 161)
222 (5 645)	50 (1 270)	221 (5 602)	135 (3 422)	86 (2 180)	338 (8 561)
226 (5 745)	50 (1 270)	195 (4 952)	139 (3 522)	56 (1 430)	312 (7 911)
226 (5 745)	50 (1 270)	201 (5 102)	139 (3 522)	62 (1 580)	318 (8 061)
226 (5 745)	50 (1 270)	221 (5 602)	139 (3 522)	82 (2 080)	338 (8 561)
230 (5 845)	50 (1 270)	199 (5 052)	143 (3 622)	56 (1 430)	316 (8 011)
230 (5 845)	50 (1 270)	205 (5 202)	143 (3 622)	62 (1 580)	322 (8 161)
230 (5 845)	50 (1 270)	221 (5 602)	143 (3 622)	78 (1 980)	338 (8 561)
234 (5 945)	50 (1 270)	203 (5 152)	147 (3 722)	56 (1 430)	320 (8 111)
234 (5 945)	50 (1 270)	209 (5 302)	147 (3 722)	62 (1 580)	326 (8 261)
234 (5 945)	50 (1 270)	221 (5 602)	147 (3 722)	74 (1 880)	338 (8 561)
238 (6 045)	50 (1 270)	207 (5 252)	150 (3 822)	56 (1 430)	324 (8 211)
238 (6 045)	50 (1 270)	213 (5 402)	150 (3 822)	62 (1 580)	330 (8 361)
238 (6 045)	50 (1 270)	221 (5 602)	150 (3 822)	70 (1 780)	338 (8 561)
238 (6 045)	50 (1 270)	240 (6 102)	150 (3 822)	90 (2 280)	357 (9 061)
242 (6 145)	50 (1 270)	211 (5 352)	154 (3 922)	56 (1 430)	328 (8 311)
242 (6 145)	50 (1 270)	217 (5 502)	154 (3 922)	62 (1 580)	334 (8 461)
242 (6 145)	50 (1 270)	240 (6 102)	154 (3 922)	86 (2 180)	357 (9 061)
246 (6 245)	50 (1 270)	215 (5 452)	158 (4 022)	56 (1 430)	332 (8 411)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
246 (6 245)	50 (1 270)	221 (5 602)	158 (4 022)	62 (1 580)	338 (8 561)
246 (6 245)	50 (1 270)	240 (6 102)	158 (4 022)	82 (2 080)	357 (9 061)
250 (6 345)	50 (1 270)	219 (5 552)	162 (4 122)	56 (1 430)	336 (8 511)
250 (6 345)	50 (1 270)	224 (5 702)	162 (4 122)	62 (1 580)	341 (8 661)
254 (6 445)	50 (1 270)	223 (5 652)	166 (4 222)	56 (1 430)	340 (8 611)
254 (6 445)	50 (1 270)	228 (5 802)	166 (4 222)	62 (1 580)	345 (8 761)
258 (6 545)	50 (1 270)	226 (5 752)	170 (4 322)	56 (1 430)	343 (8 711)
258 (6 545)	50 (1 270)	232 (5 902)	170 (4 322)	62 (1 580)	349 (8 861)
262 (6 645)	50 (1 270)	230 (5 852)	174 (4 422)	56 (1 430)	347 (8 811)
262 (6 645)	50 (1 270)	236 (6 002)	174 (4 422)	62 (1 580)	353 (8 961)
266 (6 745)	50 (1 270)	240 (6 102)	178 (4 522)	62 (1 580)	357 (9 061)
269 (6 845)	50 (1 270)	244 (6 202)	182 (4 622)	62 (1 580)	361 (9 161)
273 (6 945)	50 (1 270)	248 (6 302)	186 (4 722)	62 (1 580)	365 (9 261)
305 (7 745)	50 (1 270)	280 (7 102)	217 (5 522)	62 (1 580)	397 (10 061)
176 (4 470)	52 (1 321)	145 (3 677)	88 (2 247)	56 (1 430)	262 (6 636)
176 (4 470)	52 (1 321)	151 (3 827)	88 (2 247)	62 (1 580)	268 (6 786)
180 (4 570)	52 (1 321)	149 (3 777)	92 (2 347)	56 (1 430)	266 (6 736)
180 (4 570)	52 (1 321)	155 (3 927)	92 (2 347)	62 (1 580)	272 (6 886)
184 (4 670)	52 (1 321)	153 (3 877)	96 (2 447)	56 (1 430)	270 (6 836)
184 (4 670)	52 (1 321)	159 (4 027)	96 (2 447)	62 (1 580)	276 (6 986)
188 (4 770)	52 (1 321)	157 (3 977)	100 (2 547)	56 (1 430)	274 (6 936)
188 (4 770)	52 (1 321)	162 (4 127)	100 (2 547)	62 (1 580)	279 (7 086)
192 (4 870)	52 (1 321)	161 (4 077)	104 (2 647)	56 (1 430)	278 (7 036)
192 (4 870)	52 (1 321)	166 (4 277)	104 (2 647)	62 (1 580)	283 (7 236)
196 (4 970)	52 (1 321)	164 (4 177)	108 (2 747)	56 (1 430)	281 (7 136)
196 (4 970)	52 (1 321)	170 (4 327)	108 (2 747)	62 (1 580)	287 (7 286)
200 (5 070)	52 (1 321)	168 (4 277)	112 (2 847)	56 (1 430)	285 (7 236)
200 (5 070)	52 (1 321)	174 (4 427)	112 (2 847)	62 (1 580)	291 (7 386)
204 (5 170)	52 (1 321)	172 (4 377)	116 (2 947)	56 (1 430)	289 (7 336)
204 (5 170)	52 (1 321)	178 (4 527)	116 (2 947)	62 (1 580)	295 (7 486)
204 (5 170)	52 (1 321)	194 (4 927)	116 (2 947)	78 (1 980)	311 (7 886)
207 (5 270)	52 (1 321)	176 (4 477)	120 (3 047)	56 (1 430)	293 (7 436)
207 (5 270)	52 (1 321)	182 (4 627)	120 (3 047)	62 (1 580)	299 (7 586)
207 (5 270)	52 (1 321)	194 (4 927)	120 (3 047)	74 (1 880)	311 (7 886)
207 (5 270)	52 (1 321)	206 (5 227)	120 (3 047)	86 (2 180)	517 (8 186)
211 (5 370)	52 (1 321)	180 (4 577)	124 (3 147)	56 (1 430)	297 (7 536)
211 (5 370)	52 (1 321)	186 (4 727)	124 (3 147)	62 (1 580)	303 (7 686)
211 (5 370)	52 (1 321)	206 (5 227)	124 (3 147)	82 (2 080)	323 (8 186)
215 (5 470)	52 (1 321)	184 (4 677)	128 (3 247)	56 (1 430)	301 (7 636)
215 (5 470)	52 (1 321)	190 (4 827)	128 (3 247)	62 (1 580)	307 (7 786)
215 (5 470)	52 (1 321)	206 (5 227)	128 (3 247)	78 (1 980)	323 (8 186)
215 (5 470)	52 (1 321)	222 (5 627)	128 (3 247)	94 (2 380)	339 (8 586)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
219 (5 570)	52 (1 321)	188 (4 777)	132 (3 347)	56 (1 430)	305 (7 736)
219 (5 570)	52 (1 321)	194 (4 927)	132 (3 347)	62 (1 580)	311 (7 886)
219 (5 570)	52 (1 321)	222 (5 627)	132 (3 347)	90 (2 280)	339 (8 586)
223 (5 670)	52 (1 321)	192 (4 877)	136 (3 447)	56 (1 430)	309 (7 836)
223 (5 670)	52 (1 321)	198 (5 027)	136 (3 447)	62 (1 580)	315 (7 986)
223 (5 670)	52 (1 321)	206 (5 227)	136 (3 447)	70 (1 780)	323 (8 186)
223 (5 670)	52 (1 321)	222 (5 627)	136 (3 447)	86 (2 180)	339 (8 586)
227 (5 770)	52 (1 321)	196 (4 977)	140 (3 547)	56 (1 430)	313 (7 936)
227 (5 770)	52 (1 321)	202 (5 127)	140 (3 547)	62 (1 580)	319 (8 086)
227 (5 770)	52 (1 321)	222 (5 627)	140 (3 547)	82 (2 080)	339 (8 586)
231 (5 870)	52 (1 321)	200 (5 077)	144 (3 647)	56 (1 430)	317 (8 036)
231 (5 870)	52 (1 321)	206 (5 227)	144 (3 647)	62 (1 580)	323 (8 186)
231 (5 870)	52 (1 321)	222 (5 627)	144 (3 647)	78 (1 980)	339 (8 586)
235 (5 970)	52 (1 321)	204 (5 177)	148 (3 747)	56 (1 430)	321 (8 136)
235 (5 970)	52 (1 321)	210 (5 327)	148 (3 747)	62 (1 580)	327 (8 286)
235 (5 970)	52 (1 321)	222 (5 627)	148 (3 747)	74 (1 880)	339 (8 586)
239 (6 070)	52 (1 321)	208 (5 277)	151 (3 847)	56 (1 430)	325 (8 236)
239 (6 070)	52 (1 321)	214 (5 427)	151 (3 847)	62 (1 580)	331 (8 386)
239 (6 070)	52 (1 321)	222 (5 627)	151 (3 847)	70 (1 780)	339 (8 586)
239 (6 070)	52 (1 321)	241 (6 127)	151 (3 847)	90 (2 280)	358 (9 086)
243 (6 170)	52 (1 321)	212 (5 377)	155 (3 947)	56 (1 430)	329 (8 336)
243 (6 170)	52 (1 321)	218 (5 527)	155 (3 947)	62 (1 580)	335 (8 486)
243 (6 170)	52 (1 321)	241 (6 127)	155 (3 947)	86 (2 180)	358 (9 086)
247 (6 270)	52 (1 321)	216 (5 477)	159 (4 047)	56 (1 430)	333 (8 436)
247 (6 270)	52 (1 321)	222 (5 627)	159 (4 047)	62 (1 580)	339 (8 586)
247 (6 270)	52 (1 321)	241 (6 127)	159 (4 047)	82 (2 080)	358 (9 086)
249 (6 320)	52 (1 321)	243 (6 177)	161 (4 097)	82 (2 080)	360 (9 136)
251 (6 370)	52 (1 321)	220 (5 577)	163 (4 147)	56 (1 430)	337 (8 536)
251 (6 370)	52 (1 321)	225 (5727)	163 (4 147)	62 (1 580)	342 (8 686)
255 (6 470)	52 (1 321)	224 (5 677)	167 (4 247)	56 (1 430)	341 (8 636)
255 (6 470)	52 (1 321)	229 (5 827)	167 (4 247)	62 (1 580)	346 (8 786)
259 (6 570)	52 (1 321)	227 (5 777)	171 (4 347)	56 (1 430)	344 (8 736)
259 (6 570)	52 (1 321)	233 (5 927)	171 (4 347)	62 (1 580)	350 (8 886)
263 (6 670)	52 (1 321)	231 (5 877)	175 (4 447)	56 (1 430)	348 (8 836)
263 (6 670)	52 (1 321)	237 (6 027)	175 (4 447)	62 (1 580)	354 (8 986)
267 (6 770)	52 (1 321)	241 (6 127)	179 (4 547)	62 (1 580)	358 (9 086)
270 (6 870)	52 (1 321)	245 (6 227)	183 (4 647)	62 (1 580)	362 (9 186)
274 (6 970)	52 (1 321)	249 (6 327)	187 (4 747)	66 (1 680)	366 (9 286)
306 (7 770)	52 (1 321)	281 (7 127)	218 (5 547)	62 (1 580)	398 (10 086)
177 (4 495)	54 (1 372)	146 (3 702)	89 (2 272)	56 (1 430)	263 (6 661)
177 (4 495)	54 (1 372)	152 (3 852)	89 (2 272)	62 (1 580)	269 (6 811)
181 (4 595)	54 (1 372)	150 (3 802)	93 (2 372)	56 (1 430)	267 (6 761)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
181 (4 595)	54 (1 372)	156 (3 952)	93 (2 372)	62 (1 580)	273 (6 911)
185 (4 695)	54 (1 372)	154 (3 902)	97 (2 472)	56 (1 430)	271 (6 861)
185 (4 695)	54 (1 372)	160 (4 052)	97 (2 472)	62 (1 580)	277 (7 011)
189 (4 795)	54 (1 372)	158 (4 002)	101 (2 572)	56 (1 430)	275 (6 961)
189 (4 795)	54 (1 372)	163 (4 152)	101 (2 572)	62 (1 580)	280 (7 111)
193 (4 895)	54 (1 372)	161 (4 102)	105 (2 672)	56 (1 430)	278 (7 061)
193 (4 895)	54 (1 372)	167 (4 252)	105 (2 672)	62 (1 580)	284 (7 211)
197 (4 995)	54 (1 372)	165 (4 202)	109 (2 772)	56 (1 430)	282 (7 161)
197 (4 995)	54 (1 372)	171 (4 352)	109 (2 772)	62 (1 580)	288 (7 311)
201 (5 095)	54 (1 372)	169 (4 302)	113 (2 872)	56 (1 430)	286 (7 261)
201 (5 095)	54 (1 372)	175 (4 452)	113 (2 872)	62 (1 580)	292 (7 411)
205 (5 195)	54 (1 372)	173 (4 402)	117 (2 972)	56 (1 430)	290 (7 361)
205 (5 195)	54 (1 372)	179 (4 552)	117 (2 972)	62 (1 580)	296 (7 511)
205 (5 195)	54 (1 372)	195 (4 952)	117 (2 972)	78 (1 980)	312 (7 911)
208 (5 295)	54 (1 372)	177 (4 502)	121 (3 072)	56 (1 430)	294 (7 461)
208 (5 295)	54 (1 372)	183 (4 652)	121 (3 072)	62 (1 580)	300 (7 611)
208 (5 295)	54 (1 372)	195 (4 952)	121 (3 072)	74 (1 880)	312 (7 911)
208 (5 295)	54 (1 372)	207 (5 252)	121 (3 072)	86 (2 180)	324 (8 211)
212 (5 395)	54 (1 372)	181 (4 602)	125 (3 172)	56 (1 430)	298 (7 561)
212 (5 395)	54 (1 372)	187 (4 752)	125 (3 172)	62 (1 580)	304 (7 711)
212 (5 395)	54 (1 372)	207 (5 252)	125 (3 172)	82 (2 080)	324 (8 211)
216 (5 495)	54 (1 372)	185 (4 702)	129 (3 272)	56 (1 430)	302 (7 661)
216 (5 495)	54 (1 372)	191 (4 852)	129 (3 272)	62 (1 580)	308 (7 811)
216 (5 495)	54 (1 372)	207 (5 252)	129 (3 272)	78 (1 980)	324 (8 211)
216 (5 495)	54 (1 372)	223 (5 652)	129 (3 272)	94 (2 380)	340 (8 611)
220 (5 595)	54 (1 372)	189 (4 802)	133 (3 372)	56 (1 430)	306 (7 761)
220 (5 595)	54 (1 372)	195 (4 952)	133 (3 372)	62 (1 580)	312 (7 911)
220 (5 595)	54 (1 372)	223 (5 652)	133 (3 372)	90 (2 280)	340 (8 611)
224 (5 695)	54 (1 372)	193 (4 902)	137 (3 472)	56 (1 430)	310 (7 861)
224 (5 695)	54 (1 372)	199 (5 052)	137 (3 472)	62 (1 580)	316 (8 011)
224 (5 695)	54 (1 372)	207 (5 252)	137 (3 472)	70 (1 780)	324 (8 211)
224 (5 695)	54 (1 372)	223 (5 652)	137 (3 472)	86 (2 180)	340 (8 611)
228 (5 795)	54 (1 372)	197 (5 002)	141 (3 572)	56 (1 430)	314 (7 961)
228 (5 795)	54 (1 372)	203 (5 152)	141 (3 572)	62 (1 580)	320 (8 111)
228 (5 795)	54 (1 372)	223 (5 652)	141 (3 572)	82 (2 080)	340 (8 611)
232 (5 895)	54 (1 372)	201 (5 102)	145 (3 672)	56 (1 430)	318 (8 061)
232 (5 895)	54 (1 372)	207 (5 252)	145 (3 672)	62 (1 580)	324 (8 211)
232 (5 895)	54 (1 372)	223 (5 652)	145 (3 672)	78 (1 980)	340 (8 611)
236 (5 995)	54 (1 372)	205 (5 202)	149 (3 772)	56 (1 430)	322 (8 161)
236 (5 995)	54 (1 372)	211 (5 352)	149 (3 772)	62 (1 580)	328 (8 311)
236 (5 995)	54 (1 372)	223 (5 652)	149 (3 772)	74 (1 880)	340 (8 611)
240 (6 095)	54 (1 372)	209 (5 302)	152 (3 872)	56 (1 430)	326 (8 261)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
240 (6 095)	54 (1 372)	215 (5 452)	152 (3 872)	62 (1 580)	332 (8 411)
240 (6 095)	54 (1 372)	223 (5 652)	152 (3 872)	70 (1 780)	340 (8 611)
240 (6 095)	54 (1 372)	242 (6 152)	152 (3 872)	90 (2 280)	359 (9 111)
244 (6 195)	54 (1 372)	213 (5 402)	156 (3 972)	56 (1 430)	330 (8 361)
244 (6 195)	54 (1 372)	219 (5 552)	156 (3 972)	62 (1 580)	336 (8 511)
244 (6 195)	54 (1 372)	242 (6 152)	156 (3 972)	86 (2 180)	359 (9 111)
248 (6 295)	54 (1 372)	217 (5 502)	160 (4 072)	56 (1 430)	334 (8 461)
248 (6 295)	54 (1 372)	223 (5 652)	160 (4 072)	62 (1 580)	340 (8 611)
248 (6 295)	54 (1 372)	242 (6 152)	160 (4 072)	82 (2 080)	359 (9 111)
252 (6 395)	54 (1 372)	221 (5 602)	164 (4 172)	56 (1 430)	338 (8 561)
252 (6 395)	54 (1 372)	226 (5 752)	164 (4 172)	62 (1 580)	343 (8 711)
256 (6 495)	54 (1 372)	224 (5 702)	168 (4 272)	56 (1 430)	341 (8 661)
256 (6 495)	54 (1 372)	230 (5 852)	168 (4 272)	62 (1 580)	347 (8 811)
260 (6 595)	54 (1 372)	228 (5 802)	172 (4 372)	56 (1 430)	345 (8 761)
260 (6 595)	54 (1 372)	234 (5 952)	172 (4 372)	62 (1 580)	351 (8 911)
264 (6 695)	54 (1 372)	232 (5 902)	176 (4 472)	56 (1 430)	349 (8 861)
264 (6 695)	54 (1 372)	238 (6 052)	176 (4 472)	62 (1 580)	355 (9 011)
268 (6 795)	54 (1 372)	242 (6 152)	180 (4 572)	62 (1 580)	359 (9 111)
271 (6 895)	54 (1 372)	246 (6 252)	184 (4 672)	62 (1 580)	363 (9 211)
275 (6 995)	54 (1 372)	250 (6 352)	188 (4 772)	62 (1 580)	367 (9 311)
307 (7 795)	54 (1 372)	282 (7 152)	219 (5 572)	62 (1 580)	399 (10 111)
178 (4 510)	55 (1 397)	146 (3 717)	90 (2 287)	56 (1 430)	263 (6 676)
178 (4 510)	55 (1 397)	152 (3 867)	90 (2 287)	62 (1 580)	269 (6 826)
181 (4 610)	55 (1 397)	150 (3 817)	94 (2 387)	56 (1 430)	267 (6 776)
181 (4 610)	55 (1 397)	156 (3 967)	94 (2 387)	62 (1 580)	273 (6 926)
185 (4 710)	55 (1 397)	154 (3 917)	98 (2 487)	56 (1 430)	271 (6 876)
185 (4 710)	55 (1 397)	160 (2 487)	98 (2 487)	62 (1 580)	277 (7 026)
189 (4 810)	55 (1 397)	158 (4 017)	102 (2 587)	56 (1 430)	275 (6 976)
189 (4 810)	55 (1 397)	164 (4 167)	102 (2 587)	62 (1 580)	281 (7 126)
193 (4 910)	55 (1 397)	162 (4 117)	106 (2 687)	56 (1 430)	279 (7 076)
193 (4 910)	55 (1 397)	168 (4 267)	106 (2 687)	62 (1 580)	285 (7 226)
197 (5 010)	55 (1 397)	166 (4 217)	110 (2 787)	56 (1 430)	283 (7 176)
197 (5 010)	55 (1 397)	172 (4 367)	110 (2 787)	62 (1 580)	289 (7 326)
201 (5 110)	55 (1 397)	170 (4 317)	114 (2 887)	56 (1 430)	287 (7 276)
201 (5 110)	55 (1 397)	176 (4 467)	114 (2 887)	62 (1 580)	293 (7 426)
205 (5 210)	55 (1 397)	174 (4 417)	118 (2 987)	56 (1 430)	291 (7 376)
205 (5 210)	55 (1 397)	180 (4 567)	118 (2 987)	62 (1 580)	297 (7 526)
205 (5 210)	55 (1 397)	196 (4 967)	118 (2 987)	78 (1 980)	313 (7 926)
209 (5 310)	55 (1 397)	178 (4 517)	122 (3 087)	56 (1 430)	295 (7 476)
209 (5 310)	55 (1 397)	184 (4 667)	122 (3 087)	62 (1 580)	301 (7 627)
209 (5 310)	55 (1 397)	196 (4 967)	122 (3 087)	74 (1 880)	313 (7 926)
209 (5 310)	55 (1 397)	207 (5 267)	122 (3 087)	86 (2 180)	324 (8 226)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
213 (5 410)	55 (1 397)	182 (4 617)	125 (3 187)	56 (1 430)	299 (7 576)
213 (5 410)	55 (1 397)	188 (4 767)	125 (3 187)	62 (1 580)	305 (7 726)
213 (5 410)	55 (1 397)	207 (5 267)	125 (3 187)	82 (2 080)	324 (8 226)
217 (5 510)	55 (1 397)	186 (4 717)	129 (3 287)	56 (1 430)	303 (7 676)
217 (5 510)	55 (1 397)	192 (4 867)	129 (3 287)	62 (1 580)	309 (7 826)
217 (5 510)	55 (1 397)	207 (5 267)	129 (3 287)	78 (1 980)	324 (8 226)
217 (5 510)	55 (1 397)	223 (5 667)	129 (3 287)	94 (2 380)	340 (8 626)
221 (5 610)	55 (1 397)	190 (4 817)	133 (3 387)	56 (1 430)	307 (7 776)
221 (5 610)	55 (1 397)	196 (4 967)	133 (3 387)	62 (1 580)	313 (7 926)
221 (5 610)	55 (1 397)	223 (5 667)	133 (3 387)	90 (2 280)	340 (8 626)
225 (5 710)	55 (1 397)	194 (4 917)	137 (3 487)	56 (1 430)	311 (7 876)
225 (5 710)	55 (1 397)	199 (5 067)	137 (3 487)	62 (1 580)	316 (8 026)
225 (5 710)	55 (1 397)	207 (5 267)	137 (3 487)	70 (1 780)	324 (8 226)
225 (5 710)	55 (1 397)	223 (5 667)	137 (3 487)	80 (2 180)	340 (8 626)
229 (5 810)	55 (1 397)	198 (5 017)	141 (3 587)	56 (1 430)	315 (7 976)
229 (5 810)	55 (1 397)	203 (5 167)	141 (3 587)	62 (1 580)	320 (8 126)
229 (5 810)	55 (1 397)	223 (5 667)	141 (3 587)	82 (2 080)	340 (8 626)
233 (5 910)	55 (1 397)	201 (5 117)	145 (3 687)	56 (1 430)	318 (8 076)
233 (5 910)	55 (1 397)	207 (5 267)	145 (3 687)	62 (1 580)	324 (8 226)
233 (5 910)	55 (1 397)	223 (5 667)	145 (3 687)	78 (1 980)	340 (8 626)
237 (6 010)	55 (1 397)	205 (5 217)	149 (3 787)	56 (1 430)	322 (8 176)
237 (6 010)	55 (1 397)	211 (5 367)	149 (3 787)	62 (1 580)	328 (8 326)
237 (6 010)	55 (1 397)	223 (5 667)	149 (3 787)	74 (1 880)	340 (8 626)
241 (6 110)	55 (1 397)	209 (5 317)	153 (3 887)	56 (1 430)	326 (8 276)
241 (6 110)	55 (1 397)	215 (5 467)	153 (3 887)	62 (1 580)	332 (8 426)
241 (6 110)	55 (1 397)	223 (5 667)	153 (3 887)	70 (1 780)	340 (8 626)
241 (6 110)	55 (1 397)	243 (6 167)	153 (3 887)	90 (2 280)	360 (9 126)
244 (6 210)	55 (1 397)	213 (5 417)	157 (3 987)	56 (1 430)	330 (8 376)
244 (6 210)	55 (1 397)	219 (5 567)	157 (3 987)	62 (1 580)	336 (8 526)
244 (6 210)	55 (1 397)	243 (6 167)	157 (3 987)	86 (2 180)	360 (9 126)
248 (6 310)	55 (1 397)	217 (5 517)	161 (4 087)	56 (1 430)	334 (8 476)
248 (6 310)	55 (1 397)	223 (5 667)	161 (4 087)	62 (1 580)	340 (8 626)
248 (6 310)	55 (1 397)	243 (6 167)	161 (4 087)	82 (2 080)	360 (9 126)
252 (6 410)	55 (1 397)	221 (5 617)	165 (4 187)	56 (1 430)	338 (8 576)
252 (6 410)	55 (1 397)	227 (5 767)	165 (4 187)	62 (1 580)	344 (8 726)
256 (6 510)	55 (1 397)	225 (5 717)	169 (4 287)	56 (1 430)	342 (8 676)
256 (6 510)	55 (1 397)	231 (5 867)	169 (4 287)	62 (1 580)	387 (8 826)
260 (6 610)	55 (1 397)	229 (5 817)	173 (4 387)	56 (1 430)	346 (8 776)
260 (6 610)	55 (1 397)	235 (5 967)	173 (4 387)	62 (1 580)	352 (8 926)
264 (6 710)	55 (1 397)	233 (5 917)	177 (4 487)	56 (1 430)	350 (8 876)
264 (6 710)	55 (1 397)	239 (6 067)	177 (4 487)	62 (1 580)	356 (9 026)
268 (6 810)	55 (1 397)	243 (6 167)	181 (4 587)	62 (1 580)	360 (9 126)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
272 (6 910)	55 (1 397)	247 (6 267)	185 (4 687)	62 (1 580)	364 (9 226)
276 (7 010)	55 (1 397)	251 (6 367)	188 (4 787)	62 (1 580)	368 (9 326)
307 (7 810)	55 (1 397)	282 (7 167)	220 (5 587)	62 (1 580)	399 (10 126)
187 (4 745)	58 (1 472)	156 (3 952)	99 (2 522)	56 (1 430)	273 (6 911)
187 (4 745)	58 (1 472)	161 (4 102)	99 (2 522)	62 (1 580)	278 (7 061)
191 (4 845)	58 (1 472)	160 (4 052)	103 (2 622)	56 (1 430)	277 (7 011)
191 (4 845)	58 (1 472)	165 (4 202)	103 (2 622)	62 (1 580)	282 (7 161)
195 (4 945)	58 (1 472)	163 (4 152)	107 (2 722)	56 (1 430)	280 (7 111)
195 (4 945)	58 (1 472)	169 (4 302)	107 (2 722)	62 (1 580)	286 (7 261)
199 (5 045)	58 (1 472)	167 (4 252)	111 (2 822)	56 (1 430)	284 (7 211)
199 (5 045)	58 (1 472)	173 (4 402)	111 (2 822)	62 (1 580)	290 (7 361)
203 (5 145)	58 (1 472)	171 (4 352)	115 (2 922)	56 (1 430)	288 (7 311)
203 (5 145)	58 (1 472)	177 (4 502)	115 (2 922)	62 (1 580)	294 (7 461)
203 (5 145)	58 (1 472)	193 (4 902)	115 (2 922)	78 (1 980)	310 (7 861)
206 (5 245)	58 (1 472)	175 (4 452)	119 (3 022)	56 (1 430)	292 (7 411)
206 (5 245)	58 (1 472)	181 (4 602)	119 (3 022)	62 (1 580)	298 (7 561)
206 (5 245)	58 (1 472)	193 (4 902)	119 (3 022)	74 (1 880)	310 (7 861)
206 (5 245)	58 (1 472)	205 (5 202)	119 (3 022)	86 (2 180)	322 (8 161)
210 (5 345)	58 (1 472)	179 (4 552)	123 (3 122)	56 (1 430)	296 (7 511)
210 (5 345)	58 (1 472)	185 (4 702)	123 (3 122)	62 (1 580)	302 (7 661)
210 (5 345)	58 (1 472)	205 (5 202)	123 (3 122)	82 (2 080)	322 (8 161)
214 (5 445)	58 (1 472)	183 (4 652)	127 (3 222)	56 (1 430)	300 (7 611)
214 (5 445)	58 (1 472)	189 (4 802)	127 (3 222)	62 (1 580)	306 (7 761)
214 (5 445)	58 (1 472)	205 (5 202)	127 (3 222)	78 (1 980)	322 (8 161)
214 (5 445)	58 (1 472)	221 (5 602)	127 (3 222)	94 (2 380)	338 (8 561)
218 (5 545)	58 (1 472)	187 (4 752)	131 (3 322)	56 (1 430)	304 (7 711)
218 (5 545)	58 (1 472)	193 (4 902)	131 (3 322)	62 (1 580)	310 (7 861)
218 (5 545)	58 (1 472)	221 (5 602)	131 (3 322)	90 (2 280)	338 (8 561)
222 (5 645)	58 (1 472)	191 (4 852)	135 (3 422)	56 (1 430)	308 (7 811)
222 (5 645)	58 (1 472)	197 (5 002)	135 (3 422)	62 (1 580)	314 (7 961)
222 (5 645)	58 (1 472)	205 (5 202)	135 (3 422)	70 (1 180)	322 (8 161)
222 (5 645)	58 (1 472)	221 (5 602)	135 (3 422)	86 (2 180)	338 (8 561)
226 (5 745)	58 (1 472)	195 (4 952)	139 (3 522)	56 (1 430)	312 (7 911)
226 (5 745)	58 (1 472)	201 (5 102)	139 (3 522)	62 (1 580)	318 (8 061)
226 (5 745)	58 (1 472)	221 (5 602)	139 (3 522)	82 (2 080)	338 (8 561)
230 (5 845)	58 (1 472)	199 (5 052)	143 (3 622)	56 (1 430)	316 (8 011)
230 (5 845)	58 (1 472)	205 (5 202)	143 (3 622)	62 (1 580)	322 (8 161)
230 (5 845)	58 (1 472)	221 (5 602)	143 (3 622)	78 (1 980)	338 (8 561)
234 (5 945)	58 (1 472)	203 (5 152)	147 (3 722)	56 (1 430)	320 (8 111)
234 (5 945)	58 (1 472)	209 (5 302)	147 (3 722)	62 (1 580)	326 (8 261)
234 (5 945)	58 (1 472)	221 (5 602)	147 (3 722)	74 (1 880)	338 (8 561)
238 (6 045)	58 (1 472)	207 (5 252)	150 (3 822)	56 (1 430)	325 (8 211)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
238 (6 045)	58 (1 472)	213 (5 402)	150 (3 822)	62 (1 580)	330 (8 361)
238 (6 045)	58 (1 472)	221 (5 602)	150 (3 822)	70 (1 780)	338 (8 561)
238 (6 045)	58 (1 472)	240 (6 102)	150 (3 822)	90 (2 280)	357 (9 061)
242 (6 145)	58 (1 472)	211 (5 352)	154 (3 922)	56 (1 430)	328 (8 311)
242 (6 145)	58 (1 472)	217 (5 502)	154 (3 922)	62 (1 580)	334 (8 461)
242 (6 145)	58 (1 472)	240 (6 102)	154 (3 922)	86 (2 180)	357 (9 061)
246 (6 245)	58 (1 472)	215 (5 452)	158 (4 022)	56 (1 430)	332 (8 411)
246 (6 245)	58 (1 472)	221 (5 602)	158 (4 022)	62 (1 580)	338 (8 561)
246 (6 245)	58 (1 472)	240 (6 102)	158 (4 022)	82 (2 080)	357 (9 061)
250 (6 345)	58 (1 472)	219 (5 552)	162 (4 122)	56 (1 430)	336 (8 511)
250 (6 345)	58 (1 472)	224 (5 702)	162 (4 122)	62 (1 580)	341 (8 661)
254 (6 445)	58 (1 472)	223 (5 652)	166 (4 222)	56 (1 430)	340 (8 611)
254 (6 445)	58 (1 472)	228 (5 802)	166 (4 222)	62 (1 580)	345 (8 761)
258 (6 545)	58 (1 472)	226 (5 752)	170 (4 322)	56 (1 430)	343 (8 711)
258 (6 545)	58 (1 472)	232 (5 902)	170 (4 322)	62 (1 580)	349 (8 861)
262 (6 645)	58 (1 472)	230 (5 852)	174 (4 422)	56 (1 430)	347 (8 811)
262 (6 645)	58 (1 472)	236 (6 002)	174 (4 422)	62 (1 580)	353 (8 961)
266 (6 745)	58 (1 472)	240 (6 102)	178 (4 522)	62 (1 580)	357 (9 061)
269 (6 845)	58 (1 472)	244 (6 202)	182 (4 622)	62 (1 580)	361 (9 161)
273 (6 945)	58 (1 472)	248 (6 302)	186 (4 722)	62 (1 580)	365 (9 261)
285 (7 245)	58 (1 472)	260 (6 602)	198 (5 022)	62 (1 580)	377 (9 561)
325 (8 245)	58 (1 472)	299 (7 602)	237 (6 022)	62 (1 580)	416 (10 561)
176 (4 470)	60 (1 524)	145 (3 677)	88 (2 247)	56 (1 430)	262 (6 636)
176 (4 470)	60 (1 524)	151 (3 827)	88 (2 247)	62 (1 580)	268 (6 786)
180 (4 570)	60 (1 524)	149 (3 777)	92 (2 347)	56 (1 430)	266 (6 730)
180 (4 570)	60 (1 524)	155 (3 927)	92 (2 347)	62 (1 580)	272 (6 886)
184 (4 670)	60 (1 524)	153 (3 877)	96 (2 447)	56 (1 430)	270 (6 836)
184 (4 670)	60 (1 524)	159 (4 027)	96 (2 447)	62 (1 580)	276 (6 986)
188 (4 770)	60 (1 524)	157 (3 977)	100 (2 547)	56 (1 430)	274 (6 936)
188 (4 770)	60 (1 524)	162 (4 127)	100 (2 547)	62 (1 580)	279 (7 086)
192 (4 870)	60 (1 524)	161 (4 077)	104 (2 647)	56 (1 430)	278 (7 036)
192 (4 870)	60 (1 524)	166 (4 227)	104 (2 647)	62 (1 580)	283 (7 186)
196 (4 970)	60 (1 524)	164 (4 177)	108 (2 747)	56 (1 430)	281 (7 136)
196 (4 970)	60 (1 524)	170 (4 327)	108 (2 747)	62 (1 580)	287 (7 286)
200 (5 070)	60 (1 524)	168 (4 277)	112 (2 847)	56 (1 430)	285 (7 236)
200 (5 070)	60 (1 524)	174 (4 427)	112 (2 847)	62 (1 580)	291 (7 386)
204 (5 170)	60 (1 524)	172 (4 377)	116 (2 947)	56 (1 430)	289 (7 336)
204 (5 170)	60 (1 524)	178 (4 527)	116 (2 947)	62 (1 580)	295 (7 486)
204 (5 170)	60 (1 524)	194 (4 927)	116 (2 947)	78 (1 980)	311 (7 886)
207 (5 270)	60 (1 524)	176 (4 471)	120 (3 047)	56 (1 430)	293 (7 436)
207 (5 270)	60 (1 524)	182 (4 627)	120 (3 047)	62 (1 580)	299 (7 586)
207 (5 270)	60 (1 524)	194 (4 927)	120 (3 047)	74 (1 880)	311 (7 886)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
207 (5 270)	60 (1 524)	206 (5 227)	120 (3 047)	86 (2 180)	323 (8 186)
211 (5 370)	60 (1 524)	180 (4 577)	124 (3 147)	56 (1 430)	297 (7 536)
211 (5 370)	60 (1 524)	186 (4 727)	124 (3 147)	62 (1 580)	303 (7 686)
211 (5 370)	60 (1 524)	206 (5 227)	124 (3 147)	82 (2 080)	323 (8 186)
215 (5 470)	60 (1 524)	184 (4 667)	128 (3 247)	56 (1 430)	301 (7 626)
215 (5 470)	60 (1 524)	190 (4 827)	128 (3 247)	62 (1 580)	307 (7 786)
215 (5 470)	60 (1 524)	206 (5 227)	128 (3 247)	78 (1 980)	323 (8 186)
215 (5 470)	60 (1 524)	222 (5 627)	128 (3 247)	94 (2 380)	339 (8 586)
219 (5 570)	60 (1 524)	188 (4 777)	132 (3 347)	56 (1 430)	305 (7 736)
219 (5 570)	60 (1 524)	194 (4 927)	132 (3 347)	62 (1 580)	311 (7 886)
219 (5 570)	60 (1 524)	222 (5 627)	132 (3 347)	90 (2 280)	339 (8 586)
223 (5 670)	60 (1 524)	192 (4 877)	136 (3 447)	56 (1 430)	309 (7 836)
223 (5 670)	60 (1 524)	198 (5 027)	136 (3 447)	62 (1 580)	315 (7 986)
223 (5 670)	60 (1 524)	206 (5 227)	136 (3 447)	70 (1 780)	323 (8 186)
223 (5 670)	60 (1 524)	222 (5 627)	136 (3 447)	86 (2 180)	339 (8 586)
227 (5 770)	60 (1 524)	196 (4 977)	140 (3 547)	56 (1 430)	313 (7 936)
227 (5 770)	60 (1 524)	202 (5 127)	140 (3 547)	62 (1 580)	319 (8 086)
227 (5 770)	60 (1 524)	222 (5 627)	140 (3 547)	82 (2 080)	339 (8 586)
231 (5 870)	60 (1 524)	200 (5 077)	144 (3 647)	56 (1 430)	317 (8 036)
231 (5 870)	60 (1 524)	206 (5 227)	144 (3 647)	62 (1 580)	323 (8 186)
231 (5 870)	60 (1 524)	222 (5 627)	144 (3 647)	78 (1 980)	339 (8 586)
235 (5 970)	60 (1 524)	204 (5 177)	148 (3 747)	56 (1 430)	321 (8 136)
235 (5 970)	60 (1 524)	210 (5 327)	148 (3 747)	62 (1 580)	327 (8 286)
235 (5 970)	60 (1 524)	222 (5 627)	148 (3 747)	74 (1 880)	339 (8 586)
239 (6 070)	60 (1 524)	208 (5 277)	151 (3 847)	56 (1 430)	325 (8 236)
239 (6 070)	60 (1 524)	214 (5 427)	151 (3 847)	62 (1 580)	331 (8 386)
239 (6 070)	60 (1 524)	222 (5 627)	151 (3 847)	70 (1 780)	339 (8 586)
239 (6 070)	60 (1 524)	241 (6 127)	151 (3 847)	90 (2 280)	358 (9 086)
243 (6 170)	60 (1 524)	212 (5 377)	155 (3 947)	56 (1 430)	329 (8 336)
243 (6 170)	60 (1 524)	218 (5 527)	155 (3 947)	62 (1 580)	335 (8 486)
243 (6 170)	60 (1 524)	241 (6 127)	155 (3 947)	86 (2 180)	358 (9 086)
247 (6 270)	60 (1 524)	216 (5 477)	159 (4 047)	56 (1 430)	333 (8 436)
247 (6 270)	60 (1 524)	222 (5 627)	159 (4 047)	62 (1 580)	339 (8 586)
247 (6 270)	60 (1 524)	241 (6 127)	159 (4 047)	82 (2 180)	358 (9 086)
251 (6 370)	60 (1 524)	220 (5 577)	163 (4 147)	56 (1 430)	337 (8 536)
251 (6 370)	60 (1 524)	225 (5 727)	163 (4 147)	62 (1 580)	342 (8 686)
255 (6 470)	60 (1 524)	224 (5 677)	167 (4 247)	56 (1 430)	341 (8 636)
255 (6 470)	60 (1 524)	229 (5 827)	167 (4 247)	62 (1 580)	346 (8 786)
259 (6 570)	60 (1 524)	227 (5 777)	171 (4 347)	56 (1 430)	344 (8 736)
259 (6 570)	60 (1 524)	233 (5 927)	171 (4 347)	62 (1 580)	350 (8 886)
263 (6 670)	60 (1 524)	231 (5 877)	175 (4 447)	56 (1 430)	348 (8 836)
263 (6 670)	60 (1 524)	237 (6 027)	175 (4 447)	62 (1 580)	354 (8 986)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
267 (6 770)	60 (1 524)	241 (6 127)	179 (4 547)	62 (1 580)	358 (9 086)
270 (6 870)	60 (1 524)	245 (6 227)	183 (4 647)	62 (1 580)	362 (9 186)
274 (6 970)	60 (1 524)	249 (6 327)	187 (4 747)	62 (1 580)	366 (9 286)
286 (7 270)	60 (1 524)	261 (6 627)	199 (5 047)	62 (1 580)	378 (9 586)
326 (8 270)	60 (1 524)	300 (7 627)	238 (6 047)	62 (1 580)	417 (10 586)
221 (5 620)	72/72.5 (1 829/1 842)	224 (5 677)	134 (3 397)	90 (2 280)	341 (8 636)
225 (5 720)	72/72.5 (1 829/1 842)	208 (5 277)	138 (3 497)	70 (1 780)	325 (8 236)
225 (5 720)	72/72.5 (1 829/1 842)	224 (5 677)	138 (3 497)	86 (2 180)	341 (8 636)
229 (5 820)	72/72.5 (1 829/1 842)	224 (5 677)	142 (3 597)	82 (2 080)	341 (8 636)
233 (5 920)	72/72.5 (1 829/1 842)	224 (5 677)	146 (3 697)	78 (1 980)	341 (8 636)
237 (6 020)	72/72.5 (1 829/1 842)	224 (5 677)	149 (3 797)	74 (1 880)	341 (8 636)
241 (6 120)	72/72.5 (1 829/1 842)	224 (5 677)	153 (3 897)	70 (1 780)	341 (8 636)
241 (6 120)	72/72.5 (1 829/1 842)	243 (6 177)	153 (3 897)	90 (2 280)	360 (9 136)
245 (6 220)	72/72.5 (1 829/1 842)	243 (6 177)	157 (3 997)	86 (2 180)	360 (9 136)
249 (6 320)	72/72.5 (1 829/1 842)	243 (6 177)	161 (4 097)	82 (2 080)	360 (9 136)
308 (7 820)	72/72.5 (1 829/1 842)	283 (7 177)	220 (5 597)	62 (1 580)	400 (10 136)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,600 lb (6 486 kg)
- 18,000 lb (8 165 kg)
- 20,000 lb (9 072 kg)
- 23,000 lb (10 433 kg)

Available Tandem Rear Axle Weight Ratings:

- 38,000 lb (17 239 kg)
- 40,000 lb (18 144 kg)
- 44,000 lb (19 958 kg)
- 46,000 lb (20 866 kg)
- 52,000 lb (23 636 kg)
- 58,000 lb (26 309 kg)
- 65,000 lb (29 484 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model GU8 (6x4) — Granite Axle Back Dimensions/Configurations

Axle Back Configuration

Acceptable vehicle applications include: on-highway, on/off highway, local pick-up and delivery, dump, mixer refuse and equipment hauler.

