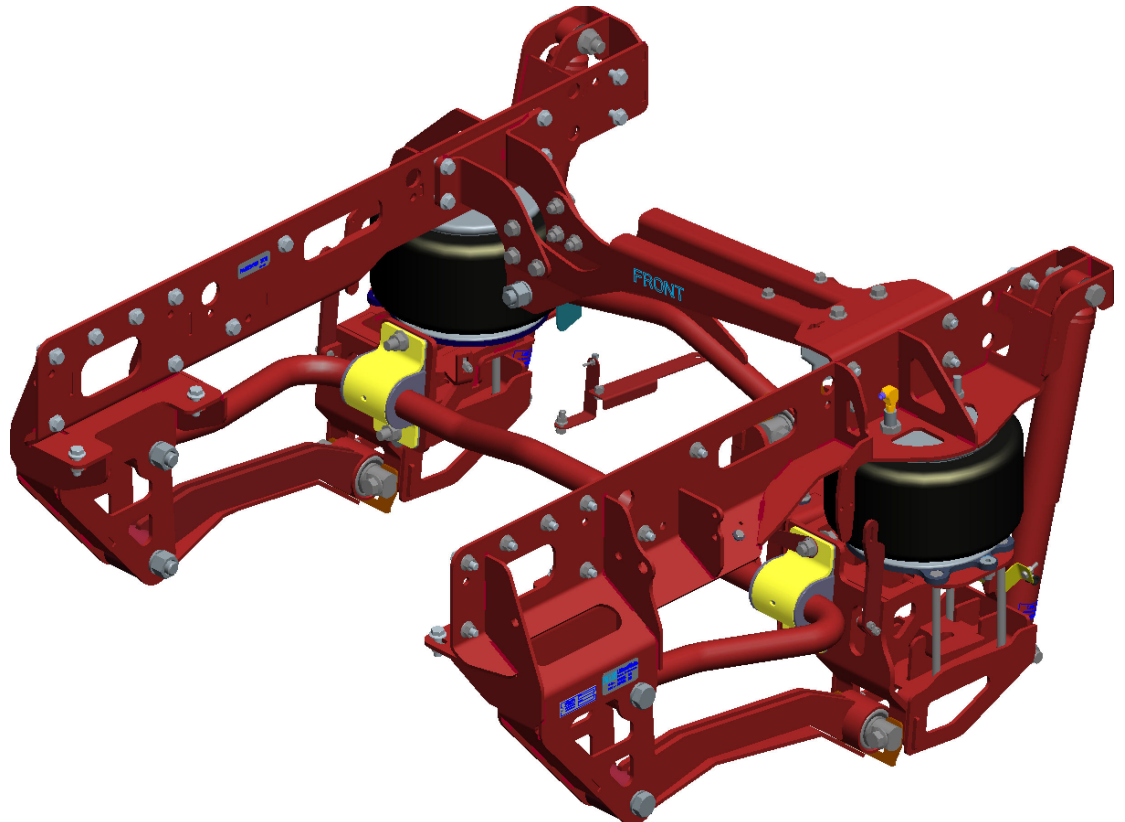


INSTALLATION GUIDE



RAM 4500/5500 CHASSIS CAB 4X2 & 4X4
16,000-19,500 GVW RANGE
2008-NEWER MODELS
(13.5K) REAR AXLE
Link Part No. 8M000100



Questions? Contact this Professional Installer :

Company : _____

Phone : _____

Installer : _____ Date : _____

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1. INTRODUCTION

NOTE: It is important that the entire installation instructions be read thoroughly before proceeding with suspension installation.









WARNING! A correct installation must result in the suspension and axle being “loaded” within the range specified by axle and suspension manufacturers. Please check vehicle specifications and intended usage to insure axle will be within Gross Axle Weight Rating (GAWR). No alteration of any suspension component is permitted. Link Mfg. is not responsible for damages from improper installation or operations beyond design capability. Link Mfg. in its sole discretion shall determine whether or not any product is defective or otherwise covered by warranty.

PRODUCT INSTALLER RESPONSIBILITIES

- ❑ Installer is responsible for installing the product in accordance with Link Mfg. specifications and installation instructions.
- ❑ Installer is responsible for providing proper suspension to vehicle attachments.
- ❑ Installer is responsible for assuring necessary clearance for vehicle and suspension components, such as axle, wheels, tires, exhaust, and air springs to ensure safe operation.
- ❑ Installer is responsible for advising the owner of proper use, service and required maintenance, and for supplying maintenance and other instruction supplied by Link Mfg.

SAFETY SYMBOLS, TORQUE SYMBOL, and NOTES

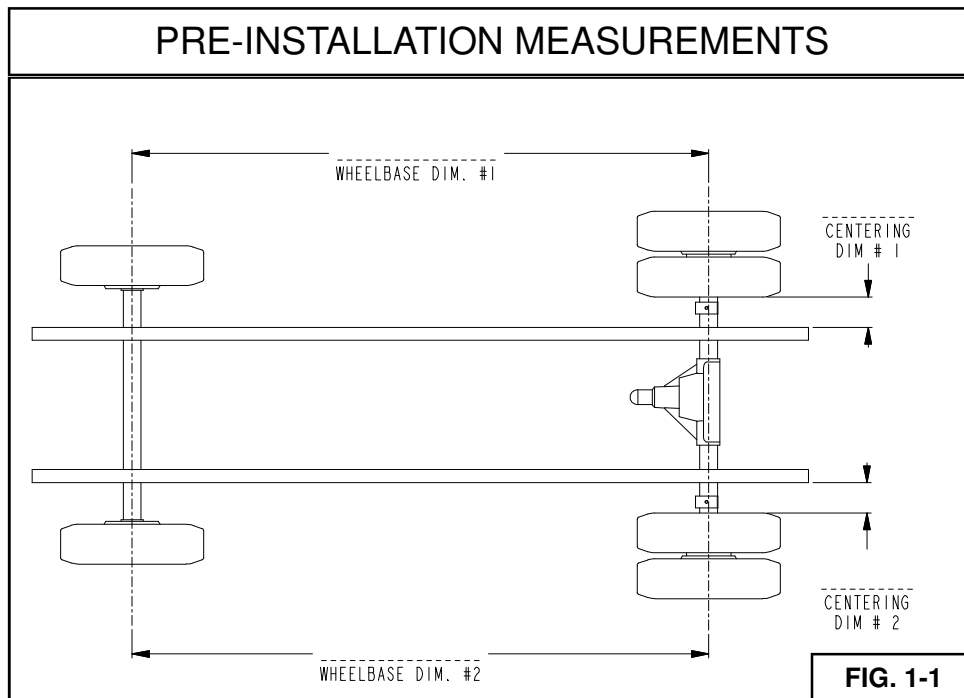
	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.		The torque symbol alerts you to tighten fasteners to a specified torque value.
 WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.	NOTE:	A Note provides information or suggestions that help you correctly perform a task.
 CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.		The electrical symbol indicates the presence of electric shock hazards which, if not avoided, may result in injury to personnel or damage to equipment.
CAUTION	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.		Proper tightening of U-Bolt nuts and mounting nuts are required for proper operation. Need for proper torque value is indicated by wrench symbol and values will be found in Table 10-1 in the Final Assembly section of the instructions. Failure to maintain proper torque can cause component failure resulting in accident with consequent injury.

INSTALLATION NOTES:

- ❑ Proper tightening of all fasteners is required for proper operation. Critical torque values are indicated by a wrench symbol. Required torque values are located Torque Table in section 7. Failure to maintain proper torque may cause component failure and may result in accident with consequent injury.
- ❑ Drilling of some frame holes may be required for installation of the suspension. Where possible, existing holes are used. Air control system mounting may require drilling of holes into the frame at the location of the installer's choice.
- ❑ When installing the UltraRide® suspension on a Ram chassis, please reference the appropriate sections of the existing service manuals or body builders books for additional requirements.
- ❑ The OE stabilizer bar is not required with the UltraRide® suspension.

PRE-INSTALLATION CHECKLIST

- ❑ Check the vehicle wheel alignment prior to installation to insure no precondition already exists; record the information for verification.
- ❑ Measure the wheelbase and axle centering dimensions before beginning installation. Record the information below in Fig 1-1.
- ❑ Remove the attached body, if necessary. Remember to disconnect all electrical connections to the body, and fuel filler tube, before removing the body. The installation may also be completed using a lift to raise the vehicle. If using a lift, body removal may not be necessary. Removal of rear wheels will aid in installation.
- ❑ When installing the suspension without using a lift:
 - ❑ Block the front wheels (both sides, front and rear of tire) and apply the emergency brake so the vehicle cannot roll.
 - ❑ Jack up the rear frame of the chassis in order to unload the rear leaf springs (or use an overhead hoist).
 - ❑ Do not lift the wheels off the ground.
 - ❑ Do not jack on any part of the axle. Stands may be used to hold the axle in it's original position.
- ❑ Install the suspension in the sequence listed in this instruction manual. Install one side of the suspension at a time. First, install the driver side completely, then install the passenger side.



2. DRIVER SIDE DISASSEMBLY

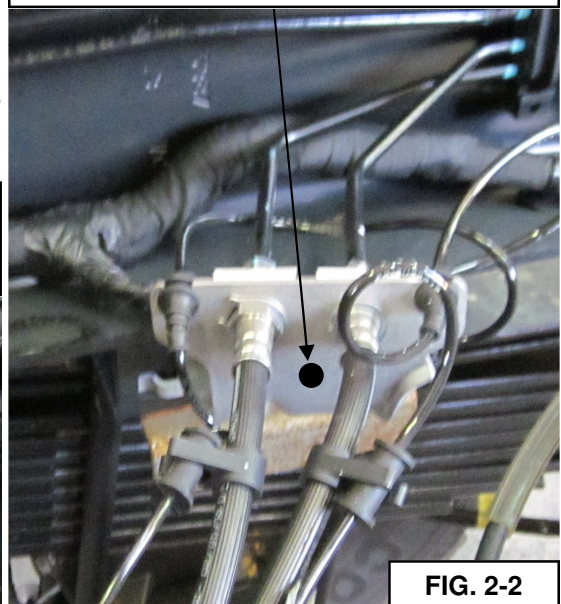
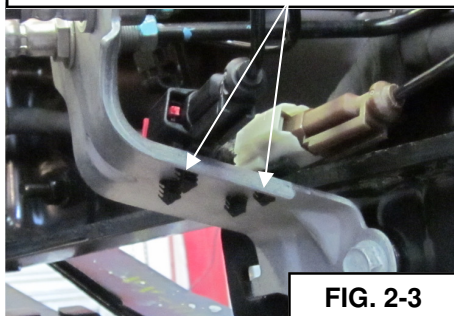
1. With weight taken off the rear springs, as noted in pre-installation checklist, remove the mount bolts or rivets from the **Front Leaf Spring Hanger Bracket**.
2. Remove the bolts or rivets attaching the **Rear Spring Hanger Bracket**, **DO NOT** re-use the fasteners that mount the hanger bracket, or the leaf spring itself. New fasteners are provided, and must be used to achieve proper clamp load on the hanger. See Figure 2-1 and 2-6.
3. Remove existing **U-bolts** that attach the **Axle** to the **Leaf Spring**. Remove the leaf spring and attached brackets from the axle. **DO NOT** re-use any U-bolts or nuts; new fasteners are provided. See Figure. 2-1 and 2-6.



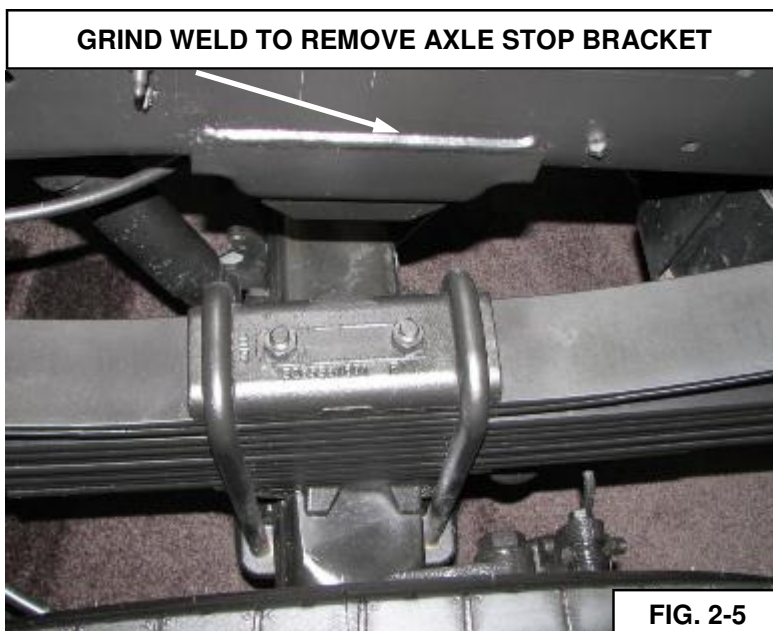
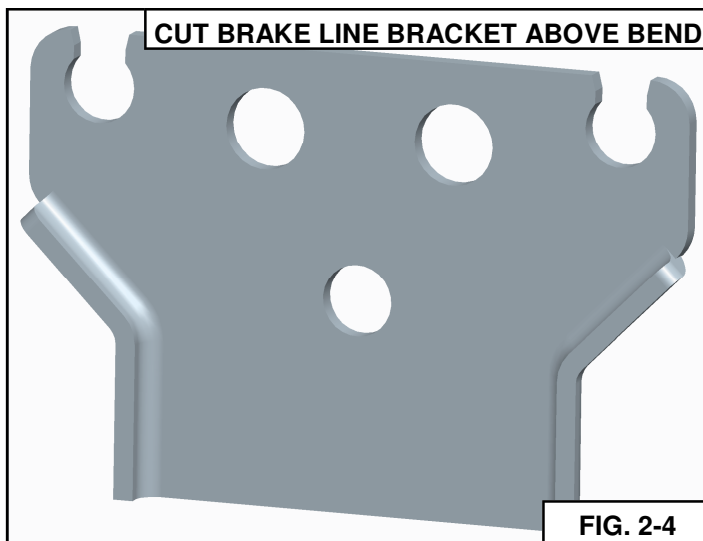
4. Drill 7/16" hole into the drivers side **Brake Line Bracket** before removal from bumper bracket as shown in figure 2-2.
5. Remove the two plug clips from lower portion of the **Brake Line Bracket** figure 2-3 and tie to the frame rail using wire ties.

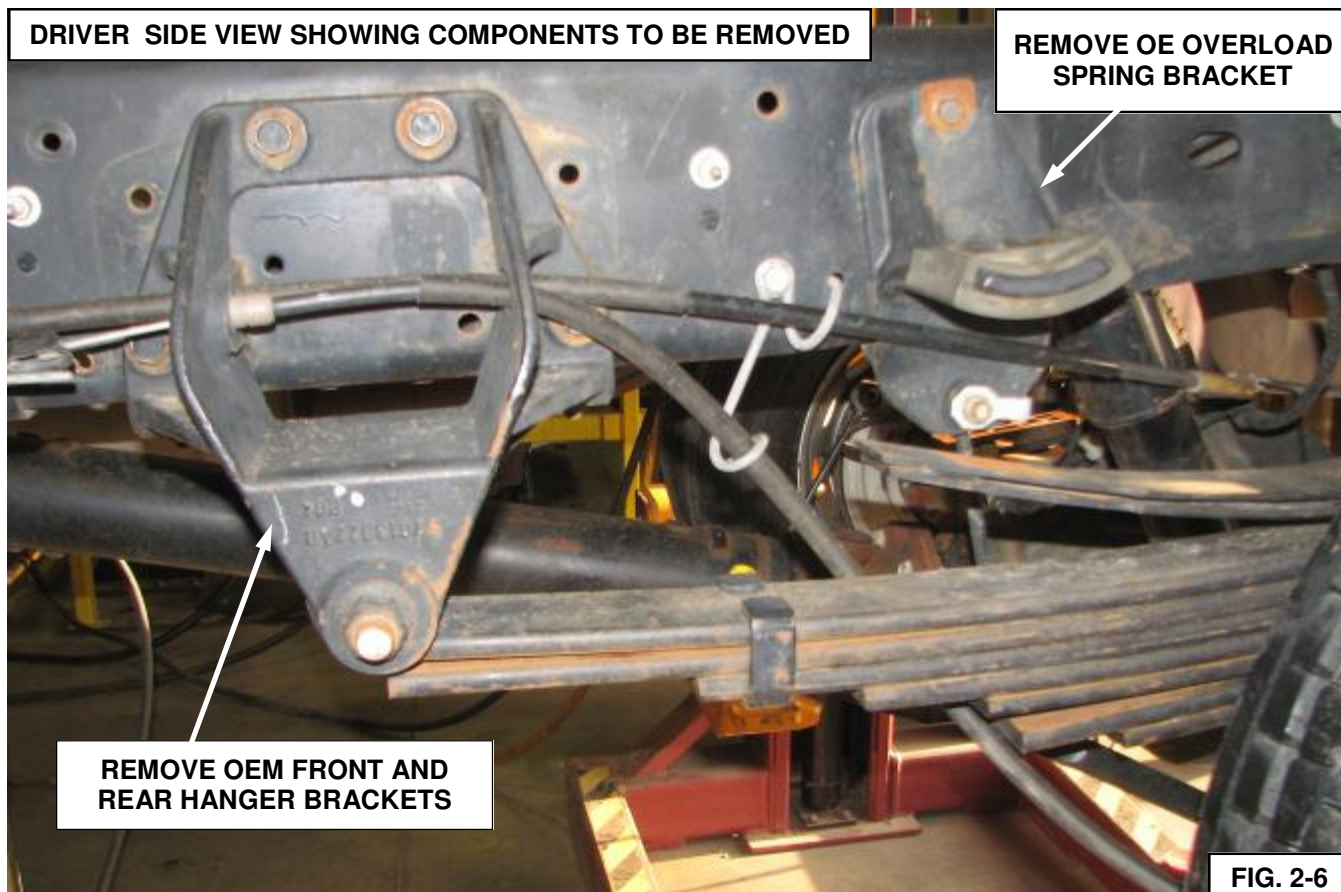
DRILL 7/16" HOLE CENTERED SIDE TO SIDE AND APPROXIMATELY 1.5" FROM TOP.

