

10014700

Version 1.2

1/2", 5/8" drill bit required



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2023+ Ford F-450/550/600 Chassis Cab 4-Link Rear Stock Height Installation Instructions



INTRODUCTION

IMPORTANT!

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

PRODUCT INSTALLER RESPONSIBILITIES

Installer is responsible for installing the product in accordance with Kelderman Mfg., Inc. specifications and installation instructions.

Installer is responsible for providing proper installation of vehicle components and attachments as well as required or necessary clearance for suspension components, axles, wheels, tires, and other vehicle components to ensure a safe and sound installation and operations.

Installer is responsible for advising the owner of proper use, service, and maintenance required by the product and for supplying maintenance and other instruction as readily available from Kelderman Mfg., Inc.

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 Weight Rating (GAWR). No alteration of any suspension component is permitted.

DEFINITION OF TERMS

WARNING –indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION –a potential hazardous situation may result in property damage.

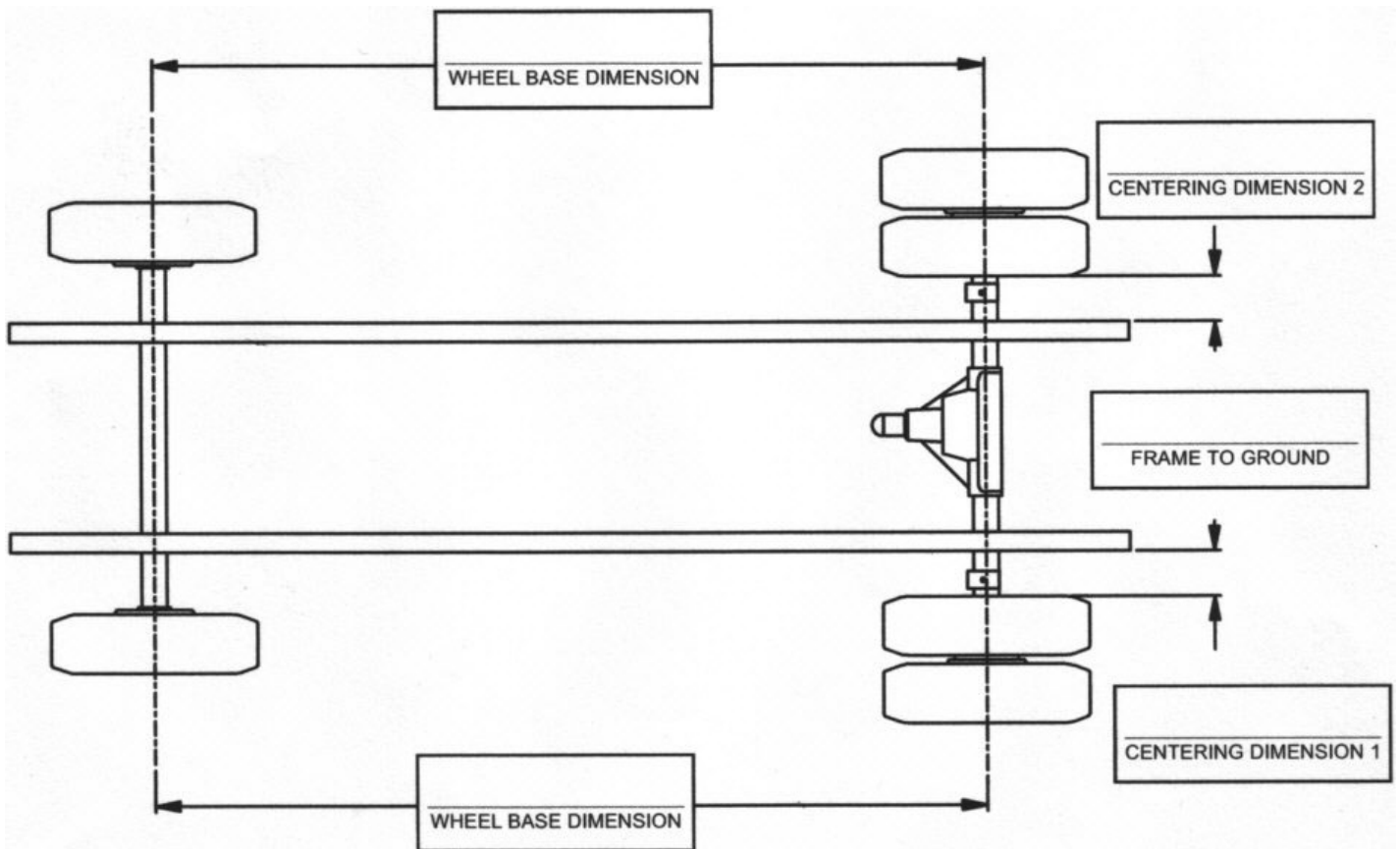
NOTE –provide information or suggestions that help you correctly perform a task.

TORQUE –the italicized torque alerts you to tighten fasteners to a specified torque value.



PRE-INSTALLATION CHECKLIST

- Check the vehicle wheel alignment prior to installation to insure no precondition already exists; record the information for verification.
- Measure and record the wheelbase and centering dimensions before beginning installation.
- Measure and record the height from the ground up to the rear of the frame.
- Measure and record the pinion angle. *See page 10 for specific instructions.*
- Remove the attached body, if applicable. Remember to disconnect all electrical connections and fuel filler tube, before removing the body. The installation can also be completed using a lift to raise the vehicle. If using a lift, chassis body removal may not be necessary but removal of rear wheels will aid in installation.
- If not using a lift, block the front wheels so the vehicle cannot roll.
- Jack up the rear frame of the truck in order to unload the rear leaf springs. Do not lift the wheels off the ground (if not using a lift to install the suspension). Do not jack on the axle itself.



DETERMINING PINION ANGLE

The pinion angle is critical in the correct installation of your Kelderman Air Suspension System. The pinion angle can be easily determined with the use of magnetic angle gauge.

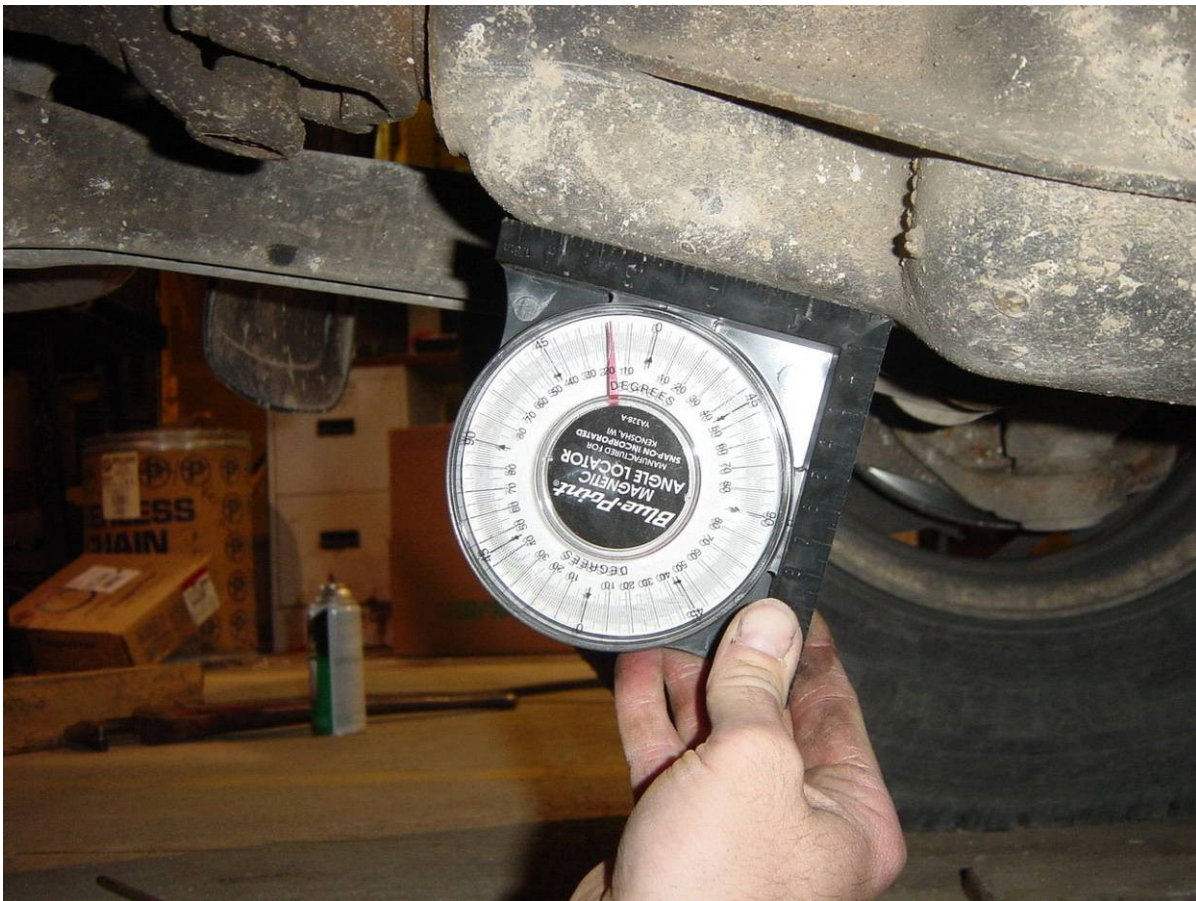
To measure the angle, find a flat surface to attach angle gauge. Mark the location of your gauge with marking pen or scribe. Record the angle on the gauge for future reference.

Note: It may be necessary to remove gauge. Marking the position of the gauge is critical to ensure accurate angle readings during adjustment steps of the assembly of your Kelderman Air Suspension System.



of
a
a

Pinion Angle: _____°



DISASSEMBLY

1. With weight taken off the rear springs, as noted in pre-installation checklist, remove the mount bolts from the front leaf spring hanger bracket. Remove the U-bolts that mount the spring to the axle. It works well to put a jack stand under the differential where the drive shaft connects to keep the axle from rolling down when the leaf springs are removed.

CAUTION: Be careful that the leaf spring does not spring out of its hanger, or off the frame.

NOTE: Be sure to save the lower factory axle clamp. As it is used for later installation.

Remove the bolt from the rear spring hanger. Remove the spring pack from the vehicle and discard. **DO NOT** re-use the fasteners that mount the bracket, or the leaf spring itself. New fasteners are provided, and must be used to achieve proper clamp load on the hanger.

2. Remove Upper shock mount nuts and pull the upper shocks off their mounting studs to aid in assembly later in the instructions. Retain hardware for installation later.

