

INSTALLATION OF R-450 FRONT HYDRAULIC AXLE LOCK KIT 2008-2016 FORD F-450/F-550 4X4, 4X2

INSTALLATION SAFETY PRECAUTIONS

If any installation problems are encountered, please call G&B Specialties for technical assistance before continuing with the installation process.



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting installation of the equipment.
- Installation instructions provided below only address the RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Do not start the vehicle with the power steering hoses disconnected. Reconnect all hoses and secure the power steering cooler if the vehicle is started.
- Ensure all removed components are given to the vehicle owner after the installation of the railgear. These components must be re-installed if the railgear is removed from the vehicle.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.
- When routing hydraulic hoses, ensure that the hoses do not contact any sharp edges or hot surfaces.

INSTALLATION OF FRONT HYDRAULIC AXLE LOCK KIT

The following procedure details the installation of the front hydraulic axle lock kit. The hardware required for this installation is listed in Table 1.

Table 1: Hydraulic Front Axle Lock Kit Installation Parts

Part Number	Description	# Req.	Remarks	Check
R-13134	Hydraulic Lockup Cylinder	2		
R-4912-A	Axle Lock-up Hook	2		
R-12016D	Axle Lock-up Bracket Driver's Side	1		
R-12016P	Axle Lock-up Bracket Passenger's Side	1		
R-13133D	Support Bracket Driver's Side	1		
R-13133P	Support Bracket Passenger's Side	1		
R-5635	Insulation Washer	4		
R-12018	Spacer	2		
R-4911	Bracket	2		
R-4914	Hook Catch	2		
R-13137	Cylinder Pin	2		
R-13132	Hydraulic Lockup Tab	2		
R-13138	Cylinder Spacer	2		
	3/4" Gr. 8 Washer	14	R-990KIT-210	
	3/4" UNC Gr. 8 Nylon Insert Lock Nut	6		
	3/4" UNC Gr. 8 Bolt x 2" Long	2		
	3/4" UNC Gr. 8 Bolt x 2 1/2" Long	2		
	3/4" UNC Gr. 8 Bolt x 5" Long	2		
	3/8" Gr.8 Washer	4		
	3/8" UNC Gr. 8 Nylon Insert Lock Nut	2		
	3/8" UNC Gr. 8 Bolt x 4" Long	2		
	1/2" Gr. 8 Washer	12		
	1/2" UNC Gr. 8 Nylon Insert Lock Nut	4		
	1/2" UNC Gr. 8 Bolt x 1 1/4" Long	4		
	3/32" Gr. 8 Cotter Pin x 1" Long	4		
	3/16" Gr. 8 Cotter Pin x 1 1/2" Long	2		

The front hydraulic axle lock kit is to be positioned just rearward of the vehicle's front suspension springs. Mounting holes in the hook hanger and bracket will align with some existing holes in the vehicle frame and suspension arm, respectively. The axle lock hook is designed to swing toward the front of the vehicle while disengaged for the road position and toward the rear of the vehicle while engaged for the rail position. The hydraulic cylinders and lockup tabs are fastened and welded to the hook to control the hook position.

1. If necessary, relocate the ABS sensor wire located along top of suspension arm, (Fig 8), as reference.

2. Position each bracket on each vehicle suspension arm as shown. The larger hole in the mounting brackets should align with the existing hole in each of the suspension arms. Mark and drill a 13/32" hole into each of the suspension arms for 3/8" bolts. Fasten each bracket to each suspension arm using one 3/4" x 5" long bolt, two 3/4" washers, and one 3/4" nut, and one 3/8" x 4" long bolt, two 3/8" washers and one 3/8" nut as shown. Do not torque these fasteners. Tighten them only sufficiently to hold the bracket on the suspension arm without deforming the suspension arm. Use (Fig 2 & Fig 4), for reference and parts identification.
3. Position the L-Bracket Weldment on to the side of the frame, (Fig 1 & Fig 4), lining up the slot on the L-Bracket with the slot on the bottom of the frame and bolt with 3/4" x 2" long bolt and washers and nut. Mark and drill or mark and remove L-Bracket and drill a 13/16" diameter hole into existing small hole on the side of the frame. Use the supplied 3/4" x 2" bolt along with washers and nut to finish mounting L-Bracket to the frame. Make certain that the correct L-Bracket weldment is fastened to the correct side of the frame. Drivers side, (R-12016D), is fastened to the drivers' frame. Fig 6 shows drivers' side assembly for reference.
4. Continue assembling hook assembly using (Fig 1) as reference and for parts identification. If lateral adjustment is required item #4, spacer can be trimmed down, or washers can be added into assembly to maintain proper clearance with frame, suspension arm, and hook. For mounting of item #5, support bracket, two 17/32" holes must be drilled into side of the frame, (Fig 5), shows support bracket bolted to frame.
5. Position each hook so that it is hanging vertically with the hooking surface horizontal. Position each hook catch on each bracket as shown so that the vertical side of the hook just touches the forward-most part of the hook catch and there is a minimal gap between the bottom of the hook catch and the hooking surface. Weld each hook catch to each bracket using a 3/8" all around fillet weld.
6. With the hydraulic cylinder mounted using (Fig 3) as a reference and the cylinder fully extended, position one lock tab on the cylinder as shown (Fig 4) so the lock tab aligns with the hook. Weld the lock tab to the hook.
7. Attach each pin to the cylinder support bracket and the cylinder rod.
8. Paint all areas that were welded or heated.
9. Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.
10. Test the operation of the front axle lock.