REMOVE PLUG CLIPS FROM BRACKET AND TIE TO FRAME RAIL

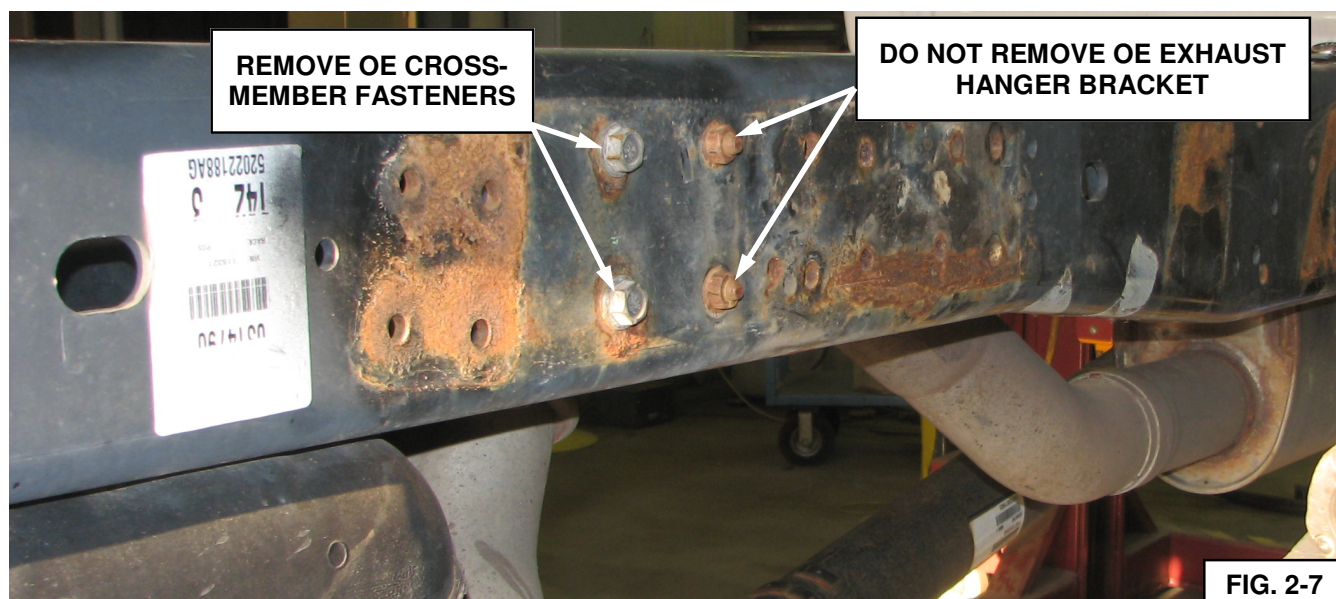


1. Cut the lower portion of the **Brake Line Bracket** as shown in figure 2-4
2. Remove the Original Equipment (OE) **Axle Stop and Overload Spring Brackets**. There is one of each on each side of the chassis. The Axle Stop Bracket is welded to the frame directly above the rear axle, Fig. 2-5. The Overload Spring Bracket is bolted to the frame ahead of the rear axle, Fig. 2-6.
3. The axle stop brackets that are welded to each side of the frame will need to be removed, by grinding the weld and removing bracket and bumper together. **CAUTION:** This must be done carefully, so that no grinding is done to the frame rail itself. See Fig. 2-5
4. Remove the OE **Shock Absorbers**, and OE shock mounting hardware. New UltraRide® tuned shock absorbers and shock mounting hardware are provided.



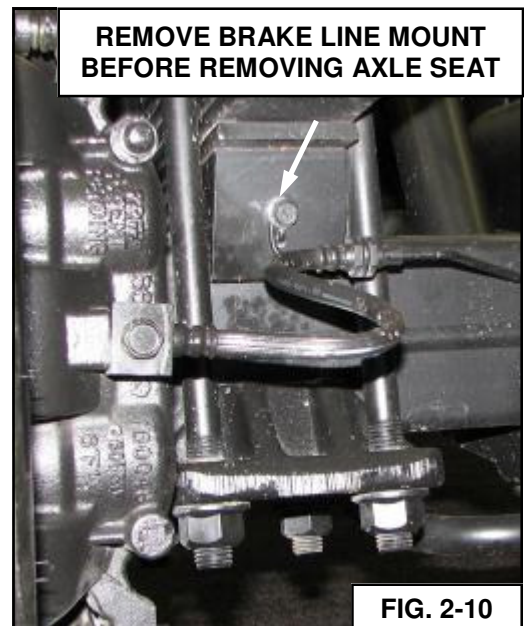
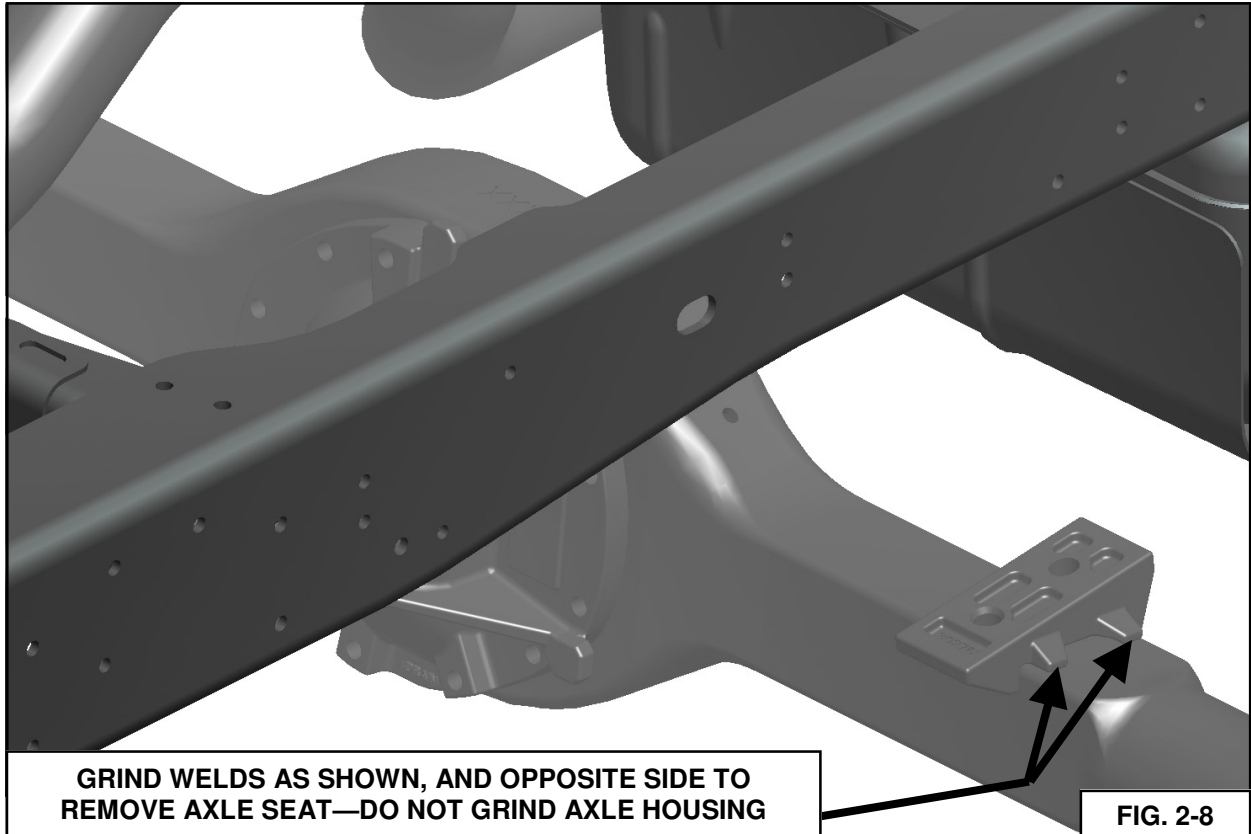


7. Remove **OE Stabilizer Bar**, if present. The stabilizer bar is not used with the UltraRide® suspension.
8. **NOTE:** The OE exhaust hanger bracket (passenger side only) does not need to be removed. See Fig. 2-7.
9. Remove the OE crossmember bolts and nuts. New fasteners are provided. See Fig. 2-7



2.1 AXLE SEAT REMOVAL

1. In order to install the UltraRide® suspension, the OE axle seats must be removed from the axle.
2. To begin, remove the bolt that attaches the brake lines to the rear of the axle seat, Fig. 2-10. These will be reattached to the LOWER AXLE SEAT in Section 9. Depending on the year of your chassis, it may be necessary to use a grinder to remove the four (4) small welds that attach the axle seat to the axle. **CAUTION:** Grind carefully to prevent damage to the axle itself. See Fig. 2-10.



3. DRIVER SIDE ASSEMBLY

1. Review figures in Section 3 and the parts list/drawing in Section 11 to acquaint yourself with the various parts of the UltraRide® suspension. Assemble components loosely as described below. Torqueing of fasteners will occur in Section 7.

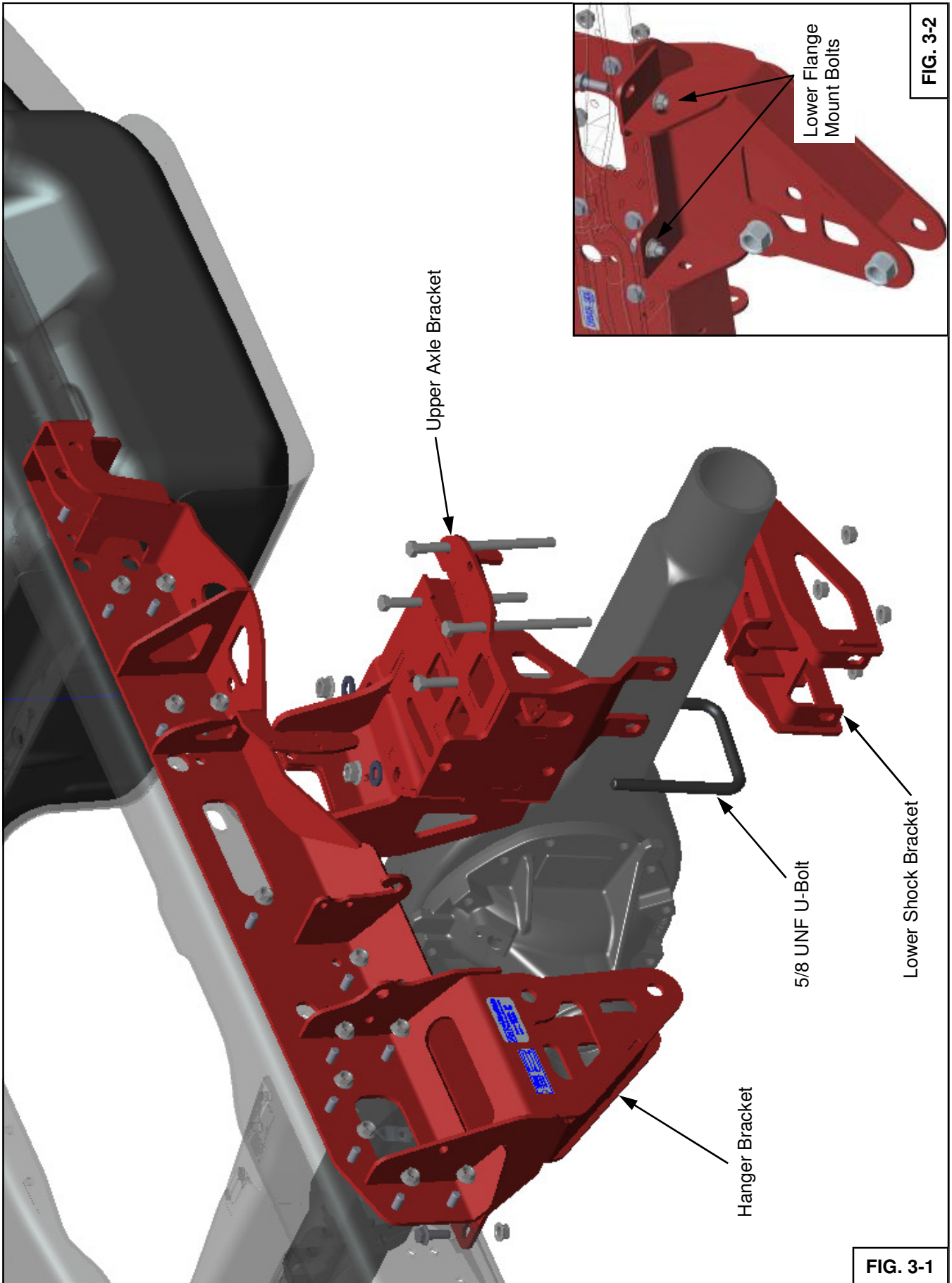


IMPORTANT! When tightening fasteners, do not use a high-speed air wrench. The heat generated between the nut and bolt threads may cause the nut to seize.

2. Loosely fasten the HANGER BRACKET to the frame using (14) M12 X 35 METRIC FLANGE BOLTS, (2) M12 X 45 METRIC FLANGE BOLTS, and (16) M12 METRIC TOP LOCK FLANGE NUTS, supplied with kit. **Two of these fasteners are to be used in the bottom flange of the frame rail. (Shown in Fig. 3-2) The two longer bolts will be used in the rearmost holes, which line up with the OE crossmember. (Shown in Fig. 3-7)** Drilling is required if the holes are not present in the rear portion of the Frame Hanger. These holes can be marked and drilled by using the FRONT HANGER as a template. With FRAME HANGER assembled to the frame rail, **make sure the AIR SPRING PLATE is flush with the bottom side of the frame, and mark all holes that need drilling. Orient all frame mount bolts so that they point outward from the center of the vehicle.** Torque later. See Fig. 3-1, 3-2 for details.
3. Place the UPPER AXLE BRACKET into position and raise LOWER SHOCK MOUNT BRACKET into position as shown in Fig. 3-1. Loosely fasten two brackets together using (4) 1/2 X 8 UNC HEX BOLTS and (4) 1/2 UNC TOP LOCK FLANGE NUTS. With these two brackets loosely connected, slide both brackets inward until the UPPER AXLE BRACKET fits the contour of the axle tightly as shown in Fig. 3-3. Slide (1) 5/8 UNF U-BOLT into position as shown in Fig. 3-1. Loosely Assemble (2) 5/8 HARDENED WASHERS, and (2) 5/8 UNF FLANGE NUTS. See following illustrations for details. Torque later. **Before tightening of U-Bolts ensure that the UPPER AND LOWER AXLE BRACKETS are aligned properly as shown in Fig. 3-3.**
4. Attach the ADAPTER PLATE to the lower piston of the AIRSPRING using (2) 1/2 X 1 UNC FLATHEAD SCREWS. Make sure orientation matches that shown in Fig. 3-4. **NOTE: The Bottom Piston of the Air Spring may need to be rotated to fit the orientation shown. In order to rotate the Piston, the bolt holding the piston to the spring must be loosened. Tighten after complete.** Torque bolt and/or screws. See Table 12-1.
5. Attach AIR SPRING ADAPTER PLATE to UPPER AXLE BRACKET by setting it on top of the bracket and aligning the protruding tab with the square notch cutout on the AIR SPRING ADAPTER PLATE. The Four Hex shaped holes in the ADAPTER PLATE need to fit over the four bolt heads connecting the Upper and Lower Axle Brackets. These bolts may need to be oriented for proper fit. The countersunk hole will also align with a hole on the UPPER AXLE BRACKET. Fasten with (1) 1/2 X 1 1/4 UNC FLATHEAD SCREW and (1) 1/2 UNC HEX NUT. Torque later, See Fig. 3-4
6. Compress the AIR SPRING enough to that the studs on the top plate can be inserted into the corresponding holes on the FRAME HANGER. Fasten using (1) 3/4 UNF JAM NUT, and (1) 1/2 UNC JAM NUT. Torque Later, See Fig. 3-5. With all components installed as described, upper and lower plates of the AIRSPRING should be relatively in line.



WARNING! Route all brake lines/cables away from air spring and other moving components.