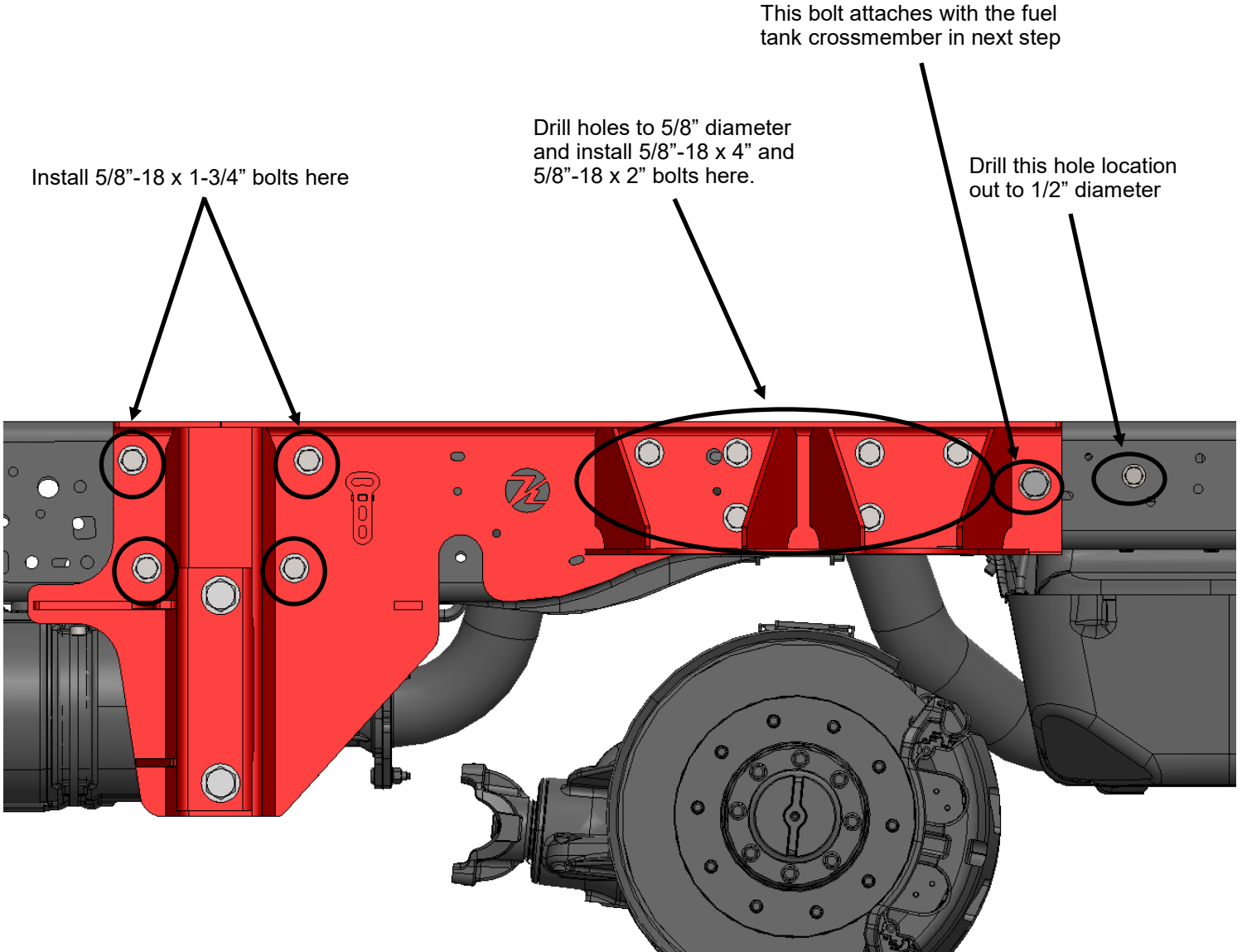
3. Remove the rivets from the forward overload spring pads and discard.

4. Remove the jounce bumper and discard.



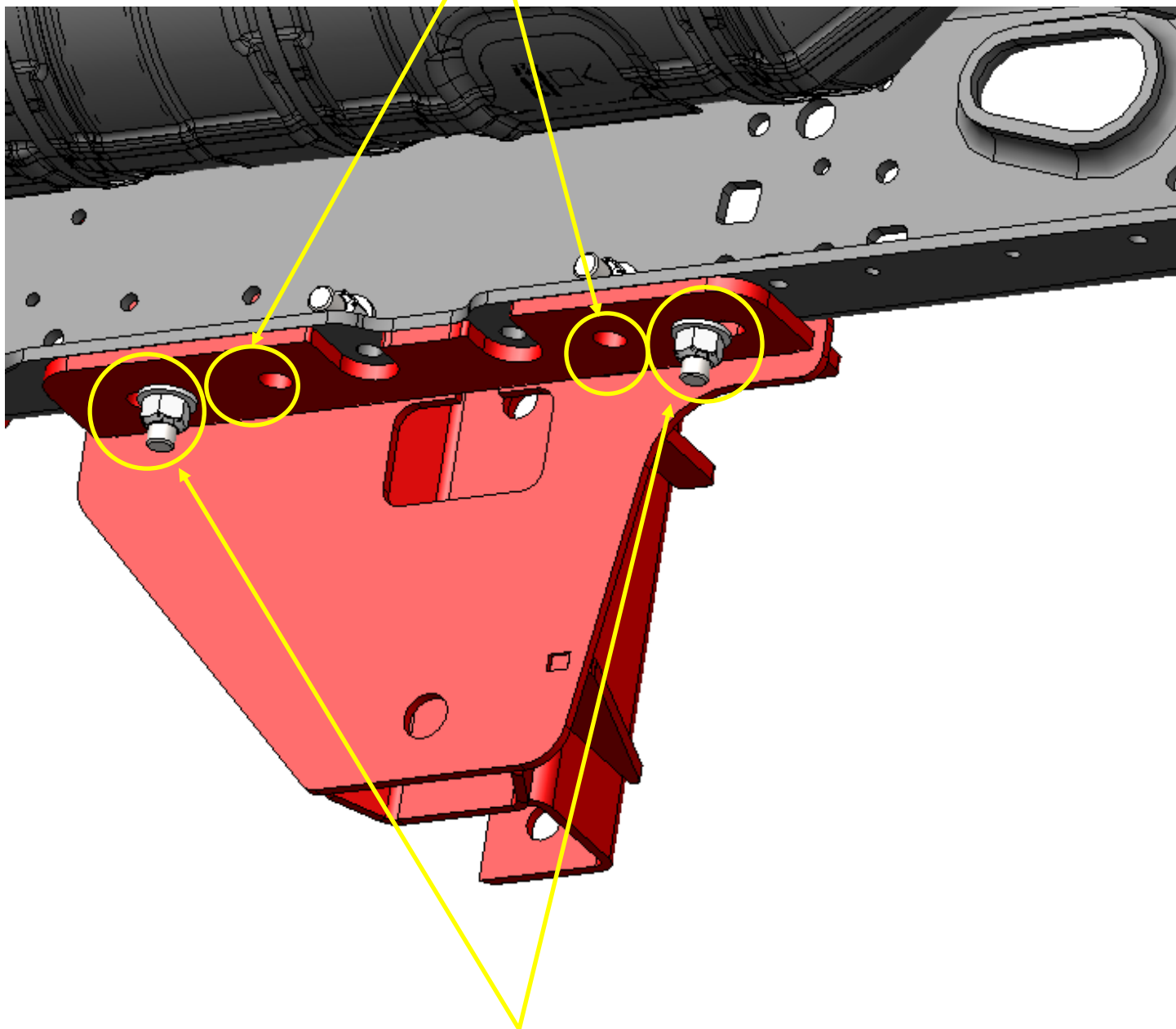
Installation

2. Locate the side plates (Part# 10014904-DS/10015109). The side plates fasten to the side of the frame with the (4) 5/8"-18 x 1-3/4", (4) 5/8"-18 x 4" and (2) 5/8"-18 x 2" bolts. Drill out holes to with 5/8" diameter drill bit for holes in center of side plate and drill out hole towards the rear with 1/2" drill bit. Install bolts in locations shown below. 5/8" bolts to 150 ft./lbs.



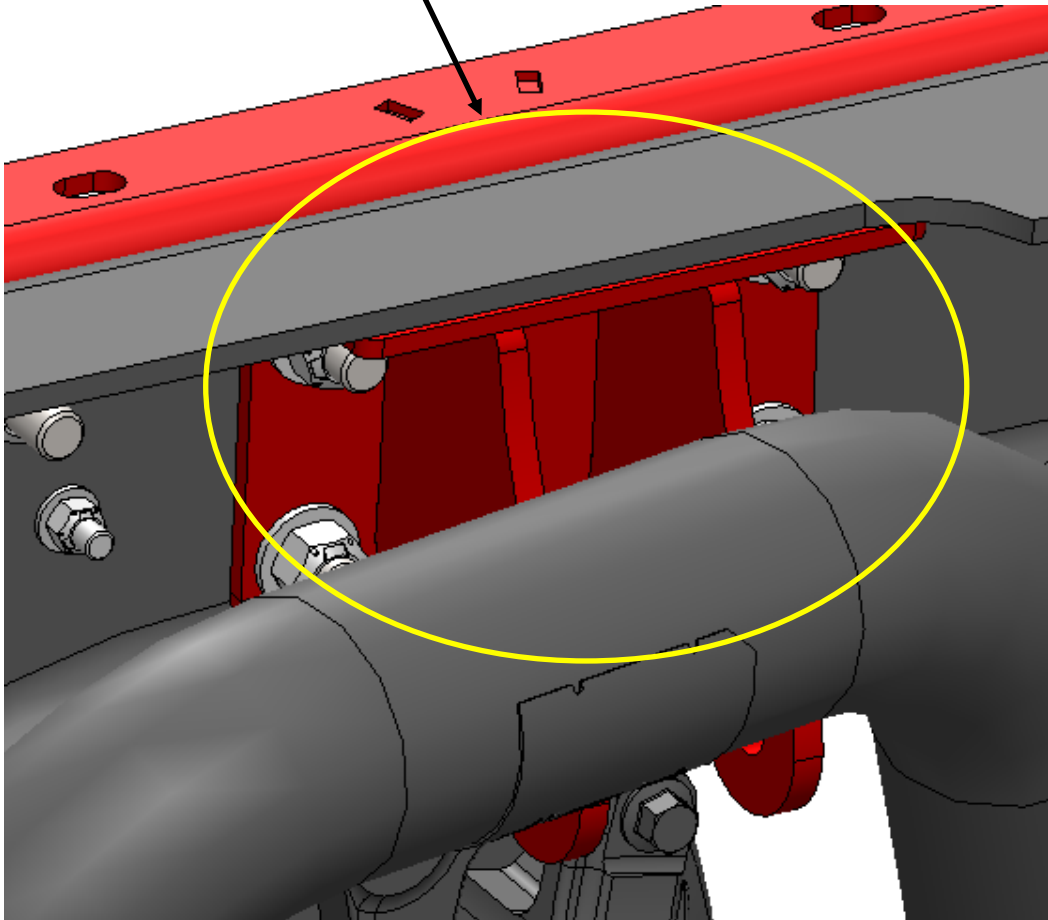
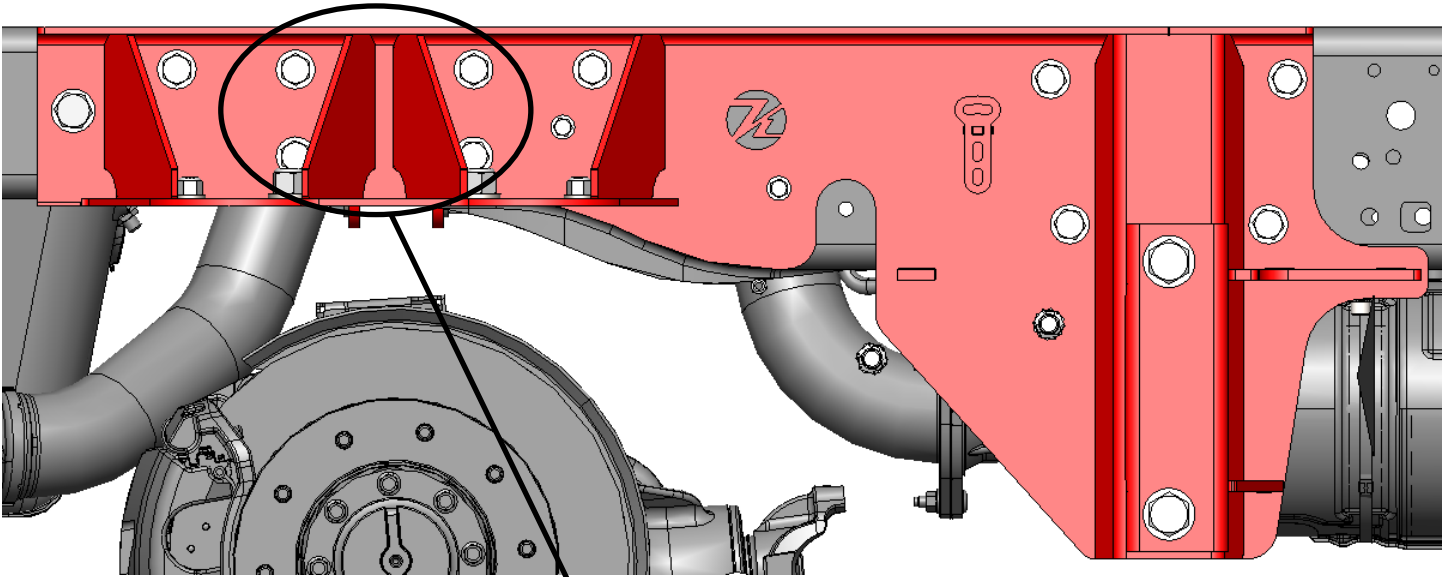
On bottom of side plates, use (2) 5/8"-18 x 1-3/4" bolts on the outside, slotted holes. Reuse the factory bolts for the inside holes.