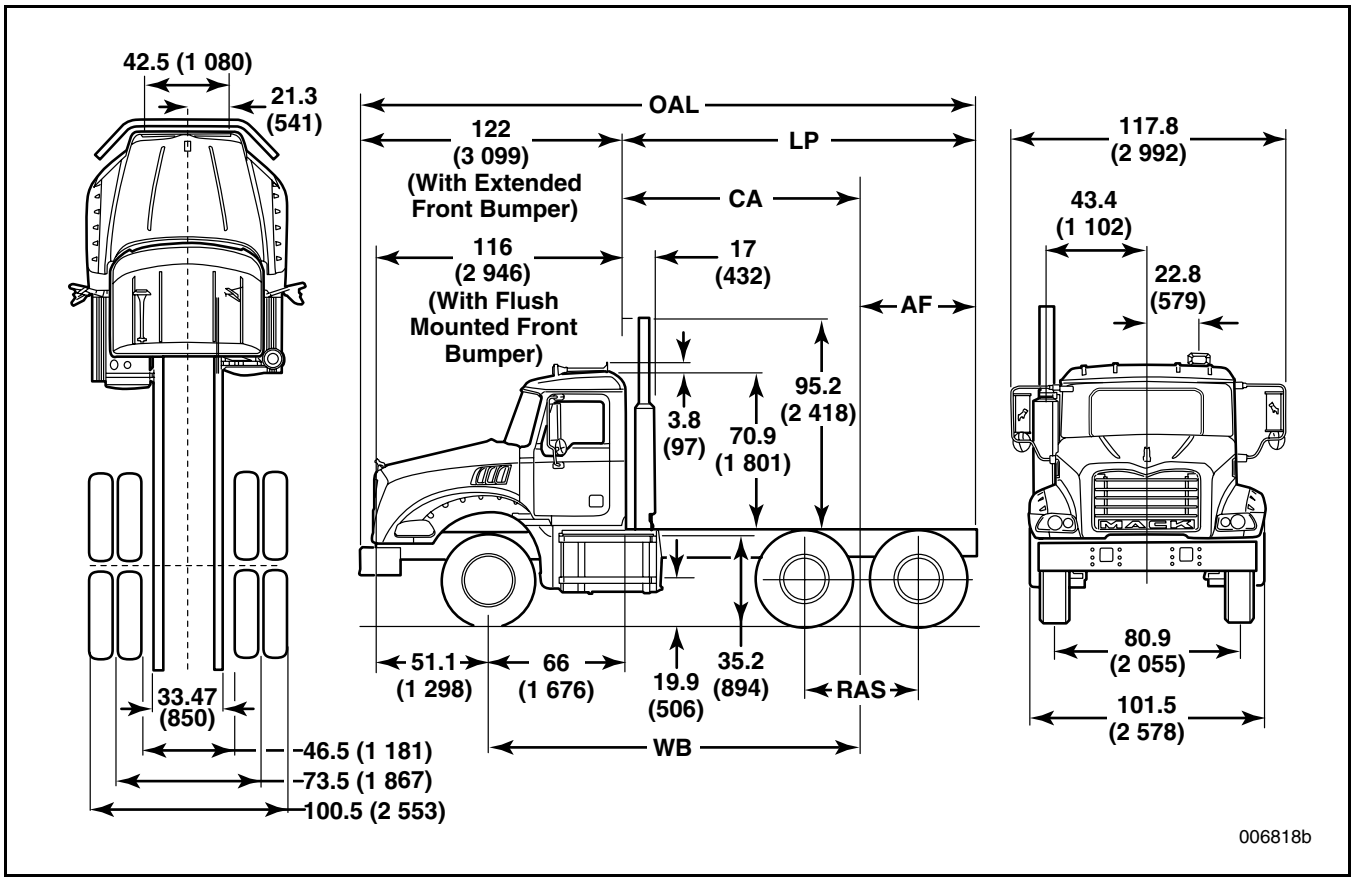


Figure 39 — GU8 — Granite Axle Back

GU8 (6X4)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
149 (3 785)	50 (1 270)	140 (3 552)	84 (2 122)	56 (1 430)	263 (6 664)
149 (3 785)	50 (1 270)	146 (3 702)	84 (2 122)	62 (1 580)	269 (6 814)
150 (3 810)	52 (1 321)	141 (3 577)	85 (2 147)	56 (1 430)	264 (6 689)
150 (3 810)	52 (1 321)	147 (3 727)	85 (2 147)	62 (1 580)	270 (6 839)
151 (3 835)	54 (1 372)	142 (3 602)	86 (2 172)	56 (1 430)	265 (6 714)
151 (3 835)	54 (1 372)	148 (3 752)	86 (2 172)	62 (1 580)	271 (6 864)
152 (3 850)	55 (1 397)	142 (3 602)	86 (2 172)	56 (1 430)	265 (6 729)
152 (3 850)	55 (1 397)	148 (3 767)	86 (2 172)	62 (1 580)	271 (6 879)
153 (3 885)	50 (1 270)	144 (3 652)	87 (2 222)	56 (1 430)	267 (6 764)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
153 (3 885)	50 (1 270)	150 (3 802)	87 (2 222)	62 (1 580)	273 (6 914)
154 (3 910)	52 (1 321)	145 (3 677)	88 (2 247)	56 (1 430)	268 (6 789)
154 (3 910)	52 (1 321)	151 (3 827)	88 (2 247)	62 (1 580)	274 (6 939)
154 (3 910)	60 (1 524)	145 (3 677)	88 (2 247)	56 (1 430)	268 (6 789)
154 (3 910)	60 (1 524)	151 (3 827)	88 (2 247)	62 (1 580)	274 (6 939)
155 (3 935)	54 (1 372)	146 (3 702)	89 (2 272)	56 (1 430)	269 (6 814)
155 (3 935)	54 (1 372)	152 (3 852)	89 (2 272)	62 (1 580)	275 (6 964)
156 (3 950)	55 (1 397)	146 (3 717)	90 (2 287)	56 (1 430)	270 (6 829)
156 (3 950)	55 (1 397)	152 (3 867)	90 (2 287)	62 (1 580)	275 (6 979)
157 (3 985)	50 (1 270)	148 (3 752)	91 (2 322)	56 (1 430)	271 (6 864)
157 (3 985)	50 (1 270)	154 (3 902)	91 (2 322)	62 (1 580)	277 (7 014)
158 (4 010)	52 (1 321)	149 (3 777)	92 (2 347)	56 (1 430)	272 (6 889)
158 (4 010)	52 (1 321)	155 (3 927)	92 (2 347)	62 (1 580)	278 (7 039)
158 (4 010)	60 (1 524)	149 (3 777)	92 (2 347)	56 (1 430)	272 (6 889)
158 (4 010)	60 (1 524)	155 (3 927)	92 (2 347)	62 (1 580)	278 (7 039)
159 (4 035)	54 (1 372)	150 (3 802)	93 (2 372)	56 (1 430)	273 (6 914)
159 (4 035)	54 (1 372)	156 (3 952)	93 (2 372)	62 (1 580)	279 (7 064)
159 (4 050)	55 (1 397)	150 (3 817)	94 (2 387)	56 (1 430)	273 (6 929)
159 (4 050)	55 (1 397)	156 (3 967)	94 (2 387)	62 (1 580)	279 (7 079)
161 (4 085)	50 (1 270)	152 (3 852)	95 (2 422)	56 (1 430)	275 (6 964)
161 (4 085)	50 (1 270)	158 (4 002)	95 (2 422)	62 (1 580)	281 (7 114)
162 (4 110)	52 (1 321)	153 (3 877)	96 (2 447)	56 (1 430)	276 (6 989)
162 (4 110)	52 (1 321)	159 (4 027)	96 (2 447)	62 (1 580)	282 (7 139)
162 (4 110)	60 (1 524)	153 (3 877)	96 (2 447)	56 (1 430)	276 (6 989)
162 (4 110)	60 (1 524)	159 (4 027)	96 (2 447)	62 (1 580)	282 (7 139)
163 (4 135)	54 (1 372)	154 (3 902)	97 (2 472)	56 (1 430)	277 (7 014)
163 (4 135)	54 (1 372)	160 (4 052)	97 (2 472)	62 (1 580)	283 (7 164)
163 (4 150)	55 (1 397)	154 (3 917)	98 (2 487)	56 (1 430)	277 (7 029)
163 (4 150)	55 (1 397)	160 (4 067)	98 (2 487)	62 (1 580)	183 (7 179)
165 (4 185)	50 (1 270)	156 (3 952)	99 (2 522)	56 (1 430)	279 (7 064)
165 (4 185)	50 (1 270)	161 (4 102)	99 (2 522)	62 (1 580)	284 (7 214)
165 (4 185)	58 (1 473)	156 (3 952)	99 (2 522)	56 (1 430)	279 (7 064)
165 (4 185)	58 (1 473)	161 (4 102)	99 (2 522)	62 (1 580)	284 (7 214)
166 (4 210)	52 (1 321)	157 (3 977)	100 (2 547)	56 (1 430)	280 (7 089)
166 (4 210)	52 (1 321)	162 (4 127)	100 (2 547)	62 (1 580)	285 (7 239)
166 (4 210)	60 (1 524)	157 (3 977)	100 (2 547)	56 (1 430)	280 (7 089)
166 (4 210)	60 (1 524)	162 (4 127)	100 (2 547)	62 (1 580)	285 (7 239)
167 (4 235)	54 (1 372)	158 (4 002)	101 (2 572)	56 (1 430)	281 (7 114)
167 (4 235)	54 (1 372)	163 (4 152)	101 (2 572)	62 (1 580)	286 (7 264)
167 (4 250)	55 (1 397)	158 (4 017)	102 (2 587)	56 (1 430)	281 (7 129)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
167 (4 250)	55 (1 397)	164 (4 167)	102 (2 587)	62 (1 580)	287 (7 279)
169 (4 285)	50 (1 270)	160 (4 052)	103 (2 622)	56 (1 430)	283 (7 164)
169 (4 285)	50 (1 270)	165 (4 202)	103 (2 622)	62 (1 580)	288 (7 304)
169 (4 285)	58 (1 473)	160 (4 052)	103 (2 622)	56 (1 430)	283 (7 164)
169 (4 285)	58 (1 473)	165 (4 202)	103 (2 622)	62 (1 580)	288 (7 314)
170 (4 310)	52 (1 321)	161 (4 077)	104 (2 647)	56 (1 430)	284 (7 189)
170 (4 310)	52 (1 321)	166 (4 227)	104 (2 647)	62 (1 580)	289 (7 339)
170 (4 310)	60 (1 524)	161 (4 077)	104 (2 647)	56 (1 430)	284 (7 189)
170 (4 310)	60 (1 524)	166 (4 227)	104 (2 647)	62 (1 580)	289 (7 339)
171 (4 335)	54 (1 372)	161 (4 102)	105 (2 672)	56 (1 430)	284 (7 214)
171 (4 335)	54 (1 372)	167 (4 252)	105 (2 672)	62 (1 580)	290 (7 364)
171 (4 350)	55 (1 397)	162 (4 117)	106 (2 687)	56 (1 430)	285 (7 229)
171 (4 350)	55 (1 397)	168 (4 267)	106 (2 687)	62 (1 580)	291 (7 479)
173 (4 385)	50 (1 270)	163 (4 152)	107 (2 722)	56 (1 430)	286 (7 264)
173 (4 385)	50 (1 270)	169 (4 302)	107 (2 722)	62 (1 580)	292 (7 414)
173 (4 385)	58 (1 473)	163 (4 152)	107 (2 722)	56 (1 430)	286 (7 264)
173 (4 385)	58 (1 473)	169 (4 302)	107 (2 722)	62 (1 580)	292 (7 414)
174 (4 410)	52 (1 321)	164 (4 177)	108 (2 747)	56 (1 430)	287 (7 289)
174 (4 410)	52 (1 321)	170 (4 327)	108 (2 747)	62 (1 580)	293 (7 439)
174 (4 410)	60 (1 524)	164 (4 177)	108 (2 747)	56 (1 430)	287 (7 289)
174 (4 410)	60 (1 524)	170 (4 327)	108 (2 747)	62 (1 580)	293 (7 439)
175 (4 435)	54 (1 372)	165 (4 202)	109 (2 772)	56 (1 430)	288 (7 314)
175 (4 435)	54 (1 372)	171 (4 352)	109 (2 772)	62 (1 580)	294 (7 464)
175 (4 450)	55 (1 397)	166 (4 217)	110 (2 787)	56 (1 430)	289 (7 329)
175 (4 450)	55 (1 397)	172 (4 367)	110 (2 787)	62 (1 580)	295 (7 479)
177 (4 485)	50 (1 270)	167 (4 252)	111 (2 822)	56 (1 430)	290 (7 364)
177 (4 485)	50 (1 270)	173 (4 402)	111 (2 822)	62 (1 580)	296 (7 514)
177 (4 485)	50 (1 270)	189 (4 802)	111 (2 822)	78 (1 980)	312 (7 914)
177 (4 485)	58 (1 473)	167 (4 252)	111 (2 822)	56 (1 430)	290 (7 364)
177 (4 485)	58 (1 473)	173 (4 402)	111 (2 822)	62 (1 580)	296 (7 514)
177 (4 485)	58 (1 473)	189 (4 802)	111 (2 822)	78 (1 980)	312 (7 914)
178 (4 510)	52 (1 321)	168 (4 277)	112 (2 847)	56 (1 430)	291 (7 389)
178 (4 510)	52 (1 321)	174 (4 427)	112 (2 847)	62 (1 580)	297 (7 539)
178 (4 510)	52 (1 321)	190 (4 827)	112 (2 847)	78 (1 980)	313 (7 949)
178 (4 510)	60 (1 524)	168 (4 277)	112 (2 847)	56 (1 430)	291 (7 389)
178 (4 510)	60 (1 524)	174 (4 427)	112 (2 847)	62 (1 580)	297 (7 539)
178 (4 510)	60 (1 524)	190 (4 277)	112 (2 847)	78 (1 980)	313 (7 949)
179 (4 535)	54 (1 372)	169 (4 302)	113 (2 872)	56 (1 430)	292 (7 414)
179 (4 535)	54 (1 372)	175 (4 452)	113 (2 872)	62 (1 580)	298 (7 564)
179 (4 235)	54 (1 372)	191 (4 852)	113 (2 872)	78 (1 980)	314 (7 964)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
179 (4 550)	55 (1 397)	170 (4 317)	114 (2 887)	56 (1 430)	293 (7 429)
179 (4 550)	55 (1 397)	176 (4 467)	114 (2 887)	62 (1 580)	299 (7 579)
179 (4 550)	55 (1 397)	192 (4 867)	114 (2 887)	78 (4 867)	315 (7 979)
181 (4 585)	50 (1 270)	171 (4 352)	115 (2 922)	56 (1 430)	294 (7 464)
181 (4 585)	50 (1 270)	177 (4 502)	115 (2 922)	62 (1 580)	300 (7 614)
181 (4 585)	50 (1 270)	189 (4 802)	115 (2 922)	74 (1 880)	312 (7 914)
181 (4 585)	50 (1 270)	201 (5 102)	115 (2 922)	86 (2 180)	324 (8 214)
181 (4 585)	58 (1 473)	171 (4 352)	115 (2 922)	56 (1 430)	294 (7 464)
181 (4 585)	58 (1 473)	177 (4 502)	115 (2 922)	62 (1 580)	300 (7 614)
181 (4 585)	58 (1 473)	189 (4 802)	115 (2 922)	74 (1 880)	312 (7 914)
181 (4 585)	58 (1 473)	201 (5 102)	115 (2 922)	86 (2 180)	324 (8 214)
181 (4 610)	52 (1 321)	172 (4 377)	116 (2 947)	56 (1 430)	295 (7 489)
181 (4 610)	52 (1 321)	178 (4 527)	116 (2 947)	62 (1 580)	301 (7 639)
181 (4 610)	52 (1 321)	190 (4 827)	116 (2 947)	74 (1 880)	313 (7 939)
181 (4 610)	52 (1 321)	202 (5 127)	116 (2 947)	86 (2 180)	325 (8 239)
181 (4 610)	60 (1 524)	172 (4 377)	116 (2 947)	56 (1 430)	295 (7 489)
181 (4 610)	60 (1 524)	178 (4 527)	116 (2 947)	62 (1 580)	301 (7 639)
181 (4 610)	60 (1 524)	190 (4 827)	116 (2 947)	74 (1 880)	313 (7 939)
181 (4 610)	60 (1 524)	202 (5 127)	116 (2 947)	86 (2 180)	325 (8 239)
182 (4 635)	52 (1 321)	173 (4 402)	117 (2 972)	56 (1 430)	296 (7 514)
182 (4 635)	52 (1 321)	179 (4 552)	117 (2 972)	62 (1 580)	302 (7 664)
182 (4 635)	52 (1 321)	191 (4 852)	117 (2 972)	74 (1 880)	314 (7 964)
182 (4 635)	52 (1 321)	203 (5 152)	117 (2 972)	86 (2 180)	326 (8 264)
183 (4 650)	55 (1 397)	174 (4 417)	118 (2 987)	56 (1 430)	297 (7 529)
183 (4 650)	55 (1 397)	180 (4 567)	118 (2 987)	62 (1 580)	303 (7 679)
183 (4 650)	55 (1 397)	192 (4 867)	118 (2 987)	74 (1 880)	315 (7 979)
183 (4 650)	55 (1 397)	203 (5 167)	118 (2 987)	86 (2 180)	326 (8 279)
184 (4 685)	50 (1 270)	175 (4 452)	119 (3 022)	56 (1 430)	298 (7 564)
184 (4 685)	50 (1 270)	181 (4 602)	119 (3 022)	62 (1 580)	304 (7 714)
184 (4 685)	50 (1 270)	201 (5 102)	119 (3 022)	82 (2 080)	324 (8 214)
184 (4 685)	58 (1 473)	175 (4 452)	119 (3 022)	56 (1 430)	298 (7 564)
184 (4 685)	58 (1 473)	181 (4 602)	119 (3 022)	62 (1 580)	304 (7 714)
184 (4 685)	58 (1 473)	201 (5 102)	119 (3 022)	82 (2 080)	324 (8 214)
185 (4 710)	52 (1 321)	176 (4 477)	120 (3 047)	56 (1 430)	299 (7 589)
185 (4 710)	52 (1 321)	182 (4 627)	120 (3 047)	62 (1 580)	305 (7 749)
185 (4 710)	52 (1 321)	202 (5 127)	120 (3 047)	82 (2 080)	325 (8 239)
185 (4 710)	60 (1 524)	176 (4 477)	120 (3 047)	56 (1 430)	299 (7 589)
185 (4 710)	60 (1 524)	182 (4 627)	120 (3 047)	62 (1 580)	305 (7 749)
185 (4 710)	60 (1 524)	202 (5 127)	120 (3 047)	82 (2 080)	325 (8 239)
186 (4 735)	54 (1 372)	177 (4 502)	121 (3 072)	56 (1 430)	300 (7 614)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
186 (4 735)	54 (1 372)	183 (4 652)	121 (3 072)	62 (1 580)	306 (7 764)
186 (4 735)	54 (1 372)	203 (5 152)	121 (3 072)	82 (2 080)	326 (8 264)
187 (4 750)	55 (1 397)	178 (4 517)	122 (3 087)	56 (1 430)	301 (7 629)
187 (4 750)	55 (1 397)	184 (4 667)	122 (3 087)	62 (1 580)	307 (7 779)
187 (4 750)	55 (1 397)	203 (5 167)	122 (3 087)	82 (2 080)	326 (8 279)
188 (4 785)	50 (1 270)	179 (4 552)	123 (3 122)	56 (1 430)	302 (7 664)
188 (4 785)	50 (1 270)	185 (4 702)	123 (3 122)	62 (1 580)	308 (7 814)
188 (4 785)	50 (1 270)	201 (5 102)	123 (3 122)	78 (1 980)	324 (8 214)
188 (4 785)	58 (1 473)	179 (4 552)	123 (3 122)	56 (1 430)	302 (7 664)
188 (4 785)	58 (1 473)	185 (4 702)	123 (3 122)	62 (1 580)	308 (7 814)
188 (4 785)	58 (1 473)	201 (5 102)	123 (3 122)	78 (1 880)	324 (8 214)
189 (4 810)	52 (1 321)	180 (4 577)	124 (3 147)	56 (1 430)	303 (7 689)
189 (4 810)	52 (1 321)	186 (4 727)	124 (3 147)	62 (1 580)	309 (7 839)
189 (4 810)	52 (1 321)	202 (5 127)	124 (3 147)	78 (1 980)	325 (8 239)
189 (4 810)	60 (1 524)	180 (4 577)	124 (3 147)	56 (1 430)	303 (7 689)
189 (4 810)	60 (1 524)	186 (4 727)	124 (3 147)	62 (1 580)	309 (7 839)
189 (4 810)	60 (1 524)	202 (5 127)	124 (3 147)	78 (1 980)	325 (8 239)
190 (4 835)	54 (1 372)	181 (4 602)	125 (3 172)	56 (1 430)	304 (7 714)
190 (4 835)	54 (1 372)	187 (4 752)	125 (3 172)	62 (1 580)	310 (7 864)
190 (4 835)	54 (1 372)	203 (5 152)	125 (3 172)	78 (1 980)	326 (8 264)
191 (4 850)	55 (1 397)	182 (4 617)	125 (3 187)	56 (1 430)	305 (7 729)
191 (4 850)	55 (1 397)	188 (4 767)	125 (3 187)	62 (1 580)	311 (7 879)
191 (4 850)	55 (1 397)	203 (5 167)	125 (3 187)	78 (1 980)	326 (7 279)
192 (4 885)	50 (1 270)	183 (4 652)	127 (3 222)	56 (1 430)	306 (7 764)
192 (4 885)	50 (1 270)	189 (4 802)	127 (3 222)	62 (1 580)	312 (7 914)
192 (4 885)	50 (1 270)	201 (5 102)	127 (3 222)	74 (1 880)	324 (8 214)
192 (4 885)	50 (1 270)	217 (5 502)	127 (3 222)	90 (2 280)	340 (8 614)
192 (4 885)	58 (1 473)	183 (4 652)	127 (3 222)	56 (1 430)	306 (7 764)
192 (4 885)	58 (1 473)	189 (4 802)	127 (3 222)	62 (1 580)	312 (7 914)
192 (4 885)	58 (1 473)	201 (5 102)	127 (3 222)	74 (1 880)	324 (8 214)
192 (4 885)	58 (1 473)	217 (5 502)	127 (3 222)	90 (2 280)	340 (8 614)
193 (4 910)	52 (1 321)	184 (4 677)	128 (3 247)	56 (1 430)	307 (7 764)
193 (4 910)	52 (1 321)	190 (4 827)	128 (3 247)	62 (1 580)	313 (7 949)
193 (4 910)	52 (1 321)	202 (5 127)	128 (3 247)	74 (1 880)	325 (8 239)
193 (4 910)	52 (1 321)	218 (5 527)	128 (3 247)	90 (2 280)	341 (8 639)
193 (4 910)	60 (1 524)	184 (4 677)	128 (3 247)	56 (1 430)	307 (7 789)
193 (4 910)	60 (1 524)	190 (4 827)	128 (3 247)	62 (1 580)	313 (7 949)
193 (4 910)	60 (1 524)	202 (5 127)	128 (3 247)	74 (1 880)	325 (8 239)
193 (4 910)	60 (1 524)	218 (5 527)	128 (3 247)	90 (2 280)	341 (8 639)
194 (4 935)	54 (1 372)	185 (4 702)	129 (3 272)	56 (1 430)	308 (7 814)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
194 (4 935)	54 (1 372)	191 (4 852)	129 (3 272)	62 (1 580)	314 (7 964)
194 (4 935)	54 (1 372)	203 (5 152)	129 (3 272)	74 (1 880)	326 (8 264)
194 (4 935)	54 (1 372)	219 (5 552)	129 (3 272)	90 (2 280)	342 (8 664)
195 (4 950)	55 (1 397)	186 (4 717)	129 (3 287)	56 (1 430)	309 (7 829)
195 (4 950)	55 (1 397)	192 (4 867)	129 (3 287)	62 (1 580)	315 (7 979)
195 (4 950)	55 (1 397)	203 (5 167)	129 (3 287)	74 (1 880)	326 (8 279)
195 (4 950)	55 (1 397)	219 (5 567)	129 (3 287)	90 (2 280)	342 (8 679)
196 (4 985)	50 (1 270)	187 (4 752)	131 (3 322)	56 (1 430)	310 (7 864)
196 (4 985)	50 (1 270)	193 (4 902)	131 (3 322)	62 (1 580)	316 (8 014)
196 (4 985)	50 (1 270)	201 (5 102)	131 (3 322)	70 (1 780)	324 (8 214)
196 (4 985)	50 (1 270)	217 (5 502)	131 (3 322)	86 (2 180)	340 (8 614)
196 (4 985)	58 (1 473)	187 (4 752)	131 (3 322)	56 (1 430)	310 (7 864)
196 (4 985)	58 (1 473)	193 (4 902)	131 (3 322)	62 (1 580)	316 (8 014)
196 (4 985)	58 (1 473)	201 (5 102)	131 (3 322)	70 (1 780)	324 (8 214)
196 (4 985)	58 (1 473)	217 (5 502)	131 (3 322)	86 (2 180)	340 (8 614)
197 (5 010)	52 (1 321)	188 (4 777)	132 (3 347)	56 (1 430)	311 (7 889)
197 (5 010)	52 (1 321)	194 (4 927)	132 (3 347)	62 (1 580)	317 (8 084)
197 (5 010)	52 (1 321)	202 (5 127)	132 (3 347)	70 (1 780)	325 (8 239)
197 (5 010)	52 (1 321)	218 (5 527)	132 (3 347)	86 (2 180)	341 (8 639)
197 (5 010)	60 (1 524)	188 (4 777)	132 (3 347)	56 (1 430)	311 (7 889)
197 (5 010)	60 (1 524)	194 (4 927)	132 (3 347)	62 (1 580)	317 (8 084)
197 (5 010)	60 (1 524)	202 (5 127)	132 (3 347)	70 (1 780)	325 (8 239)
197 (5 010)	60 (1 524)	218 (5 527)	132 (3 347)	86 (2 180)	341 (8 639)
198 (5 035)	54 (1 372)	189 (4 802)	133 (3 372)	56 (1 430)	312 (7 914)
198 (5 035)	54 (1 372)	195 (4 952)	133 (3 372)	62 (1 580)	318 (8 064)
198 (5 035)	54 (1 372)	203 (5 152)	133 (3 372)	70 (1 780)	326 (8 264)
198 (5 035)	54 (1 372)	219 (5 552)	133 (3 372)	86 (2 180)	342 (8 664)
199 (5 050)	55 (1 397)	190 (4 817)	133 (3 387)	56 (1 430)	313 (7 929)
199 (5 050)	55 (1 397)	196 (4 967)	133 (3 387)	62 (1 580)	319 (8 079)
199 (5 050)	55 (1 397)	203 (5 167)	133 (3 387)	70 (1 780)	326 (8 279)
199 (5 050)	55 (1 397)	219 (5 567)	133 (3 387)	86 (2 180)	342 (8 679)
199 (5 060)	72 (1 829)	204 (5 177)	134 (3 397)	70 (1 780)	327 (8 229)
199 (5 060)	72 (1 829)	220 (5 577)	134 (3 397)	86 (2 180)	343 (8 689)
200 (5 085)	50 (1 270)	191 (4 852)	135 (3 422)	56 (1 430)	314 (7 964)
200 (5 085)	50 (1 270)	197 (5 002)	135 (3 422)	62 (1 580)	320 (8 114)
200 (5 085)	50 (1 270)	217 (5 502)	135 (3 422)	82 (2 080)	340 (8 614)
200 (5 085)	50 (1 270)	236 (6 002)	135 (3 422)	102 (2 580)	359 (9 114)
200 (5 085)	50 (1 270)	256 (6 502)	135 (3 422)	121 (3 080)	379 (9 614)
200 (5 085)	58 (1 473)	191 (4 852)	135 (3 422)	56 (1 430)	314 (7 964)
200 (5 085)	58 (1 473)	197 (5 002)	135 (3 422)	62 (1 580)	320 (8 114)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
200 (5 085)	58 (1 473)	217 (5 502)	135 (3 422)	82 (2 080)	340 (8 614)
200 (5 085)	58 (1 473)	236 (6 002)	135 (3 422)	102 (2 580)	359 (9 114)
200 (5 085)	58 (1 473)	256 (6 502)	135 (3 422)	121 (3 080)	379 (9 614)
201 (5 110)	52 (1 321)	192 (4 877)	136 (3 447)	56 (1 430)	315 (7 989)
201 (5 110)	52 (1 321)	198 (5 027)	136 (3 447)	62 (1 580)	321 (8 139)
201 (5 110)	52 (1 321)	218 (5 527)	136 (3 447)	82 (2 080)	341 (8 369)
201 (5 110)	52 (1 321)	237 (6 027)	136 (3 447)	102 (2 580)	360 (9 139)
201 (5 110)	60 (1 524)	257 (6 527)	136 (3 447)	121 (3 080)	380 (9 639)
201 (5 110)	60 (1 524)	192 (4 877)	136 (3 447)	56 (1 430)	315 (7 989)
201 (5 110)	60 (1 524)	198 (5 027)	136 (3 447)	62 (1 580)	321 (8 139)
201 (5 110)	60 (1 524)	218 (5 527)	136 (3 447)	82 (2 080)	341 (8 369)
201 (5 110)	60 (1 524)	237 (6 027)	136 (3 447)	102 (2 580)	360 (9 139)
201 (5 110)	60 (1 524)	257 (6 527)	136 (3 447)	121 (3 080)	380 (9 639)
202 (5 135)	54 (1 372)	193 (4 902)	137 (3 472)	56 (1 430)	316 (8 014)
202 (5 135)	54 (1 372)	199 (5 052)	137 (3 472)	62 (1 580)	322 (8 164)
202 (5 135)	54 (1 372)	219 (5 552)	137 (3 472)	82 (2 080)	342 (8 664)
202 (5 135)	54 (1 372)	238 (6 052)	137 (3 472)	102 (2 580)	361 (9 164)
202 (5 135)	54 (1 372)	258 (6 552)	137 (3 472)	121 (3 080)	381 (9 664)
203 (5 150)	55 (1 397)	194 (4 917)	137 (3 487)	56 (1 430)	317 (8 029)
203 (5 150)	55 (1 397)	199 (5 067)	137 (3 487)	62 (1 580)	322 (8 179)
203 (5 150)	55 (1 397)	219 (5 567)	137 (3 487)	82 (2 080)	342 (8 679)
203 (5 150)	55 (1 397)	239 (6 067)	137 (3 487)	102 (2 580)	362 (9 179)
203 (5 150)	55 (1 397)	259 (6 567)	137 (3 487)	121 (3 080)	382 (9 679)
203 (5 160)	72 (1 829)	220 (5 577)	138 (3 497)	82 (2 080)	343 (8 689)
203 (5 160)	72 (1 829)	239 (6 077)	138 (3 497)	102 (2 580)	362 (9 189)
203 (5 160)	72 (1 829)	259 (6 577)	138 (3 497)	121 (3 080)	382 (9 689)
204 (5 185)	50 (1 270)	195 (4 952)	139 (3 522)	56 (1 430)	318 (8 064)
204 (5 185)	50 (1 270)	201 (5 102)	139 (3 522)	62 (1 580)	324 (8 214)
204 (5 185)	50 (1 270)	217 (5 502)	139 (3 522)	78 (1 980)	340 (8 614)
204 (5 185)	50 (1 270)	236 (6 002)	139 (3 522)	98 (2 480)	359 (9 114)
204 (5 185)	50 (1 270)	256 (6 502)	139 (3 522)	117 (2 980)	379 (9 614)
204 (5 185)	58 (1 473)	195 (4 952)	139 (3 522)	56 (1 430)	318 (8 064)
204 (5 185)	58 (1 473)	201 (5 102)	139 (3 522)	62 (1 580)	324 (8 214)
204 (5 185)	58 (1 473)	217 (5 502)	139 (3 522)	78 (1 980)	340 (8 614)
204 (5 185)	58 (1 473)	236 (6002)	139 (3 522)	98 (2 480)	359 (9 114)
204 (5 185)	58 (1 473)	256 (6 502)	139 (3 522)	117 (2 980)	379 (9 614)
205 (5 210)	52 (1 321)	196 (4 977)	140 (3 547)	56 (1 430)	319 (8 064)
205 (5 210)	52 (1 321)	202 (5 127)	140 (3 547)	62 (1 580)	325 (8 239)
205 (5 210)	52 (1 321)	218 (5 527)	140 (3 547)	78 (1 980)	341 (8 369)
205 (5 210)	52 (1 321)	237 (6 027)	140 (3 547)	98 (2 480)	360 (9 139)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
205 (5 210)	52 (1 321)	257 (6 527)	140 (3 547)	117 (2 980)	380 (9 639)
205 (5 210)	60 (1 524)	196 (4 977)	140 (3 547)	56 (1 430)	319 (8 089)
205 (5 210)	60 (1 524)	202 (5 127)	140 (3 547)	62 (1 580)	325 (8 239)
205 (5 210)	60 (1 524)	218 (5 527)	140 (3 547)	78 (1 980)	341 (8 639)
205 (5 210)	60 (1 524)	237 (6 027)	140 (3 547)	98 (2 480)	360 (9 139)
205 (5 210)	60 (1 524)	257 (6 527)	140 (3 547)	117 (2 980)	380 (9 639)
206 (5 235)	54 (1 372)	197 (5 002)	141 (3 572)	56 (1 430)	320 (8 114)
206 (5 235)	54 (1 372)	203 (5 152)	141 (3 572)	62 (1 580)	326 (8 264)
206 (5 235)	54 (1 372)	219 (5 552)	141 (3 572)	78 (1 980)	342 (8 664)
206 (5 235)	54 (1 372)	238 (6 052)	141 (3 572)	98 (2 480)	361 (9 164)
206 (5 235)	54 (1 372)	258 (6 552)	141 (3 572)	117 (2 980)	381 (9 664)
207 (5 250)	55 (1 397)	198 (5 017)	141 (3 572)	56 (1 430)	321 (8 129)
207 (5 250)	55 (1 397)	203 (5 167)	141 (3 572)	62 (1 580)	326 (8 279)
207 (5 250)	55 (1 397)	219 (5 567)	141 (3 572)	78 (1 980)	342 (8 679)
207 (5 250)	55 (1 397)	239 (6 067)	141 (3 572)	98 (2 480)	362 (9 179)
207 (5 250)	55 (1 397)	259 (6 567)	141 (3 572)	117 (2 980)	382 (9 679)
207 (5 260)	72 (1 829)	220 (5 577)	142 (3 597)	78 (1 980)	343 (8 689)
207 (5 260)	72 (1 829)	239 (6 077)	142 (3 597)	98 (2 480)	362 (9 189)
207 (5 260)	72 (1 829)	259 (6 577)	142 (3 597)	117 (2 980)	382 (9 689)
208 (5 285)	50 (1 270)	199 (5 052)	143 (3 622)	56 (1 430)	322 (8 164)
208 (5 285)	50 (1 270)	205 (5 202)	143 (3 622)	62 (1 580)	328 (8 314)
208 (5 285)	50 (1 270)	205 (5 202)	143 (3 622)	62 (1 580)	328 (8 314)
208 (5 285)	50 (1 270)	217 (5 502)	143 (3 622)	74 (1 880)	340 (8 614)
208 (5 285)	50 (1 270)	236 (6002)	143 (3 622)	94 (2 380)	360 (9 114)
208 (5 285)	50 (1 270)	256 (6 502)	143 (3 622)	113 (2 880)	379 (9 614)
208 (5 285)	58 (1 473)	199 (5 052)	143 (3 622)	56 (1 430)	322 (8 164)
208 (5 285)	58 (1 473)	205 (5 202)	143 (3 622)	62 (1 580)	328 (8 314)
208 (5 285)	58 (1 473)	217 (5 502)	143 (3 622)	74 (1 880)	340 (8 614)
208 (5 285)	58 (1 473)	236 (6002)	143 (3 622)	94 (2 380)	359 (9 114)
208 (5 285)	58 (1 473)	256 (6 502)	143 (3 622)	113 (2 880)	379 (9 614)
209 (5 310)	52 (1 321)	200 (5 077)	144 (3 647)	56 (1 430)	323 (8 189)
209 (5 310)	52 (1 321)	206 (5 227)	144 (3 647)	62 (1 580)	329 (8 339)
209 (5 310)	52 (1 321)	218 (5 527)	144 (3 647)	74 (1 880)	341 (8 639)
209 (5 310)	52 (1 321)	237 (6 027)	144 (3 647)	94 (2 380)	360 (9 139)
209 (5 310)	52 (1 321)	257 (6 527)	144 (3 647)	113 (2 880)	380 (9 639)
209 (5 310)	60 (1 524)	200 (5 077)	144 (3 647)	56 (1 430)	323 (8 189)
209 (5 310)	60 (1 524)	206 (5 227)	144 (3 647)	62 (1 580)	329 (8 339)
209 (5 310)	60 (1 524)	218 (5 527)	144 (3 647)	74 (1 880)	341 (8 639)
209 (5 310)	60 (1 524)	237 (6 027)	144 (3 647)	94 (2 380)	360 (9 139)
209 (5 310)	60 (1 524)	257 (6 527)	144 (3 647)	113 (2 880)	380 (9 639)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
210 (5 335)	54 (1 372)	201 (5 102)	145 (3 672)	56 (1 430)	324 (8 214)
210 (5 335)	54 (1 372)	207 (5 252)	145 (3 672)	62 (1 580)	330 (8 364)
210 (5 335)	54 (1 372)	219 (5 552)	145 (3 672)	74 (1 880)	342 (8 664)
210 (5 335)	54 (1 372)	238 (6 052)	145 (3 672)	94 (2 380)	361 (9 164)
210 (5 335)	54 (1 372)	258 (6 552)	145 (3 672)	133 (2 880)	381 (9 664)
211 (5 350)	55 (1 397)	201 (5 117)	145 (3 687)	56 (1 430)	324 (8 229)
211 (5 350)	55 (1 397)	207 (5 267)	145 (3 687)	62 (1 580)	330 (8 379)
211 (5 350)	55 (1 397)	219 (5 567)	145 (3 687)	74 (1 880)	342 (8 679)
211 (5 350)	55 (1 397)	239 (6 067)	145 (3 687)	94 (2 380)	362 (9 179)
211 (5 350)	55 (1 397)	259 (6 567)	145 (3 687)	113 (2 880)	382 (9 679)
211 (5 360)	72 (1 829)	220 (5 577)	146 (3 697)	74 (1 880)	343 (9 689)
211 (5 360)	72 (1 829)	239 (6 077)	146 (3 697)	94 (2 380)	362 (9 189)
211 (5 360)	72 (1 829)	259 (6 577)	146 (3 697)	113 (2 880)	382 (9 689)
212 (5 385)	50 (1 270)	203 (5 152)	147 (3 722)	56 (1 430)	326 (8 264)
212 (5 385)	50 (1 270)	209 (5 302)	147 (3 722)	62 (1 580)	332 (8 414)
212 (5 385)	50 (1 270)	217 (5 502)	147 (3 722)	70 (1 780)	340 (8 614)
212 (5 385)	50 (1 270)	236 (6 002)	147 (3 722)	90 (2 280)	359 (9 114)
212 (5 385)	50 (1 270)	256 (6 502)	147 (3 722)	109 (2 780)	379 (9 614)
212 (5 385)	58 (1 473)	203 (5 152)	147 (3 722)	56 (1 430)	326 (8 264)
212 (5 385)	58 (1 473)	209 (5 302)	147 (3 722)	62 (1 580)	332 (8 414)
212 (5 385)	58 (1 473)	217 (5 502)	147 (3 722)	70 (1 780)	340 (8 614)
212 (5 385)	58 (1 473)	236 (6 002)	147 (3 722)	90 (2 280)	359 (9 114)
212 (5 385)	58 (1 473)	256 (6 502)	147 (3 722)	109 (2 780)	379 (9 614)
213 (5 410)	52 (1 321)	204 (5 177)	148 (3 747)	56 (1 430)	327 (8 289)
213 (5 410)	52 (1 321)	210 (5 327)	148 (3 747)	62 (1 580)	333 (8 439)
213 (5 410)	52 (1 321)	218 (5 527)	148 (3 747)	70 (1 780)	341 (8 639)
213 (5 410)	52 (1 321)	237 (6 027)	148 (3 747)	90 (2 280)	360 (9 139)
213 (5 410)	52 (1 321)	257 (6 527)	148 (3 747)	109 (2 780)	380 (9 639)
213 (5 410)	60 (1 524)	204 (5 177)	148 (3 747)	56 (1 430)	327 (8 289)
213 (5 410)	60 (1 524)	210 (5 327)	148 (3 747)	62 (1 580)	333 (8 439)
213 (5 410)	60 (1 524)	218 (5 527)	148 (3 747)	70 (1 780)	341 (8 639)
213 (5 410)	60 (1 524)	237 (6 027)	148 (3 747)	90 (2 280)	360 (9 139)
213 (5 410)	60 (1 524)	257 (6 527)	148 (3 747)	109 (2 780)	380 (9 639)
214 (5 435)	54 (1 372)	205 (5 202)	149 (3 772)	56 (1 430)	328 (8 314)
214 (5 435)	54 (1 372)	211 (5 352)	149 (3 772)	62 (1 580)	334 (8 464)
214 (5 435)	54 (1 372)	219 (5 552)	149 (3 772)	70 (1 780)	342 (8 664)
214 (5 435)	54 (1 372)	238 (6 052)	149 (3 772)	90 (2 280)	361 (9 164)
214 (5 435)	54 (1 372)	258 (6 552)	149 (3 772)	109 (2 780)	381 (9 664)
215 (5 450)	55 (1 397)	205 (5 217)	149 (3 787)	56 (1 430)	328 (8 329)
215 (5 450)	55 (1 397)	211 (5 367)	149 (3 787)	62 (1 580)	334 (8 479)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
215 (5 450)	55 (1 397)	219 (5 567)	149 (3 787)	70 (1 780)	342 (8 679)
215 (5 450)	55 (1 397)	239 (6 067)	149 (3 787)	90 (2 280)	362 (9 179)
215 (5 450)	55 (1 397)	259 (6 567)	149 (3 787)	109 (2 280)	382 (9 679)
215 (5 460)	72 (1 829)	220 (5 577)	149 (3 797)	70 (1 780)	343 (8 689)
215 (5 460)	72 (1 829)	239 (6 077)	149 (3 797)	90 (2 280)	362 (9 189)
215 (5 460)	72 (1 829)	259 (6 577)	149 (3 797)	109 (2 780)	382 (9 689)
216 (5 485)	50 (1 270)	207 (5 252)	150 (3 822)	56 (1 430)	330 (8 364)
216 (5 485)	50 (1 270)	213 (5 402)	150 (3 822)	62 (1 580)	336 (8 514)
216 (5 485)	50 (1 270)	236 (6 002)	150 (3 822)	86 (2 180)	359 (9 114)
216 (5 485)	50 (1 270)	256 (6 502)	150 (3 822)	106 (2 680)	379 (9 614)
216 (5 485)	58 (1 473)	207 (5 252)	150 (3 822)	56 (1 430)	330 (8 364)
216 (5 485)	58 (1 473)	213 (5 402)	150 (3 822)	62 (1 580)	336 (8 514)
216 (5 485)	58 (1 473)	236 (6 002)	150 (3 822)	86 (2 180)	359 (9 114)
216 (5 485)	58 (1 473)	256 (6 502)	150 (3 822)	106 (2 680)	379 (9 614)
217 (5 510)	52 (1 321)	208 (5 277)	151 (3 847)	56 (1 430)	331 (8 389)
217 (5 510)	52 (1 321)	214 (5 427)	151 (3 847)	62 (1 580)	337 (8 539)
217 (5 510)	52 (1 321)	237 (6 027)	151 (3 847)	86 (2 180)	360 (9 139)
217 (5 510)	52 (1 321)	257 (6 527)	151 (3 847)	106 (2 680)	380 (9 639)
217 (5 510)	60 (1 524)	208 (5 277)	151 (3 847)	56 (1 430)	331 (8 389)
217 (5 510)	60 (1 524)	214 (5 427)	151 (3 847)	62 (1 580)	337 (8 539)
217 (5 510)	60 (1 524)	237 (6 027)	151 (3 847)	86 (2 180)	360 (9 139)
217 (5 510)	60 (1 524)	257 (6 527)	151 (3 847)	106 (2 680)	380 (9 639)
218 (5 535)	54 (1 372)	209 (5 302)	152 (3 872)	56 (1 430)	332 (8 414)
218 (5 535)	54 (1 372)	215 (5 452)	152 (3 872)	62 (1 580)	338 (8 564)
218 (5 535)	54 (1 372)	238 (6 052)	152 (3 872)	86 (2 180)	361 (9 164)
218 (5 535)	54 (1 372)	258 (6 552)	152 (3 872)	106 (2 680)	381 (9 664)
219 (5 550)	55 (1 397)	209 (5 317)	153 (3 887)	56 (1 430)	332 (8 429)
219 (5 550)	55 (1 397)	215 (5 467)	153 (3 887)	62 (1 580)	338 (8 579)
219 (5 550)	55 (1 397)	239 (6 067)	153 (3 887)	86 (2 180)	362 (9 179)
219 (5 550)	55 (1 397)	259 (6 567)	153 (3 887)	106 (2 680)	382 (9 679)
219 (5 560)	72 (1 829)	239 (6 077)	153 (3 897)	86 (2 180)	362 (9 189)
219 (5 560)	72 (1 829)	259 (6 577)	153 (3 897)	106 (2 680)	382 (9 689)
220 (5 585)	50 (1 270)	211 (5 352)	154 (3 922)	56 (1 430)	334 (8 464)
220 (5 585)	50 (1 270)	217 (5 502)	154 (3 922)	62 (1 580)	340 (8 614)
220 (5 585)	50 (1 270)	236 (6 002)	154 (3 922)	82 (2 080)	359 (9 114)
220 (5 585)	50 (1 270)	256 (6 502)	154 (3 922)	102 (2 580)	379 (9 614)
220 (5 585)	50 (1 270)	276 (7 002)	154 (3 922)	121 (3 080)	399 (10 114)
220 (5 585)	58 (1 473)	211 (5 352)	154 (3 922)	56 (1 430)	334 (8 464)
220 (5 585)	58 (1 473)	217 (5 502)	154 (3 922)	62 (1 580)	340 (8 614)
220 (5 585)	58 (1 473)	236 (6 002)	154 (3 922)	82 (2 080)	359 (9 114)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
220 (5 585)	58 (1 473)	256 (6 502)	154 (3 922)	102 (2 580)	379 (9 614)
220 (5 585)	58 (1 473)	276 (7 002)	154 (3 922)	121 (3 080)	399 (10 114)
221 (5 610)	52 (1 321)	212 (5 377)	155 (3 947)	56 (1 430)	335 (8 489)
221 (5 610)	52 (1 321)	218 (5 527)	155 (3 947)	62 (1 580)	341 (8 639)
221 (5 610)	52 (1 321)	237 (6 027)	155 (3 947)	82 (2 080)	360 (9 139)
221 (5 610)	52 (1 321)	257 (6 527)	155 (3 947)	102 (2 580)	380 (9 639)
221 (5 610)	52 (1 321)	277 (7 027)	155 (3 947)	121 (3 080)	400 (10 139)
221 (5 610)	60 (1 524)	212 (5 377)	155 (3 947)	56 (1 430)	335 (8 489)
221 (5 610)	60 (1 524)	218 (5 527)	155 (3 947)	62 (1 580)	341 (8 639)
221 (5 610)	60 (1 524)	237 (6 027)	155 (3 947)	82 (2 080)	360 (9 139)
221 (5 610)	60 (1 524)	257 (6 527)	155 (3 947)	102 (2 580)	380 (9 639)
221 (5 610)	60 (1 524)	277 (7 027)	155 (3 947)	121 (3 080)	400 (10 139)
222 (5 635)	54 (1 372)	213 (5 042)	156 (3 972)	56 (1 430)	336 (8 154)
222 (5 635)	54 (1 372)	219 (5 552)	156 (3 972)	62 (1 580)	342 (8 664)
222 (5 635)	54 (1 372)	238 (6 052)	156 (3 972)	82 (2 080)	361 (9 164)
222 (5 635)	54 (1 372)	258 (6 552)	156 (3 972)	102 (2 580)	381 (9 664)
222 (5 635)	54 (1 372)	278 (7 052)	156 (3 972)	121 (3 080)	401 (10 164)
222 (5 650)	55 (1 397)	213 (5 417)	157 (3 987)	56 (1 430)	336 (8 529)
222 (5 650)	55 (1 397)	219 (5 567)	157 (3 987)	62 (1 580)	342 (8 679)
222 (5 650)	55 (1 397)	239 (6 067)	157 (3 987)	82 (2 080)	362 (9 179)
222 (5 650)	55 (1 397)	259 (6 567)	157 (3 987)	102 (2 580)	382 (9 679)
222 (5 650)	55 (1 397)	279 (7 067)	157 (3 987)	121 (3 080)	402 (10 179)
223 (5 660)	72 (1 829)	239 (6 077)	157 (3 997)	82 (2 080)	362 (9 189)
223 (5 660)	72 (1 829)	259 (6 577)	157 (3 997)	102 (2 580)	382 (9 689)
223 (5 660)	72 (1 829)	279 (7 077)	157 (3 997)	121 (3073)	402 (10 189)
224 (5 685)	50 (1 270)	215 (5 452)	158 (4 022)	56 (1 430)	338 (8 564)
224 (5 685)	50 (1 270)	221 (5 602)	158 (4 022)	62 (1 580)	344 (8 714)
224 (5 685)	50 (1 270)	236 (6 002)	158 (4 022)	78 (1 980)	359 (9 114)
224 (5 685)	50 (1 270)	256 (6 502)	158 (4 022)	98 (2 480)	379 (9 614)
224 (5 685)	50 (1 270)	276 (7 002)	158 (4 022)	117 (2 980)	399 (10 114)
224 (5 685)	58 (1 473)	215 (5 452)	158 (4 022)	56 (1 430)	338 (8 564)
224 (5 685)	58 (1 473)	221 (5 602)	158 (4 022)	62 (1 580)	344 (8 714)
224 (5 685)	58 (1 473)	236 (6 002)	158 (4 022)	78 (1 980)	359 (9 114)
224 (5 685)	58 (1 473)	256 (6 502)	158 (4 022)	98 (2 480)	379 (9 616)
224 (5 685)	58 (1 473)	276 (7 002)	158 (4 022)	117 (2 980)	399 (10 114)
225 (5 710)	52 (1 321)	216 (5 477)	159 (4 047)	56 (1 430)	339 (8 589)
225 (5 710)	52 (1 321)	222 (5 627)	159 (4 047)	62 (1 580)	345 (8 739)
225 (5 710)	52 (1 321)	237 (6 027)	159 (4 047)	78 (1 980)	360 (9 139)
225 (5 710)	52 (1 321)	257 (6 527)	159 (4 047)	98 (2 480)	380 (9 639)
225 (5 710)	52 (1 321)	277 (7 027)	159 (4 047)	117 (2 980)	400 (10 139)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
225 (5 710)	60 (1 524)	216 (5 477)	159 (4 047)	56 (1 430)	339 (8 589)
225 (5 710)	60 (1 524)	222 (5 627)	159 (4 047)	62 (1 580)	345 (8 739)
225 (5 710)	60 (1 524)	237 (6 027)	159 (4 047)	78 (1 980)	360 (9 139)
225 (5 710)	60 (1 524)	257 (6 527)	159 (4 047)	98 (2 480)	380 (9 639)
225 (5 710)	60 (1 524)	277 (7 027)	159 (4 047)	117 (2 980)	400 (10 139)
226 (5 735)	54 (1 372)	217 (5 502)	160 (4 072)	56 (1 430)	340 (8 614)
226 (5 735)	54 (1 372)	223 (5 652)	160 (4 072)	62 (1 580)	346 (8 764)
226 (5 735)	54 (1 372)	238 (6 052)	160 (4 072)	78 (1 980)	361 (9 164)
226 (5 735)	54 (1 372)	258 (6 552)	160 (4 072)	98 (2 480)	381 (9 664)
226 (5 735)	54 (1 372)	278 (7 052)	160 (4 072)	117 (2 980)	401 (10 164)
226 (5 750)	55 (1 397)	217 (5 517)	161 (4 087)	56 (1 430)	340 (8 629)
226 (5 750)	55 (1 397)	223 (5 667)	161 (4 087)	62 (1 580)	346 (8 779)
226 (5 750)	55 (1 397)	239 (6 067)	161 (4 087)	78 (1 980)	362 (9 179)
226 (5 750)	55 (1 397)	259 (6 567)	161 (4 087)	98 (2 480)	382 (9 679)
226 (5 750)	55 (1 397)	279 (7 067)	161 (4 087)	117 (2 980)	402 (10 179)
227 (5 760)	72 (1 829)	239 (6 077)	161 (4 097)	78 (1 980)	362 (9 189)
227 (5 760)	72 (1 829)	259 (6 577)	161 (4 097)	98 (2 480)	382 (9 689)
227 (5 760)	72 (1 829)	279 (7 077)	161 (4 097)	117 (2 980)	402 (10 189)
228 (5 785)	50 (1 270)	219 (5 552)	162 (4 122)	56 (1 430)	342 (8 664)
228 (5 785)	50 (1 270)	224 (5 702)	162 (4 122)	62 (1 580)	347 (8 814)
228 (5 785)	50 (1 270)	236 (6 002)	162 (4 122)	78 (1 880)	359 (9 114)
228 (5 785)	50 (1 270)	256 (6 502)	162 (4 122)	94 (2 380)	379 (9 614)
228 (5 785)	50 (1 270)	276 (7 002)	162 (4 122)	113 (2 880)	399 (10 114)
228 (5 785)	58 (1 473)	219 (5 552)	162 (4 122)	56 (1 430)	342 (8 664)
228 (5 785)	58 (1 473)	224 (5 702)	162 (4 122)	62 (1 580)	347 (8 814)
228 (5 785)	58 (1 473)	236 (6 002)	162 (4 122)	74 (1 880)	359 (9 114)
228 (5 785)	58 (1 473)	256 (6 502)	162 (4 122)	94 (2 380)	379 (9 614)
228 (5 785)	58 (1 473)	276 (7 002)	162 (4 122)	113 (2 880)	399 (10 114)
229 (5 810)	52 (1 321)	220 (5 577)	163 (4 147)	56 (1 430)	342 (8 689)
229 (5 810)	52 (1 321)	225 (5 727)	163 (4 147)	62 (1 580)	348 (8 839)
229 (5 810)	52 (1 321)	237 (6 027)	163 (4 147)	78 (1 880)	360 (9 139)
229 (5 810)	52 (1 321)	257 (6 527)	163 (4 147)	94 (2 380)	380 (9 639)
229 (5 810)	52 (1 321)	277 (7 027)	163 (4 147)	113 (2 880)	400 (10 139)
229 (5 810)	60 (1 524)	220 (5 577)	163 (4 147)	56 (1 430)	343 (8 689)
229 (5 810)	60 (1 524)	225 (5 727)	163 (4 147)	62 (1 580)	348 (8 839)
229 (5 810)	60 (1 524)	237 (6 027)	163 (4 147)	78 (1 880)	360 (9 139)
229 (5 810)	60 (1 524)	257 (6 527)	163 (4 147)	94 (2 380)	380 (9 639)
229 (5 810)	60 (1 524)	277 (7 027)	163 (4 147)	113 (2 880)	400 (10 139)
230 (5 835)	54 (1 372)	221 (5 602)	164 (4 172)	56 (1 430)	344 (8 714)
230 (5 835)	54 (1 372)	226 (5 752)	164 (4 172)	62 (1 580)	349 (8 864)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
230 (5 835)	54 (1 372)	238 (6 052)	164 (4 172)	74 (1 880)	361 (9 164)
230 (5 835)	54 (1 372)	258 (6 552)	164 (4 172)	94 (2 480)	381 (9 664)
230 (5 835)	54 (1 372)	278 (7 052)	164 (4 172)	113 (2 880)	401 (10 164)
230 (5 850)	55 (1 397)	221 (5 617)	165 (4 187)	56 (1 430)	344 (8 729)
230 (5 850)	55 (1 397)	227 (5 767)	165 (4 187)	62 (1 580)	350 (8 879)
230 (5 850)	55 (1 397)	239 (6 067)	165 (4 187)	74 (1 880)	362 (9 179)
230 (5 850)	55 (1 397)	259 (6 567)	165 (4 187)	94 (2 480)	382 (9 679)
230 (5 850)	55 (1 397)	278 (7 067)	165 (4 187)	113 (2 880)	401 (10 179)
231 (5 860)	72 (1 829)	239 (6 077)	165 (4 197)	74 (1 880)	362 (9 189)
231 (5 860)	72 (1 829)	259 (6 577)	165 (4 197)	94 (2 480)	382 (9 689)
231 (5 860)	72 (1 829)	279 (7 077)	165 (4 197)	113 (2 880)	402 (10 189)
232 (5 885)	50 (1 321)	223 (5 652)	166 (4 222)	56 (1 430)	346 (8 764)
232 (5 885)	50 (1 321)	228 (5 802)	166 (4 222)	62 (1 580)	351 (8 914)
232 (5 885)	50 (1 321)	236 (6 002)	166 (4 222)	70 (1 780)	359 (9 114)
232 (5 885)	50 (1 321)	256 (6 502)	166 (4 222)	90 (2 280)	379 (9 614)
232 (5 885)	50 (1 321)	276 (7 002)	166 (4 222)	109 (2 780)	399 (10 114)
232 (5 885)	58 (1 473)	223 (5 652)	166 (4 222)	56 (1 430)	346 (8 764)
232 (5 885)	58 (1 473)	228 (5 802)	166 (4 222)	62 (1 580)	351 (8 914)
232 (5 885)	58 (1 473)	236 (6 002)	166 (4 222)	70 (1 780)	359 (9 114)
232 (5 885)	58 (1 473)	256 (6 502)	166 (4 222)	90 (2 280)	379 (9 614)
232 (5 885)	58 (1 473)	276 (7 002)	166 (4 222)	109 (2 780)	399 (10 114)
233 (5 910)	52 (1 321)	224 (5 677)	167 (4 247)	56 (1 430)	347 (8 789)
233 (5 910)	52 (1 321)	229 (5 827)	167 (4 247)	62 (1 580)	352 (8 939)
233 (5 910)	52 (1 321)	237 (6 027)	167 (4 247)	70 (1 780)	360 (9 139)
233 (5 910)	52 (1 321)	257 (6 527)	167 (4 247)	90 (2 280)	380 (9 639)
233 (5 910)	52 (1 321)	277 (7 027)	167 (4 247)	109 (2 780)	400 (10 139)
233 (5 910)	60 (1 524)	224 (5 677)	167 (4 247)	56 (1 430)	347 (8 789)
233 (5 910)	60 (1 524)	229 (5 827)	167 (4 247)	62 (1 580)	352 (8 939)
233 (5 910)	60 (1 524)	237 (6 027)	167 (4 247)	70 (1 780)	360 (9 139)
233 (5 910)	60 (1 524)	257 (6 527)	167 (4 247)	90 (2 280)	380 (9 639)
233 (5 910)	60 (1 524)	277 (7 027)	167 (4 247)	109 (2 780)	400 (10 139)
234 (5 935)	54 (1 372)	224 (5 702)	168 (4 272)	56 (1 430)	347 (8 814)
234 (5 935)	54 (1 372)	230 (5 852)	168 (4 272)	62 (1 580)	353 (8 964)
234 (5 935)	54 (1 372)	238 (6 052)	168 (4 272)	70 (1 780)	361 (9 164)
234 (5 935)	54 (1 372)	258 (6 552)	168 (4 272)	90 (2 280)	381 (9 664)
234 (5 935)	54 (1 372)	278 (7 052)	168 (4 272)	109 (2 780)	401 (10 164)
234 (5 950)	55 (1 397)	225 (5 717)	169 (4 287)	56 (1 430)	348 (8 829)
234 (5 950)	55 (1 397)	231 (5 867)	169 (4 287)	62 (1 580)	354 (8 979)
234 (5 950)	55 (1 397)	239 (6 067)	169 (4 287)	70 (1 780)	362 (9 179)
234 (5 950)	55 (1 397)	259 (6 567)	169 (4 287)	90 (2 280)	382 (9 679)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
234 (5 950)	55 (1 397)	278 (7 067)	169 (4 287)	109 (2 780)	401 (10 179)
235 (5 960)	72 (1 829)	239 (6 077)	169 (4 297)	70 (1 780)	362 (9 189)
235 (5 960)	72 (1 829)	259 (6 577)	169 (4 297)	90 (2 280)	382 (9 689)
235 (5 960)	72 (1 829)	279 (7 077)	169 (4 297)	109 (2 780)	402 (10 189)
236 (5 985)	50 (1 270)	226 (5 752)	170 (4 322)	56 (1 430)	349 (8 864)
236 (5 985)	50 (1 270)	232 (5 902)	170 (4 322)	62 (1 580)	355 (9 014)
236 (5 985)	50 (1 270)	256 (6 502)	170 (4 322)	86 (2 180)	379 (9 614)
236 (5 985)	50 (1 270)	276 (7 002)	170 (4 322)	106 (2 680)	399 (10 114)
236 (5 985)	50 (1 270)	295 (7 502)	170 (4 322)	125 (3 180)	418 (10 614)
236 (5 985)	58 (1 473)	226 (5 752)	170 (4 322)	56 (1 430)	349 (8 864)
236 (5 985)	58 (1 473)	232 (5 902)	170 (4 322)	62 (1 580)	355 (9 014)
236 (5 985)	58 (1 473)	256 (6 502)	170 (4 322)	86 (2 180)	379 (9 614)
236 (5 985)	58 (1 473)	276 (7 002)	170 (4 322)	106 (2 680)	399 (10 114)
236 (5 985)	58 (1 473)	295 (7 502)	170 (4 322)	125 (3 180)	418 (10 614)
237 (6 010)	52 (1 321)	227 (5 777)	171 (4 347)	56 (1 430)	350 (8 889)
237 (6 010)	52 (1 321)	233 (5 927)	171 (4 347)	62 (1 580)	356 (9 039)
237 (6 010)	52 (1 321)	257 (6 527)	171 (4 347)	86 (2 180)	380 (9 639)
237 (6 010)	52 (1 321)	277 (7 027)	171 (4 347)	106 (2 680)	400 (10 139)
237 (6 010)	52 (1 321)	296 (7 527)	171 (4 347)	125 (3 180)	419 (10 639)
237 (6 010)	60 (1 524)	227 (5 777)	171 (4 347)	56 (1 430)	350 (8 889)
237 (6 010)	60 (1 524)	233 (5 927)	171 (4 347)	62 (1 580)	356 (9 039)
237 (6 010)	60 (1 524)	257 (6 527)	171 (4 347)	86 (2 180)	380 (9 639)
237 (6 010)	60 (1 524)	277 (7 027)	171 (4 347)	106 (2 680)	400 (10 139)
237 (6 010)	60 (1 524)	296 (7 527)	171 (4 347)	125 (3 180)	419 (10 639)
238 (6 035)	54 (1 372)	228 (5 802)	172 (4 372)	56 (1 430)	351 (8 914)
238 (6 035)	54 (1 372)	234 (5 952)	172 (4 372)	62 (1 580)	357 (9 064)
238 (6 035)	54 (1 372)	258 (6 552)	172 (4 372)	86 (2 180)	381 (9 664)
238 (6 035)	54 (1 372)	278 (7 052)	172 (4 372)	106 (2 680)	401 (10 164)
238 (6 035)	54 (1 372)	297 (7 552)	172 (4 372)	125 (3 180)	420 (10 664)
238 (6 050)	55 (1 397)	229 (5 817)	173 (4 387)	56 (1 430)	352 (8 929)
238 (6 050)	55 (1 397)	235 (5 967)	173 (4 387)	62 (1 580)	358 (9 079)
238 (6 050)	55 (1 397)	259 (6 567)	173 (4 387)	86 (2 180)	382 (9 679)
238 (6 050)	55 (1 397)	278 (7 067)	173 (4 387)	106 (2 680)	401 (10 179)
238 (6 050)	55 (1 397)	298 (7 567)	173 (4 387)	125 (3 180)	421 (10 679)
239 (6 060)	72 (1 829)	259 (6 577)	173 (4 397)	86 (2 180)	382 (9 689)
239 (6 060)	72 (1 829)	279 (7 077)	173 (4 397)	106 (2 680)	402 (10 189)
239 (6 060)	72 (1 829)	298 (7 577)	173 (4 397)	125 (3 180)	421 (10 689)
240 (6 085)	50 (1 270)	230 (5 852)	174 (4 422)	56 (1 430)	353 (8 964)
240 (6 085)	50 (1 270)	236 (6 002)	174 (4 422)	62 (1 580)	359 (9 114)
240 (6 085)	50 (1 270)	256 (6 502)	174 (4 422)	86 (2 080)	379 (9 614)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
240 (6 085)	50 (1 270)	276 (7 002)	174 (4 422)	102 (2 580)	399 (10 114)
240 (6 085)	50 (1 270)	295 (7 502)	174 (4 422)	121 (3 080)	418 (10 614)
240 (6 085)	58 (1 473)	230 (5 852)	174 (4 422)	56 (1 430)	353 (8 964)
240 (6 085)	58 (1 473)	236 (6 002)	174 (4 422)	62 (1 580)	359 (9 114)
240 (6 085)	58 (1 473)	256 (6 502)	174 (4 422)	86 (2 080)	379 (9 614)
240 (6 085)	58 (1 473)	276 (7 002)	174 (4 422)	102 (2 580)	399 (10 114)
240 (6 085)	58 (1 473)	295 (7 502)	174 (4 422)	121 (3 080)	418 (10 614)
241 (6 110)	52 (1 321)	231 (5 877)	175 (4 447)	56 (1 430)	354 (8 989)
241 (6 110)	52 (1 321)	237 (6 027)	175 (4 447)	62 (1 580)	360 (9 139)
241 (6 110)	52 (1 321)	257 (6 527)	175 (4 447)	86 (2 080)	380 (9 639)
241 (6 110)	52 (1 321)	277 (7 027)	175 (4 447)	102 (2 580)	400 (10 139)
241 (6 110)	52 (1 321)	296 (7 527)	175 (4 447)	121 (3 080)	419 (10 639)
241 (6 110)	60 (1 524)	231 (5 877)	175 (4 447)	56 (1 430)	354 (8 989)
241 (6 110)	60 (1 524)	237 (6 027)	175 (4 447)	62 (1 580)	360 (9 139)
241 (6 110)	60 (1 524)	257 (6 527)	175 (4 447)	82 (2 080)	380 (9 639)
241 (6 110)	60 (1 524)	277 (7 027)	175 (4 447)	102 (2 580)	400 (10 139)
241 (6 110)	60 (1 524)	296 (7 527)	175 (4 447)	121 (3 080)	419 (10 639)
242 (6 135)	54 (1 372)	232 (5 902)	176 (4 472)	56 (1 430)	355 (9 014)
242 (6 135)	54 (1 372)	238 (6 052)	176 (4 472)	62 (1 580)	361 (9 164)
242 (6 135)	54 (1 372)	258 (6 552)	176 (4 472)	86 (2 080)	381 (9 664)
242 (6 135)	54 (1 372)	278 (7 052)	176 (4 472)	102 (2 580)	401 (10 164)
242 (6 135)	54 (1 372)	297 (7 552)	176 (4 472)	121 (3 080)	420 (10 664)
242 (6 150)	55 (1 397)	233 (5 917)	177 (4 487)	56 (1 430)	356 (9 029)
242 (6 150)	55 (1 397)	239 (6 067)	177 (4 487)	62 (1 580)	362 (9 179)
242 (6 150)	55 (1 397)	259 (6 567)	177 (4 487)	86 (2 080)	382 (9 679)
242 (6 150)	55 (1 397)	278 (7 067)	177 (4 487)	102 (2 580)	401 (10 179)
242 (6 150)	55 (1 397)	298 (7 567)	177 (4 487)	121 (3 080)	421 (10 679)
243 (6 160)	72 (1 829)	259 (6 577)	177 (4 497)	82 (2 080)	382 (9 689)
243 (6 160)	72 (1 829)	279 (7 077)	177 (4 497)	102 (2 580)	402 (10 189)
243 (6 160)	72 (1 829)	298 (7 577)	177 (4 497)	121 (3 080)	421 (10 689)
244 (6 185)	50 (1 270)	240 (6 102)	178 (4 522)	62 (1 580)	363 (9 214)
244 (6 185)	50 (1 270)	256 (6 502)	178 (4 522)	78 (1 980)	379 (9 614)
244 (6 185)	50 (1 270)	276 (7 002)	178 (4 522)	98 (2 480)	399 (10 114)
244 (6 185)	50 (1 270)	295 (7 502)	178 (4 522)	117 (2 980)	418 (10 614)
244 (6 185)	58 (1 473)	240 (6 102)	178 (4 522)	62 (1 580)	363 (9 214)
244 (6 185)	58 (1 473)	256 (6 502)	178 (4 522)	78 (1 980)	379 (9 614)
244 (6 185)	58 (1 473)	276 (7 002)	178 (4 522)	98 (2 480)	399 (10 114)
244 (6 185)	58 (1 473)	295 (7 502)	178 (4 522)	117 (2 980)	418 (10 614)
244 (6 210)	52 (1 321)	241 (6 127)	179 (4 547)	62 (1 580)	364 (9 239)
244 (6 210)	52 (1 321)	257 (6 527)	179 (4 547)	78 (1 980)	380 (9 639)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
244 (6 210)	52 (1 321)	277 (7 027)	179 (4 547)	98 (2 480)	400 (10 139)
244 (6 210)	52 (1 321)	296 (7 527)	179 (4 547)	117 (2 980)	419 (10 639)
244 (6 210)	60 (1 524)	241 (6 127)	179 (4 547)	62 (1 580)	364 (9 239)
244 (6 210)	60 (1 524)	257 (6 527)	179 (4 547)	78 (1 980)	380 (9 639)
244 (6 210)	60 (1 524)	277 (7 027)	179 (4 547)	98 (2 480)	400 (10 139)
244 (6 210)	60 (1 524)	296 (7 527)	179 (4 547)	117 (2 980)	419 (10 639)
245 (6 235)	54 (1 372)	242 (6 152)	180 (4 572)	62 (1 580)	365 (9 264)
245 (6 235)	54 (1 372)	258 (6 552)	180 (4 572)	78 (1 980)	381 (9 664)
245 (6 235)	54 (1 372)	278 (7 052)	180 (4 572)	98 (2 480)	401 (10 164)
245 (6 235)	54 (1 372)	297 (7 552)	180 (4 572)	117 (2 980)	420 (10 664)
246 (6 250)	55 (1 397)	243 (6 167)	181 (4 587)	62 (1 580)	366 (9 279)
246 (6 250)	55 (1 397)	259 (6 567)	181 (4 587)	78 (1 980)	382 (9 679)
246 (6 250)	55 (1 397)	278 (7 067)	181 (4 587)	98 (2 480)	401 (10 179)
246 (6 250)	55 (1 397)	298 (7 567)	181 (4 587)	117 (2 980)	421 (10 679)
246 (6 260)	72 (1 829)	259 (6 577)	181 (4 597)	78 (1 980)	382 (9 689)
246 (6 260)	72 (1 829)	279 (7 077)	181 (4 597)	98 (2 480)	402 (10 189)
246 (6 260)	72 (1 829)	298 (7 577)	181 (4 597)	117 (2 980)	421 (10 689)
247 (6 285)	50 (1 270)	244 (6 202)	182 (4 622)	62 (1 580)	367 (9 314)
247 (6 285)	50 (1 270)	256 (6 502)	182 (4 622)	74 (1 880)	379 (9 614)
247 (6 285)	50 (1 270)	276 (7 002)	182 (4 622)	94 (2 380)	399 (10 114)
247 (6 285)	50 (1 270)	295 (7 502)	182 (4 622)	113 (2 880)	418 (10 614)
247 (6 285)	58 (1 473)	244 (6 202)	182 (4 622)	62 (1 580)	367 (9 314)
247 (6 285)	58 (1 473)	256 (6 502)	182 (4 622)	74 (1 880)	379 (9 614)
247 (6 285)	58 (1 473)	276 (7 002)	182 (4 622)	94 (2 380)	399 (10 114)
247 (6 285)	58 (1 473)	295 (7 502)	182 (4 622)	113 (2 880)	418 (10 614)
248 (6 310)	52 (1 321)	245 (6 227)	183 (4 647)	62 (1 580)	368 (9 339)
248 (6 310)	52 (1 321)	257 (6 527)	183 (4 647)	74 (1 880)	380 (9 639)
248 (6 310)	52 (1 321)	277 (7 027)	183 (4 647)	94 (2 830)	400 (10 139)
248 (6 310)	52 (1 321)	296 (7 527)	183 (4 647)	113 (2 880)	419 (10 639)
248 (6 310)	60 (1 524)	245 (6 227)	183 (4 647)	62 (1 580)	368 (9 339)
248 (6 310)	60 (1 524)	257 (6 527)	183 (4 647)	74 (1 880)	380 (9 639)
248 (6 310)	60 (1 524)	277 (7 027)	183 (4 647)	94 (2 830)	400 (10 139)
248 (6 310)	60 (1 524)	296 (7 527)	183 (4 647)	113 (2 880)	419 (10 639)
249 (6 335)	54 (1 372)	246 (6 252)	184 (4 672)	62 (1 580)	369 (9 364)
249 (6 335)	54 (1 372)	258 (6 552)	184 (4 672)	74 (1 880)	381 (9 664)
249 (6 335)	54 (1 372)	278 (7 052)	184 (4 672)	94 (2 380)	401 (10 164)
249 (6 335)	54 (1 372)	297 (7 552)	184 (4 672)	113 (2 880)	420 (10 664)
250 (6 350)	55 (1 397)	247 (6 267)	185 (4 687)	62 (1 580)	370 (9 379)
250 (6 350)	55 (1 397)	259 (6 567)	185 (4 687)	74 (1 880)	382 (9 679)
250 (6 350)	55 (1 397)	278 (7 067)	185 (4 687)	94 (2 380)	401 (10 179)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
250 (6 350)	55 (1 397)	298 (7 567)	185 (4 687)	113 (2 880)	421 (10 679)
250 (6 360)	72 (1 829)	259 (6 577)	185 (4 697)	74 (1 880)	382 (9 689)
250 (6 360)	72 (1 829)	279 (7 077)	185 (4 697)	94 (2 380)	402 (10 189)
250 (6 360)	72 (1 829)	298 (7 577)	185 (4 697)	113 (2 880)	421 (10 689)
251 (6 385)	50 (1 270)	248 (6 302)	186 (4 722)	62 (1 580)	371 (9 414)
251 (6 385)	50 (1 270)	256 (6 502)	186 (4 722)	70 (1 780)	379 (9 614)
251 (6 385)	50 (1 270)	276 (7 002)	186 (4 722)	90 (2 280)	399 (10 114)
251 (6 385)	50 (1 270)	295 (7 502)	186 (4 722)	109 (2 780)	418 (10 614)
251 (6 385)	50 (1 270)	315 (8 002)	186 (4 722)	129 (3 280)	438 (11 114)
251 (6 385)	58 (1 473)	248 (6 302)	186 (4 722)	62 (1 580)	371 (9 414)
251 (6 385)	58 (1 473)	256 (6 502)	186 (4 722)	70 (1 780)	379 (9 614)
251 (6 385)	58 (1 473)	276 (7 002)	186 (4 722)	90 (2 280)	399 (10 114)
251 (6 385)	58 (1 473)	295 (7 502)	186 (4 722)	109 (2 780)	418 (10 614)
251 (6 385)	58 (1 473)	315 (8 002)	186 (4 722)	129 (3 280)	438 (11 114)
252 (6 410)	52 (1 321)	249 (6 327)	187 (4 747)	62 (1 580)	372 (9 439)
252 (6 410)	52 (1 321)	257 (6 527)	187 (4 747)	70 (1 780)	380 (9 639)
252 (6 410)	52 (1 321)	277 (7 027)	187 (4 747)	90 (2 280)	400 (10 139)
252 (6 410)	52 (1 321)	296 (7 527)	187 (4 747)	109 (2 780)	419 (10 639)
252 (6 410)	52 (1 321)	316 (8 027)	187 (4 747)	129 (3 280)	439 (11 139)
252 (6 410)	60 (1 524)	249 (6 327)	187 (4 747)	62 (1 580)	372 (9 439)
252 (6 410)	60 (1 524)	257 (6 527)	187 (4 747)	70 (1 780)	380 (9 639)
252 (6 410)	60 (1 524)	277 (7 027)	187 (4 747)	90 (2 280)	400 (10 139)
252 (6 410)	60 (1 524)	296 (7 527)	187 (4 747)	109 (2 780)	419 (10 639)
252 (6 410)	60 (1 524)	316 (8 027)	187 (4 747)	129 (3 280)	439 (11 139)
253 (6 435)	54 (1 372)	250 (6 352)	188 (4 772)	62 (1 580)	373 (9 464)
253 (6 435)	54 (1 372)	258 (6 552)	188 (4 772)	70 (1 780)	381 (9 664)
253 (6 435)	54 (1 372)	278 (7 052)	188 (4 772)	90 (2 280)	401 (10 164)
253 (6 435)	54 (1 372)	297 (7 552)	188 (4 772)	109 (2 780)	420 (10 664)
253 (6 435)	54 (1 372)	317 (8 052)	188 (4 772)	129 (3 280)	440 (11 164)
254 (6 450)	55 (1 397)	251 (6 367)	188 (4 787)	62 (1 580)	374 (9 479)
254 (6 450)	55 (1 397)	259 (6 567)	188 (4 787)	70 (1 780)	382 (9 679)
254 (6 450)	55 (1 397)	278 (7 067)	188 (4 787)	90 (2 280)	401 (10 179)
254 (6 450)	55 (1 397)	298 (7 567)	188 (4 787)	109 (2 780)	421 (10 679)
254 (6 450)	55 (1 397)	318 (8 067)	188 (4 787)	129 (3 280)	441 (11 179)
254 (6 460)	72 (1 829)	259 (6 577)	189 (4 797)	70 (1 780)	382 (9 689)
254 (6 460)	72 (1 829)	279 (7 077)	189 (4 797)	90 (2 280)	402 (10 189)
254 (6 460)	72 (1 829)	298 (7 577)	189 (4 797)	109 (2 780)	421 (10 689)
254 (6 460)	72 (1 829)	318 (8 077)	189 (4 797)	129 (3 280)	441 (11 189)
255 (6 485)	58 (1 473)	256 (6 502)	190 (4 822)	66 (1 680)	379 (9 614)
255 (6 485)	58 (1 473)	276 (7 002)	190 (4 822)	86 (2 180)	399 (10 114)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
255 (6 485)	58 (1 473)	295 (7 502)	190 (4 822)	106 (2 680)	418 (10 614)
255 (6 485)	58 (1 473)	315 (8 002)	190 (4 822)	125 (3 180)	438 (11 114)
256 (6 510)	60 (1 524)	257 (6 527)	191 (4 847)	66 (1 680)	380 (9 639)
256 (6 510)	60 (1 524)	277 (7 027)	191 (4 847)	86 (2 180)	400 (10 139)
256 (6 510)	60 (1 524)	296 (7 527)	191 (4 847)	106 (2 680)	419 (10 639)
256 (6 510)	60 (1 524)	316 (8 027)	191 (4 847)	125 (3 180)	439 (11 139)
259 (6 585)	50 (1 270)	256 (6 502)	194 (4 922)	62 (1 580)	379 (9 614)
259 (6 585)	50 (1 270)	276 (7 002)	194 (4 922)	82 (2 080)	399 (10 114)
259 (6 585)	50 (1 270)	295 (7 502)	194 (4 922)	102 (2 580)	418 (10 614)
259 (6 585)	50 (1 270)	315 (8 002)	194 (4 922)	121 (3 080)	438 (11 114)
260 (6 610)	52 (1 321)	257 (6 527)	195 (4 947)	62 (1 580)	380 (9 639)
260 (6 610)	52 (1 321)	277 (7 027)	195 (4 947)	82 (2 080)	400 (10 139)
260 (6 610)	52 (1 321)	296 (7 527)	195 (4 947)	102 (2 580)	419 (10 639)
260 (6 610)	52 (1 321)	316 (8 027)	195 (4 947)	121 (3 080)	439 (11 139)
261 (6 635)	54 (1 372)	258 (6 552)	196 (4 972)	62 (1 580)	381 (9 664)
261 (6 635)	54 (1 372)	278 (7 052)	196 (4 972)	82 (2 080)	401 (10 164)
261 (6 635)	54 (1 372)	297 (7 552)	196 (4 972)	102 (2 580)	420 (10 664)
261 (6 635)	54 (1 372)	317 (8 052)	196 (4 972)	121 (3 080)	440 (11 164)
262 (6 650)	55 (1 397)	259 (6 567)	196 (4 987)	62 (1 580)	382 (9 679)
262 (6 650)	55 (1 397)	279 (7 067)	196 (4 987)	82 (2 080)	401 (10 179)
262 (6 650)	55 (1 397)	298 (7 567)	196 (4 987)	102 (2 580)	421 (10 679)
262 (6 650)	55 (1 397)	318 (8 067)	196 (4 987)	121 (3 080)	441 (11 179)
262 (6 660)	72 (1 829)	259 (6 577)	197 (4 997)	62 (1 580)	382 (9 689)
262 (6 660)	72 (1 829)	279 (7 077)	197 (4 997)	82 (2 080)	402 (10 189)
262 (6 660)	72 (1 829)	298 (7 577)	197 (4 997)	102 (2 580)	421 (10 689)
262 (6 660)	72 (1 829)	318 (8 077)	197 (4 997)	121 (3 080)	441 (11 189)
263 (6 685)	58 (1 473)	276 (7 002)	198 (5 002)	78 (1 980)	399 (10 114)
263 (6 685)	58 (1 473)	295 (7 502)	198 (5 002)	98 (2 480)	418 (10 614)
263 (6 685)	58 (1 473)	315 (8 002)	198 (5 002)	117 (2 980)	438 (11 114)
264 (6 710)	60 (1 524)	277 (7 027)	199 (5 047)	78 (1 980)	400 (10 139)
264 (6 710)	60 (1 524)	296 (7 527)	199 (5 047)	98 (2 480)	419 (10 639)
264 (6 710)	60 (1 524)	316 (8 027)	199 (5 047)	117 (2 980)	439 (11 139)
267 (6 785)	50 (1 270)	276 (7 002)	202 (5 122)	74 (1 880)	399 (10 114)
267 (6 785)	50 (1 270)	295 (7 502)	202 (5 122)	94 (2 380)	418 (10 614)
267 (6 785)	50 (1 270)	315 (8 002)	202 (5 122)	113 (2 880)	438 (11 114)
268 (6 810)	52 (1 321)	277 (7 027)	203 (5 147)	74 (1 880)	400 (10 139)
268 (6 810)	52 (1 321)	296 (7 527)	203 (5 147)	94 (2 380)	419 (10 639)
268 (6 810)	52 (1 321)	316 (8 027)	203 (5 147)	113 (2 880)	439 (11 139)
269 (6 835)	54 (1 372)	278 (7 052)	204 (5 172)	74 (1 880)	401 (10 164)
269 (6 835)	54 (1 372)	297 (7 552)	204 (5 172)	94 (2 380)	420 (10 664)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
269 (6 835)	54 (1 372)	317 (8 052)	204 (5 172)	113 (2 880)	440 (11 164)
270 (6 850)	55 (1 397)	278 (7 067)	204 (5 187)	74 (1 880)	401 (10 179)
270 (6 850)	55 (1 397)	298 (7 567)	204 (5 187)	94 (2 380)	421 (10 679)
270 (6 850)	55 (1 397)	318 (8 067)	204 (5 187)	113 (2 880)	441 (11 179)
270 (6 860)	72 (1 829)	279 (7 077)	205 (5 197)	74 (1 880)	402 (10 189)
270 (6 860)	72 (1 829)	298 (7 577)	205 (5 197)	94 (2 380)	421 (10 689)
270 (6 860)	72 (1 829)	318 (8 077)	205 (5 197)	113 (2 880)	441 (11 189)
271 (6 885)	58 (1 473)	276 (7 002)	206 (5 222)	70 (1 780)	399 (10 114)
271 (6 885)	58 (1 473)	295 (7 502)	206 (5 222)	90 (2 280)	418 (10 614)
271 (6 885)	58 (1 473)	315 (8 002)	206 (5 222)	109 (2 780)	438 (11 114)
272 (6 910)	60 (1 524)	277 (7 027)	207 (5 247)	70 (1 780)	400 (10 139)
272 (6 910)	60 (1 524)	296 (7 527)	207 (5 247)	90 (2 280)	419 (10 639)
272 (6 910)	60 (1 524)	316 (8 027)	207 (5 247)	109 (2 780)	439 (11 139)
275 (6 985)	50 (1 270)	276 (7 002)	210 (5 322)	66 (1 680)	399 (10 114)
275 (6 985)	50 (1 270)	295 (7 502)	210 (5 322)	86 (2 180)	418 (10 614)
275 (6 985)	50 (1 270)	315 (8 002)	210 (5 322)	106 (2 680)	438 (11 114)
276 (7 010)	52 (1 321)	277 (7 027)	211 (5 347)	66 (1 680)	400 (10 139)
276 (7 010)	52 (1 321)	296 (7 527)	211 (5 347)	86 (2 180)	419 (10 639)
276 (7 010)	52 (1 321)	316 (8 027)	211 (5 347)	106 (2 680)	439 (11 139)
277 (7 035)	54 (1 372)	278 (7 052)	211 (5 372)	66 (1 680)	401 (10 164)
277 (7 035)	54 (1 372)	297 (7 552)	211 (5 372)	86 (2 180)	420 (10 664)
277 (7 035)	54 (1 372)	317 (8 052)	211 (5 372)	106 (2 680)	440 (11 164)
278 (7 050)	55 (1 397)	278 (7 067)	212 (5 387)	66 (1 680)	401 (10 179)
278 (7 050)	55 (1 397)	298 (7 567)	212 (5 387)	86 (2 180)	421 (10 679)
278 (7 050)	55 (1 397)	318 (8 067)	212 (5 387)	106 (2 680)	441 (11 179)
278 (7 060)	72 (1 829)	279 (7 077)	212 (5 397)	66 (1 680)	402 (10 189)
278 (7 060)	72 (1 829)	298 (7 577)	212 (5 397)	86 (2 180)	421 (10 679)
278 (7 060)	72 (1 829)	318 (8 077)	212 (5 397)	106 (2 680)	441 (11 189)
279 (7 085)	58 (1 473)	276 (7 002)	213 (5 422)	62 (1 580)	399 (10 114)
279 (7 085)	58 (1 473)	295 (7 502)	213 (5 422)	82 (2 080)	418 (10 614)
279 (7 085)	58 (1 473)	315 (8 002)	213 (5 422)	102 (2 580)	438 (11 114)
280 (7 110)	60 (1 524)	277 (7 027)	214 (5 447)	62 (1 580)	400 (10 139)
280 (7 110)	60 (1 524)	296 (7 527)	214 (5 447)	82 (2 080)	419 (10 639)
280 (7 110)	60 (1 524)	316 (8 027)	214 (5 447)	102 (2 580)	439 (11 139)
283 (7 185)	50 (1 270)	295 (7 502)	217 (5 522)	78 (1 980)	418 (10 614)
283 (7 185)	50 (1 270)	315 (8 002)	217 (5 522)	98 (2 480)	438 (11 114)
284 (7 210)	52 (1 321)	296 (7 527)	218 (5 547)	78 (1 980)	419 (10 639)
284 (7 210)	52 (1 321)	316 (8 027)	218 (5 547)	98 (2 480)	439 (11 139)
285 (7 235)	54 (1 372)	297 (7 552)	219 (5 572)	78 (1 980)	420 (10 664)
285 (7 235)	54 (1 372)	317 (8 052)	219 (5 572)	98 (2 480)	440 (11 164)

AVAILABLE WHEELBASE PLATFORM IN. (MM)					
WB	**RAS**	**LP**	**CA**	**AF**	**OAL**
285 (7 250)	55 (1 397)	298 (7 567)	220 (5 587)	78 (1 980)	421 (10 679)
285 (7 250)	55 (1 397)	318 (8 067)	220 (5 587)	98 (2 480)	441 (11 179)
286 (7 260)	72 (1 829)	298 (7 577)	220 (5 597)	78 (1 980)	421 (10 689)
286 (7 260)	72 (1 829)	318 (8 077)	220 (5 597)	98 (2 480)	441 (11 189)
287 (7 285)	58 (1 473)	295 (7 502)	221 (5 622)	74 (1 880)	418 (10 614)
287 (7 285)	58 (1 473)	315 (8 002)	221 (5 622)	94 (2 380)	438 (11 114)
288 (7 310)	60 (1 524)	296 (7 527)	222 (5 647)	74 (1 880)	419 (10 639)
288 (7 310)	60 (1 524)	316 (8 027)	222 (5 647)	94 (2 380)	439 (11 139)
291 (7 385)	50 (1 270)	295 (7 502)	225 (5 722)	70 (1 780)	418 (10 614)
291 (7 385)	50 (1 270)	315 (8 002)	225 (5 722)	90 (2 280)	438 (11 114)
292 (7 410)	52 (1 321)	296 (7 527)	226 (5 747)	70 (1 780)	419 (10 639)
292 (7 410)	52 (1 321)	316 (8 027)	226 (5 747)	90 (2 280)	439 (11 139)
293 (7 435)	54 (1 372)	297 (7 552)	227 (5 772)	70 (1 780)	420 (10 664)
293 (7 435)	54 (1 372)	317 (8 052)	227 (5 772)	90 (2 280)	440 (11 164)
293 (7 450)	55 (1 397)	298 (7 567)	228 (5 787)	70 (1 780)	421 (10 679)
293 (7 450)	55 (1 397)	318 (8 067)	228 (5 787)	90 (2 280)	441 (11 179)
294 (7 460)	72 (1 829)	298 (1 577)	228 (5 797)	70 (1 780)	421 (10 689)
294 (7 460)	72 (1 829)	318 (8 077)	228 (5 797)	90 (2 280)	441 (11 189)
295 (7 485)	58 (1 473)	295 (7 502)	229 (5 822)	66 (1 680)	418 (10 614)
295 (7 485)	58 (1 473)	315 (8 002)	229 (5 822)	86 (2 180)	438 (11 114)
296 (7 510)	60 (1 524)	296 (7 527)	230 (5 847)	66 (1 680)	419 (10 639)
296 (7 510)	60 (1 524)	316 (8 027)	230 (5 847)	86 (2 180)	439 (11 139)
299 (7 585)	50 (1 270)	295 (7 502)	233 (5 922)	62 (1 580)	418 (10 614)
299 (7 585)	50 (1 270)	315 (8 002)	233 (5 922)	82 (2 080)	438 (11 114)
300 (7 610)	52 (1 321)	296 (7 527)	234 (5 947)	62 (1 580)	419 (10 639)
300 (7 610)	52 (1 321)	316 (8 027)	234 (5 947)	82 (2 080)	439 (11 139)
301 (7 635)	54 (1 372)	297 (7 552)	235 (5 972)	62 (1 580)	420 (10 664)
301 (7 635)	54 (1 372)	317 (8 052)	235 (5 972)	82 (2 080)	440 (11 164)
301 (7 650)	55 (1 397)	298 (7 567)	236 (5 987)	62 (1 580)	421 (10 679)
301 (7 650)	55 (1 397)	318 (8 067)	236 (5 987)	82 (2 080)	441 (11 179)
302 (7 660)	72 (1 829)	298 (7 577)	236 (5 997)	62 (1 580)	421 (10 689)
302 (7 660)	72 (1 829)	318 (8 077)	236 (5 997)	82 (2 080)	441 (11 189)
303 (7 685)	58 (1 473)	315 (8 002)	237 (6 022)	78 (1 980)	438 (11 114)
304 (7 710)	60 (1 524)	316 (8 027)	238 (6 047)	78 (1 980)	439 (11 139)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,600 lb (6 486 kg)
- 18,000 lb (8 165 kg)
- 20,000 lb (9 072 kg)
- 23,000 lb (10 433 kg)

Available Tandem Rear Axle Weight Ratings:

- 38,000 lb (17 239 kg)
- 40,000 lb (18 144 kg)
- 44,000 lb (19 958 kg)
- 46,000 lb (20 866 kg)
- 52,000 lb (23 636 kg)
- 58,000 lb (26 309 kg)
- 65,000 lb (29 484 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model MRU602 Low Cab Forward (4x2) — Dimensions/Configurations

Acceptable vehicle applications include: on-highway, on/off-highway, local pick-up and delivery, dump, refuse, tanker, and wrecker.

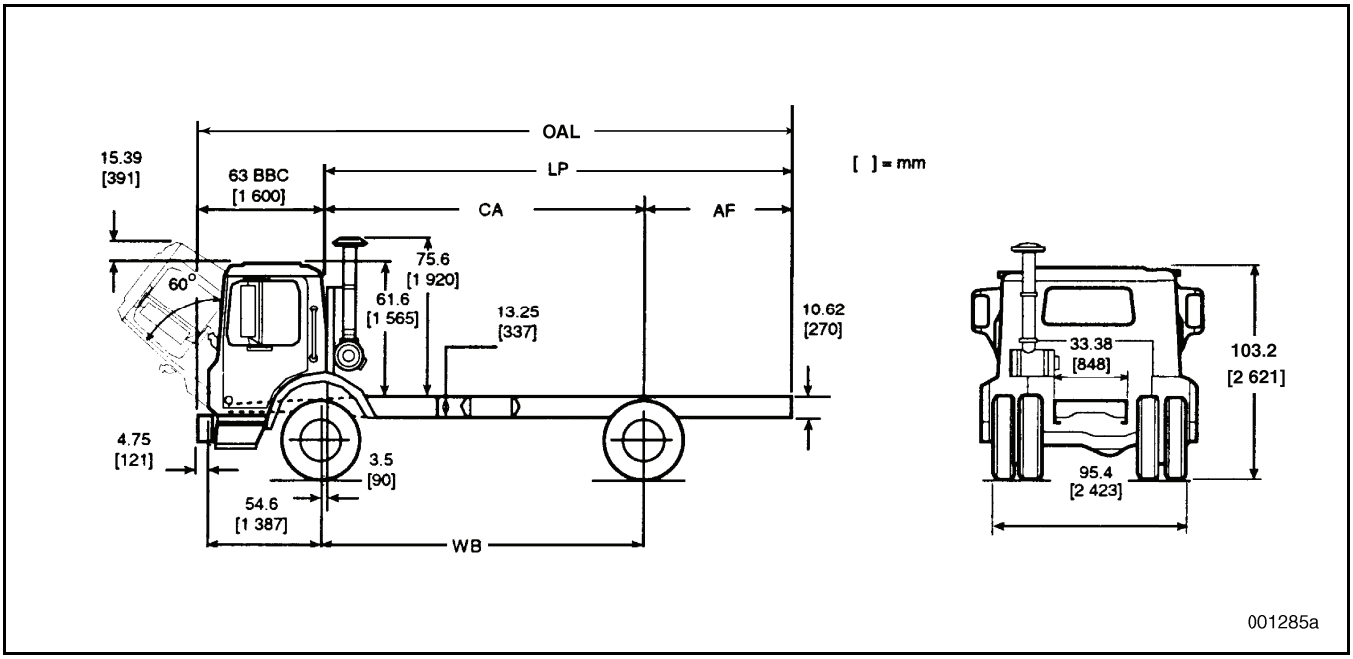


Figure 40 — MRU602 Low Cab Forward (4x2)

MRU602 LOW CAB FORWARD (4X2)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
98 (2 489)	128 (3 251)	95 (2 413)	33 (838)	191 (4 851)
122 (3 099)	152 (3 861)	119 (3 023)	33 (838)	215 (5 461)
133 (3 378)	201 (5 105)	130 (3 302)	71 (1 803)	264 (6 705)
139 (3 531)	210 (5 334)	136 (3 454)	74 (1 880)	273 (6 934)
149 (3 785)	210 (5 334)	146 (3 708)	64 (1 626)	273 (6 934)
157 (3 988)	249 (6 325)	154 (3 912)	95 (2 413)	312 (7 925)
169 (4 293)	249 (6 325)	166 (4 216)	83 (2 108)	312 (7 925)
173 (4 394)	249 (6 325)	170 (4 318)	79 (2 001)	312 (7 925)
181 (4 597)	249 (6 325)	178 (4 521)	71 (1 803)	312 (7 925)
181 (4 597)	273 (6 934)	178 (4 521)	95 (2 413)	336 (8 534)
184 (4 674)	297 (7 544)	181 (4 597)	116 (2 943)	360 (9 144)
197 (5 004)	297 (7 544)	194 (4 928)	103 (2 616)	360 (9 144)
205 (5 207)	297 (7 544)	202 (5 131)	95 (2 413)	360 (9 144)
210 (5 334)	297 (7 554)	207 (5 258)	90 (2 286)	360 (9 144)
210 (5 334)	320 (8 128)	207 (5 258)	113 (2 870)	383 (9 728)
255 (6 477)	320 (8 128)	252 (6 401)	68 (1 727)	383 (9 728)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,300 lb (6 486 kg)
- 14,600 lb (6 623 kg)
- 18,000 lb (8 165 kg)
- 20,000 lb (9 072 kg)

Available Rear Axle Weight Ratings:

- 23,000 lb (10 433 kg)
- 30,000 lb (13 608 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model MRU603 Low Cab Forward (6x4) — Dimensions/Configurations

Acceptable vehicle applications include: on-highway, on/off-highway, local pick-up and delivery, dump, refuse, tanker, and concrete pumper.

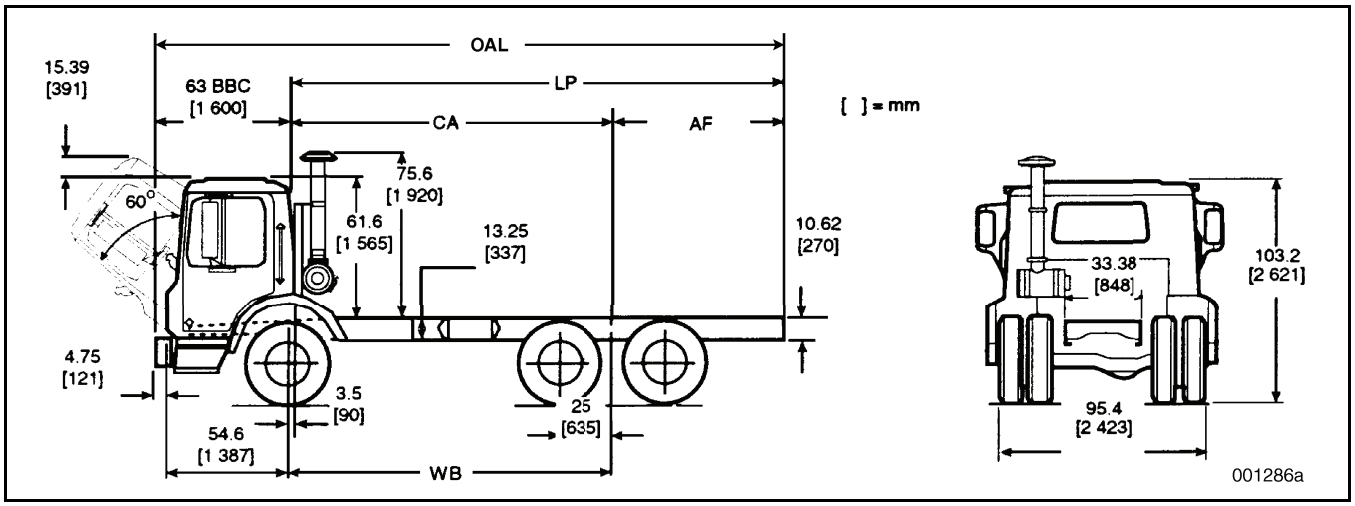


Figure 41 — MRU603 Low Cab Forward (6x4)

MRU603 LOW CAB FORWARD (6X4)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
143 (3 632)	128 (3 251)	95 (2 413)	33 (838)	191 (4 851)
159 (4 039)	152 (3 861)	119 (3 023)	33 (838)	215 (5 461)
159 (4 039)	201 (5 105)	130 (3 302)	71 (1 803)	264 (6 705)
166 (4 216)	210 (5 334)	136 (3 454)	74 (1 880)	273 (6 934)
166 (4 216)	210 (5 334)	146 (3 708)	64 (1 626)	273 (6 934)
173 (4 394)	249 (6 325)	154 (3 912)	95 (2 413)	312 (7 925)
173 (4 394)	249 (6 325)	166 (4 216)	83 (2 108)	312 (7 925)
179 (4 547)	249 (6 325)	170 (4 318)	79 (2 001)	312 (7 925)
181 (4 597)	249 (6 325)	178 (4 521)	71 (1 803)	312 (7 925)
181 (4 597)	273 (6 934)	178 (4 521)	95 (2 413)	336 (8 534)
185 (4 699)	297 (7 544)	182 (4 623)	91 (2 311)	360 (9 144)
185 (4 699)	297 (7 544)	182 (4 623)	115 (2 921)	360 (9 144)
189 (4 801)	273 (6 934)	186 (4 724)	87 (2 210)	336 (8 534)
189 (4 801)	290 (7 366)	186 (4 724)	104 (2 642)	353 (8 966)
189 (4 801)	310 (7 874)	186 (4 724)	124 (3 150)	373 (9 474)
197 (5 004)	273 (6 934)	194 (4 928)	79 (2 007)	336 (8 534)
197 (5 004)	290 (7 366)	194 (4 928)	96 (2 434)	353 (8 966)
197 (5 004)	310 (7 874)	194 (4 928)	116 (2 946)	373 (9 474)
201 (5 105)	273 (6 934)	198 (5 029)	75 (1 905)	336 (8 534)

AVAILABLE WHEELBASE PLATFORM IN. (MM)				
WB	**LP**	**CA**	**AF**	**OAL**
205 (5 207)	273 (6 934)	202 (5 131)	71 (1 803)	336 (8 534)
205 (5 207)	297 (7 544)	202 (5 131)	95 (2 413)	360 (9 144)
205 (5 207)	310 (7 874)	202 (5 131)	108 (2 743)	373 (9 474)
210 (5 334)	273 (6 934)	207 (5 258)	66 (1 676)	336 (8 534)
210 (5 334)	297 (7 544)	207 (5 258)	90 (2 286)	360 (9 144)
210 (5 334)	320 (8 128)	207 (5 258)	113 (2 870)	383 (9 728)
215 (5 461)	273 (6 934)	212 (5 385)	61 (1 549)	336 (8 534)
215 (5 461)	297 (7 544)	212 (5 385)	85 (2 159)	360 (9 144)
215 (5 461)	310 (7 874)	212 (5 385)	98 (2 489)	373 (9 474)
220 (5 580)	300 (7 620)	217 (5 512)	83 (2 108)	363 (9 220)
220 (5 580)	320 (8 128)	217 (5 512)	103 (2 616)	383 (9 728)
225 (5 715)	300 (7 620)	222 (5 639)	78 (1 981)	363 (9 220)
225 (5 715)	320 (8 128)	222 (5 639)	98 (2 489)	383 (9 728)
230 (5 842)	320 (8 128)	227 (5 766)	93 (2 362)	383 (9 728)
230 (5 842)	350 (8 890)	227 (5 766)	123 (3 124)	413 (10 490)
237 (6 020)	300 (7 620)	234 (5 944)	66 (1 676)	363 (9 220)
237 (6 020)	366 (9 296)	234 (5 944)	132 (3 353)	429 (10 896)
242 (6 147)	366 (9 296)	239 (6 071)	127 (3 266)	429 (10 896)
255 (6 477)	350 (8 890)	252 (6 401)	98 (2 489)	413 (10 490)
284 (7 214)	350 (8 890)	281 (7 137)	69 (1 753)	413 (10 490)

Available Front Axle Weight Ratings:

- 12,000 lb (5 443 kg)
- 14,300 lb (6 486 kg)
- 14,600 lb (6 623 kg)
- 18,000 lb (8 165 kg)
- 20,000 lb (9 072 kg)

Available Rear Tandem Axle Weight Ratings:

- 34,000 lb (15 422 kg)
- 38,000 lb (17 239 kg)
- 40,000 lb (18 144 kg)
- 44,000 lb (19 958 kg)
- 46,000 lb (20 866 kg)
- 50,000 lb (22 680 kg)
- 58,000 lb (26 309 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model LEU602 Low Cab Forward (4x2) — Dimensions/Configurations

Acceptable vehicle applications include:
on-highway, on/off-highway, and refuse.