**ALIGN COMPONENTS VERTICALLY AS SHOWN
POSITION UPPER AXLE BRACKET TO FIT CONTOUR OF AXLE**

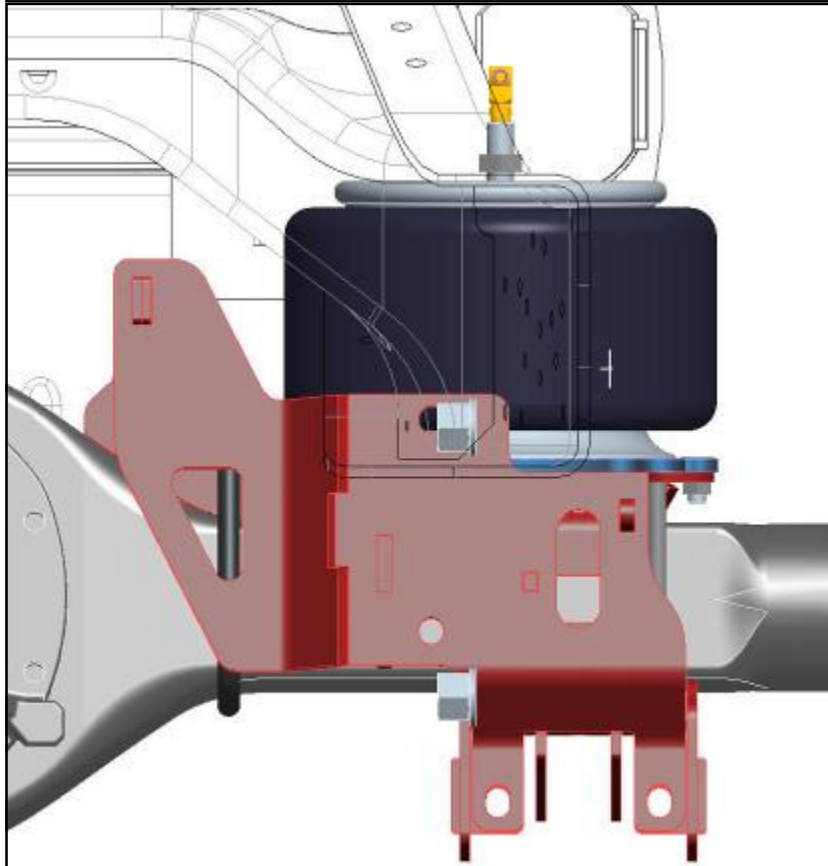


FIG. 3-3

ATTACH LOWER AIRSPRING PLATE AS SHOWN

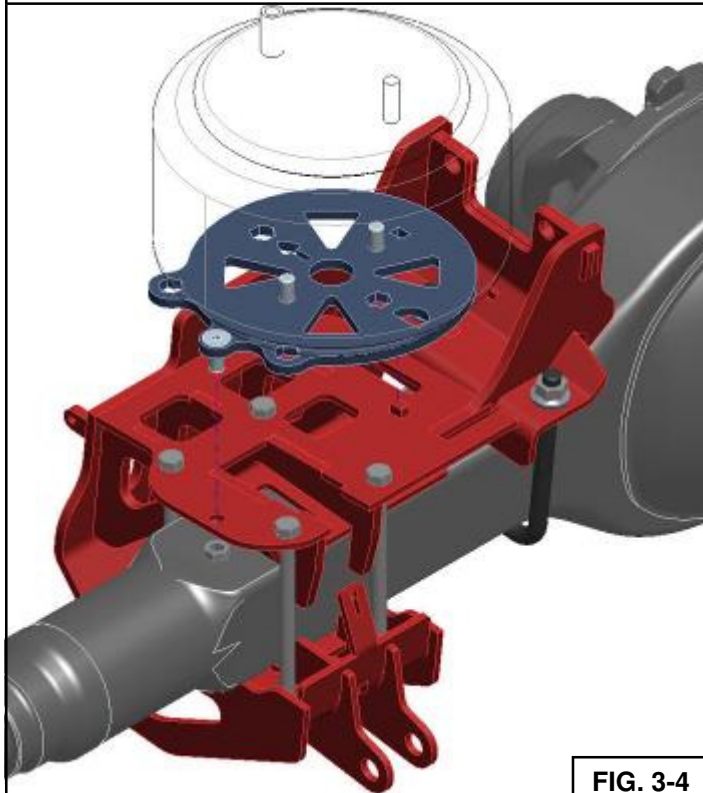


FIG. 3-4

ASSEMBLE UPPER PLATE AS SHOWN

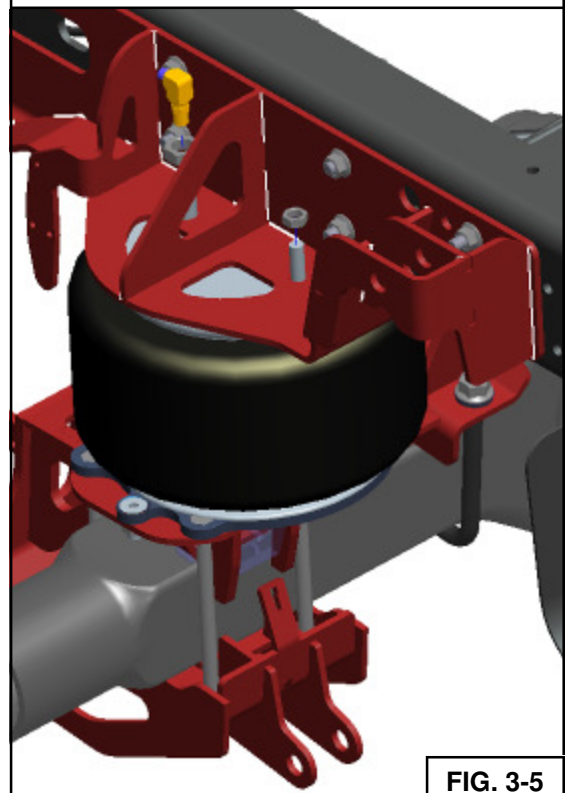
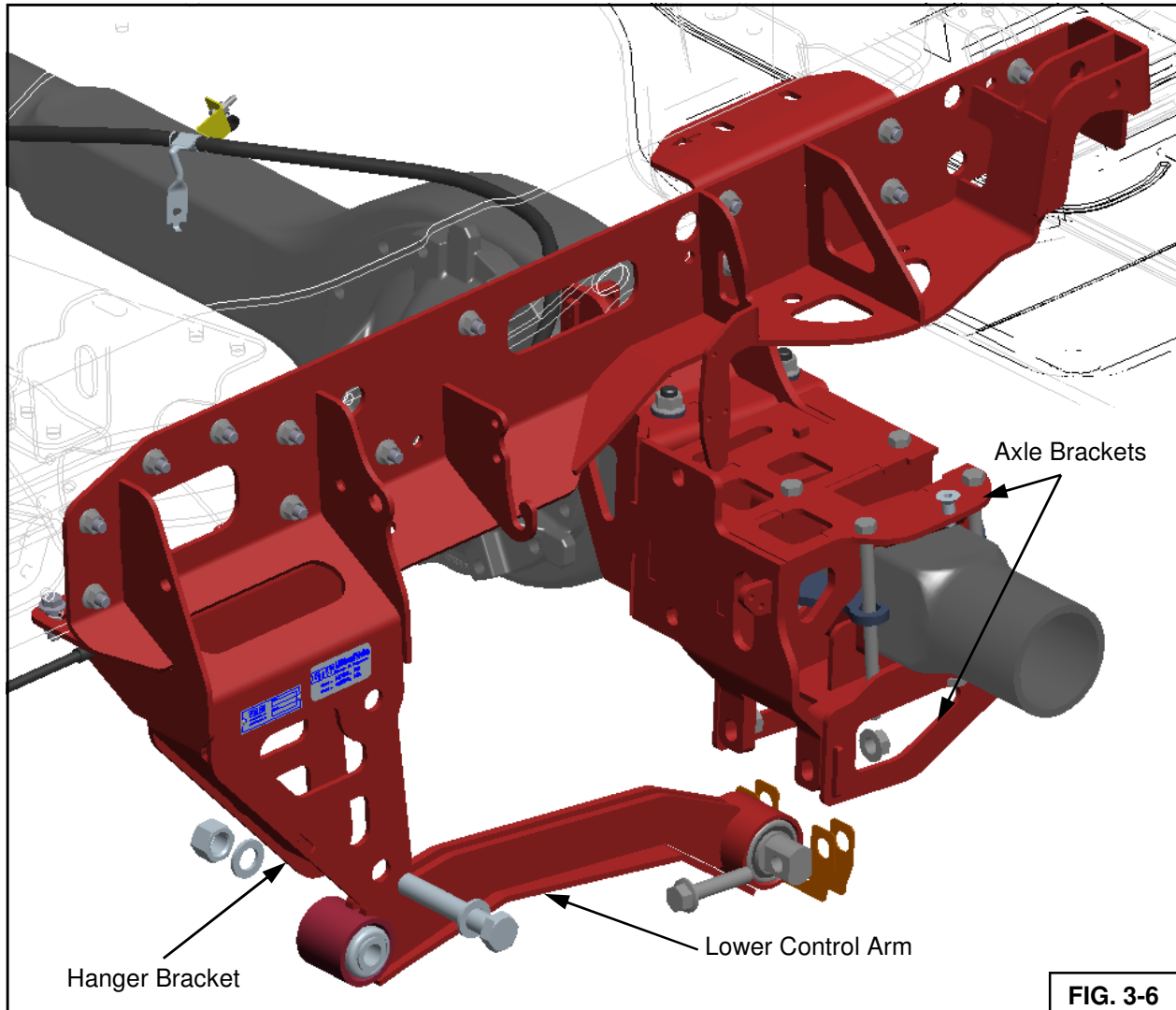


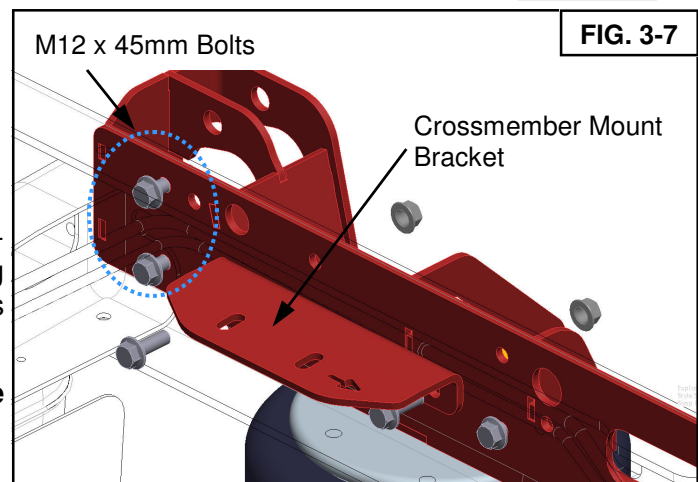
FIG. 3-5

7. Raise the LOWER CONTROL ARM into position as shown in Fig. 3-6. Loosely assemble this component to the HANGER BRACKET using (1) M22 X 130 HEX BOLT, (2) 22mm HARDENED WASHERS, AND (1) M22 HEX NUT at the front of the arm. Torque later.
8. Loosely assemble the rear of the CONTROL ARM by placing (2) CONTROL ARM SHIMS in between the CONTROL ARM and the AXLE BRACKETS, and attaching with (2) 5/8 X 3 UNC FLANGE BOLTS, and (2) 5/8 UNC FLANGE NUTS. Torque later. See Fig. 3-6 for details.



9. Loosely assemble driver side CROSSMEMBER MOUNT BRACKET to corresponding holes in frame and HANGER BRACKET as shown in Fig. 3-7.

Note: Arrow that is cut into part should be pointing towards front of vehicle.



4. PASSENGER SIDE DISASSEMBLY

1. Repeat Section 2 for the passenger's side of the truck.

5. PASSENGER SIDE ASSEMBLY

1. Repeat Section 3 for the passenger's side of the truck. Fasten loosely all components shown in Fig. 5-1.
2. On the Passenger Side Frame Bracket (10) M12 X 35 METRIC FLANGE BOLTS, (2) M12 X 45 METRIC FLANGE BOLTS, and (12) M12 METRIC TOP LOCK FLANGE NUTS should be used to install the bracket. The longer bolts should be used in the rearmost bracket holes. The last (4) M12 X 45 METRIC FLANGE BOLTS, and (4) M12 METRIC TOP LOCK FLANGE NUTS will be installed in section 7.
3. DO NOT install the Passenger Side Crossmember Bracket and Fasteners until it is connected to the Lateral Control Rod and the Crossmember Channels, later in section 7.
4. Assemble the EXHAUST SHIELD using (2) 1/4 UNC CARRIAGE HEAD BOLTS, and (2) 1/4 NYLOCK HEX NUTS. Torque nuts. See Table 11-1. Fig. 5-3 shows correct bolt and EXHAUST SHIELD orientation.

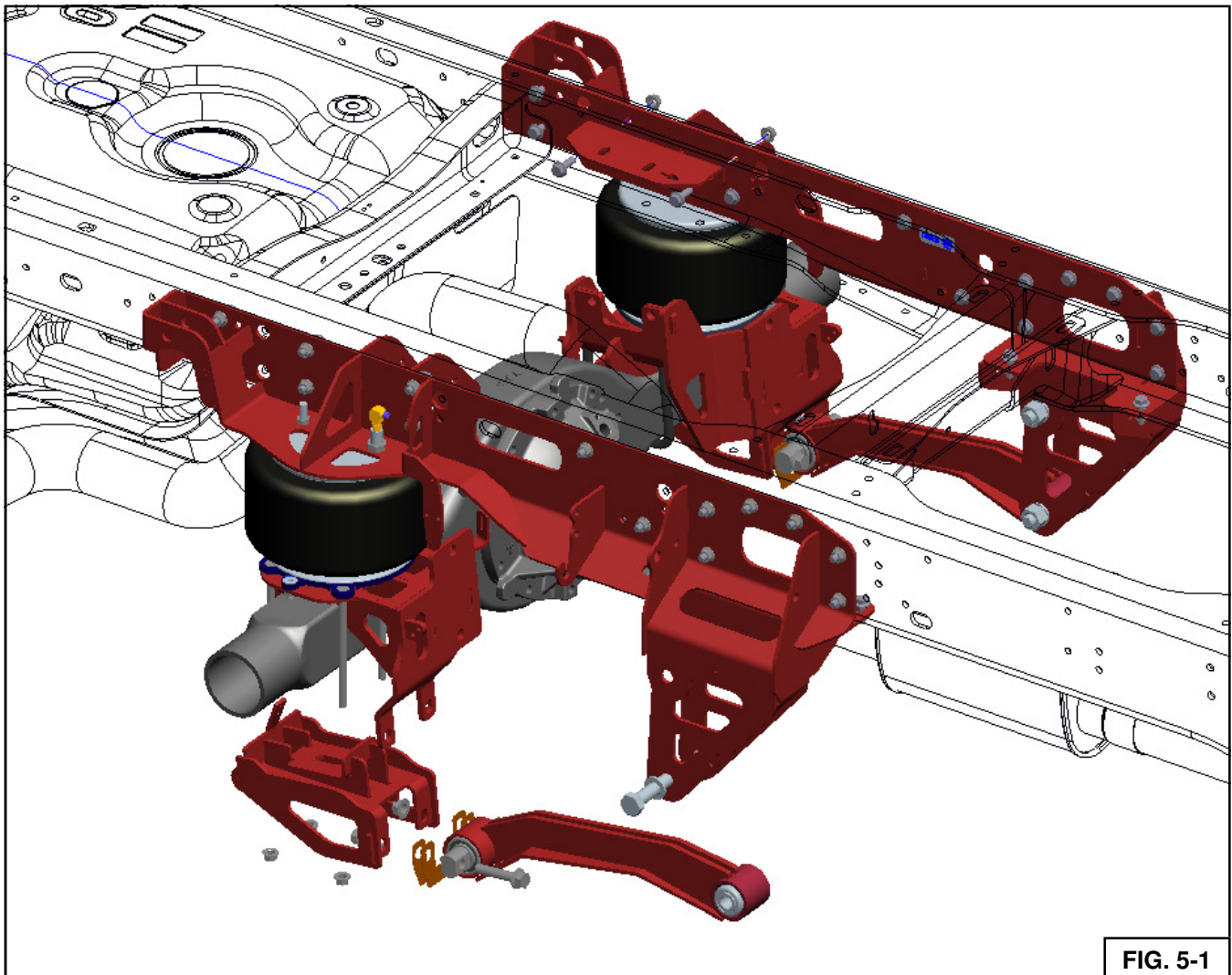
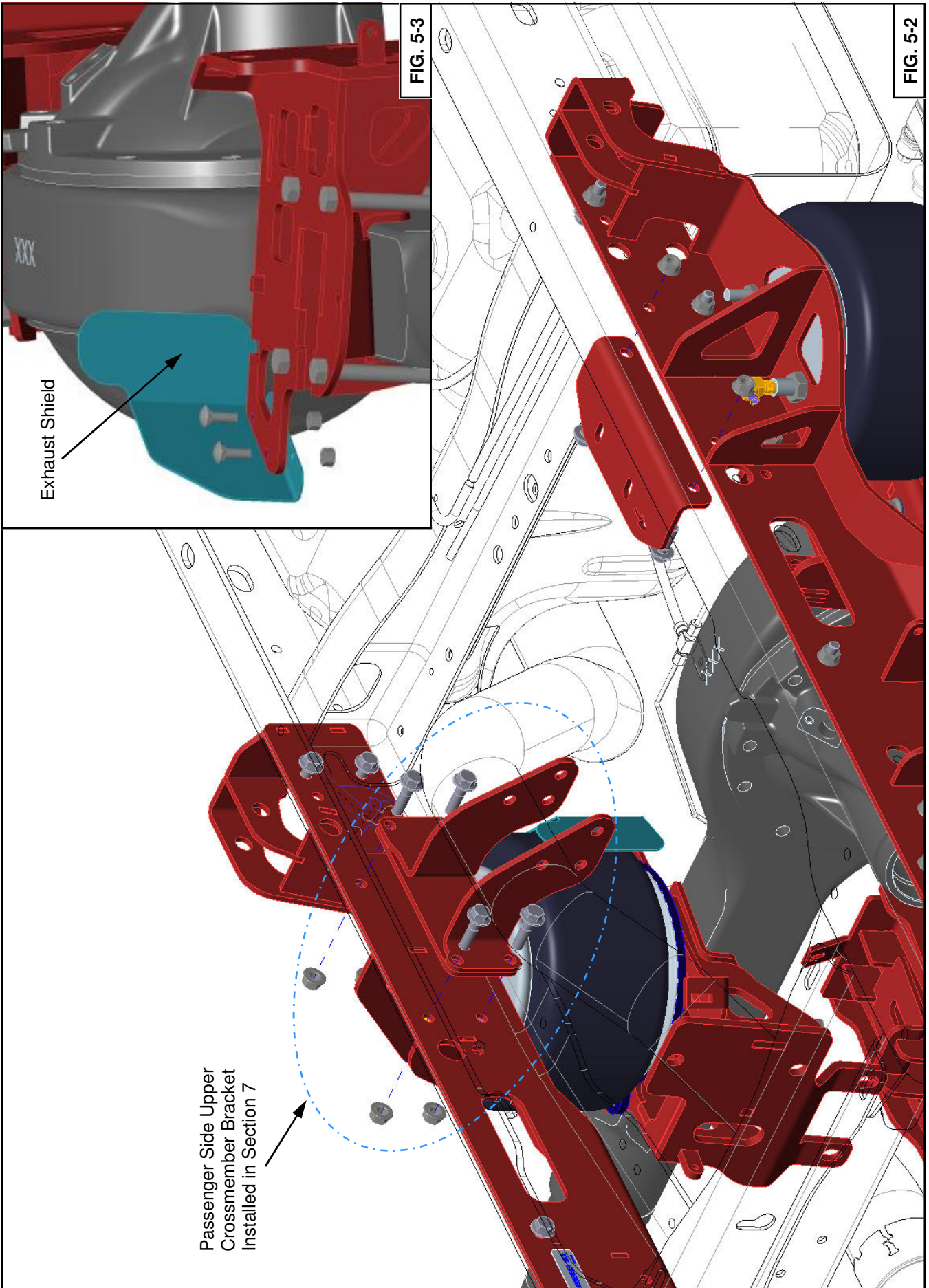