Inside Holes, Reuse Factory Hardware

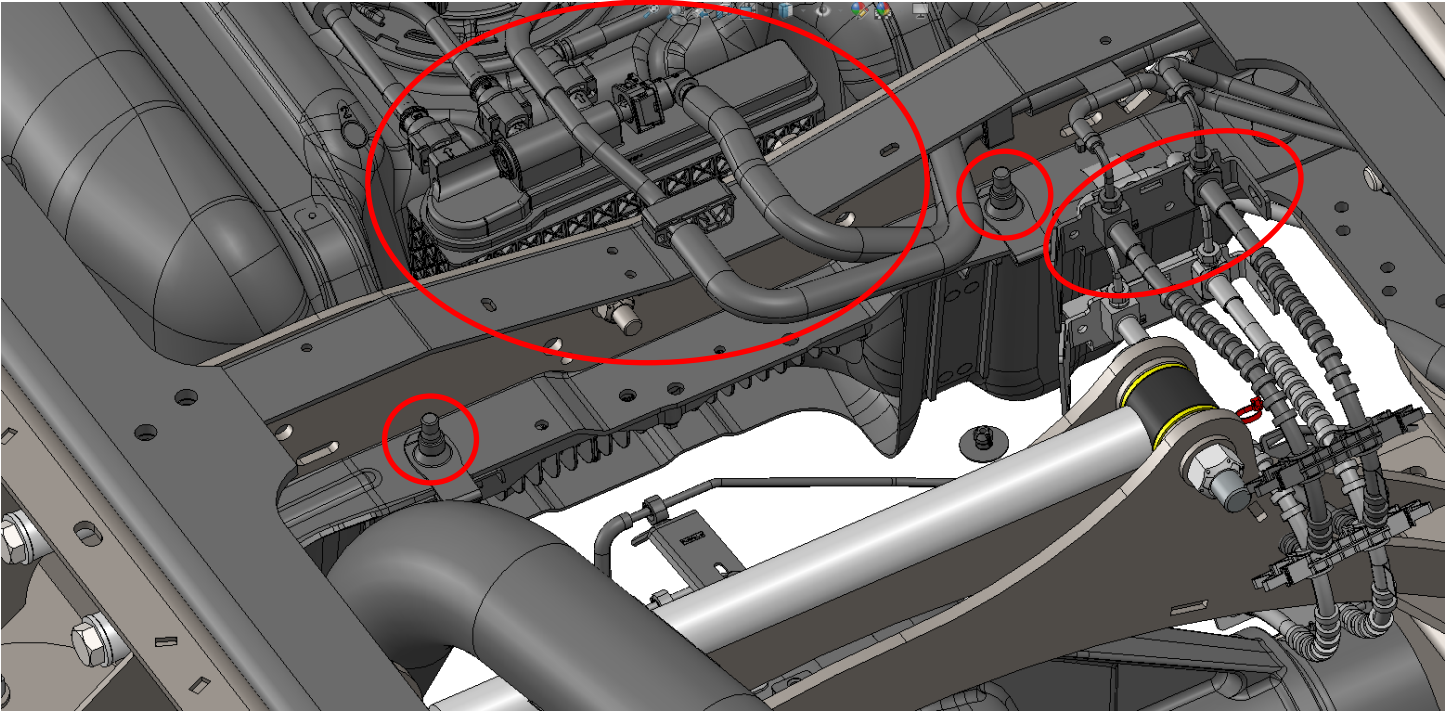


Outside holes use 5/8" -18 x 1-3/4" Bolts

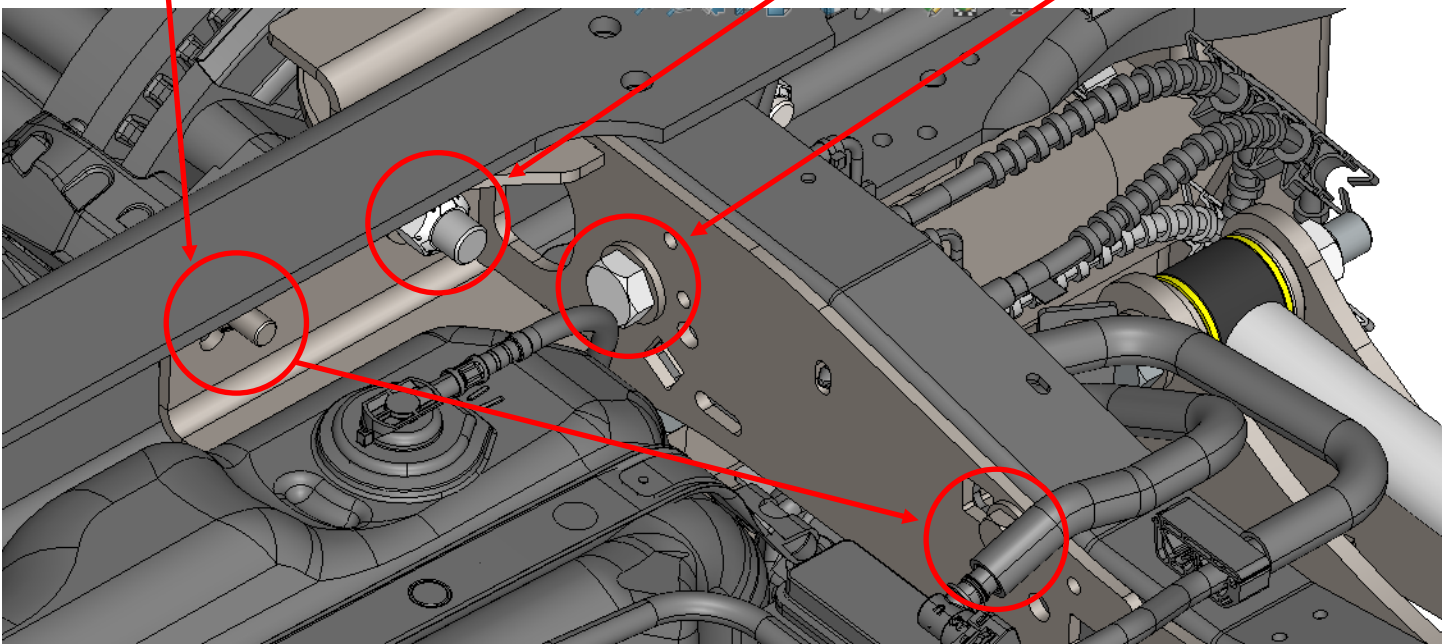
3. Locate Upper Pan Hard Bar Mount (#10015044). The upper PHB mount utilizes the bolts on the passenger side plate. Place inside the frame and tighten down.



4. Locate the (3) piece fuel tank cross member parts (#10015070, 10015051 & 10015053). The kit mounts inside the frame rails and across the back side of the factory cross member in front of the fuel tank. To assemble backing plate (#10015070), loosen fuel tank strap bolts and let the tank drop a bit. A jack will be necessary to hold the weight of the fuel tank. Also may be necessary to disconnect fuels line that may be in the way. Disconnect brake line bracket and move to the side.