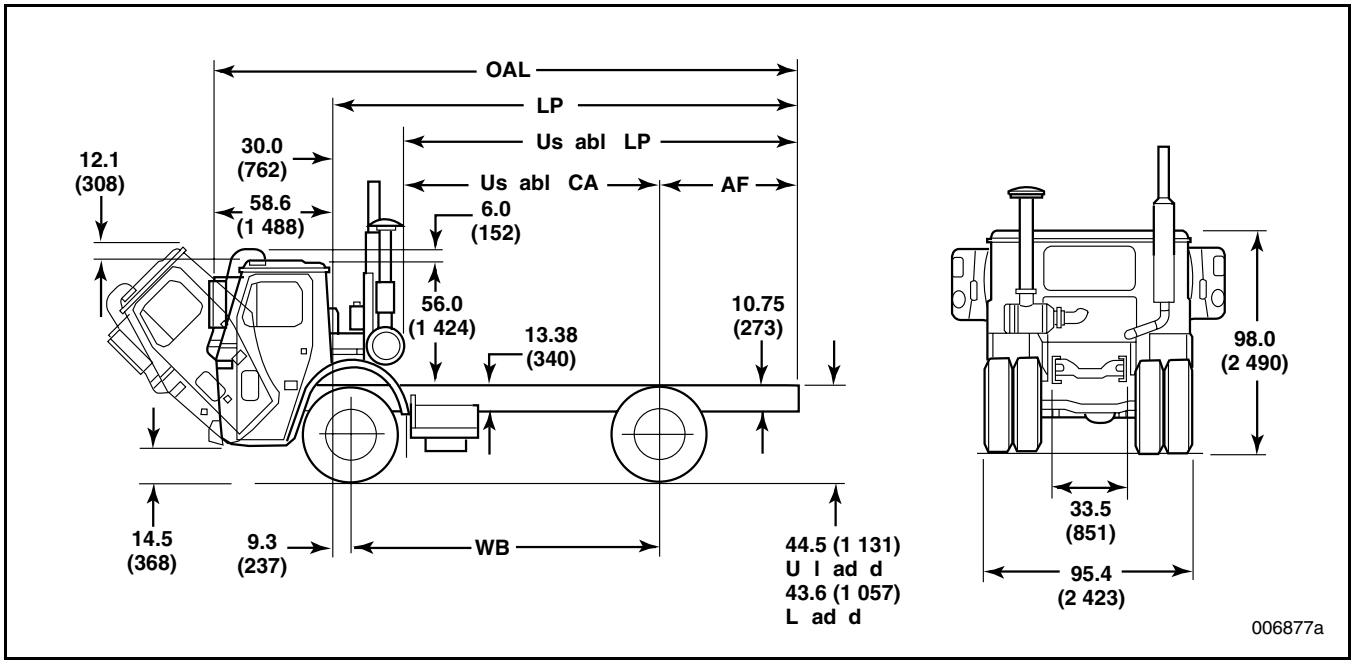


Figure 42 — LEU602 Low Cab Forward (4x2)

LEU602 LOW CAB FORWARD (4X2)

AVAILABLE WHEELBASE/PLATFORM — IN. (MM)					
WB	**LP**	**Usable LP**	**Usable CA**	**AF**	**OAL**
98 (2 489)	128 (3 251)	98 (2 489)	95 (2 413)	33 (838)	217 (5 501)
122 (3 099)	152 (3 861)	122 (3 099)	119 (3 023)	33 (838)	241 (6 111)
133 (3 378)	201 (5 105)	171 (4 343)	130 (3 302)	71 (1 803)	290 (7 355)
139 (3 531)	210 (5 334)	180 (4 572)	136 (3 454)	74 (1 880)	299 (7 584)
149 (3 785)	210 (5 334)	180 (4 572)	146 (3 708)	64 (1 626)	299 (7 584)
157 (3 988)	249 (6 325)	219 (5 563)	154 (3 912)	95 (2 413)	338 (8 575)
161 (4 089)	218 (5 537)	188 (4 775)	158 (4 013)	48 (1 219)	307 (7 787)
169 (4 293)	249 (6 325)	219 (5 563)	166 (4 216)	83 (2 108)	338 (8 575)
173 (4 394)	249 (6 325)	219 (5 563)	170 (4 318)	79 (2 007)	338 (8 575)
181 (4 597)	249 (6 325)	219 (5 563)	178 (4 521)	71 (1 803)	338 (8 575)
181 (4 597)	273 (6 934)	243 (6 172)	178 (4 521)	95 (2 413)	362 (9 184)
184 (4 674)	297 (7 544)	267 (6 782)	181 (4 597)	116 (2 946)	386 (9 794)
197 (5 004)	297 (7 544)	267 (6 782)	194 (4 928)	103 (2 616)	386 (9 794)
205 (5 207)	297 (7 544)	267 (6 782)	202 (5 131)	95 (2 413)	386 (9 794)
210 (5 334)	297 (7 544)	267 (6 782)	207 (5 258)	90 (2 286)	386 (9 794)
210 (5 334)	320 (8 128)	290 (7 366)	207 (5 258)	113 (2 870)	409 (10 378)
255 (6 477)	320 (8 128)	290 (7 366)	252 (6 401)	68 (1 727)	409 (10 378)

Available Front Axle Weight Rating:

- 20,000 lb (9 072 kg)

Available Rear Tandem Axle Weight Ratings:

- 23,000 lb (10 433 kg)
- 30,000 lb (13 608 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

Model LEU603 Low Cab Forward (6x4) — Dimensions/Configurations

Acceptable vehicle applications include:
on-highway, on/off-highway, and refuse.

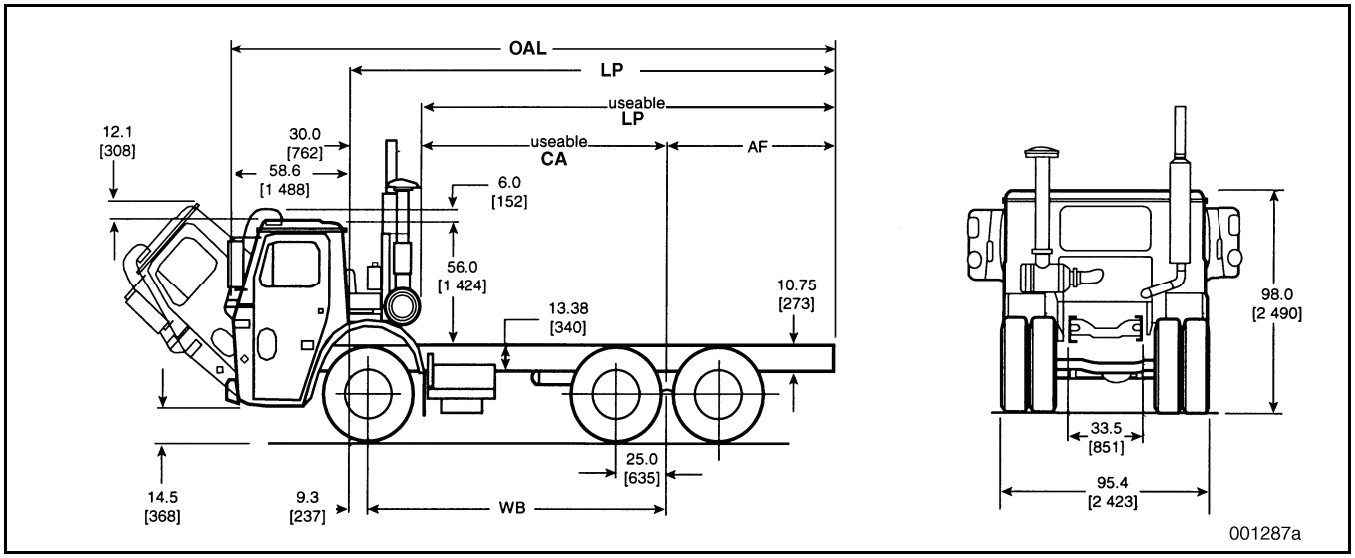


Figure 43 — LEU603 Low Cab Forward (6x4)

LEU603 LOW CAB FORWARD (6X4)

Frame Type	WB	LP	Usable LP	Usable CA	AF	OAL
Standard Frame	173 (4 394)	286 (7 264)	256 (6 502)	152.3 (3 868)	104 (2 642)	345 (8 763)
Standard Frame	197 (5 004)	286 (7 264)	256 (6 502)	176.3 (4 478)	80 (2 032)	345 (8 763)
Standard Frame	210 (5 334)	286 (7 264)	256 (6 502)	189.3 (4 808)	67 (1 702)	345 (8 763)
Standard Frame	246 (6 248)	322 (8 179)	292 (7 417)	225.3 (5 723)	67 (1 702)	381 (9 677)
Standard Frame	186 (4 724)	286 (7 264)	256 (6 502)	165.3 (4 199)	60 (1 524)	345 (8 763)
Drop Frame	250 (6 350)	320 (8 128)	290 (7 366)	Drop Frame	61 (1 549)	379 (9 627)

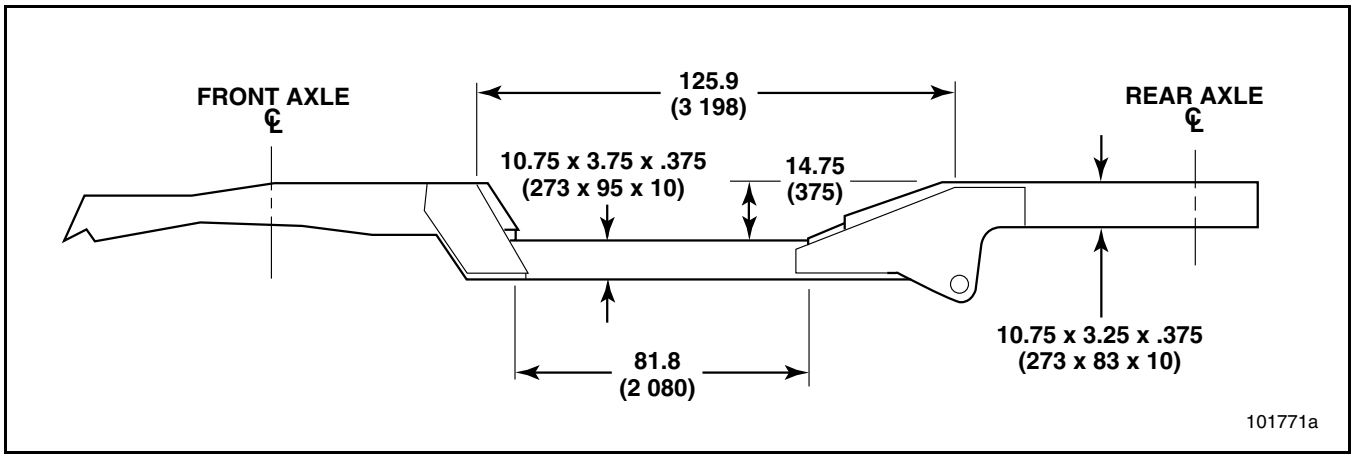


Figure 44 — Drop Frame Dimensions

Available Front Axle Weight Rating:

- 20,000 lb (9 072 kg)

Available Rear Tandem Axle Weight Ratings:

- 38,000 lb (17 239 kg)
- 46,000 lb (20 866 kg)

NOTE

The Gross Axle Weight Rating (GAWR) depends upon various factors such as the axle weight rating, tire and rim ratings, suspension rating, etc., and is determined by the lowest rated component of the axle system. The Gross Vehicle Weight Rating (GVWR) is (usually, but not necessarily) the sum of the GAWRs. The GVWR could be limited by the frame or transmission.

BODY MOUNTING

BODY MOUNTING CONSIDERATIONS

When mounting a body to a particular type of chassis, the following design considerations must be considered for each type of chassis:

- Accessibility to the various critical locations, including lubrication (grease) points and fuel tank.
- Ease of removal of the various powertrain and suspension components.
- Allow for rear wheel maximum spring movement.
- Ensure proper ventilation and subsequent cooling of brake drums, and the battery within the battery box.
- Do not block, or partially cover the engine air intake or the frontal area of the cab/hood in a way that would block the flow of air through the radiator grille opening. Maintain clear access and free flow of air to these areas (while the vehicle is moving).
- Free movement and safe operation throughout the range of movement for all moving parts of the frame (i.e., springs, driveshafts, etc.) must be maintained.

⚠ CAUTION

The addition of a body to a vehicle frame must not adversely affect the safe operation and handling characteristics of the vehicle.

- Maintain proper load distribution between the right- and left-hand sides of the vehicle.
- The body installation must not cause excessive frame rail deflection. Contact Mack Trucks, Inc. Customer Service for assistance in obtaining approval for an installation on a specific chassis. Be prepared to supply detailed information concerning intended weight distribution of the completed vehicle.
- Body attachment fasteners must be tightened gradually in progressive steps, using an alternating pattern.
- To avoid any sudden change of inertia, sectioning of sub-frames or underframes must decrease progressively toward the chassis front.
- Tank bodies must be mounted on a full-length sub-frame.
- Any body that is mounted to the chassis by U-bolts must have stops at the rear of each frame side member to restrain the body installation and prevent it from exerting undue stress on the U-bolts during a panic stop. These stops will also help to restrain the body if the U-bolts break or loosen.

  There should be two stops per frame rail, one mounted at each end of the body.
- If wheel removal is necessary, take the following precautions.

  a. Do not paint the wheel bearing surfaces of the hubs. Particularly in the case of hub-piloted wheels, the faces of the hub, flange mounting surfaces of the wheels, and mounting surfaces of the flange nuts must be clean and free of any foreign material or excess paint.

  b. Do not paint the wheel nut bearing surfaces, or the surfaces of the wheel nuts themselves.

  c. When remounting hub-piloted wheels, anti-seize compound may be applied to the hub pilot pads to prevent corrosion. Apply two drops of oil to the joint between the nut and flange of each flange nut and a small amount of oil to the lead threads of the stud. On stud piloted ball seat disc wheels, the wheel nuts are installed dry.

  d. Tighten the wheel nuts, using proper wheel nut tightening procedures. For specific information on installing spoked, disc and hub-piloted wheels refer to the *Maintenance and Lubrication Manual*, TS494, or the *Wheels, Rims and Tires Service Manual*, 15-101.

  e. After any operation that requires removal and reinstallation of the wheel assemblies, the wheel nuts must be retightened with an accurately calibrated torque wrench during the first 50–100 miles (80–161 km) of use.

BODY-TO-CHASSIS MATCHING

Properly matching a truck body and/or accessory equipment to a chassis is important to ensure that the completed vehicle will perform as intended without adversely affecting handling characteristics or weight distribution. Typically, 60–70% of the body weight should be forward of the centerline of the rear axle(s). This percentage can be adjusted by either moving the center of gravity forward, which places more weight on the front axle, or moving the center of gravity rearward, which places more weight on the rear axle(s). The addition of a body, associated equipment and the payload should never result in the GAWRs and/or GVWR being exceeded.

When choosing a chassis for a body, the following must be considered:

- How much weight can be placed on the front and rear axles (GAWR).
- How much the vehicle can weigh, including the vehicle with full capacities of fuel, oil, coolant, etc., the driver and passenger if applicable, all associated equipment and the body's payload (GVWR).
- Curb or tare weight, or how much the chassis weighs before the body and/or equipment are installed. Tare weight includes the weight of all options, fuel, lubricants and coolants.
- Cab-to-Axle (CA) — This is the dimension from the back of the cab to the centerline of the rear axle, or the centerline of the rear tandem axle assembly. (Refer to Figure 29.)
- Wheelbase (WB) — This is the dimension between the centerline of the front axle and the centerline of the rear axle (or the centerline of the tandem axle assembly). (Refer to Figure 29.) This dimension is important because it affects body installation, vehicle performance and whether a particular axle is overloaded.
- Back-of-Cab (BOC) — The distance between the back of the cab and the body. (Refer to Figure 29.)
- Body Length (BL) — This is the dimension from the front to the rear of the body.
- Overall Vehicle Length — State regulated for straight trucks. If in doubt, contact the appropriate State Department of Transportation.

Dimension Calculations — Body Length

When selecting a body for an existing chassis, use the following formula to calculate body length:

$$BL = \left[\frac{(GAWR.R - CWR) \bullet WB}{GVWR - CW} - WB + CA - BOC \right] \bullet 2$$

001266a

Figure 45 — Formula for Calculating Body Length

Where:

GAWR.R =	Gross axle weight rating of the rear axle
CWR =	Amount of curb weight at the rear of the chassis
WB =	Chassis wheelbase
GVWR =	Gross vehicle weight rating of the chassis
CW =	Curb weight of the chassis
CA =	Dimension between the rear of the cab and the centerline of the rear axle or tandem
BOC =	Distance between the back of the cab and the front of the body

Dimension Calculations — Wheelbase

When selecting a chassis for an existing body, use the following formula to calculate the required wheelbase dimension.

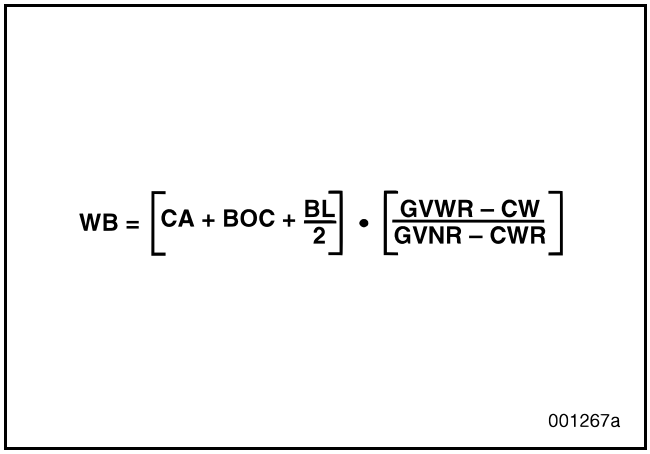


Figure 46 — Formula for Calculating Chassis Wheelbase

Where:

WB =	Chassis wheelbase
AB =	Dimension from centerline of front steer axle to back of cab. Refer to Figure 1 “Vehicle Dimensions.”
BOC =	Back of cab to body clearance
CW =	Chassis curb weight
CWR =	Chassis curb weight at the rear of the chassis
GAWR.R =	Gross axle weight rating of the rear axle

Dimension Calculations — Front Axle to Back of Cab

The following formula can be used to calculate the CA (front steer axle centerline to back of cab) dimension for a particular body length.

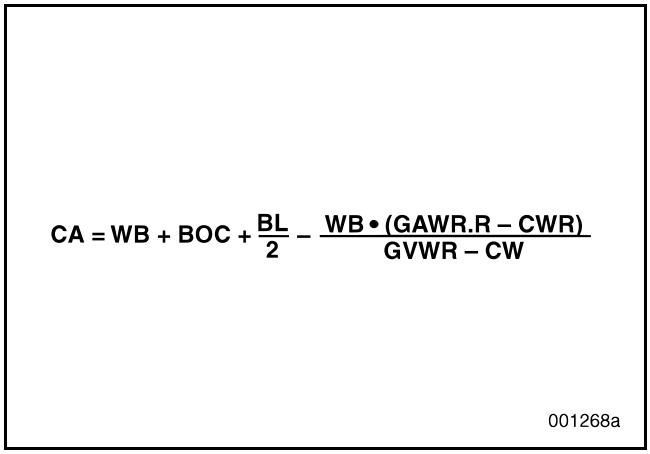


Figure 47 — Formula for Calculating CA Dimension

Where:

WB =	Chassis wheelbase
BOC =	Clearance from back of cab to front of body
BL =	Body length
GAWR.R =	Gross axle weight rating of the rear axle
CWR =	Chassis curb weight at the rear of the chassis
GVWR =	Gross vehicle weight rating
CW =	Chassis curb weight

FRAME DRILLING

Body attachment, frame lengthening, shortening or any other type of modification, requires drilling holes in the frame side members. Whenever holes are drilled in the frame, certain precautions must be taken to maintain the strength and integrity of the frame.

When drilling the frame, observe the following guidelines to avoid frame damage:

⚠ CAUTION

Do not drill the frame flanges, as this may result in frame failure.

- The hole centerline must not be closer than 1-3/4 inches (45 mm) from the top or bottom frame flange. If inside frame liners are used, hole centerline must be at least 1-3/4 inches (45 mm) from the flange of the inside liner.
- Hole centerlines must be at least 3 inches (75 mm) apart. Additionally, there should be no more than two holes on the same vertical line. Ideally, holes should be staggered as shown in the illustration below.

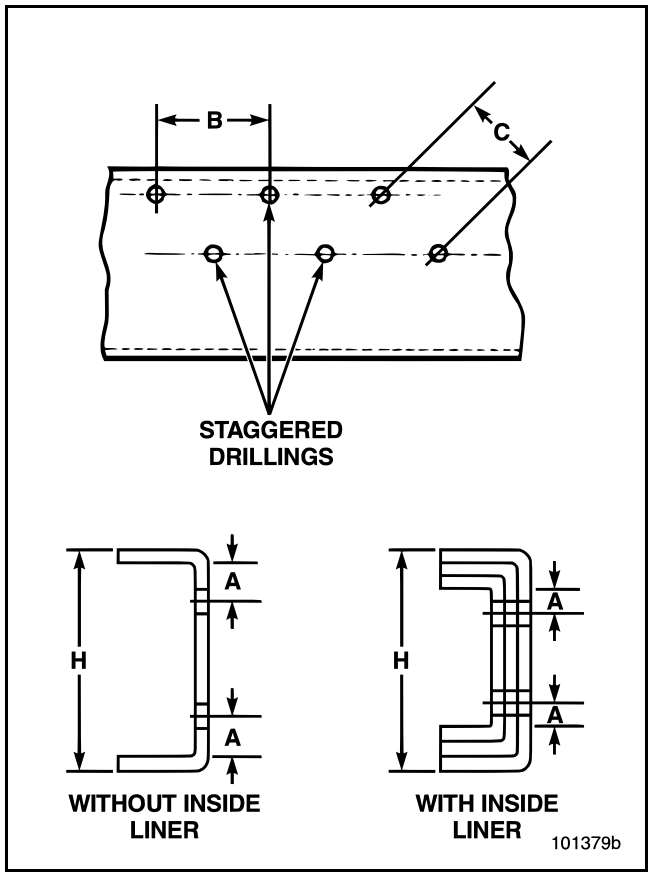


Figure 48 — Drilling Locations in Frame Webs

Location	Dimension Inches (mm)
A	1-3/4 (45)
B	3 (75)
C	3 (75)
H	Frame Height

- Holes must be no larger than existing holes in the frame, such as holes for the spring bracket bolts. As an example, spring bracket bolt sizes for the certain MACK suspensions are as follows:
  - — **MACK SS** — 20 mm
  - — **MACK AL** — 16 mm
  - — **MaxLite™ 20–40** — 14 mm
- Use proper drill bits. Cobalt high-speed drills are superior to conventional high-speed drill bits for frame drilling operations. Drills should be sharpened to give 150 degrees included angle with 7 to 15 degrees lip clearance. This prevents localized overheating of the frame in the area of the drilling operation.

  When a pilot hole is drilled, it should not be enlarged in successive stages, as rapid wear of drill bits will occur. Also, stop drilling before fully breaking through. Remove the remaining lip with a reamer.

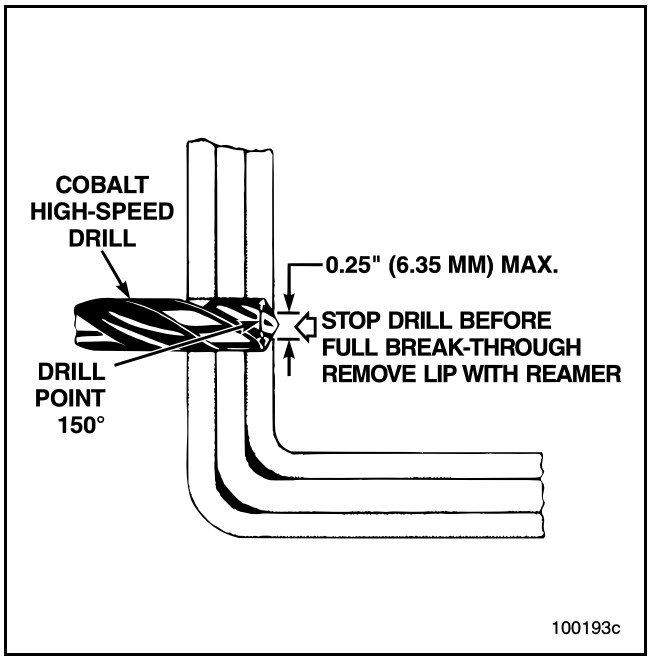


Figure 49 — Frame Drilling

- Never cut holes into the frame with a torch.
- Do not drill holes near any high-stress points such as locations around the spring brackets.
- Holes must be deburred and reamed to no more than 1/32 inch (0.946 mm) larger than the intended fastener.

FRAME — WELDING AND CUTTING

Certain frame modifications, such as lengthening and shortening, require welding and cutting the frame. In general, frame welding is not recommended. However, for modifications that do require cutting or welding the frame (such as frame lengthening, shortening, etc.), the following welding and cutting practices are recommended by Mack Trucks, Inc.

⚠ CAUTION

The only acceptable method of lengthening a frame is by adding a section behind the rear axles. Cutting and splicing the frame ahead of the rear axles will severely weaken the frame in the area of the splice and will result in frame failure. DO NOT splice a frame.

Frame Cutting

Mechanical sawing is the preferred method for cutting the frame. However, the oxygen gas process (either oxygen and acetylene or oxygen and MAPP) is acceptable.

Surface areas of the parts to be joined must be ground smooth to prepare them for welding. Edges must be bevelled to a 30-degree angle with a 1/16-inch (1.588 mm) land.

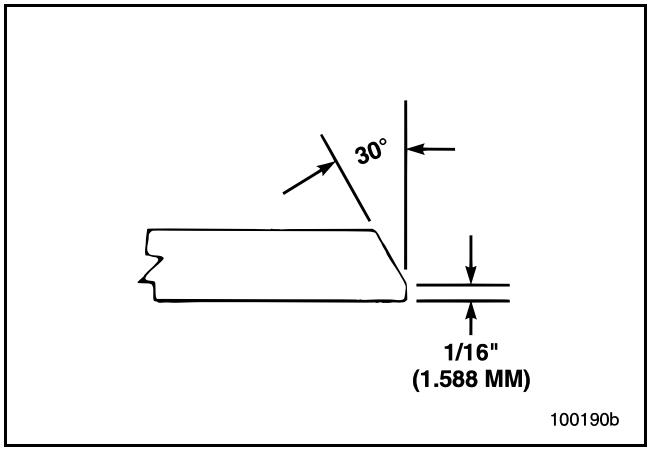


Figure 50 — Joint Preparation

When joining frame members, the bevel must be away from the frame. Parts being joined must be brought as close together as possible. A gap of approximately 1/16 inch (1.588 mm) should be maintained. Align the sections and clamp them with a piece of scrap channel.

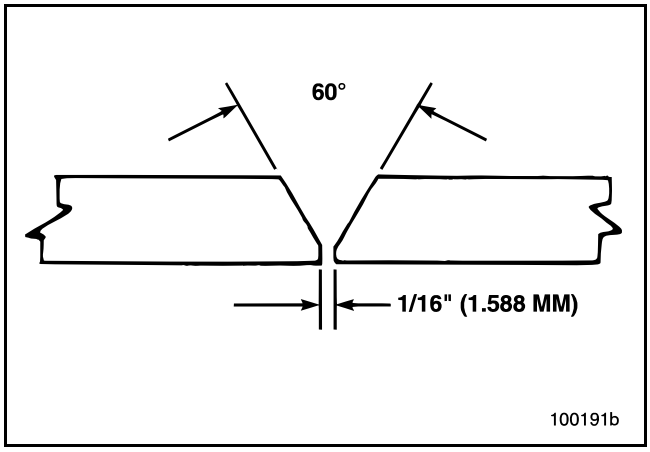


Figure 51 — Aligning Joints for Welding

When the gap between parts is greater than 1/16 inch (1.588 mm), edges may be built up by welding and grinding. DO NOT use fillers.

Frame Welding

⚠ CAUTION

Before welding the frame, disconnect all battery cables, and all harnesses to any electronic controls to avoid serious damage to the electrical system and sensitive electrical components. When disconnecting the batteries, disconnect the negative battery cable first, then the positive cable. Do NOT disconnect the batteries while the engine is running.

NOTE

On vehicles equipped with V-MAC, it will be necessary to reprogram the date and time, if the vehicle batteries are disconnected. Refer to the appropriate V-MAC User Guide for programming information.

Weld using a 3/32-inch (2.3 mm), E11018M welding rod with either direct or alternating current, reverse polarity and a positive electrode. Use the following voltage and current for either process:

- Volts — 21–24
- Amperes — 70–120

When assembling or joining parts by welding, the procedure must be completed so as to minimize distortion and shrinkage. For multiple pass welds, slag must be completely removed before proceeding with subsequent weld passes. Slag must be completely removed from finished welds, and the finished weld must be ground completely smooth on both sides of the joint.

Cracks, porosity, overlaps and deep undercuts greater than 1/16 inch (1.588 mm), must be ground out and rewelded. Craters, unacceptable undercuts (less than 1/16 inch [1.588 mm]) and undersize welds can be corrected by additional welding.

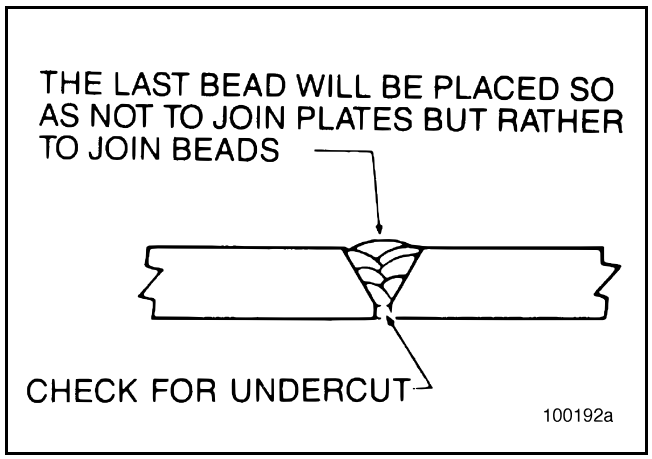


Figure 52 — Proper Weld

WELD QUALITY

The following figures illustrate acceptable and unacceptable weld profiles for both fillet and butt welds.

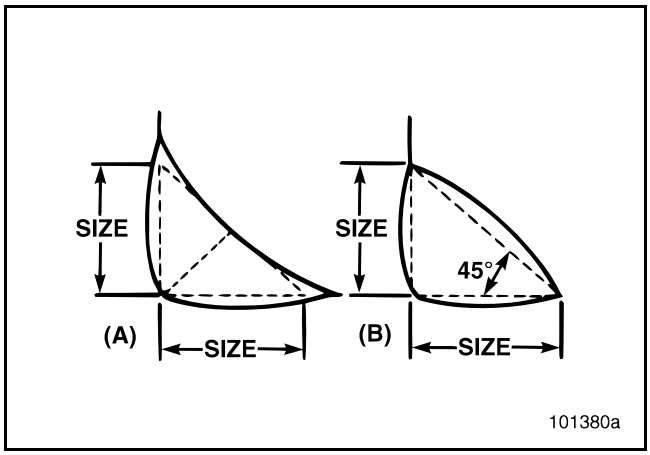


Figure 53 — Desirable Fillet Weld Profile

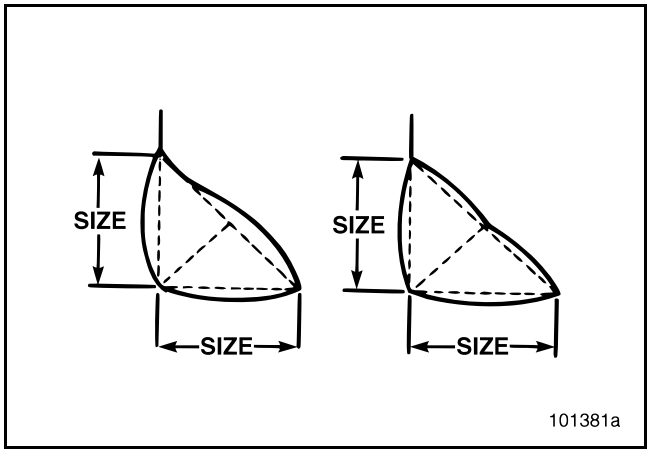


Figure 54 — Acceptable Fillet Weld Profile

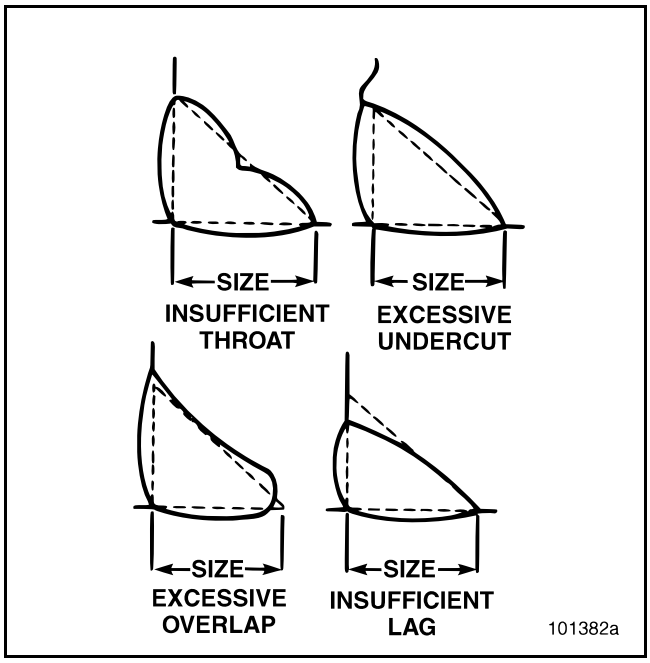


Figure 55 — Unacceptable Fillet Weld Profiles

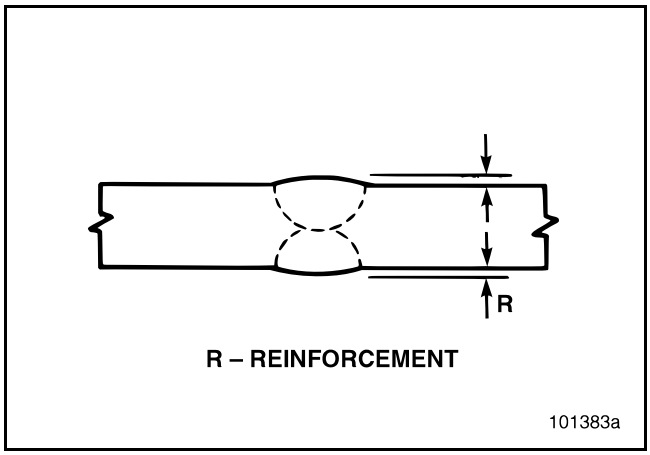


Figure 56 — Acceptable Butt Weld Profile

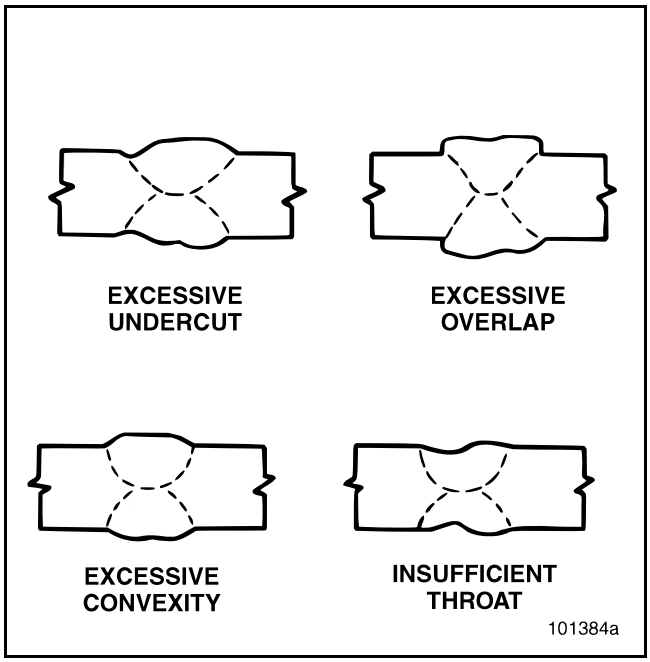


Figure 57 — Unacceptable Butt Weld Profiles

FRAME REINFORCEMENT

Frame Reinforcement Design

For some modifications, it may be necessary to install reinforcement plates. As weight is applied to the chassis, the frame has a tendency to flex.

Where the frame is not directly supported by the suspension, it flexes downward. As this occurs, one frame flange stretches (tension flange), while the other flange is compressed (compression flange).

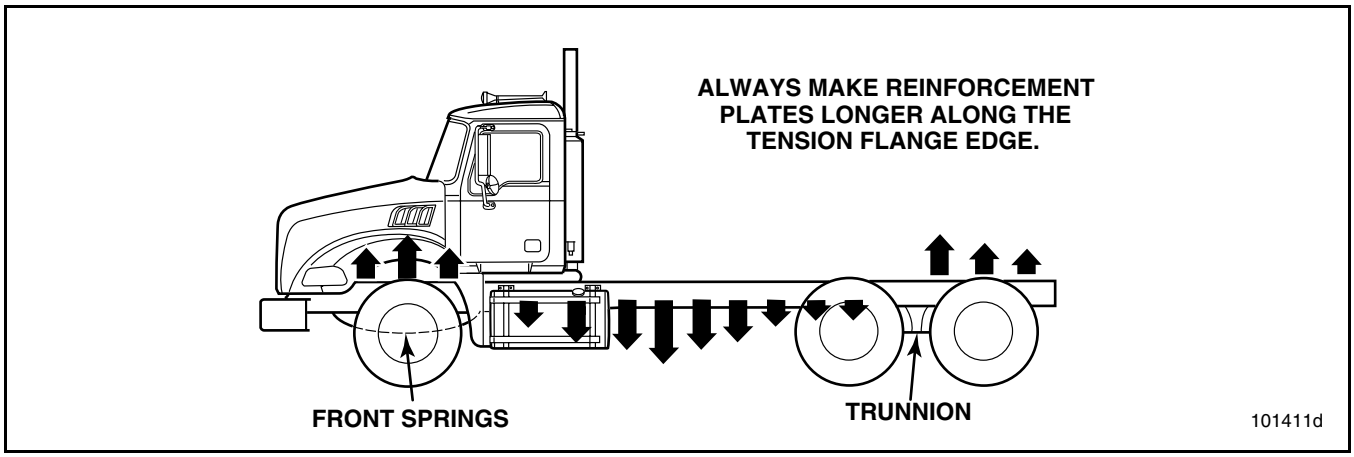


Figure 58 — Frame Flexing

Because frame stress is greatest at the tension flange, reinforcement plates must be longer on the tension flange edge to provide additional support to this area.

Frame reinforcement plates must be free of any cracks, nicks and burrs. Prepare the edges of the plate by grinding smooth. Avoid load concentrations on all body mounting brackets and supports.

Reinforcement plates must be long enough to extend beyond the critical area so that the ends can be cut on an angle rather than square across the frame section as shown in the illustration below.

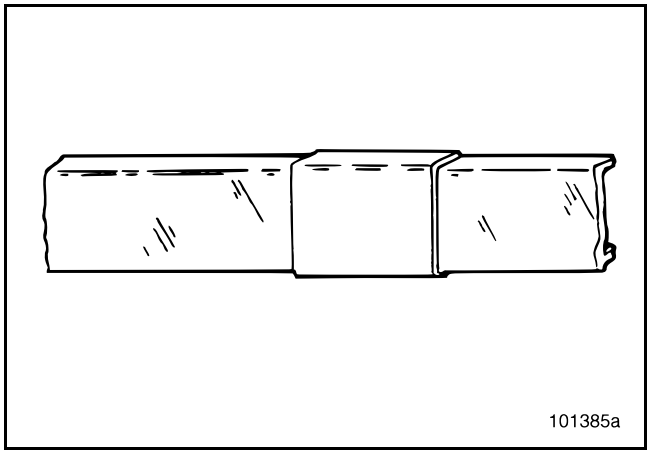


Figure 59 — Unacceptable Reinforcement Plate Design

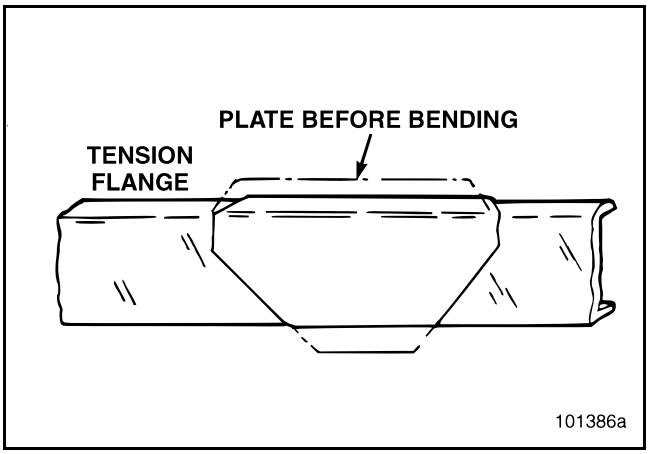


Figure 60 — Acceptable Reinforcement Plate Design

Avoid section gaps between the reinforcement plate and the ends of adjacent brackets or crossmember gussets. Always extend the reinforcement plate as far as necessary to align with the end of an adjacent bracket or crossmember gusset.

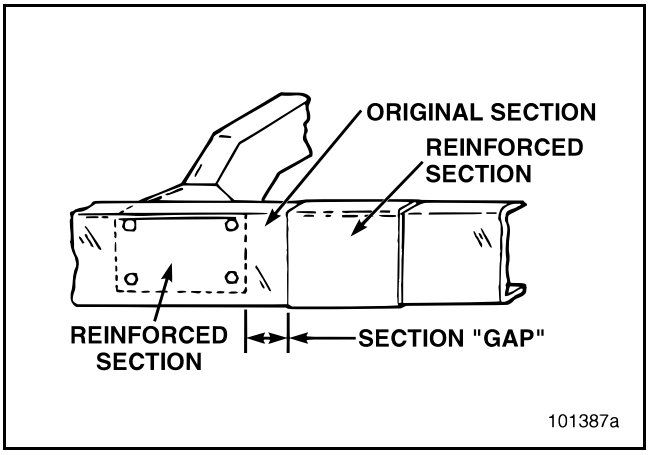


Figure 61 — Unacceptable Reinforcement Plate Location

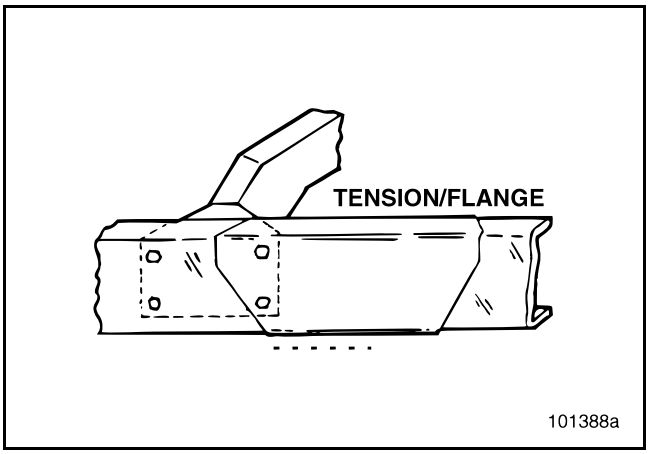


Figure 62 — Acceptable Reinforcement Plate Location

Never leave a sharp internal angle when cutting a reinforcement plate, or when modifying structural members. Cutting a radius is acceptable, but cutting the plate at an angle is preferred.

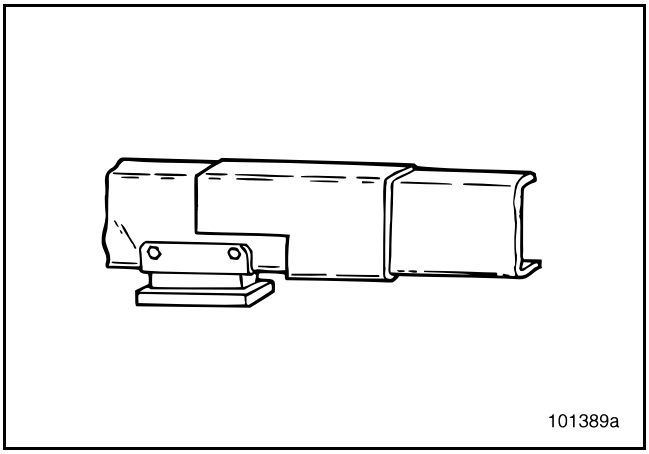


Figure 63 — Sharp Internal Angle (Unacceptable)

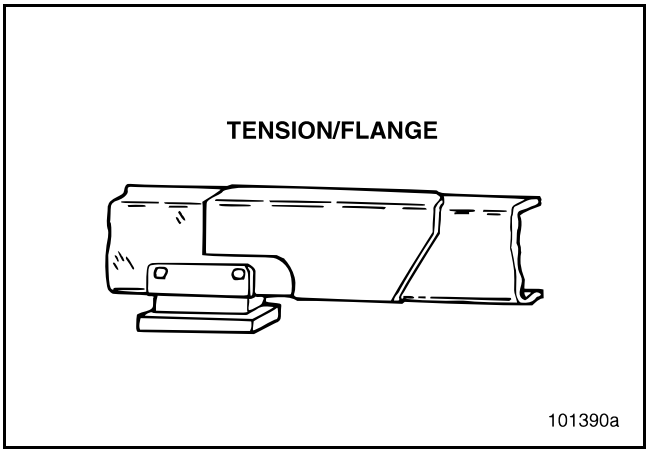


Figure 64 — Internal Angle Cut on Radius (Acceptable)

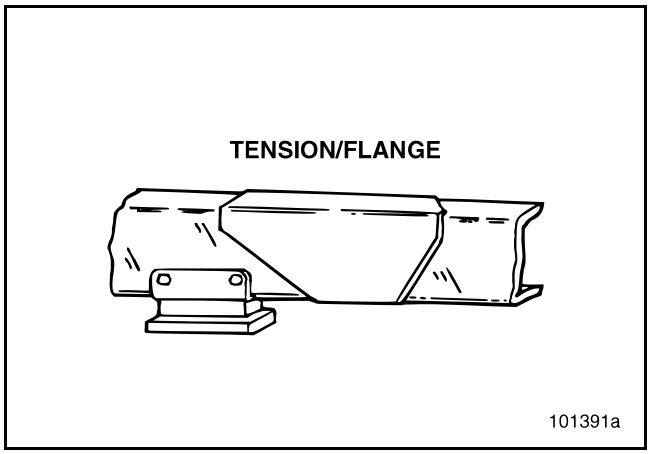


Figure 65 — Plate Cut on Angle (Preferred)

Frame Reinforcement Attachment

⚠ CAUTION

Use bolts to attach reinforcement plates to the frame. Do NOT attach reinforcement plates by welding to the frame, as this creates stress risers in the area of the weld and may result in frame failure.

In critical areas, use bodybound bolts with hardened washers to attach the reinforcement plate to the frame. Bodybound bolts require reaming the hole to a non-standard size to effect an interference fit for the bolt. HUCK® fasteners can also be used in these instances.

Avoid several holes in direct vertical alignment, or holes that are too close together, because this weakens the frame in the area of the drilling. A staggered bolt pattern with good spacing and sufficient edge distance is most desirable. Refer to the Frame Drilling section for additional information.

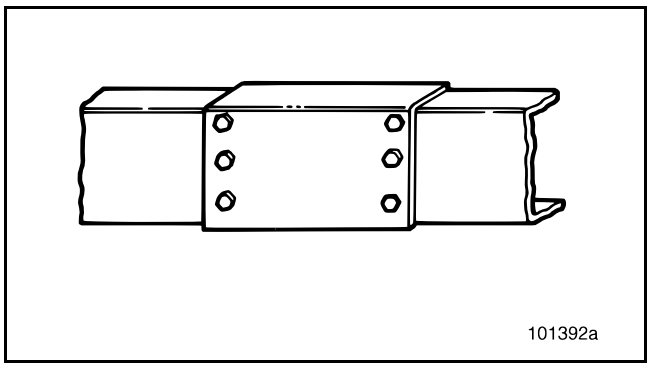


Figure 66 — Bolt Holes in Vertical Alignment (Unacceptable)

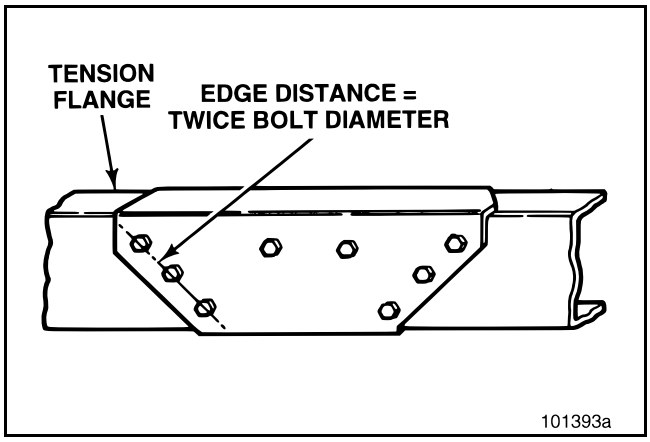


Figure 67 — Staggered Bolt Pattern (Acceptable)

WHEELBASE CHANGES

⚠ DANGER

Wheelbase changes CANNOT be made to vehicles equipped with the MACK RSA (Road Stability Advantage) system, as doing so will adversely affect performance of the system. Every effort must be made to avoid wheelbase changes on vehicles equipped with the MACK RSA system. If such changes are unavoidable, however, the system must be disabled by having a qualified technician replace the Bendix® Advanced EC-60™ ECU (ABS control unit with ESP®) with a Bendix® Premium EC-60™ ECU (ABS control unit without ESP®).

Failure to disable the RSA system on a vehicle where a wheelbase change has been made will result in serious vehicle braking and performance issues, including unnecessary system interventions. These interventions could lead to a loss of vehicle control.

In addition to disabling the system, any cab labels, such as WARNING and CAUTION labels relating to the Bendix® ABS-6 Advanced with ESP® (the basis for the MACK RSA system) located on the sun visor must be removed and notations must be made to the operator's manuals so that the vehicle operator has a clear understanding as to which ABS options are installed on the vehicle.

Vehicle wheelbase dimensions may be changed by moving the rear axle and suspension assembly to the new, desired location on the frame. When the axle assembly is moved, the suspension should be remounted to the frame, using as many existing drillings in the frame as possible. The number of new drillings in the frame rails should be limited. All unused drilled holes in the frame must be filled with a proper size bolt, nut and hardened washers. Tighten the hardware to proper specifications.

Wheelbase Changes and Driveshaft Length

Wheelbase changes affect driveshaft length, driveline angularity and size requirements. To avoid potential vibration problems and failures, the driveline for the new wheelbase dimension must maintain the correct driveshaft angle, size and length.

Wheelbase Changes and ABS/ATC Systems

An important factor in maintaining MVSS 121 complying brake timing is keeping the brake valves in the same relative position to the rear axle brake assemblies. Particularly with ABS/ATC chassis, the ABS/ATC components (modulator valve) for the rear axle must be moved to correspond with the increase or decrease in wheelbase length. The relationship between the rear axle and the modulator valve must be kept the same. Additionally, the service brake relay valve must be moved to maintain the same distance between the modulator valve and the relay valve.

Do not cut and splice harnesses for the ABS/ATC speed sensors and modulator valves to compensate for changes in chassis wheelbase. Extension harnesses are available in 2-, 4- and 6-foot lengths. Contact a MACK dealer, service dealer or parts dealer for necessary extension harness part numbers.

Wheelbase Changes and Steering Geometry

Changes to vehicle wheelbase will affect steering geometry (specifically, Ackerman angle), and may require a different cross-steering lever and cross-steering tube. For additional information, contact Mack Trucks, Inc. Product Support.

Wheelbase Changes on MACK Model Chassis Equipped with 105 mm Frame Flanges

On models equipped with frame rails having 105 mm flanges, the lower frame flange may have a relief cutout to provide clearance for the suspension trunnion, or for the transverse torque rod bracket. When changing wheelbase on one of these chassis, it will be necessary to cut a new relief in the frame flange to accommodate a new location of the trunnion and/or transverse torque rod bracket.

To ensure a dimensionally correct relief cutout, templates are available through the MACK Parts System. Three of the templates are unique to the specific rear suspension model, and one template is for the transverse torque rod relief cutout.

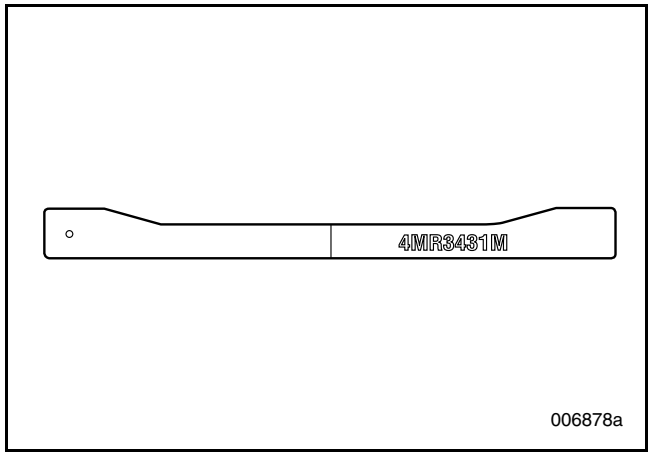


Figure 68 — Relief Cutout Template

Part numbers for the different templates are as follows:

Part No.	Application
4MR3431M	Transverse torque rod relief cutout template
4MR3431M2	MACK SS44/36 trunnion relief cutout template
4MR3431M3	Raydan SL460/AL520 relief cutout template
4MR3431M4	MACK SS52 trunnion relief cutout template

When cutting the frame flange, a plasma cutter with a tracing tip must be used. The template will be used to guide the tracing tip.

⚠ CAUTION

A plasma cutter with a tracing tip is the only approved method for cutting the frame flange. Using a standard acetylene torch or some other means of mechanically cutting the frame (such as a Sawzall) can result in an unfavorable cut edge and may lead to premature frame failure.

Procedures for cutting the frame using the relief cutout template are as follows:

1. Mark the location on the lower frame flange which corresponds to the new centerline of the suspension or transverse torque rod mounting bracket location.
2. Align the centerline marking on the template with the centerline marked on the frame rail, and position the template with the flat edges at each end of the template flush with the edge of the frame.
3. While holding the template in place, scribe a line along the template to mark the location where the cut will be made on the frame flange.
4. Measure the thickness of the tracing tip collar.

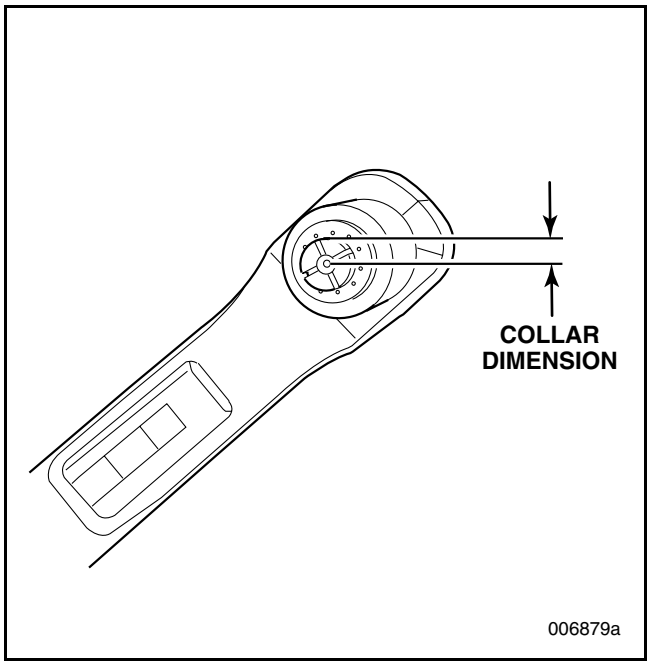


Figure 69 — Measuring Tracing Tip Collar

This dimension will be used to position the template on the frame rail so that the relief cut will be made at the correct location.

5. Move the template back from the edge of the flange (toward the web) a distance equal to the thickness of the tracing tip collar. This will properly locate the template so that the tracing tip will cut along the line scribed on the flange.

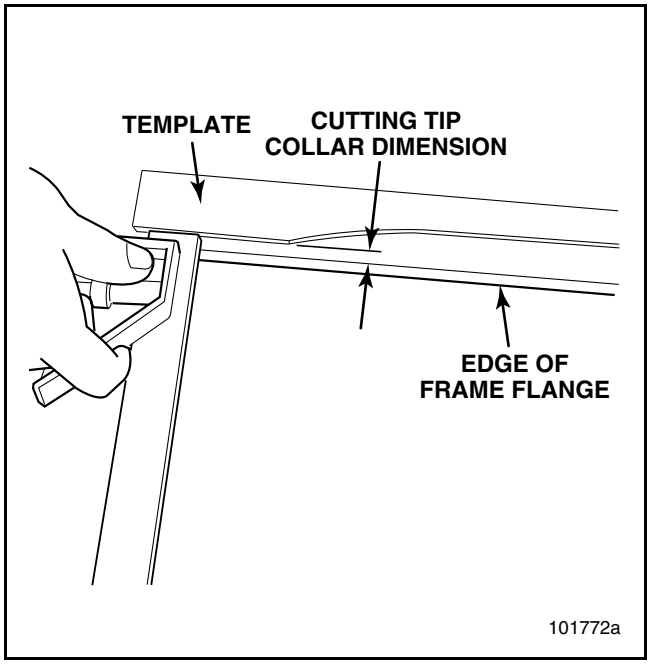


Figure 70 — Locating Template

6. Clamp the template in place, and then ensure that the template is properly positioned so that the tracing tip will cut along the line that was previously marked on the flange.
7. With the template securely clamped in place, use the plasma cutter to make the cut by carefully moving the tracing tip along the edge of the template.
8. After completing the cut, remove the slag from the edge of the flange.
9. Using either a belt or disk sander, grind the cut edge smooth. When performing the grinding operation, avoid creating vertical marks in the cut edge. A belt sander is preferred, and it should be held against the frame edge so that the direction of belt travel is on the horizontal plane of the frame. Holding the sander with the direction of belt travel perpendicular to the frame will create vertical marks on the cut edge.

   If a disk sander is used, hold the sander so that only the outer circumference of the disk is in contact with the cut edge as shown below. Vertical marks will be created if the contact area between the sanding disk and the cut edge is too close to the center of the disk.

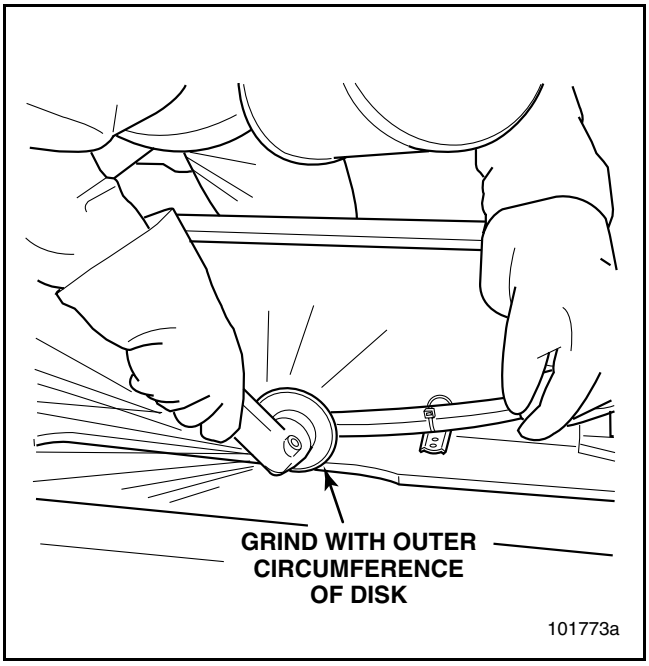


Figure 71 — Grinding Cut Edge with a Disk Sander

NOTE

DO NOT leave any sharp or jagged edges in the cut area of the frame flange, or in the radius area of the cut where the relief transitions to the original flange width.

10. After the cut edge has been ground smooth, dress the cut by grinding the square edges of the cut (both on the top and bottom) to a radius. This eliminates any stress risers that would eventually lead to frame cracks.

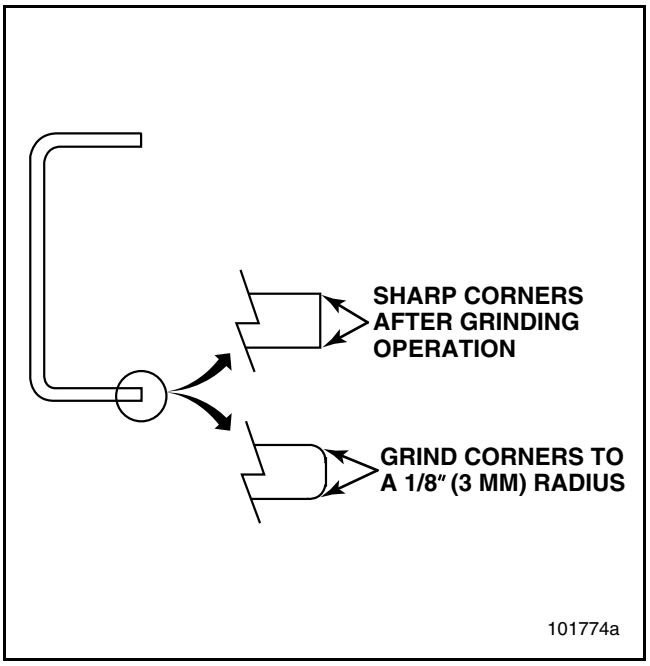


Figure 72 — Dress Sharp Corners of Cut Edge

11. Paint the exposed bare metal on the cut edge.

FRAME LENGTH CHANGES

⚠ DANGER

Frame length changes CANNOT be made to vehicles equipped with the MACK RSA (Road Stability Advantage) system, as doing so will adversely affect performance of the system. Every effort must be made to avoid changes to the frame length. If such changes are unavoidable, however, the system must be disabled by having a qualified technician replace the Bendix® Advanced EC-60™ ECU (ABS control unit with ESP®) with a Bendix® Premium EC-60™ ECU (ABS control unit without ESP®).

Failure to disable the RSA system on a vehicle where the length of the frame has been changed (either lengthened or shortened) will result in serious vehicle braking and performance issues, including unnecessary system interventions. These interventions could lead to a loss of vehicle control.

In addition to disabling the system, any cab labels, such as WARNING and CAUTION labels relating to the Bendix® ABS-6 Advanced with ESP® (the basis for the MACK RSA system) located on the sun visor must be removed and notations must be made to the operator's manuals so that the vehicle operator has a clear understanding as to which ABS options are installed on the vehicle.

NOTE

Lengthening or shortening a frame will require cutting and/or welding. In general, frame welding is not recommended. However, when cutting or welding a frame is required, use the frame cutting and welding practices outlined in the section "FRAME — WELDING AND CUTTING" on page 124.

The frame may be shortened by simply cutting the side members to the desired length. The only way a frame can be lengthened is by adding to the afterframe. DO NOT splice a frame by adding a section ahead of the rear suspension because this severely weakens the frame in the area of the splice and may lead to frame failure.

The additional lengths of frame are added to the existing frame by butt welding the two pieces together and grinding the weld inside the frame rail smooth. A length of inside channel is then added to support the new afterframe. The inside channel should extend from the center of the rear suspension bracket/crossmember, picking up at least one set of mounting holes, and extending to the end of the afterframe. The inside liner must be secured in place with either bodybound bolts or HUCK® fasteners.

If the chassis is already equipped with inside frame liners, they should be replaced with new liners long enough to reach the end of the new afterframe section.

All parts, such as frame rail sections, inside liners and other components, should be properly prepared, primed and painted to eliminate the possibility of corrosion between the inside channel and the frame side member. Cut ends of the frame rail and inside channels must be chamfered as described in the welding section of this guide. The chamfers must face inward on the chassis.

Frame Lengthening — Additional Crossmembers

Crossmembers must be added to a new afterframe section to provide acceptable frame rigidity for the assembly. Due to added equipment, wheelbase changes and other modifications, it may also be necessary to add crossmembers to provide acceptable support and frame rigidity. The distance between crossmembers should not exceed a maximum of 60 inches between crossmember centers. Crossmembers should be secured to the frame using either bodybound bolts or HUCK® fasteners.

SUBFRAMES

Subframe Design

⚠ CAUTION

Do NOT mount bodies directly to the chassis side members by drilling the frame flanges because this weakens the frame and may result in frame failure.

The body must be secured to the chassis frame so that both static and dynamic stresses are transmitted without causing excessive localized stress which could result in frame damage, or affect road handling of the vehicle.

The body unit must be mounted to the chassis frame using a subframe assembly. The illustration below shows some typical subframe design cross sections.

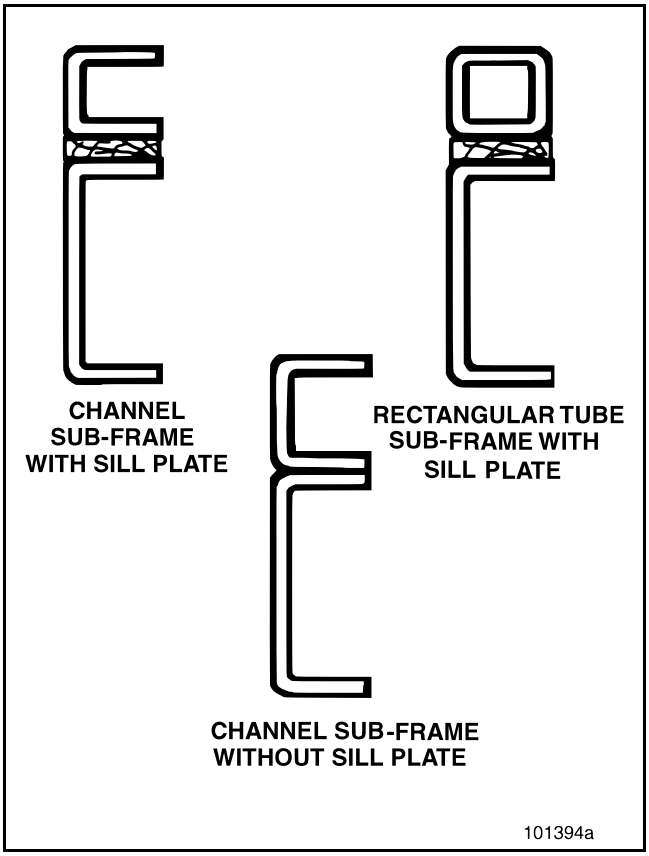


Figure 73 — Typical Subframe Cross Sections

Subframe Construction

The subframe should be fabricated from channel steel to form a continuous longitudinal channel. The width of the subframe flange must be between 70%–100% of the frame rail flange width.

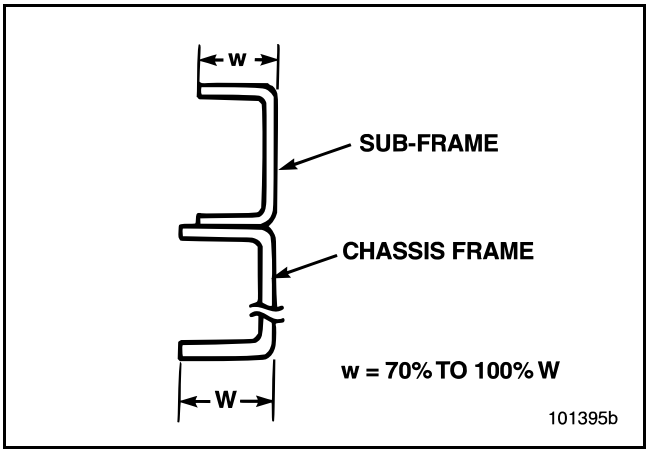


Figure 74 — Subframe Flange Width

The lower subframe flange must be mounted flush with the upper flange of the chassis side member. Do not mount the subframe at an angle to the chassis. Use either crossmembers, or the body unit itself, to connect the subframe sides together. (Refer to “FRAME DRILLING” on page 123 for additional information.)

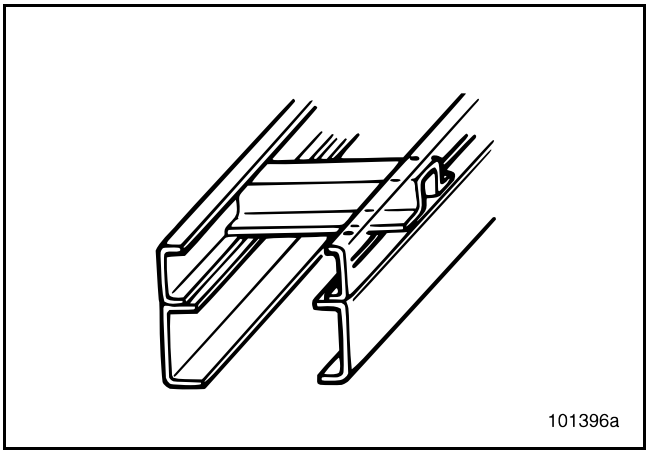


Figure 75 — Subframe Crossmembers

The subframe channel opening should face inward toward the longitudinal center line of the chassis. Also, the subframe web surface should align with the frame rail web as shown in the following illustration.

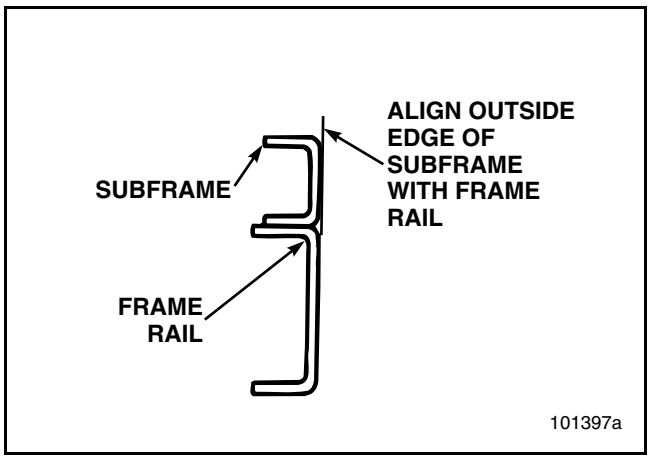


Figure 76 — Align Subframe to Frame Rail

Subframe End Shape

To reduce the possibilities of stress concentration on the chassis frame, the front end of the subframe should be shaped so that rigidity gradually decreases. Additionally, the front end of the subframe should extend as far forward as possible. The following three figures illustrate three different types of subframe end design.

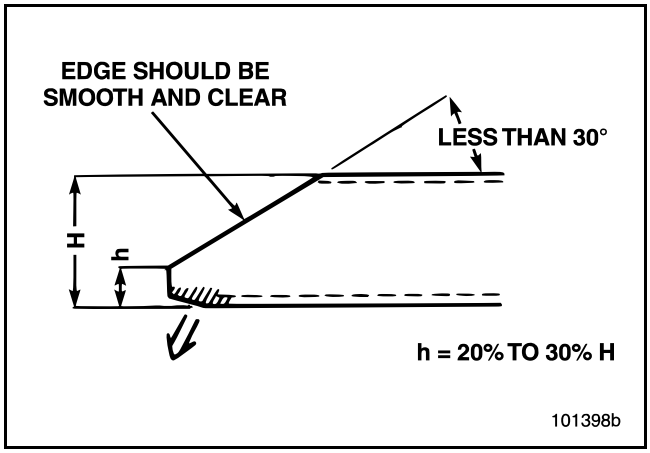


Figure 77 — Preferred Subframe End Design

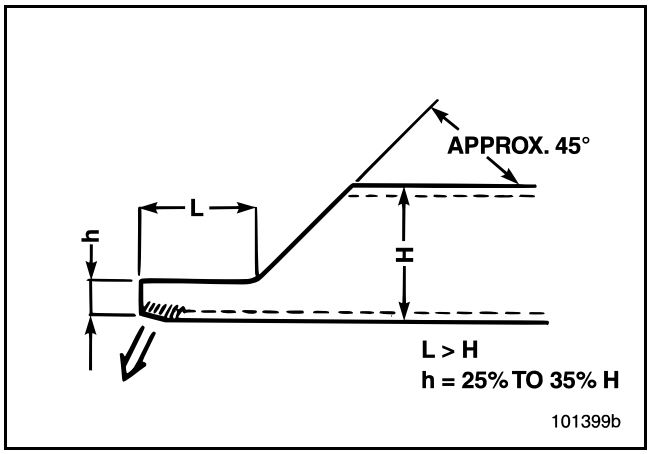


Figure 78 — Alternate Subframe Design

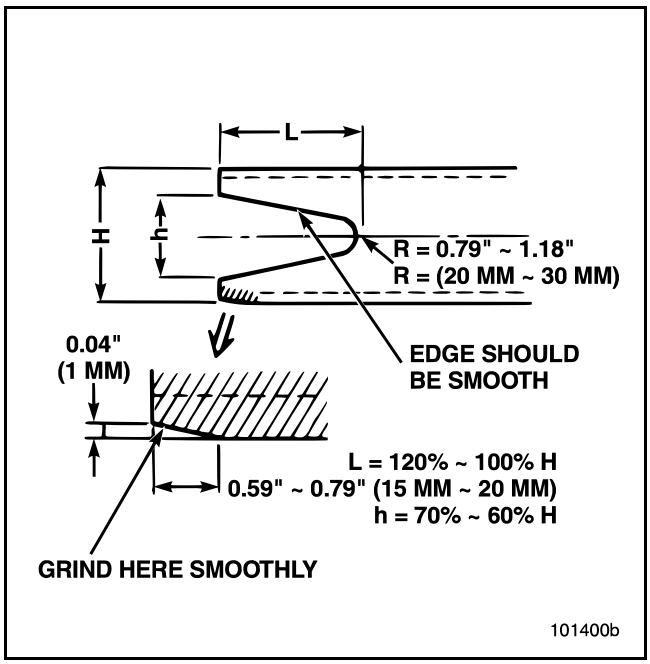


Figure 79 — Alternate Subframe End Design

If the subframe is fabricated from square or rectangular tubing, the end should be cut as shown.

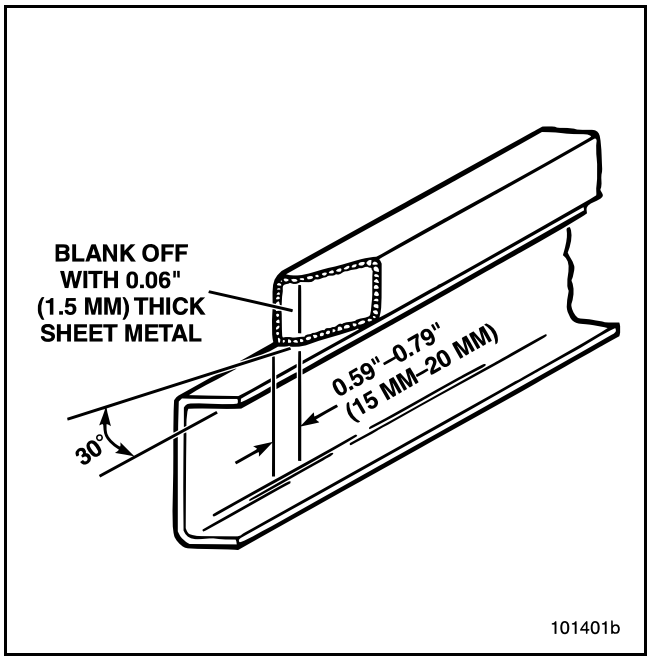


Figure 80 — End-Cut Design for Square or Rectangular Tube Subframe

Subframe designs shown in Figure 78, Figure 79 and Figure 80 are recommended. If body design or other factors prevent any of these designs from being used, the subframe shape shown in Figure 81 may be used.

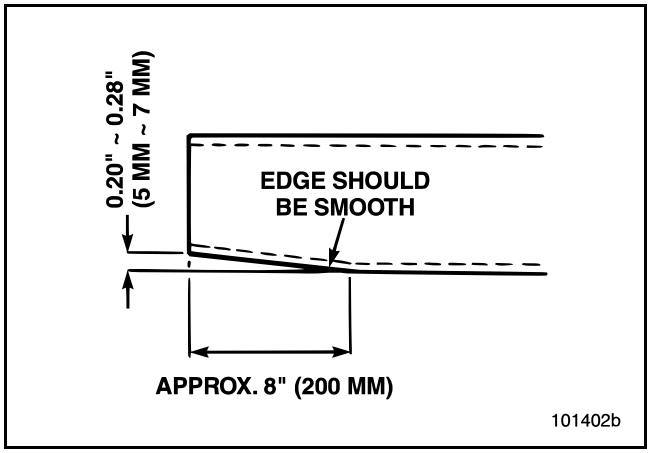


Figure 81 — Alternate Design

If mounting a tank or other rigid type of body, the subframe shapes shown in Figure 78, Figure 79 and Figure 80 must be used.