FIG. 5-1

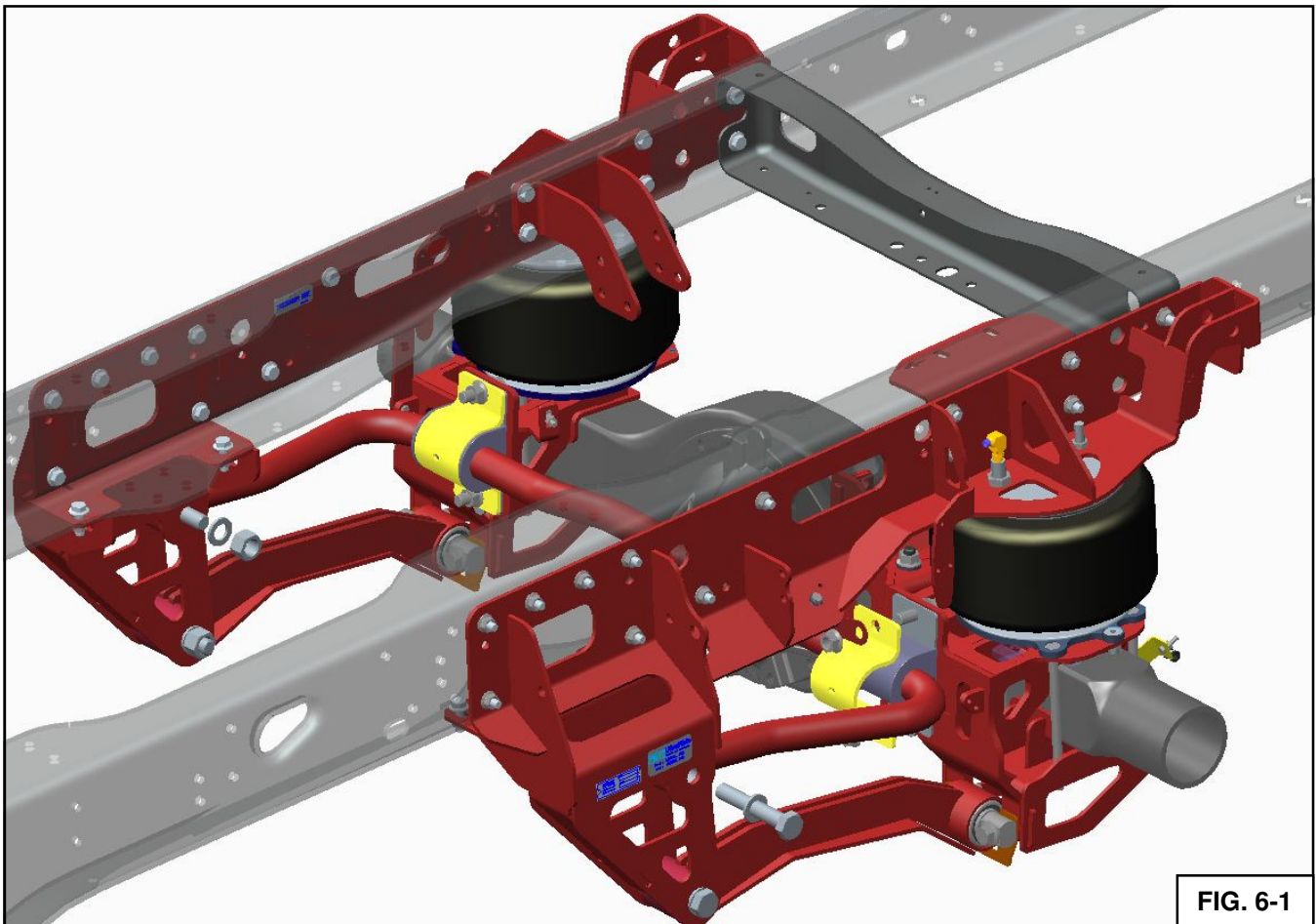


6. STABILIZER BAR INSTALLATION

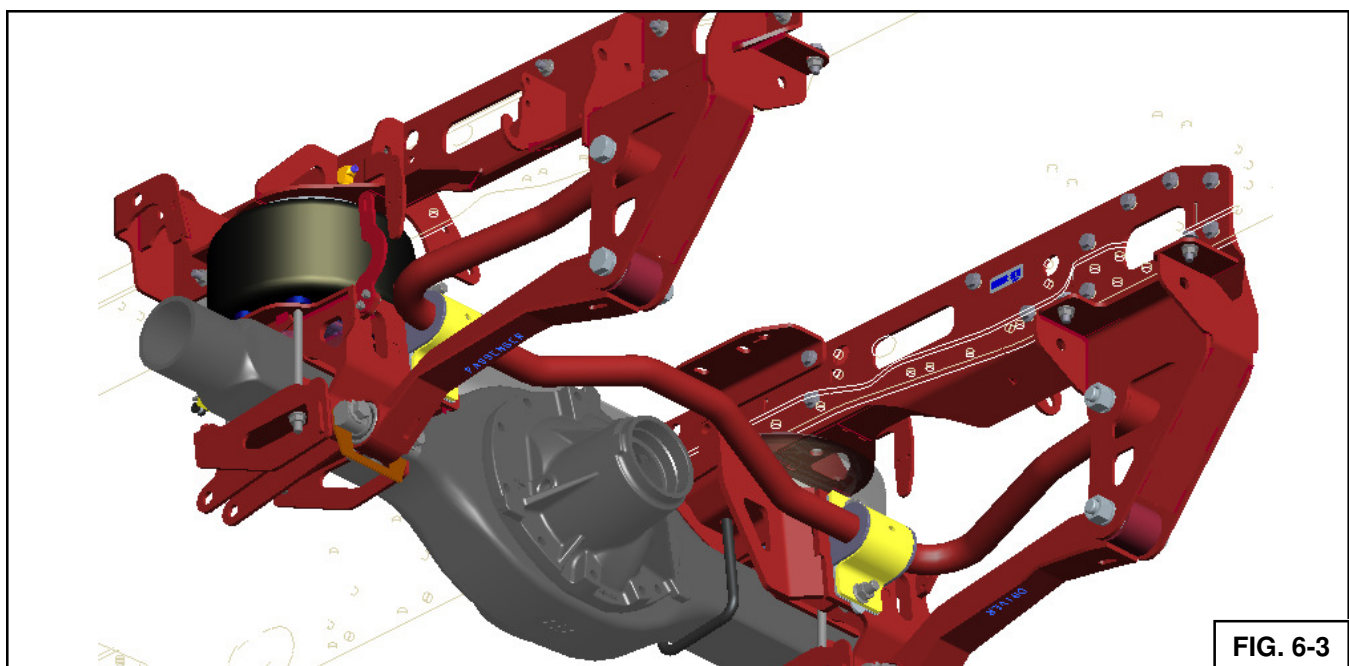
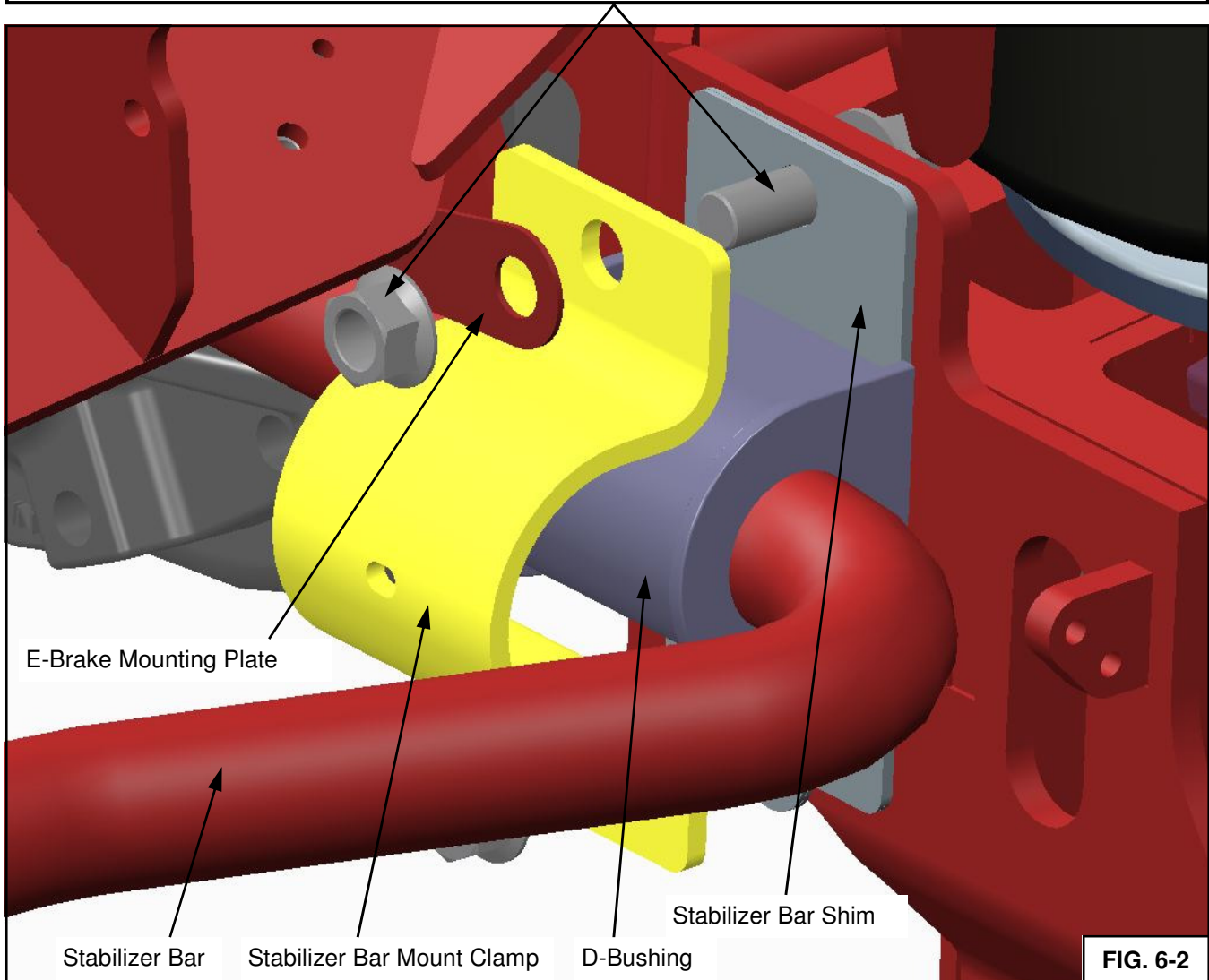
1. Install the Stabilizer bar with the center bend pointing up, away from the pinion as shown in Fig. 6-3.
3. Loosely fasten to the Hanger Brackets using the (2) M22 X 130 HEX BOLTS, (4) 22mm HARDENED WASHERS, AND (2) M22 HEX NUTS. Torque later.

IMPORTANT: Ensure (2) M22 HEX BOLTS are installed with nut on D-BRACKET side as shown in Fig. 6-2. Interference with AIRSPRING could occur if orientation is not as shown.

2. Apply Lithium grease, or other lubricant, to the inside of the polyurethane D-BUSHINGS (this will reduce any potential noise transmission). Place the polyurethane D-BUSHINGS over the bar in the appropriate locations on the AXLE BRACKETS. Be sure to place supplied STABILIZER BAR SHIMS between the D-BUSHING and AXLE BRACKETS, and fasten to the UPPER AXLE BRACKETS using the STABILIZER BAR MOUNT CLAMPS, and (4) 5/8 x 2 UNC FLANGE BOLTS and (4) 5/8 UNC FLANGE NUTS. On the Driver's side install the E-Brake cable mounting plate in the top bolt location. Torque later. See Fig. 6-1 and 6-2 for details.
3. Inspect Stabilizer Bar for any interference with other components, paying close attention to clearance with any flexible components such as brake lines, cables, and air springs.

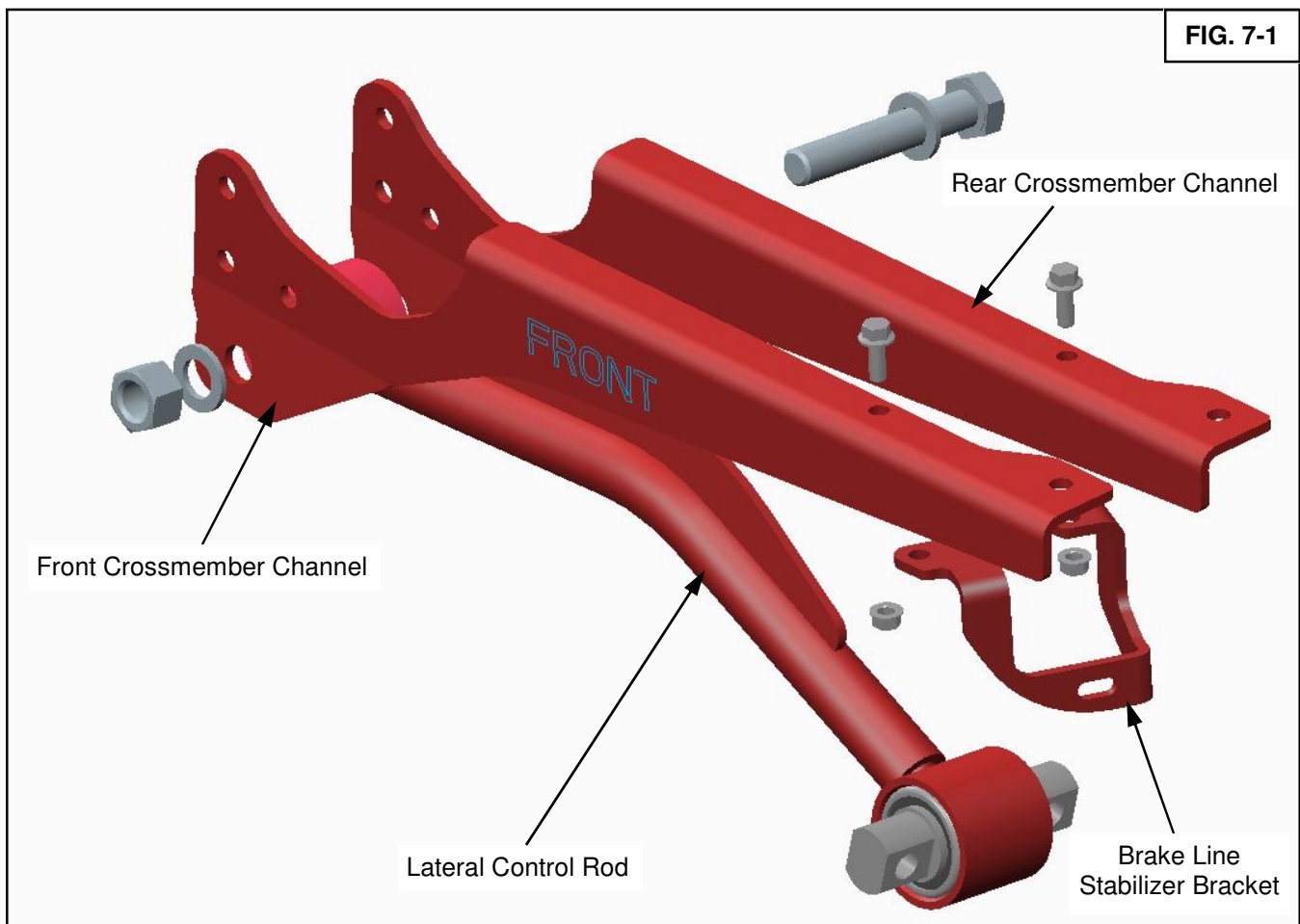


IMPORTANT: Ensure (2) M22 HEX BOLTS are installed with nut on D-BRACKET side as shown in Fig. 6-2. Interference with AIR SPRING could occur if orientation is not as shown.



7. CROSSMEMBER, LATERAL CONTROL ROD, & SHOCK INSTALLATION

1. Check to insure the axle is centered between the frame rails, by measuring from the outside of the driver and passenger side frame rails to the inside of the wheel hub or tire.
2. Loosely assemble the FRONT AND REAR CROSSMEMBER components to the Lateral Control Rod as shown in Fig. 7-1. Note the CROSSMEMBER CHANNEL marked "Front" must be assembled towards the front of the vehicle and the rib of the Lateral Control Rod must be facing up. Use (1) M22 X 130 HEX BOLT, (2) 22mm HARDENED WASHERS, AND (1) M22 HEX NUT. The Bolt Head should face the Rear Crossmember Channel to prevent interference with the exhaust. See Fig 7-1. Torque later.



3. Fasten the Crossmembers to the inside of the Passenger Side Crossmember Bracket using (6) 1/2 X 1 1/4 UNC Flange Bolts and (6) 1/2 UNC FLANGE NUTS. The bolt heads should face outward as shown in Fig 7-2. Torque later.
4. This assembly should now be fastened to the Passenger Side Frame, using the (4) M12 x 45 FLANGE BOLTS and (4) M12 FLANGE NUTS. The nuts should face outward from the vehicle. See Fig 7-3. Torque Later.