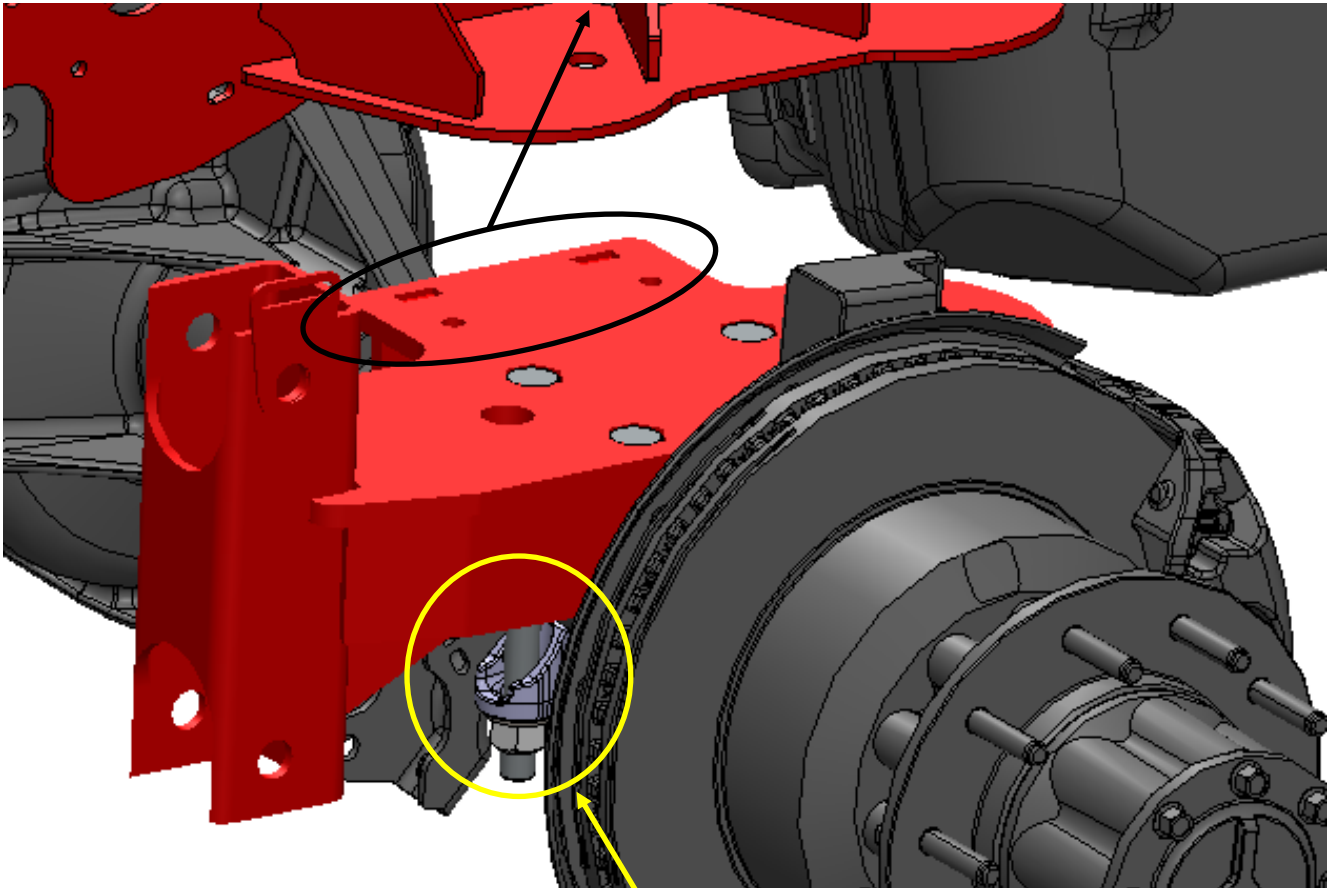
Install corner brace weldments (10015051 & 10015053) with (2) 3/4"-16 x 2-1/2", (2) 3/4"-16 x 2" bolts and (4) 1/2"-20 x 2" bolts.



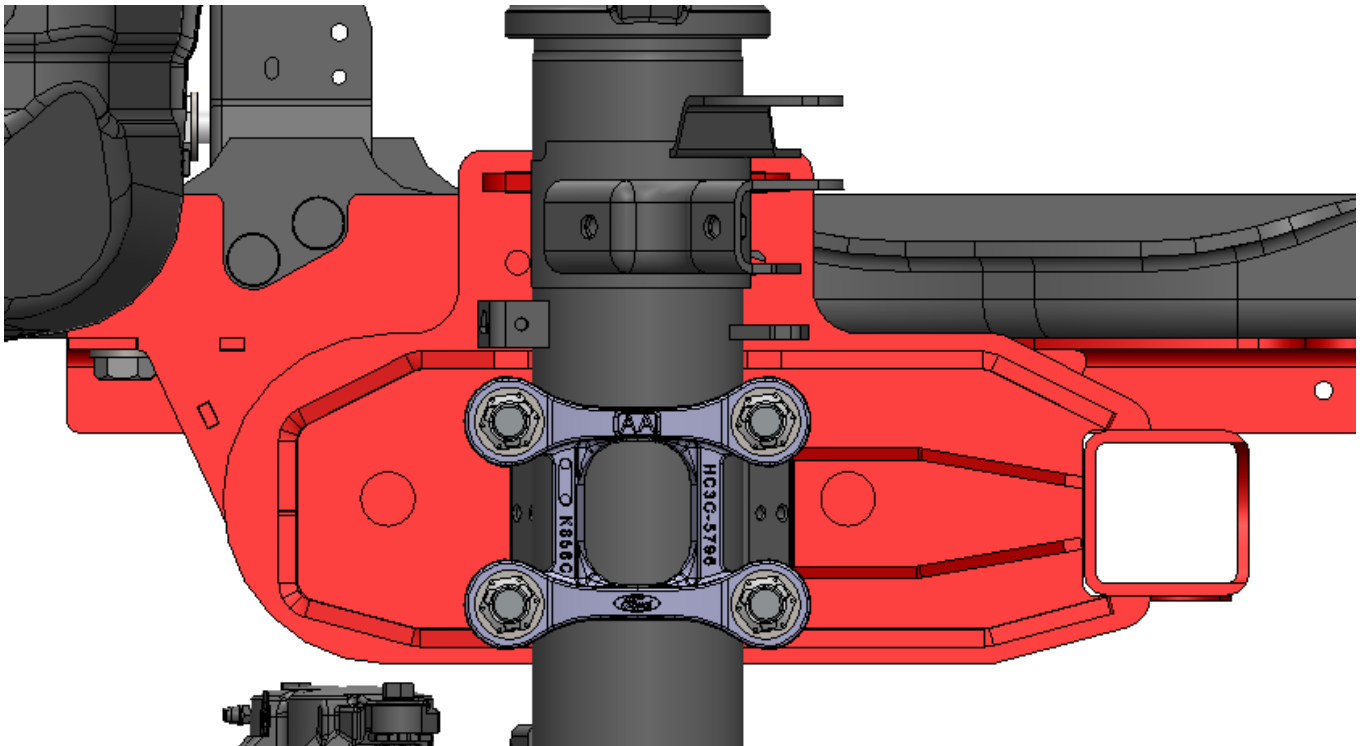
If midship fuel tank is present, a fuel line is routed through the crossmember and must be removed prior to installation of fuel tank crossmember kit. Be careful not to bend, kink, tear, cut or scratch the fuel line. After the crossmember is installed and bolted, reinstall all fuel lines, brake line brackets and fuel tank straps.

5. Locate the Lower Bag Mounts (#10014892-DS and 10014880-PS). Install lower bag mounts over the axle utilizing the factory lower axle clamps removed during disassembly. Use provide 3/4"-16 x 8-1/2" bolts and tighten down. **Note:** The (2) holes in the side of the lower bag mount should face towards the center of the truck. Repeat for passenger and drivers sides.

Towards center of the truck



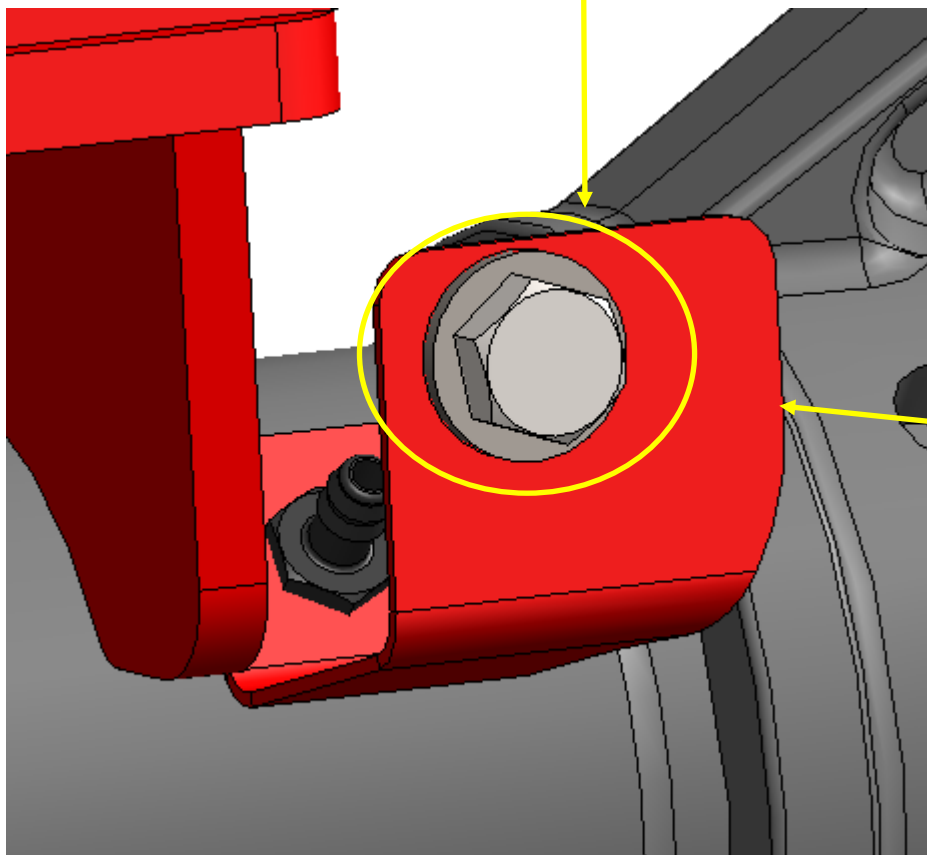
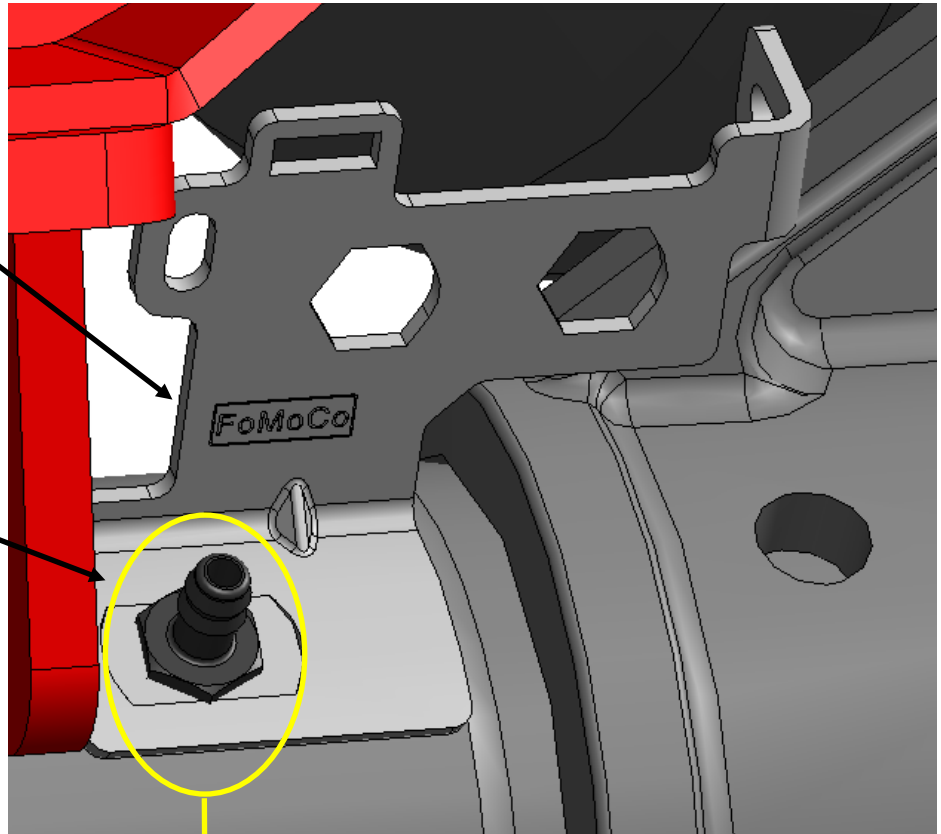
Factory Axle Clamp & 3/4"-16 x 8-1/2" bolts



7. Locate Brake line relocation bracket (#10015222). Remove axle breather hose and fitting from axle. Place brake line relocation bracket over axle breather hole and reattach breather hose. Next angle factory brake bracket upwards and attach to relocation bracket with a 1/2"-20 x 1" bolt and nut. Ensure the brake hoses are pushed towards the outside of the vehicle (driver side).