Subframe Attachment

A variety of methods can be used to secure the subframe assembly to the chassis frame. They include U-bolts, flexible attachments and bolted plates. When the subframe is installed, however, a mounting sill plate made of hardwood or other suitable material may be installed between the subframe and the chassis frame to protect the flange surfaces, and to allow for irregularities in the surfaces of the two frame members.

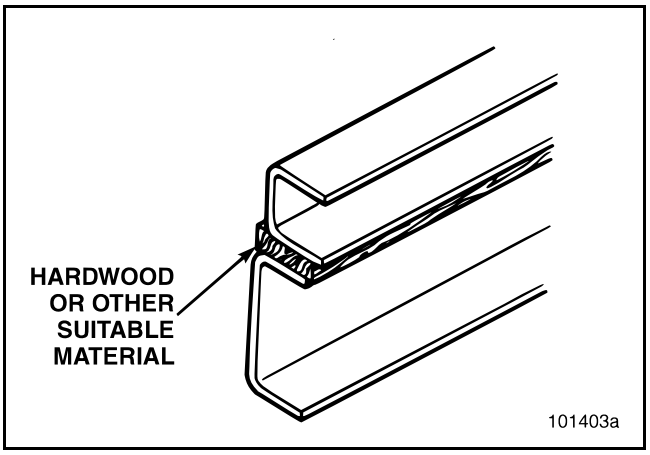


Figure 82 — Subframe Sill Plate

Sills must be chamfered 1/2 inch at the front end, and tapered approximately 1 inch from the front end of the sill.

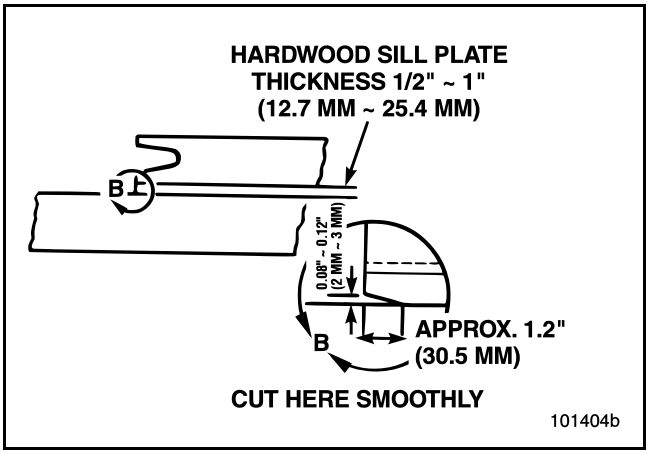


Figure 83 — Sill Plate Chamfer

U-BOLTS, TIE BARS AND OTHER TYPES OF CLAMPING DEVICES ATTACHMENT

NOTE

U-bolts, tie bars and other similar types of clamping methods rely on friction and a maintained clamping force for attachment. When using these methods of attachment, the surfaces must be free from oils, grease and other agents that could allow slippage and adversely affect attachment.

When using U-bolts, tie bars or other similar types of clamping methods, install an anti-crush spacer inside the side members to prevent distorting, or crushing the frame when the bolts are tightened. These spacers should be fabricated from seamless angle irons or rectangular/cylindrical tubing, and suitably spot welded into position.

⚠ CAUTION

Do not use U-profile (angle iron) spacers having welded construction. Anti-crush spacers must be of one-piece, seamless construction design.

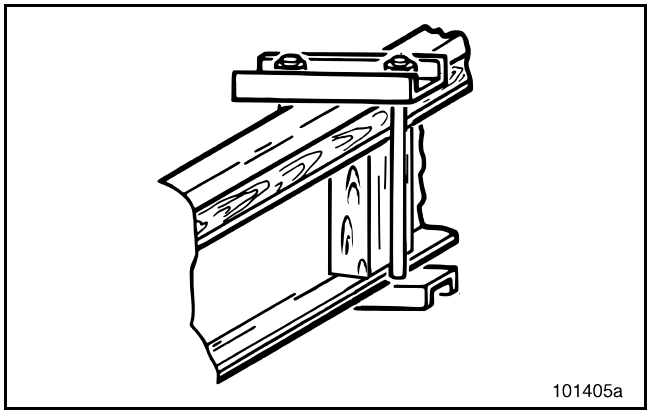


Figure 84 — Tie Bar Type Attachment with Anti-Crush Spacers

When round U-bolts are used for body attachment, rounded shims that follow the curvature of the U-bolt must be used.

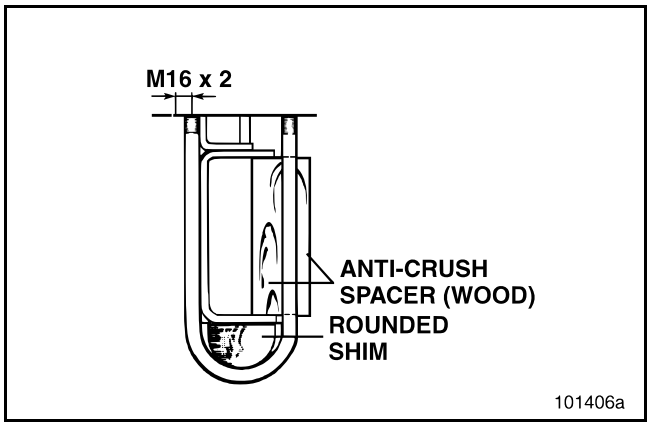


Figure 85 — U-Bolt with Rounded Shim and Anti-Crush Spacer

Body clamps (U-bolts, tie bars, etc.) must not be located in the vicinity of the rear axle or suspension. Additionally, the U-bolts or tie bolts must not contact the frame rail side member.

⚠ CAUTION

Do NOT notch the frame rail flanges in order to make a U-bolt or tie bolt fit. If the frame rail flanges are too wide for the U-bolt, select another size U-bolt or another method of attachment.

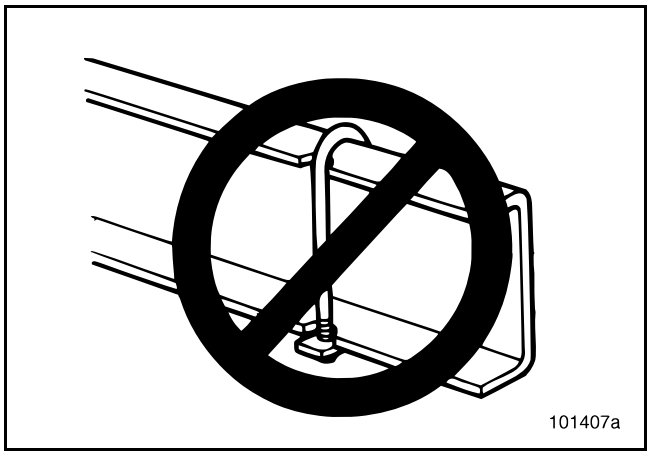


Figure 86 — Do Not Notch Frame Rail Flange

BOLTED METHODS OF ATTACHMENT

The two bolted methods of attachment are rigid mounting and flexible mounting. Both of these methods include clips, brackets and other types of mountings which are bolted to non-critical areas of the frame rail web. The use of existing holes in the frame is encouraged. But when this is not possible, holes in the frame must be drilled in accordance with the frame drilling methods as outlined earlier in this section.

As a rule, holes in the frame should be located no closer to the top and bottom frame flanges than existing holes that were drilled at the assembly plant.

Rigid Mounting

Rigid types of mounting should be used for mounting vans or other similar types of bodies. A rigid type of mounting arrangement consists of a bolted plate or bracket welded to the subframe assembly and bolted to the chassis frame. Brackets must be bolted, not welded, to the chassis frame.

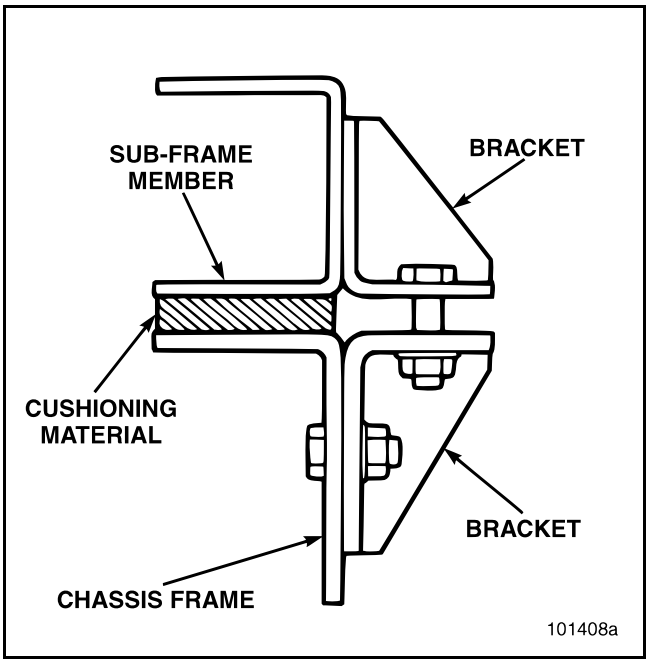


Figure 87 — Bracket-Style Rigid Mount

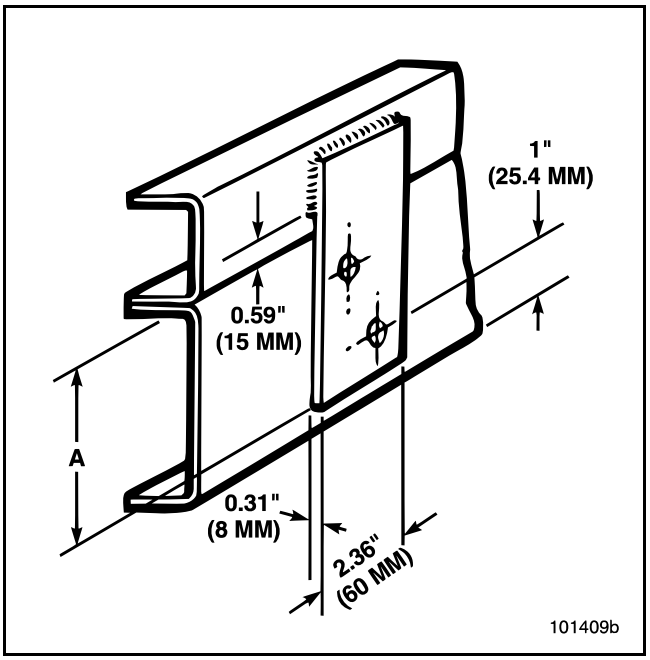


Figure 88 — Bolted-Plate-Style Rigid Mount

Flexible Mounting

For torsionally stiff types of bodies, such as tanks or refuse bodies, the mounting must allow some flexing of the frame under normal driving conditions. Flexible mounting should be used. Flexible mounting is accomplished by using rubber mountings or spring-loaded brackets.

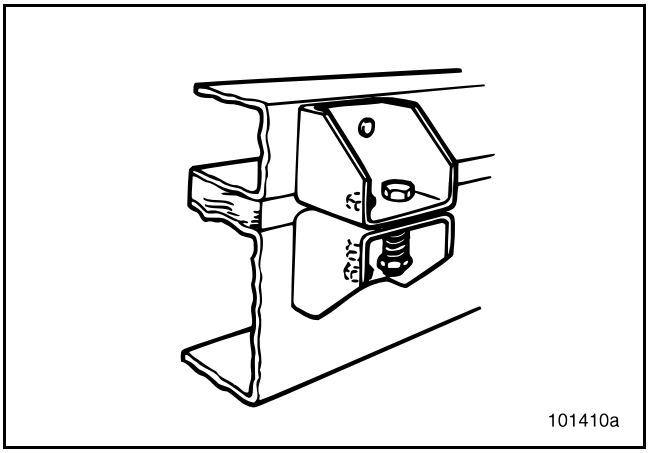


Figure 89 — Flexible Mounting Arrangement

SUBFRAMES FOR BRIDGE FORMULA MIXERS

Certain mixer applications require an extended tag axle for the chassis to meet the federal bridge formula (Boost-A-Load, Bridge Master, etc.). On these chassis, welding the subframe to the chassis frame rails is acceptable, providing the following installation criteria are met:

- Yield strength of the welding rods must be at least equal to the yield strength of the least strongest component of the assembly (either the chassis frame rail at 110,000 psi or the mixer subframe). Low hydrogen electrodes must be used, and they must comply with the applicable provisions of the American Welding Society (AWS) welding codes.
- Welding procedures must conform to those recommended by AWS to ensure frame material integrity. Design of the subframe must be tailored to the particular chassis frame configuration, and caution must be exercised to prevent weld stress concentrations and excessive heat effects in critical stress areas, especially at the front end of the subframe. For additional information on welding, refer to “FRAME — WELDING AND CUTTING” on page 124.
- The subframe must be constructed of 0.375 inch (9.5 mm) angle iron, with a minimum web dimension of 4.5 inches (114.3 mm) and a minimum flange dimension of 4.0 inches (101.6 mm).

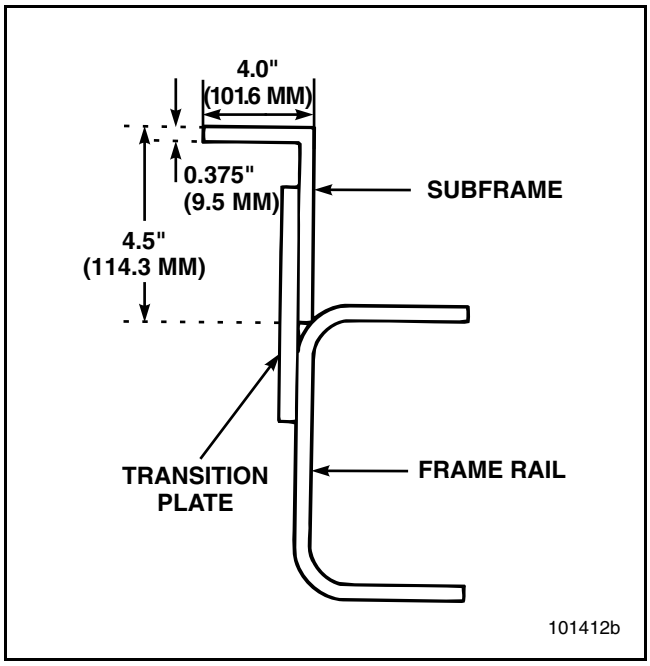


Figure 90 — Welded Subframe Specifications

- The subframe must extend as far forward as possible, and a transition plate should be welded or bolted to the forward end of the subframe and bolted to the chassis frame rail. The transition plate should be fabricated from 0.375 inch (9.5 mm) plate steel.

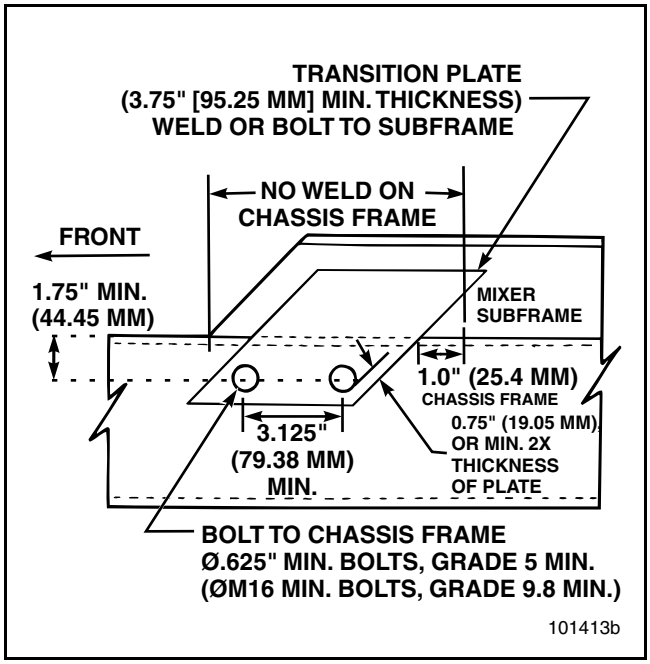


Figure 91 — Subframe Transition Plate

- The subframe to chassis weld should begin approximately 1 inch (25.4 mm) behind the transition plate. Refer to Figure 91.

Any new welded subframe designs, first-time installers, or any changes to already approved existing designs, must be approved by Mack Trucks, Inc. Product Development and Quality Assurance departments. Approvals are coordinated through the Mack Trucks, Inc. Product Support department. Contact Product Support at 610-709-3961.

Samples of welding workmanship will be requested. A sample section of the subframe piece typically used for the installation must be welded as an actual piece of frame rail section used by Mack Trucks, Inc. The sample must be long enough to provide a representative sample of the actual weld procedure.

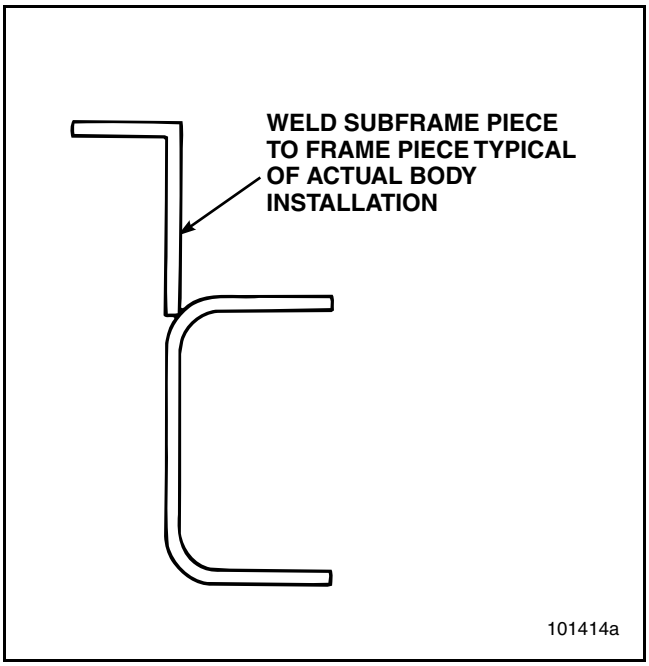


Figure 92 — End View of Workmanship Sample

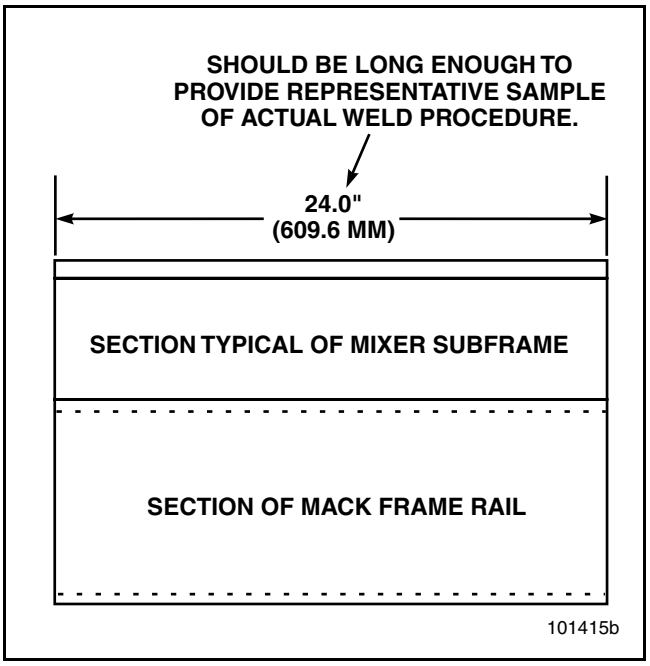


Figure 93 — Side View of Workmanship Sample

The workmanship sample must be sent to the following address:

Mack Trucks, Inc.

2100 Mack Blvd.

Allentown, PA 18105

Attn: Sales Engineering Department

If additional information is required, contact Sales Engineering at 1-800-TNT-MACK.

FIFTH WHEEL MOUNTING AND SPECIFICATION

The following is offered as a guide for installing fifth wheels. Because of the many different makes and types of fifth wheels available and the variety of vehicles on which they can be mounted, it is impossible to give specific instructions. Instead, general recommendations are given. Each installation must be made on an individual basis within these recommendations. Also follow the fifth wheel manufacturer's installation instructions if available.

The most important factor to remember about fifth wheels is that the final mounting location determines the semitrailer and payload weight distribution to the tractor axles. Ride quality, vehicle stability, steering control, frame integrity and brake performance are all affected by this critical placement.

It is assumed that many factors have already been considered in the preparation of the specifications for the chassis ordered. These factors would typically include the following:

a. Legal restrictions

b. Front and rear axle load limits

c. Length of semitrailer

d. Anticipated payload

e. Semitrailer axle location

f. Movable or fixed trailer rear axle(s)

g. Kingpin offset

h. Front and rear semitrailer weights (Front semitrailer weight is the weight imposed on the kingpin.)

These factors are not covered in this section. Instead, this discussion covers the two major considerations in the mounting of the fifth wheel: WHERE to mount it, and HOW to mount it.

The following illustration provides a description of nomenclature that is used to properly identify the fifth wheel parts and mounting components. Also provided is a list of abbreviations established by SAE International (formerly the Society of Automotive Engineers) when referring to fifth wheels (reference SAE J701 AUG84).

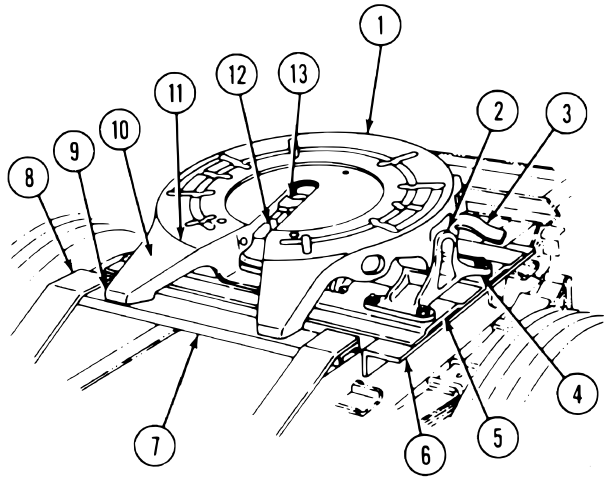


Figure 94 — Fifth Wheel Nomenclature

1. Skid Plate or Top Plate	7. Skid Ramp Stop
2. Base Plate Pivot	8. Pick-Up Ramp
3. Operating Handle	9. Skid Ramp Tips
4. Base Mounting Bracket	10. Skid Ramp
5. Mounting Plate	11. End of Skid Ramp
6. Frame Mounting Supports	12. Throat
	13. Coupler Jaws

Trailer Abbreviations

Refer to Figure 95.

TL = Trailer Length

SR = Swing Radius (centerline of kingpin to corner of trailer)

KP = Front of Trailer to Kingpin

LWC = Kingpin to Landing Gear (includes 3 inches of clearance)

TH = Trailer Height

R = Trailer Corner Radius

Tractor Abbreviations

Refer to Figure 95.

CFW = Back of Cab to Centerline of Fifth Wheel

BBC = Bumper to Back of Cab

BFW = Bumper to Centerline of Fifth Wheel

FW = Kingpin to Rear Axle Centerline

CA = Back of Cab to Centerline of Rear Axle or Tandem Axle

BFA = Bumper to Front Axle Centerline

W = Width

OAL = Overall Length

OH = Overall Height

CL = Clearance Between Rear of Cab and Trailer Corner (4 inches minimum)

CT = Clearance Between Rear of Cab and Trailer Front in Straight Ahead Position

WB = Wheelbase

TR = Tire Radius

C and L Superimposed = Centerline of Single Axle or Tandem Axle

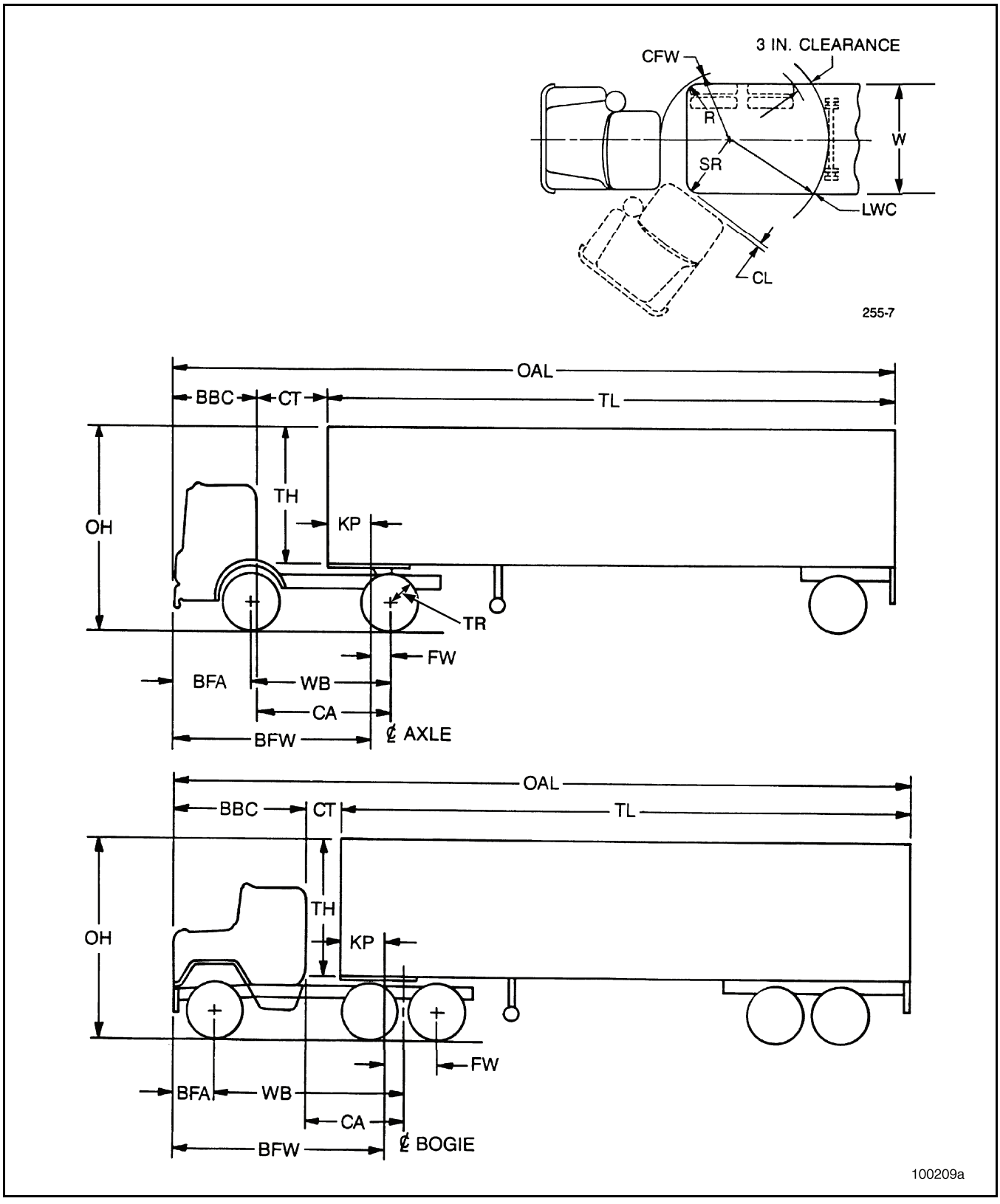


Figure 95 — Dimensions Used in Locating Fifth Wheels

Fifth Wheel — Locating

Locating the fifth wheel depends on factors such as wheelbase and desired weight distribution, frame section, tractor axle capacity, ride quality, cab clearance, and clearance between the landing gear and the outer tractor tires.

Fifth wheel offset is defined as the maximum distance forward of the single/tandem rear axle centerline that a fixed fifth wheel can be positioned, or where a sliding fifth wheel can be moved. The fifth wheel offset must be adequate to comply with any maximum overall combination vehicle length law within the state(s) in which the combination is intended to be operated.

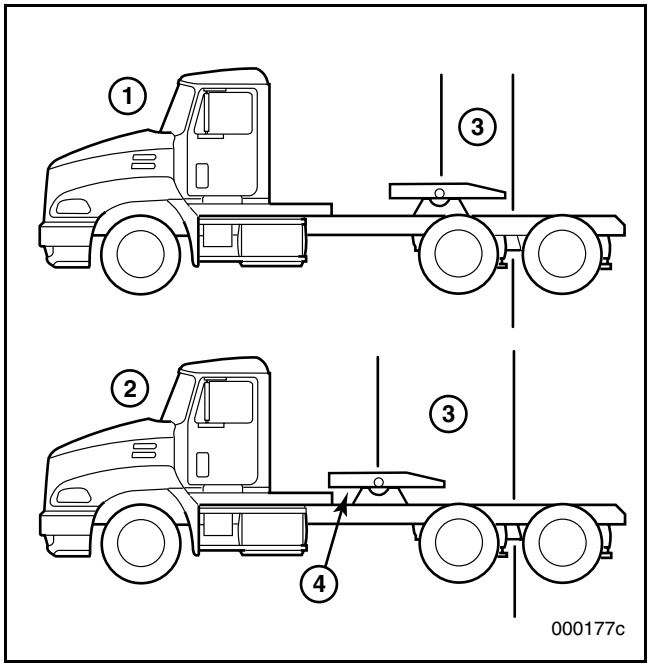


Figure 96 — Fixed and Sliding Fifth Wheel Location

1. Fixed 2. Sliding 3. Offset	4. Slider Positioned as Far Forward as Possible

The maximum allowable offset is also determined by the required amount of landing gear clearance and the semitrailer swing clearance. In a sharp turn, as the semitrailer corner approaches the chassis centerline, placement of the fifth wheel determines the clearance between the cab and trailer. The recommended minimum clearances are 4 inches between semitrailer and back of cab, and 3 inches between landing gear and the rearmost part of the outside dual tire.

NOTE

When calculating the required clearance between semitrailer and back of cab, always consider any accessories or exhaust components that may extend further back than the cab itself.

These considerations would then dictate that the fifth wheel be mounted to the frame between the required offset, to comply with any applicable overall vehicle length limits, and the maximum allowable offset, to maintain swing clearance.

In addition, engineering experience has determined that frame section, vehicle application and axle ratings further limit the mounting location. The Maximum Fifth Wheel Offset — Inches chart lists maximum fifth wheel offset based upon these factors. Based on wheelbase and other chassis specifications, all chassis models may not be able to fully use the maximum available offset.

⚠ CAUTION

To avoid unloading the front axle and the resultant possible reduced steering control, do not locate the fifth wheel so that the centerline of the fifth wheel coupler jaws (kingpin locks) is behind the centerline of the rear axle, tandem axles or tri-axles, as applicable. Sliding fifth wheels must be blocked so that the centerline of the coupler jaws cannot be located behind the centerline of the axle(s).

The height of the fifth wheel is important to ensure that the tractor couples with the semitrailer and that the overall height limit is not exceeded.

The height must be such to provide adequate clearance between the tires and the semitrailer when the semitrailer is fully loaded. This clearance must allow for tire chains and tractor suspension deflection under bump conditions.

When mounting a sliding or a fixed fifth wheel with a base plate on a chassis with air suspension and MACK axles, a spacer must be included between the fifth wheel mounting plate and the top flange of the frame rail. This is to provide adequate dynamic clearance for the transverse torque rod.

Steel spacers between the base mounting bracket and the mounting plate are also necessary in other applications if additional height is required and cannot be obtained by selecting an optional fifth wheel base mounting bracket.

NOTE

Truck tractors shipped from the Mack Trucks, Inc. assembly plant without fifth wheels are certified as incomplete vehicles. Any facility that installs a fifth wheel is considered the final stage manufacturer and must certify that the completed vehicle complies with all applicable motor vehicle safety standards (see "VEHICLE CERTIFICATION" on page 42).

MAXIMUM FIFTH WHEEL OFFSET — PINNACLE AXLE BACK (CXU) TRACTOR, 12,000 LB (5 443 KG) FRONT AXLE RATING

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
138 (3 505)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
144 (3 658)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
148 (3 759)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
149 (3 785)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
150 (3 810)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
154 (3 912)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
155 (3 937)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
156 (3 962)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
160 (4 064)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
161 (4 089)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
162 (4 115)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
166 (4 216)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
167 (4 242)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
168 (4 267)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
172 (4 369)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
173 (4 394)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
174 (4 420)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
178 (4 521)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
179 (4 547)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
180 (4 572)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
183 (4 648)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
184 (4 674)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
185 (4 699)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
189 (4 801)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
190 (4 826)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
191 (4 851)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
195 (4 953)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
196 (4 978)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
197 (5 004)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
201 (5 105)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
202 (5 131)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
203 (5 156)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
207 (5 258)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
208 (5 283)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
209 (5 309)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
213 (5 410)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
214 (5 436)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
215 (5 461)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
219 (5 563)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
220 (5 588)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
221 (5 613)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
225 (5 715)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
226 (5 740)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
227 (5 766)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
231 (5 867)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
232 (5 893)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
233 (5 918)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
237 (6 020)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
238 (6 045)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
239 (6 071)	N/A	N/A	N/A	N/A	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
243 (6 172)	N/A	N/A	N/A	N/A	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
248 (6 299)	N/A	N/A	N/A	N/A	18 (457)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
249 (6 325)	N/A	N/A	N/A	N/A	18 (457)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
250 (6 350)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
252 (6 401)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
254 (6 452)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
255 (6 477)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
256 (6 502)	N/A	N/A	N/A	N/A	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
258 (6 553)	N/A	N/A	N/A	N/A	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
260 (6 604)	N/A	N/A	N/A	N/A	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
261 (6 629)	N/A	N/A	N/A	N/A	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
138 (3 505)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
144 (3 658)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
148 (3 759)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
149 (3 785)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
150 (3 810)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
154 (3 912)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
155 (3 937)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
156 (3 962)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
160 (4 064)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
161 (4 089)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
162 (4 115)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
166 (4 216)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
167 (4 242)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
168 (4 267)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
172 (4 369)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
173 (4 394)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
174 (4 420)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
178 (4 521)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
179 (4 547)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
180 (4 572)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
183 (4 648)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
184 (4 674)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
185 (4 699)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
189 (4 801)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
190 (4 826)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
191 (4 851)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
195 (4 953)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
196 (4 978)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
197 (5 004)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
201 (5 105)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
202 (5 131)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
203 (5 156)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
207 (5 258)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
208 (5 283)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
209 (5 309)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
213 (5 410)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
214 (5 436)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
215 (5 461)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
219 (5 563)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
220 (5 588)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
221 (5 613)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
225 (5 715)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
226 (5 740)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
227 (5 766)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
231 (5 867)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
232 (5 893)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
233 (5 918)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
237 (6 020)	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
238 (6 045)	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
239 (6 071)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
243 (6 172)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
248 (6 299)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
249 (6 325)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
250 (6 350)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
252 (6 401)	N/A	20 (508)	24 (610)	24 (610)	N/A	18(457)	22 (559)	24 (610)
254 (6 452)	N/A	20 (508)	24 (610)	24 (610)	N/A	18(457)	22 (559)	24 (610)
255 (6 477)	N/A	18 (457)	24 (610)	24 (610)	N/A	18(457)	20 (508)	24 (610)
256 (6 502)	N/A	18 (457)	24 (610)	24 (610)	N/A	N/A	20 (508)	24 (610)
258 (6 553)	N/A	18 (457)	24 (610)	24 (610)	N/A	N/A	20 (508)	24 (610)
260 (6 604)	N/A	18 (457)	24 (610)	24 (610)	N/A	N/A	20 (508)	24 (610)
261 (6 629)	N/A	18 (457)	24 (610)	24 (610)	N/A	N/A	20 (508)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

MAXIMUM FIFTH WHEEL OFFSET — PINNACLE AXLE BACK (CXU) TRACTOR, 14,600 LB (6 623 KG) FRONT AXLE RATING

	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
138 (3 505)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
144 (3 658)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
148 (3 759)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
149 (3 785)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
150 (3 810)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
154 (3 912)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
155 (3 937)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
156 (3 962)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
160 (4 064)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
161 (4 089)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
162 (4 115)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
166 (4 216)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
167 (4 242)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
168 (4 267)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
172 (4 369)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
173 (4 394)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
174 (4 420)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
178 (4 521)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
179 (4 547)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
180 (4 572)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
183 (4 648)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
184 (4 674)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
185 (4 699)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
189 (4 801)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
190 (4 826)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
191 (4 851)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
195 (4 953)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
196 (4 978)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
197 (5 004)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
201 (5 105)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
202 (5 131)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
203 (5 156)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
207 (5 258)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
208 (5 283)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
209 (5 309)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
213 (5 410)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
214 (5 436)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
215 (5 461)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
219 (5 563)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
220 (5 588)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
221 (5 613)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
225 (5 715)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	24 (610)	24 (610)	24 (610)
226 (5 740)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	24 (610)	24 (610)	24 (610)

Wheelbase Inches (mm)	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
227 (5 766)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	24 (610)	24 (610)	24 (610)
231 (5 867)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	22 (559)	24 (610)	24 (610)
232 (5 893)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	22 (559)	24 (610)	24 (610)
233 (5 918)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
237 (6 020)	24 (610)	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
238 (6 045)	24 (610)	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
239 (6 071)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
243 (6 172)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
248 (6 299)	N/A	N/A	N/A	N/A	N/A	22 (559)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
249 (6 325)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
250 (6 350)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
252 (6 401)	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
254 (6 452)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
255 (6 477)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	N/A	16 (406)	18 (457)	24 (610)
256 (6 502)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	N/A	N/A	18 (457)	24 (610)
258 (6 553)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	N/A	N/A	18 (457)	24 (610)
260 (6 604)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	N/A	N/A	18 (457)	24 (610)
261 (6 629)	N/A	N/A	N/A	N/A	N/A	N/A	24 (610)	24 (610)	N/A	N/A	24 (610)	24 (610)	N/A	N/A	18 (457)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
138 (3 505)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
144 (3 658)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
148 (3 759)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
149 (3 785)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
150 (3 810)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
154 (3 912)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
155 (3 937)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
156 (3 962)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
160 (4 064)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
161 (4 089)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
162 (4 115)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
166 (4 216)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
167 (4 242)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
168 (4 267)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
172 (4 369)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
173 (4 394)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
174 (4 420)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
178 (4 521)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
179 (4 547)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
180 (4 572)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
183 (4 648)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
184 (4 674)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
185 (4 699)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
189 (4 801)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
190 (4 826)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
191 (4 851)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
195 (4 953)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
196 (4 978)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
197 (5 004)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
201 (5 105)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
202 (5 131)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
203 (5 156)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
207 (5 258)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
208 (5 283)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
209 (5 309)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
213 (5 410)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
214 (5 436)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
215 (5 461)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
219 (5 563)	N/A	20 (508)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
220 (5 588)	N/A	20 (508)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
221 (5 613)	N/A	20 (508)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
225 (5 715)	N/A	18 (457)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
226 (5 740)	N/A	18 (457)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
227 (5 766)	N/A	18 (457)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
231 (5 867)	N/A	16 (406)	22 (559)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
232 (5 893)	N/A	16 (406)	22 (559)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
233 (5 918)	N/A	16 (406)	22 (559)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
237 (6 020)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
238 (6 045)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
239 (6 071)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
243 (6 172)	N/A	16 (406)	20 (508)	24 (610)	N/A	14 (356)	18 (457)	24 (610)
248 (6 299)	N/A	14 (356)	18 (457)	24 (610)	N/A	N/A	18 (457)	24 (610)
249 (6 325)	N/A	N/A	18 (457)	24 (610)	N/A	N/A	18 (457)	24 (610)
250 (6 350)	N/A	N/A	18 (457)	24 (610)	N/A	N/A	18 (457)	24 (610)
252 (6 401)	N/A	N/A	18 (457)	24 (610)	N/A	N/A	18 (457)	24 (610)
254 (6 452)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)
255 (6 477)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)
256 (6 502)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)
258 (6 553)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)
260 (6 604)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)
261 (6 629)	N/A	N/A	16 (406)	24 (610)	N/A	N/A	18 (457)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

MAXIMUM FIFTH WHEEL OFFSET — PINNACLE AXLE FORWARD (CHU) TRACTOR, 12,000 LB (5 443 KG) FRONT AXLE RATING

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
154 (3 912)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
166 (4 216)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
171 (4 343)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
172 (4 369)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
177 (4 496)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
178 (4 521)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
183 (4 648)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
184 (4 674)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
188 (4 775)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
189 (4 801)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
190 (4 826)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
194 (4 928)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
195 (4 953)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
196 (4 978)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
200 (5 080)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
201 (5 105)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
202 (5 131)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
205 (5 207)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
206 (5 232)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
207 (5 258)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)

Wheelbase Inches (mm)	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
211 (5 359)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
212 (5 385)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	20 (508)	24 (610)	24 (610)
213 (5 410)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	20 (508)	24 (610)	24 (610)
217 (5 512)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	20 (508)	24 (610)	24 (610)
218 (5 537)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)
219 (5 563)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	18 (457)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)
223 (5 664)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	18 (457)	24 (610)	24 (610)
224 (5 690)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	18 (457)	24 (610)	24 (610)
225 (5 715)	22 (559)	24 (610)	24 (610)	N/A	18 (457)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	18 (457)	24 (610)	24 (610)
229 (5 817)	22 (559)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	18 (457)	24 (610)	24 (610)
235 (5 969)	22 (559)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)	24 (610)	16 (406)	18 (457)	22 (559)	24 (610)	14 (356)	18 (457)	22 (559)	24 (610)
241 (6 121)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	22 (559)	24 (610)	14 (356)	16 (406)	20 (508)	24 (610)
243 (6 172)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	20 (508)	24 (610)	14 (356)	16 (406)	20 (508)	24 (610)
244 (6 198)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	20 (508)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)
247 (6 274)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
248 (6 299)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
249 (6 325)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	14 (356)	18 (457)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
250 (6 350)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	22 (559)	24 (610)	14 (356)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
253 (6 426)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	14 (356)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
254 (6 452)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
255 (6 477)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
256 (6 502)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)
259 (6 579)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)
260 (6 604)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)
261 (6 629)	N/A	N/A	N/A	N/A	14 (356)	18 (457)	22 (559)	24 (610)	12 (305)	16 (406)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
154 (3 912)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
166 (4 216)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
171 (4 343)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
172 (4 369)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
177 (4 496)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
178 (4 521)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
183 (4 648)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
184 (4 674)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
188 (4 775)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
189 (4 801)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
190 (4 826)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
194 (4 928)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
195 (4 953)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
196 (4 978)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
200 (5 080)	N/A	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)
201 (5 105)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
202 (5 131)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
205 (5 207)	N/A	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)
206 (5 232)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
207 (5 258)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
211 (5 359)	N/A	18 (457)	24 (610)	24 (610)	N/A	18 (457)	24 (610)	24 (610)
212 (5 385)	N/A	18 (457)	24 (610)	24 (610)	N/A	16 (406)	24 (610)	24 (610)
213 (5 410)	N/A	18 (457)	24 (610)	24 (610)	N/A	16 (406)	24 (610)	24 (610)
217 (5 512)	N/A	18 (457)	22 (559)	24 (610)	N/A	16 (406)	24 (610)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

AXLE RATING — FRONT AND REAR								
	Front Axle 12,000 lb (5 443 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
218 (5 537)	N/A	18 (457)	22 (559)	24 (610)	N/A	16 (406)	24 (610)	24 (610)
219 (5 563)	N/A	18 (457)	22 (559)	24 (610)	N/A	16 (406)	24 (610)	24 (610)
223 (5 664)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
224 (5 690)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
225 (5 715)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	22 (559)	24 (610)
229 (5 817)	N/A	16 (406)	20 (508)	24 (610)	N/A	14 (357)	20 (508)	24 (610)
235 (5 969)	N/A	16 (406)	20 (508)	24 (610)	N/A	14 (357)	20 (508)	24 (610)
241 (6 121)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
243 (6 172)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
244 (6 198)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
247 (6 274)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
248 (6 299)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
249 (6 325)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
250 (6 350)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
253 (6 426)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
254 (6 452)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	16 (406)	24 (610)
255 (6 477)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	16 (406)	24 (610)
256 (6 502)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	16 (406)	24 (610)
259 (6 579)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	14 (357)	24 (610)
260 (6 604)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	14 (357)	24 (610)
261 (6 629)	N/A	14 (357)	16 (406)	24 (610)	N/A	12 (305)	14 (357)	24 (610)

MAXIMUM FIFTH WHEEL OFFSET — PINNACLE AXLE FORWARD (CHU) TRACTOR, 14,600 LB (6 623 KG) FRONT AXLE RATING

	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
154 (3 912)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
166 (4 216)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
171 (4 343)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
172 (4 369)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
177 (4 496)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
178 (4 521)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
183 (4 648)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
184 (4 674)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
188 (4 775)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
189 (4 801)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)
190 (4 826)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
194 (4 928)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
195 (4 953)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
196 (4 978)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)
200 (5 080)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
201 (5 105)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)	18 (457)	24 (610)	24 (610)	24 (610)
202 (5 131)	24 (610)	24 (610)	24 (610)	N/A	24 (610)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)
205 (5 207)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)	18 (457)	22 (559)	24 (610)	24 (610)
206 (5 232)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	22 (559)	24 (610)	24 (610)	16 (406)	22 (559)	24 (610)	24 (610)
207 (5 258)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)

Wheelbase Inches (mm)	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
211 (5 359)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)
212 (5 385)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)
213 (5 410)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)	16 (406)	20 (508)	24 (610)	24 (610)
217 (5 512)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	14 (357)	18 (457)	24 (610)	24 (610)	14 (357)	18 (457)	24 (610)	24 (610)
218 (5 537)	24 (610)	24 (610)	24 (610)	N/A	22 (559)	24 (610)	24 (610)	24 (610)	14 (357)	18 (457)	24 (610)	24 (610)	14 (357)	18 (457)	24 (610)	24 (610)
219 (5 563)	24 (610)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	14 (357)	18 (457)	22 (559)	24 (610)	14 (357)	18 (457)	22 (559)	24 (610)
223 (5 664)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	14 (357)	16 (406)	22 (559)	24 (610)	14 (357)	16 (406)	20 (508)	24 (610)
224 (5 690)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	14 (357)	16 (406)	20 (508)	24 (610)	14 (357)	16 (406)	20 (508)	24 (610)
225 (5 715)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	14 (357)	16 (406)	20 (508)	24 (610)	14 (357)	16 (406)	20 (508)	24 (610)
229 (5 817)	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)
235 (5 969)	22 (559)	24 (610)	24 (610)	N/A	18 (457)	22 (559)	24 (610)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)	12 (305)	16 (406)	20 (508)	24 (610)
241 (6 121)	N/A	N/A	N/A	N/A	18 (457)	22 (559)	24 (610)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)
243 (6 172)	N/A	N/A	N/A	N/A	18 (457)	22 (559)	24 (610)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)
244 (6 198)	N/A	N/A	N/A	N/A	18 (457)	22 (559)	24 (610)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)	12 (305)	14 (356)	18 (457)	24 (610)
247 (6 274)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)
248 (6 299)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)
249 (6 325)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)
250 (6 350)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	22 (559)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)
253 (6 426)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	12 (305)	16 (406)	24 (610)	10 (254)	14 (356)	16 (406)	24 (610)
254 (6 452)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	12 (305)	16 (406)	24 (610)	10 (254)	12 (305)	16 (406)	24 (610)
255 (6 477)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 14,600 lb (6 623 kg)															
	Rear Axle 23,000 lb (10 433 kg)				Rear Axle 34,000 lb (15 422 kg)				Rear Axle 38,000 lb (17 239 kg)				Rear Axle 40,000 lb (18 144 kg)			
	FRAME THICKNESS (MM)															
	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
256 (6 502)	N/A	N/A	N/A	N/A	16 (406)	20 (508)	24 (610)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)
259 (6 579)	N/A	N/A	N/A	N/A	16 (406)	18 (457)	22 (559)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)
260 (6 604)	N/A	N/A	N/A	N/A	16 (406)	18 (457)	22 (559)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)
261 (6 629)	N/A	N/A	N/A	N/A	16 (406)	18 (457)	22 (559)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)	10 (254)	12 (305)	14 (356)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
154 (3 912)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
166 (4 216)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
171 (4 343)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
172 (4 369)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
177 (4 496)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
178 (4 521)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
183 (4 648)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
184 (4 674)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
188 (4 775)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
189 (4 801)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
190 (4 826)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
194 (4 928)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
195 (4 953)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
196 (4 978)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
200 (5 080)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
201 (5 105)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
202 (5 131)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
205 (5 207)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
206 (5 232)	N/A	22 (559)	24 (610)	24 (610)	N/A	20 (508)	24 (610)	24 (610)
207 (5 258)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
211 (5 359)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
212 (5 385)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
213 (5 410)	N/A	20 (508)	24 (610)	24 (610)	N/A	20 (508)	22 (559)	24 (610)
217 (5 512)	N/A	18 (457)	22 (559)	24 (610)	N/A	18 (457)	22 (559)	24 (610)

AXLE RATING — FRONT AND REAR								
	Front Axle 14,600 lb (6 623 kg)							
	Rear Axle 44,000 lb (19 958 kg)				Rear Axle 46,000 lb (20 866 kg)			
	FRAME THICKNESS (MM)							
	6	7	8	9.5	6	7	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)				Maximum 5th Wheel Offset Inches (mm)			
218 (5 537)	N/A	18 (457)	22 (559)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
219 (5 563)	N/A	18 (457)	22 (559)	24 (610)	N/A	18 (457)	22 (559)	24 (610)
223 (5 664)	N/A	18 (457)	20 (508)	24 (610)	N/A	18 (457)	20 (508)	24 (610)
224 (5 690)	N/A	16 (406)	20 (508)	24 (610)	N/A	18 (457)	20 (508)	24 (610)
225 (5 715)	N/A	16 (406)	20 (508)	24 (610)	N/A	18 (457)	20 (508)	24 (610)
229 (5 817)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
235 (5 969)	N/A	16 (406)	20 (508)	24 (610)	N/A	16 (406)	20 (508)	24 (610)
241 (6 121)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	18 (457)	24 (610)
243 (6 172)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	18 (457)	24 (610)
244 (6 198)	N/A	14 (357)	18 (457)	24 (610)	N/A	14 (357)	18 (457)	24 (610)
247 (6 274)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)
248 (6 299)	N/A	14 (357)	16 (406)	24 (610)	N/A	14 (357)	16 (406)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

Wheelbase Range	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)								Front Axle 14,600 lb (6 486 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
	Maximum 5th Wheel Offset Inches (mm)															
149–152 (3 785–3 850)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
153–156 (3 885–3 950)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
157–159 (3 985–4 035)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
160–163 (4 064–4 135)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)
164–167 (4 166–4 235)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)
168–171 (4 267–4 335)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	20 (508)	24 (610)
172–175 (4 369–4 435)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
176–179 (4 470–4 535)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
180–183 (4 572–4 650)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
184–187 (4 685–4 750)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
188–191 (4 785–4 850)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
192–195 (4 855–4 950)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
196–199 (4 985–5 050)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
200–203 (5 085–5 150)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
204–207 (5 185–5 250)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
208–211 (5 285–5 360)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
212–215 (5 385–5 485)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
216–219 (5 485–5 560)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
220–223 (5 585–5 650)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
224–227 (5 685–5 760)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)								Front Axle 14,600 lb (6 486 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
228–231 (5 785–5 860)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
232–235 (5 885–5 960)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
236–239 (5 985–6 060)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
240–243 (6 085–6 160)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
244–246 (6 185–6 250)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
247–250 (6 285–6 350)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
251–254 (6 385–6 450)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
255–258 (6 485–6 553)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
259–262 (6 585–6 660)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

	AXLE RATING — FRONT AND REAR															
	Front Axle 18,000 lb (8 165 kg)								Front Axle 20,000 lb (9 072 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
149–152 (3 785–3 850)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
153–156 (3 885–3 950)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
157–159 (3 985–4 035)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
160–163 (4 064–4 135)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
164–167 (4 166–4 235)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
168–171 (4 267–4 335)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
172–175 (4 369–4 435)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
176–179 (4 470–4 535)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
180–183 (4 572–4 650)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
184–187 (4 685–4 750)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
188–191 (4 785–4 850)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
192–195 (4 855–4 950)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
196–199 (4 985–5 050)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
200–203 (5 085–5 150)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
204–207 (5 185–5 250)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
208–211 (5 285–5 360)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
212–215 (5 385–5 485)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
216–219 (5 485–5 560)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
220–223 (5 585–5 650)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
224–227 (5 685–5 760)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 18,000 lb (8 165 kg)								Front Axle 20,000 lb (9 072 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Inches (mm)	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
228–231 (5 785–5 860)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
232–235 (5 885–5 960)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
236–239 (5 985–6 060)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
240–243 (6 085–6 160)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
244–246 (6 185–6 250)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
247–250 (6 285–6 350)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
251–254 (6 385–6 450)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
255–258 (6 485–6 553)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
259–262 (6 585–6 660)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)								Front Axle 14,600 lb (6 486 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
149–152 (3 785–3 850)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
153–156 (3 885–3 950)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
157–159 (3 985–4 035)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
160–163 (4 064–4 135)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
164–167 (4 166–4 235)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
168–171 (4 267–4 335)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
172–175 (4 369–4 435)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
176–179 (4 470–4 535)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
180–183 (4 572–4 650)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
184–187 (4 685–4 750)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
188–191 (4 785–4 850)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
192–195 (4 855–4 950)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
196–199 (4 985–5 050)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
200–203 (5 085–5 150)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
204–207 (5 185–5 250)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
208–211 (5 285–5 360)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
212–215 (5 385–5 485)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
216–219 (5 485–5 560)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
220–223 (5 585–5 650)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
224–227 (5 685–5 760)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 12,000 lb (5 443 kg)								Front Axle 14,600 lb (6 486 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Range	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
228–231 (5 785–5 860)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
232–235 (5 885–5 960)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
236–239 (5 985–6 060)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
240–243 (6 085–6 160)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
244–246 (6 185–6 250)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
247–250 (6 285–6 350)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
251–254 (6 385–6 450)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
255–258 (6 485–6 553)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)
259–262 (6 585–6 660)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

	AXLE RATING — FRONT AND REAR															
	Front Axle 18,000 lb (8 165 kg)								Front Axle 20,000 lb (9 072 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Inches	Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)		Maximum 5th Wheel Offset Inches (mm)	
149–152 (3 785–3 850)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
153–156 (3 885–3 950)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
157–159 (3 985–4 035)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
160–163 (4 064–4 135)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
164–167 (4 166–4 235)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
168–171 (4 267–4 335)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
172–175 (4 369–4 435)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
176–179 (4 470–4 535)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
180–183 (4 572–4 650)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
184–187 (4 685–4 750)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
188–191 (4 785–4 850)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
192–195 (4 855–4 950)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
196–199 (4 985–5 050)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
200–203 (5 085–5 150)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
204–207 (5 185–5 250)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
208–211 (5 285–5 360)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
212–215 (5 385–5 485)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
216–219 (5 485–5 560)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
220–223 (5 585–5 650)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
224–227 (5 685–5 760)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)

	AXLE RATING — FRONT AND REAR															
	Front Axle 18,000 lb (8 165 kg)								Front Axle 20,000 lb (9 072 kg)							
	Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)		Rear Axle 38,000 lb (17 239 kg)		Rear Axle 40,000 lb (18 144 kg)		Rear Axle 44,000 lb (19 958 kg)		Rear Axle 46,000 lb (20 866 kg)	
	FRAME THICKNESS (MM)								FRAME THICKNESS (MM)							
	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5	8	9.5
Wheelbase Inches	Maximum 5th Wheel Offset Inches (mm)															
228–231 (5 785–5 860)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
232–235 (5 885–5 960)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
236–239 (5 985–6 060)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
240–243 (6 085–6 160)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
244–246 (6 185–6 250)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
247–250 (6 285–6 350)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
251–254 (6 385–6 450)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
255–258 (6 485–6 553)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)
259–262 (6 585–6 660)	24 (610)	24 (610)	24 (610)	24 (610)	22 (559)	24 (610)	20 (508)	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)	N/A	24 (610)

Wheelbase and fifth wheel offset combinations must be verified for trailer swing, landing clearance, etc.

FASTENERS

Fasteners — Bodybound Bolts

Bodybound bolts, both SAE and metric, are manufactured with closely controlled shank diameters to provide an interference fit with the members that they attach. The shank diameter (**B**) is approximately 0.031 inch (0.79 mm) larger than the rolled threads. This type of bolt eliminates the undesirable condition of having parts bearing on the threaded portion of the bolt.

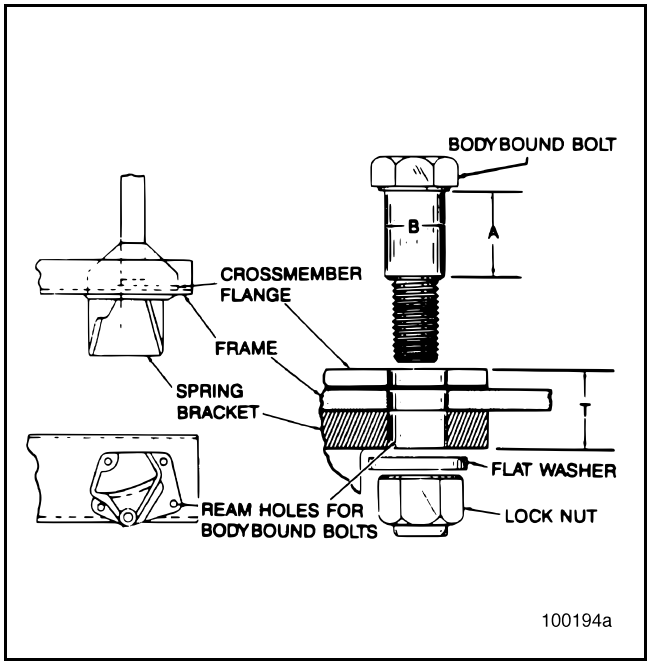


Figure 97 — Determining Bodybound Bolt Size

Before bodybound bolts can be used in engine and spring supports, the holes in the supports and frame must be reamed to the proper diameter so that the bolts can be installed with the required interference fit.

⚠ CAUTION

Reamers must only be used in a clockwise rotation. Do not reverse rotation to withdraw reamer. Use a drill with a maximum no-load speed of 350 rpm. Always use cutting oil. Failure to follow these instructions will lead to premature reamer damage.

Holes already provided in the frame may be utilized if they are not worn to a degree where reaming them will make them oversized. To ream a hole, select the correct reamer for the size of bolt to be used from the accompanying chart. It is recommended that an inside micrometer or other accurate measuring device be used to determine if the reamed holes are kept within the prescribed tolerances.

Align the existing holes in the frame with those in the brackets or supports by using drift pins, locating pins, or standard bolts and nuts in two diagonally opposed holes. Temporarily bolt the parts together to prevent shifting. Ream the unused holes to the proper diameter, as listed in table on page 174 or table on page 175, using a spiral cobalt reamer. Be sure the reamer is kept 90 degrees to the frame during the reaming operation. The length of the cutting surface of the reamer must not exceed 6 inches.

After reaming, clean out any metal chips that may remain in the holes. Install bodybound bolts with the necessary washers, and torque the nuts to the specified value. Hit the head of the bolt several times with a brass hammer during final torquing to ensure proper seating of the fasteners. Remove drift pins, locating pins, and bolts and nuts used to align and clinch the brackets or supports. Repeat the reaming and mounting procedure for the remaining holes.

It is good practice to check the bolts for size before being driven into the holes. Removing them, if necessary, will be difficult.

⚠ CAUTION

Where Alumalastic® sealer is used between aluminum and ferrous surfaces, the threads on the bolts must be wiped clean after insertion and before threading the nut onto the bolt. Alumalastic® acts as an extreme lubricant, and incorrect torque values will be obtained, with the possibility of thread stripping if this procedure is not followed.

To select the proper SAE bodybound bolt, the parts to be assembled must first be measured to determine the accumulated thickness (**T**) so that the proper bolt shank length (**A**) can be selected. A hardened flat washer must be used under each nut for assemblies with both steel and aluminum parts. When the bolt head comes in contact with an aluminum part, a hardened washer must be used under the bolt head to prevent loosening.

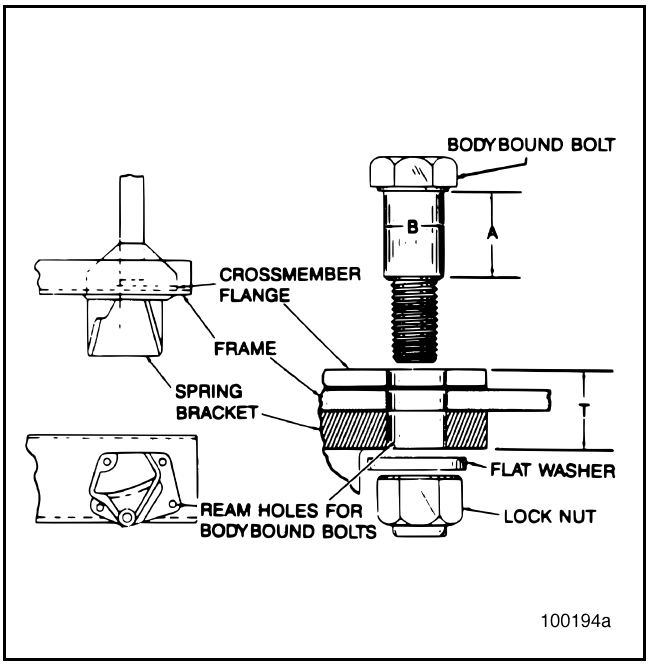


Figure 98 — Determining Bodybound Bolt Size

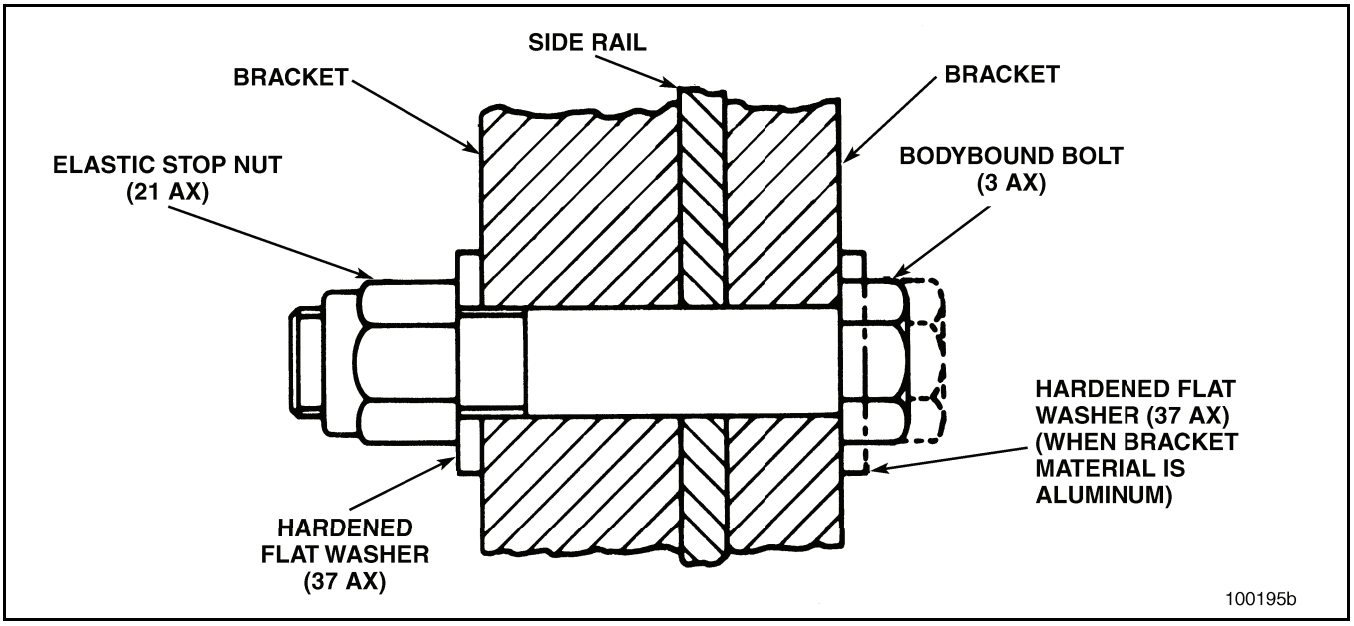


Figure 99 — Recommended SAE Bodybound Bolt Installation

To select the proper metric bodybound bolt length, the parts to be assembled must first be measured to determine the accumulated pack thickness. The shank of the bolt should extend a minimum of 66% into the last part of the bodybound pack. A hardened flat washer (271AM) is used under each nut for both steel and aluminum assemblies to compensate for minor variations in pack thickness, to ensure relatively constant torque values, and to properly distribute the clamping load. A hardened flat washer is also used under the bolt head to properly distribute the clamping load.

Be sure that the shank of the bolt does not protrude from the hole, or the nut will bottom against the shank before the proper clamping force is applied. Too short a bolt will not provide an adequate bearing surface, reducing the effectiveness of the bodybound bolt. Use the correct length bolt and washer thickness, as required, to obtain ideal conditions. Do not use more than one washer.

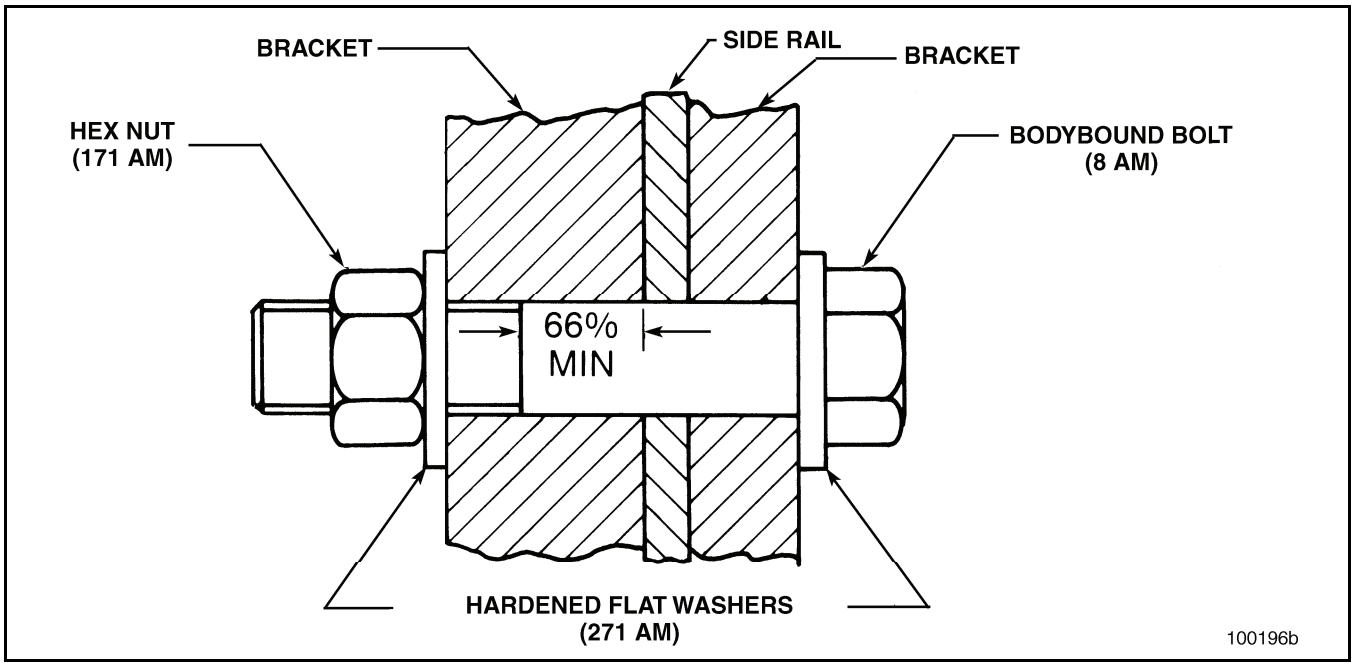


Figure 100 — Recommended Metric Bodybound Bolt Installation

METRIC BODYBOUND BOLT CHART

METRIC BODYBOUND BOLT CHART				
Bolt Size	**Shank Diameter mm (in.)**	**Reamer No.**	**Recommended Drill Size mm**	**Torque N•m (lb-ft)**
12 mm	12.70 (0.500) 12.60 (0.496)	J 34922 (12.6 mm)	11	78 (58)
16 mm	16.69 (0.657) 16.59 (0.653)	J 26461 (0.652 in.)	15	225 (166)
20 mm	20.70 (0.815) 20.60 (0.811)	J 34679 (20.5 mm)	19	365 (270)

GRADE 5 AND GRADE 8 BODYBOUND BOLT CHART

GRADE 5 BODYBOUND BOLT CHART				
Bolt Size	**Shank Diameter mm (in.)**	**Reamer No.**	**Recommended Drill Size mm**	**Torque lb-ft (N•m)**
5/8-18 UNF-2A	0.657 (16.69) 0.653 (16.59)	J 26461 (0.652 in.)	19/32	155–175 (210–237)
3/4-16 UNF-2A	0.782 (19.86) 0.778 (19.76)	J 26462 (0.776 in.)	11/16	240–270 (325–366)
1-14 NS-2A	1.034 (26.26) 1.028 (26.11)	J 26463 (1.027 in.)	31/32	590–640 (800–868)
GRADE 8 BODYBOUND BOLT CHART				
5/8-18 UNF-2A	0.657 (16.69) 0.653 (16.59)	J 26461 (0.652 in.)	19/32	268–296 (363–401)
3/4-16 UNF-2A	0.782 (19.96) 0.778 (19.76)	J 26462 (0.776 in.)	11/16	476–528 (645–716)

- Flanged Head Bodybound Bolt — Do not use hardened washers with flanged head bolts except to position bolt penetration correctly.
- Standard Head Bodybound Bolt — Use hardened washers on steel or aluminum and to position bolt penetration correctly.

Reamers listed above may be ordered directly from:

KENT-MOORE

O. E. TOOL EQUIPMENT GROUP

SPX CORPORATION

28635 MOUND RD.

WARREN, MICHIGAN 48092-3499

Telephone: 1-800-328-6657

FAX: 1-800-578-7375

IN CANADA:

KENT-MOORE CANADA, INC.

5466 TIMBERLEA BLVD.

UNIT #2

MISSISSAUGA, ONTARIO, CANADA L4W2T7

TELEPHONE: (416) 634-6295

TELEX: 06-961338

Fasteners — HUCK® Metric

HUCK-SPIN® fasteners are used at MACK assembly plants to attach various assemblies to the frame. The major advantages of HUCK® fasteners are consistent clamp value and high resistance to vibration-induced loosening. A special power swaging installation tool delivers uniformly high preloads, independent of the individual operator. MACK specification HUCK® fasteners prevent unwanted loss of clamping force, yet permit subsequent removal with power hand tools. A simple visual inspection of installed HUCK® fasteners eliminates costly periodic torque checking and retorquing of conventional fasteners.

In the event that HUCK® fasteners are removed for wheelbase changes, fifth-wheel mounting, etc., it is strongly recommended that **new** HUCK® fasteners be used for attachment/reattachment of components. Superior clamping ability cannot be duplicated with the use of conventional bolts and nuts.

⚠ CAUTION

*DO NOT reuse HUCK® fasteners. If reused, they can loosen and cause frame damage. Use only **new** HUCK® fasteners.*

HUCK® FASTENERS — IDENTIFICATION AND SELECTION

HUCK-SPIN® fasteners are used in production, whereas HUCK-FIT® fasteners are currently available through the MACK Parts System for field service repairs. HUCK-FIT® fasteners are available in 12 mm, 16 mm and 20 mm pin and collar diameters, while the 14 mm pins and collars are available only in the HUCK-SPIN® configuration. All HUCK® fasteners are metric property class 10.9. A fastener is selected based on the thickness of the material to be clamped. This thickness is called the “GRIP” when working with HUCK® fasteners. A grip number is stamped into the head of each HUCK® pin, and represents the midpoint of the grip range (expressed in millimeters) for that particular pin.

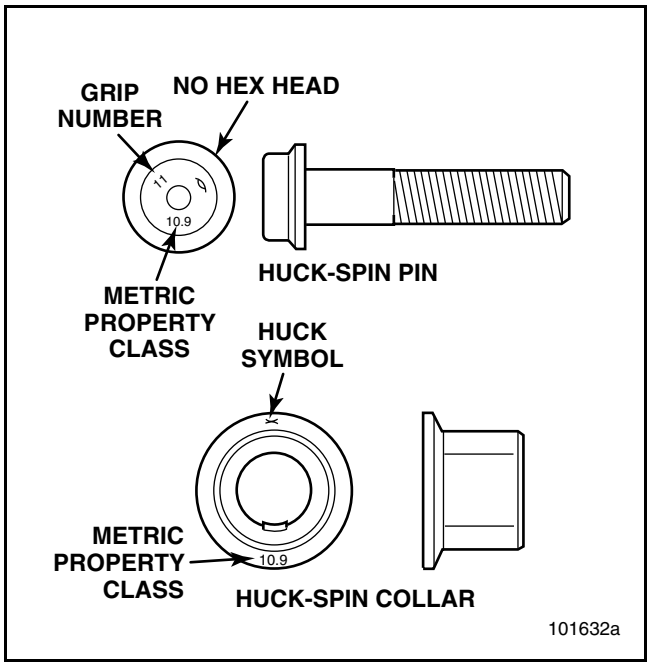


Figure 101 — HUCK-SPIN® Fastener Identification

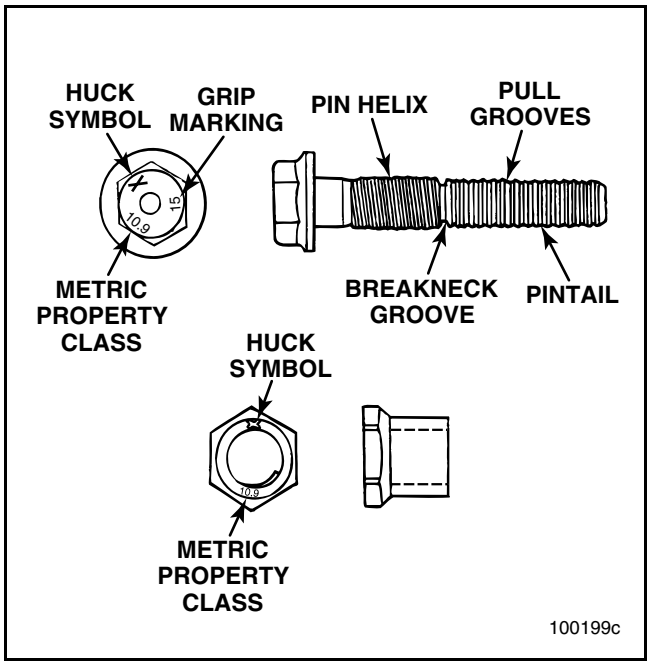


Figure 102 — HUCK-FIT® Fastener Identification

Most HUCK® pins have a grip range of approximately 10 millimeters. A pin with a grip marking of 15, for example, could be used to clamp material from 10 mm to 20 mm thick. One with a grip marking of 40 would be used if the thickness of the parts to be clamped is between 35 mm and 45 mm. The exception to this is a HUCK® pin with a grip marking of 17. This pin has a grip range of 10 mm to 24 mm. Only the 16 mm diameter pin is available with this extended grip, and it can also be identified by the raised nipple at the center of the pin head.