FIG. 7-2

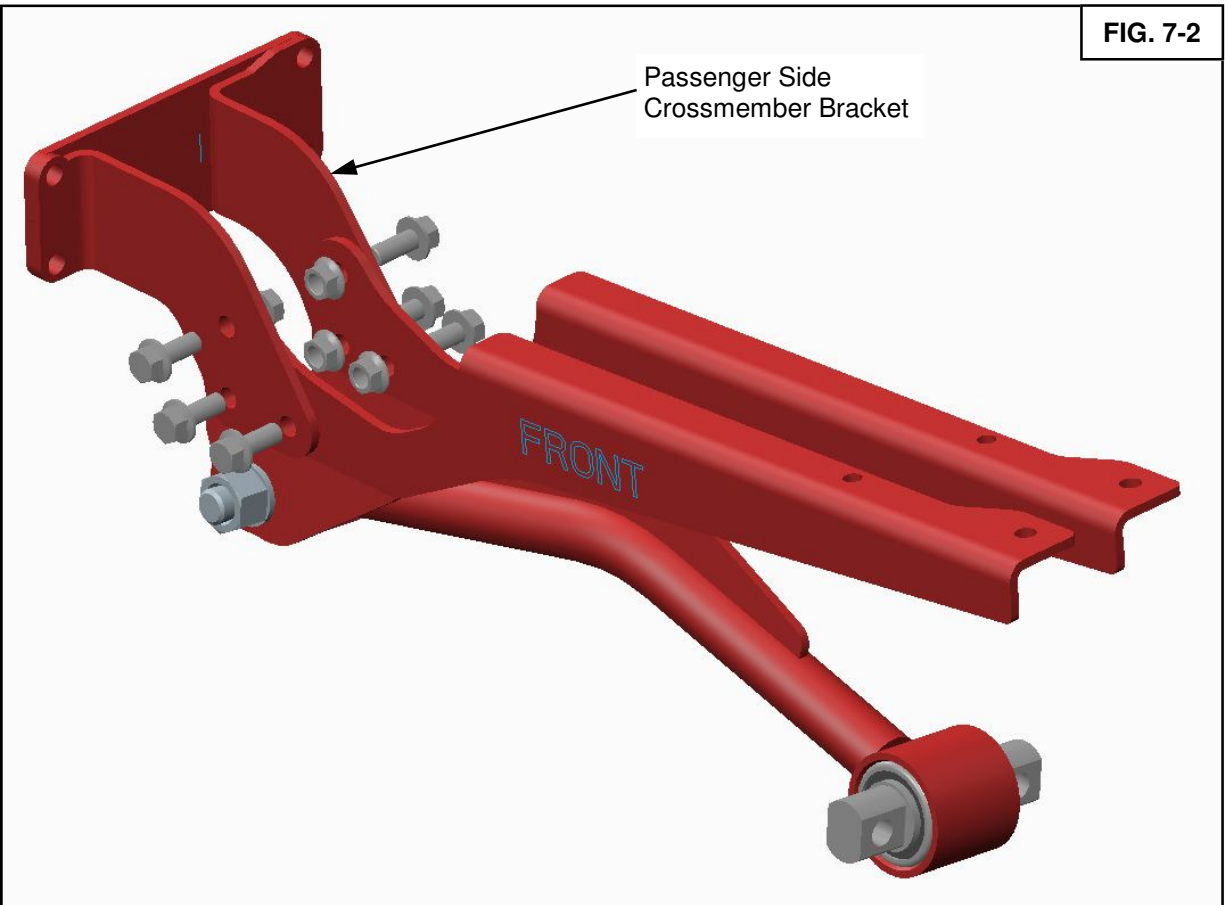
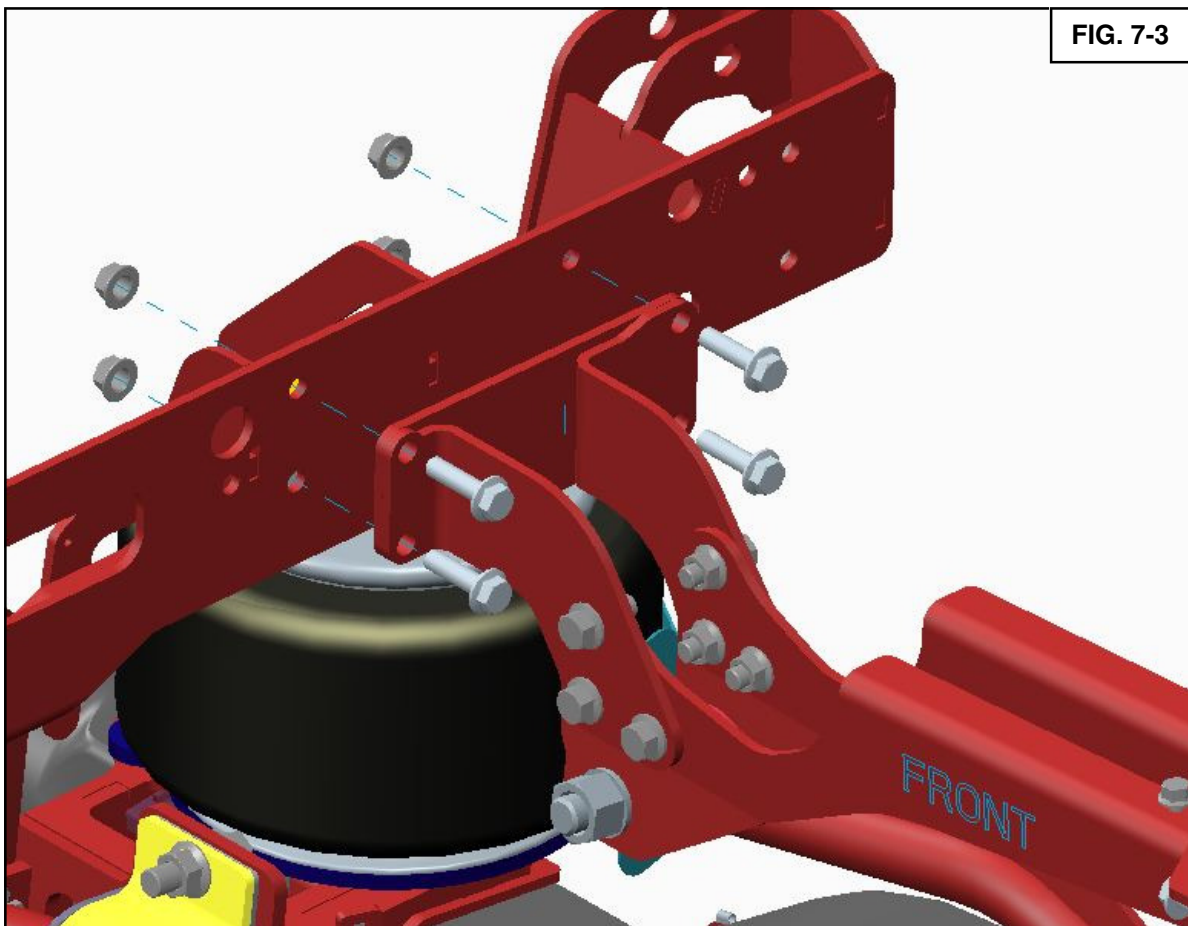


FIG. 7-3



5. Fasten the Crossmember Channels to the Driver Side Crossmember Bracket using (2) 1/2 X 1 1/4 UNC Flange Bolts and (2) 1/2 UNC FLANGE NUTS, as shown in Fig 7-4. Torque Later.
6. ALIGNMENT SHIMS are provided to ensure axle is centered between frame rails. Install the LATERAL CONTROL ROD initially using (2) shims as a starting point. Use (2) 5/8 X UNC FLANGE BOLTS and (2) 5/8 UNC TOP LOCK NUTS to loosely attach lower end of LATERAL CONTROL ROD. See Fig. 7-4 for details.



WARNING! Inspect Lateral Control Rod and its mounting brackets for any interference with other components, paying close attention to clearance with any flexible components such as brake and fuel lines, axle breathers and wiring.

7. New SHOCK ABSORBERS are provided with this kit and can be installed using (2) 3/4 x 3 UNC HEX BOLTS AND NUTS. Torque later. See Fig. 7-5 for details. Repeat for both Driver and Passenger Sides.



WARNING! 2013 and newer shim alignment is critical so as not to damage brake lines by contact with the shims.

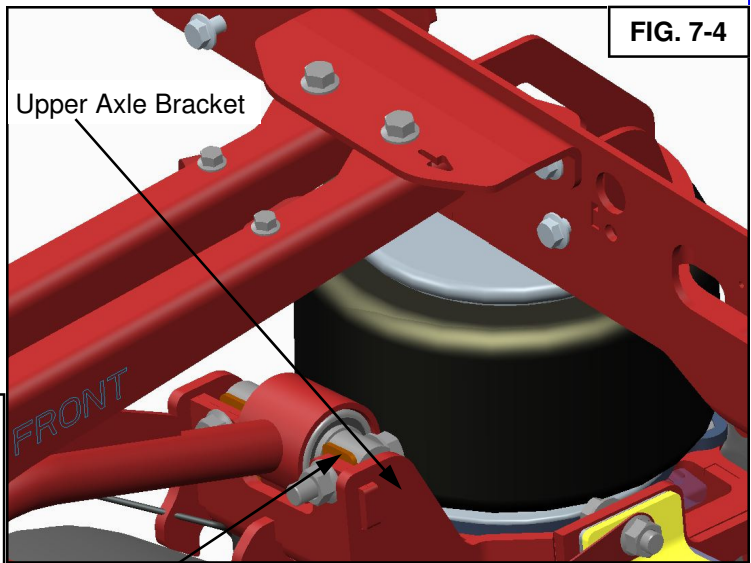


FIG. 7-4

Alignment Shims (note orientation)

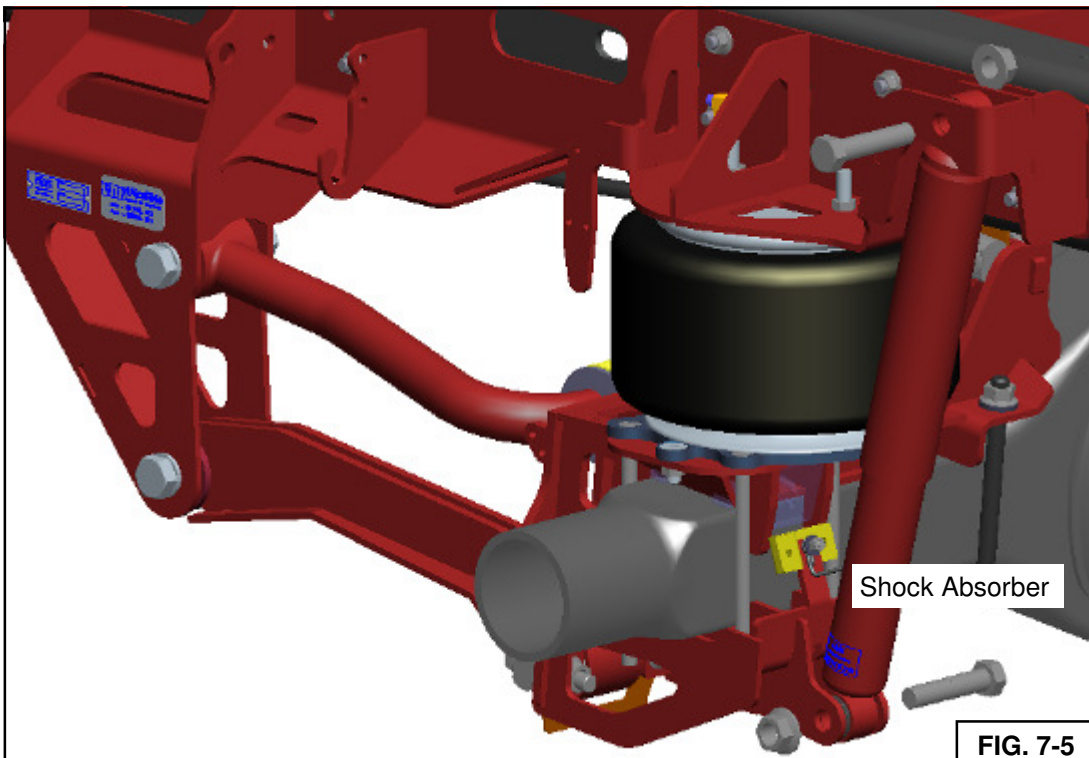
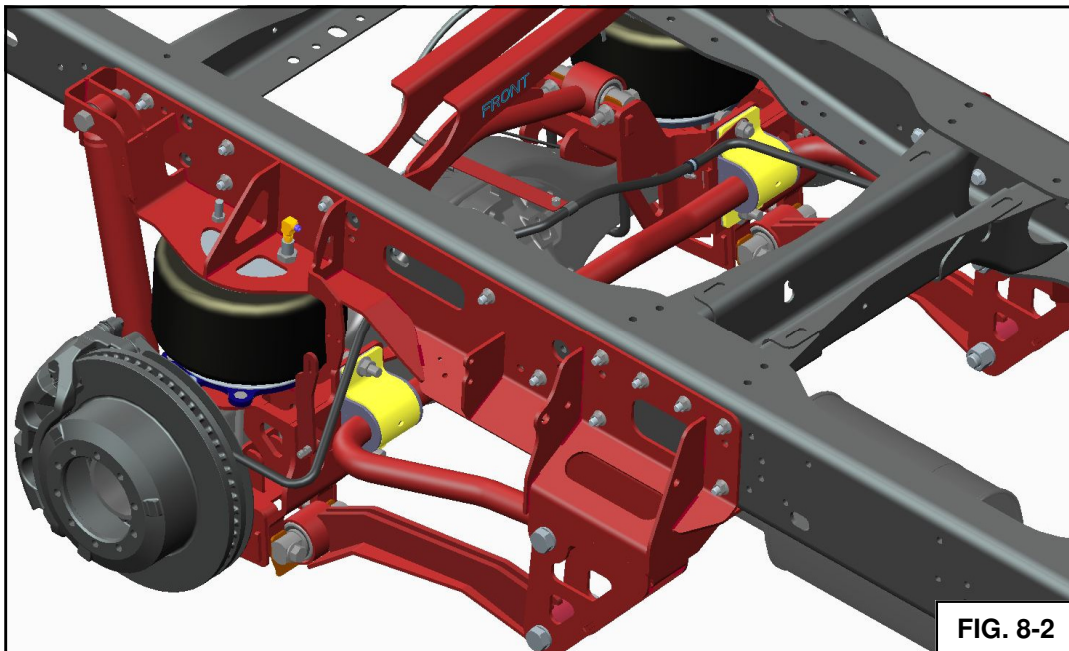
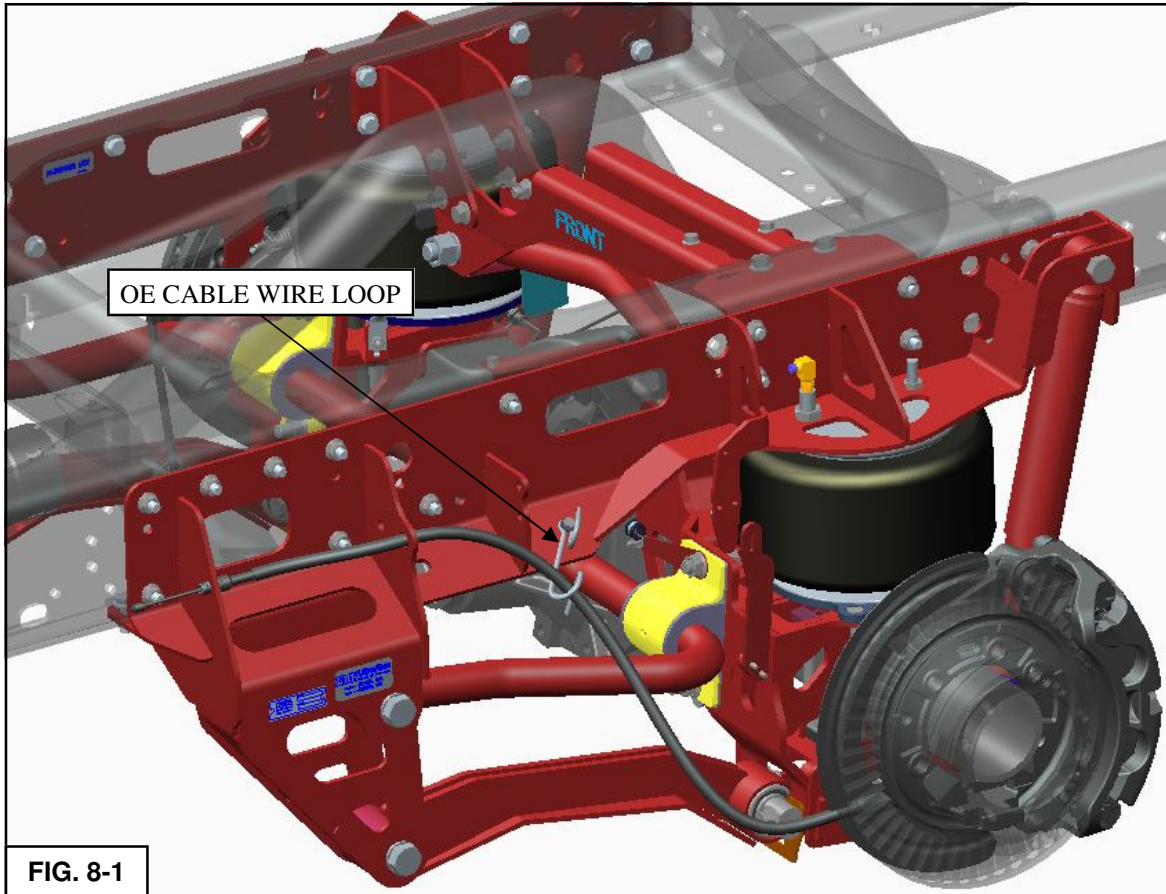
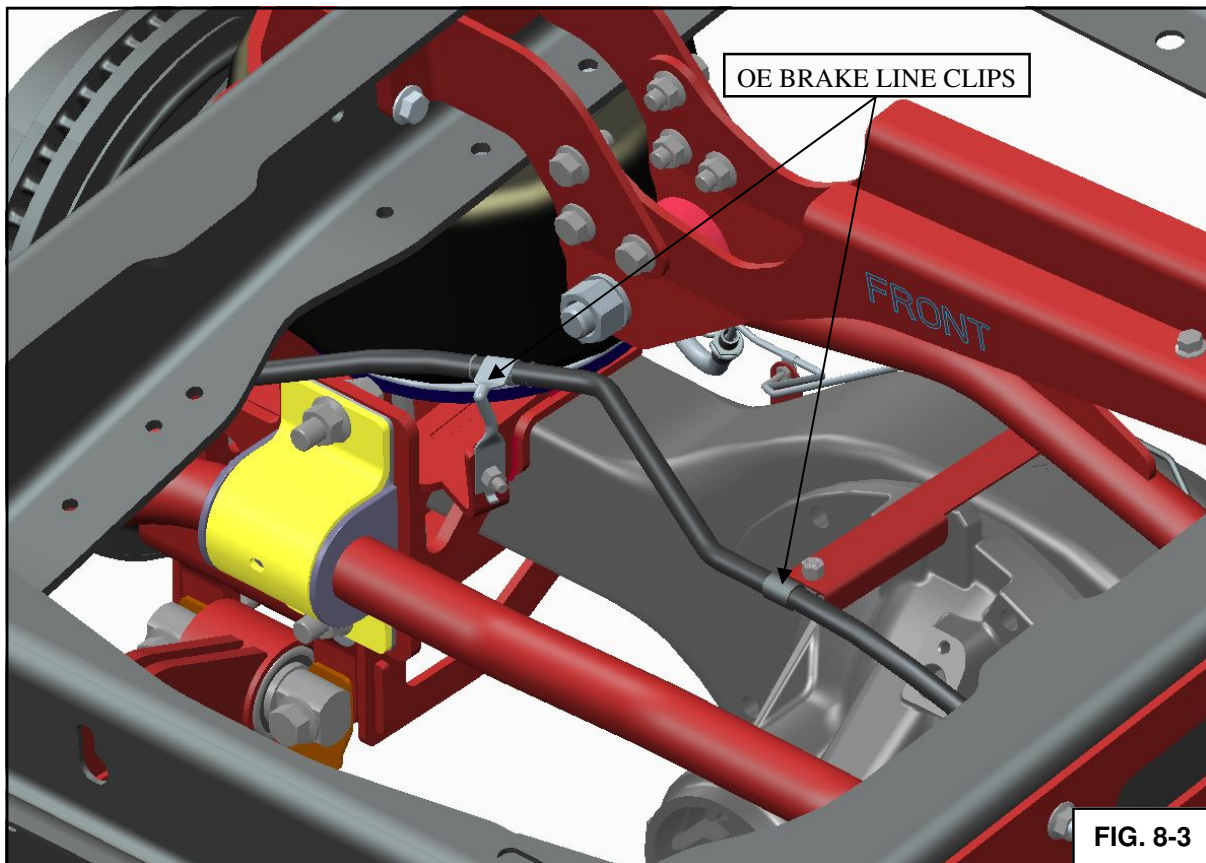


FIG. 7-5

8. EMERGENCY BRAKE CABLE ROUTING

1. Emergency Brake Cables need to be re-routed through the holes provided in the HANGER BRACKETS. Figures 8-1, and 8-2 show how the cables need to be run. Figure 8-3 shows how the brake cable needs to be re-attached to the UPPER AXLE BRACKET using (1) 5/16 UNC CARRIAGE BOLT and (1) 5/16 UNC LOCK NUT. After these cables are re-routed, they can be re-connected as they were originally. See Fig. 8-1 for details.