Factory Brake Bracket

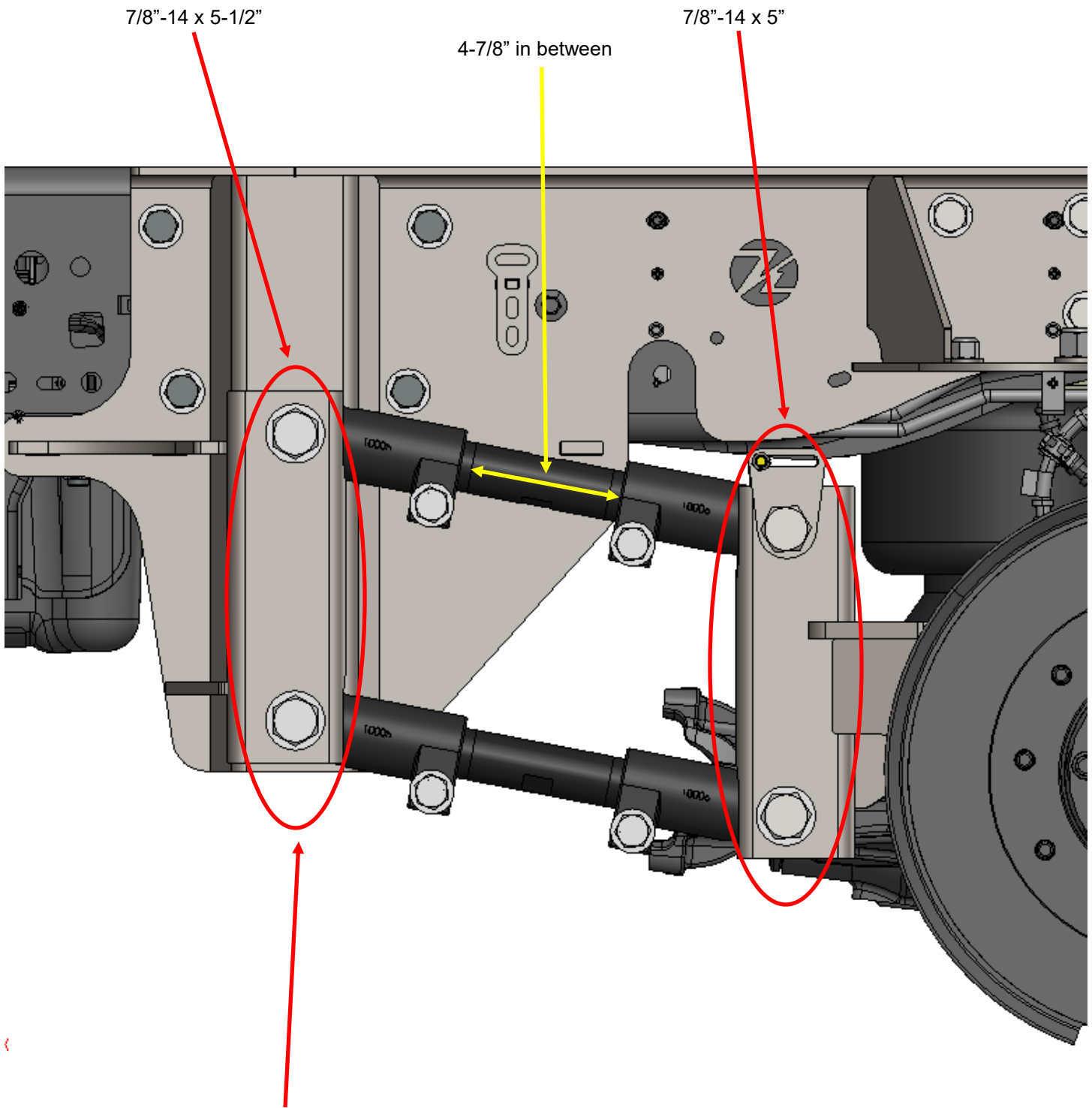
Axle Breather fitting



Attach factory brake bracket to brake relocation bracket with 1/2"-20 x 1" bolt.

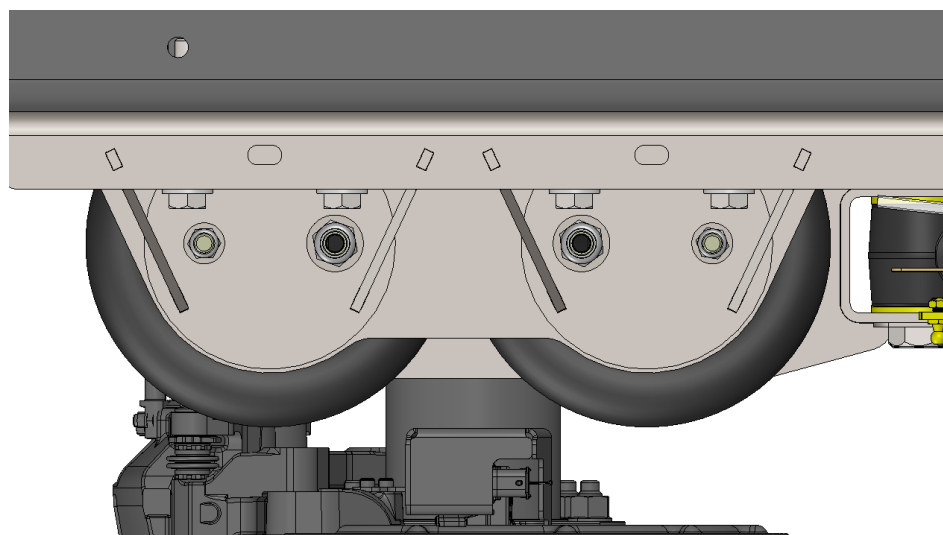
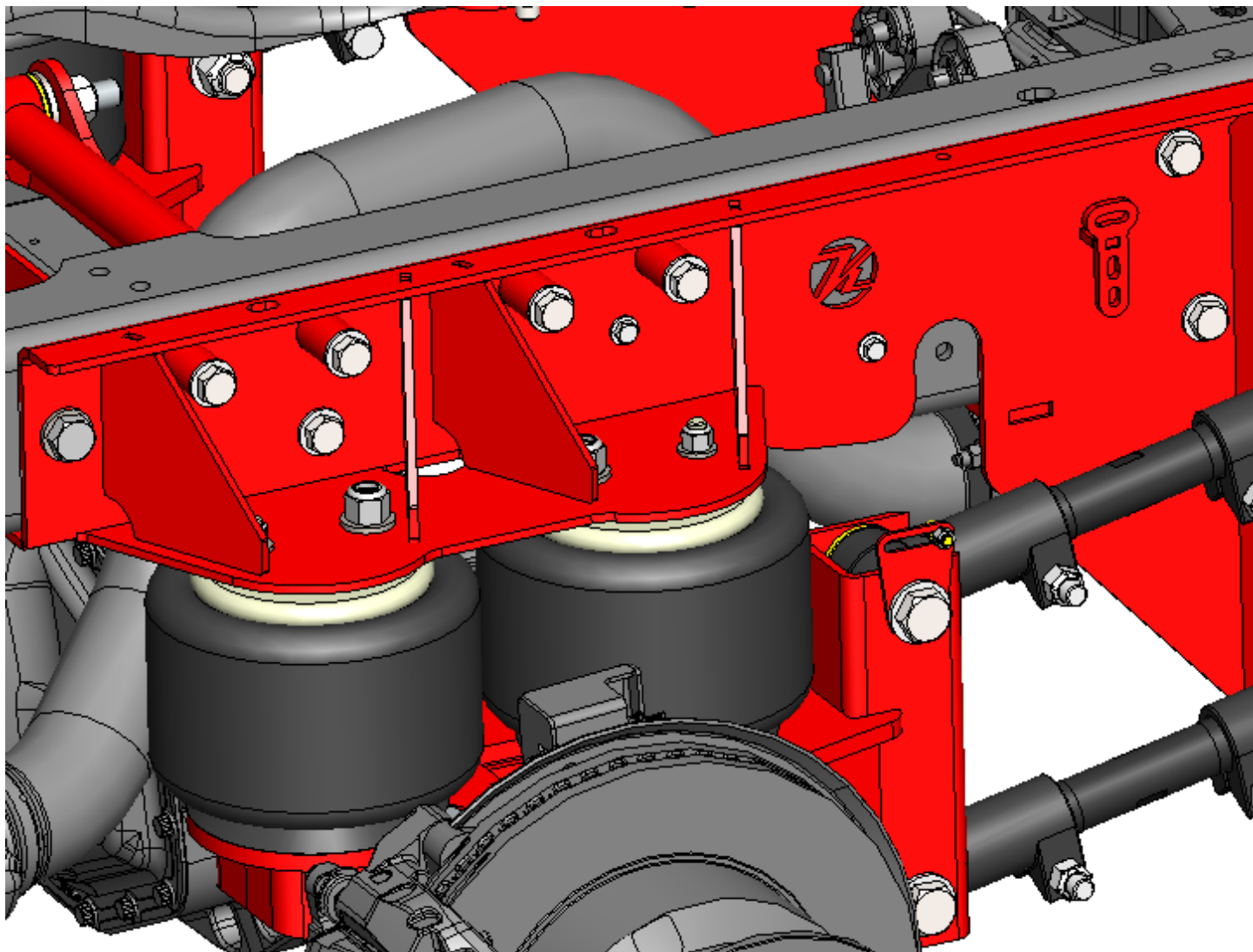
8. Locate the (4) trailing arms. Adjust (4) of them so the approximate distance is 4-7/8" between the cast knuckles.