HUCK® FASTENERS — PART NUMBERS

Following is a list of available HUCK-SPIN® and HUCK-FIT® fastener part numbers for 12 mm, 14 mm, 16 mm and 20 mm diameter pins and collars.

Pin Diameter (MM)	MACK Part No. (Huck-Spin®)	MACK Part No. (Huck-Fit®)	Grip No.	Grip Range In. (MM)	MACK Part No. (Collar)	Installation Nose No.		Installation Tool No.
						Huck-Spin®	Huck-Fit®	
12	NA	4AM1	10	0.20–0.60 (5–15)	159AM1	NA	99-5404	2620
14	4AM34	NA	10	0.12–0.75 (4–19)	159AM5	99-7511	NA	2624HS
14	4AM36	NA	20	0.55–1.14 (14–29)	159AM5	99-7511	NA	2624HS
14	4AM37	NA	25	0.75–1.34 (19–34)	159AM5	99-7511	NA	2624HS
14	4AM38	NA	30	0.95–1.54 (24–39)	159AM5	99-7511	NA	2624HS
14	4AM39	NA	35	1.14–1.73 (29–44)	159AM5	99-7511	NA	2624HS
14	4AM40	NA	40	1.34–1.93 (34–49)	159AM5	99-7511	NA	2624HS
14	4AM41	NA	45	1.54–2.13 (39–54)	159AM5	99-7511	NA	2624HS
14	4AM42	NA	50	1.73–2.32 (44–59)	159AM5	99-7511	NA	2624HS
14	4AM43	NA	55	1.93–2.52 (49–64)	159AM5	99-7511	NA	2624HS
14	4AM44	NA	60	2.13–2.72 (54–69)	159AM5	99-7511	NA	2624HS
14	4AM45	NA	65	2.32–2.91 (59–74)	159AM5	99-7511	NA	2624HS
14	4AM46	NA	70	2.52–3.11 (64–79)	159AM5	99-7511	NA	2624HS
14	4AM47	NA	75	2.72–3.31 (69–84)	159AM5	99-7511	NA	2624HS
16	4AM9	4AM9M2	15	0.40–0.80 (10–20)	159AM2	99-7501	99-5301	2628
16	4AM10	4AM10M2	17	0.40–0.94 (10–24)	159AM2	99-7501	99-5301	2628
16	4AM11	4AM11M2	20	0.60–0.98 (15–25)	159AM2	99-7501	99-5301	2628
16	4AM12	4AM12M2	25	0.80–1.18 (20–30)	159AM2	99-7501	99-5301	2628
16	4AM13	4AM13M2	30	0.60–1.38 (25–35)	159AM2	99-7501	99-5301	2628
16	4AM14	4AM14M2	35	1.18–1.57 (30–40)	159AM2	99-7501	99-5301	2628
16	4AM15	4AM15M2	40	1.38–1.77 (35–45)	159AM2	99-7501	99-5301	2628
16	4AM16	4AM16M2	45	1.57–1.97 (40–50)	159AM2	99-7501	99-5301	2628
16	4AM24	4AM24M2	10	0.20–0.60 (5–15)	159AM2	99-7501	99-5301	2628
20	4AM18	4AM18M2	20	0.60–0.98 (15–25)	159AM3	99-7512	99-5403	2628
20	4AM19	4AM19M2	25	0.80–1.18 (20–30)	159AM3	99-7512	99-5403	2628
20	4AM20	4AM20M2	30	0.60–1.38 (25–35)	159AM3	99-7512	99-5403	2628
20	4AM21	4AM21M2	35	1.18–1.57 (30–40)	159AM3	99-7512	99-5403	2628

101622b

Figure 103 — MACK Part Numbers for HUCK® Fasteners

HUCK® FASTENERS — REMOVAL

HUCK-SPIN® pins and collars do not have hex heads and cannot be removed with an air impact wrench. HUCK-FIT® pins and collars have hex heads and can be removed with an air impact wrench. When removing a HUCK-FIT® fastener, always try to remove the collar with an air impact wrench first. Should difficulty be encountered, increase air pressure to the maximum allowable for the tool to obtain the best results. If the fastener cannot be removed with an air impact wrench, the collar must be cut with a torch.

A hydraulic collar splitter is available from Huck International for removing HUCK-SPIN® fasteners. If a collar splitter is available, it should be used. If the splitter is not available or is impractical to use, the collar should be cut with a torch.

NOTE

Use this method of removal only if the fastener cannot be removed with an air impact wrench or hydraulic splitter.

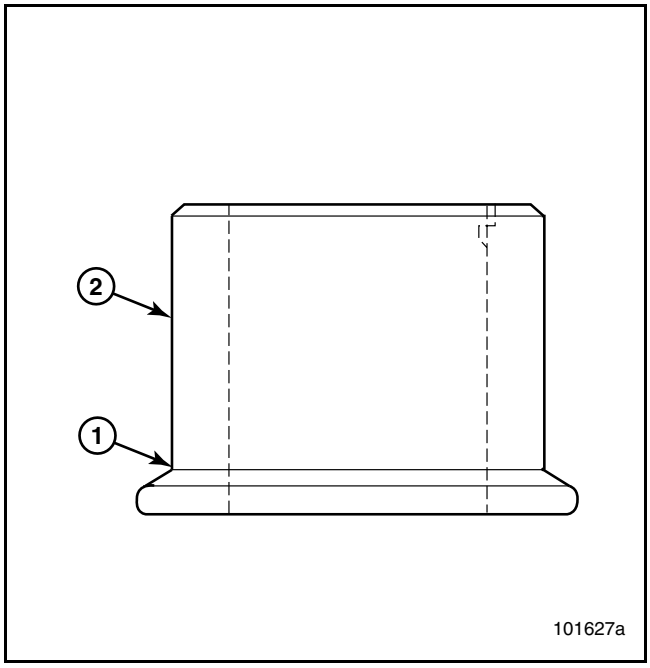


Figure 104 — HUCK-SPIN® Collar (Transverse Cut Location)

1. Cut through collar and pin at this location with a torch.	2. Swaged Area

If cutting the collar with a torch, make the cut just above the collar flange. When cutting, use extreme care to avoid damage to, or excessive heating of, chassis components in the area. To help avoid damage to other components, use a metal shield (1/8-inch thick) with a hole in it which will fit around the HUCK® collar. When a torch is used to cut the collar, removal is easier if the center shank is driven out while the part is still hot.

In summary, try the impact wrench or hydraulic collar splitter first. If the fastener cannot be removed by using these methods first, the collar can be cut with a torch as described.

HUCK® FASTENERS — INSTALLATION

To install HUCK® fasteners, first select the proper diameter and grip range HUCK® pin. To ensure flush pin seating, the hole size must be as follows:

- **12 mm pin:** 12.8 mm–13.5 mm hole (use 33/64- or 17/32-inch drill bit)
- **14 mm pin:** 14.3 mm–14.8 mm hole (use 9/16-inch drill bit)
- **16 mm pin:** 17.1 mm–17.5 mm hole (use 11/16-inch drill bit)
- **20 mm pin:** 21.6 mm–22.0 mm hole (use 55/64-inch drill bit)

Holes as small as the nominal diameter of the pin (e.g., 12 mm hole for 12 mm pin) may be used. Chamfer the pin head side to ensure proper seating.

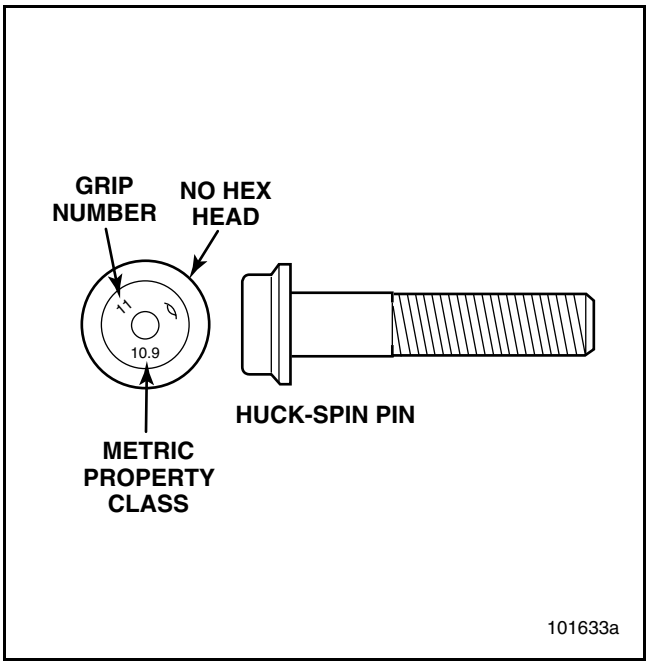


Figure 105 — HUCK-SPIN® Pin

⚠ CAUTION

DO NOT reuse HUCK® fasteners. If reused, they can loosen and cause frame damage. Use only ***new*** *HUCK® fasteners.*

To install the fasteners, select the correct grip range pin. To ensure flush pin seating, the hole size for 16 mm pins must be 0.673–0.689 inch (17.1–17.5 mm) in diameter. An 11/16-inch drill bit can be used. Holes can be as small as 0.630 inch (16 mm), but must be chamfered on the head side to ensure proper seating.

1. Insert the pin through the prepared hole.
2. Slide the collar over the pin and hand tighten.

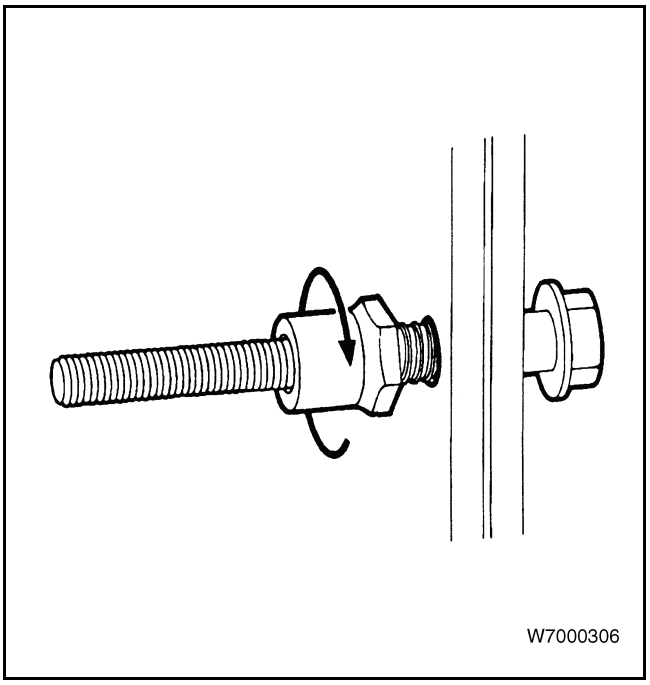


Figure 106 — Threading Collar onto Pin (HUCK-FIT® Fastener Shown)

3. Place the nose assembly of the hydraulic installation tool over the pin and squeeze the trigger to activate the tool. When activated, the nose assembly pulls on the pin, drawing the work pieces together. The anvil pushes on the collar.

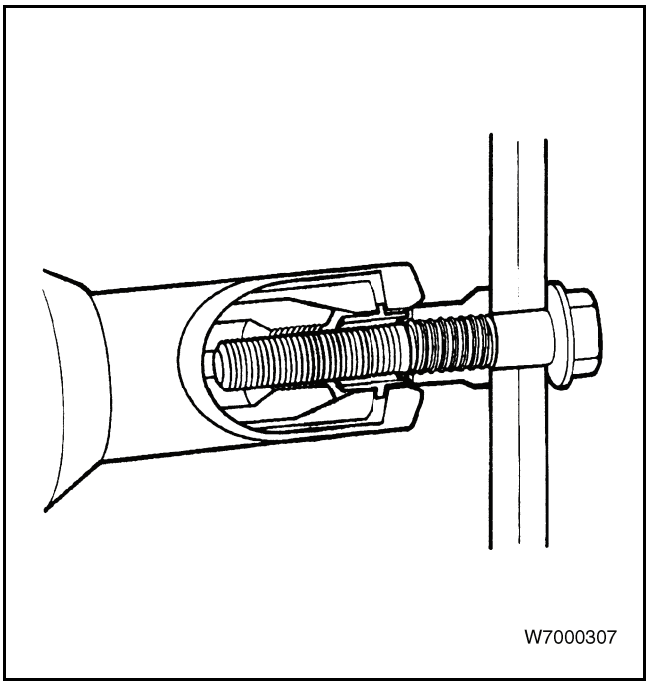


Figure 107 — Swaging Collar (HUCK-FIT® Fastener Shown)

The tool continues pulling on the pin, moving the anvil forward and swaging the collar into the locking grooves of the pin, thereby achieving clamp.

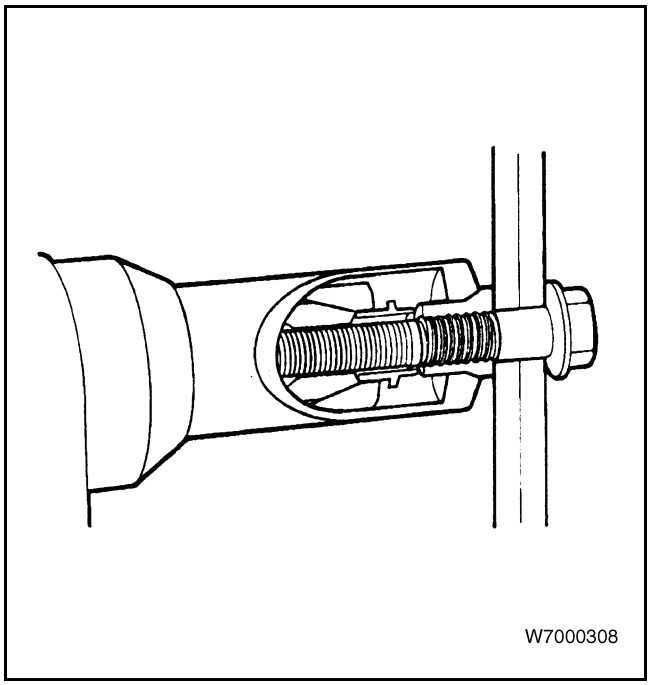


Figure 108 — Swaging Completed (HUCK-FIT® Fastener Shown)

With HUCK-FIT® fasteners, the pintail breaks off at the breakneck groove when the tool completes the swage.

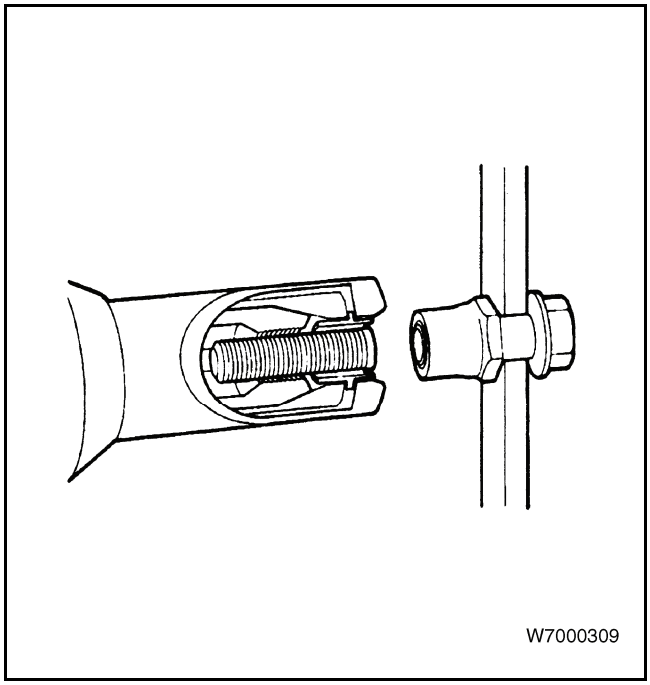


Figure 109 — Pintail Break Off (HUCK-FIT® Fastener Shown)

4. Release the trigger and remove the tool. With HUCK-FIT® fasteners, remove the pintail from the tool.
5. Visually inspect the installed fastener.

INSPECTION OF INSTALLED HUCK® FASTENERS

Visual inspection of installed fasteners consists of checking for a complete swage, and checking for proper pin protrusion. Certain types of HUCK® fasteners installed at MACK assembly plants may have greater pin protrusion than that shown here. There is nothing wrong with these special factory-installed fasteners. The installation method is different than that used for service fasteners. A properly functioning tool with the correct nose assembly produces installed fasteners as shown as long as the right grip range HUCK® pin was selected.

If the HUCK-FIT® pin breaks off inside the collar, or pin protrusion exceeds 10.6 mm (14.6 mm for 17-grip pin), the fastener is improperly installed. Although visual inspection is generally sufficient, other measurements can be taken to monitor tool performance. The following dimensions apply:

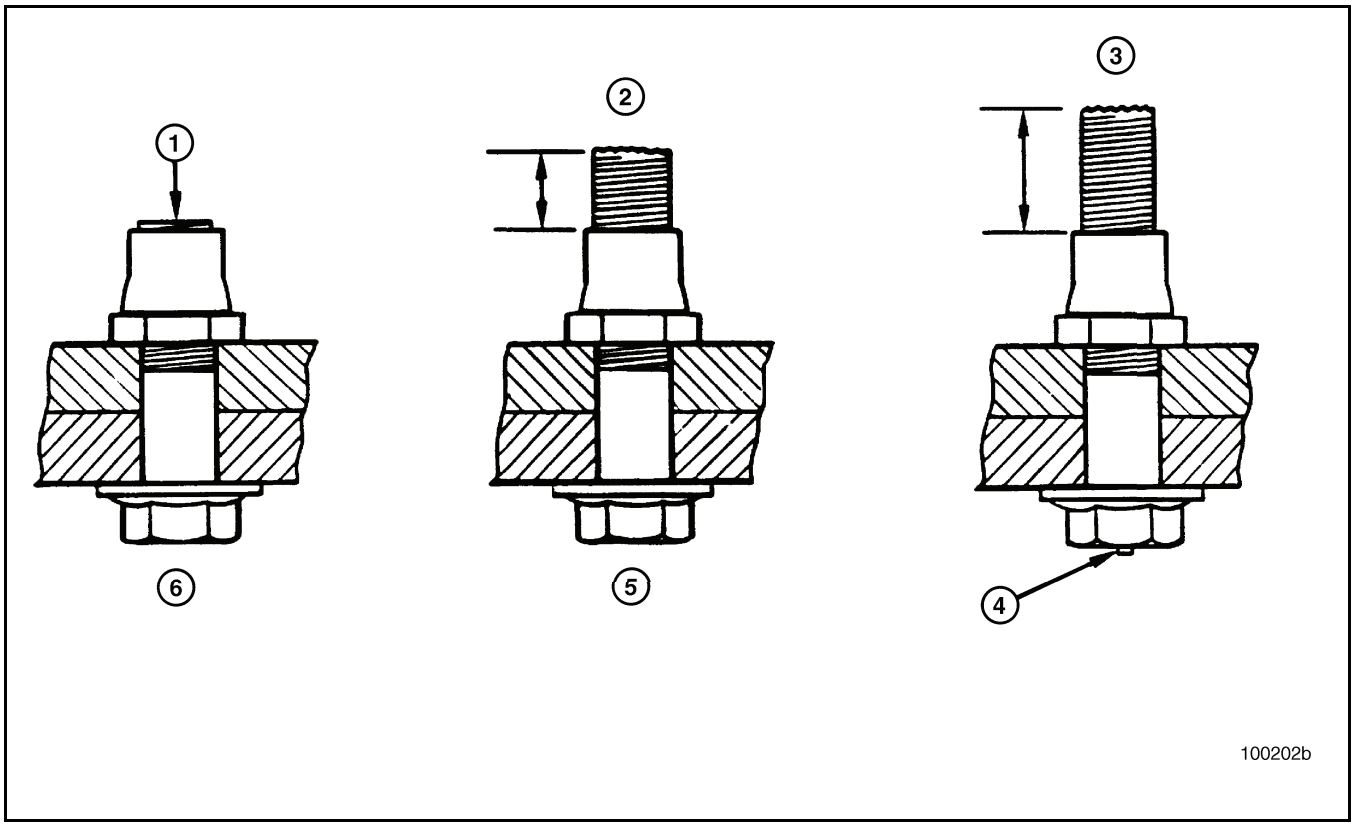


Figure 110 — Correctly Installed HUCK-FIT® Fasteners

1. Flush 2. 10.6 mm (0.417 inch) Maximum Protrusion 3. 14.6 mm (0.575 inch) Maximum Protrusion (17 Grip Only)	4. OK Only for 17-Grip HUCK® Pin 5. OK 6. OK

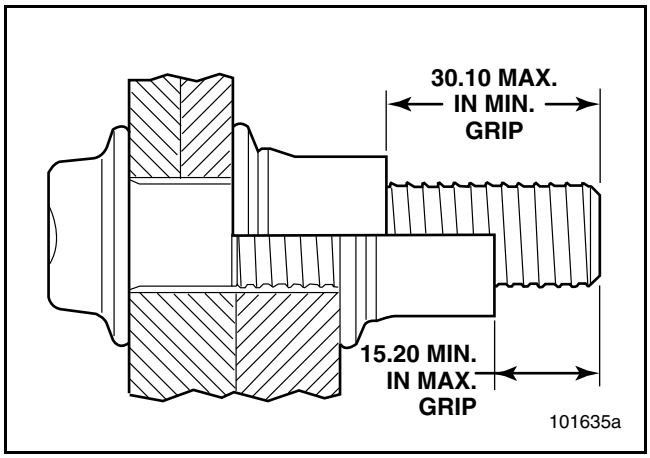


Figure 111 — Correctly Installed HUCK-SPIN® Fasteners

The 17-grip HUCK® pin has a raised point in the center of the pin head in addition to the normal grip mark.

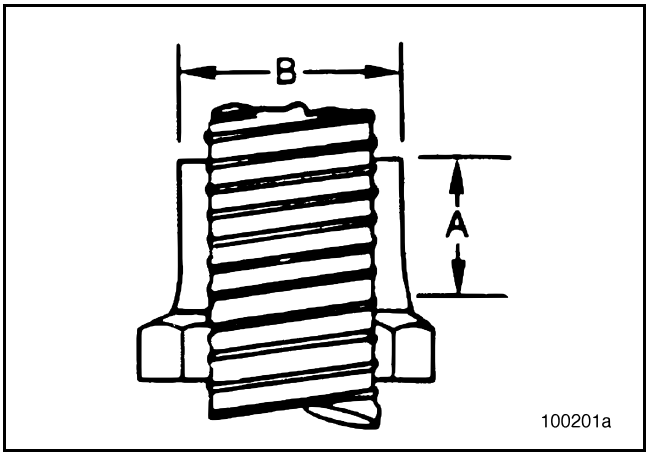


Figure 112 — Installed HUCK® Fastener Dimensions

Referring to Figure 112, an "**A**" dimension **less than** the specified value indicates an incomplete swage. A "**B**" dimension **greater than** the specified value indicates an incorrect or worn anvil on the installation tool. The following table lists the specified dimensions for a properly installed fastener.

INSTALLED HUCK® FASTENER DIMENSIONS

Fastener Diameter	Installed Dimensions
12 mm	**A** — 13.8 mm (0.543 in.) Minimum **B** — 18.3 mm (0.720 in.) Maximum
14 mm	**A** — 16.2 mm (0.638 in.) Minimum **B** — 21.9 mm (0.862 in.) Maximum
16 mm	**A** — 17.7 mm (0.697 in.) Minimum **B** — 24.1 mm (0.949 in.) Maximum
20 mm	**A** — 21.2 mm (0.835 in.) Minimum **B** — 30.3 mm (1.193 in.) Maximum

NOTE

If the installed pin protrusion and collar dimensions noted during inspection are not within the specified limits, the fastener is installed incorrectly and must be replaced.

Properly installed HUCK® fasteners provide the following minimum values in pounds of force:

HUCK® FASTENER STRENGTH (INSTALLED)

Fastener Diameter	Pounds of Force	
12 mm	**Shear**: **Tensile**: **Clamp**:	15,770 19,845 13,725
14 mm	**Shear**: **Tensile**: **Clamp**:	21,560 26,978 18,660
16 mm	**Shear**: **Tensile**: **Clamp**:	28,350 36,810 25,515
20 mm	**Shear**: **Tensile**: **Clamp**:	44,325 57,465 39,780

ACCEPTABLE AND UNACCEPTABLE INSTALLATION

HUCK-SPIN® and HUCK-FIT® fasteners can be turned inward or outward (Figure 113) as tool limitations may require.

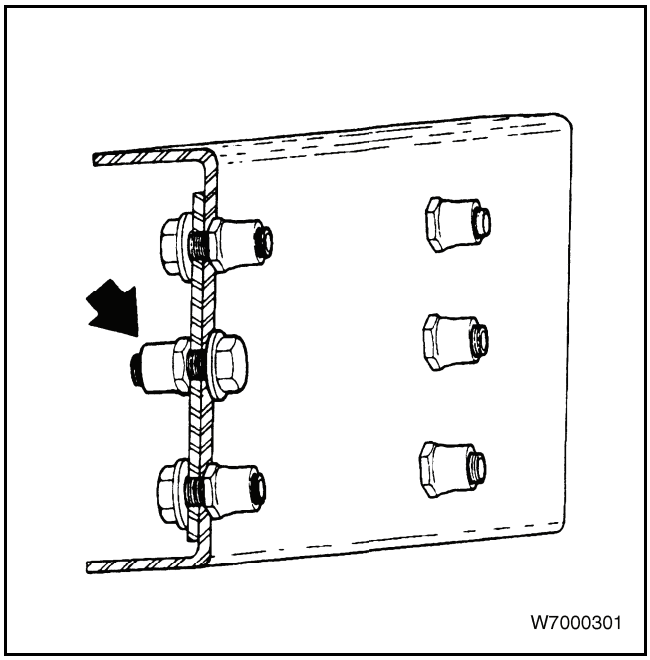


Figure 113 — Fastener Facing Inboard

HUCK-FIT® fastener pin-break is to be flush with or greater than the collar length (Figure 114). A recessed pin-break less than flush with the collar is **unacceptable**.

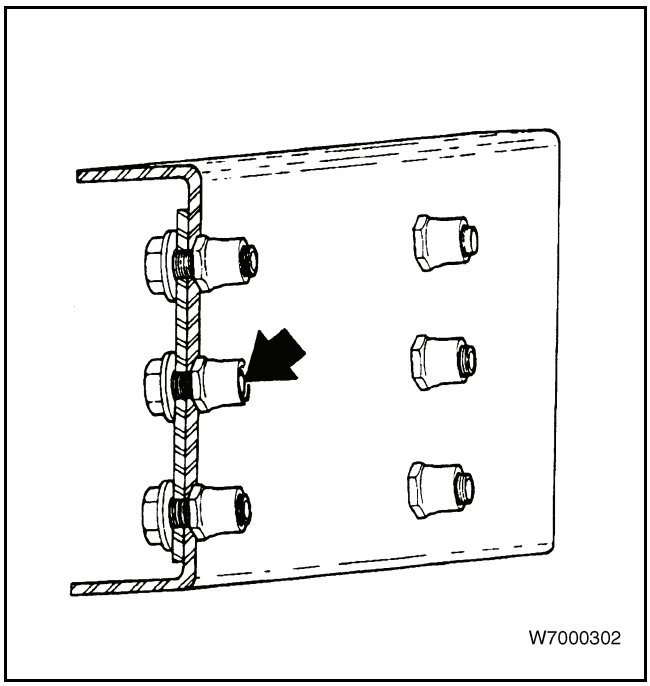


Figure 114 — Recessed Pin-Break

DO NOT mix HUCK® fasteners and flange bolts within a hole pattern (Figure 115).

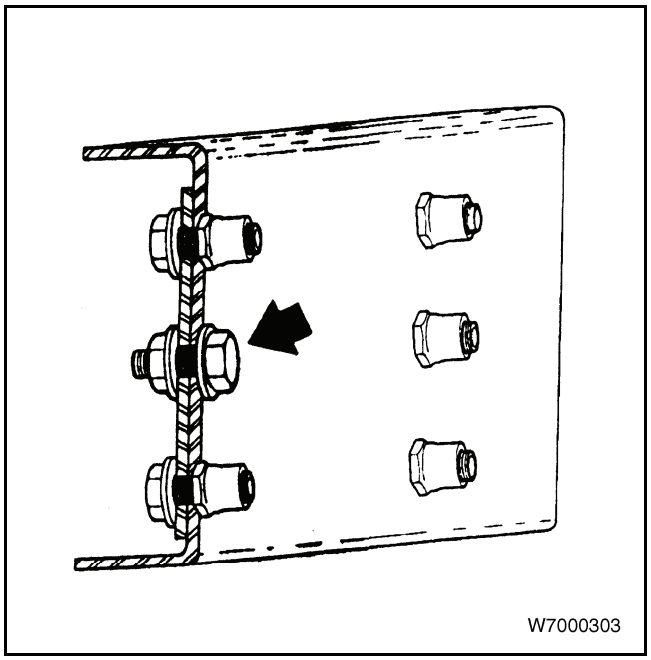


Figure 115 — Flange Bolt and HUCK® Fasteners

If the collar is scored (Figure 116), the tool anvil is worn and should be replaced.

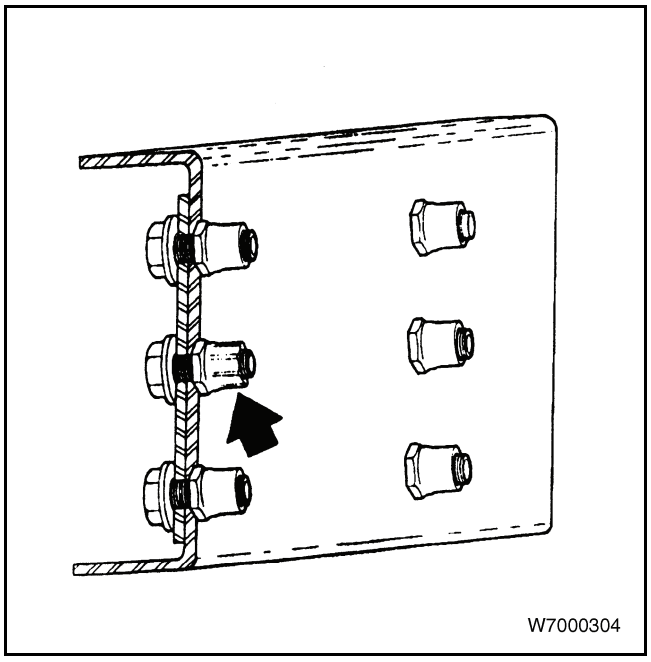


Figure 116 — Scored Collar

Fasteners — Flange Head, SAE Grade 8

Some MACK chassis utilize flange head fasteners for attachment of certain components (i.e., front spring front bracket). This hardware is all coarse thread grade 8 configuration, with zinc-plated bolts and cadmium-plated, waxed finish locknuts. The locknuts sustain their locking action by precision-compressed elliptical upper threads which grip the bolt threads to resist back-off.

With the use of flange head hardware, no washers are required, as the heads of both the bolt and nut are flanged to provide a large surface area. Included in the flange design is a recess feature which provides for the same clamp load as conventional fasteners, but at a much lower torque. The bearing surfaces under the fasteners must be flat, smooth, and dry (no lubricant present). Torque values are applicable for fasteners assembled on bare aluminum and/or steel, and prime-painted aluminum or steel bearing surfaces only.

Six dots on the bolt head define the bolt as a grade 8 fastener.

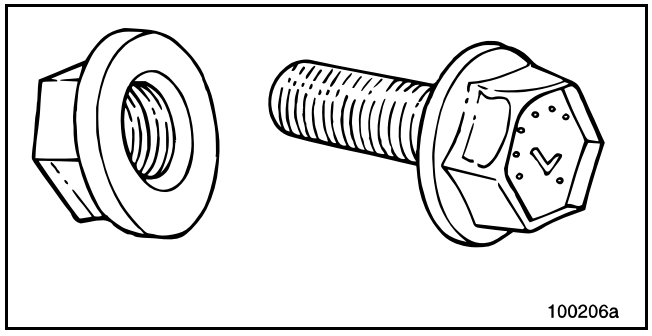


Figure 117 — Typical Flange Head Bolt and Nut

Observe the following torque requirements when tightening flange head fasteners. The appropriate torque may be applied to either the hex flange screw or the hex flange locknut, while the other is held stationary. However, tightening the nut is preferred. No lubrication should be used. Where sealer (Alumalastic® or equivalent) is used between aluminum and ferrous surfaces, the threads on the bolt must be wiped clean after insertion, and before threading the nut onto the bolt.

⚠ CAUTION

Do not tighten flange head hardware to general fastener grade 8 specifications.

Flange Head Hardware Torque Chart

Diameter (Inch)	Torque Lb-Ft (N•m)
3/8-16 UNC	*25 to 35 (34–47)
1/2-13 UNC	*65 to 75 (88–102)
	#85 to 95 (115–129)
5/8-11 UNC	*125 to 150 (169–203)
3/4-10 UNC	*230 to 270 (312–366)

* When torquing nut

When torquing bolt head

Fasteners — Flange Head, Metric

All metric flange head capscrews used by Mack Trucks, Inc. are zinc or cadmium plated. All metric nuts are cadmium plated and waxed. Torque should be applied to the nut whenever possible. No lubricant is to be used. Where sealer (Alumalastic® or equivalent) is used between aluminum and ferrous surfaces, the threads on the bolt must be wiped clean after insertion, and before threading the nut onto the bolt.

Torque to be applied when the flanged fastener spins on steel plate or ferrous castings:

SIZE	TORQUE
mm	N•m (lb-ft)
* 6	13 (9.6)
* 8	23 (17)
10	65 (48)
12	110 (81)
16	260 (192)
20	360 (266)

Torque to be applied when the flanged fastener spins on aluminum plate, aluminum forgings, or aluminum castings:

SIZE	TORQUE
mm	N•m (lb-ft)
* 6	10 (7.4)
* 8	19 (14)
10	52 (38)
12	85 (63)
16	200 (148)
20	280 (207)

* These values are for property class 9.8 bolts. Other values are for property class 10.9 bolts.

LIFTABLE AXLES

LIFTABLE AXLES

Liftable axles (tags and pushers) can be added to increase the load-carrying capacity of a vehicle. When one or more liftable axle(s) is installed on a newly manufactured vehicle prior to the vehicle being delivered to the ultimate customer, the installer must ensure that the GAWR/GVWR, tire, rim and inflation pressure information is updated on an addendum to the Incomplete Vehicle Document or vehicle certification label, as applicable. For information on certifying a vehicle, refer to “VEHICLE CERTIFICATION” on page 42.

⚠ DANGER

Liftable axles CANNOT be added to vehicles equipped with the MACK RSA (Road Stability Advantage) system, as doing so will adversely affect performance of the system. Every effort must be made to avoid adding a liftable axle on a vehicle equipped with the MACK RSA system. If a liftable axle must be added, the RSA system must be disabled by having a qualified technician replace the Bendix® Advanced EC-60™ ECU (ABS control unit with ESP®) with a Bendix® Premium EC-60™ ECU (ABS control unit without ESP®).

Additionally, if a MACK factory-installed liftable axle must be removed from an RSA-equipped chassis, the stability system must also be disabled by having a qualified technician replace the Advanced EC-60™ ECU with a Premium EC-60™ ECU.

Failure to disable the RSA system on a vehicle to which a liftable axle has been added will result in serious vehicle braking and performance issues, including unnecessary system interventions. These interventions could lead to a loss of vehicle control.

In addition to disabling the system, any cab labels, such as WARNING and CAUTION labels relating to the Bendix® ABS-6 Advanced with ESP® (the basis for the MACK RSA system) located on the sun visor must be removed and notations must be made to the operator’s manuals so that the vehicle operator has a clear understanding as to which ABS options are installed on the vehicle.

Installing a liftable axle requires tapping into the air system to supply air for various functions such as the lift axle air suspension, up and down air bags and lift axle brakes. The axle installer is responsible for ensuring that the air brake system continues to comply with the requirements of FMVSS/CMVSS 106, Brake Hoses, and 121, Air Brake Systems, as applicable (requirements for stopping distance, park brake grade holding ability, etc.), after the liftable axle(s) is installed. For information on air systems for liftable axles, refer to “AIR SYSTEM” on page 250.

NOTE

Some chassis are available as “liftable axle ready” from the factory with the necessary piping, gauges and regulators required for easy installation of the liftable axle(s).

This section includes general information on installing liftable axles on MACK chassis. For more detailed information concerning axle selection, application and specifications, contact the specific axle manufacturer, or refer to the axle manufacturer’s service literature. For additional information concerning installation, contact the Mack Trucks, Inc. Customer Service Department.

NOTE

When a liftable axle is installed on a chassis, front and rear axle alignment must be checked and adjusted as necessary.

Liftable Axle — Location

A liftable axle(s) must be located on the chassis so that gross vehicle weight is appropriately distributed on all axles, i.e., so that no one axle, or group of axles will exceed its gross axle weight rating. The selected lift axle(s) location(s) must not cause excessive frame rail deflection. Contact Mack Trucks, Inc. Customer Service for assistance in obtaining approval for a location(s) on a specific chassis. Be prepared to supply detailed information concerning intended weight distribution of the completed vehicle. Additionally, the axle(s) should be installed with consideration to applicable weight regulations.

The following example explains how to use the U.S. Federal Bridge Formula Table to locate a liftable axle on a chassis. The four axle dump truck in the following example is intended for a gross vehicle weight rating of 64,000 lbs. The vehicle is equipped with an 18,000 lb front axle, and a tandem rear axle of adequate capacity to carry the legal limit of 34,000 lbs.

The U.S. Federal Bridge Formula Table shows that the spread between the centerline of the front steer axle and the centerline of the rearmost axle of the tandem for this four axle truck must be 33 ft. In this configuration, the chassis will carry 18,000 lbs on the front steer axle and 46,000 lbs on the rear tandem axles (18,000 + 46,000 = 64,000 lbs).

Legally, however, only 34,000 lbs is allowable on the rear axles for vehicles that operate on the national network of highways. For this chassis to legally carry 46,000 lbs on the rear axles, a 12,000 lb pusher axle must be added (12,000 + 34,000 = 46,000 lbs). To properly locate the pusher axle, refer to the U.S. Federal Bridge Formula Table. For a three axle group (pusher axle plus tandem axles), the spread between the centerline of the pusher and the centerline of the rearmost axle of the tandem must be 13.5 ft. However, to ensure that the chassis configuration satisfies the U.S. Federal Bridge Formula, all groups of two or more axles on the chassis must be checked and verified to ensure that axle distance requirements are met.

NOTE

Refer to “U.S. FEDERAL BRIDGE FORMULA TABLES” on page 33 for complete bridge formula table.

Distance in feet (meters) between the extremes of any group of 2 or more consecutive axles	Maximum Load in Pounds (kg)		
	2 Axles	3 Axles	4 Axles
4 (1.22)	34,000		
5 (1.52)	34,000		
6 (1.83)	34,000		
7 (2.13)	34,000		
8 (2.44) and less	34,000	34,000	
8 (2.44) and more	38,000	42,000	
9 (2.74)	39,000	42,500	
10 (3.05)	40,000	43,500	
11 (3.35)		44,000	
12 (3.66)		45,000	50,000
13 (3.96)		45,500	50,500
14 (4.27)		46,500	
15 (4.57)		47,000	52,000
16 (4.88)		48,000	52,500
17 (5.18)		48,500	53,500
18 (5.49)		49,500	54,000
19 (5.79)		50,000	54,500
20 (6.10)		51,000	55,500
21 (6.40)		51,500	56,000
22 (6.71)		52,500	56,500
23 (7.01)		53,000	57,500
24 (7.32)		54,000	58,000
25 (7.62)		54,500	58,500
26 (7.93)		55,500	59,500
27 (8.23)		56,000	60,000
28 (8.53)		57,000	60,500
29 (8.84)		57,500	61,500
30 (9.14)		58,500	62,000
31 (9.45)		59,000	62,500
32 (9.75)		60,000	63,500
33 (10.06)			64,000
34 (10.36)			64,500
35 (10.67)			65,500
36 (10.97)			66,000+

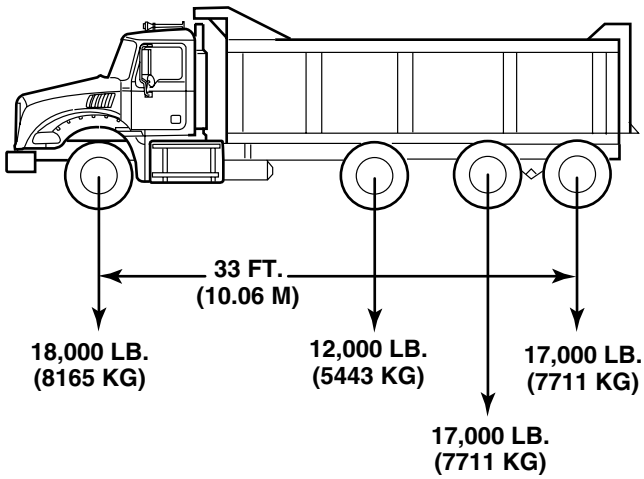


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Figure 118 — Applying U.S. Federal Bridge Formula to Liftable Axle Location

Liftable Axle — Clearances

After selecting the proper location for the liftable axle, make sure there is sufficient clearance between:

- The driveshaft and liftable axle in both the extreme up and down positions — Allow at least 1.25-inch clearance between the driveshaft and the liftable axle subassembly.
- Tires (laterally, fore and aft, and vertically) — There should be sufficient clearance between the liftable axle tires and all frame and other components so that there is no interference in both the extreme up and down positions.
- Air springs (if applicable) — When inflated to their maximum diameter.

Additionally, sufficient clearance must exist between the ground and the liftable axle subassembly, tires, and other components when the axle is in the raised position.

Liftable Axle — Mounting

Mounting and installation instructions are generally supplied by the specific axle manufacturer. For specific mounting information (such as frame drilling, cutting, hardware selection, etc.), refer to the BODY MOUNTING section of this manual.

Liftable Axle — Crossmember Location

Liftable axles should be installed in a way that allows axle loading to be transmitted into a crossmember, and not directly into the frame side rails. In general, crossmembers should be located in the area where the liftable axle front hanger bracket assemblies are attached to the frame.

NOTE

Service crossmember assemblies that utilize body bound bolts for mounting to the frame rails are available for CTP model chassis.

Because of the many variations in frame design, the location of crossmembers on different vehicles may also vary. If necessary, a crossmember may be added to the chassis if there is no crossmember in the vicinity of the liftable axle installation. Unless it supports a center bearing, a crossmember may be moved the width of the crossmember mounting gusset to bring the member closer to the liftable axle front hanger brackets. Distance between crossmembers, however, must not exceed 60 inches.

For more detailed information concerning crossmember placement and liftable axle installation, contact the Mack Trucks, Inc. Product Support group.

ELECTRICAL

ELECTRICAL GUIDELINES

Wiring — Precautions

Most body installations require connecting into the chassis electrical system to supply the necessary power or other electrical signals. To maintain the integrity of the system when connecting into the electrical system, the following precautions must be taken:

⚠ CAUTION

If relocation of the battery box is necessary, and the new location of the battery box requires longer battery cables, DO NOT splice the existing cables. Longer battery cables may require heavier gauge wire to comply with "SAE J541, Oct 96 and TMC RP 105B.96 for voltage drop requirements of the starter motor circuit at 0.10 volt/100 amps." Not complying with this requirement may void any warrantable coverage regarding the electrical system, and could result in serious damage to the vehicle.

⚠ CAUTION

The electrical systems on all MACK chassis include a circuit breaker located in the ground circuit. Any additional electrical components that may be added MUST NOT be connected directly to the battery or negative connection of the starter. Doing so may defeat the protection provided by this circuit breaker. Components may be ground connected to other locations, such as frame or engine grounding points.

- Whenever possible, use existing connectors and terminal studs to connect to the electrical system.

NOTE

DO NOT splice into a V-MAC, ABS/ATC or any other electronic control unit harness.

⚠ CAUTION

Be aware that the electrical system on V-MAC equipped vehicles takes two to three seconds to shut down after the ignition key is turned OFF (six seconds for V-MAC III).

- Use sealed connectors for applications outside the cab. Unsealed connectors may be used for connections inside the cab.
- Accessory electrical circuits should always be fused. Where possible, use the designated spare fuses/circuit breakers that are already supplied. Never overload the circuit beyond the rated amperage of the fuse/circuit breaker. Inductive loads such as motors, light bulbs, relays, etc., cause higher current draw (surge current) in electrical circuits during initial start-up or turn on. These circuits may require the use of slow-blow fuses or higher rated fuses or circuit breakers.
- Installation of add-on circuits for the body installation may cause interference with the proper operation of other vehicle electrical components. The body installer is responsible for ensuring the continued proper operation of all electrical systems on the vehicle with respect to conducted or radiated signals by the installation.
- When welding is necessary, take precautions to prevent damaging sensitive electronic equipment (e.g., control units for V-MAC, automatic transmissions, antilock brakes, etc.). Refer to the caution in the section on welding guidelines in the BODY MOUNTING section of this manual.
- Do not connect to any system sensors, such as vehicle speed sensors, engine speed sensors, wheel speed sensors or temperature sensors, in parallel or series. If this type of sensor information is required, it can be obtained by connecting into the V-MAC System data bus. Contact Mack Trucks, Inc. Product Support Group for information. Stud connections for this purpose (buffered signals for vehicle road speed, engine speed, etc.) are located on the electrical equipment panel.

Wiring — Adding Circuits on ABS-Equipped Chassis

The check-out procedure for chassis equipped with an antilock brake system (ABS) should include operating any added circuits under the following test conditions:

- Engine running and brake air system pressure within operating range.
- Chassis stationary.
- Brake pedal pressed and held for a full application pressure.

Operate added electrical equipment in all starting, running and shutdown modes. Listen for any air exhausting from the ABS modulator valves. If air exhausts from the controllers, this indicates an interference condition which must be corrected before the chassis is released for highway use.

Wiring — Routing and Clamping

Use the following guidelines for routing and clamping wires.

- Wires routed through holes in the frame rails, sheet metal, holes in castings and other sharp or abrasive edges, must be protected by a rubber grommet.

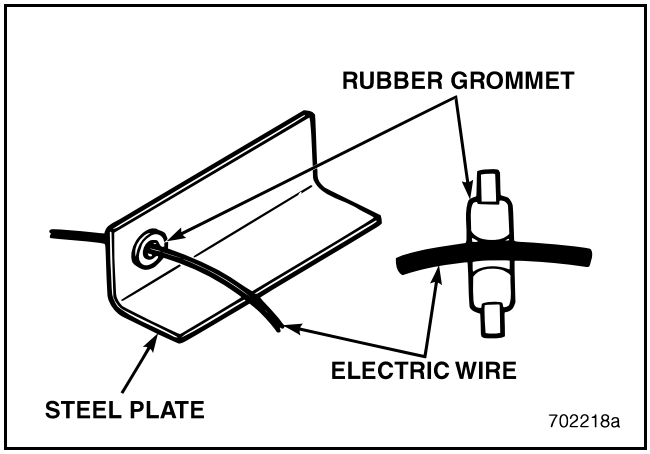


Figure 119 — Protect Wire with a Grommet

- Route wires in such a way so as to avoid contact with sharp metal edges, screws and abrasive surfaces. When such routing is unavoidable, use protective devices, such as shields or caps, to protect the wire. When a wire must cross a metal edge, make sure the edge is covered with a protective shield, or the wire is encased in a convoluted tube, and clamped within 3 inches on each side of the edge.

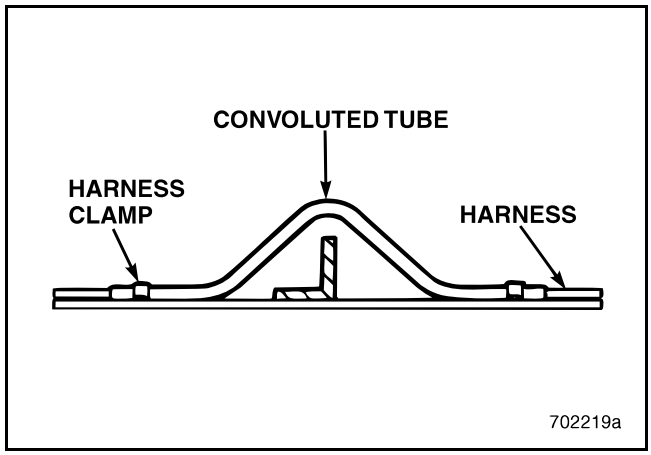


Figure 120 — Routing Wires Over Metal Edges

- Allow at least 3 inches of clearance from moving parts unless the wire is sufficiently clamped or protected in a conduit.
- Route wires to avoid areas of excessive heat. A minimum of 6 inches of clearance should be maintained from any exhaust system components. If wires must be routed near hot surfaces, heat shields and high temperature insulation must be used.
- Existing heat shields, insulation and wire shielding/twisting must be maintained.
- Wires that are routed between two members of relative motion must be secured to each member. Maintain enough wire slack to allow flexing without damaging the wire.
- Wiring to any circuit components (switches, relays, etc.) in exposed areas must have a drip loop to prevent moisture from entering the component through the wire connection.

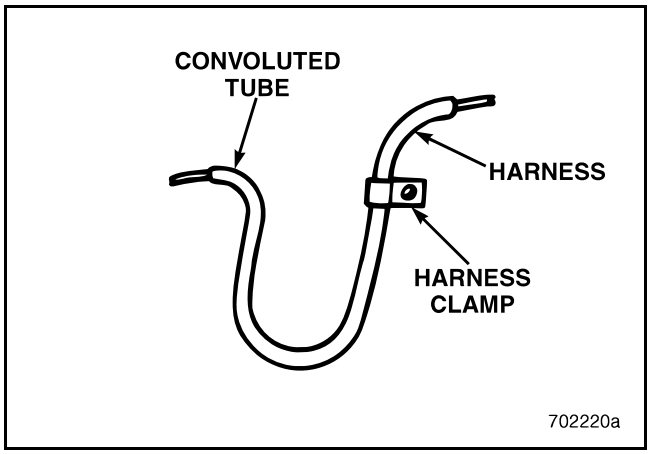


Figure 121 — Drip Loop

- Avoid routing wires in areas of wheel splash. If this cannot be avoided, adequate clamping and protective shields are required to prevent damage.
- Do not route harnesses inside the lower flange of the frame rail.

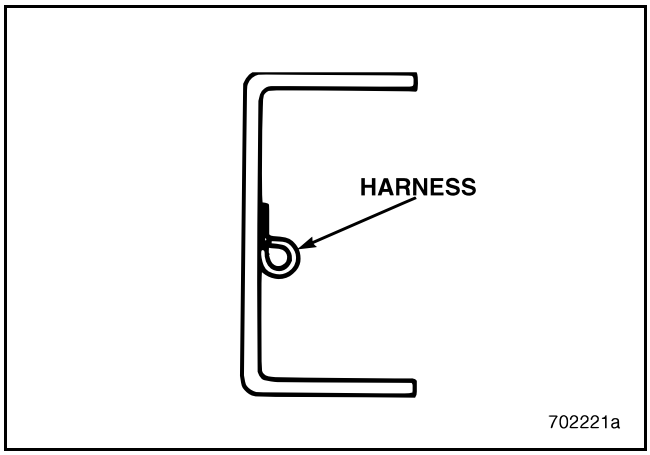


Figure 122 — Proper Harness Routing in Frame Rail

- Use rustproof harness clamps to clamp the wire harnesses as required. The distance between harness clamps depends on the harness diameter. Refer to the following table:

CLAMP DISTANCE TABLE

Harness Diameter	Clamp Distance
Less than 0.2″	Less than 12″
0.2″–0.4″	Approximately 16″
0.4″–0.8″	Approximately 20″

Wiring — Splicing

- When stripping the wires to prepare wire ends for a splice, be careful to avoid damaging the individual outer strands of the wire.
- When soldering, use only rosin core solder. DO NOT use acid core solder. DO NOT use flux.
- When installing crimp joints, use only butt-type metal barrel fasteners and proper crimping tools. DO NOT use solderless crimp-type splice connections. All splices should be soldered and properly insulated.
- Spliced connections must be adequately sealed and insulated. Use adhesive-lined heat-shrink tubing. DO NOT use electrical tape.
- When adding wires into existing connectors, or when adding **new** connectors, always install the hot side of the circuit into the female side of the connector, and the load side into the male side of the connector.

Although many types of wire splice techniques are available, only soldered splices are recommended. Do NOT use solderless, crimp-type splice connectors. The following butt-splice technique is recommended for splicing two wires together:

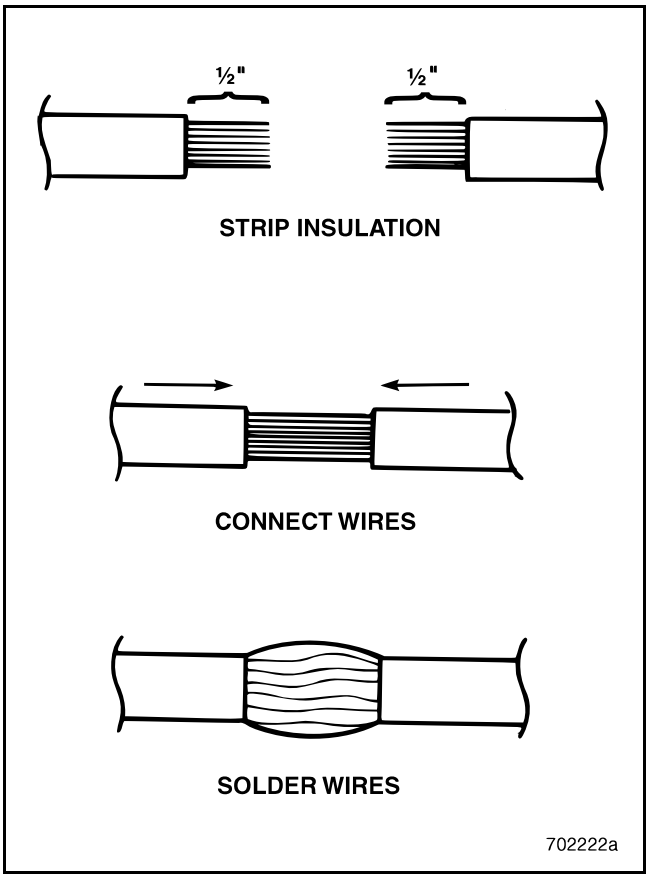


Figure 123 — Recommended Butt-Splice Technique

1. Strip approximately 1/2 inch of insulation from the ends of both wires.
2. Without twisting the wire strands together, push the two bare sections of wire together.
3. Solder the splice.

NOTE

A mechanical splice clip should be installed prior to soldering the splice. Splice packs that have a heat-shrink seal, solder and a mechanical splice clip are also available, and should be used to ensure the integrity of the splice connection.

4. Insulate the splice with heat-shrink tube.

Wiring — Correct Use of Tie Wraps

The correct use of tie wraps to secure electrical wires on a MACK chassis is very important. Whenever a tie wrap is removed, a **new** tie wrap must be installed before the job can be considered finished. In addition to replacing tie wraps removed during servicing, technicians may need to reroute wires or secure two harnesses together.

Proper use of tie wraps helps to reduce the likelihood of problems while the truck is in service. A properly installed tie wrap minimizes wire movement and chafing and holds a wire harness away from other objects. They also provide protection from the vibrations that occur during the life of a heavy-duty truck.

To ensure proper installation tension of tie wraps, Mack Trucks, Inc. recommends using a tool such as a Panduit No. GS4H, a Snap-on® No. YA317, or equivalent. These tools cut off the excess length of the tie wrap, leaving the end smooth and flush.

⚠ CAUTION

If the recommended tool is not used, the cut-off end of the tie wrap may have sharp edges that can cause injury. Be sure to remove any sharp edges on all tie wraps.

JOINING TWO HARNESSES

Whenever two wiring harnesses must be joined together or split to travel in two directions (especially at the point where the harnesses separate from each other), special attention must be given to ensure that the joint is properly supported. To obtain the greatest support, follow the steps illustrated below:

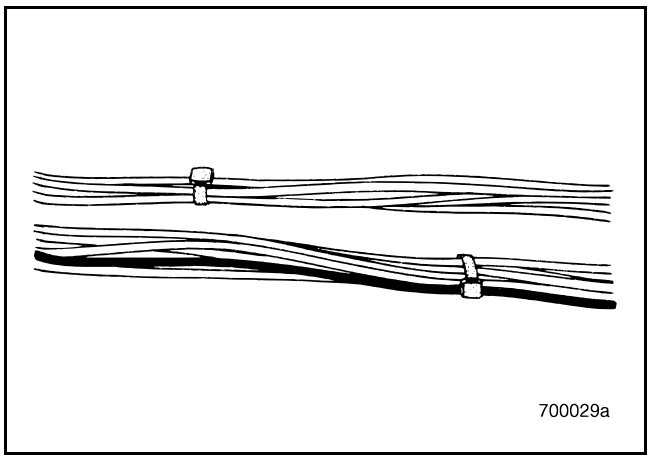


Figure 124 — Joining Two Harnesses

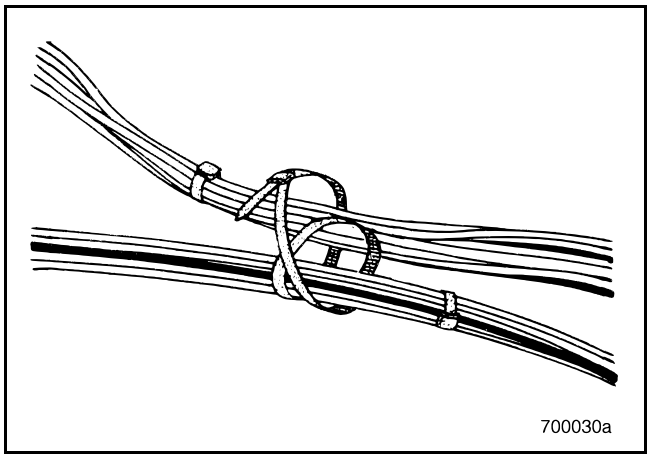


Figure 125 — Installing Tie Wrap Around Both Harnesses

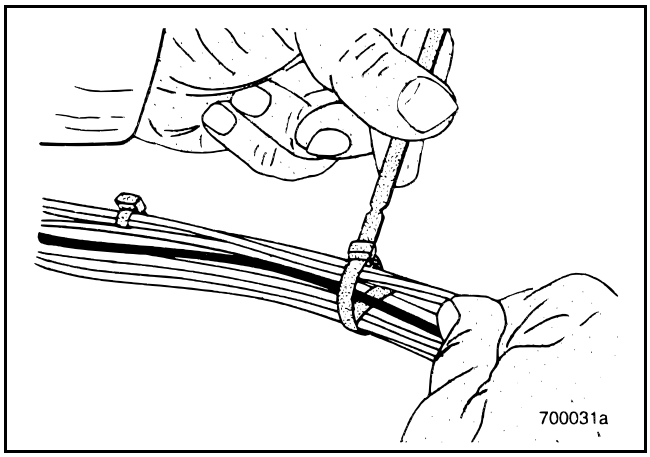


Figure 126 — Hand Tightening

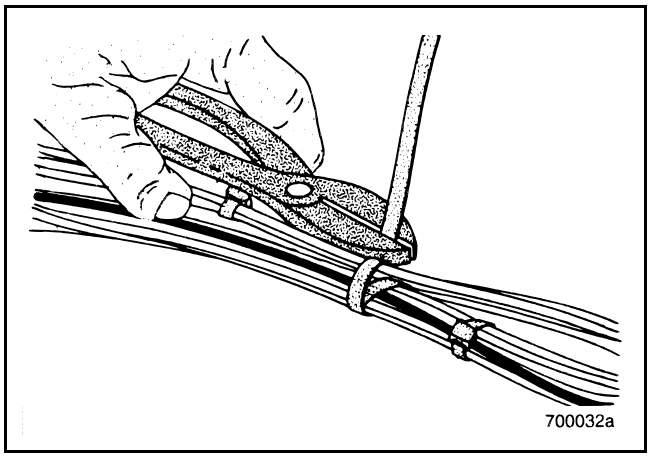


Figure 127 — Use Proper Tool to Cut Off Excess Length of Tie Wrap

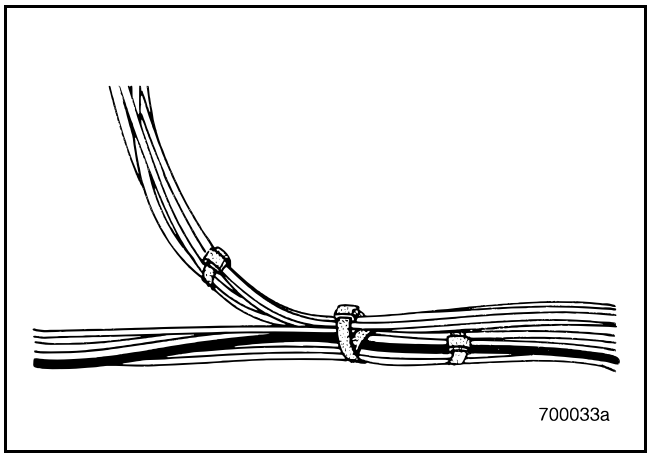


Figure 128 — Completed Joint

CREATING A TEE CONNECTION

Whenever two wiring harnesses must be joined together or split to create a tee connection, special attention must be given to ensure that the joint is properly supported and that the joint remains in the desired location. To provide the greatest security of the joint, follow the steps illustrated below.

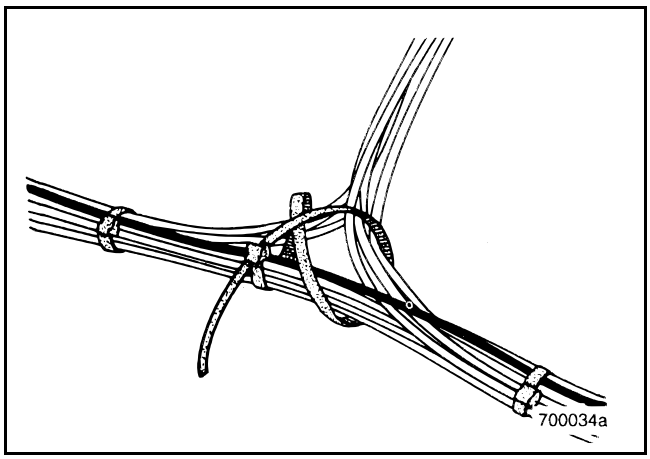


Figure 129 — Installing Tie Wrap Around the Tee

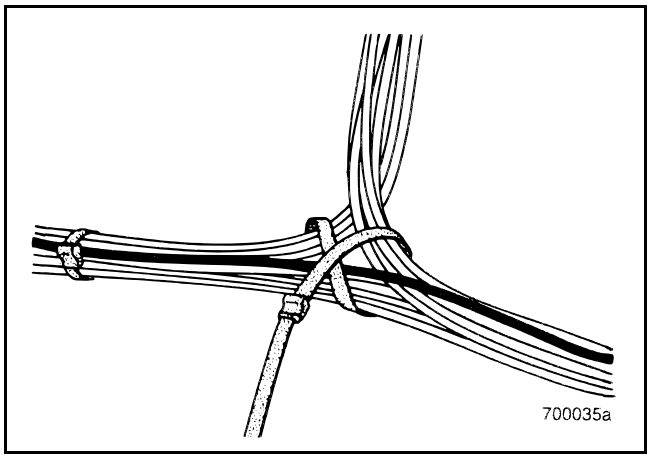


Figure 130 — Partially Tightened

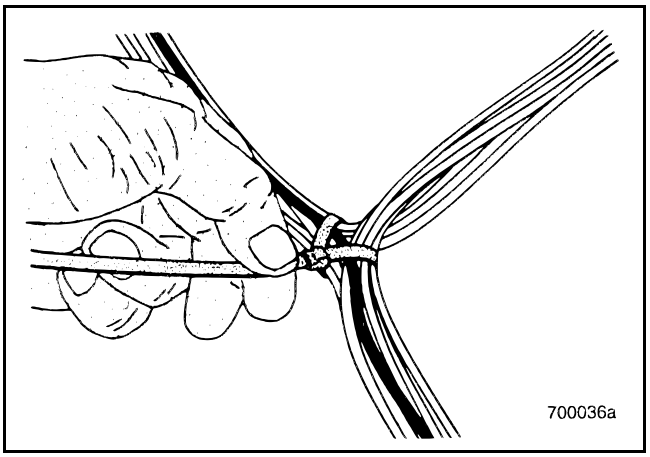


Figure 131 — Hand-Tighten Tie Wrap

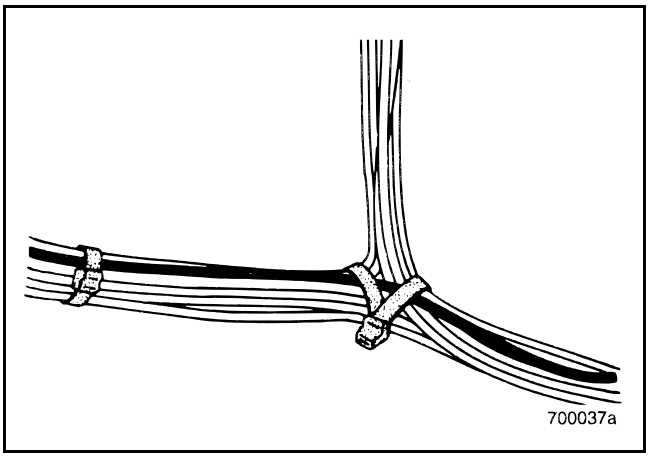


Figure 132 — Completed Tee Connection

ADDING A WIRE TO A TEE

When adding a wire to a tee, secure it to the existing harness in a manner that provides support and prevents it from being snagged. Secure the wire close to the joint.

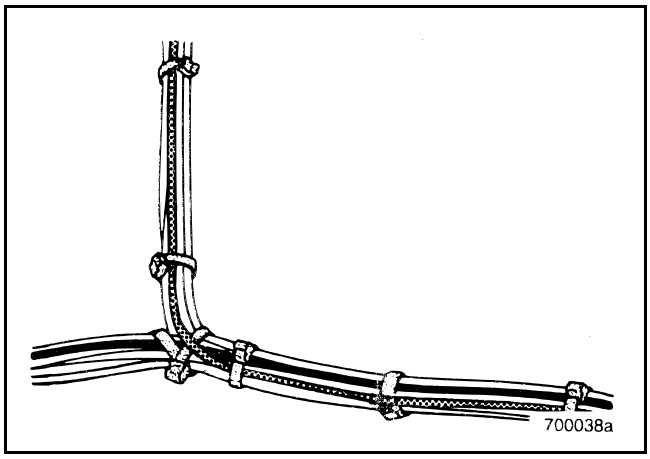


Figure 133 — Correct Way to Attach a Wire to a Tee

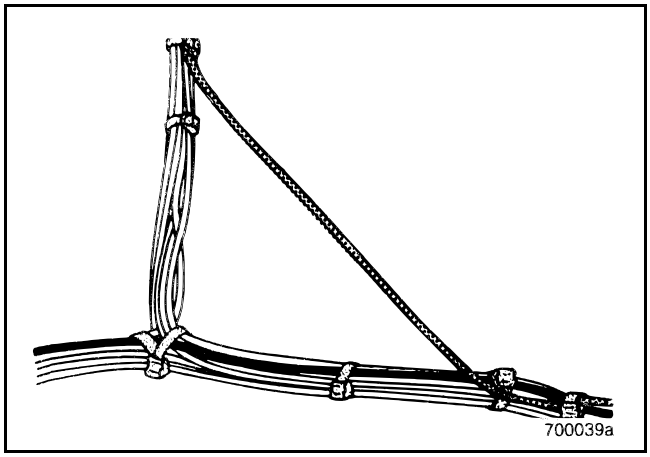


Figure 134 — Incorrect Way to Attach a Wire to a Tee. DO NOT USE THIS METHOD.

Wiring — Electrical Sealant

There are several areas on MACK chassis that require the application of electrical sealant spray. The fuel tank sending unit terminals, starter solenoid terminals, engine ground terminals and various other terminals, or exposed electrical contacts, must be sealed from the elements. This is to prevent corrosion, which leads to terminal deterioration and electrical leakage, and to insulate against accidental shorting and damage to electrical circuits.

This clear or colored (usually red) insulating spray is varnish-like, and can be used to coat exposed electrical contacts or terminals. Electrical sealant has high insulating properties and is moisture and chemical resistant.

The following is a list of the various locations that benefit from the use of electrical sealant spray, such as KRYLON 1385 Red Insulating Varnish.

- Various Relay Accessory Wire Terminals
- Backup Alarm
- Fuel Tank Sending Unit Connections
- Battery Disconnect Switch
- Battery Hold Downs
- Various Solenoid Wire Terminals
- Starter Exposed Terminals
- Engine and Frame Ground Wires and Terminals
- Alternator Wire Terminals
- Any Exposed Terminals Requiring Corrosion Protection

NOTE

U.S. Federal Motor Carrier Safety Regulation (FMCSR) 393.28 requires the complete wiring system (including fittings) to be weather resistant.

ELECTRICAL GREASE — USAGE AND LOCATION

To prevent corrosion of lamp socket terminals, particularly with clearance and marker lamps, apply a coating of electrical sealing grease, such as Lubriplate DS-EX. Apply grease to the socket and terminal assemblies.

NOTE

Do not use electrical greases on any V-MAC connector.

ELECTRICAL — CIRCUIT IDENTIFICATION

Electrical circuits on MACK chassis are identified by a color coding and numbering system. Wires that make up the wire harnesses utilize the following colors:

- **White with Orange Stripe (W/OR)** — All branch circuits that are protected by either a fuse or a circuit breaker, or are a switched ground.
- **Red (R)** — All unprotected battery circuits.
- **Gray (GR)** — All ground circuits including all unprotected ground with the exception of switched ground.

Power and Signal Circuits

Circuits are identified by a numbering system that designates the circuit and branch. These identifiers, which are printed on the individual wires in the harnesses, are broken down as follows:

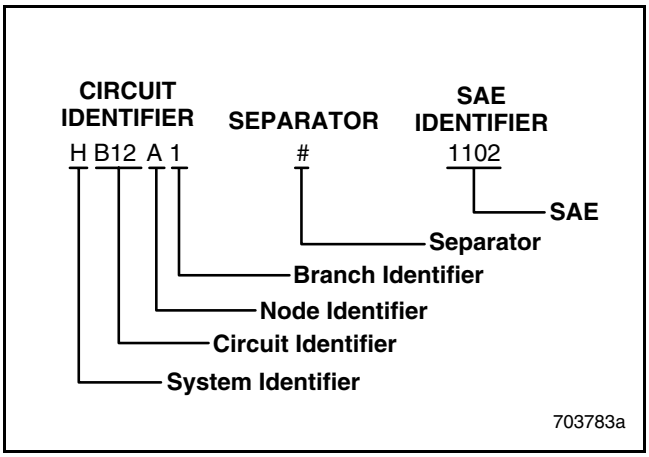


Figure 135 — Chassis Electrical Wire Identification (V-MAC® IV Chassis)

- **System Identifier** — The first alpha character in the wire identification sequence identifies the system to which the circuit belongs. These system identifiers are listed in the following table.

Character	System Identifier
A	Braking and Traction Systems (Air Systems, Central Tire Inflation)
B	Charging System
C	Control (Fuel, Engine, Cruise, Door)
D	Emergency/Vision
E	Engine Accessories
F	Protected Circuits
G	HVAC
H	Instrumentation, Monitoring (Warning Systems)
I	Lighting Systems
J	Serial/Data Communications
K	Protected Power
L	Operator Convenience, Entertainment, Navigation, Accessories
M	Trailer Systems
N	Transmission and Drive Train (Rear Axles)
P	(for future use)
R	(for future use)
S	(not to be used)
T	(for future use)
U	Unprotected Power
V	(for future use)
W	(for future use)
X	Ground
Y	(for future use)
Z	(for future use)

- **Circuit Identifier** — The set of numbers (or alpha character and numbers) following the “System Identifier” identifies the circuit number. When a circuit originates at a protection device (i.e., a fuse or circuit breaker), the circuit is identified by the identification number assigned to the device (i.e., fuse No. 48 or circuit breaker No. 70). If the circuit identifier is an alpha character followed by a number, the alpha character designates a connector and the number designates the connector cavity. The connector portion of the circuit identifier is used only when multiple connectors are used to interface the controlling feature of the system.

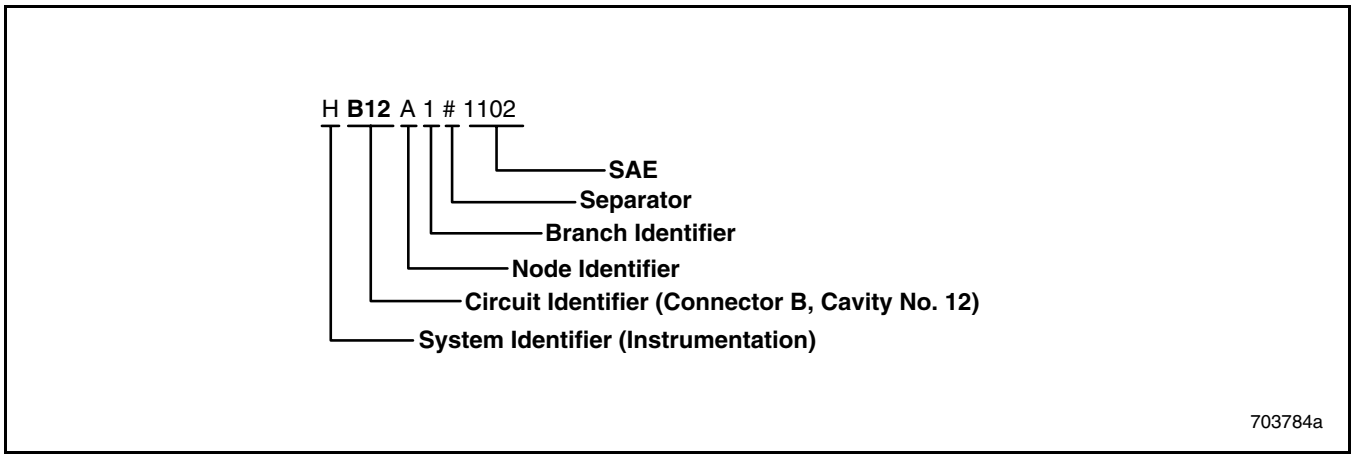


Figure 136 — Circuit Identifier

In the case of a vendor system (i.e., Allison automatic transmissions), the circuit identifier designates the vendor circuit as shown in the example below.