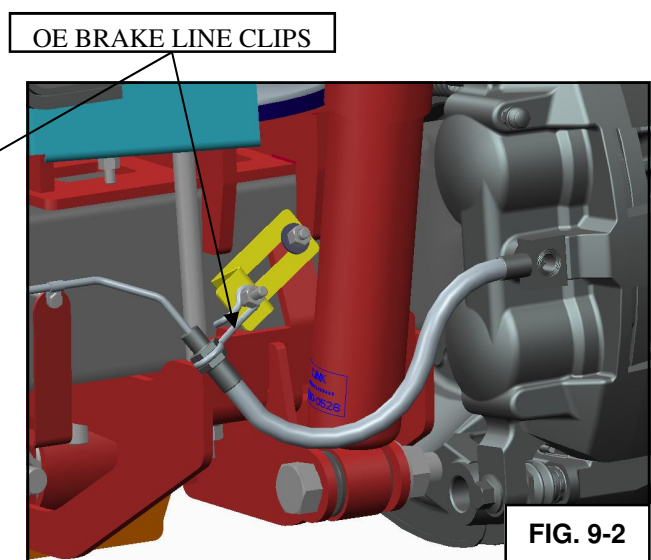
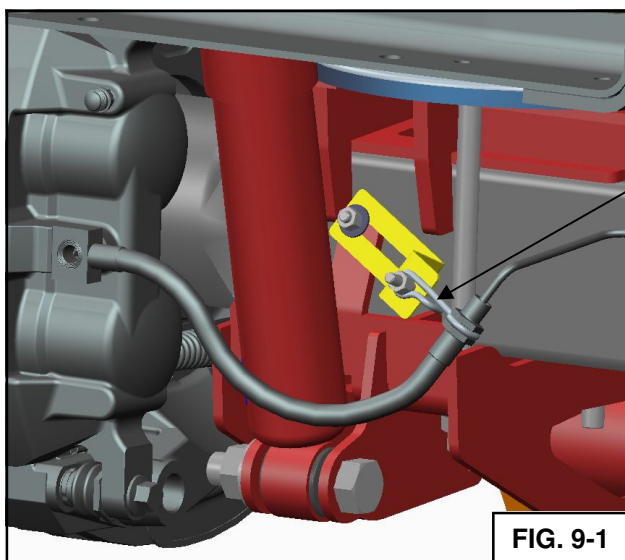


9. BRAKE LINE RELOCATION

1. The Brake Lines that were originally mounted to the rear of the Axle Seat that was removed in Section 2-1 will need to be re-attached. The LOWER AXLE BRACKETS have a tab that will allow this to be done. Secure each side with a 1/4x1 UNC CARRIAGE BOLT, 1/4x1 UNC BOLT, 1/4 WASHERS, 1/4 UNC LOCK NUTS, BRAKE LINE RELOCATION BRACKET, and LOOP CLAMP. as shown in Fig. 9-1 and Fig. 9-2.



WARNING! Ensure that the brake line is not kinked or pinched, and that it does not rub against the shocks.



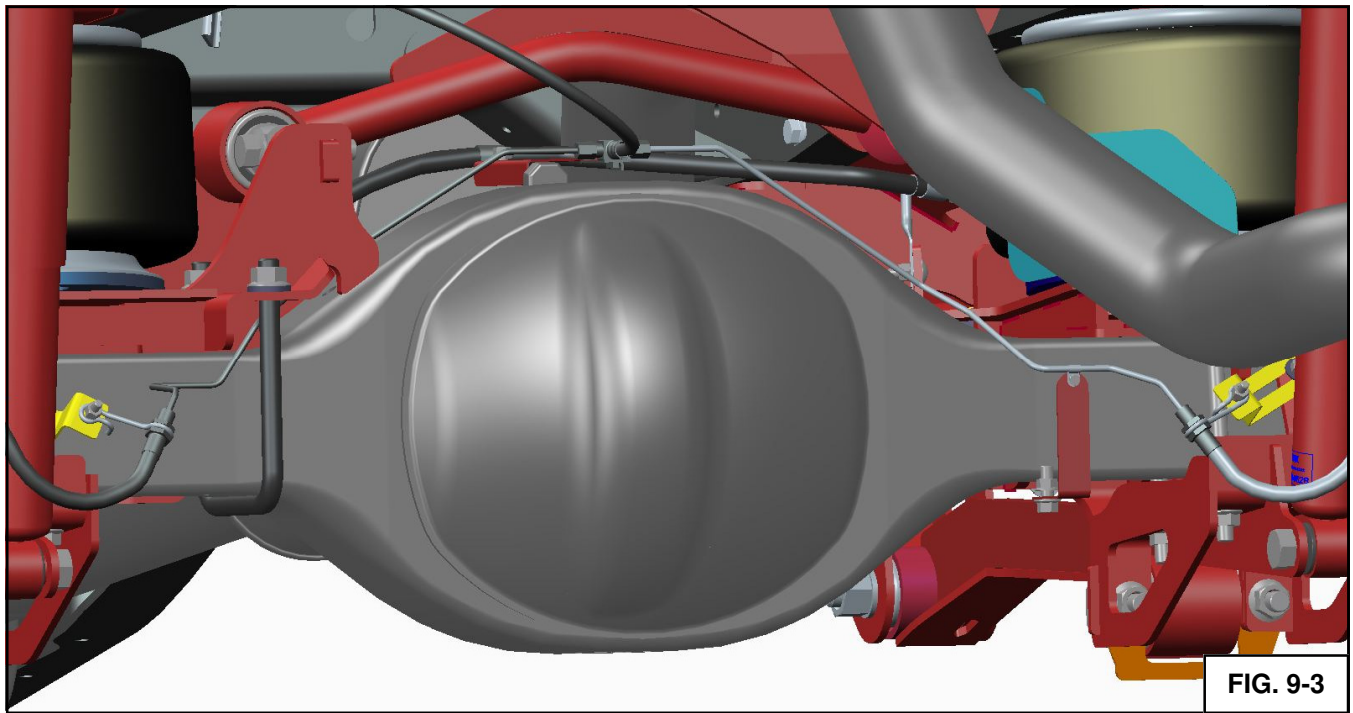


FIG. 9-3

2. The Brake Lines that were originally mounted to the Axle Seat Bracket that was removed in Section 2 will need to be re-attached. Refer to Fig. 9-3 for complete view. The REAR CROSSMEMBERS have a bracket that will allow this to be done. Secure with the 3/8X1 UNC FLANGE BOLT and 3/8 UNC TOP LOCK FLANGE NUT as shown in Fig. 9-4.



WARNING! Ensure that the brake lines are not kinked or pinched, and that they do not contact the lateral control rod. Refer to Fig. 7-4 and confirm shim plate alignment.

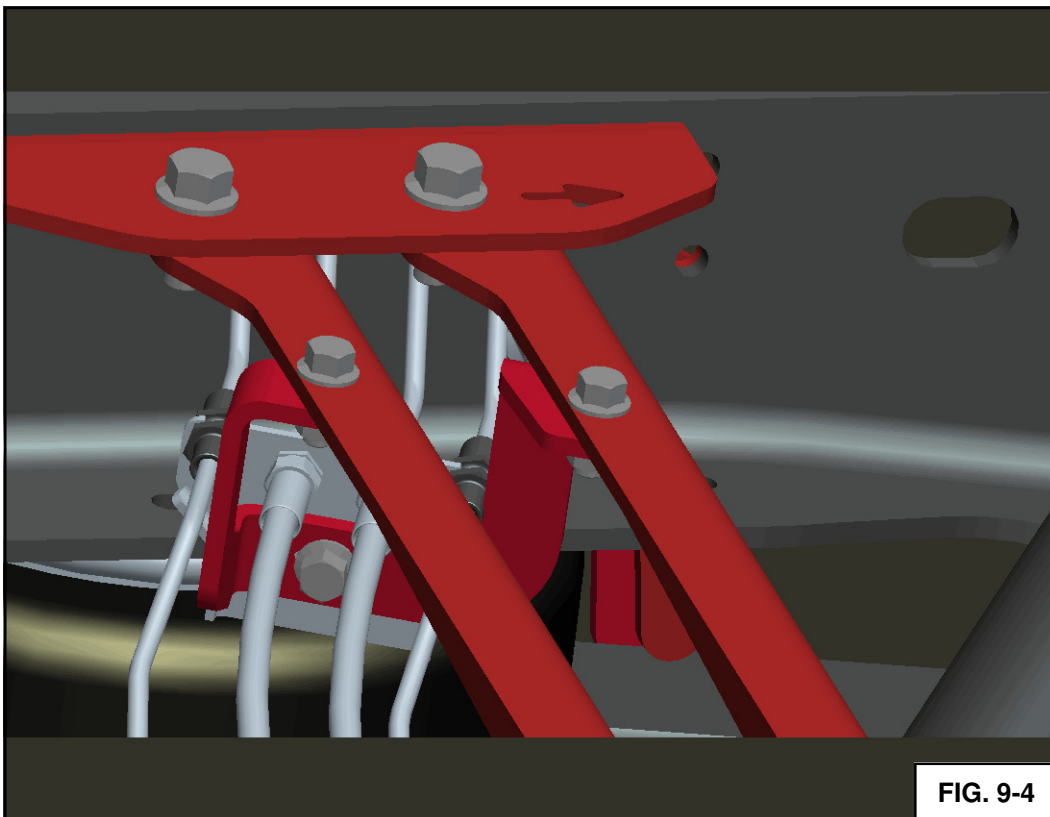


FIG. 9-4

10. AIR CONTROL AND ELECTRICAL SYSTEM

ASSEMBLY



CAUTION! Route all airline away from exhaust, moving parts, and sharp objects. Be careful not to crimp the edges of the tubing. When installing the airline, fully insert into fitting and give a slight pull to seat properly and to be sure airline will not pull out.

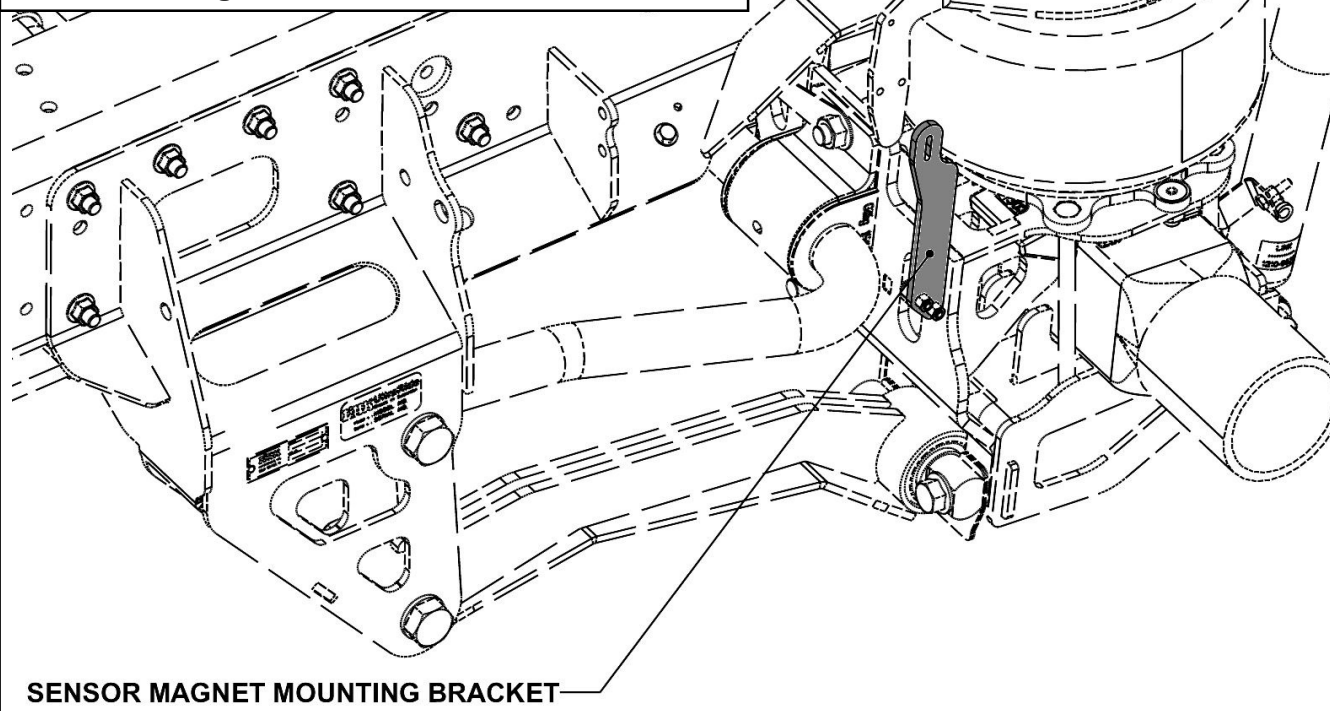
1. Instructions for mounting the Electronic Air Control Unit and routing the airlines can be found in the Electronic Air Control Unit installation instructions.
2. For suspensions using the electronic height control system (800M1300), mount (2) Magnet Mount Plates to the Upper Axle Mounting Brackets in the position shown in Figure 10-1 using (4) 1/4 x 1 UNC CAP SCREWS and (4) 1/4 UNC HEX NYLOC NUTS. To mount the remaining components, refer to the Electronic Air Kit Manual.
3. For suspensions using the Mechanical Height Control Valve Kits (800M1070), mount (1) Valve Bracket to the Driver Side frame hanger using (2) 3/8 x 1 UNC FLANGE BOLTS, and (2) 3/8 UNC TOP LOCK FLANGE NUTS. Mount the Height Control Valve to the inside of the Mount Bracket using (2) 1/4 UNC HEX NYLOC NUTS. Undo the 1/4 UNC HEX NUT and Lock Washer on the free end of the linkage and connect the linkage to the tab on the Upper Axle Bracket. For See Fig. 10-2. For systems using dual mechanical valve kits, repeat installation for the Passenger side.



CAUTION! All wiring should be routed and secured neatly to avoid any functional or visual issues. Under hood and under-body wire routings should be clear of sharp edges (3/4 inches minimum) and direct sources of heat (4 inches minimum). All wiring should be routed away from high temperature areas around exhaust. Wiring should not be routed through wheel well areas where it may be damaged by tire or road debris, and it should not be routed over the exhaust system. Wiring should not contact the brake lines or fuel lines. Disconnect the battery cables before servicing any electrical components.