The front trailing arm knuckles fasten into the side plates with the 7/8"-14 x 5-1/2" bolts and the rear trailing arm knuckles fasten to the lower bag mounts with 7/8"-14 x 5" bolts.



Nut faces the wheel on the rear trailing arms

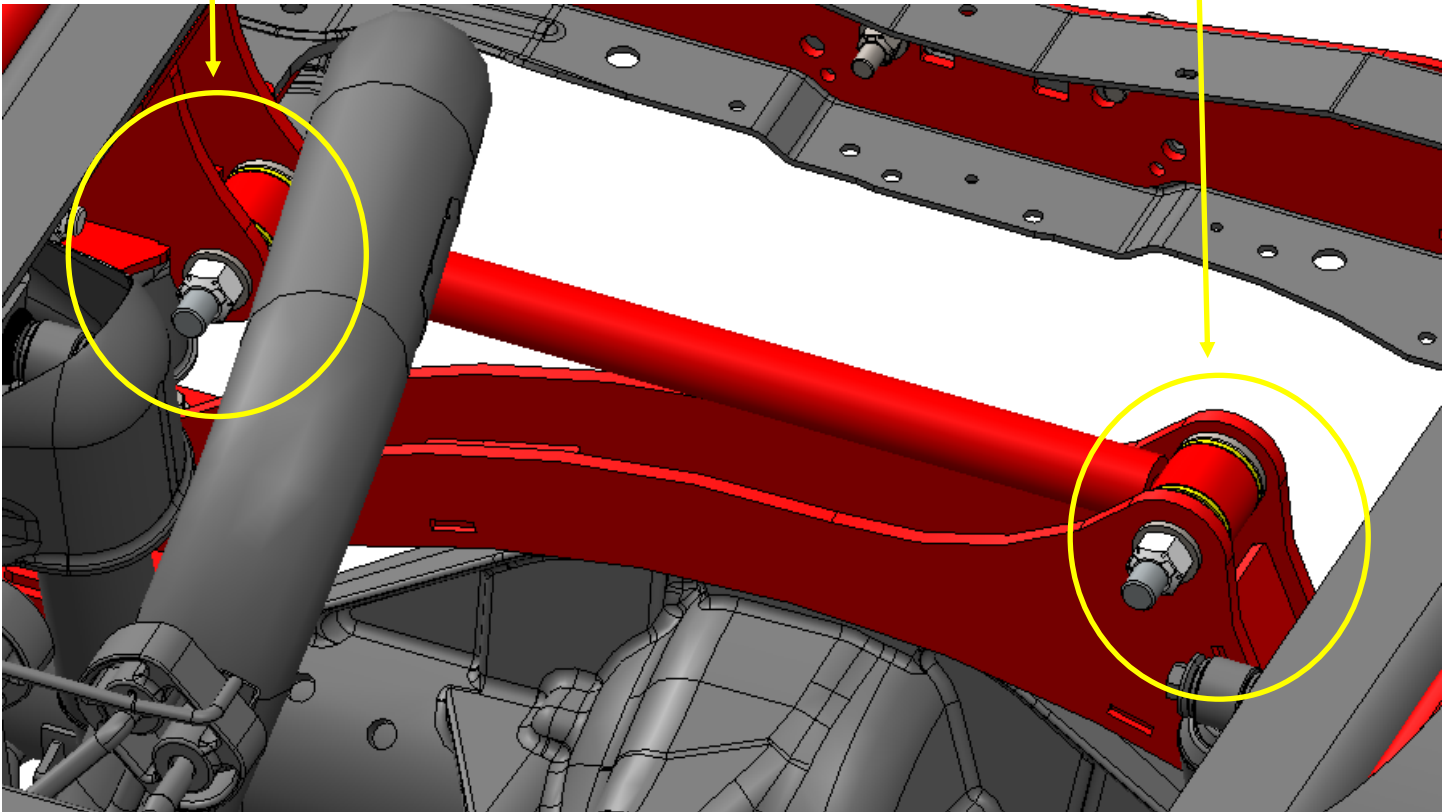
9. Locate (4) 8997 air bags. Place each air bag stud through the holes in the top of the lower bag mount and fasten with a thin 1/2"-13 nylock nut and flat washer. Do not tighten down yet, as you may need to rotate the air bag to fit in the upper bag mount. Lower the truck on the air bags and align the air bag studs to the upper bag mount. Attach upper mount to air bag with 1/2"-13 nylock nut and 3/4"-16 nylock nut. Repeat step for both drivers and passenger sides. Tighten all nuts down.



10. Locate the Panhard Bar (#10015031). It fastens into the upper pan hard bar mount with the 3/4"-16 x 4" bolt and the crossmember with the 3/4"-16 x 5" bolts and has a Spacer (#28678) on each side. To align you may have to raise or lower truck and move axle in or out, in order to install

3/4-16 x 4" Bolt

3/4-16 x 5" Bolt



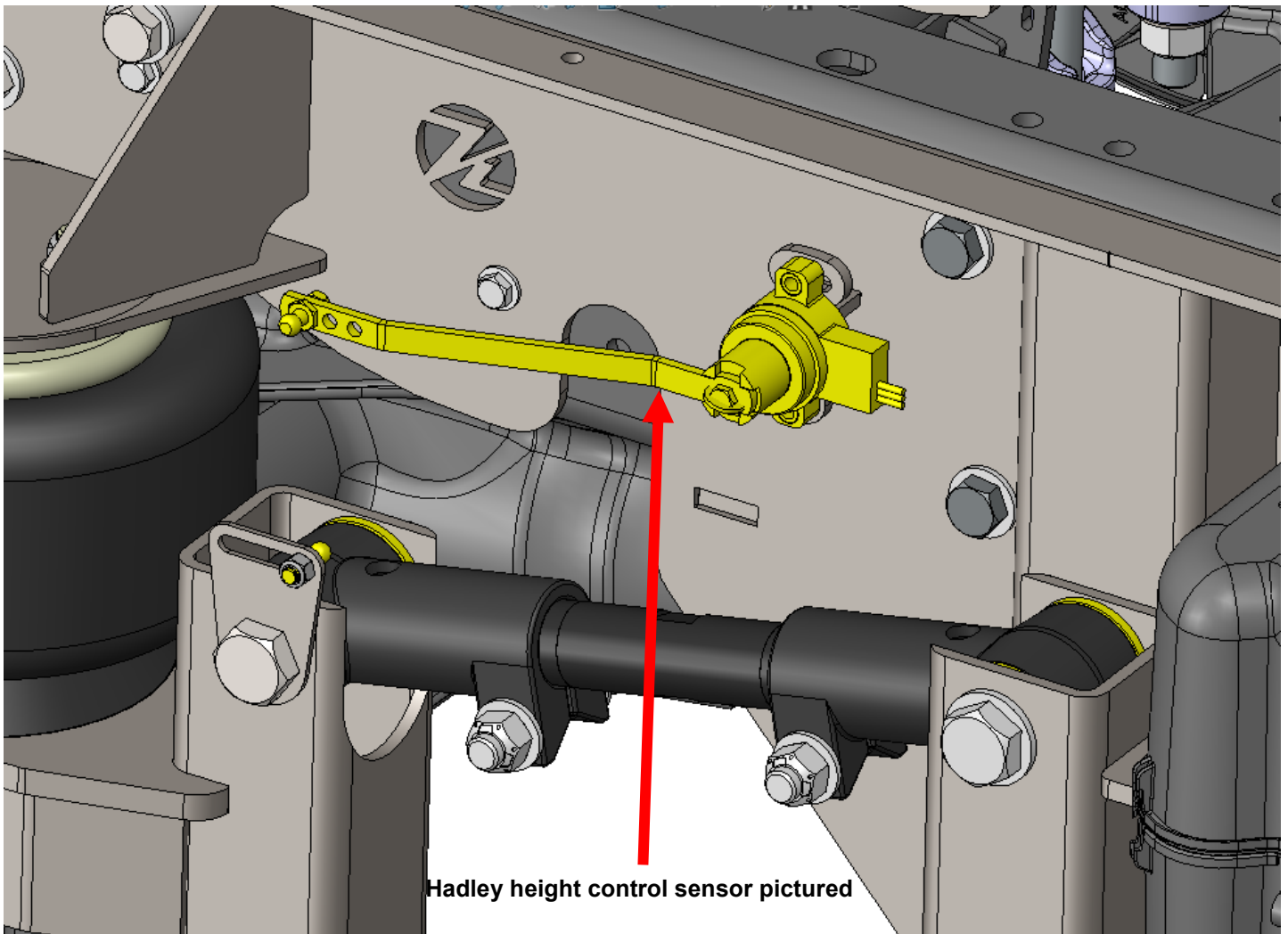
11. Locate the rear sway bar & Bushing Kit (#1139-190KLD). It fastens to the original OEM mounts with the factory bolts and D-ring. Use the new bushings provided. Use Loctite on the factory bolts.



Attach sway bar to factory OEM end links

ELECTRONIC HADLEY CONTROL SYSTEM

Use the Hadley instructions for wiring and installing



****NOTE:** Once the system is wired up and plumbed, turn on the ignition and the compressor will start running. Upon first start up when there is no air in the tank, it will take around 6-8 minutes until the system is charged, air bags filled. After the compressor shuts off, check for leaks. It works best to use soapy water or gas leak detector sold at hardware stores. Check all the fittings and connections in the entire system.