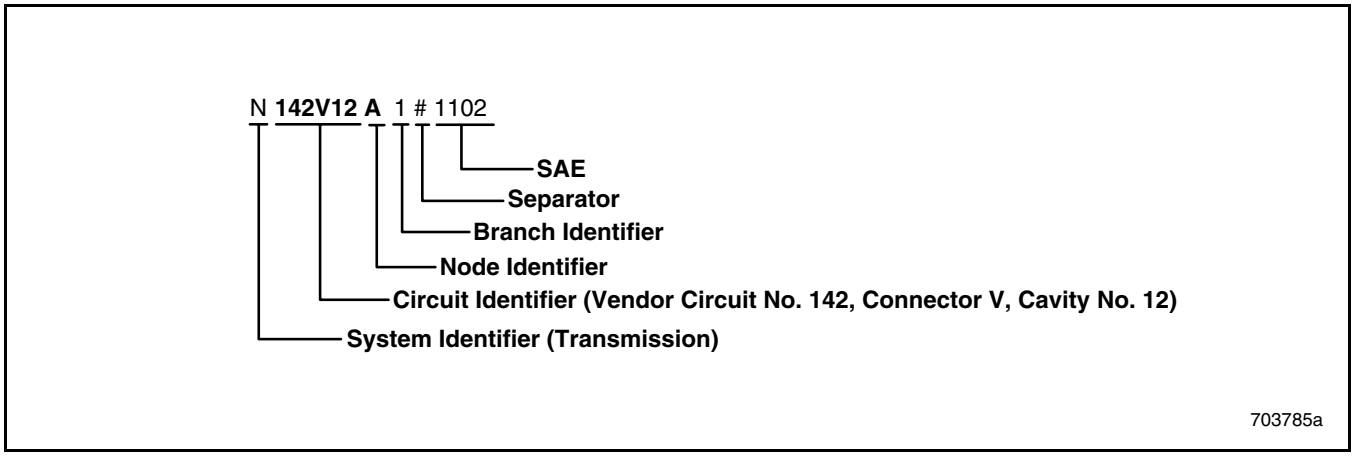


Figure 137 — Circuit Identifier — Vendor Circuit

- **Node Identifier** — The number following the circuit identifier indicates the power node of the circuit the wire (or set of wires) forms. A node is identified as any unswitched portion of a circuit that transmits electrical current from a driving device to a load. The node identifier changes any time the circuit passes through a switching device such as a relay, switch, Field Effect Transistor (FET), etc.

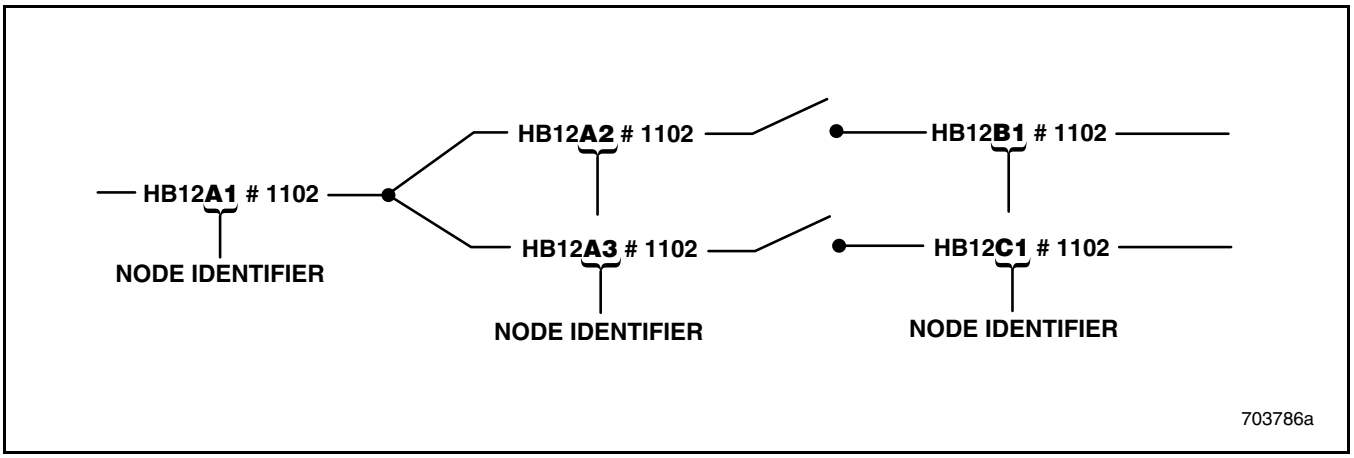


Figure 138 — Node Identifier

- **Branch Identifier** — The number following the Node identifier identifies the circuit branch. A branch is defined as any wire that is mechanically or electrically joined to a node for the purpose of providing a path for uninterrupted current flow.
- **Separator** — The "#" symbol separates the circuit identifier from the SAE supplementary identifier.
- **SAE Identifier** — The SAE identifier originates from the list of identifiers contained within the SAE J2191 document, where additional information regarding the subsystem or circuit function can be obtained.
- **Serial/Data Communications Identifiers** — Serial and Data Link identifiers are explained in the following illustration.

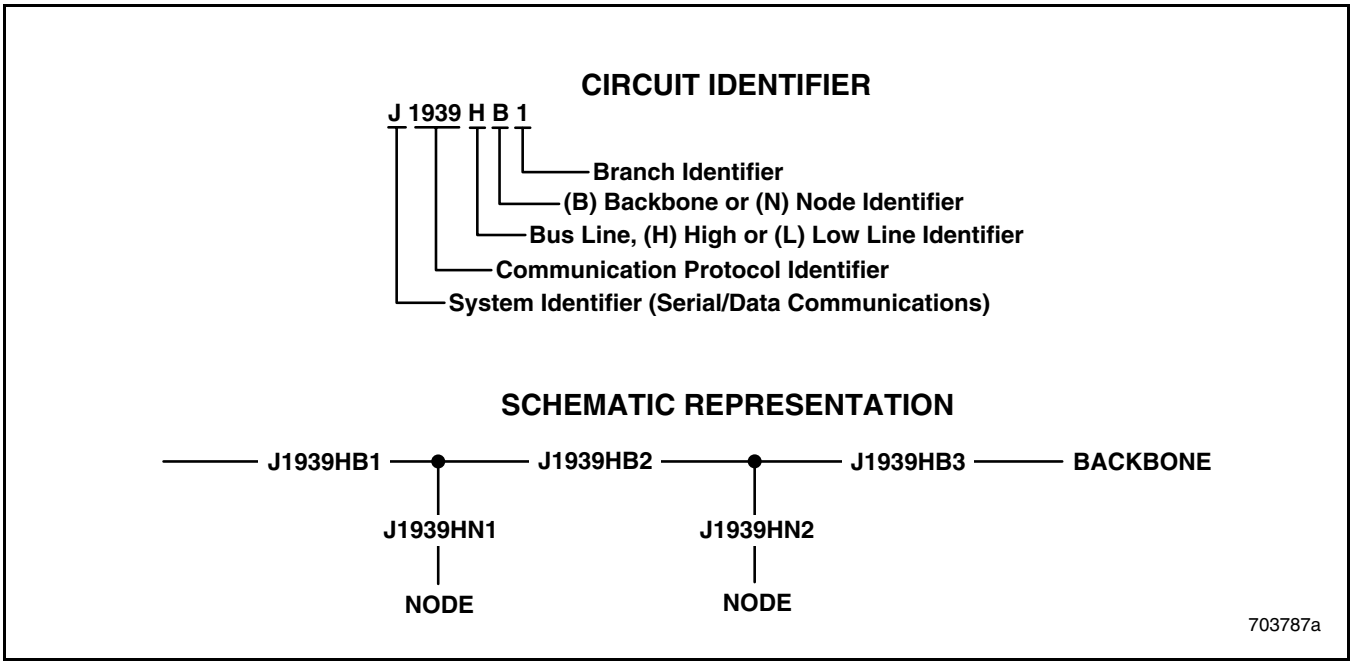


Figure 139 — Serial/Data Link Identifiers

Anti-Lock Brake Circuit Identification

Circuits for the Anti-Lock Brake System (ABS) follow the same format as described above for other circuits. ABS circuit identifiers are defined in the table that follows:

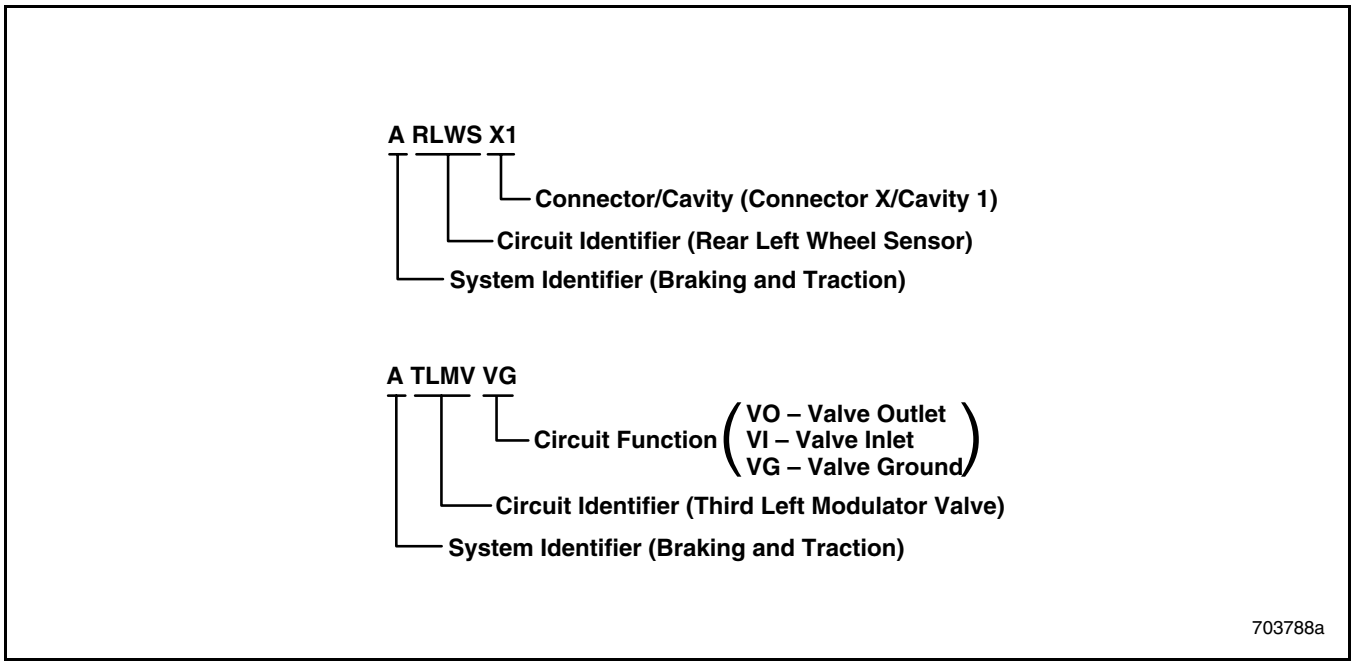


Figure 140 — ABS Circuit Identifier

ABS Circuit Identifiers	
Component/Location	**Identifier**
RLWS	Rear Left Wheel Sensor
RRWS	Rear Right Wheel Sensor
FLWS	Front Left Wheel Sensor
FRWS	Front Right Wheel Sensor
FLMV	Front Left Modulator Valve
FRMV	Front Right Modulator Valve
RLMV	Rear Left Modulator Valve
RRMV	Rear Right Modulator Valve
TLMV	Third Left Modulator Valve
TRMV	Third Right Modulator Valve
TLWS	Third Left Wheel Sensor
TRWS	Third Right Wheel Sensor
ATCV	ATC Valve
ATCS	ATC Limited Slip Switch Input

Ground Circuits

The following information describes the identification system for ground circuits. Identifiers follow the same format as used for power, control, serial/data communications, etc.

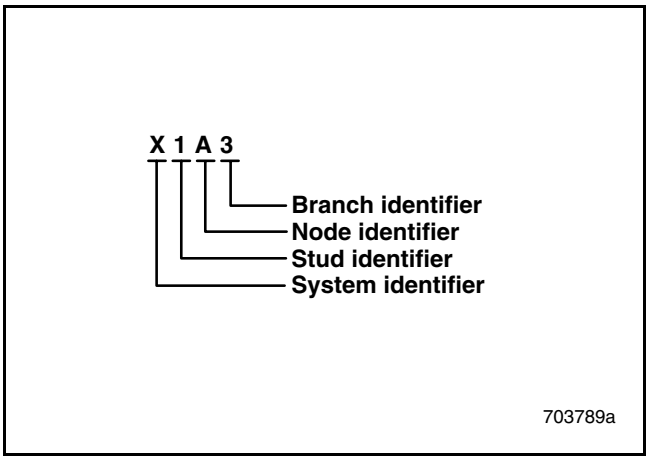


Figure 141 — Ground Circuit Identifier

- **System Identifier** — Ground circuits are always identified with an “X” as the system identifier.
- **Stud Identifier** — The numeric character following the system identifier identifies the name of the ground stud. All studs are named in numerical sequence beginning with “0,” which is the battery stud.
- **Node Identifier** — The node identifier, which is designated by an alpha character, is determined by the number of circuits attached to the stud.
- **Branch Identifier** — The number following the Node identifier designates the number of ground wires attached to the node. All ground wires (excluding the feed wire) are named in numerical order beginning with the splice or splice pack.

Switched grounds are named as a node of the power side of the circuit.

ELECTRICAL — WIRE SIZES

Wires used on MACK chassis are sized according to the thickness of the wire core, not the insulation. The wires are sized according to the metric wire gauge system and used in the electrical system according to the amount of current they must carry and the circuit they are in. Another method of gauging wire size is the American Wire Gauge (AWG) numbering system. To convert between the AWG and metric wire sizes, refer to the table below:

AWG TO METRIC WIRE SIZE CONVERSION CHART

AWG Sizes	Metric Sizes	Ohms/1000 ft — Stranded
20	0.5	10.32
18	0.8	7.24
16	1.0	4.72
14	2.0	2.99
12	3.0	1.883
10	5.0	1.166
8	8.0	0.733
6	13.0	0.377
4	19.0	0.293
2	32.0	0.178
1	40.0	0.142
0	50.0	0.112
00	62.0	0.089
000	81.0	0.070
0000	103.0	0.055

In the AWG numbering system, the higher numbered wires (such as 20), are thin, and the lower numbered wires (such as 2) are thick. The opposite is true of metric wire gauges, the lower numbered wires (such as 0.5) are thin, and the higher numbered wires (such as 50.0) are thick.

Whenever wires must be replaced, it is important that wires of the same gauge be used. Replacing a thick wire (metric gauge 13.0 or AWG 6) with a thin wire (metric gauge 0.5 or AWG 20) poses a fire hazard. If it cannot accommodate the amount of current flow needed for a particular circuit, a thinner wire may overheat and eventually burn.

ELECTRICAL — TYPICAL CONNECTORS

Use the procedures in this section to repair the various connectors found on a MACK chassis.

Deutsch Connectors

Typical uses for this connector are:

- Bulkhead Connector
- Serial Communication Port
- Transmission Harness Connector

CONTACT REMOVAL

1. Using the proper size pin removal tool for the gauge of the wire being removed, slide the tool, tapered end first, onto the wire to be removed. Pin removal tools are included in the V-MAC® Terminal Kit, J 38582.

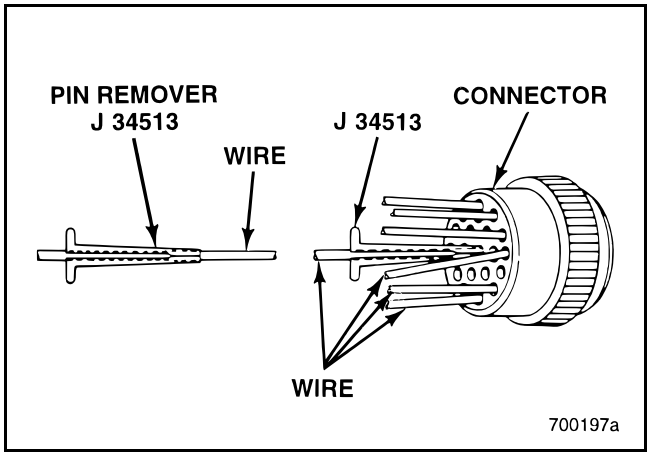


Figure 142 — Pin Removal Tool

2. Work tool along wire into the insert cavity until it engages the contact and resistance is felt. Do not twist or insert tool at an angle.

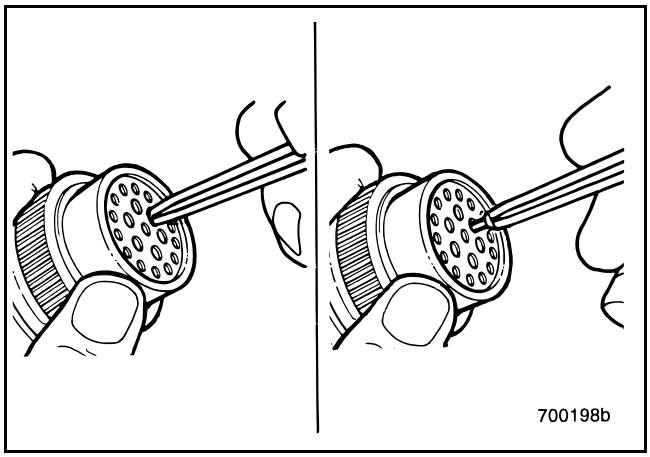


Figure 143 — Release Pin with Removal Tool

3. Pull the removal tool, terminal and wire from the connector socket.

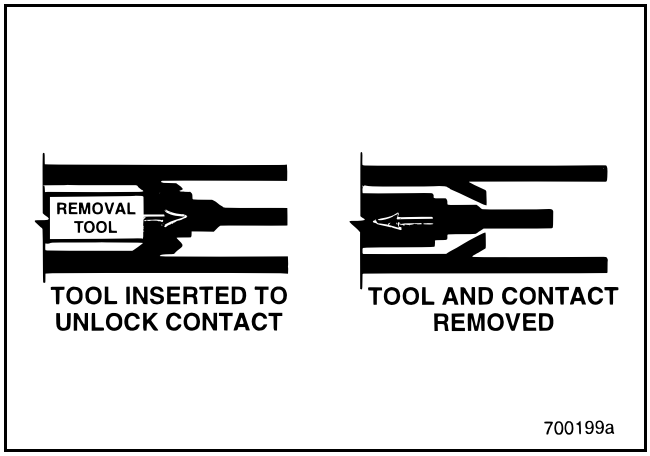


Figure 144 — Contact Removal

4. Repeat the removal steps for each of the damaged wires or contacts.
5. Cut the wire as close to the contact as possible to minimize wire loss.

CONTACT REPLACEMENT

1. Strip 0.24 to 0.32 inch (6 to 8 mm) of insulation from the wire.
2. Set the wire size indicator on crimping tool J 34182 by matching the gauge wire being used. Remove the lock clip, raise the wire gauge selector and rotate the knob to the number matching the correct gauge wire. Lower the selector and insert the lock clip.

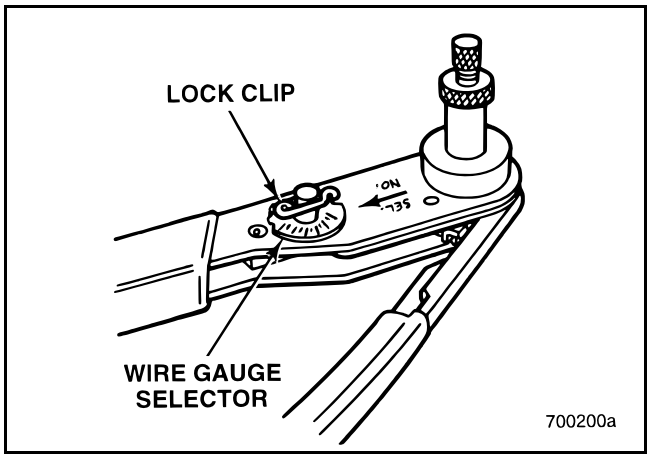


Figure 145 — Hand Crimp Tool

3. Insert the contact, long end first, into tool J 34182. Close the crimping tool just enough to hold the contact. Back off the locking nut so the adjusting nut is free. Turn the contact depth adjustment screw until the top of the contact is above the crimping hole. Tighten the locking nut against the crimping tool.

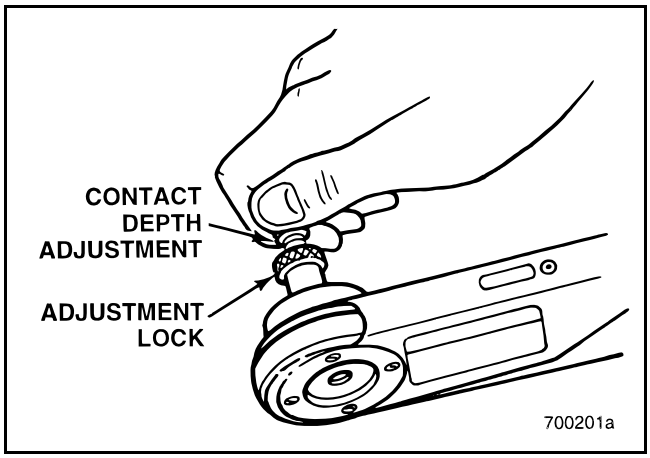


Figure 146 — Adjusting Crimp Tool

4. Insert the stripped end of the wire into the crimp barrel and contact. Be sure the wire is fully inserted. Squeeze the crimping tool handles together until the ratchet in the crimping tool releases. Release the handles and remove the wire and contact from the crimping tool.

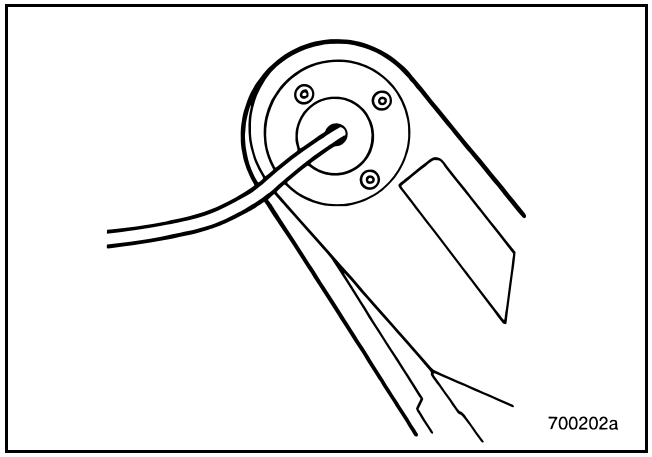


Figure 147 — Crimping Contact

5. Inspect the terminal for a proper crimp. Make sure that all strands are in the crimp barrel and that the wire is visible in the terminal inspection hole.

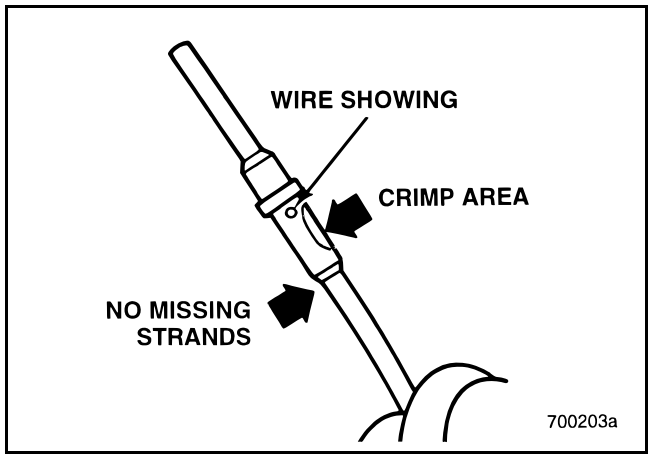


Figure 148 — Inspecting for Proper Crimp

CONTACT INSERTION

1. Grasp contact approximately 1 inch (25.4 mm) behind the contact crimp barrel.

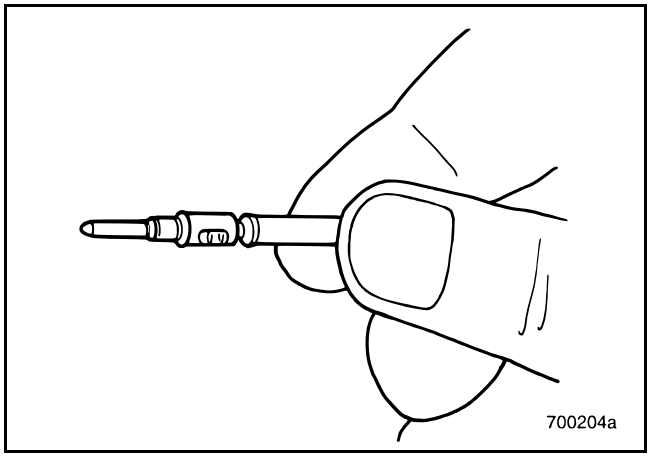


Figure 149 — Contact

2. Hold connector with rear grommet facing contact and wire.

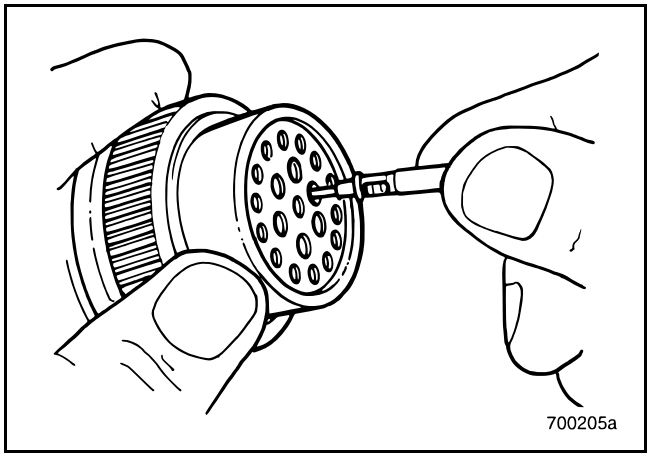


Figure 150 — Contact Insertion

3. Push contact straight into connector grommet until a positive stop is felt. Tug slightly to confirm that it is properly locked in place.

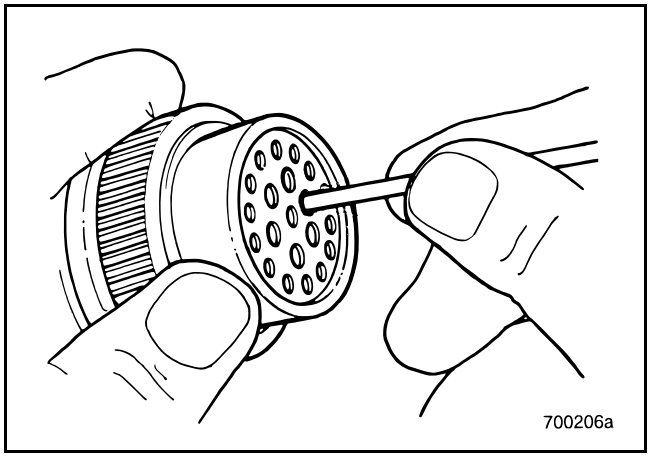


Figure 151 — Contact Installed

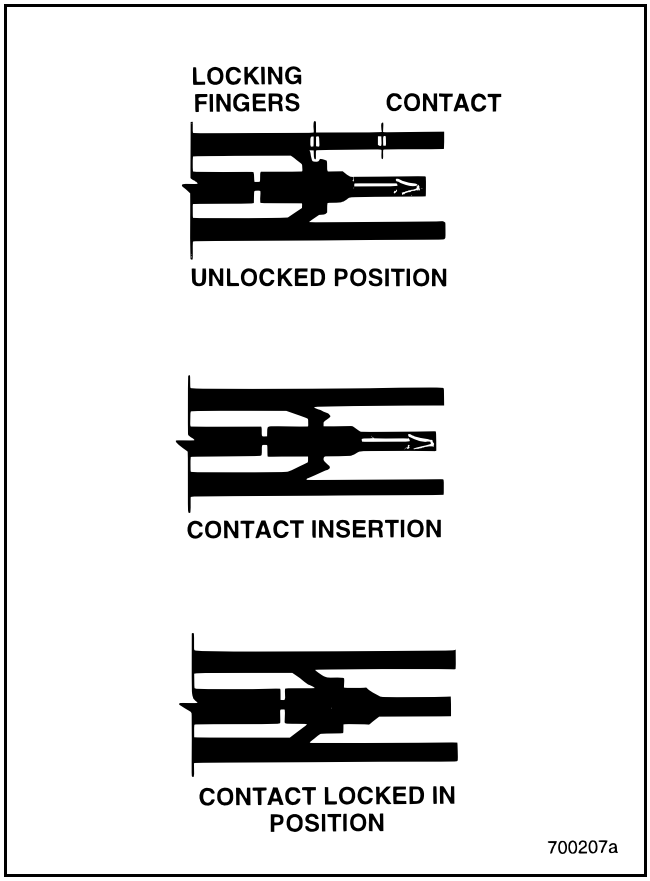


Figure 152 — Contact Insertion Sequence

Weather Pack Connectors

Typical uses for this connector are:

- Throttle Position Sensor
- Switch Connector

To remove the terminals on these two-part connectors, first unlatch and open the secondary lock on the connector. Removal is the same for both halves of the connector.

TERMINAL REMOVAL

1. Firmly grasp the connector body. Push the terminal forward in the connector as far as possible. Locate the terminal lock tab in the connector. Insert remover tool J 28742-A in the front of the connector, over the terminal. Push the tool over the terminal and pull the terminal out of the back of the connector.

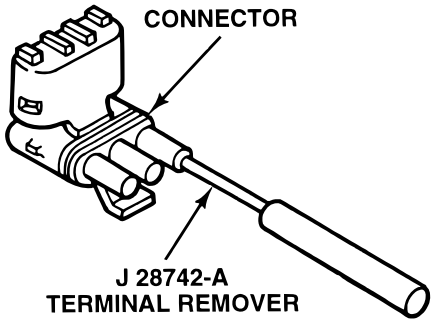


Figure 153 — Terminal Removal

2. Cut the damaged terminal from the wire as close as possible to the terminal end of the wire. If the wire has a rubber seal, remove it.

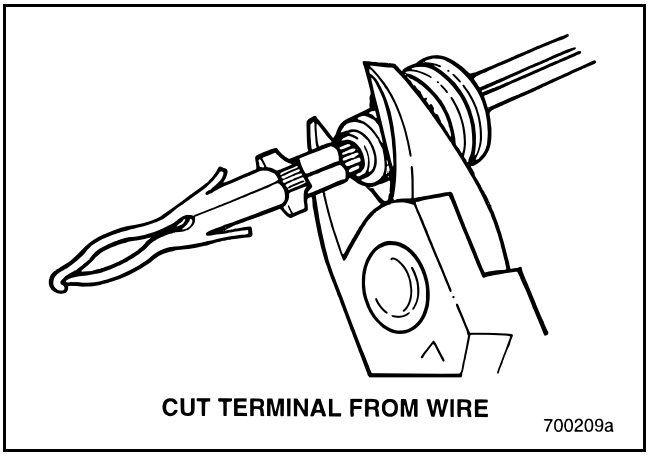


Figure 154 — Cut Terminal from Wire

TERMINAL REPLACEMENT

1. If the wire originally had a rubber seal, install a **new** one. Strip 0.23 to 0.25 inch (5.75 to 6.26 mm) of insulation from the wire. Be careful not to cut through any strands of wire.
2. Align the edge of the rubber seal with the edge of the wire insulation.

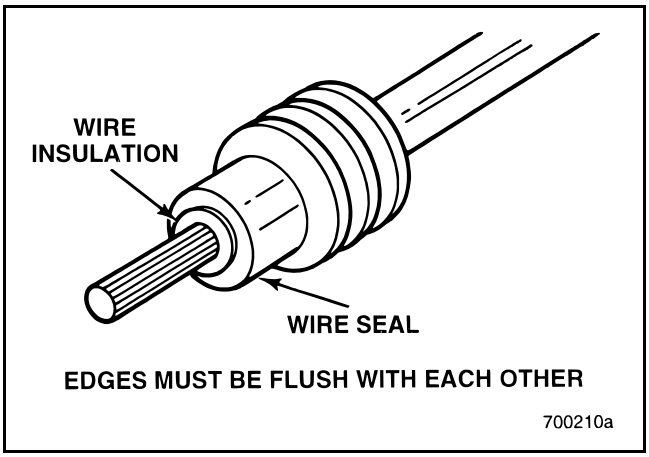


Figure 155 — Align Seal

3. Using crimping tool J 35606, squeeze the handles together until the ratchet automatically opens. Hold the tool so the gauge numbers are facing the user.
4. Insert the terminal into the terminal holder until the insulation wings are flush with the anvil on the crimp tool. Make sure the core wings and the insulation wings of the terminal are pointing toward the smooth, concave side of the crimping jaw anvil.

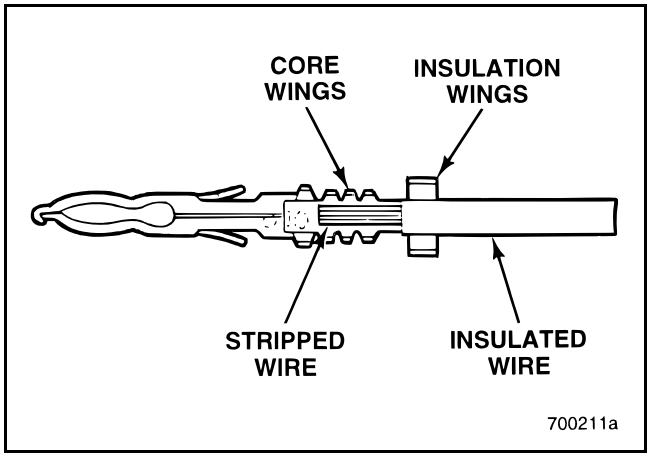


Figure 156 — Terminal Crimp Locations

5. Place the wire and seal (if equipped) into the terminal until the first rib of the seal is flush against the crimper.

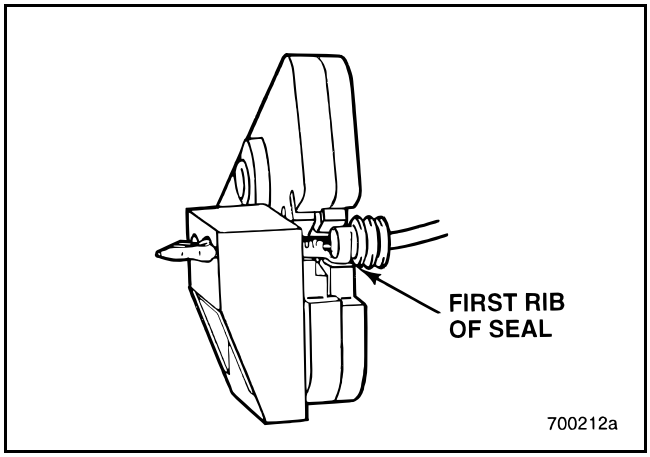


Figure 157 — Position Crimper

6. Cradle one handle of the crimper on a workbench so that only one hand is necessary to operate the tool. This allows faster, more efficient operation. The anvil should be on the bottom when crimping.

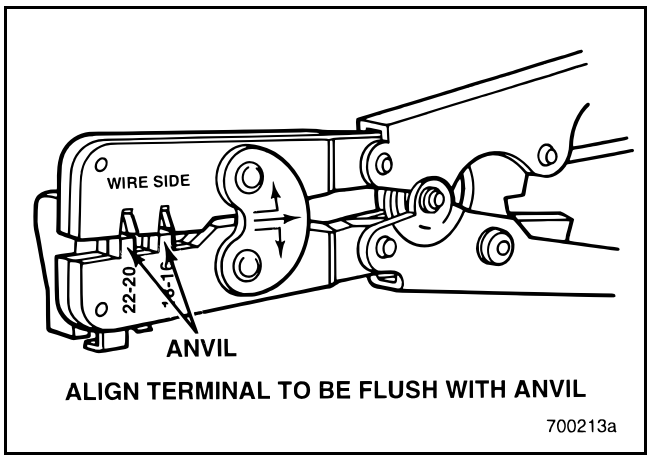


Figure 158 — Anvil Position

7. Compress the handles until the ratchet automatically releases and the crimp is complete. Be careful not to crimp the first rib of the seal.

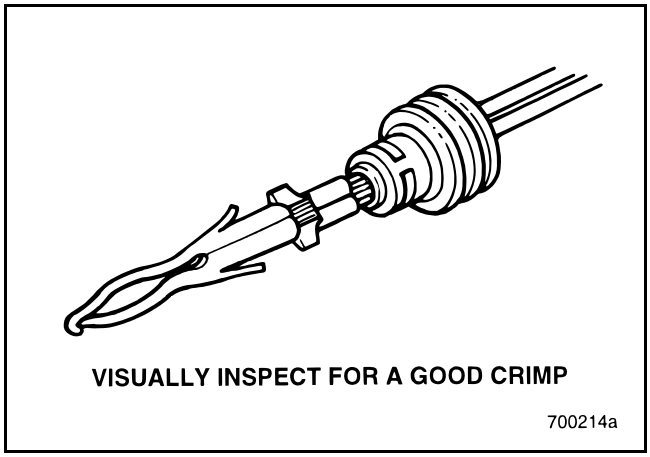


Figure 159 — Inspect Crimp

Delphi-Packard 56 Series Connectors

Typical uses for this connector are:

- Bolt-Down Solenoid Connector
- Pressure Switch Connector

TERMINAL REMOVAL

1. Insert remover tool J 33095 into the front of the connector.

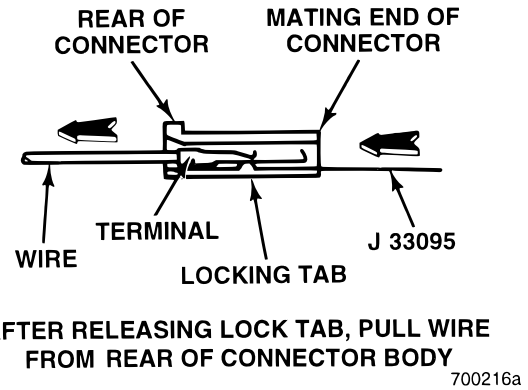


Figure 160 — Releasing Lock Tab

2. Push the terminal-holding prong straight in, and pull the wire and terminal out the back end of the connector.

NOTE

The connector on the forward pressure switch does not allow access to the secondary lock slots. This connector cannot be serviced and must be replaced.

TERMINAL REPLACEMENT

1. Remove the terminal by cutting the wire as close to the terminal as possible. This minimizes the amount of wire loss during the repair.
2. Strip 0.23 to 0.25 inch (5.75 to 6.25 mm) of insulation from the wire.
3. Insert the terminal into crimping tool J 25563.

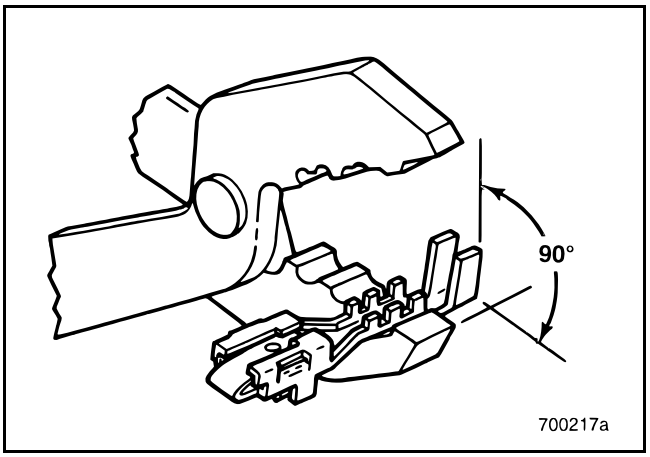


Figure 161 — Terminal Crimping

4. The u-shaped portion of the tool should hold the flat area of the terminal. The m-shaped portion of the tool should close around the open edge of the terminal.
5. Slightly close the crimping tool to hold the terminal steady.
6. Insert the wire so that the stripped portion is in the area to be crimped and the insulated portion is in the other crimping area.
7. Crimp the stripped section of wire.

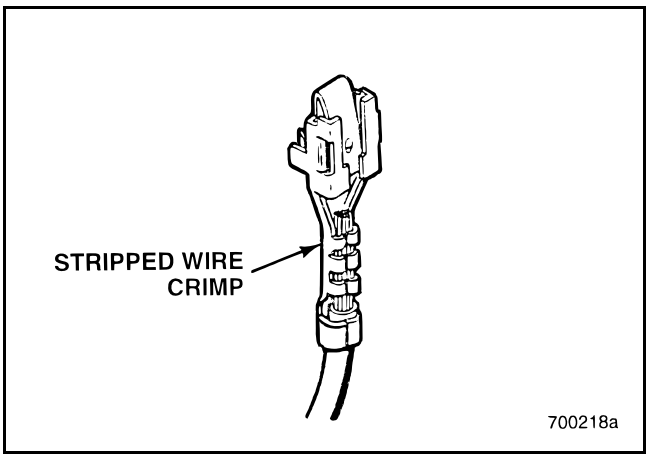


Figure 162 — Crimp Terminal

8. Remove the terminal from the crimping tool.
9. Use a pair of needlenose pliers to start the bend on the terminal area that crimps around the insulation.

10. Using the area behind the crimping tool pivot, crimp the insulated section of wire.

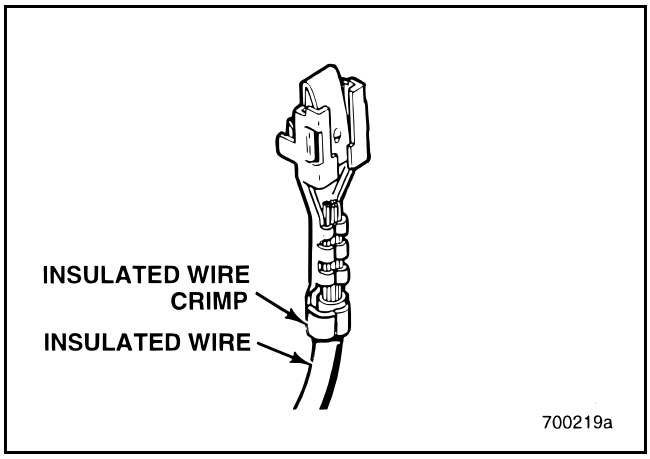


Figure 163 — Crimp Insulation Section

11. Remove the terminal from the crimping tool.
12. Pull on the terminal to ensure a tight fit.
13. Insert the terminal into the connector with the holding prong facing toward the connector.
14. The terminal should click in place and not pull out.

Delphi-Packard 150 Series (Pull-To-Seat) Connectors

TERMINAL REMOVAL

Typical uses for this connector are:

- Automatic Transmission Shift Selector

1. Grasp the connector body firmly. Pull the terminal toward the rear of the connector as far as possible.
2. Insert needle end of terminal remover J 35689-A into the small notch in the cavity of the terminal being removed. Move the holding prong toward the terminal.

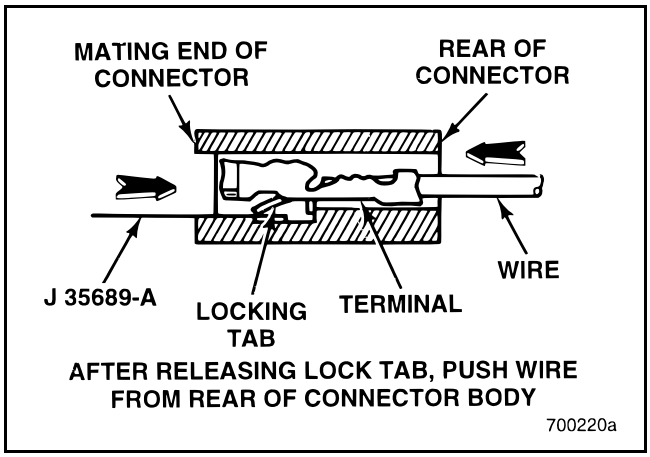


Figure 164 — Terminal Release

3. After releasing the tab, push the wire and terminal from the rear through the front of the connector (this type of terminal is pulled into position from the front of the connector body, to seat).

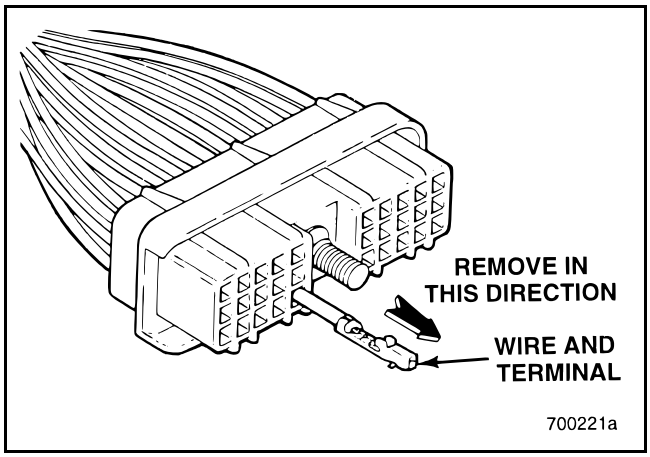


Figure 165 — Terminal Removal

4. Pull the terminal as far as necessary from the connector. This is limited by the number of wires inserted into the connector and by the distance between the back side of the connector and the beginning of the harness covering.
5. Remove the terminal by cutting the wire as close to the terminal as possible to minimize wire loss during the repair.

TERMINAL REPLACEMENT

1. Before stripping, push the wire through the proper hole in the seal and out the other side of the connector.
2. Strip 0.15 to 0.17 inch (3.75 to 4.25 mm) insulation from the wire.
3. Push open the terminal holder on the crimper tool J 35123 and insert a terminal into the appropriate sized opening for the wire being used. Position the terminal so that the crimp ends point up. Release the terminal holder.

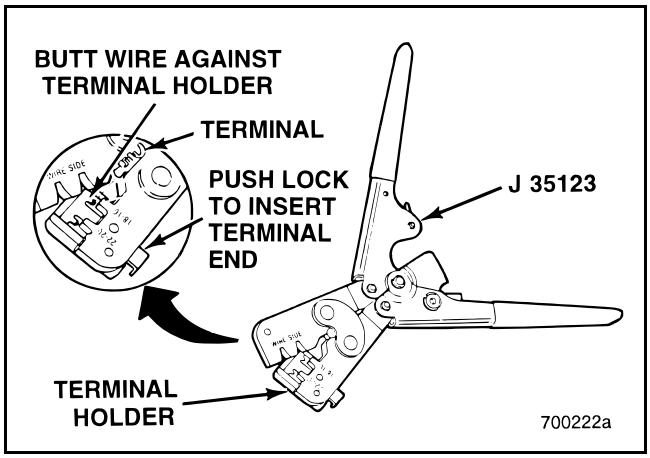


Figure 166 — Position the Terminal

4. Slightly close the crimping tool until a click is heard. Do not start to crimp the terminal. Orient the terminal so it is in the same position as it will be when pulled back into the connector.
5. Insert the wire into the terminal until the wire hits the holder. This positions the wire and insulation for the crimp.
6. Squeeze the crimper fully until it opens when released.
7. Open the terminal holder and remove the wire and terminal from the crimping tool.

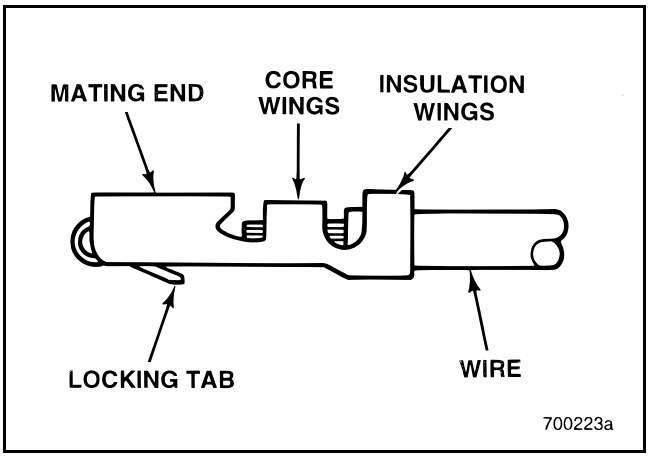


Figure 167 — Correctly Crimped Terminal

8. Pull on the terminal to ensure the crimp is tight.
9. Position the terminal so that the holding prong aligns with the appropriate notch in the connector cavity.
10. Pull the wire and terminal completely into the cavity. A click should be heard and the terminal should stay in place if the wire is pushed.

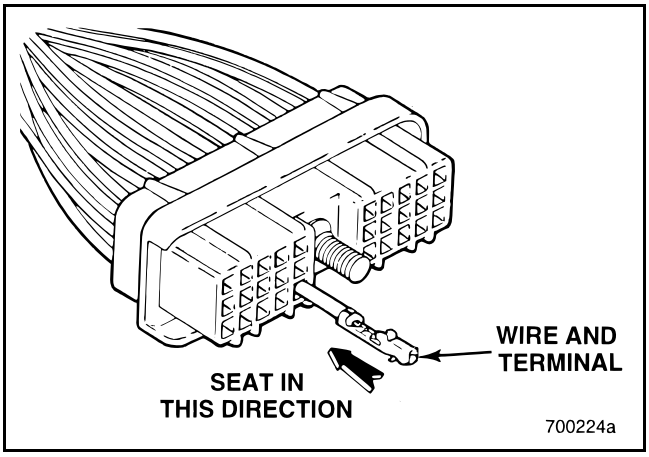


Figure 168 — Terminal Installation

11. Plug unused openings in the wire seal with sealing plugs.

Delphi Micro-Pack 100W (Rectangular) Connectors

Typical uses for this connector are:

- Transmission ECU Connector

Use the procedures in this section to repair these connectors.

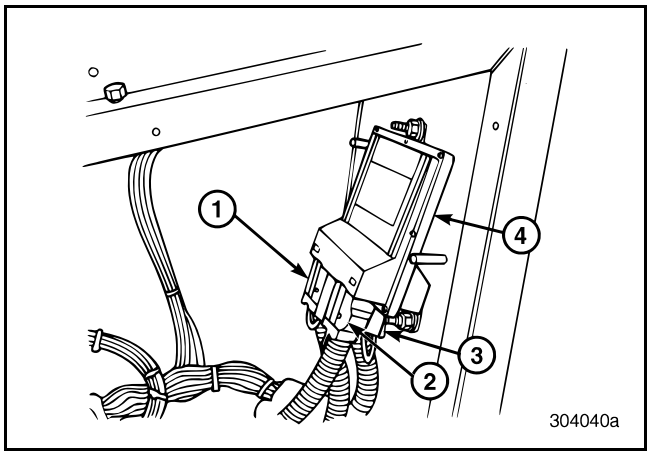


Figure 169 — Typical Transmission ECU Connectors

1. Black Connector 2. Gray Connector	3. Blue Connector 4. Transmission ECU

TERMINAL REMOVAL

1. Use a small-bladed screwdriver to gently release the lock tabs at the splitline of the strain relief.

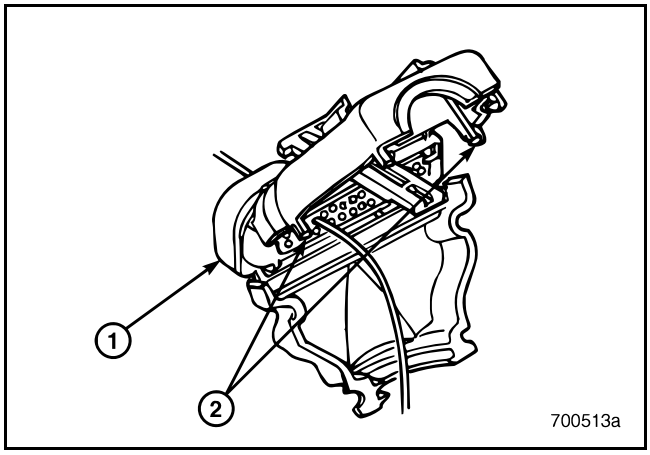


Figure 170 — ECU Harness Connector

1. Strain Relief	2. Lock Tabs

2. Spread the connector strain relief open.
3. Remove the retainer from the connector by using a small-bladed screwdriver to depress the lock tabs on the side of the connector.

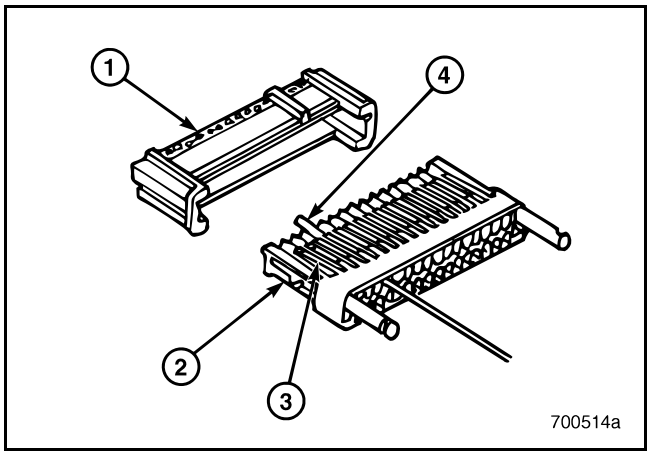


Figure 171 — ECU Connector Retainer

1. Retainer 2. Lock Tab (Secures Retainer)	3. Terminal Locking Finger 4. Socket Terminal (Female)

4. Remove a selected terminal by pushing forward on the wire, or by lifting the locking finger and pulling the wire and terminal rearward out of the connector.
5. Cut the damaged terminal from the wire as close as possible to the terminal end of the wire.

TERMINAL REPLACEMENT

1. Carefully strip insulation to leave 5.0 mm ± 0.5 mm of bare wire showing.
2. Insert the **new** terminal to be crimped in the J 42215 crimping tool. A spring-loaded terminal positioner at the front of the tool holds the terminal in place. Squeeze the crimper handles for a few clicks to start the crimping process, but leave room to insert the bare wire end.

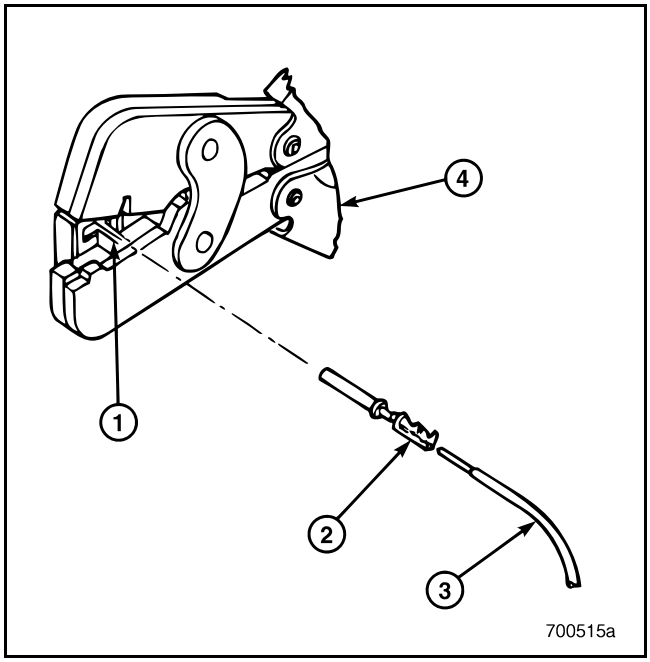


Figure 172 — Terminal Positioning

1. Lock Terminal in Tool 2. Socket Terminal	3. Stripped Wire 4. Crimping Tool J 42215

3. Insert the bare wire end into the terminal. Squeeze the crimper handles until the crimper handles open when released. Remove the terminal/wire assembly from the crimping tool J 42215.

TERMINAL INSTALLATION

1. Align the locking posts on the connector with the seal and push the locking posts through the seal into the mating holes in the strain relief (if the connector was removed from the strain relief).

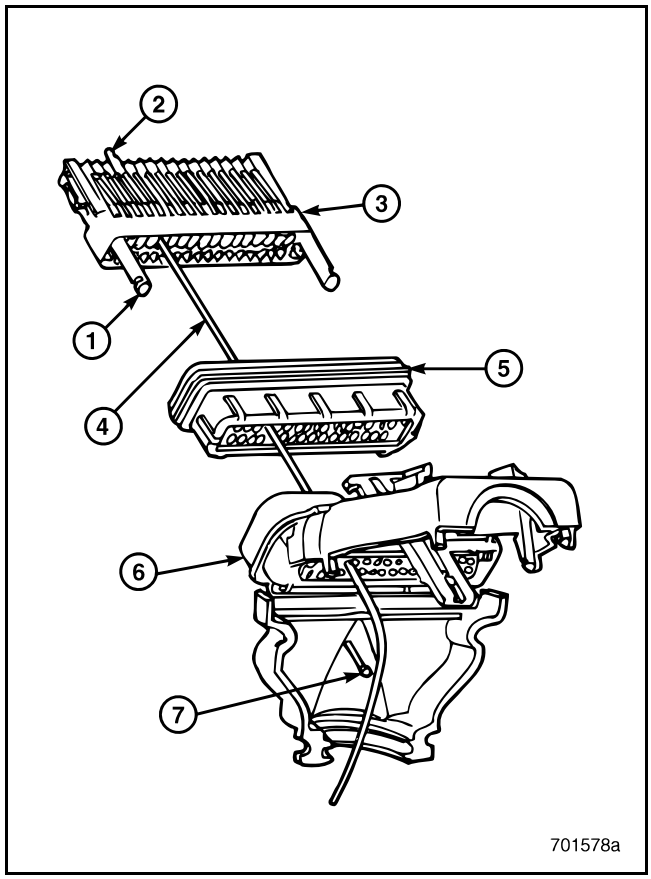


Figure 173 — Connector Alignment

1. Locking Post 2. Socket Terminal (Female) 3. Connector	4. Typical Wire 5. Connector Seal 6. Strain Relief 7. Connector Cavity Plug

2. Push the terminal/wire assembly through the proper hole in the back of the seal. Push the wire in until the terminal clicks into position.

NOTE

All terminals must be properly positioned in the seal to install the retainer.

3. Install the retainer on the connector body to lock the terminals in position. Pull rearward on the wire to be sure that the terminal is fully seated. Install cavity plugs as needed to fill any open cavities.

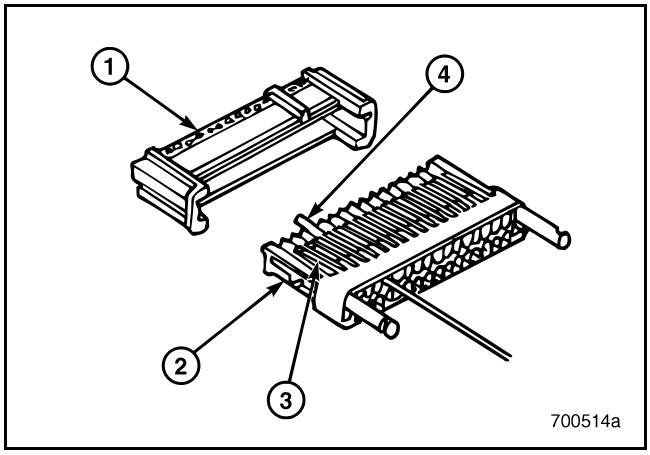


Figure 174 — Connector Retainer Installation

1. Retainer 2. Lock Tab (Secures Retainer)	3. Terminal Locking Finger 4. Socket Terminal (Female)

4. Position the conduit inside the strain relief and snap the strain relief halves together.

Delphi Micro-Pack 100W (Circular) Connectors — Type I

Typical uses for this connector are:

- Transmission Shift Selector Harness Connector
- Body Builder Interface Connector (limited for use with Allison transmission interfaces)

TERMINAL REMOVAL

To repair these connectors, use the following procedure.

1. Carefully insert a small screwdriver blade between the connector body and the secondary lock. Twist/pry the secondary lock to remove it from the connector body.

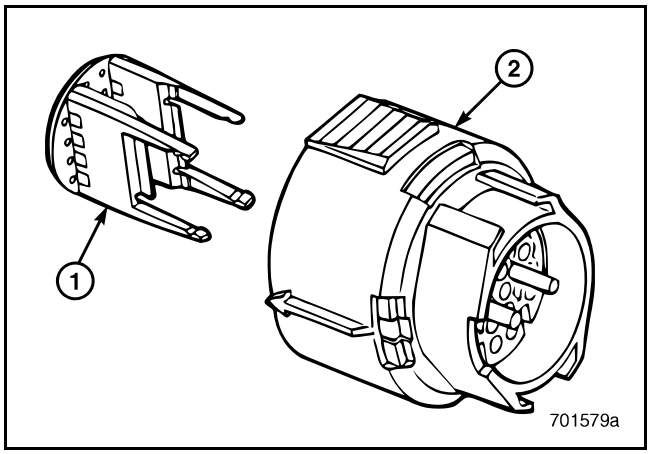


Figure 175 — Connector Secondary Lock Removal

1. Secondary Lock	2. Mating Connector with Female (Socket) Terminals

2. Open the conduit clip on the back of the connector after lifting the lock tabs on each side. Slide the clip back to release it from the connector.

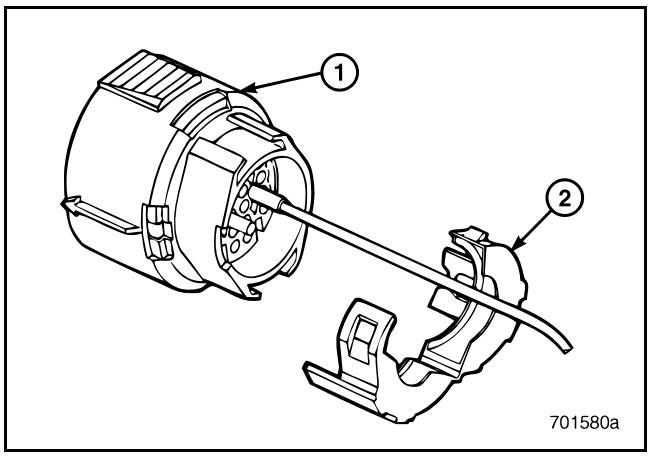


Figure 176 — Connector Conduit Clip Removal

1. Mating Connector	2. Conduit Clip

3. Use the J 39227 removal tool to release the locking finger inside the connector and pull the terminal/wire assembly out the rear of the connector.

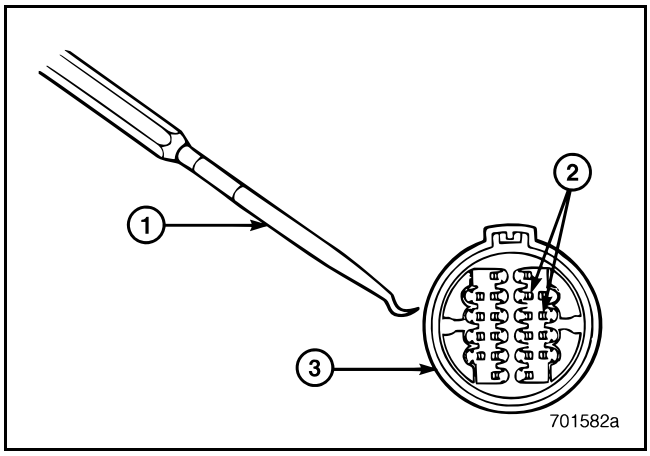


Figure 177 — Terminal/Wire Release from Connector

1. J 39227 Removal Tool 2. Connector Terminal Locking Fingers	3. Rear View of Connector

4. Cut the damaged terminal from the wire as close as possible to the terminal end of the wire.

TERMINAL REPLACEMENT

1. Carefully strip insulation to leave 5.0 mm ± 0.5 mm of bare wire showing.
2. Insert the **new** terminal to be crimped in the J 42215 crimping tool. A spring-loaded terminal positioner at the front of the tool holds the terminal in place. Squeeze the crimper handles for a few clicks to start the crimping process, but leave room to insert the bare wire end.

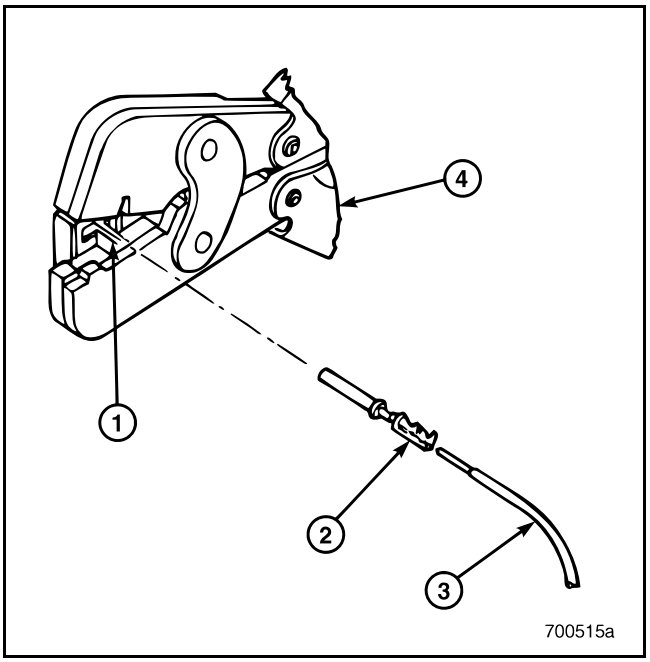


Figure 178 — Terminal Positioning

1. Lock Terminal in Tool 2. Socket Terminal	3. Stripped Wire 4. Crimping Tool J 42215

3. Insert the bare wire end into the terminal. Squeeze the crimper handles until the crimper handles open when released and remove the terminal/wire assembly from the crimping tool J 42215.

TERMINAL INSTALLATION

1. Insert the wire seal into the back of the connector.

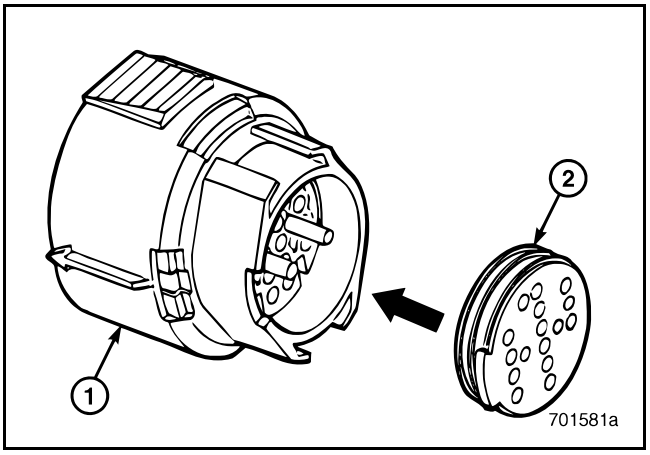


Figure 179 — Wire Seal Installation

1. Mating Connector	2. Wire Seal

2. Push the terminal/wire assembly through the proper hole in the back of the wire seal. Push the wire in until the terminal clicks into position. Gently pull rearward on the wire to be sure that the terminal is fully seated. Install cavity plugs as needed to fill any open cavities.
3. Install the secondary lock into the connector body.

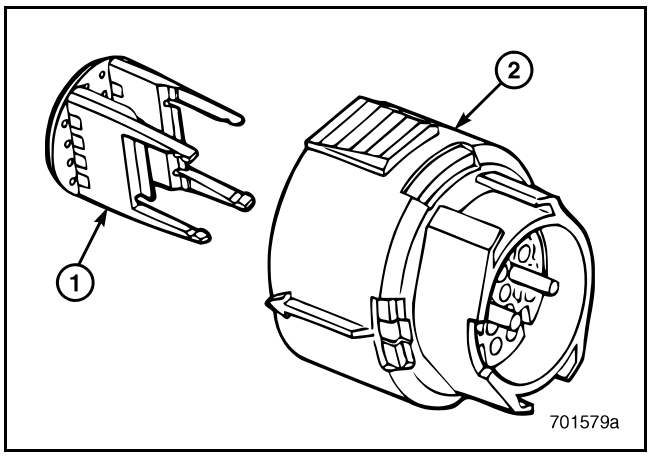


Figure 180 — Secondary Lock Installation

1. Secondary Lock	2. Mating Connector with Female (Socket) Terminals

4. Close the conduit clip around the conduit and lock into the rear of the connector body.

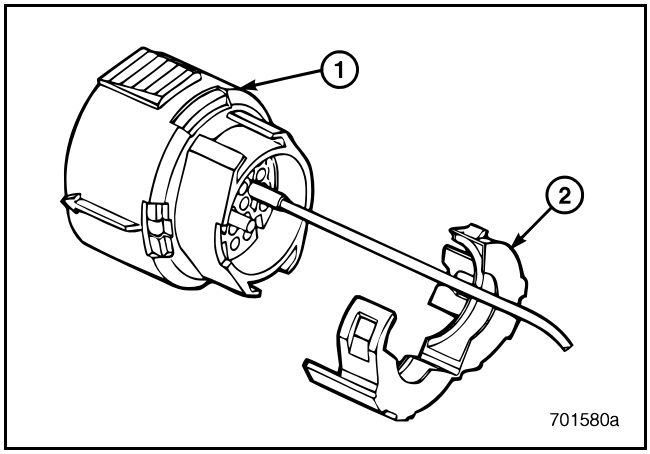


Figure 181 — Positioning Conduit Clip

1. Mating Connector	2. Conduit Clip

Delphi Micro-Pack 100W (Circular) Connectors — Type II

Typical uses for this connector are:

- Body Builder Interface Connector

To repair this connector, use the following procedures.

TERMINAL REMOVAL

1. Lift the lock tabs on the side of the connector and remove the lock assist.

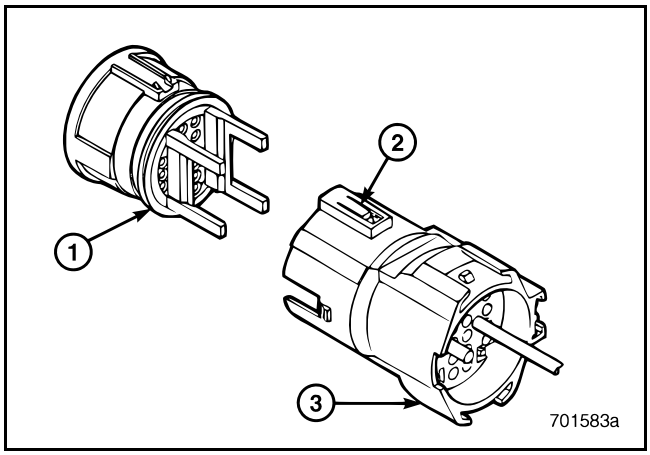


Figure 182 — Releasing Lock Assist Lock Tabs

1. Lock Assist 2. Lock Tab	3. Mating Connector

2. Open the conduit clip on the back of the connector after lifting the lock tabs on each side. Slide the clip back to release it from the connector.

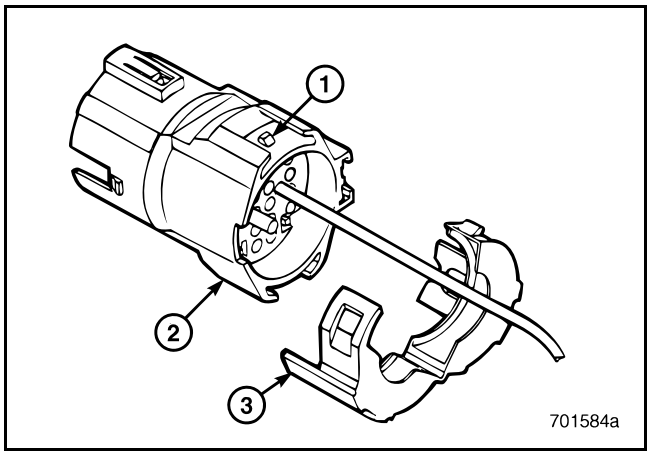


Figure 183 — Releasing Connector Side Lock Tabs

1. Conduit Clip Lock Tab 2. Mating Connector with Male (Pin) Terminals	3. Conduit Clip

3. Use the J 39227 removal tool to release the locking finger inside the connector and pull the terminal/wire out of the rear of the connector.

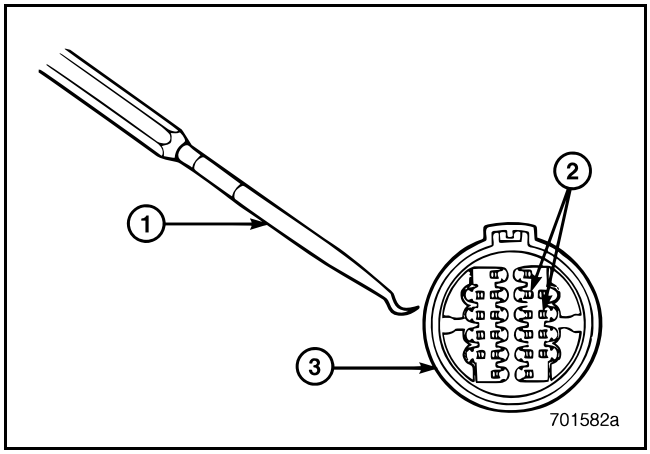


Figure 184 — Releasing Terminal Locking Finger

1. J 39227 Removal Tool 2. Connector Terminal Locking Fingers	3. Rear View of Connector

TERMINAL REPLACEMENT

1. Carefully strip insulation to leave 5.0 mm ± 0.5 mm of bare wire showing.
2. Insert the **new** terminal to be crimped in the J 42215 crimping tool. A spring-loaded terminal positioner at the front of the tool holds the terminal in place. Squeeze the crimper handles for a few clicks to start the crimping process but leave room to insert the bare wire end.

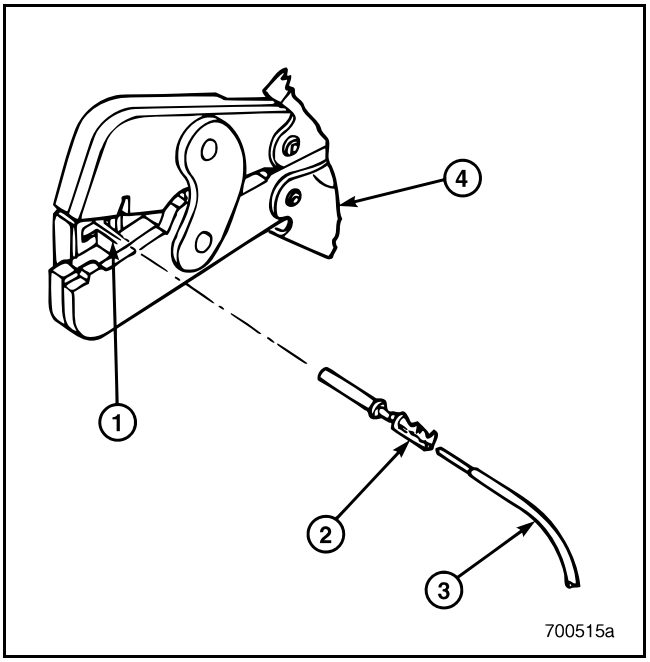


Figure 185 — Terminal Positioning

1. Lock Terminal in Tool 2. Socket Terminal	3. Stripped Wire 4. Crimping Tool J 42215

3. Insert the bare wire end into the terminal. Squeeze the crimper handles until the crimper handles open when released, and remove the terminal/wire assembly from the crimping tool J 42215.

TERMINAL INSTALLATION

1. Insert the wire seal into the back of the connector.

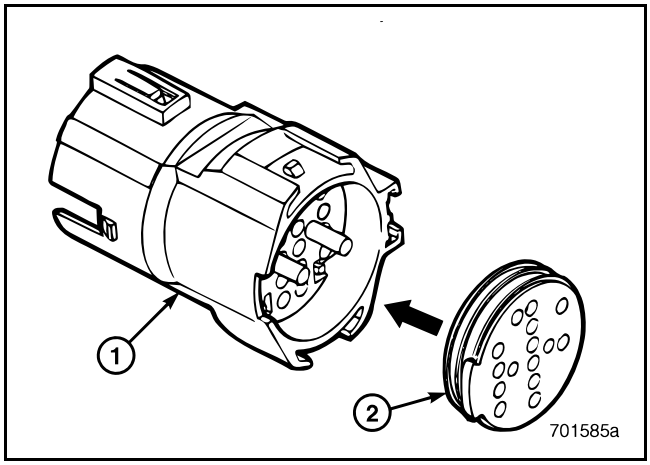


Figure 186 — Wire Seal Installation

1. Mating Connector	2. Wire Seal

2. Push the terminal/wire assembly through the proper hole in the back of the wire seal. Push the wire in until the terminal clicks into position. Gently pull rearward on the wire to be sure that the terminal is fully seated. Install cavity plugs as needed to fill any open cavities.
3. Install the lock assist into the connector body until the side lock tabs fully engage.