Electronic Height Control Bracket Installation

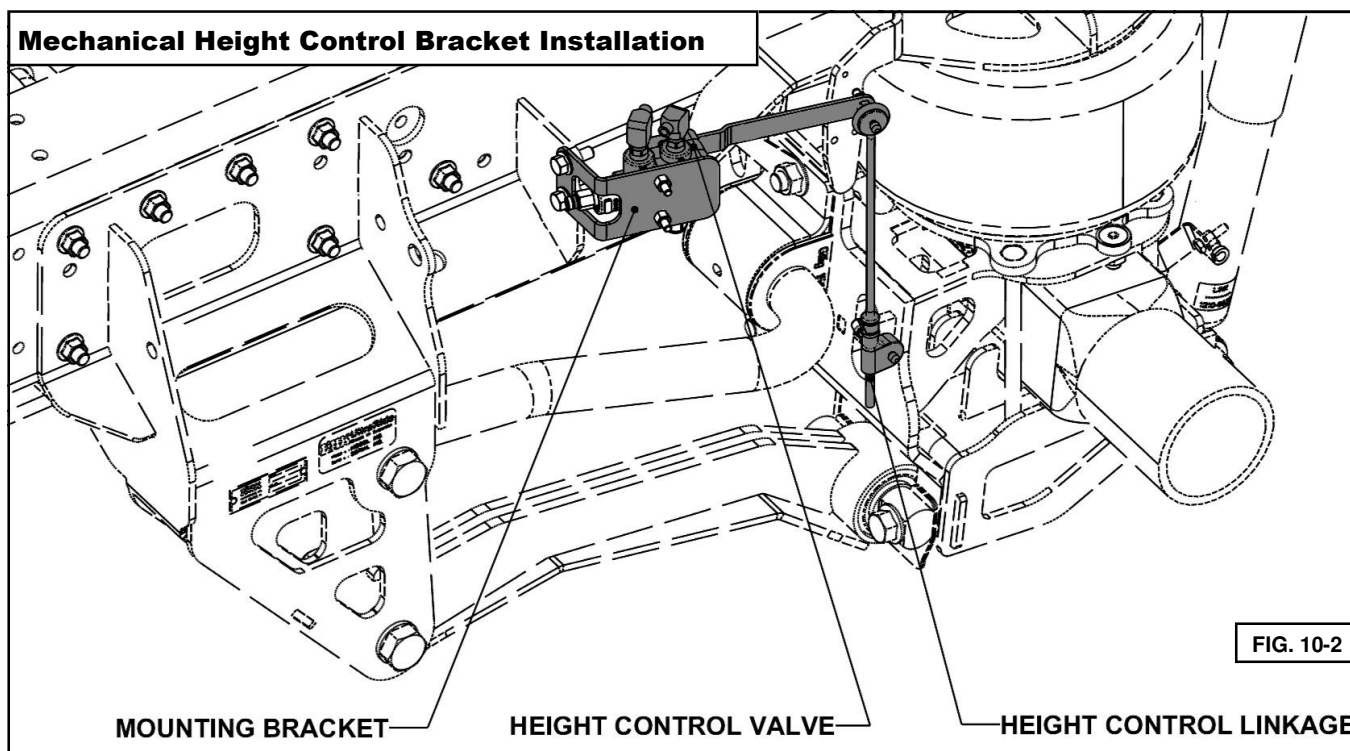
FIG. 10-1



SENSOR MAGNET MOUNTING BRACKET

Mechanical Height Control Bracket Installation

FIG. 10-2



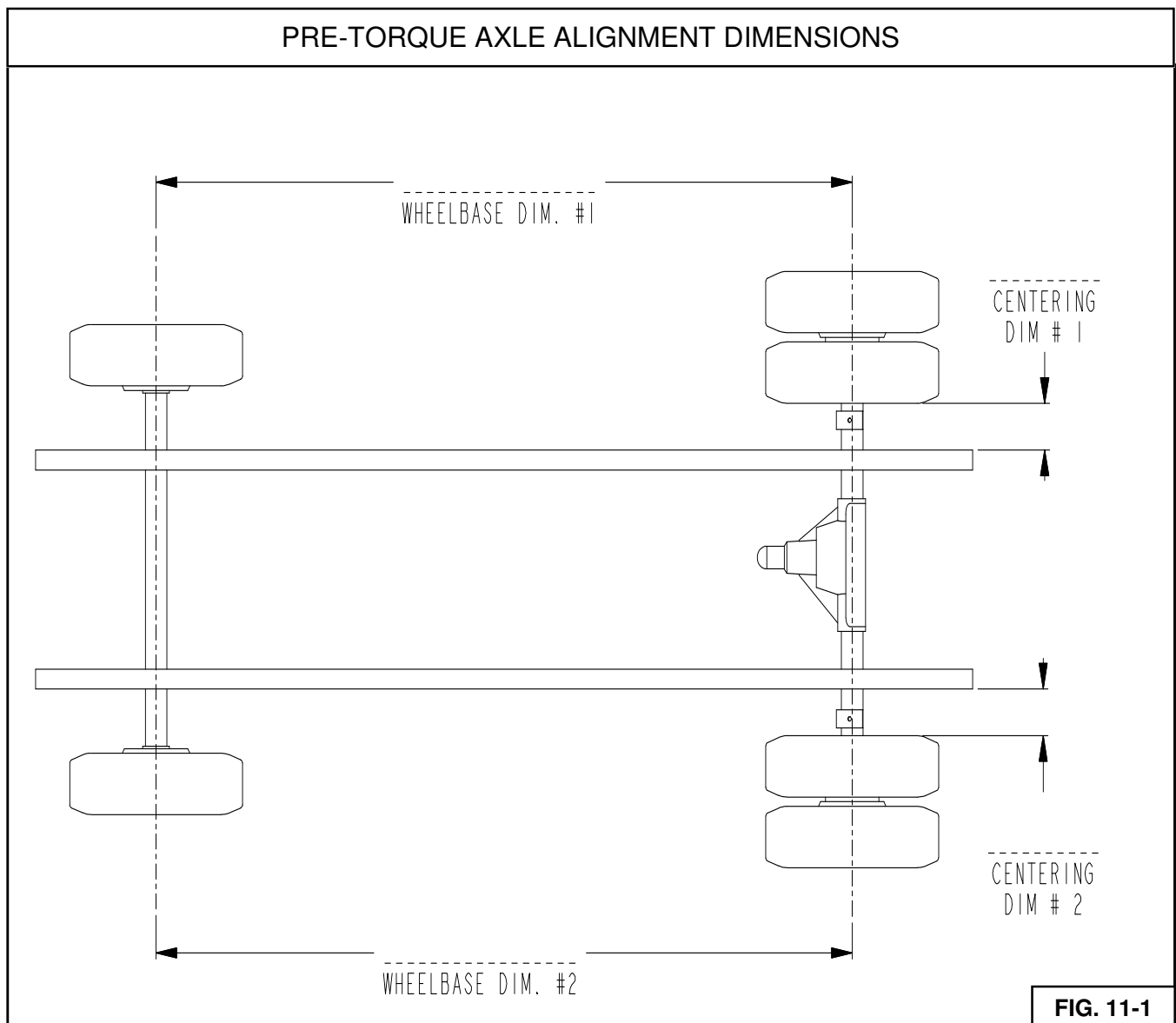
MOUNTING BRACKET

HEIGHT CONTROL VALVE

HEIGHT CONTROL LINKAGE

11. AXLE ALIGNMENT

1. To adjust front-to-rear axle alignment, remove shims to both the lower control arm and sway bar bushing on the side (driver or passenger) that needs to be moved forward. Note that both components (lower control arm and sway bar) need to be moved together to ensure proper suspension geometry.
2. To adjust pinion angle, remove shims to both sides (driver and passenger) of the sway bar bushing (to increase pinion angle) or lower control arm (to decrease pinion angle).
3. To adjust side-to-side axle location, add or remove shims from the lateral control rod.



12. FINAL ASSEMBLY AND INSPECTION

☐ Air System Start Up and Check

Remove all jacks and air system up by either using the fill valve on the air tank or by starting the vehicle and allowing the compressor to fill the system.

☐ Set Ride Height according to 7.50 inches (see Fig. 12-2) according to the instructions in your air control kit.

☐ Bushing Bolts Final Torque

With the suspension at design height torque all bushing fasteners. This will include all fasteners for the Control Arm, Sway Arm and LCR bushings. (See Table 13-1 for appropriate Torque)

☐ Recheck the air spring design height and repeat the above setting procedure if the design height needs to be adjusted.

☐ Move the suspension throughout its entire range of motion, by inflating and deflating the air springs to achieve full travel. Check for any interferences with the lateral control rod, axle, shocks, exhaust, frame, brake lines (**especially on the driver side**), fuel lines, etc. Reconnect the valve/sensor linkage to the lever. **Note: if contacting the brake lines, hand caulk the line to make clearance at least 1/4".**

☐ Recheck all fasteners for specified torque.

☐ Double check all electrical connections and wire routings.

☐ IMPORTANT! Check all fittings and airlines for air leaks.

☐ Reinstall the chassis body (if applicable).

☐ Measure and record wheelbase and centering dims on following page (Fig. 12-1).

After all final checks are complete, it is recommended to complete a full four- wheel alignment and drive line angle check. The pages following the installation instructions describe the proper method for checking drive line angles. Note: improper driveline angles may have a detrimental effect on ride, u-joints, and transmission. If any driveline vibration (or out of spec. angle measurement) occurs, Adjust shims as outlined in section 11.

POST INSTALLATION MEASUREMENTS

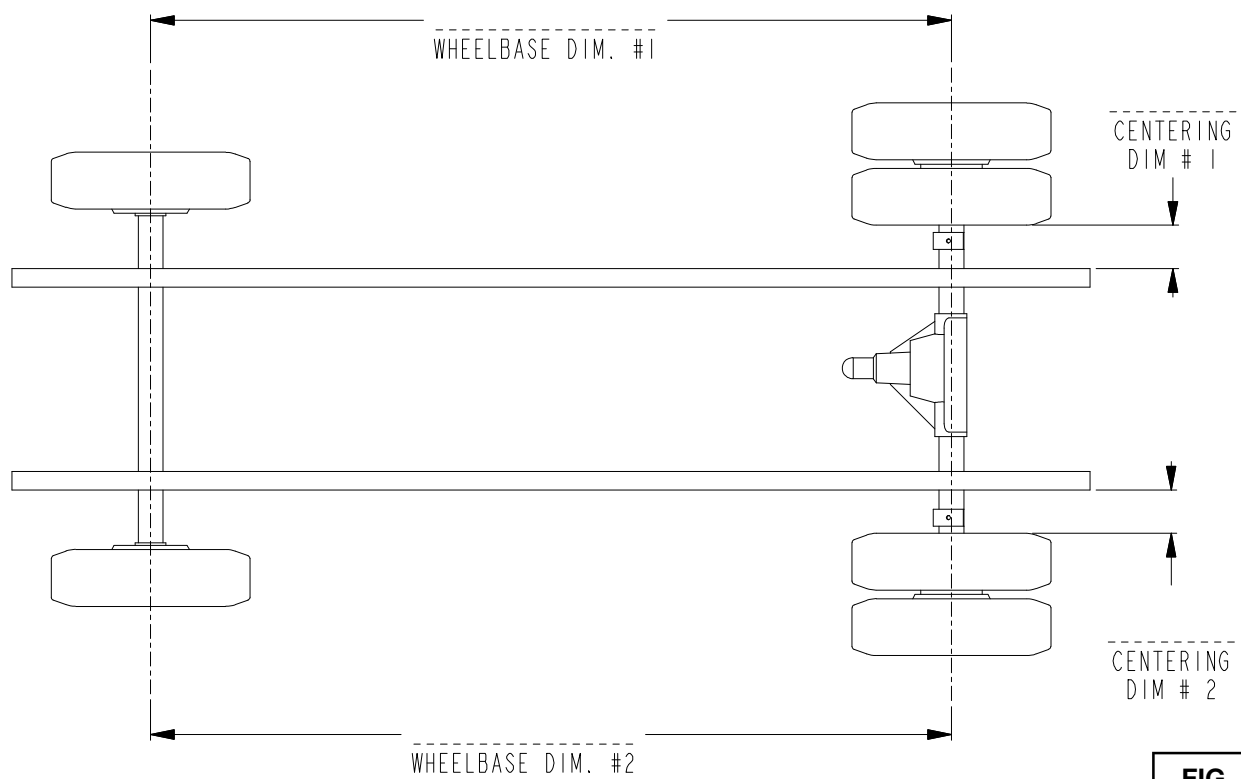


FIG. 12-1

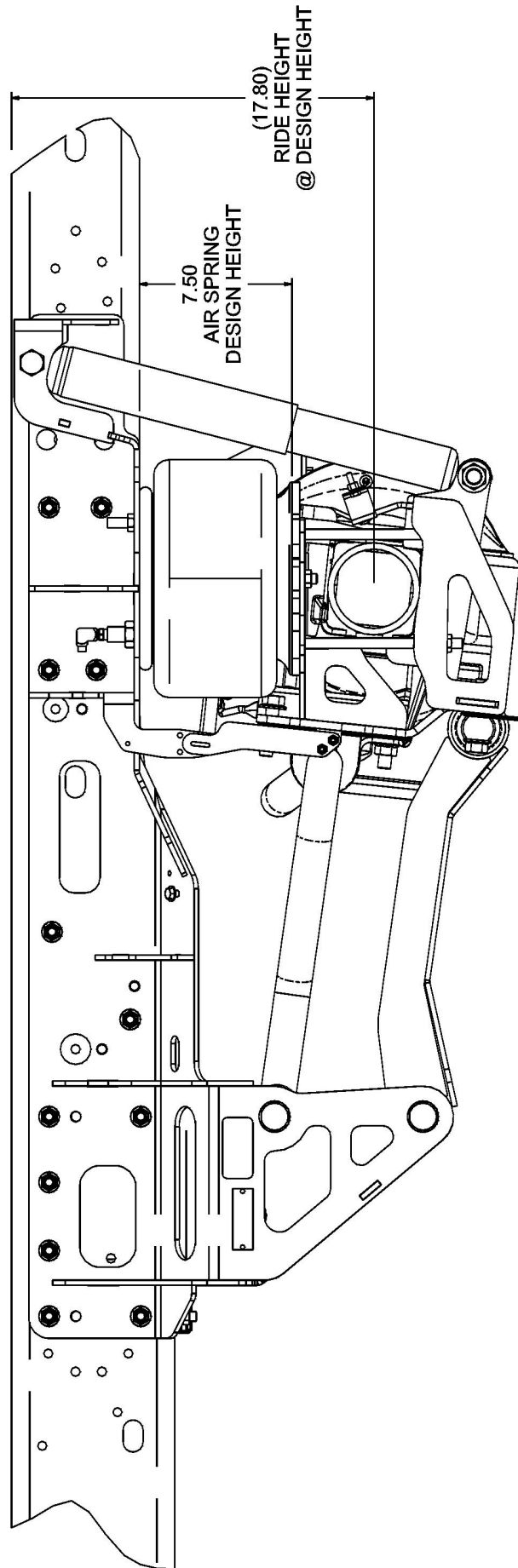


FIG. 12-2

13. FINAL INSTALLATION AND SUSPENSION

COMPONENT TORQUING

IMPORTANT: Before final torqueing of fasteners, adjust the Frame and Axle vertical height until the Frame is at the Ride Height described in Section 12 and shown in Figure 12-2. Setting the Frame to Ride Height before the Final Torqueing assures the Axle and Suspension will not shift when the Suspension is later inflated to Ride Height. Before tightening of upper axle bracket nuts, make sure the brackets are properly aligned with the axle and axle seats. See Fig. 3-1 and 5-1, Components should align vertically as shown.



□ See Torque Table for appropriate Torque values.



1. Torque all (32) M12 x 1.75 FRAME HANGER BRACKET Nuts .
2. Torque the (4) AIRSPRING TOP STUD NUTS
3. Torque the (8) 1½ UNC UPPER AXLE BRACKET Nuts.
4. Torque the (2) 1½ UNC UPPER AXLE BRACKET-ADAPTER PLATE JAM Nuts
5. Torque the (2) 5/8 UNF DRIVER SIDE UPPER AXLE U-BOLT Nuts.
6. Torque the (4) 5/8 UNC LOWER CONTROL ARM Nuts.
7. Torque the (2) M22 x 2.5 LOWER CONTROL ARM Nuts.
8. Torque the (8) 1/2 UNC CROSSMEMBER CHANNELS Nuts.
9. Torque the (2) 5/8 UNC LATERAL CONTROL ROD Nuts.
10. Torque the (1) M22 x 2.5 Pass. Side LATERAL CONTROL ROD Nut.
11. Torque the (2) M22 x 2.5 STABILIZER BAR Nuts.
12. Torque the (4) 5/8 UNC Nuts.
13. Torque the (4) 3/4 UNC NUTS securing the SHOCK ABSORBERS.
14. Torque the (4) 1/4 UNC NYLOC NUTS securing the magnet mounting plates.

IMPORTANT: Route the all brake cables away from the air spring and other moving components.



TORQUE TABLE 13-1



LOCATION	FASTENER	TORQUE
FRAME HANGER BRACKET	M12 x 1.75 NUTS	85 FT-LBS
UPPER AXLE BRACKET	1/2 UNC NUTS	100 FT-LBS
UPPER AXLE BRACKET	5/8 UNF NUTS (U-BOLT)	150 FT-LBS
AIR SPRING TOP STUD	3/4 UNC JAM NUT	50 FT-LBS
PISTON TO AIRSPRING	1/2 UNC BOLT	35 FT-LBS
AIR SPRING BOTTOM (Piston to Adapter Plate)	1/2 UNC BOLTS	30 FT-LBS
AIR SPRING ADAPTER PLATE (To Upper Axle Bracket)	1/2 UNC JAM NUT	30 FT-LBS
HEAT SHIELD	1/4 UNC NUTS	12 FT-LBS
LOWER CONTROL ARMS (At Axle Bracket)	5/8 UNC NUTS	200 FT-LBS
LOWER CONTROL ARMS (At Frame Hanger)	M22 x 2.5 NUTS	610 FT-LBS
CROSSMEMBER CHANNELS	1 1/2 UNC NUTS	100 FT-LBS
LATERAL CONTROL ROD (DRIVER SIDE)	5/8 UNC NUTS	200 FT-LBS
LATERAL CONTROL ROD (PASS. SIDE)	M22 x 2.5 NUT	610 FT-LBS
STABILIZER BAR END	M22 x 2.5 NUT	610 FT-LBS
STABILIZER BAR BUSHINGS	5/8 UNC NUTS	200 FT-LBS
SHOCK ABSORBER BOLTS	3/4 UNC NUTS	275 FT-LBS
MAGNET MOUNTING PLATE	1/4 UNC NYLOC NUTS	8-10 FT-LBS

14. SERVICE & MAINTENANCE

The UltraRide® suspension needs no lubrication and little maintenance. The following components should be checked at the time the vehicle is being serviced. However, immediate corrective action should be taken if a serious malfunction occurs. See the Parts List Drawing on following page for details.



WARNING! If maintenance or service is to be done on the air system, be sure to drain **all** air from system. Serious injury could occur if components are removed while system is full of air.

PRODUCT OWNER RESPONSIBILITIES

- ❑ Owner is solely responsible for pre-operation inspection, periodic inspections, maintenance, and use of the product as specified in the particular LINK MFG. instructions available by product model, except as provided in this warranty, and for maintenance of other vehicle components. Of particular importance is the re-torque of fasteners including axle U-bolts, torque rod bolts and track rod bolts. This re-torque must be performed within 90 days of the suspension being put in service.
- ❑ Owner is responsible for “down time” expenses, cargo damage, and all business costs and losses resulting from a warrantable failure.
- ❑ The UltraRide® Chassis Air Suspension is fully automatic in controlling the height of the chassis. No manual intervention to control air pressure or ride height is needed during the course of operation.
- ❑ The compressors are controlled by the pressure switch located in the Electronic Air Control Unit. This switch automatically turns the compressors on when the tank pressure falls below 120 psi, and turns them off at 155 psi.
- ❑ The Low Pressure Warning Light indicates a severe drop in tank pressure (below 60 psi). Immediate corrective action should be taken to determine the cause of air loss or system malfunction. **NOTE:** The Low Pressure Warning Light could come on briefly when the “Dump” feature is being used.
- ❑ If not using an automatic drain valve, it is important to release any moisture contained within the air tank on a **daily** basis. This is done by pulling on the attached release cable for approximately 5 seconds. See Air Control Kit Owners Manual for location of this cable. Not releasing the moisture on a regular basis will cause the drain valve to not operate properly.



CAUTION! Do not operate the vehicle while the Dump Switch is on and the air springs are deflated. **This may damage the air springs and suspension components.**

DAILY SERVICE:

- ❑ Release any moisture in air tank by pulling on air release cable.

CHECK AT EVERY VEHICLE SERVICE INTERVAL:

- ❑ Check Design Height $\pm 1/4$ ".
- ❑ Check for air leaks around fittings.
- ❑ Check air compressor filter and replace annually.
- ❑ Visually check Valve/Linkage Hardware for Function and that components/fasteners are intact.

CHECK AFTER THE FIRST 1000 MILES:

- ❑ Recheck & tighten any loose fasteners.
- ❑ Check for any loose or worn components.