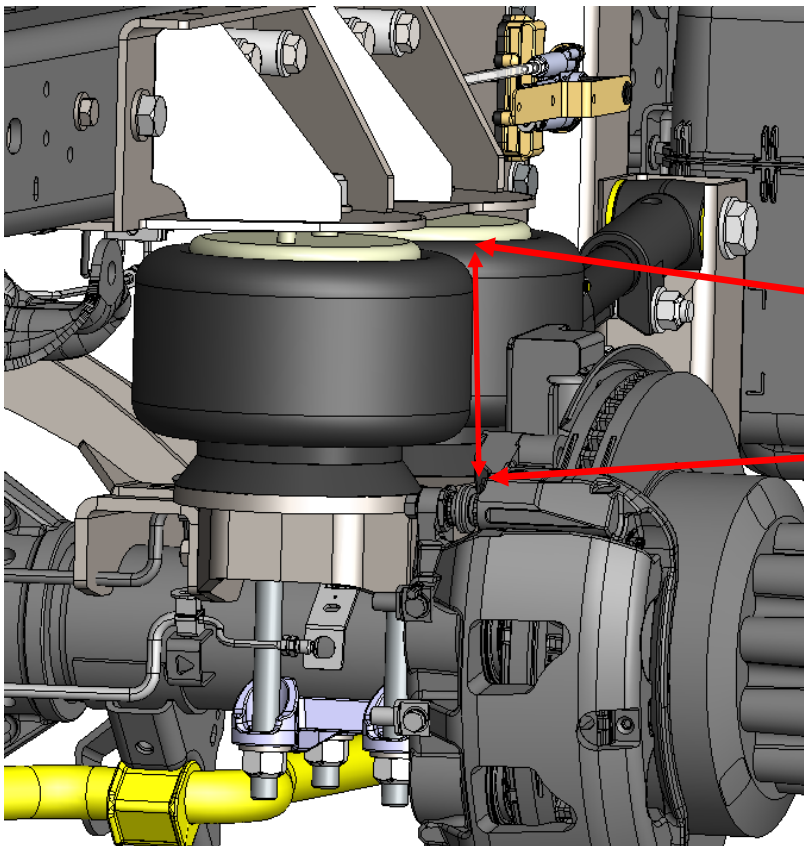
FINAL INSPECTION CHECKLIST

1. Air System Start Up and Check - remove all jacks, and air the system up by either using the fill valve on the air tank or by starting the vehicle and switching the compressor switch to "ON". Note: the maximum allowable pressure in the air tank is 175 psi. It is recommended to fill the air tank using the supplied Schrader valve so that the compressors are not taxed too much by running for a long period of time.
2. Height Control Valve Operation Check - with one end of the valve linkage disconnected, rotate the valve arm down 45°, air should exhaust from the air bag. Rotating the valve arm up 45° should cause the valve to fill the air bag.
3. Measure & Record the "Ride Height" of the air bag - measure ride height of the air bag from upper air bag mount to lower air bag mount (see picture below). The kit is designed to ride at 8". To adjust the ride height, complete the following steps (see picture on next page). Loosen upper height control valve bolt. Rotating height control valve body toward rear of chassis this will increase the ride height. Rotating height control valve body toward front of chassis will decrease ride height. Tighten upper height control valve bolt. Once the ride height is set, reconnect the linkages. Jostle the suspension up and down and allow it to come back to ride height. Recheck the initial measurement and adjust if needed.
4. Bushing Bolts Final Torque - with the suspension at ride height, torque all bushing fasteners. This will include all fasteners for the Control Arm and Pan Hard Bar. (Refer to *Torque* table for specific torques).
5. Reinstall shocks and mounting nuts.
6. Move the suspension through its entire range of motion by inflating and deflating the air bags to achieve full travel. Check for any interference with the pan hard bar, axle, shocks, exhaust, frame, brake lines, fuel lines, etc. Reconnect valve linkage to trailing arm.
7. Recheck all fasteners for specified torque.
8. Double check all electrical connections and wire routings.
9. **IMPORTANT!** Check all fittings and air lines for air leaks.
10. Measure and record wheelbase and centering dimensions on final dimension sheet.
11. Reinstall the chassis body (if applicable).

OPERATION GUIDELINES

1. After all final checks are complete, it is recommended to perform a road test. If vehicle pulls to the left or right, or any driveline vibration occurs, return and recheck wheelbase measurements and driveline angles. **Note:** improper driveline angles may have a detrimental affect on ride, U-joints, and transmission.
2. **Kneeling Operation:** Moving the dump switch to "ON" position will exhaust all air from the air bags and lower the rear of the vehicle approximately 3-4 inches. Air bags will inflate when the switch is returned to the "OFF" position. **WARNING: Do not drive the vehicle while the Dump Switch is on and the air bags are deflated.**
3. **IMPORTANT!** During servicing check tightness of all fasteners and for any air systems leaks.
4. **IMPORTANT!** Immediate corrective action should be taken if malfunctions occur.
5. **Air Bag Ride Height Setting Procedure for Systems with Dual Height Control Valves**
 1. Deflate the passenger side air bag by disconnecting the linkage from the arm.
 2. With the driver side linkage connected, measure the ride height and adjust accordingly by the methods mentioned above.
 3. Once the ride height is set for the driver side, repeat the same steps for the passenger side, including deflating the driver side air bag.
 4. Once the ride height is set, reconnect the linkages.
 5. Jostle the suspension up and down (or take the vehicle on a short drive) and allow it to come back to ride height. Recheck the initial measurement and adjust if needed.

Note: this procedure to set ride height can be done when empty or under light load.



Set the air bags so there is **7-7/16"** between the mounting brackets that hold the air bags in place

SERVICE & MAINTENANCE

The Kelderman suspension needs no lubrication and little maintenance. The following components should be checked at the same time the chassis is being serviced. However, immediate corrective action should be taken if a serious malfunction occurs. See Exploded Assembly on page 18 for details.

Caution! 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.

Note: It is important to release any moisture contained within the air reservoir on a daily basis. Not releasing the moisture on a regular basis will cause the drain valve to not operate properly, and may cause the valve to malfunction. Excess moisture in the system can also cause premature failure of other components including the tank itself.

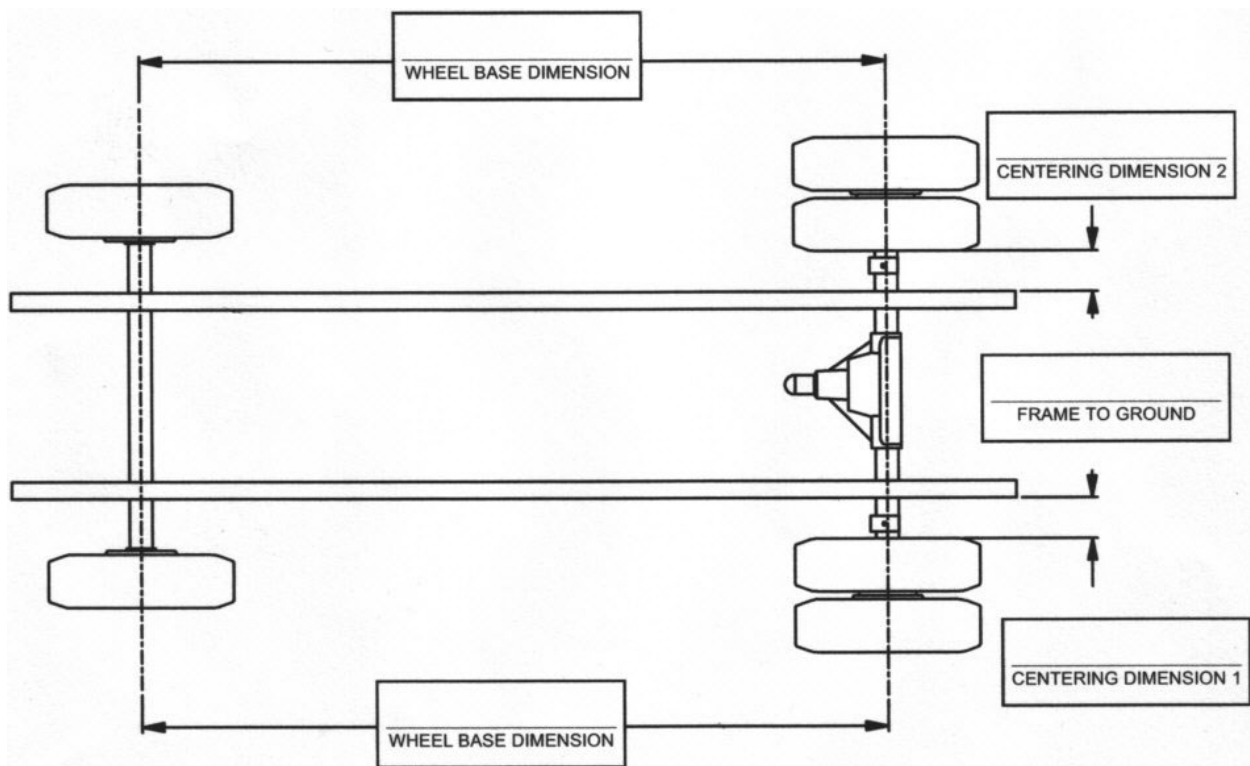
AIR BAG SERVICE

The forward air bag can be serviced without removing the axle brackets from the axle. Detach the upper air bag mounting studs from the upper bag plate. Utilizing a modified 3/4" wrench, the forward air bag lower mounting bolt can be loosened. Rotate the air bag counter-clockwise off the lower mounting bolt to remove air bag. To install, reverse the process.

SERVICE & MAINTENANCE CHECKLIST

1. Check and document rear axle alignment.
2. Verify ride height at 8" between upper and lower air bag mounting plates.
3. Verify suspension function via dump and re-inflation.
4. Check for air leaks and system integrity.
5. Check clearances throughout suspension motion range.
6. Check driveline angle.
7. Check 4 wheel alignment.

FINAL DIMENSION SHEET



FORD F450/550/600 OWNERS GUIDELINES

The Kelderman suspension needs no lubrication and little maintenance. However, immediate corrective action should be taken if a serious malfunction occurs.

CAUTION! If maintenance or service is to be done on the air system, be sure to drain all air from the 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 Kelderman 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 bolts, four link bolts, and pan hard bar bolts. This re-torque must be performed within 90 days of the suspension being put into service.
- Owner is responsible for “down time” expenses, cargo damage, and all business costs and losses resulting from a warrantable failure.
- The Kelderman Air Suspension is fully automatic in controlling the height of the chassis when properly installed. No manual intervention to control air pressure or ride height is needed during the course of operation.
- The Compressor Switch must be on for the compressor to operate. During difficult starting circumstances, (i.e. extremely cold weather) it is recommended to turn the compressor switch off until the vehicle is running, so it will not draw current from the battery. The compressor is controlled by the pressure switch located in the Air Control Box. This switch automatically turns the compressor on when the tank pressure falls below 110 psi, and turns them off at 145 psi.
- The Low Pressure Warning Light indicates a severe drop in tank pressure (below 45 psi). Immediate corrective action should be taken to determine the cause of air loss. Compressor switch should be turned off if Low Pressure Warning Light is on, and remains on even after the compressor has run for a normal period of time. **NOTE:** The Low Pressure Warning Light could come on briefly when the “Dump” feature is being used.
- When the weather is below freezing, 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 or turning the petcock. Not releasing the moisture on a regular basis will cause the drain valve to not operate properly.

CHECK AT EVERY VEHICLE SERVICE INTERVAL:

- Check Ride Height $\pm 1/4$ "
- Check for air leaks around fittings.

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 trailing arm bushings and pan hard bar bushings for wear; replace if worn.

TROUBLESHOOTING GUIDE

<u>COMPONENT</u>	<u>POSSIBLE PROBLEM</u>	<u>CORRECTIVE ACTION</u>
Air lines	Air leaks	Replace air line.
Fittings	Air leaks	Remove fitting and apply fresh joint compound. Reinstall fitting, but Do Not Over Tighten. Do not use Teflon tape.
Air Bags	A. Improper height B. Air leakage	A. Adjust valve linkage to maintain proper air spring height. B. Replace air bag.
Panhard Bar	A. Loose nuts on lateral control rod bolts. B. Worn bushings	A. Tighten securely. B. Replace lateral control rod.