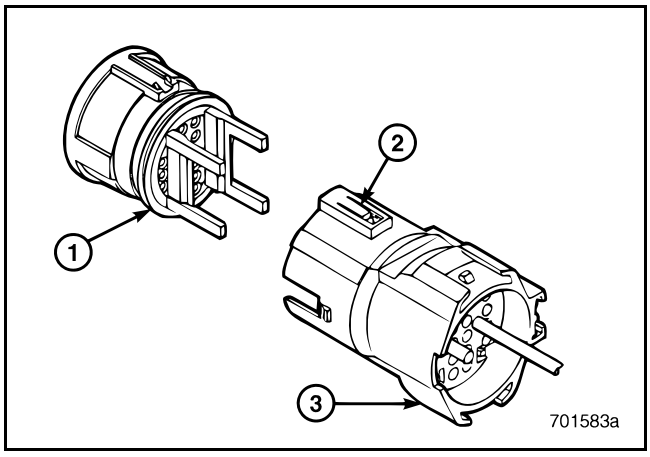


Figure 187 — Connector Lock Assist Installation

1. Lock Assist 2. Lock Tab	3. Mating Connector with Male (Pin) Terminals

4. Close the conduit clip around the conduit and lock into the rear of the connector body.

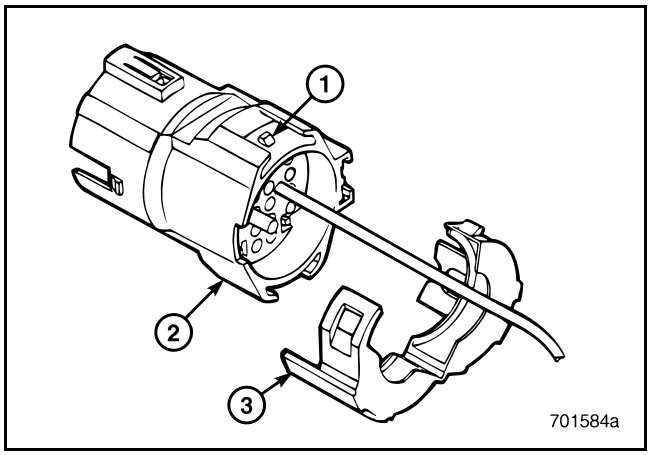


Figure 188 — Installing Conduit Clip

1. Conduit Clip Lock Tab 2. Mating Connector with Male (Pin) Terminals	3. Conduit Clip

Deutsch DT Series Connectors

Typical uses for this connector are:

- J1939 Serial Port Connector

To repair this type of connector, use the following procedure.

TERMINAL REMOVAL

1. Use a small-bladed screwdriver to remove the wedge lock that holds the terminals in place.

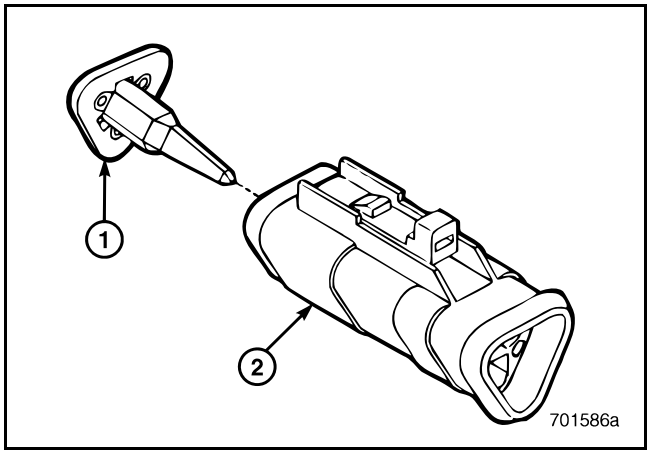


Figure 189 — Removing Wedge Lock

1. Wedge Lock	2. Connector Body

2. Use a sharp knife to carefully remove the shrink tubing from the rear of the connector plug.
3. Use a small screwdriver to release the locking lever for all of the terminals. Pull the wire and terminal out of the rear of the connector.

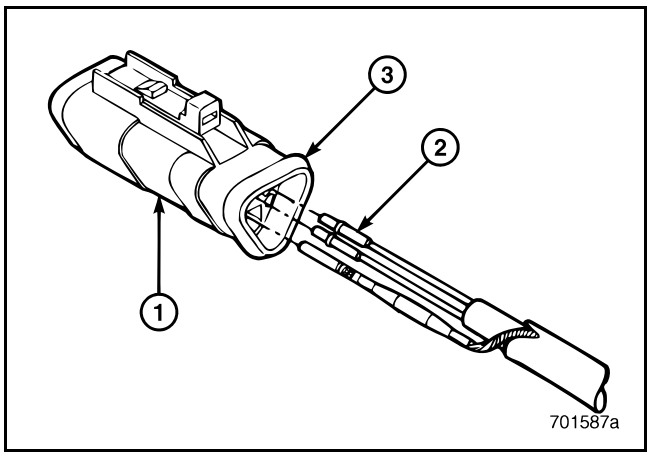


Figure 190 — Removing Wires and Terminals

1. Connector Body 2. Standard Socket Terminal	3. Shrink Tubing Installation Area

4. Slide a **new** piece of shrink tubing over the removed terminals and onto the cable.
5. If replacing the terminal, cut the wire through the middle of the terminal crimp to minimize wire loss.

TERMINAL CRIMPING

1. Strip 0.24–0.32 inch (6–8 mm) of insulation from the wire. (There is no insulation on the shield wire.)
2. Set crimping tool J 34182 wire size adjustment to number 18. To set the wire size, remove the retainer pin. Lift and rotate the indicator until 18 is aligned with the arrow labeled “SEL NO.”. Reinstall the retainer pin.

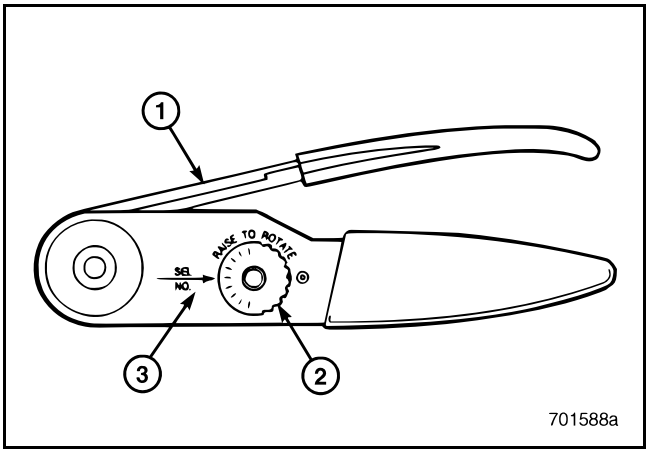


Figure 191 — Setting Wire Size Adjustment

1. Crimper J 34182 2. Wire Size Indicator	3. SEL NO. Arrow

3. Insert the contact end of the terminal down into crimping tool J 34182. Adjust the crimping tool depth by loosening the locking ring until the depth adjusting screw is free. Turn the adjusting screw until the wire end of the terminal is just above the top of the crimping hole. The depth adjustment screw must be backed out a large amount to accept the extended shield terminal. The crimping jaws will now contact the middle of the terminal barrel. Tighten the locking ring to retain the adjustment.

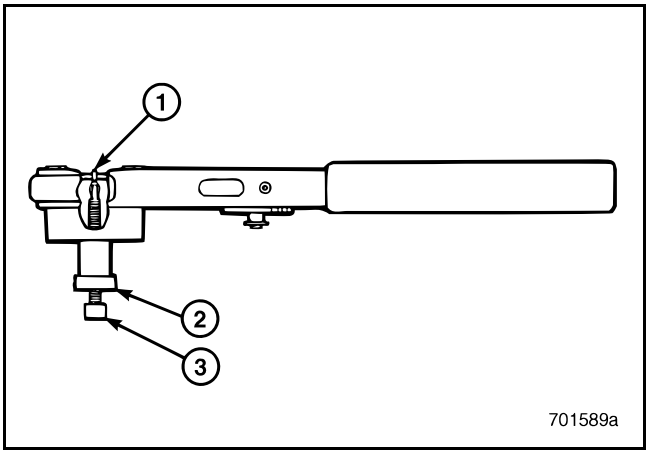


Figure 192 — Adjusting Crimping Tool Depth

1. Terminal 2. Locking Ring	3. Depth Adjustment Screw

4. Fully insert the wire into the terminal so that the stripped portion of the wire is in the crimp area. A small section (0.020–0.040 inch [0.5–1.0 mm]) of wire will be visible above the terminal barrel.
5. Squeeze the crimping tool handle until it releases. The terminal is now crimped onto the wire.
6. Remove the terminal and wire from the crimping tool.
7. Tug on the terminal to make sure the crimp is tight.

TERMINAL INSERTION

1. Slide the wire with crimped terminal attached, into the rear of the connector.

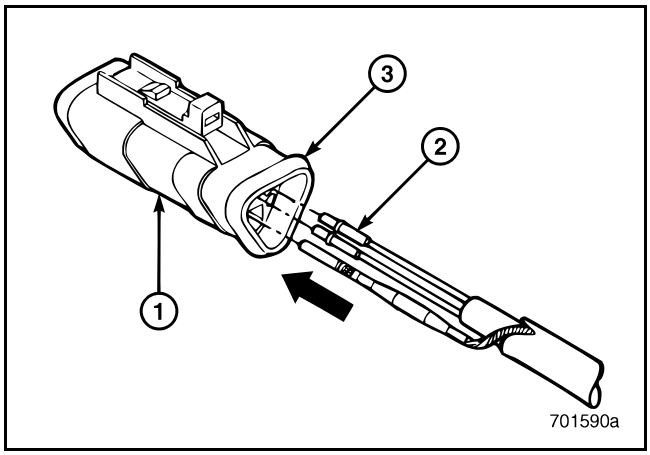


Figure 193 — Inserting Wires and Terminals

1. Connector Body 2. Standard Socket Terminal	3. Shrink Tubing Installation Area

2. Insert the wedge lock to hold the terminals in place. Make sure that the connector seal fits tight to the connector.

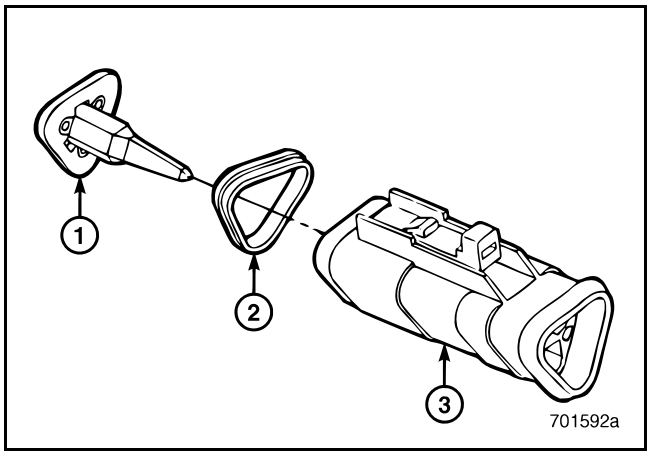


Figure 194 — Inserting Wedge Lock

1. Wedge Lock 2. Connector Seal	3. Connector Body

3. Slide the shrink tubing over the raised area of the connector. Use a heat gun to shrink the tubing into position over the connector and harness.

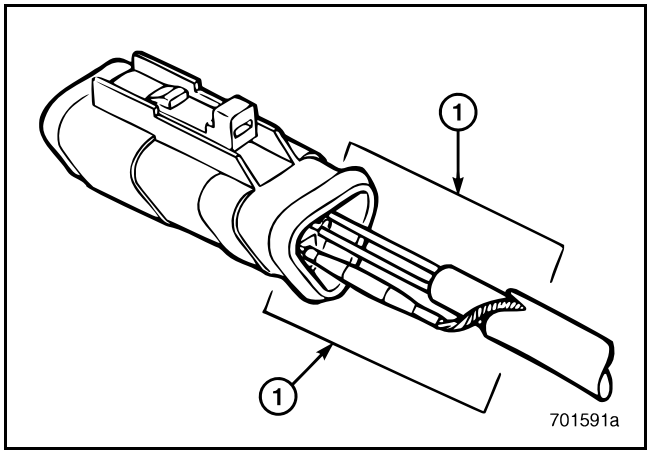


Figure 195 — Applying Shrink Tubing

1. Shrink Tubing Applied to this Area

ELECTRICAL — BODY INSTALLER CONNECTION POINTS

Body installer electrical connection points are provided on some chassis as convenient locations for connecting into various circuits (e.g., taillight power, stoplight power, turn signal power, ground connection, etc.). Typically, a junction box is mounted inside the left-side frame rail at the rear of the chassis, and another junction box is mounted inside the left-side frame rail behind the battery box.

NOTE

On LE model chassis, various terminal blocks and harness connectors, intended specifically for body installation electrical connection points, are located in the electrical equipment area inside the cab (under the driver seat). For complete descriptions of these connections, refer to the *LE Model Service and Repair Manual*, 19-002 and/or 19-003.

Body Link II (Electrical Connection Points) — Granite Models

Body Link II is an optional system offered for the Granite series of chassis (GU7 and GU8 models) that allows body installers to connect to the chassis electrical system using common “quick-connect” electrical connectors. A pair of environmentally sealed Deutsch twist-on connectors (a 9-pin connector and a 29-pin connector) are located at the back of the cab. The connectors are located on the right-hand side of the chassis, mounted on the back-of-cab crossmember. These two connectors provide an easy means of connecting to the most common electrical circuits used by body installers. Included in the same area of the connectors is an electrical ground stud. Chassis on which Body Link II has been specified include a label affixed to the frame rail in the area of the interface connectors that identifies each circuit.

A Body Link II harness connector kit (part No. 204SX420) is available through the MACK Parts System. This kit contains the mating (male) connectors (part Nos. 598AX245 for the 9-pin connector and 598AX236 for the 29-pin connector), and all associated pins. Part numbers are as follows:

Pin Part No.	Wire Gauge
980AX18	No. 12
980AX20	No. 16
980AX44	No. 4
980AX46	No. 8
980AX49	No. 16
980AX54	No. 20
980AX71	No. 12

In addition to the electrical system interface connectors located at the back of the cab, a convenient cab floor pass-through hole can also be provided for easier routing of any wiring harnesses necessary for the various body controls. The pass-through hole includes a heavy-duty rubber boot.

Body Link II can also be supplied with a body warning indicator lamp and extra switches. The body lamp illuminates a red warning signal to alert the operator of a body function as defined by the body installer. The 12-volt electrical input for the body lamp is located in the cab near the Vehicle Electronic Control Unit (VECU), and a lamp input is also provided at the 29-pin body builder interface connector located at the back of the cab on the left-hand frame rail.

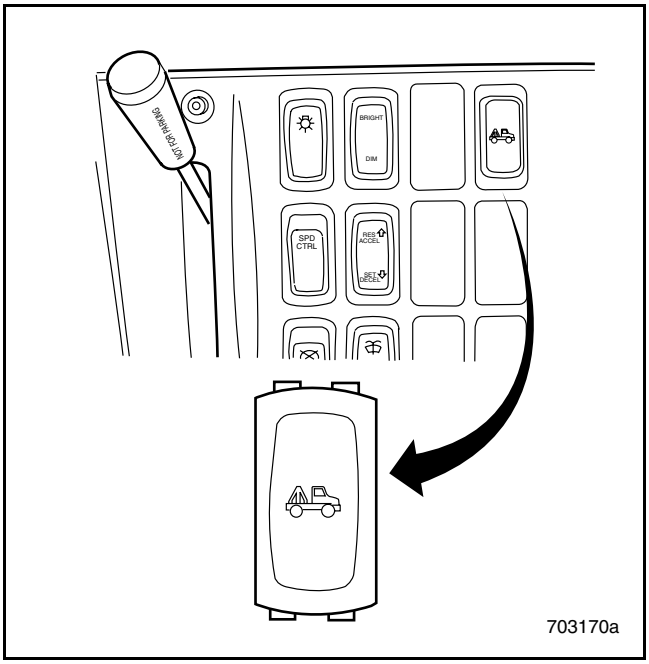
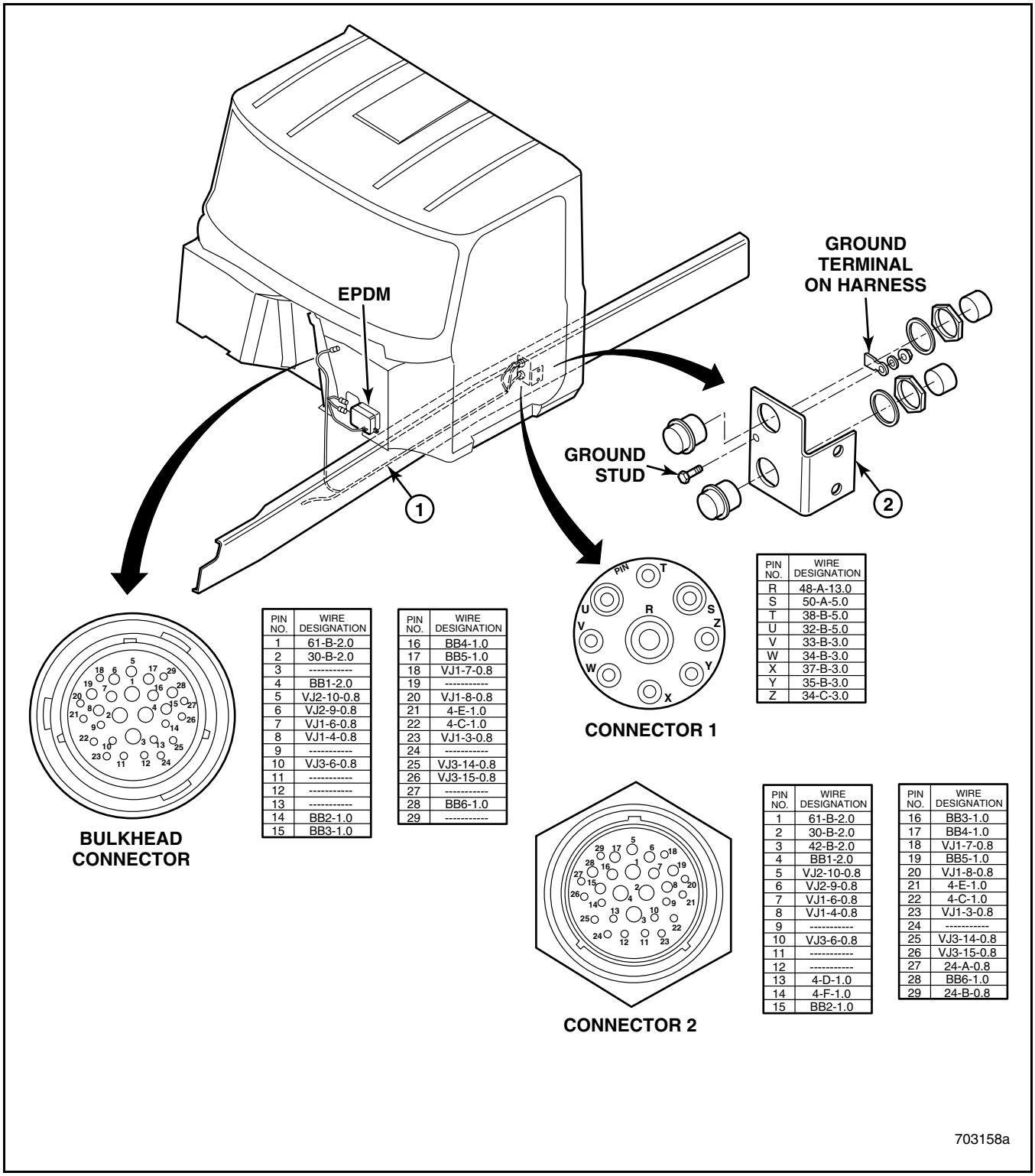


Figure 196 — Body Lamp Warning Indicator

The additional instrument panel switches can be used for functions as required by the body installer.



PIN NO.	WIRE DESIGNATION
1	61-B-2.0
2	30-B-2.0
3	----------
4	BB1-2.0
5	VJ2-10-0.8
6	VJ2-9-0.8
7	VJ1-6-0.8
8	VJ1-4-0.8
9	----------
10	VJ3-6-0.8
11	----------
12	----------
13	----------
14	BB2-1.0
15	BB3-1.0

PIN NO.	WIRE DESIGNATION
16	BB4-1.0
17	BB5-1.0
18	VJ1-7-0.8
19	----------
20	VJ1-8-0.8
21	4-E-1.0
22	4-C-1.0
23	VJ1-3-0.8
24	----------
25	VJ3-14-0.8
26	VJ3-15-0.8
27	----------
28	BB6-1.0
29	----------

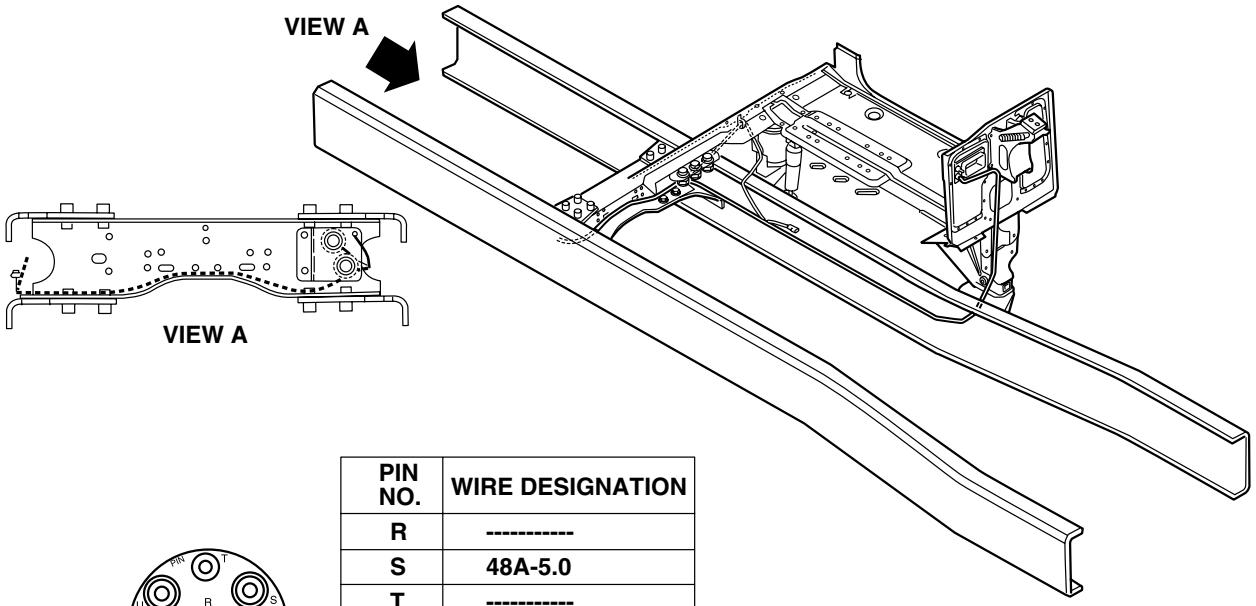
PIN NO.	WIRE DESIGNATION
R	48-A-13.0
S	50-A-5.0
T	38-B-5.0
U	32-B-5.0
V	33-B-3.0
W	34-B-3.0
X	37-B-3.0
Y	35-B-3.0
Z	34-C-3.0

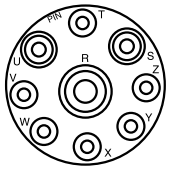
PIN NO.	WIRE DESIGNATION
1	61-B-2.0
2	30-B-2.0
3	42-B-2.0
4	BB1-2.0
5	VJ2-10-0.8
6	VJ2-9-0.8
7	VJ1-6-0.8
8	VJ1-4-0.8
9	----------
10	VJ3-6-0.8
11	----------
12	----------
13	4-D-1.0
14	4-F-1.0
15	BB2-1.0

PIN NO.	WIRE DESIGNATION
16	BB3-1.0
17	BB4-1.0
18	VJ1-7-0.8
19	BB5-1.0
20	VJ1-8-0.8
21	4-E-1.0
22	4-C-1.0
23	VJ1-3-0.8
24	----------
25	VJ3-14-0.8
26	VJ3-15-0.8
27	24-A-0.8
28	BB6-1.0
29	24-B-0.8

Figure 197 — Body Link II Interface Harness Connector Locations/Pin Assignments — CT Model Chassis

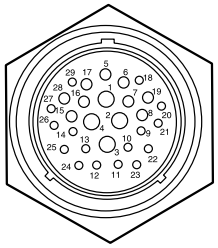
1. Body Installer Interface Harness (41MR5914M)	2. Mounting Bracket (71RU3354M)





CONNECTOR 1

PIN NO.	WIRE DESIGNATION
R	----------
S	48A-5.0
T	----------
U	70B-3.0
V	33B2-3.0
W	34B2-3.0
X	37B2-3.0
Y	35B7-3.0
Z	34C2-3.0



CONNECTOR 2

PIN NO.	WIRE DESIGNATION
1	30B-2.0
2	61B-2.0
3	47B7-2.0
4	----------
5	CB7A-0.8
6	17M1-0.8
7	17E2-0.8
8	HB30B-0.8
9	BB1-2.0
10	----------
11	----------
12	----------
13	4C6-2.0
14	4D6-3.0

15	BB2-1.0
16	BB3-1.0
17	BB4-1.0
18	17C2-0.8
19	BB5-1.0
20	17D2-0.8
21	5D2-1.0
22	5E2-1.0
23	HB29B-0.8
24	----------
25	1587HN8-0.8
26	1587LN8-0.8
27	64A1-1.0
28	BB6-1.0
29	64B1-1.0

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Figure 198 — Body Link II Interface Harness Connector Locations/Pin Assignments — CTP Model Chassis

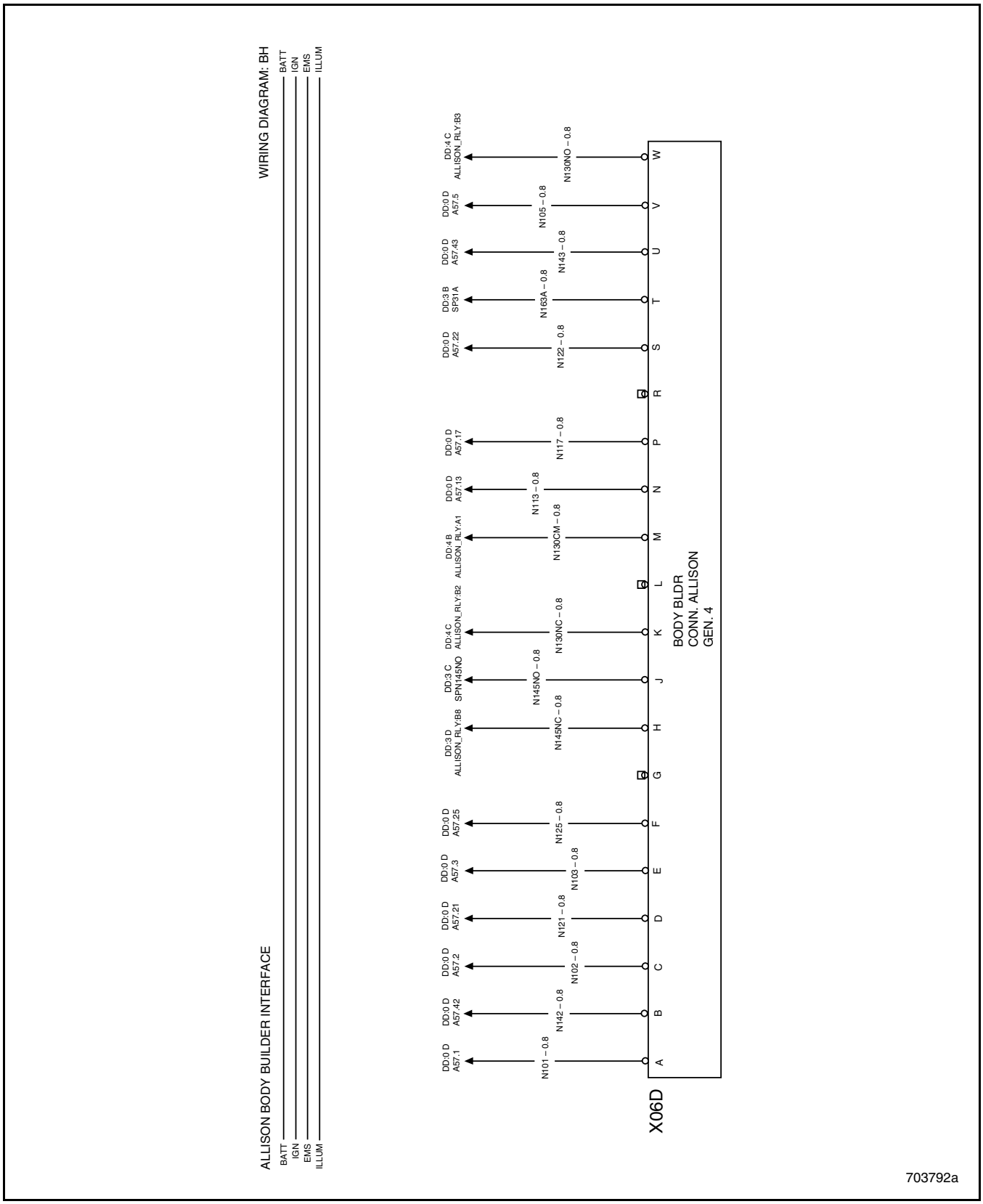


Figure 199 — Body Builder Circuits Wiring Diagram Allison Automatic Transmission Interface 8MR51433 Revision A Sheet 13 (Wiring Diagram BH) — GU7 and GU8 Model Chassis

Body Link II — Construction Body Builder Circuits — Wiring Diagram 8MR51433 Revision 01 Sheet 14 (Wiring Diagram BJ) — MRU Model Chassis

Concrete Dual Transmission PTO Body Builder Package — Wiring Diagram 8MR51433 Revision 01 Sheet 15 (Wiring Diagram BK) — MRU Model Chassis

Concrete Single Driveshaft PTO Body Builder Package — Wiring Diagram 8MR51433 Revision 01 Sheet 16 (Wiring Diagram BL) — MRU Model Chassis

Body Link II — Refuse Body Builder Circuits — Wiring Diagram 8MR51433 Revision 01 Sheet 17 (Wiring Diagram BM) — MRU Model Chassis

Concrete Dual Driveshaft PTO Package 1/2 — Wiring Diagram 8MR51433 Revision 01 Sheet 18 (Wiring Diagram BN) — MRU Model Chassis

Concrete Dual Driveshaft PTO Package 2/2 — Wiring Diagram 8MR51443 Revision 01 Sheet 19 (Wiring Diagram BO) — MRU Model Chassis

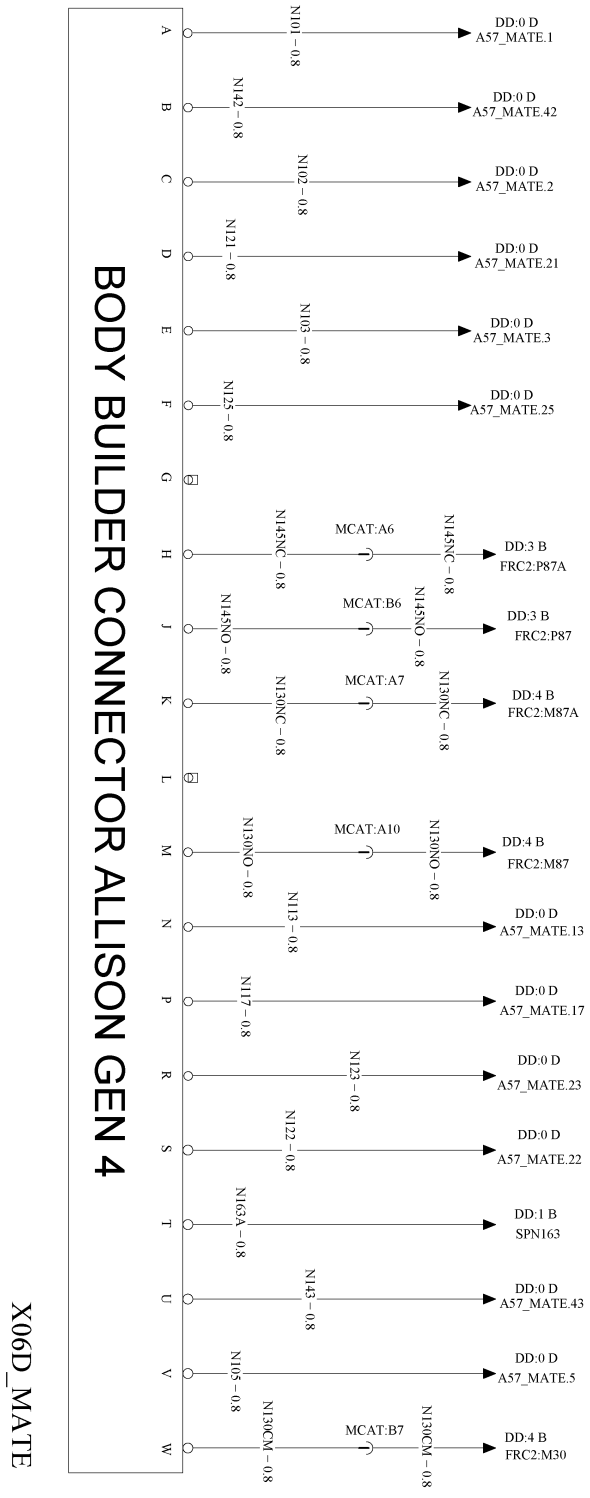


Figure 200 — Body Builder Circuits Wiring Diagram Allison Automatic Transmission Interface 8MR51443 Revision 01 Sheet 13 (Wiring Diagram BH) — MRU Model Chassis

Body Link II Construction Body Builder Circuits — Wiring Diagram 8MR51437 Revision 01 Sheet 14 (Wiring Diagram BJ) — LEU Model Chassis

Body Link II Refuse Body Builder Circuits 1/2 — Wiring Diagram 8MR51437 Revision 01 Sheet 15 (Wiring Diagram BM) — LEU Model Chassis

Body Link II Refuse Body Builder Circuits 2/2 — Wiring Diagram 8MR51437 Revision 01 Sheet 16 (Wiring Diagram BN) — LEU Model Chassis

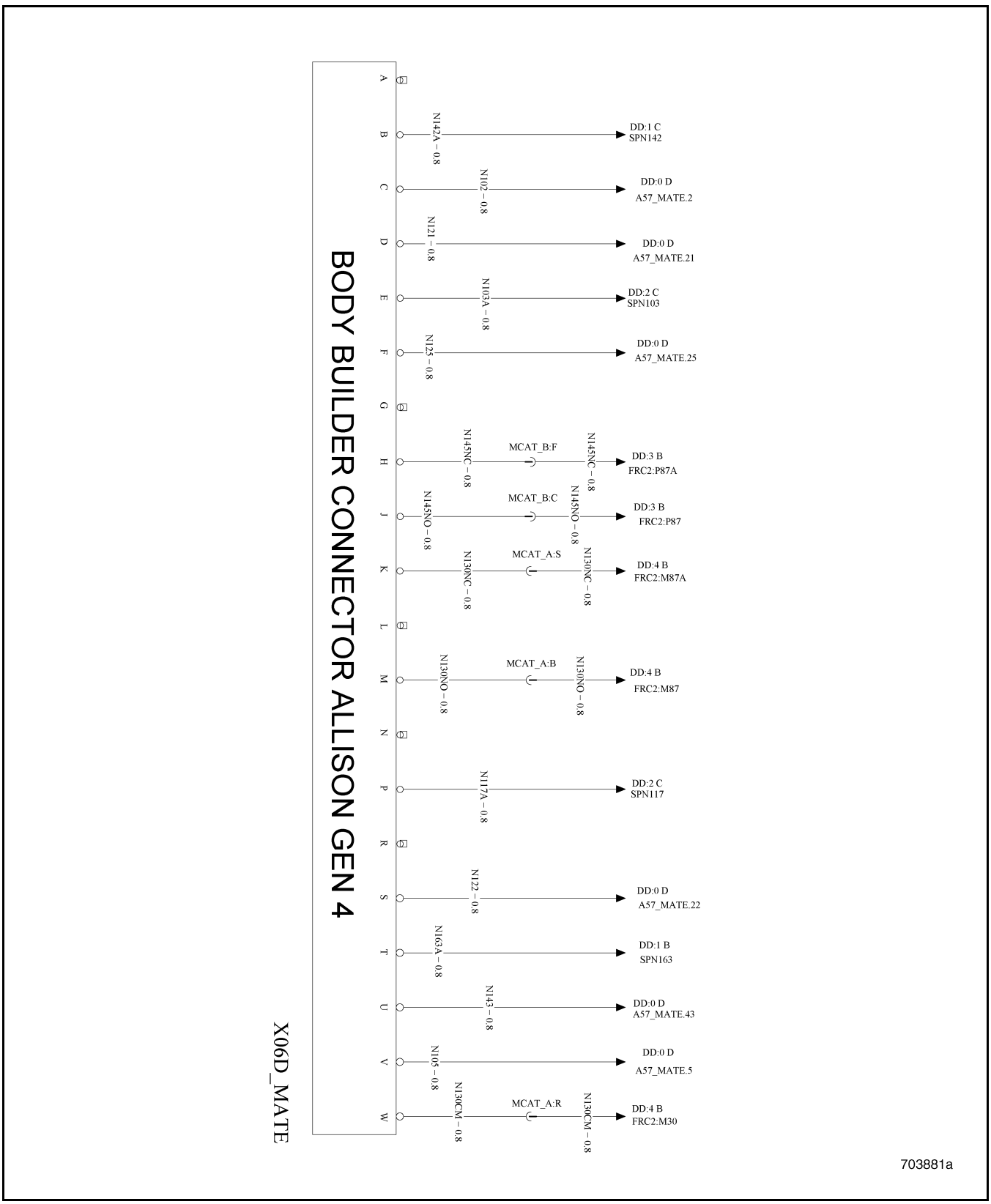
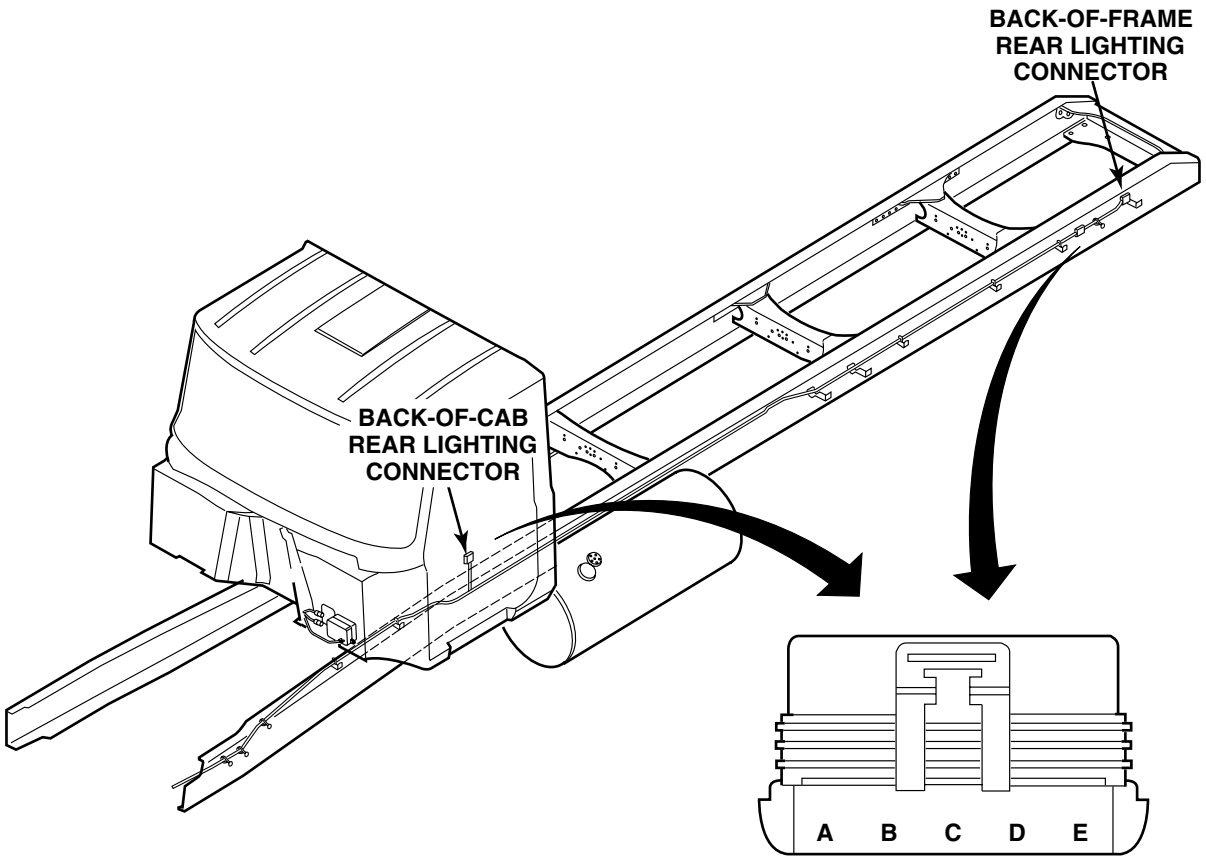


Figure 201 — Body Builder Circuits Wiring Diagram Allison Automatic Transmission Interface 8MR51437 Revision 01 Sheet 13 (Wiring Diagram BH) — LEU Model Chassis

Rear Lighting Connection Points — Granite Model Chassis

To allow easy connection to the lighting circuits, two standard 5-way connectors are provided on all Granite models. These connectors, which are located at the back of the cab and the back of the frame, allow the body installer to connect to the normal rear lighting system without having to splice into the existing chassis harnesses. The 5-way connector includes connections for the parking lamps, reverse lamps, left and right stop and turn signal lamps and ground connections.



PIN	CIRCUIT	DESCRIPTION
A	42-B-2.0	BACKUP LAMPS
B	3-B-1.0	PARK/TAIL LAMPS
C	4-C-1.0	STOP/TURN LH
D	4-E-1.0	STOP/TURN RH
E	BK-U-2.0	GROUND

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Figure 202 — Rear Lighting Connectors

Electrical — Automatic Transmission Interface Connector

On CTP, CV, LE and MR model chassis, an automatic transmission interface connector is provided as an easy and convenient method for connecting into the transmission electronics when required. Location of the connectors varies by vehicle model. Refer to the following illustrations for connector locations.

Electrical — Accessory Connection Points

All MACK chassis are equipped with convenient connection points for installation of electrical accessories. For the installation of any electrical accessories, use only the designated battery post (+12v), ground post, CB jack, buffered rpm outputs, buffered mph outputs, and the SAE/ATA J-1708 post, located on the electrical equipment panel. Location of the electrical equipment panel varies by vehicle. Refer to the specific model operator's manual (provided with each chassis) for the exact location of the electrical equipment panel. A description of each connection point follows.

Battery Post (BATT)

This is a +12 volt unswitched battery power connection. It can be used to power external devices that require power at all times, regardless of ignition switch position. This source is protected by a 20-amp circuit breaker.

Ignition Post (IGN)

This is a +12 volt switched battery power connection. It can be used to power external devices that require power only when the ignition switch is in the ON position. This source is protected by a 15-amp circuit breaker.

Ground Post (GND)

This is a ground connection. It can be used as a power return (–) connection for external devices.

RPM Output

This is a 50% duty cycle, 5-volt Transistor-Transistor Logic (TTL) compatible, square-wave signal, that is calibrated to provide a standard pulse rate of 12 pulses per engine revolution.

NOTE

TTL compatibility of this output may be affected by other devices connected to this output. Maximum rated current of the TTL output is 10 mA. Total current draw of all devices connected to this output must not exceed 10 mA at 4 volts.

MPH Output

This is a 50% duty cycle, 5-volt TTL compatible, square-wave signal, that is calibrated to provide a standard pulse rate of 30,000 pulses per mile.

NOTE

TTL compatibility of this output may be affected by other devices connected to this output. Maximum rated current of the TTL output is 10 mA. Total current draw of all devices connected to this output must not exceed 10 mA at 4 volts.

SAE/ATA J-1708 Posts (Series Link A and B)

This is a serial communication interface. It conforms to the SAE/ATA J-1708 Recommended Practice for Serial Data Communications Between Microcomputer Systems in Heavy Duty Vehicle Applications.

AIR SYSTEM

AIR SYSTEM

NOTE

For detailed information concerning air systems (theory of operation, air system valves, piping diagrams, etc.), refer to the *Air and Brake System Service Manual*, 16-104.

Air Brake System — MVSS Requirements

MVSS COMPLIANCE

As manufactured by Mack Trucks, Inc., the air brake system on MACK chassis (both incomplete and complete) comply with the applicable requirements of U.S. Federal and Canada Motor Vehicle Safety Standards (MVSS) 106, Brake Hoses, and 121, Air Brake Systems. Any change or addition to the system may cause the vehicle to no longer be in compliance with these MVSS.

MVSS 121 requirements cover (but are not limited to) the following:

- Air compressor build-up time
- Air reservoir volume
- Service brake stopping distance
- Brake actuation time
- Brake release time
- Parking brake hold on grades
- Emergency brake stopping distance

For a complete list of certification requirements, refer to FMVSS 121 or CMVSS 121. These motor vehicle safety standards can be accessed at the following web addresses:

- **Federal Motor Vehicle Safety Standards**
  www.gpoaccess.gov/cfr/index.html
- **Canada Motor Vehicle Safety Standards**
  www.tc.gc.ca/acts-regulations/GENERAL/M/mvsa/menu.htm

It is the responsibility of the body/equipment installer/alterer to ensure that the MACK vehicle remains in compliance with applicable Motor Vehicle Safety Standards. It is also the responsibility of the body/equipment installer/alterer to comply with applicable vehicle certification regulations (see “VEHICLE CERTIFICATION” on page 42 of this guide).

Air Brake System — Truck Tractor

There are basic differences between straight truck and truck tractor air systems. On a straight truck, a spring brake control valve is added to the emergency brake air circuit. This gives the driver modulated control of the spring brakes through the treadle valve in the event of a primary system air loss. Additionally, spring brake chambers are installed on both axles of a tandem rear axle unit so that if there is a partial air system pressure loss, the emergency brake system will stop the vehicle within the required stopping distance, and also to meet parking brake system requirements.

A truck air system is designed to be operated as that of a truck, and a truck tractor air system is designed to be operated as that of a truck tractor. When converting chassis for use other than as originally intended (e.g., converting a truck tractor to a truck), the air system must also be changed to ensure that the vehicle remains in compliance with Motor Vehicle Safety Standards. Contact Mack Trucks, Inc. Product Support for more information.

Air-Operated Equipment

Additional air system capacity may be required for air-powered accessories to operate properly without jeopardizing the integrity of the air brake system. MVSS 121 requires an air capacity 12 times the total volume of all air brake chambers on the vehicle. For additional information on calculating total air volume and brake chamber rated air volumes, refer to “Liftable Axle — Air System Requirements” on page 251 of this guide.

If additional air capacity is required, an expansion reservoir should be installed. The reservoir and piping must comply with Motor Vehicle Safety Standards.

NOTE

When making any modifications to the vehicle that involves the addition of air springs (i.e., liftable tag or pusher axles having air suspensions), the air springs should be supplied by a pressure protected air source so that the air brake system is protected (to the setting of the pressure protection valve) against air loss should a leak develop in the auxiliary system.

On CV model chassis, when ordered with additional air system capacity, the primary expansion reservoir is located on the left-hand side of the chassis, mounted below the battery box. All reservoirs on the vehicle are located forward of the fuel tanks to provide sufficient room on the frame for mounting body equipment.

Air Compressor Capacity

If increased air system volume is necessary, it is also necessary to determine if the air compressor has the capacity to supply the air system without having to run in the loaded mode (compressing) for long periods of time. MVSS 121 requires that the air compressor must be able to increase pressure in the supply and service (primary and secondary) reservoirs from 85 psi to 100 psi, with the engine running at maximum governed rpm, in a specific amount of time, depending on required and actual reservoir capacity. If the existing compressor cannot accomplish this, a larger compressor must be used. First, however, make sure that an air compressor malfunction or other type of problem with the air system is not causing the slow build-up time.

Build-up time may be calculated as shown in Figure 203.

$$\text{Build-up Time} = \frac{\text{Actual Reservoir Capacity}}{\text{Required Reservoir Capacity}} \times 25$$

Example:

$$\text{Build-up Time} = \frac{7500}{6900} \times 25$$

$$\text{Build-up Time} = 1.087 \times 25$$

$$\text{Build-up Time} = 27.2 \text{ Seconds}$$

585931a

Figure 203 — Calculating Air System Build-up Time

Liftable Axle — Air System Requirements

NOTE

CTP model chassis are available as “liftable axle ready” from the factory with the necessary piping, gauges and regulators required for easy installation of the liftable axle(s).

Installation of a liftable axle(s) may require additional air capacity for operation of the service brakes, up/down air bags and suspension air bags.

NOTE

The addition of a liftable axle increases the load carrying capacity of the vehicle, which may affect the ability of the parking brake system to hold the vehicle on a hill. MVSS 121 requires that the parking brake system be capable of holding the vehicle under specified conditions. To ensure continued compliance with MVSS 121 when a liftable axle is added, it may be necessary for the installer to increase the capacity of the parking brake system to account for the increase in the gross vehicle weight rating (GVWR).

LIFTABLE AXLE — AIR CAPACITY

U.S. Federal and Canada Motor Vehicle Safety Standard (MVSS) 121 requires that total air capacity for the vehicle must be 12 times the total volume of all air chambers (front and rear chambers and liftable axle air brake chambers). As an example, a standard chassis having four type-30 service brake chambers on the rear axles and two type-24 service brake chambers on the front axle would require a total air system capacity of 5,880 cubic inches, excluding air requirements for the liftable axle brake chambers.

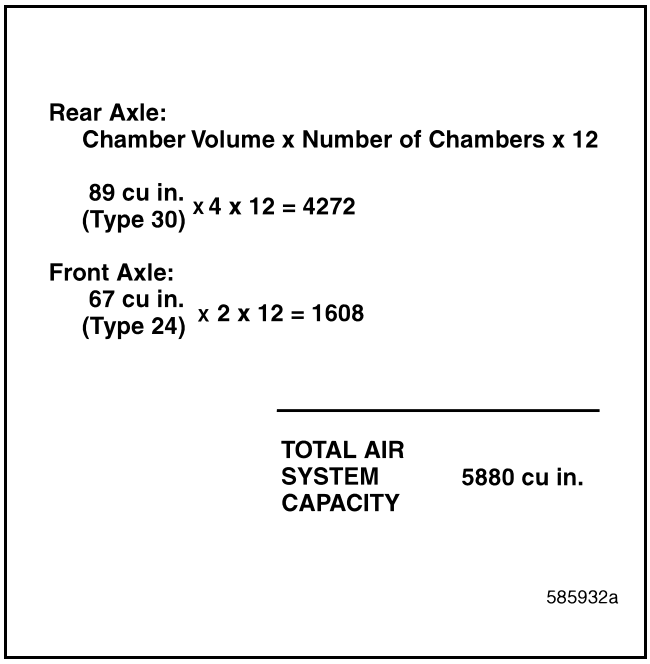


Figure 204 — Calculating Air System Capacity

The addition of two type-24 brake chambers for the liftable axle installation would require an additional 1,608 cubic inches of air system capacity.

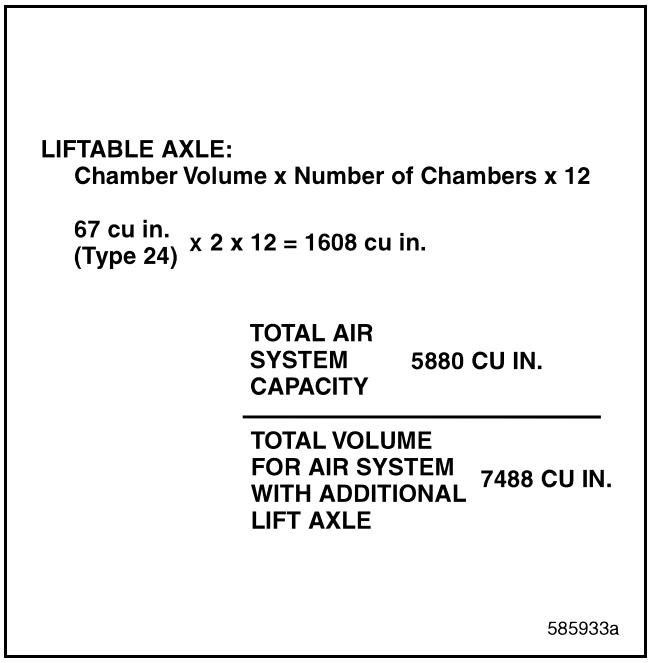


Figure 205 — Calculating Air System Capacity with Additional Chambers for Liftable Axle

Total air system capacity for the chassis, including the additional capacities for the two type-24 brake chambers, would be 7,488 cubic inches.

The following table from MVSS 121 lists the brake chamber rated volumes at 100 psi for the length of stroke for each chamber type.

BRAKE CHAMBER RATED VOLUMES

Brake Chamber (Nominal Area of Piston or Diaphragm in Square Inches)	Full Stroke (Inches)	Rated Volume (Cubic Inches)
Type 9	1.75/2.10	25
Type 12	1.75/2.10	30
Type 14	2.25/2.70	40
Type 16	2.25/2.70	46
Type 18	2.25/2.70	50
Type 20	2.25/2.70	54
Type 24	2.50/3.20	67
Type 30	2.50/3.20	89
Type 36	3.00/3.60	135

MVSS 121 requires that the combined volume of all service reservoirs and supply reservoirs be at least 12 times the combined volume of all service brake chambers. For each brake chamber type having a full stroke at least as great as the first number in Column 1 of the table above, but no more than the second number in Column 1 of the table above, the volume of each brake chamber for purposes of calculating the required combined service and supply reservoir volume shall be either that specified in Column 2 of the table above or the actual volume of the brake chamber at maximum travel of the brake piston or push rod, whichever is lower. The volume of a brake chamber not listed in the table above, is the volume of the brake chamber at maximum travel of the brake piston or push rod. The reservoirs of the truck portion of an auto transporter need not meet this requirement for reservoir volume.

An expansion reservoir must be added to the air system to supply air pressure for the braking and up/down functions of a liftable axle(s). The expansion reservoir for the liftable axle brake function must be supplied by the primary air system, and supply to the expansion reservoir should include a one-way check valve to protect the liftable axle air system should a leak develop in the primary air system. Additionally, supply to the liftable axle(s) control valves for suspension function should be supplied by the secondary air system and should also include a pressure protection valve. A pressure protection valve prevents a total loss of pressure should a leak develop in any part of the lift axle system.

It must also be determined if the air compressor capacity is sufficient to handle the increase in air volume. Refer to the section “Air Compressor Capacity” on page 251 for additional information.

LIFTABLE AXLE — AIR PIPING

- **Relay Valve**

  A liftable axle must have its own service brake relay valve. A standard R-12 relay valve (part No. 8235-9732980360 or 745-103009) can be used.

NOTE

It is the responsibility of the body/equipment installer/alterer to ensure that the chassis remains in compliance with U.S. Federal and Canada Motor Vehicle Safety Standards 106 and 121 when modifications are made to the air brake system. With respect to brake timing, a quick release valve (such as part No. 8235-S9738990110) may be necessary in the control circuit when a liftable axle is added. Do not use a pressure differential-type quick release valve for this type of application.

NOTE

One relay valve is capable of supplying pressure to four brake chambers. For multiple axle installations, additional relay valves must be installed according to the number of additional brake chambers being added to the system (i.e., one relay valve is required for one or two additional axles [four brake chambers], two relay valves are required for three or four additional axles [eight brake chambers], etc.).

- **Air Line Tubing**

  It is recommended that 1/2 inch plastic air line tubing be used from the expansion air reservoir to the supply port of a lift axle service brake relay valve. On liftable axles equipped with Type 20, 24 or 30 brake chambers, 1/2 inch air line hose is recommended for the line from the relay valve delivery ports to the brake chambers. A 3/8 inch air line hose is recommended for Type 12 and 16 brake chambers. If air pressure is being delivered from a liftable axle relay valve to a bulkhead fitting, 1/2 inch air line hose is recommended for the line to the bulkhead fitting. It is recommended that the guidelines listed above be used for the lines from the bulkhead fitting to the brake chambers.

  It is recommended that 3/8 inch plastic air line tubing be used for control pressure lines. Control pressure for a liftable axle brake circuit must be supplied from the primary side of the brake treadle valve. On chassis NOT equipped with automatic traction control (ATC), a T-fitting should be installed into the control port of the rear axle service brake relay valve to supply control pressure to a liftable axle service brake relay valve. On chassis equipped with ATC, control pressure must be plumbed into the rear axle relay control circuit ahead of the ATC valve.

  Air pressure for the liftable axle suspension and lift bags should be supplied from the secondary air system.

The following piping diagrams illustrate the recommended brake, suspension and lift air piping for liftable axles.

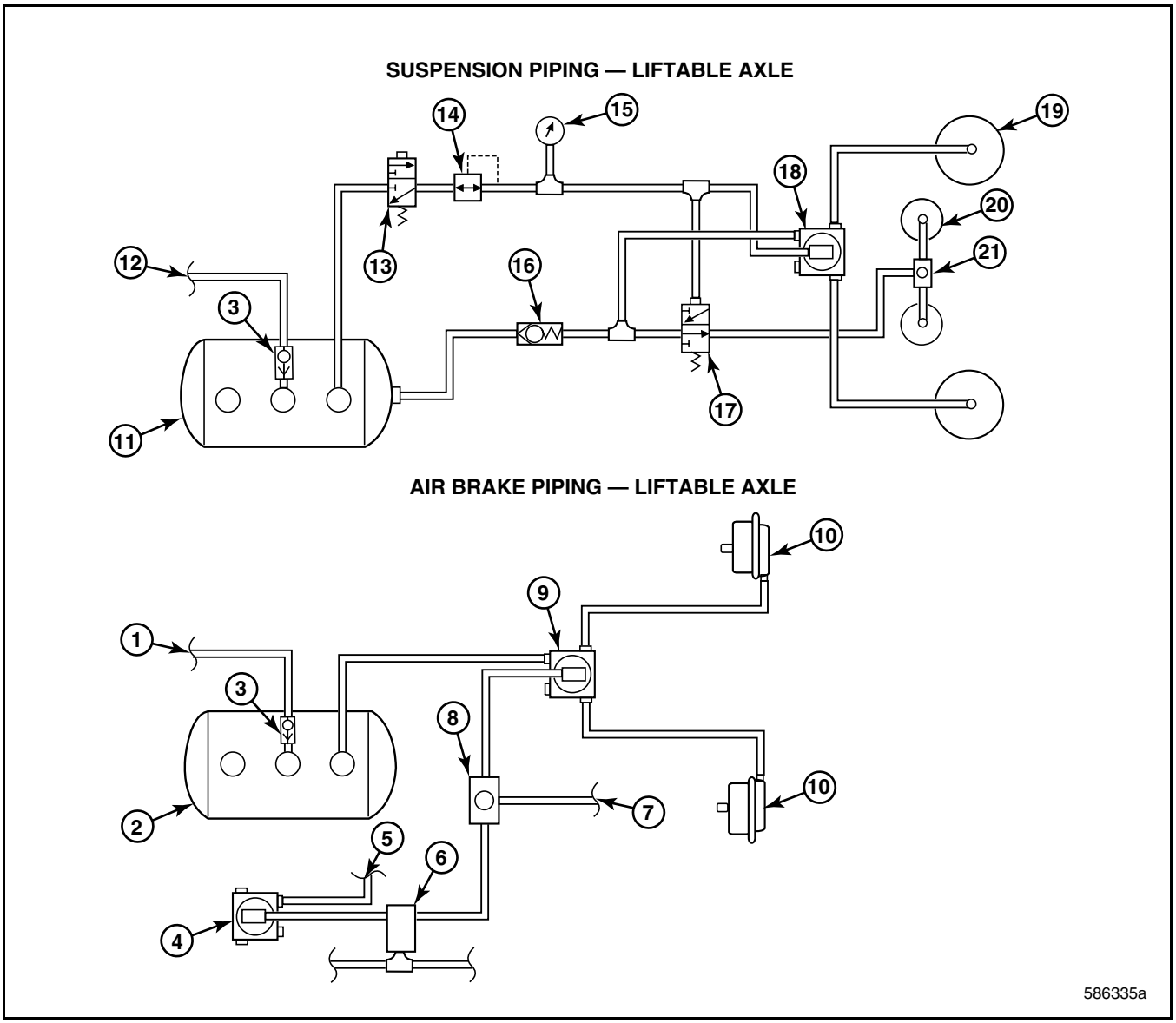
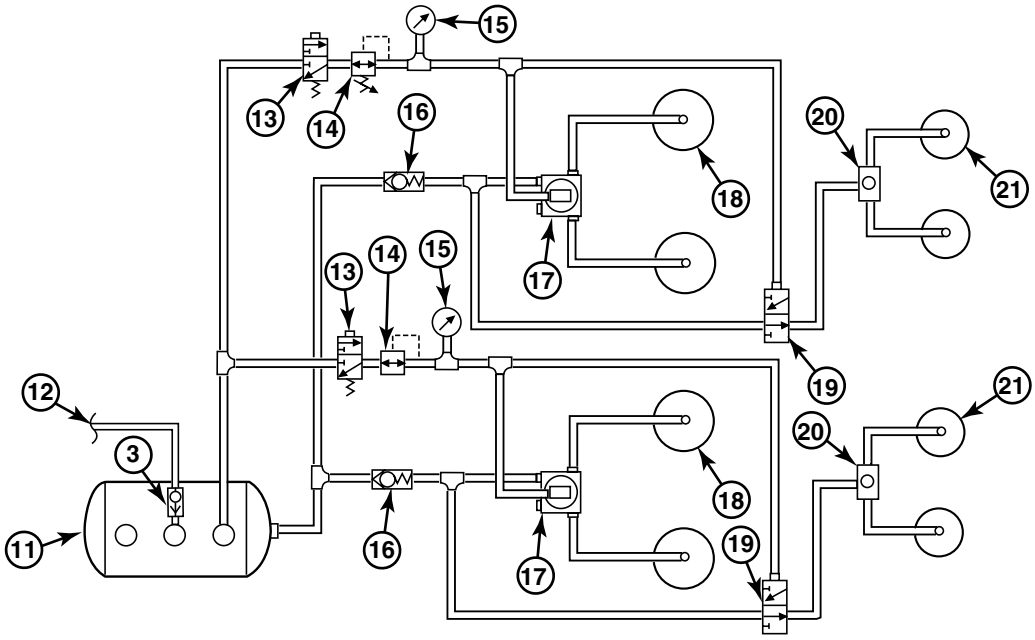


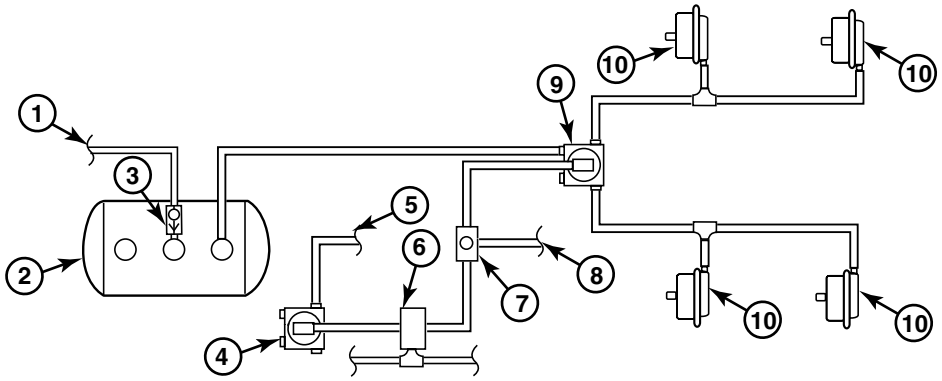
Figure 206 — One Tag Axle or One Pusher Axle

1. Primary Supply Pressure (from Primary Reservoir)	12. Supply Pressure to Secondary Reservoir (from Supply Reservoir)
2. Primary Expansion Reservoir	13. Up/Down Solenoid Valve
3. One Way Check Valve (MACK Part No. 63AX3805)	14. Pressure Regulator
4. Rear Axle Service Brake Relay Valve	15. Pressure Gauge
5. Primary Supply Pressure	16. Pressure Protection Valve (MACK Part No. 20QE2326AP2)
6. ATC Valve (if Equipped)	17. Lift Control Valve (Normally Open)
7. Primary Control Pressure (from Treadle Valve)	18. Liftable Axle Air Suspension Relay Valve
8. Quick Release Valve (if Required)	19. Liftable Axle Suspension Air Bag
9. Liftable Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)	20. Liftable Axle Lift Air Bag
10. Tag or Pusher Axle Brake Chamber	21. Quick Release Valve
11. Secondary Reservoir	

SUSPENSION PIPING — LIFTABLE AXLE



AIR BRAKE PIPING — LIFTABLE AXLE



586336a

Figure 207 — Two Pusher Axles

1. Primary Supply Pressure (from Primary Reservoir)
2. Primary Expansion Reservoir
3. One Way Check Valve (MACK Part No. 63AX3805)
4. Rear Axle Service Brake Relay Valve
5. Primary Supply Pressure
6. ATC Valve (if Equipped)
7. Quick Release Valve (if Required)
8. Primary Control Pressure (from Treadle Valve)
9. Pusher Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)
10. Pusher Axle Brake Chamber
11. Supply Pressure to Secondary Reservoir (from Supply Reservoir)
12. Secondary Reservoir
13. Up/Down Solenoid Valve
14. Pressure Regulator
15. Pressure Gauge
16. Pressure Protection Valve (MACK Part No. 20QE2326AP2)
17. Pusher Axle Air Suspension Relay Valve
18. Pusher Axle Suspension Air Bag
19. Lift Control Valve (Normally Open)
20. Quick Release Valve
21. Pusher Axle Lift Air Bag

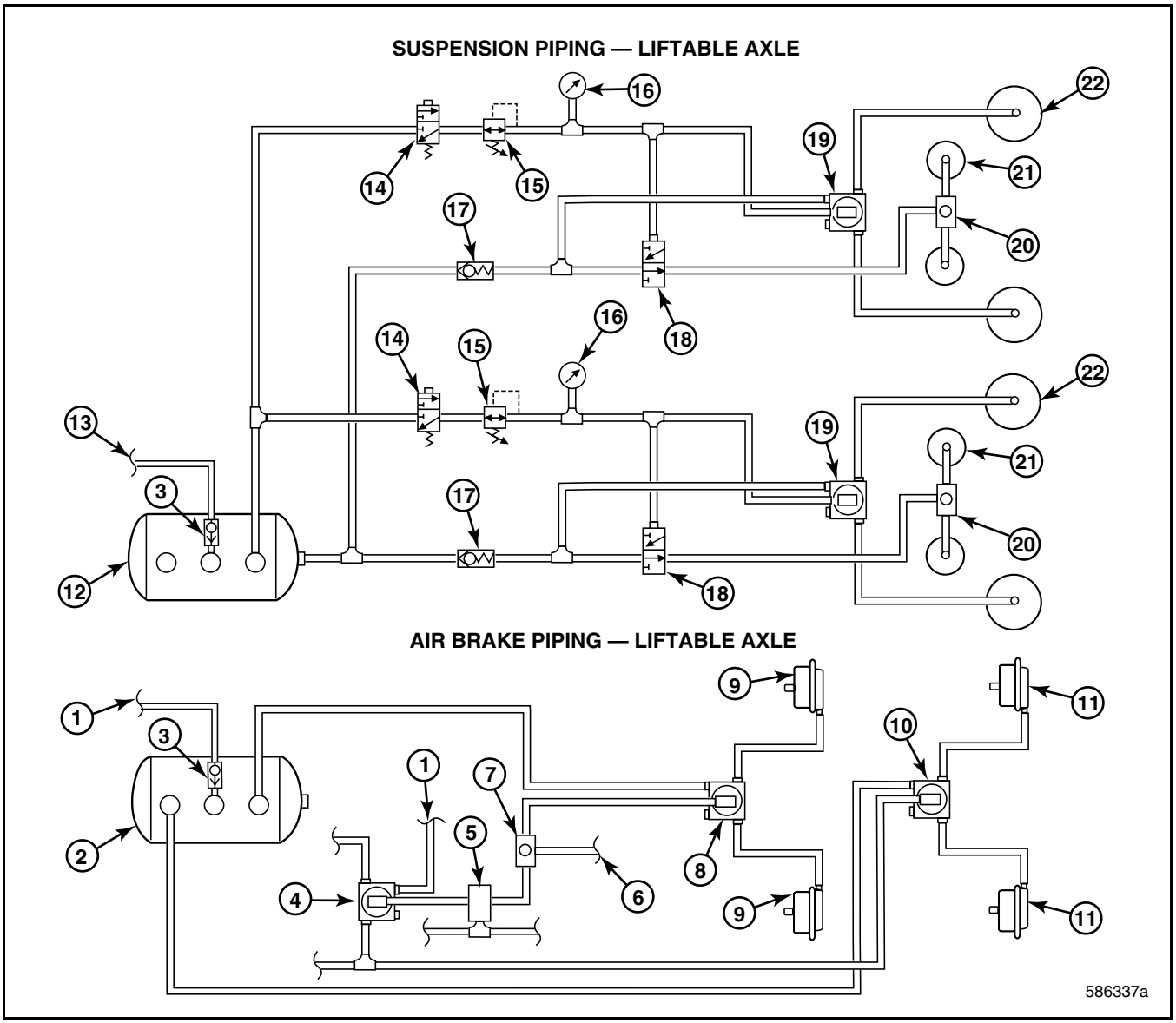


Figure 208 — One Tag Axle and One Pusher Axle

1. Primary Supply Pressure (from Primary Reservoir)
2. Primary Expansion Reservoir
3. One Way Check Valve (MACK Part No. 63AX3805)
4. Service Brake Relay Valve
5. ATC Valve (if Equipped)
6. Primary Control Pressure (from Treadle Valve)
7. Quick Release Valve (if Required)
8. Pusher Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)
9. Pusher Axle Brake Chamber
10. Tag Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)
11. Tag Axle Brake Chamber
12. Secondary Reservoir
13. Supply Pressure to Secondary Reservoir (from Supply Reservoir)
14. Up/Down Solenoid Valve (Tag and Pusher Circuits)
15. Pressure Regulator (Tag and Pusher Circuits)
16. Pressure Gauge (Tag and Pusher Circuits)
17. Pressure Protection Valve for Tag and Pusher Circuits (MACK Part No. 20QE2326AP2)
18. Lift Control Valve (Normally Open)
19. Tag and Pusher Suspension Air Bag Relay Valve
20. Quick Release Valve
21. Axle Lift Air Bags (Tag and Pusher Axles)
22. Axle Air Suspension Air Bags (Tag and Pusher Axles)

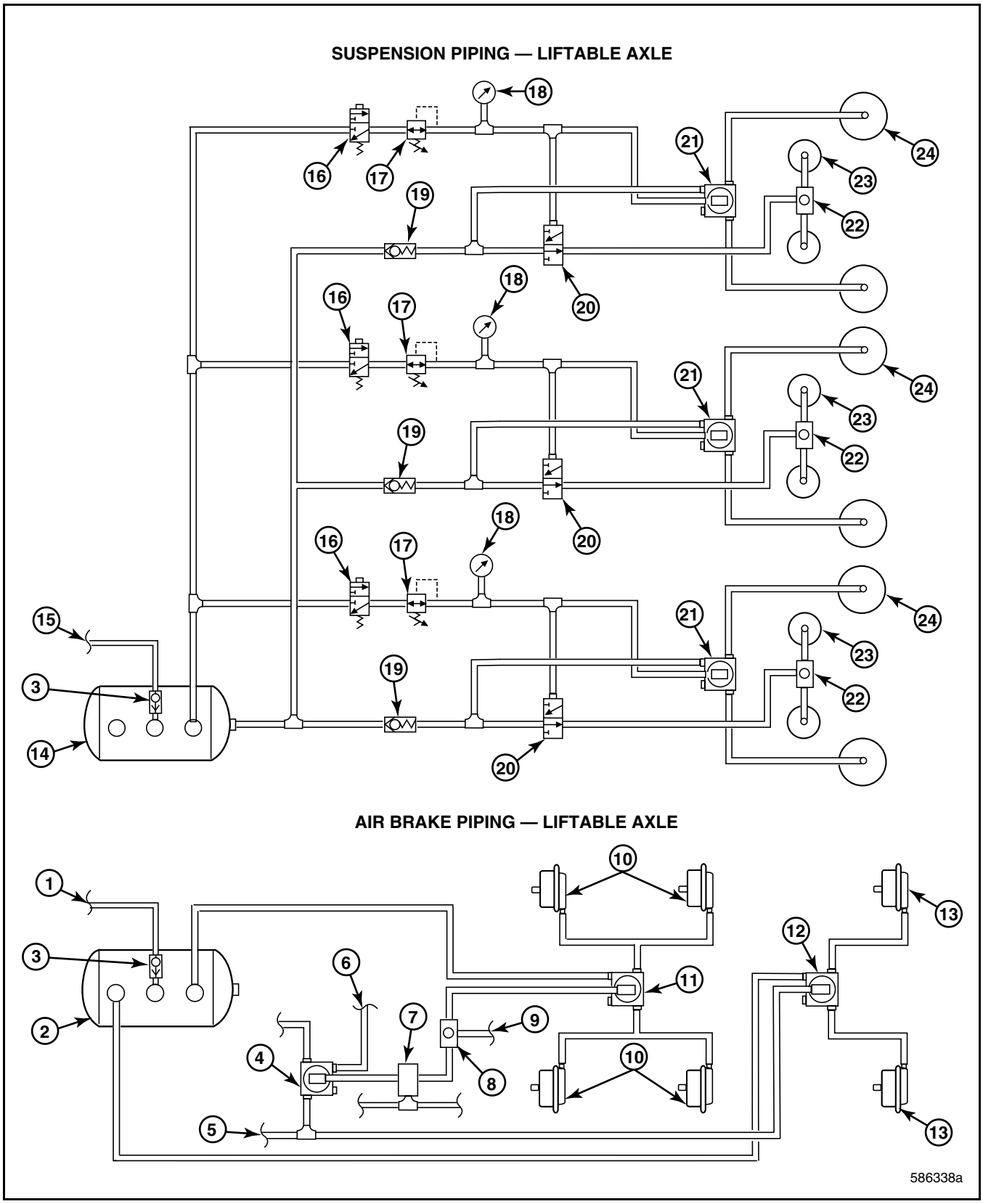
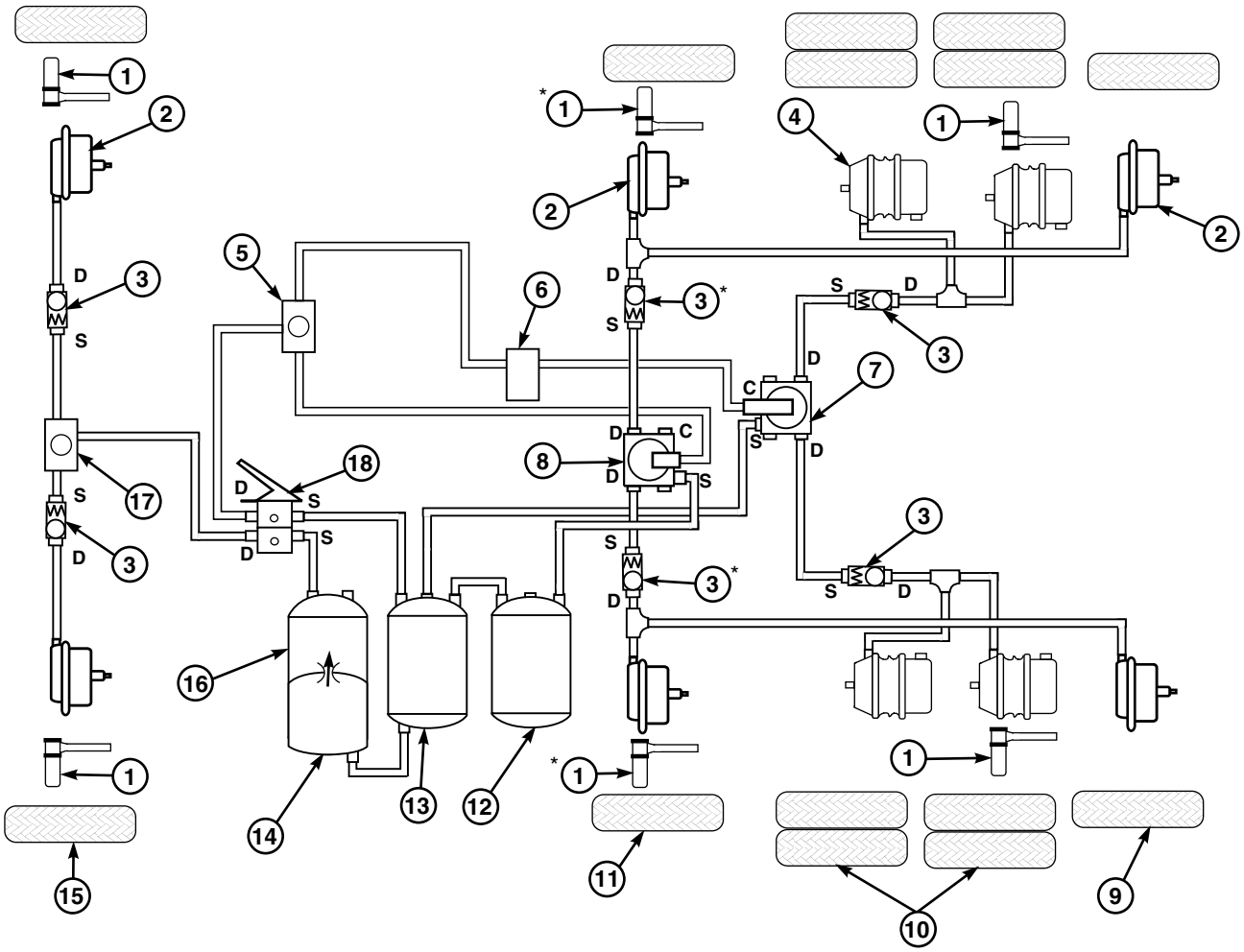


Figure 209 — Two Pusher Axles and One Tag Axle

1. Primary Supply Pressure (from Primary Reservoir)
2. Primary Expansion Reservoir
3. One Way Check Valve (MACK Part No. 63AX3805)
4. Rear Axle Service Brake Relay Valve
5. Delivery Pressure to Rear
6. Primary Supply Pressure
7. ATC Valve (if Equipped)
8. Quick Release Valve (if Required)
9. Primary Control Pressure (from Treadle Valve)
10. Pusher Axle Brake Chambers
11. Pusher Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)
12. Tag Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)
13. Tag Axle Brake Chamber
14. Secondary Reservoir
15. Supply Pressure (from Supply Reservoir)
16. Up/Down Solenoid Valve
17. Pressure Regulator
18. Pressure Gauge
19. Pressure Protection Valve (MACK Part No. 20QE2326AP2)
20. Lift Control Valve (Normally Open)
21. Liftable Axle Air Suspension Relay Valve
22. Quick Release Valve
23. Liftable Axle Lift Air Bag
24. Liftable Axle Suspension Air Bag

LIFTABLE AXLE — ANTI-LOCK BRAKES

Anti-lock brakes are not specifically required for liftable axles. Should anti-lock brakes be desired, however, the following piping diagrams illustrate how liftable axles can be included in the anti-lock brake system.