CHECK AFTER EVERY 30,000 MILES:

- ❑ Check arm pivot bushings and lateral control rod bushings for wear; replace if worn

UltraRide® - RAM 4500/5500

PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	11030501	SPRING-AIR	2
2	12100528	SHOCK ABSORBER	2
3	1302-5091	ELBOW, 1/4 TB 1/4 M-NPT, PUSH-IN DOT	2
4	1401-0806	1/4 X 3/4 UNC HEX CAP SCR (GR 5)	1
5	1401-0808	1/4 X 1 UNC HEX CAP SCR (GR 5)	6
6	1401-1004	5/16 X 1/2 UNC HEX CAP SCR (GR 5)	1
7	1401-1008	5/16 X 1 UNC HEX CAP SCR (GR 5)	1
8	14010P08	NO. 10 X 1 UNC HEX CAP SCR (GR 5)	1
9	14062226	HEX CAP SCREW, M22 X 2.5 X 130, CLASS 10.9, O&P	5
10	140B-1664	1/2 X 8 UNC HEX CAP SCR (GR 8) O&P	8
11	140B-2428	3/4 X 3 1/2 UNC HEX CAP SCR (GR 8) O&P	4
12	14171608	1/2 X 1 UNC SOC FLAT CSK HD CAP SCREW	4
13	14171610	1/2 X 1 1/4 UNC SOC FLAT CSK HD CAP SCREW	2
14	141A-1208	3/8 X 1 UNC FLANGE BOLT (GRADE 8) O&P	4
15	141A-1610	1/2 X 1 1/4 UNC FLANGE BOLT (GR 8) O&P	8
16	141A-2016	5/8 X 2 UNC FLANGE BOLT (GR 8) O&P	4
17	141A-2024	5/8 X 3 UNC FLANGE BOLT (GR 8) O&P	6
18	141B1207	HEAVY HEX FLNG SCR M12X1.75X35 CLS 10.9	24
19	141B1209	HEAVY HEX FLNG SCR M12X1.75X45 CLS 10.9	8
20	1435-0808	1/4 X 1 UNC RND HD SQ NK BOLT (GRADE 5)	4
21	1435-1008	5/16 X 1 UNC RND HD SQ NK BOLT (GRADE 5)	1
22	1470-0600	10-24 UNC HEX NUT (GR B)	1
23	1474-1600	1/2 UNC HEX JAM NUT	4
24	1475-2402	3/4 UNF HEX JAM NUT, O&P	2
25	1476-2207	HEX TOP LOCK NUT, M22 X 2.5, CLASS 10	5
26	1478-0800	1/4 UNC HEX NYLOCK NUT (GR B)	11
27	1478-1000	5/16 UNC HEX NYLOCK NUT (GR B)	3
28	1480-1204	3/8 UNC TOP LOCK FL NUT (GR G) O&P	4
29	1480-1604	1/2 UNC TOP LOCK FL NUT (GR G) O&P	16
30	1480-2004	5/8 UNC TOP LOCK FL NUT (GR G) O&P	10
31	1480-2005	5/8 UNF TOP LOCK FL NUT (GR G) O&P	2
32	1480-2404	3/4 UNC TOP LOCK FL NUT (GR G) O&P	4
33	14801202	HEX TOP LOCK FLANGE NUT, M12 X 1.75, CLASS 10	32
34	14870800	1/4 TYPE A PLAIN WASHER	3
35	14882002	5/8 HARDENED WASHER, ZINC PLATED	2
36	14892200	WASHER-HARDENED, 22mm	10
37	14950029	U-BOLT-SQUARE, 5/8 UNF, 5.06 X 7.00	1
38	1500-0843	BUSHING-SWAY BAR, POLYURETHANE	2
39	1500-1305	TAG-SERIAL, CABMATE	1
40	15000930	CLAMP-LOOP, RUBBER CUSHIONED	2
41	1505-1801	PLASTIC LOOM CLAMP-3/16	1

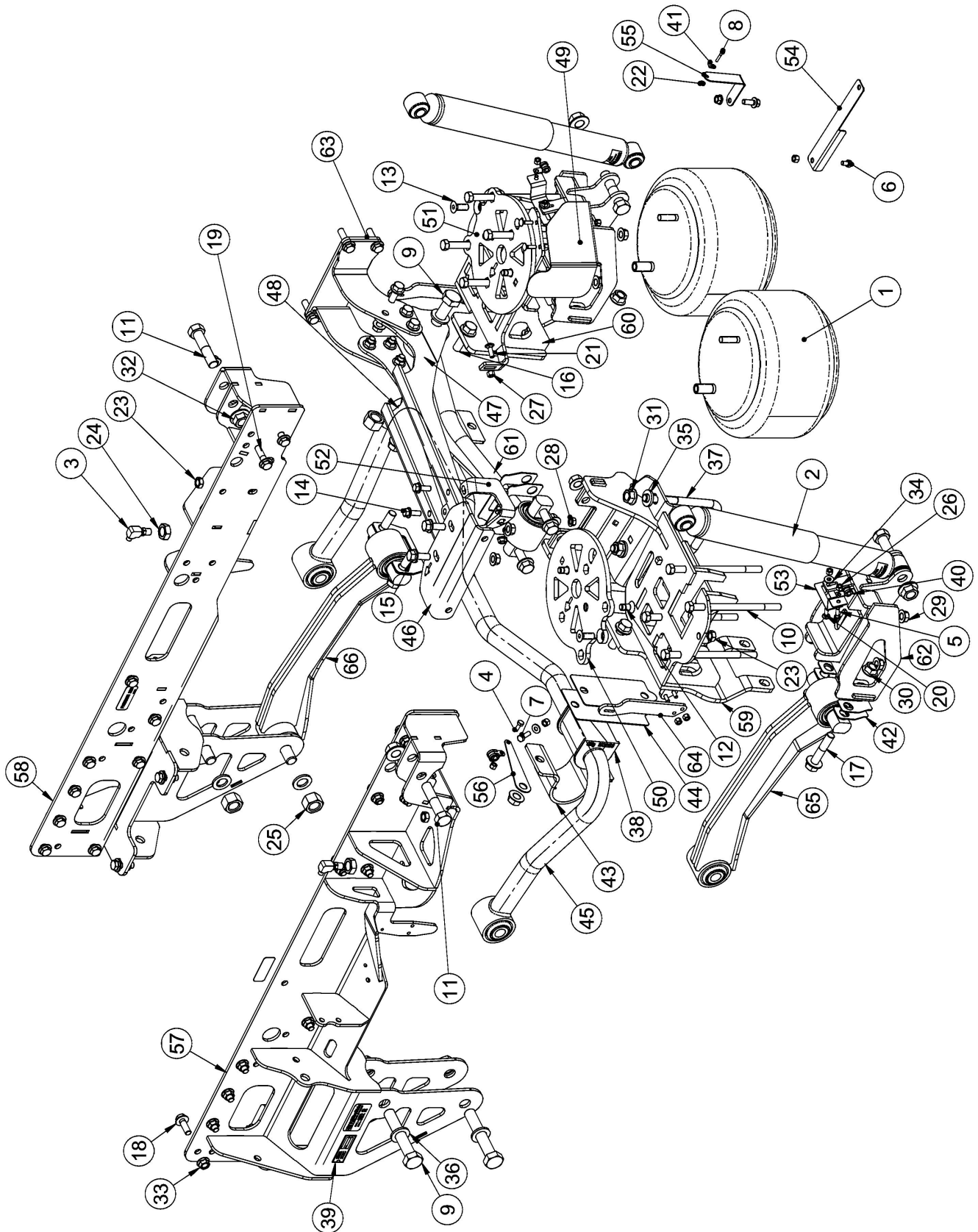
UltraRide® - RAM 4500/5500 PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
42	80001819	SHIM-LATERAL CONTROL ROD	6
43	80001954	CLAMP-MOUNT, SWAY BAR	2
44	80001963	SHIM-SWAY BAR	4
45	80001974	SWAY BAR ASSEMBLY	1
46	80002042	BRACKET-MOUNT, CROSSMEMBER	1
47	80002043	CROSSMEMBER-REAR	1
48	80002044	CROSSMEMBER-REAR	1
49	80002057	SHIELD-EXHAUST	1
50	80002061	PLATE-ADAPTER, AIR SPRING	1
51	80002062	PLATE-ADAPTER, AIR SPRING	1
52	80002071	MOUNT-STABILIZER, BRAKE LINE	1
-	80002167	OWNERS GUIDE-ULTRARIDE	1
53	80002225	BRACKET-RELOCATION, BRAKE LINE	2
54	80002704	BRACKET - E BRAKE CENTER	1
55	80002705	BRACKET - BRAKE LINE	1
56	80002706	PLATE MTG - E BRAKE DRIVER SIDE	1
57	800M0116	BRACKET-HANGER, SUSPENSION	1
58	800M0117	BRACKET-HANGER, SUSPENSION	1
59	800M1063	BRACKET-MOUNT, AXLE, SWAY BAR	1
60	800M1064	BRACKET-MOUNT, AXLE, SWAY BAR	1
61	800M1065	LATERAL CONTROL ROD	1
62	800M1066	BRACKET-CLAMP, AXLE	2
63	800M1103	BRACKET-MOUNT, CROSSMEMBER	1
64	81000539	PLATE-MAGNET MOUNT	2
65	820M0044	CONTROL ARM	1
66	820M0045	CONTROL ARM	1

UltraRide® – TROUBLE SHOOTING GUIDE

COMPONENT	POSSIBLE PROBLEM	CORRECTIVE ACTION
Airlines	Air leaks	Replace airline
Fittings	Air leaks	Remove fitting and apply fresh joint compound. Reinstall fitting, but Do Not Over tighten. Do not use Teflon tape.
Air Springs	A. Improper height B. Air leakage	A. Adjust valve/sensor linkage to maintain proper air spring height. B. Replace air spring.
Height Control Valve/Sensor	Air spring(s) will not inflate when weight is added to the chassis. OR Air spring(s) will not deflate when weight is removed from the chassis.	A. Inspect valve/sensor to ensure it is oriented correctly. Check that the airlines and fittings are assembled to their correct ports. See Section 10 for orientation details B. Replace valve OR see Air Kit Manual
Shock Absorber	Insufficient damping effect	Replace shocks
Lateral Control Rod	A. Loose nuts on lateral control rod bolts B. Worn bushings	A. Tighten securely. B. Replace lateral control rod.

UltraRide® – RAM 4500/5500,



Guideline -Driveline Angles

After vehicle build is complete, the driveline angles must meet the following "rules", both at unloaded, and fully-loaded, vehicle attitudes .

Rule #1: The NET OPERATING ANGLE, at any individual joint, must be at least 1/2 degree, and not to exceed 3 degrees. The net operating angle at any individual joint on the Ram 4500/5500 must not exceed 4 degrees. The preferred maximum angle is 2 degrees.

The NET OPERATING ANGLE (e) at any one joint is the combination of the joint angles in both the side view and the plan (top) view. This NET OPERATING ANGLE (e) equals:

By example, using Figure 1:
The NET OPERATING ANGLE at **JOINT - A** = (ea) =

$$\sqrt{\left[\text{Plan View Angle} \right]^2 + \left[\text{Side View Angle} \right]^2}$$

$$\sqrt{(0)^2 + (\text{angle} - a)^2} \geq 0.5^\circ \leq 3.0^\circ \text{ or } \leq 4.0^\circ$$

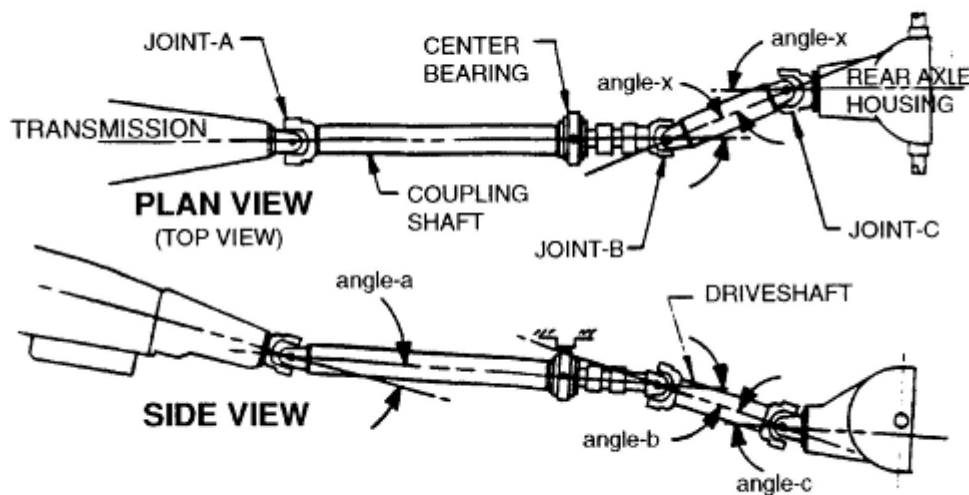
The NET OPERATING ANGLE at **JOINT - B** = (eb) =

$$\sqrt{(\text{angle} - x)^2 + (\text{angle} - b)^2} \geq 0.5^\circ \leq 3.0^\circ \text{ or } \leq 4.0^\circ$$

The NET OPERATING ANGLE at **JOINT - C** = (ec) =

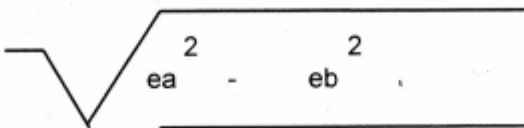
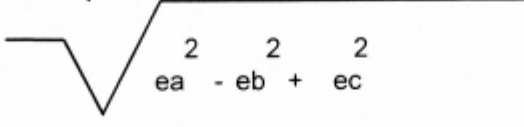
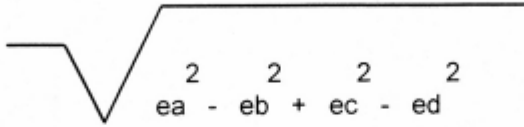
$$\sqrt{(\text{angle} - x)^2 + (\text{angle} - c)^2} \geq 0.5^\circ \leq 3.0^\circ \text{ or } \leq 4.0^\circ$$

Fig. 1



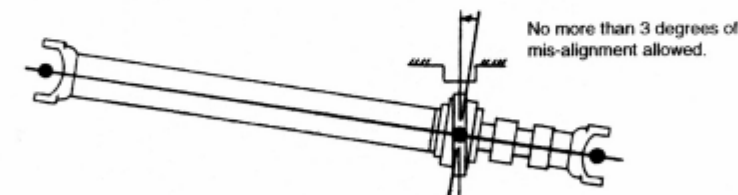
Guideline - Driveline Angles (Continued)

Rule #2: The combination of NET OPERATING ANGLES, throughout the whole driveline, **must** "cancel". It is preferred that the NET OPERATING ANGLES at either end of a shaft be within 1 degree of each other. However, at a minimum, the following formulas must be satisfied for sufficient "cancellation" to occur:

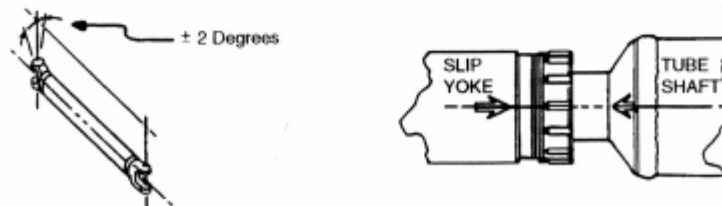
For a 1-shaft driveline: (2 - joint)		$\leq 3.0^\circ \text{ or } \leq 4.0^\circ$
For a 2-shaft driveline: (3-joint) (as exemplified in Figure-1)		$\leq 3.0^\circ \text{ or } \leq 4.0^\circ$
For a 3-shaft driveline: (4-joint)		$\leq 3.0^\circ \text{ or } \leq 4.0^\circ$

Rule #3: The center bearing mounting bracket, surrounding the rubber insulator, must be **90 ± 3 degrees** to the center bearing. In other words, no more than 3 degrees of mis-alignment can be absorbed by the rubber surrounding the center bearing. See Figure 2.

Fig. 2



- A. Ensure that u-joints are in-line to within ± 2 degrees.
B. Ensure matching alignment arrows between slip yoke and tube shaft



Observe alignment arrows stamped on parts. If there are no alignment marks, then add them before disassembly to ensure proper phasing alignment of shaft and yoke.

GUIDELINE - DRIVELINE COMPONENT PHASING

MINIMUM UNIVERSAL JOINT OPERATING ANGLE:

A slight angle is required to prevent universal joints from brinelling. Therefore, a minimum operating angle of 1/2 degree is required.

MAXIMUM UNIVERSAL JOINT OPERATING ANGLE:

Universal joint operating angles can be quite high, sometimes as high as 12 degrees. But to get a vehicle to operate successfully above 3 degrees often requires larger universal joints, double cardan or constant velocity joints, or restrictions on operating speed. A reduction in universal joint life becomes noticeable when they are operated at more than 3 degrees if precautions are not taken. That having been stated, the Ram 4500/5500 can tolerate angles up to 4 degrees. However, maximum angles of 2 degrees are preferable for all vehicles.

Two shafts connected with a single cardan joint and turning at a constant speed with no joint angle, have no angular acceleration that could cause a vibration. When there is an angle between them and the input shaft is turning at a constant speed, the driven shaft is forced to continuously accelerate and decelerate, twice per revolution, creating a vibration. If the speed changes are small, the vibration is not objectionable. The guidelines in this appendix limit driveline angular acceleration to a maximum of 400 radians per second per second. This is the requirement for all Ram light trucks. (SAE specifies 500.) Some modified drivelines have been measured at over 11,000 radians per second per second causing driveline failures at very low mileage.

DRIVELINE ANGLE MEASUREMENT:

Driveline angle measurements should be made with the vehicle supported by the tires and resting on a level surface. Avoid hoisting a vehicle by the frame since this will distort the chassis enough to make any measurements inaccurate.

MATCH MOUNTING DRIVESHAFTS TO THE REAR AXLE:

Runout is measured on OEM rear axle input shafts and the maximum measurement is shown with a dot or other marking on the yoke or pilot bearing flange. The OEM driveshafts may also be marked with indicative marking on the "light" side. When the parts are assembled, the marks are aligned to aid the overall system balance. Vehicle modifiers should look for these alignment marks and maintain this match when the drivetrain is reassembled after modification. Remanufactured or modified driveshafts should also have their "light" sides matched to the mark on the yoke or pilot bearing flange.

DRIVELINE VIBRATION DAMPERS:

Driveline vibration dampers are sometimes added to driveshafts or axles to reduce noise, vibration, and harshness (NVH). If the chassis has these devices when it is received, they should be retained on the modified chassis.

USE OF DOUBLE CARDAN UNIVERSAL JOINTS FOR GREATER DRIVE ANGLES:

In general, the use of these joints can allow increased drive angles up to as much as 8 degrees. However, when used at the rear of a coupling shaft a double cardan universal joint will prevent cancellation from occurring at the forward end of the shaft. Therefore the single cardan joint must still be maintained at less than 3 degrees (or 4 degrees for the Ram 4500/5500).

GENERAL COMMENTS:

It is good practice, for any chassis that will have a driveline modification, to measure and record the driveline angles in each of the following conditions for later comparison.

- A. The chassis as first received from Ram (note that the drive angles may not conform exactly to this bulletin in this incomplete condition).
- B. The completed vehicle, unloaded.
- C. The completed vehicle loaded to GVWR with maximum front GAWR.
- D. The completed vehicle loaded to GVWR with maximum rear GAWR.



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