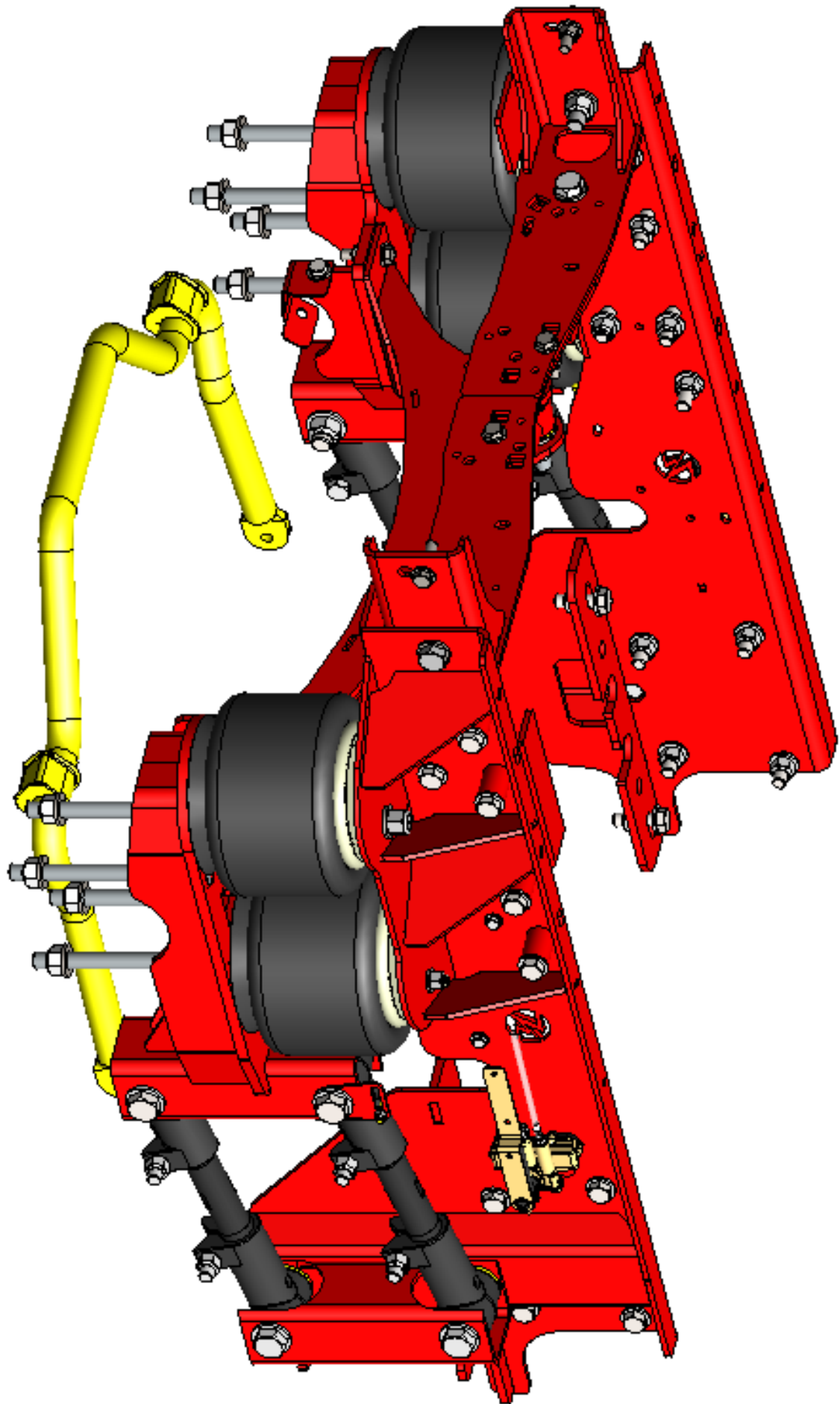
Torque Chart		
Bolt Size	Bolt Grade	Torque Value (ft-lbs.)
3/8-24	GR8	25
1/2-13	GR5	55
1/2-20	GR8	65
5/8-18	GR8	130
3/4-16	GR8	175
7/8-14	GR8	250

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
-	See K3	-	-



FIRST CHECK/ITEM NO.	PART NUMBER	DESCRIPTION	QTY	FINAL CHECK
1	12011	Hex Bolt - 1/2"-20 x 2" - GR8 - YZ	8	
2	12217	Hex Bolt - 3/8"-24 x 1-1/2" - GR8 - YZ	2	
3	12409	Hex Bolt - 5/8"-18 x 2" - GR8 - YZ	16	
4	12420	Hex Bolt - 5/8"-11 x 3/4" - GR5 - Z	8	
5	12427	Hex Bolt - 5/8"-18 x 4" - GR8 - YZ	8	
6	12511	Hex Bolt - 3/4"-16 x 2" - GR8 - YZ	2	
7	12517	Hex Bolt - 3/4"-16 x 2-1/2" - GR8 - YZ	2	
8	12537	Hex Bolt - 3/4"-16 x 5" - GR8 - YZ	2	
9	12545	Hex Bolt - 3/4"-16 x 8-1/2" - GR8 - YZ	8	
10	12629	Hex Bolt - 7/8"-14 x 5-1/2" - GR8 - YZ	4	
11	12633	Hex Bolt - 7/8"-14 x 5-1/2" - GR8 - YZ	4	
12	13022	Flat Washer SAE - 3/8" - GR8 - YZ	4	
13	13024	Flat Washer SAE - 1/2" - GR8 - YZ	26	
14	13026	Flat Washer SAE - 5/8" - GR8 - YZ	48	
15	13028	Flat Washer SAE - 3/4" - GR8 - YZ	24	
16	13030	Flat Washer SAE - 7/8" - GR8 - YZ	16	
17	13106	Top Distorted Thread Lock Nut - 5/8"-11 - WP/MAX	8	
18	13122	Top Distorted Thread Lock Nut - 3/8"-24 - GR8 - YZ	2	
19	13124	Top Distorted Thread Lock Nut - 1/2"-20 - GR8 - YZ	9	
20	13126	Top Distorted Thread Lock Nut - 5/8"-18 - GR8 - YZ	24	
21	13128	Top Distorted Thread Lock Nut - 3/4"-16 - GR8 - YZ	14	
22	13130	Top Distorted Thread Lock Nut - 7/8"-14 - GR8 - YZ	8	
23	10014944	Nylon Lock Nut - 5/16 - 18 - GR5 - Z	2	
24	10014946	Nylon Lock Nut - 1/2" - 13 - GR8 - YZ	4	
25	10014947	Nylon Lock Nut - 3/4" - 16 - GR8 - YZ	4	
26	10014949	Thin Nylon Lock Nut - 1/2" - 13 - GR8 - YZ	4	
27	12003	Hex Bolt - 1/2"-20 x 1" - GR8 - YZ	1	

SHEET 2 OF 2



Kelderman Manufacturing
Warranty Policy
2021



Kelderman Manufacturing Product Warranties, Disclaimers, and Warnings.

Kelderman Manufacturing, Kelderman Air Suspension (Warrantor), offers a product warranty to the original retail purchaser, with which whom owns vehicle on which the unit was installed, and with Commercial wholesale purchasers. Please see below for warranty terms.

It is the **Installer** and **Sellers** responsibility to review these warranties, warnings, and disclaimers with the consumer prior to installation.

Retail Customers:

3-year limited warranty from original invoice date for defects in materials and workmanship related to fabricated parts, i.e., upper or lower bag mounts or pan hard bar.

1-year limited warranty from original invoice date for defects on purchased parts, i.e., compressors, air bags, or a part that comes from an outside supplier.

Some products may come with their own warranties supplied by their manufacturer. If so, that warranty is passed onto you as the consumer. Please keep your original invoice as it will be needed for that warranty.

Warrantor reserves the right to request any product to be returned for further review/inspection before approving claims. In the case of a requested return, Warrantor shall provide shipping instructions.

Commercial Customers:

3-year/100,000-mile limited warranty from the date the unit was put into service for defects in materials and workmanship related to fabricated parts, i.e., upper or lower bag mounts or pan hard bar.

1-year/50,000-mile limited warranty from the date the unit was put into service for defects on purchased parts, i.e., compressors, air bags, or a part that comes from an outside supplier.

Labor will also be covered for commercial customers only. Labor is only a coverable expense, as long as part is covered under warranty program. Labor Rate is payable for \$75/hr, and an invoice must be supplied in order to be paid.

Warrantor must be contacted for warranty authorization before any diagnostic work or repairs are performed. At that time, Warrantor will provide diagnostic assistance and authorization for the repairs if warrantable. Any unauthorized diagnostic work performed before contacting Warrantor will not be covered under the warranty program, if deemed unreasonable. Defective parts must be returned to Kelderman Manufacturing as per warranty program, unless otherwise stated.

Kelderman Technical Line 641-673-5396 x130



Kelderman Warranty Line 641-673-5396 x135

Monday – Friday 7:00 am to 4:00 pm CST

Kelderman Manufacturing
Warranty Policy
2021



Warranty Terminations

The following actions or events will result in the automatic termination of this warranty and relieve Kelderman Manufacturing from any and all obligations under this warranty:

- Attempting to repair or alter the product in any way after purchase.
- Misuse or neglect of the product including accidents, improper installation, or application.
- Failure to operate or abuse vehicle in anyway, as determined by Warrantor.
- Vehicle being operated outside the recommended ride height as predetermined by Kelderman Manufacturing and set forth clearly by installation instructions.
- Vehicle has combination and/or substitution of other suspension systems in lieu of Kelderman products.

Warranty Does Not Cover

The following are items Warrantor will not cover in case of warrantable part.

- Finish of part, i.e., powder coat, paint, or plating.
- Warrantor is not obligated to cover any "down time" for vehicles to due warranty parts and/or availability of warranty parts.
- Damages to vehicle related/non-related to the installed Kelderman Air Suspension.
- Excessive freight charges, i.e., Next Day Air. As seen to be determined by Warrantor.

Warning

Kelderman Air Suspension Systems are designed to be installed, and run at the recommend ride heights provided by Kelderman Manufacturing. Failure to do so may cause premature wear and inhibit the suspension system from operating as designed. This may cause a vehicular accident leading to severe injury or death.

Disclaimer

Kelderman Manufacturing reserves the right to supersede, discontinue, re-design parts and/or applications and finishes of powder coat or paint as deemed necessary without written notice.

- Kelderman Manufacturing tries to ensure that suspension parts you receive fit the vehicle they were designed for, however due to unknown vehicle manufacturer's production changes and/or inconsistencies, We cannot be responsible for 100% fitment.
- All products not specifically called out can be referenced by call the warranty line listed at the bottom of the page.

Kelderman Technical Line 641-673-5396 x130



Kelderman Warranty Line 641-673-5396 x135

Monday – Friday 7:00 am to 4:00 pm CST