***REQUIRES 6S/6M ABS MODULE (MACK PART NO. 7MN46M5 [ARVINMERITOR PART NO. 446 003 702 0]), AND LIFT AXLE WITH ABS SENSORS MUST BE PROGRAMMED AS AXLE NO. 3.**

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Figure 210 — 6S/6M Anti-Lock Brakes with Single Tag and Single Pusher and One Relay Valve for Tag and Pusher Axles

1. ABS Sensor	9. Tag Axle
2. Brake Chamber	10. Drive Axles
3. ABS Modulator Valve	11. Pusher Axle
4. Spring Brake Chamber	12. Expansion Reservoir (Primary Air)
5. T-Fitting or Quick Release Valve (If Required)	13. Primary Reservoir
6. Automatic Traction Control (ATC) (If Equipped)	14. Supply Reservoir
7. Service Brake Relay Valve R-14	15. Steer Axle
8. Lift Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)	16. Secondary Reservoir
	17. Quick Release Valve
	18. Treadle Valve

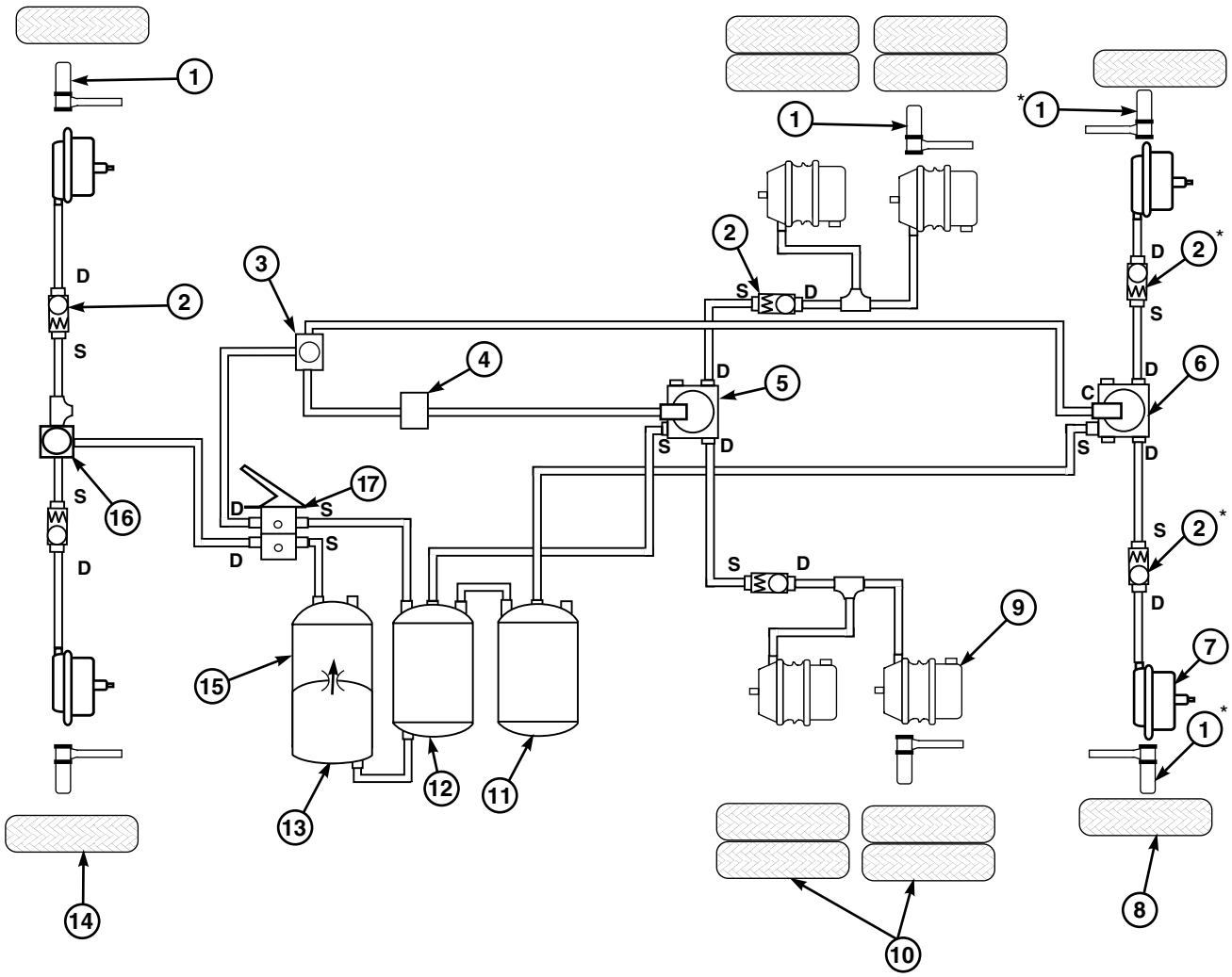

Figure 211 — 6S/6M Anti-Lock Brakes with Single Tag and One Relay Valve for Tag Axle Brakes

1. ABS Sensor	9. Spring Brake Chamber
2. ABS Modulator Valve	10. Drive Axles
3. T-Fitting or Quick Release Valve (If Required)	11. Expansion Reservoir (Primary Air)
4. Automatic Traction Control (ATC) Valve (If Equipped)	12. Primary Reservoir
5. Service Brake Relay Valve R-14	13. Supply Reservoir
6. Lift Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)	14. Steer Axle
7. Brake Chamber	15. Secondary Reservoir
8. Tag Axle	16. Front Axle Quick Release Valve
	17. Treadle Valve

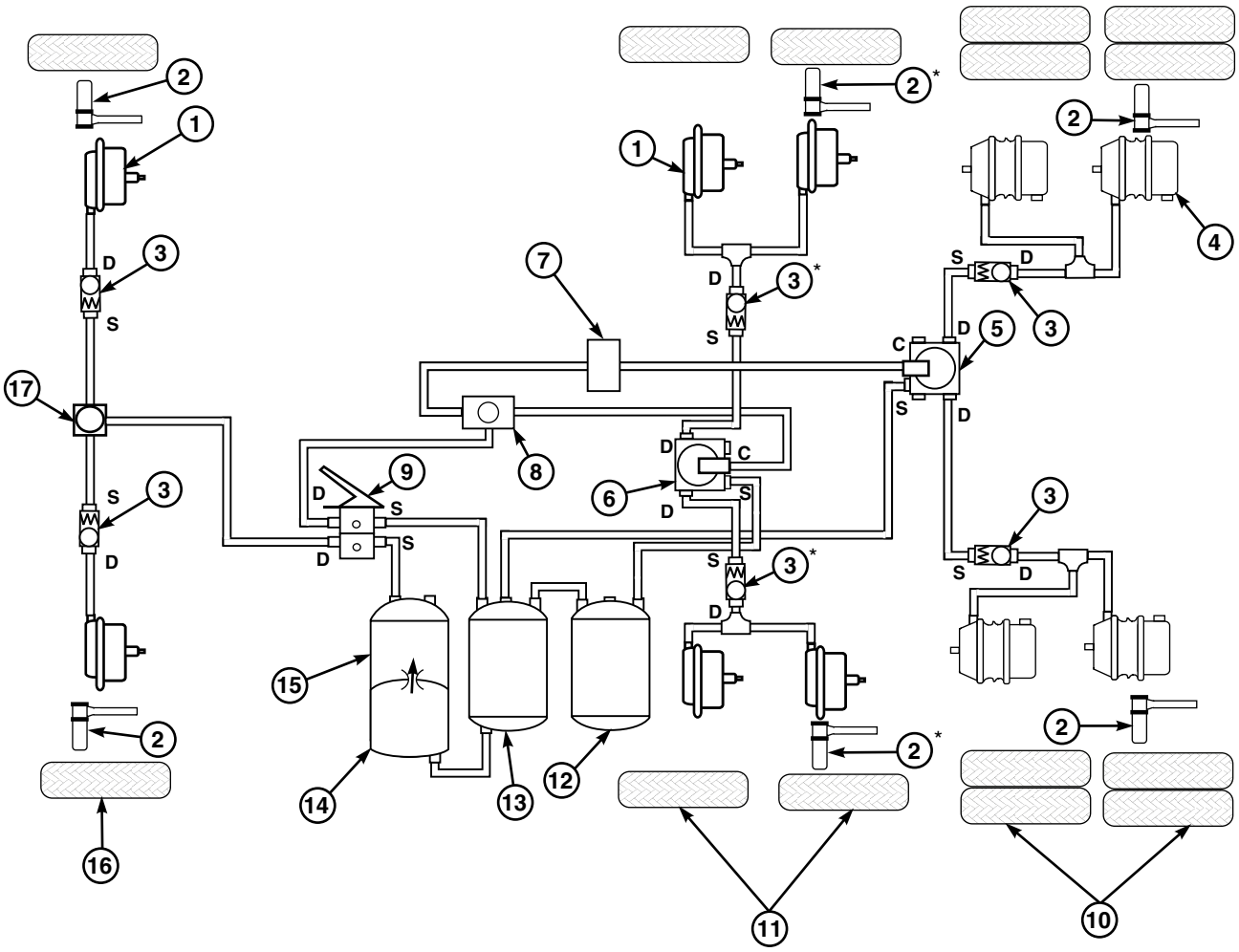

Figure 212 — 6S/6M Anti-Lock Brakes with Double Pusher and One Relay Valve for Pusher Axle Brakes

1. Brake Chamber	9. Treadle Valve
2. ABS Sensor	10. Drive Axles
3. ABS Modulator Valve	11. Pusher Axles
4. Spring Brake Chamber	12. Expansion Reservoir (Primary Air)
5. Service Brake Relay Valve R-14	13. Primary Reservoir
6. Lift Axle Service Brake Relay Valve R-12 (Part No. 8235-9732980360 or 745-103009)	14. Supply Reservoir
7. Automatic Traction Control (ATC) Valve	15. Secondary Reservoir
8. T-Fitting or Quick Release Valve (If Required)	16. Steer Axle
	17. Front Axle Quick Release Valve

AIR LINES — JOYSTICK CONTROL

MRU and LEU models include a bundle of seven 1/4" air lines routed from the joystick area inside the cab to the outside of the cab. These air lines provide a convenient means of connecting a joystick to the chassis air system and to the different systems that the joystick will control. Refer to the following illustration for the location of the air line bundle.

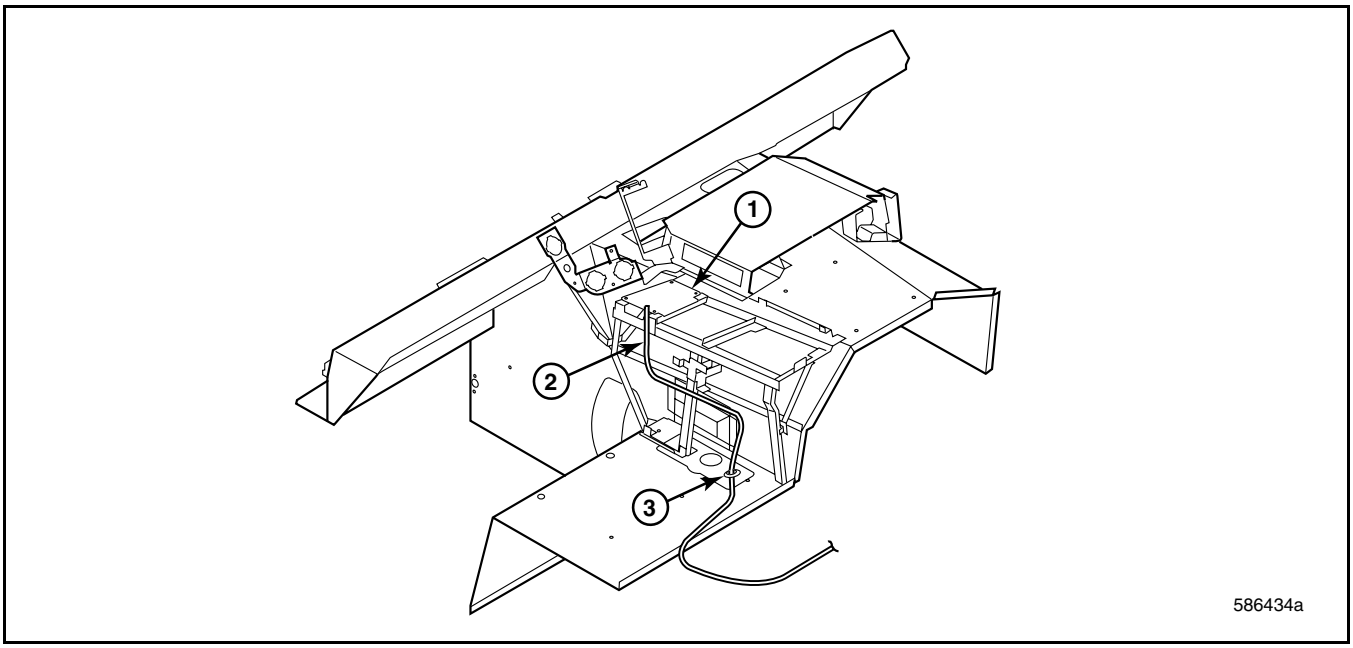

Figure 213 — Joystick Air Line Bundle — MRU Models

1. Joystick Air Line Bundle 2. Joystick Mounting Area	3. Air Line Bundle Pass-Through Grommet

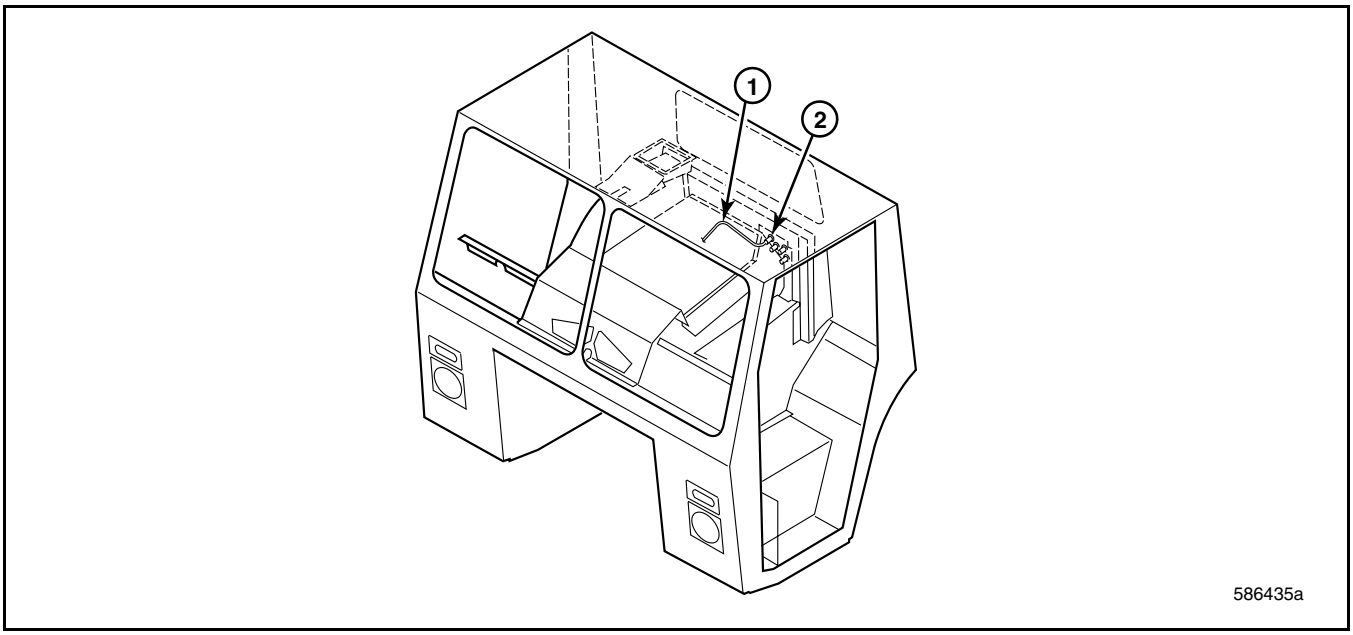

Figure 214 — Joystick Air Line Bundle — LEU Models

1. Joystick Air Line Bundle	3. Air Line Bundle Pass-Through Grommet

AIR LINE HOSE — INSTALLATION

Flexible air line hose may eventually fail. However, by following proper installation, clamping and routing procedures, hose life can be maximized. Also, when selecting an air line hose, make sure that the hose is the same diameter as the hose being replaced. Replacing an air line hose with a different size hose may affect brake timing.

Avoid Twisting — Hoses are imprinted with a layline along the length of the hose to help determine if the hose is twisted. The hose is twisted if the layline spirals around the hose. Swivel fittings make it possible to install a hose without a twist. When installing a hose, install one fitting so that the layline is visible when the fitting is tight. While the other fitting is still loose, the hose may be rotated as needed until the layline follows the hose routing without spiraling around the hose. Similarly, elbow fittings can be aligned to avoid hose twist.

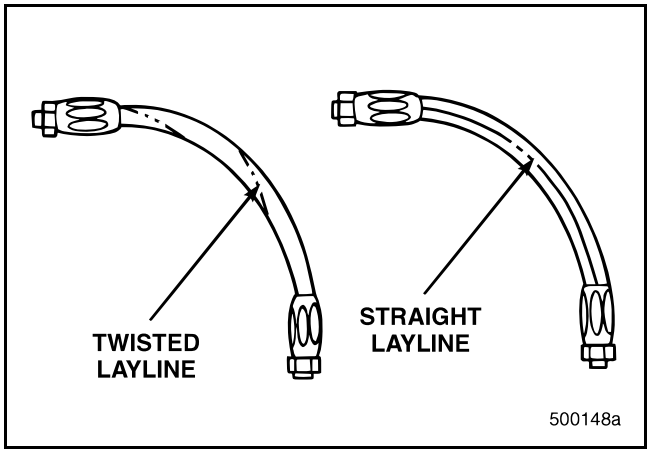

Figure 215 — Twisted and Straight Laylines

Avoid Excessive Torque on Fittings — Unlike pipe threads, swivel fittings do not depend on thread compression to seal. DO NOT overtighten a swivel fitting, as this will damage the fitting or sealing surfaces.

An air line should be installed as follows:

1. Tighten male pipe ends of hose assemblies first, then tighten the swivel fittings.
2. Whenever possible, install any adapters needed in accessories (as a bench procedure) first.
3. Use an adjustable or open end wrench to install air hose assemblies. DO NOT use pipe wrenches as they will mar the fittings and damage the plating material.
4. DO NOT use pipe thread-sealing compound on swivel-nut hose fittings. Thread sealant should only be used on pipe threads.
5. When installing male-end fittings, use the nipple hex, not the socket hex, to tighten the fitting. Refer to Figure 216.

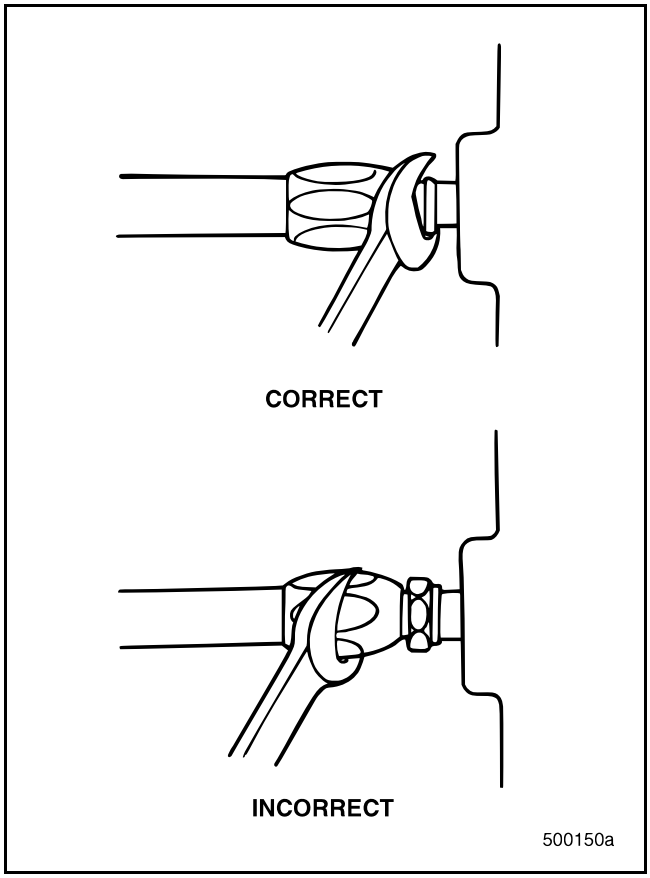

Figure 216 — Tightening Male-End Fittings

Air Fittings — Quick Disconnect

Quick connect style (push-to-connect) air fittings may be used for various applications in the chassis air system. The following guidelines for fitting disassembly and assembly will greatly reduce the possibility of an air leak.

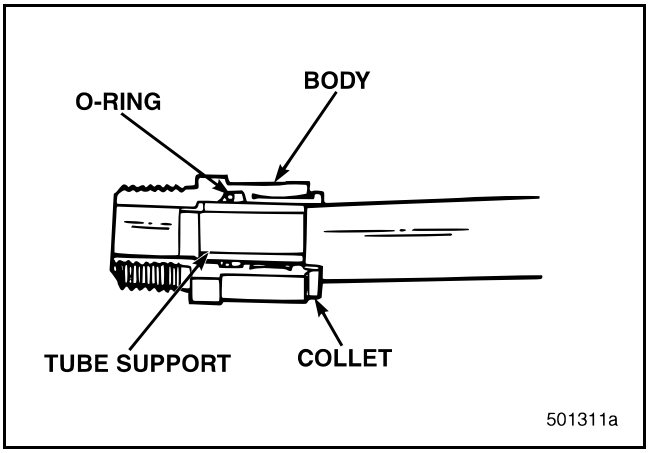

Figure 217 — Push-to-Connect Fitting Cross-Sectional View

FITTING DISASSEMBLY

1. Ensure that all pressure has been exhausted from the line before disassembling.
2. Using either the Weatherhead Tube Release tool (Weatherhead part No. 1800TRK) or fingers, depress the collet head to release the grip on the tubing.

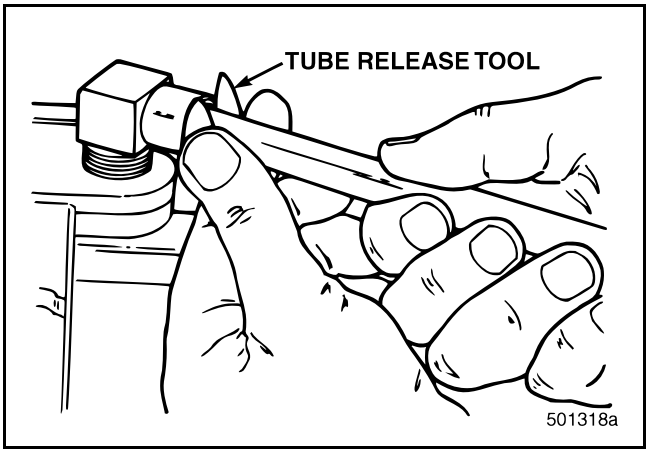

Figure 218 — Depress Collet

3. With the collet depressed, pull the tubing from the fitting.

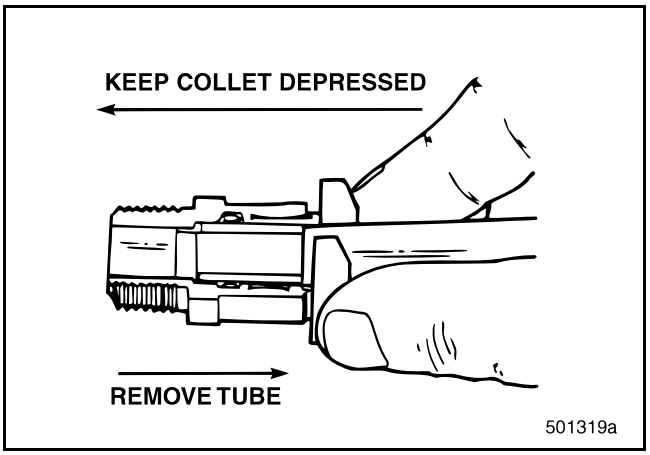

Figure 219 — Remove Tube

FITTING ASSEMBLY GUIDELINES

1. When installing a fitting, install hand-tight, then make final adjustments with a wrench on the hex or flats of the fitting body. Do not use a wrench near the tubing entry or collet head of the fitting.

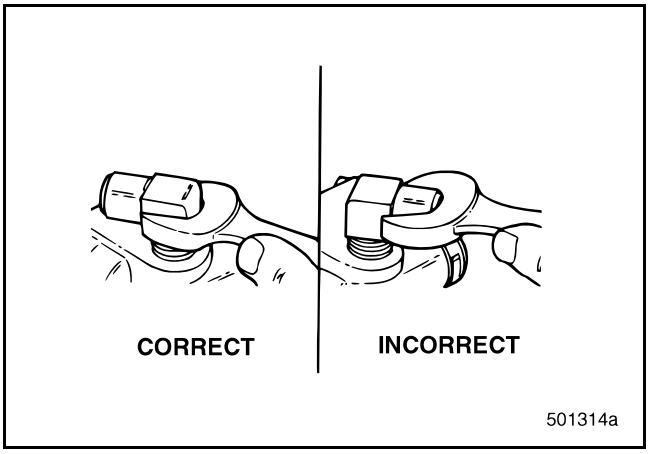

Figure 220 — Proper Fitting Installation

2. When preparing the tube for installation, a square (90-degree), clean cut edge is recommended. An angled cut up to 15 degrees, however, is acceptable.

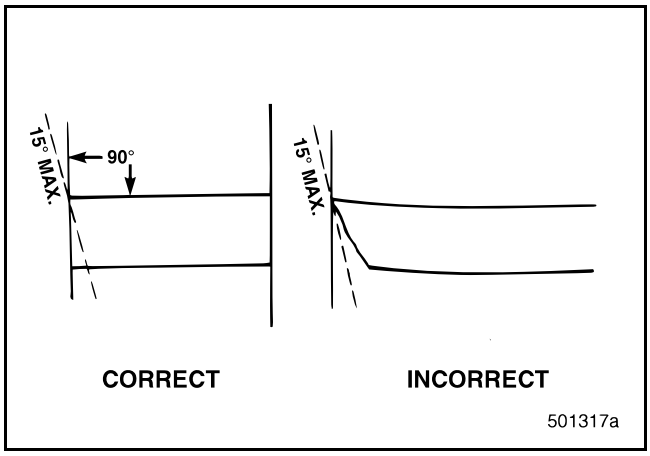

Figure 221 — Clean, Square Cut Tubing Edge

Use a tubing cutter (Weatherhead part No. T919 or equivalent) to ensure a good clean cut. Dull knives, side-cutters or other types of cutting tools may not ensure a good, clean cut. Burrs, oval tubing and contamination can damage seals and other air system components.

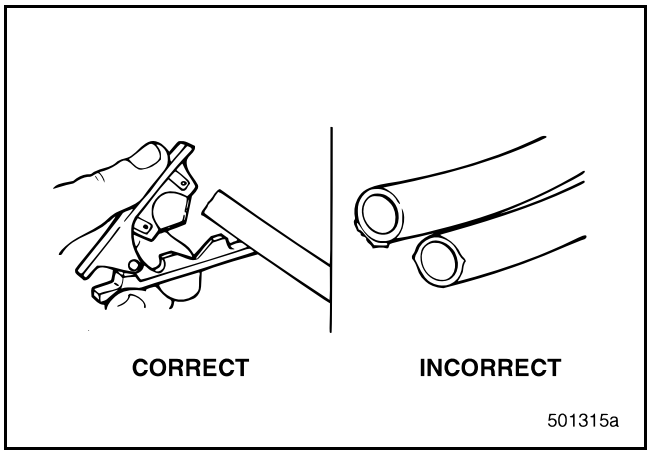

Figure 222 — Use a Tubing Cutter for Proper Cut Edges

3. Install the tubing straight into the fitting until a solid stop is felt. The tubing grip and seal (on the O-ring) is then accomplished. Always protect against contaminants in cartridges and fittings during assembly.

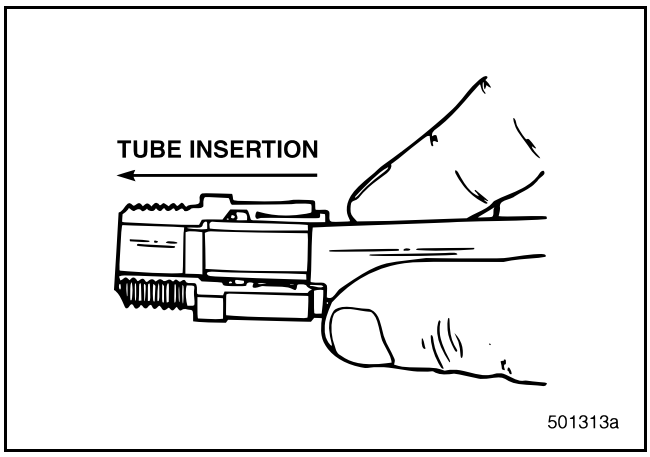

Figure 223 — Insert Tube

NOTE

DO NOT use detergent, soap and water, or similar types of solutions as a lubricant when installing the tube.

4. After the tube is fully inserted, gently tug on the tubing to ensure that it is secure in the fitting.

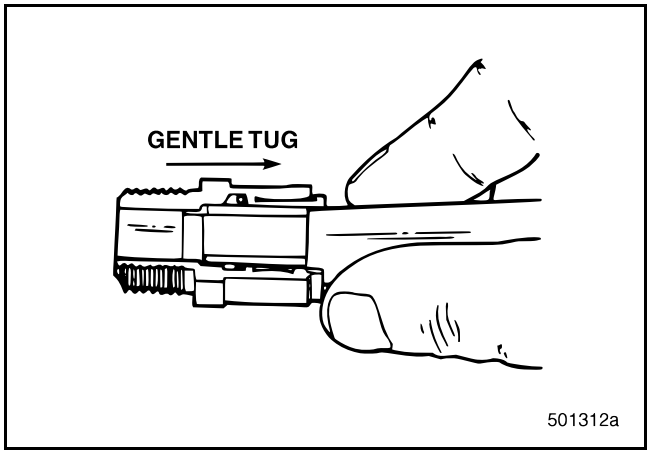

Figure 224 — Ensure Tubing is Secure

5. Check the completed installation. Allow the tube ample room for a gradual bend. Severe bends can collapse the tubing, resulting in line blockage, flow restrictions and an eventual air leak.

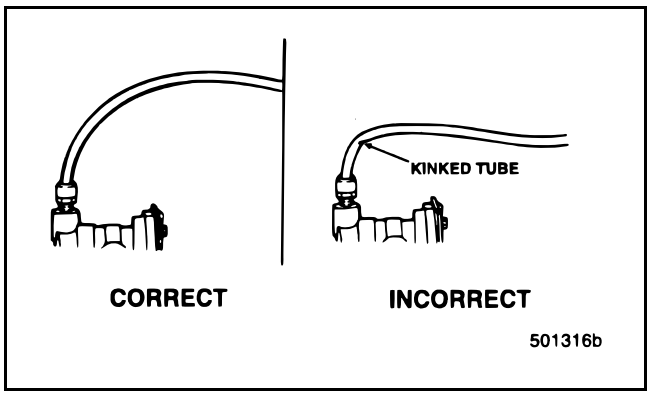

Figure 225 — Inspect Final Installation

6. Start the engine and allow the air system to build pressure to governor cut-out. Stop the engine. Then, using soap and water solution, check the installation for leaks.

Air Lines — Routing

A leading cause of flexible air line leakage is routing. Hoses that are too long, too short, twisted, have sharp bends or that rub against other components will eventually leak.

The following basic rules apply when installing and routing flexible air line:

- A flexible air line should be routed in a straight line or should follow the contours of the equipment to which it is clamped.

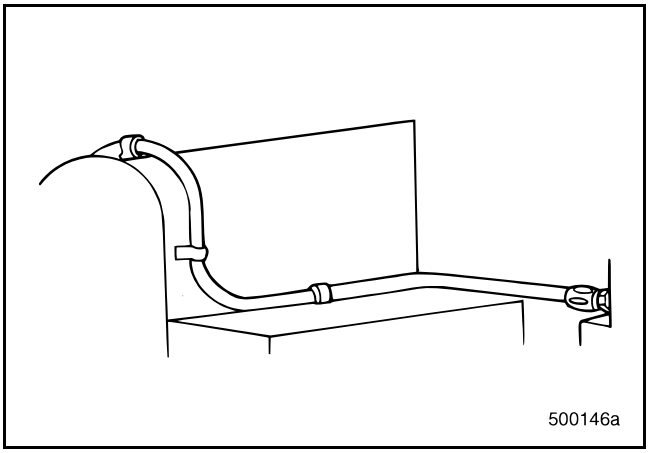

Figure 226 — Flexible Air Line Following Contour of Equipment

- Pairs of flexible air line should be routed together and parallel.

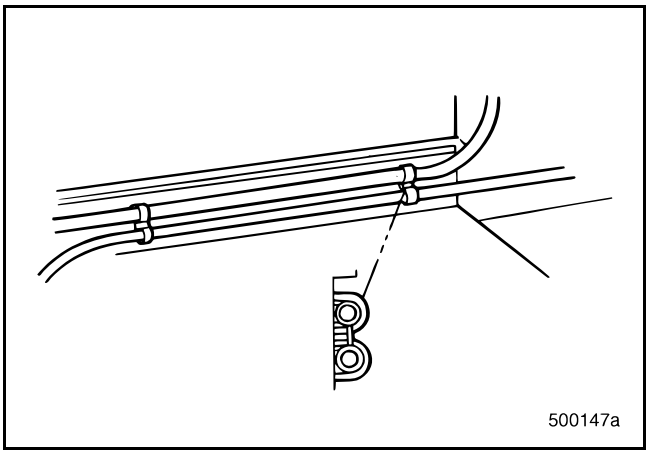

Figure 227 — Air Line Pairs Routed Parallel

- A flexible air line should be routed and clamped to prevent contact with points of abrasion. When clamping air lines, use clamps that are suitably sized for the diameter of hose. Clamps that are too large allow the hose to move in the clamp, and clamps that are too small may pinch the hose.

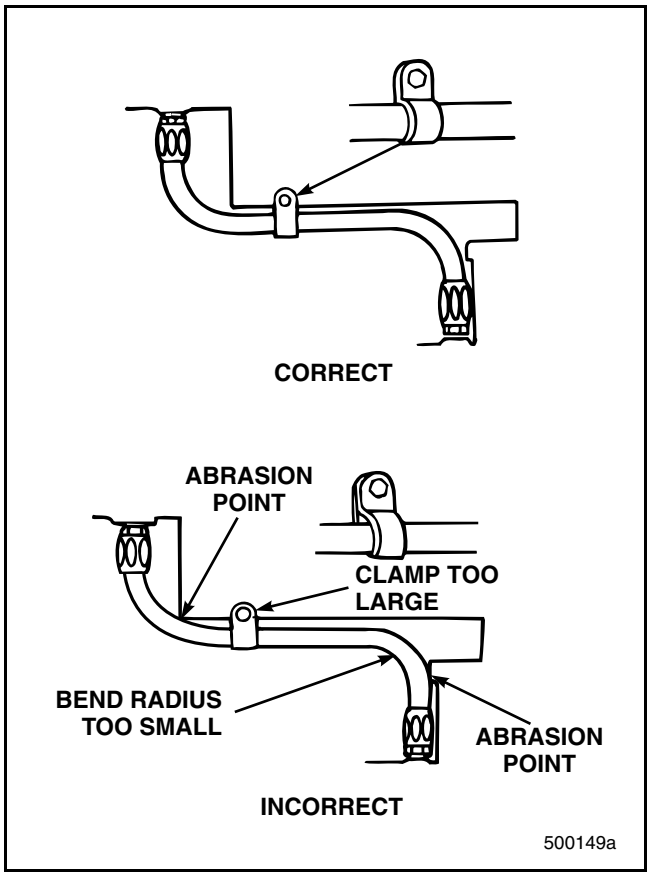

Figure 228 — Route and Clamp Line to Prevent Abrasion

- A flexible air line must be routed and adequately clamped to avoid contact with sharp edges. Clamps should be installed so that the air line is properly supported to prevent drooping and contacting a sharp edge.

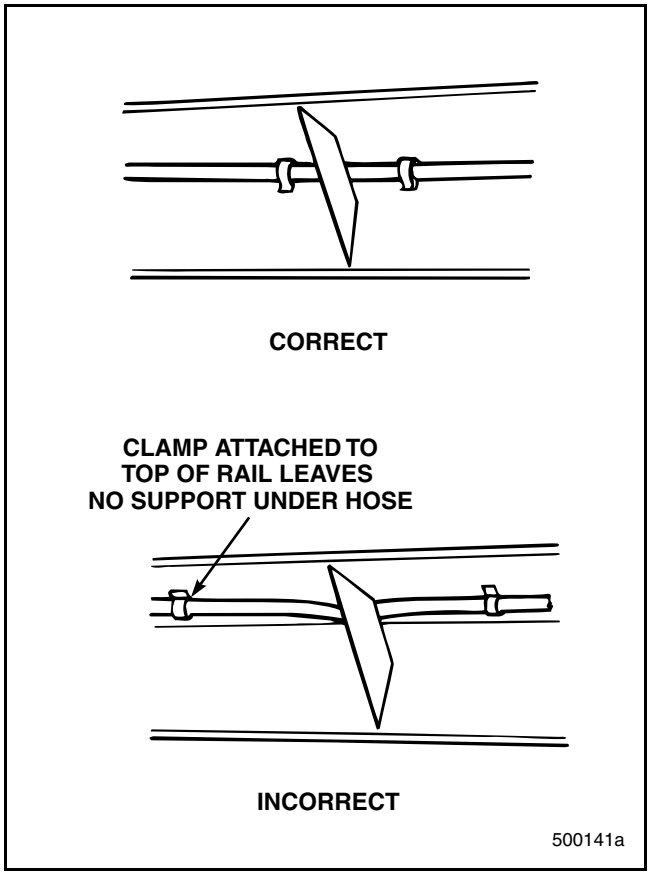

Figure 229 — Clamps Provide Proper Support

- Route flexible air line to avoid moving parts. If necessary, use a stand-off bracket to clamp the line away from a moving part.

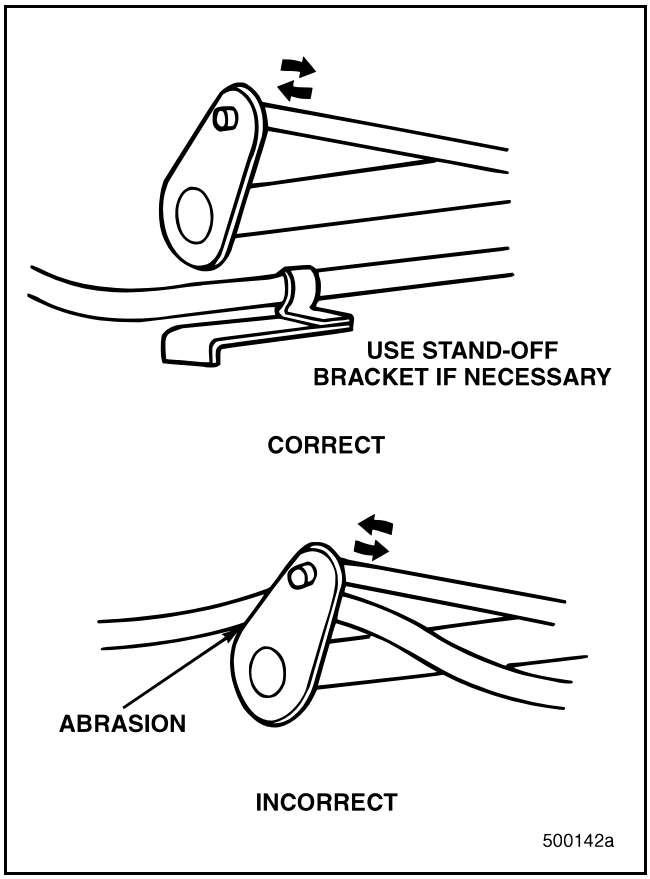

Figure 230 — Route to Avoid Moving Parts

- DO NOT crisscross flexible air lines. The “sawing” action between crisscrossed hoses eventually causes the line to leak. Use suitable clamps to keep the crisscrossed hoses apart.

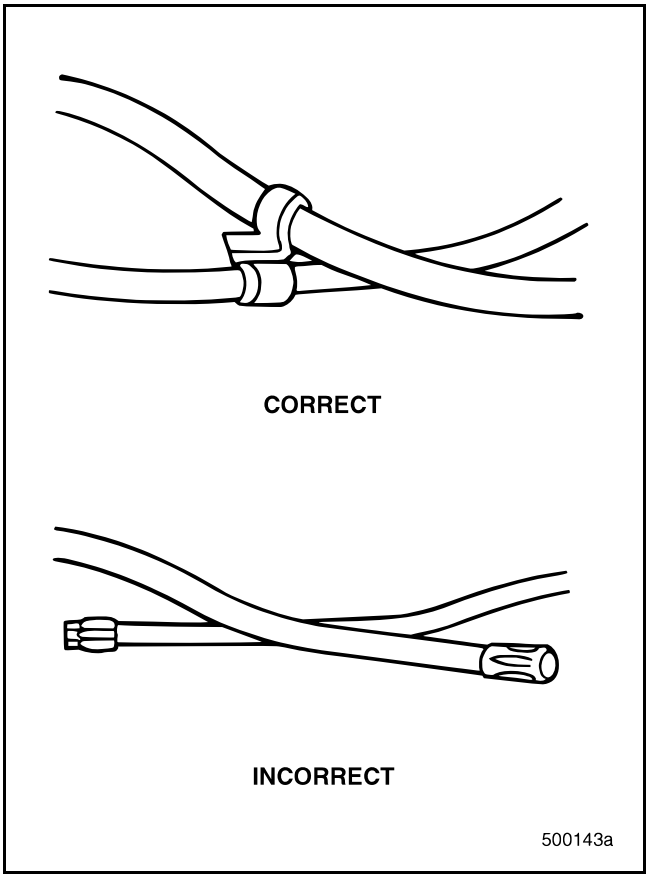

Figure 231 — Properly Clamp Crisscrossed Lines

When routing a flexible air line between components in relative motion, leaks due to abrasion and/or less than optimal bend radius may occur. To minimize possible air leakage, the following guidelines are recommended:

- Sufficient line length must be provided to allow for movement.
- Fittings must not be part of the flexible portion of the hose assembly. To minimize twisting, the hose should bend in the same plane of motion as the boss to which it is connected.

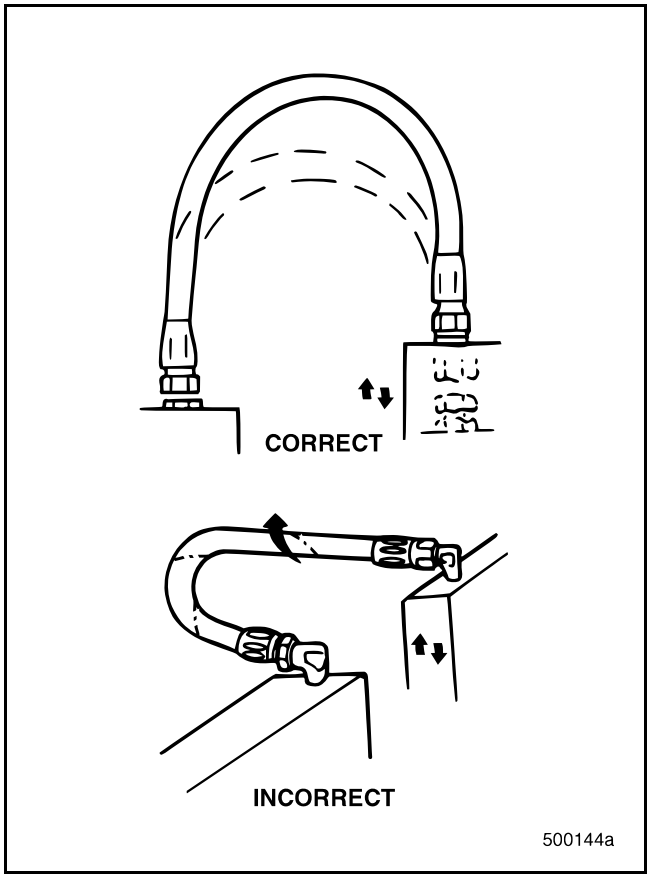

Figure 232 — Install Line to Bend in Same Plane of Motion

- Flexible air line that is bent in two planes should be clamped at the point where the line changes planes. In effect, this divides the line into two assemblies. DO NOT use nylon tubing in these types of applications.

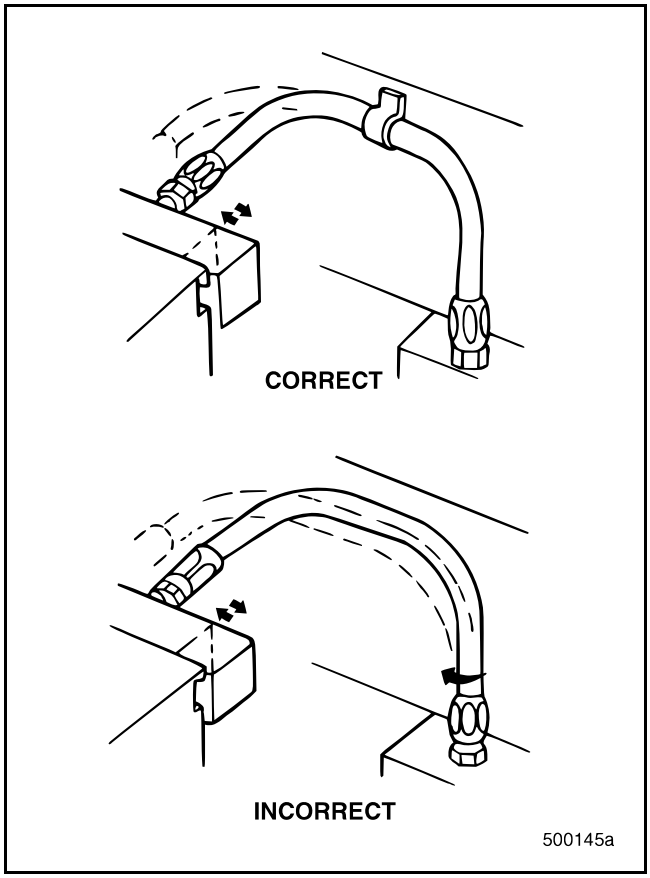

Figure 233 — Clamp Line Where Planes Change

When an air line is routed close to a high heat source (e.g., exhaust pipe, exhaust manifold or radiator), the following minimum clearances must be maintained:

- Braided hose — 4 inches
- Plastic, nylon or rubber line — 6 inches

The above clearances may be reduced if an appropriate heat shield is used.

Air Lines — Clamping

To minimize the occurrence of air leakage, the following clamp installation procedures are recommended:

- When installing a clamp, install the fastener parallel to the ground with the clamp suspended from the fastener and the clamp well backed.

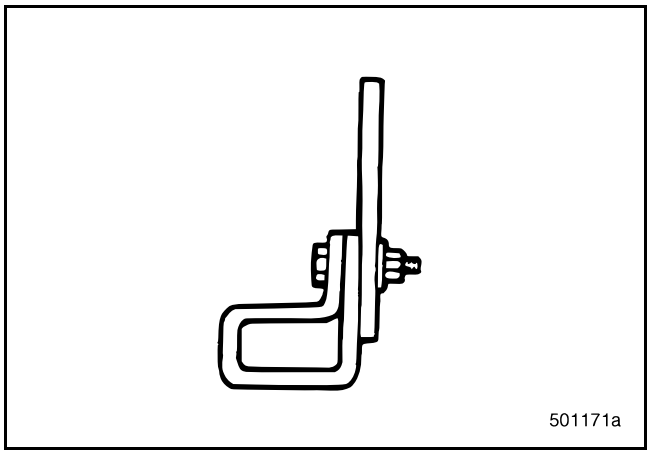

Figure 234 — Preferred Clamp Installation

- DO NOT install the clamp fastener perpendicular to the ground. The weight of the clamped line may cause the clamp to bend and the line to move.

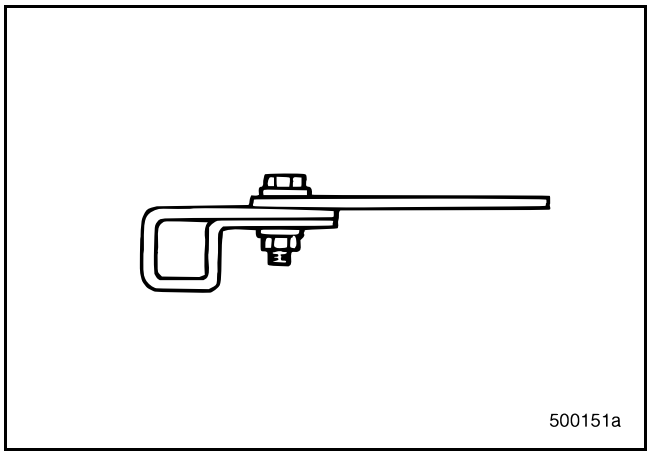

Figure 235 — Avoid Installation Where Fastener is Perpendicular to Ground

- If the clamp fastener must be installed perpendicular to the ground, provide full-length support for the clamp.

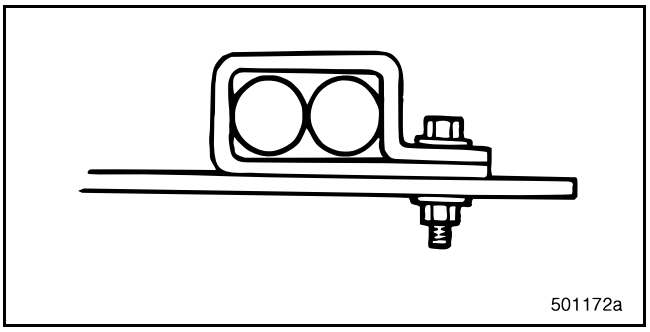

Figure 236 — Provide Proper Clamp Support

- When installing two clamps on one fastener, install the upper clamp first, then suspend the second clamp.

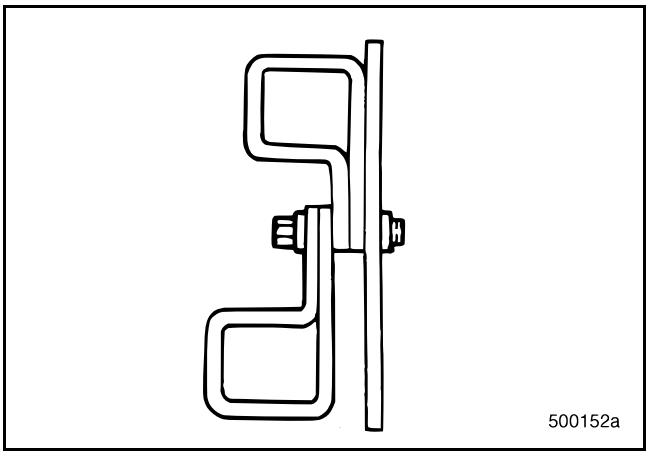

Figure 237 — Installing Two Clamps on One Fastener

Avoid installations where the clamp will not be adequately supported.

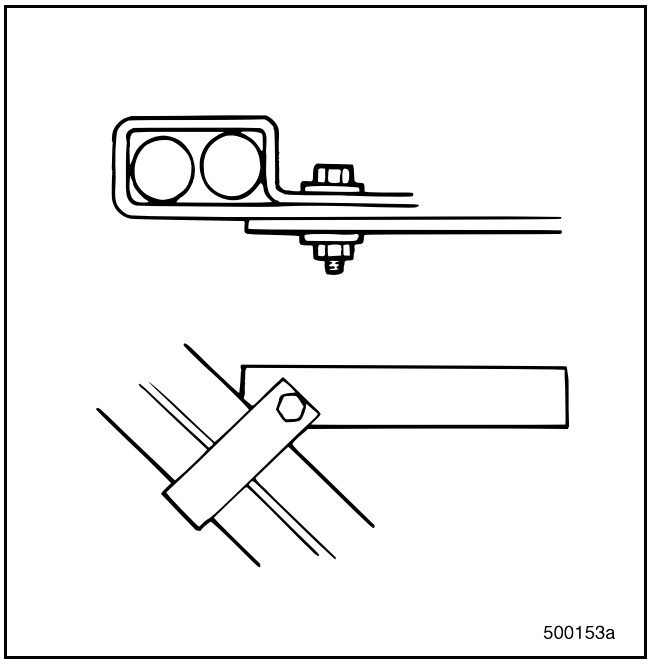

Figure 238 — Avoid Inadequate Clamp Support

- When clamping multiple hoses, provide a backing of 0.25 inch minimum past the mounting legs of the clamp.

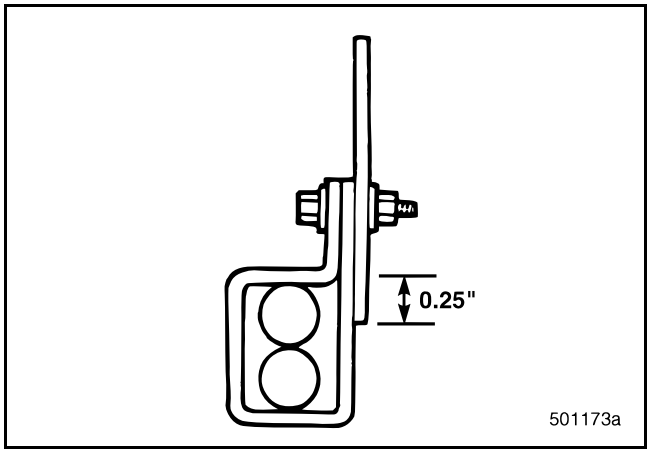

Figure 239 — Proper Backing for Multiple-Hose Clamp Installations

- Inverted clamps may be used if the clamp material is of adequate strength to support the load and resist bending.

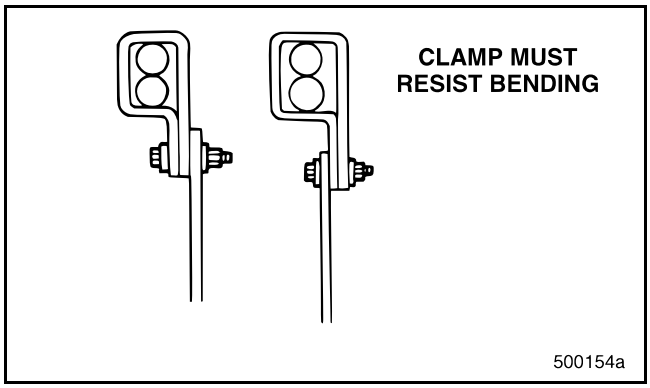

Figure 240 — Inverted Clamp Installation

- If an installation requires that the clamp mounting legs be bent, make sure the clamp material is of adequate strength to support the load and resist further bending.

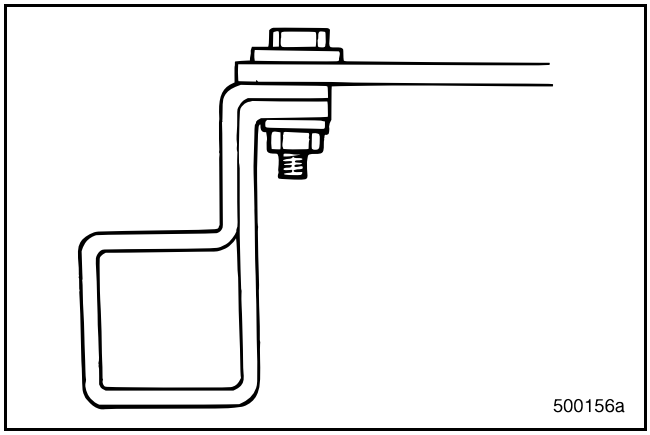

Figure 241 — Bent Clamp Leg Installation

CLAMPS

Rubber-covered metal-band clamps of suitable size for the hose being clamped should be used for primary support. DO NOT use a clamp that is too large for the diameter of the hose, because the hose may rub against the clamp and result in an air leak.

TIE WRAPS

Nylon tie wraps should be used for bundling air lines together, when necessary, between primary supporting clamps. Do not use tie wraps for primary support of hose lines unless button-head tie wraps are used. Additional information concerning button-head tie wraps can be found in the section “BUTTON-HEAD TIE WRAPS” on page 274.

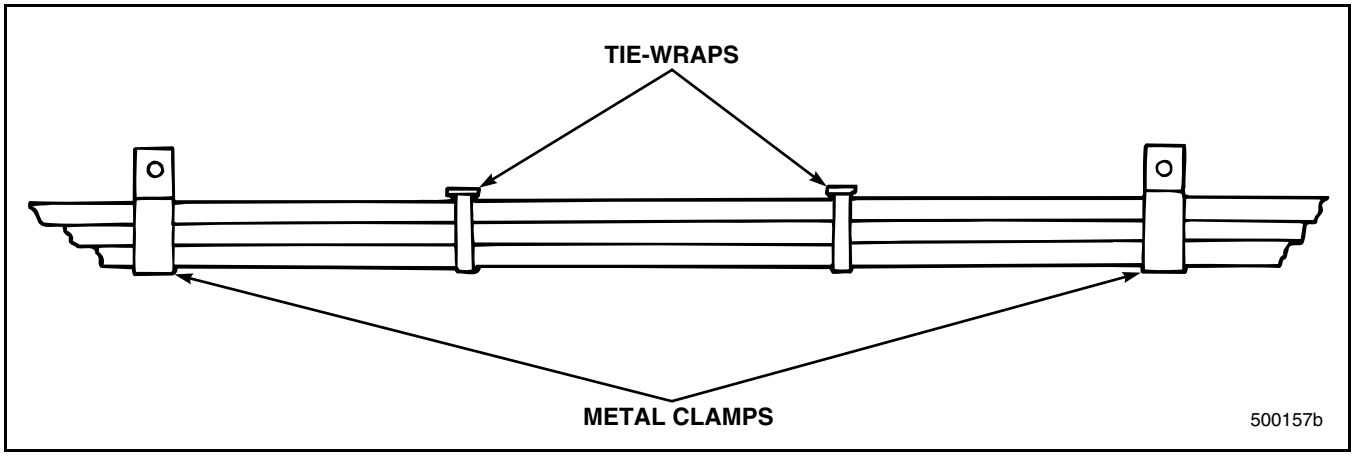

Figure 242 — Metal Clamps for Primary Support, Tie Wraps for Bundling

Nylon tie wraps may be used for primary support when clamping additional hoses to metal clamped hoses as long as the number and size of the additional hose(s) are not greater than the metal clamped hoses. When installing tie wraps, they should be snug, but not so tight as to collapse or cut the hose. Always trim the ends of the tie wraps.

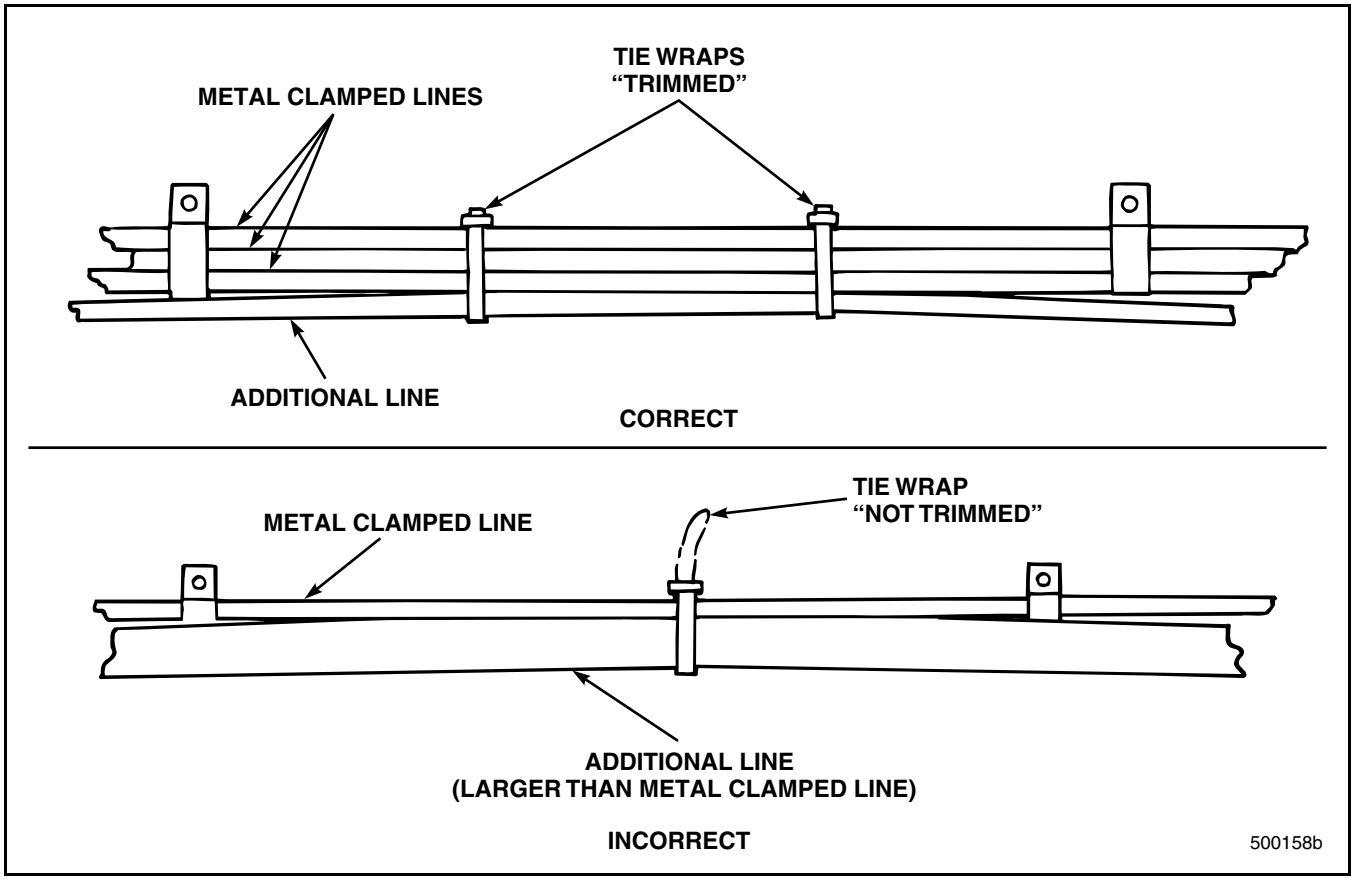

Figure 243 — Use Tie Wraps for Primary Support of Additional Hose(s)

BUTTON-HEAD TIE WRAPS

Button-head tie wraps were used in certain applications for primary support of air lines at MACK assembly plants. If it becomes necessary to cut this type of tie wrap to install a new air line, install a **new** button-head tie wrap as follows:

- Install the tie wrap through the frame hole and around the air line(s).
- Tighten the wrap by hand until snug, then use Panduit tool No. GS4H or Snap-on® tool No. YA317 to properly tension and cut off the excess end of the tie-wrap.
- The cutoff should be flush with the button-head, leaving no burrs or sharp edges. If these special tools are not available, or if the tie wrap was originally installed on a stand-off bracket and clearance for using the tensioning tool is insufficient, tension the tie wrap by hand, then cut off the excess with a diagonal cutter (or similar tool). The tie wrap should be tight, but not so tight that it collapses or pinches the line.
- For bundled air line installations, the lines should be secure within the bundle and without excessive clearance. Refer to the following illustration.

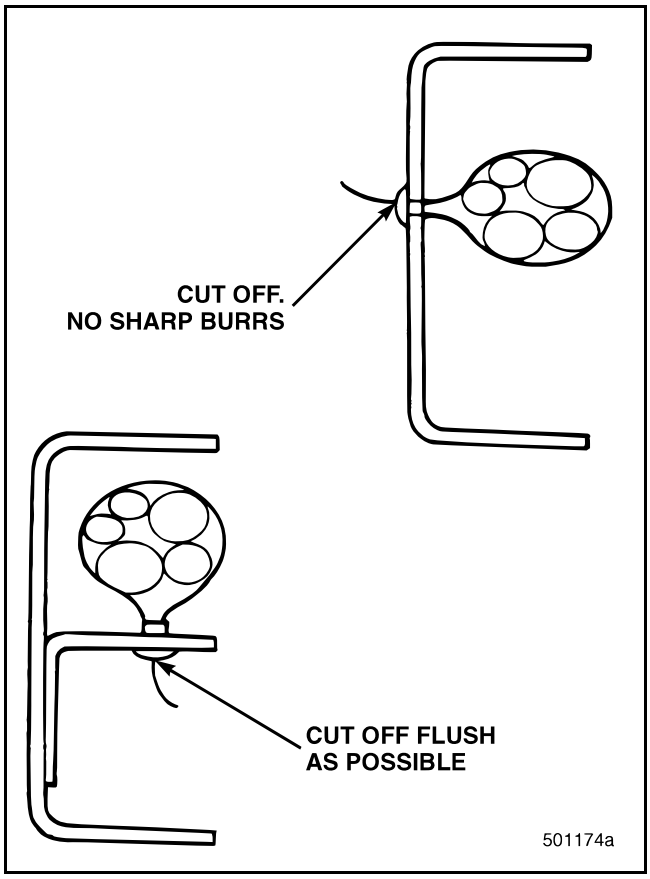

Figure 244 — Installing Button-Head Tie Wraps

TIE WRAPS WITH FRICTION CLIPS

- When using tie wraps with friction clips, install the tie wrap through the slots in the clip and around the air lines.
- Tighten the tie wrap by hand until snug, then trim the excess. DO NOT leave sharp edges on the cut end of the tie wrap.
- For this type of installation, the air lines must be adequately supported as shown below.

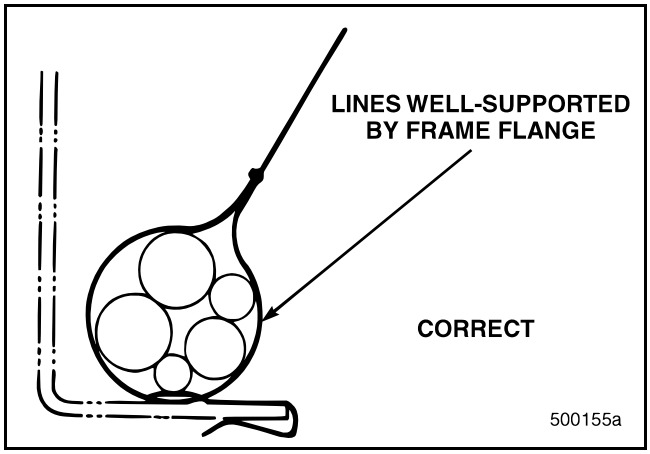

Figure 245 — Proper Installation

- DO NOT use tie wraps with friction clips in installations where side loads may be applied because the clip and air lines may be forced off the frame. DO NOT allow the weight of the air lines to hang from the friction clip.

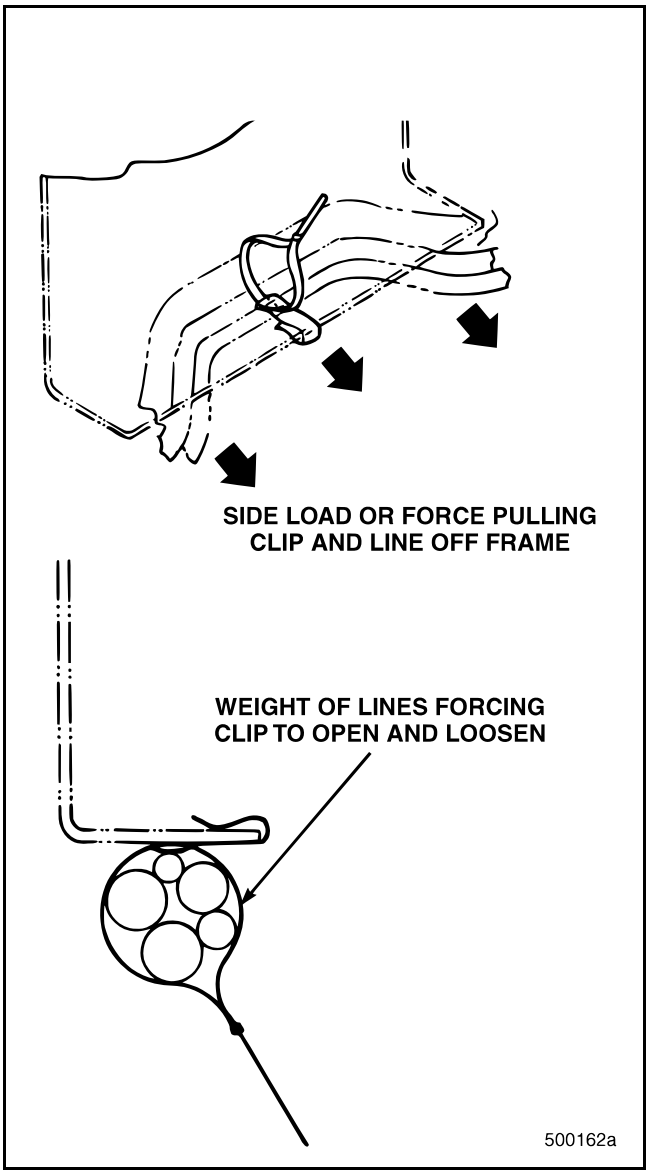

Figure 246 — Improper Installations

Air Lines — Minimum Allowable Radius

For rigid air lines, minimum bending radius recommendations are as follows:

RIGID AIR LINES

	Minimum Bending Radius	
Tubing OD	**Bent by Hand**	**Bent with Bending Tool**
1/4″	1″	9/16″
3/8″	2″	1″
1/2″	3″	1-1/2″
5/8″	4″	2″
3/4″	6″	2-1/2″

For flexible air lines, minimum bending radius recommendations are as follows:

FLEXIBLE AIR LINES

Hose Size	Hose ID	Hose OD	Minimum Bending Radius
No. 4	3/16″	0.52″	3/4″
No. 6	5/16″	0.68″	1-1/4″
No. 8	13/32″	0.77″	1-3/4″
No. 10	1/2″	0.92″	2-1/4″

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