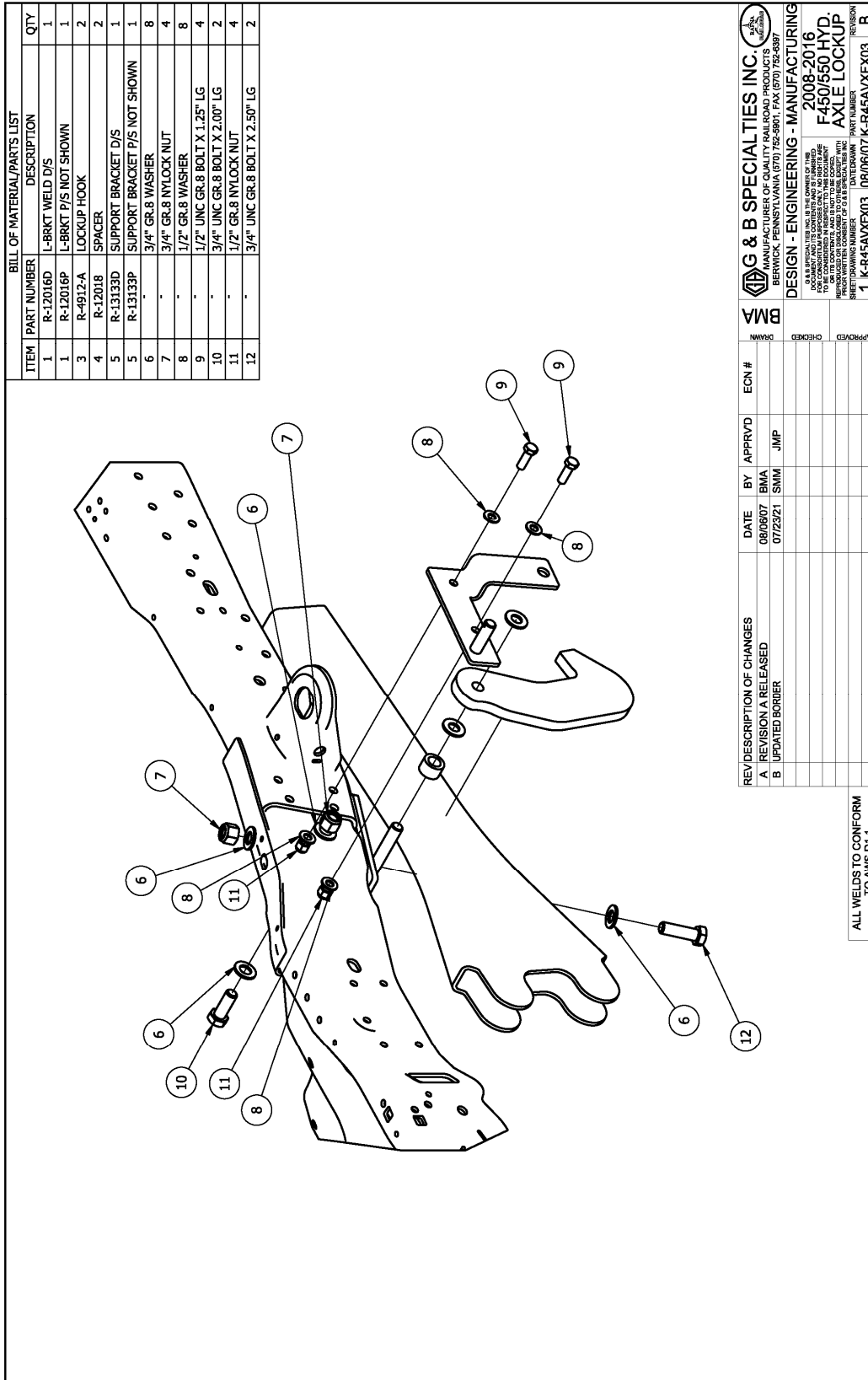


Figure 1

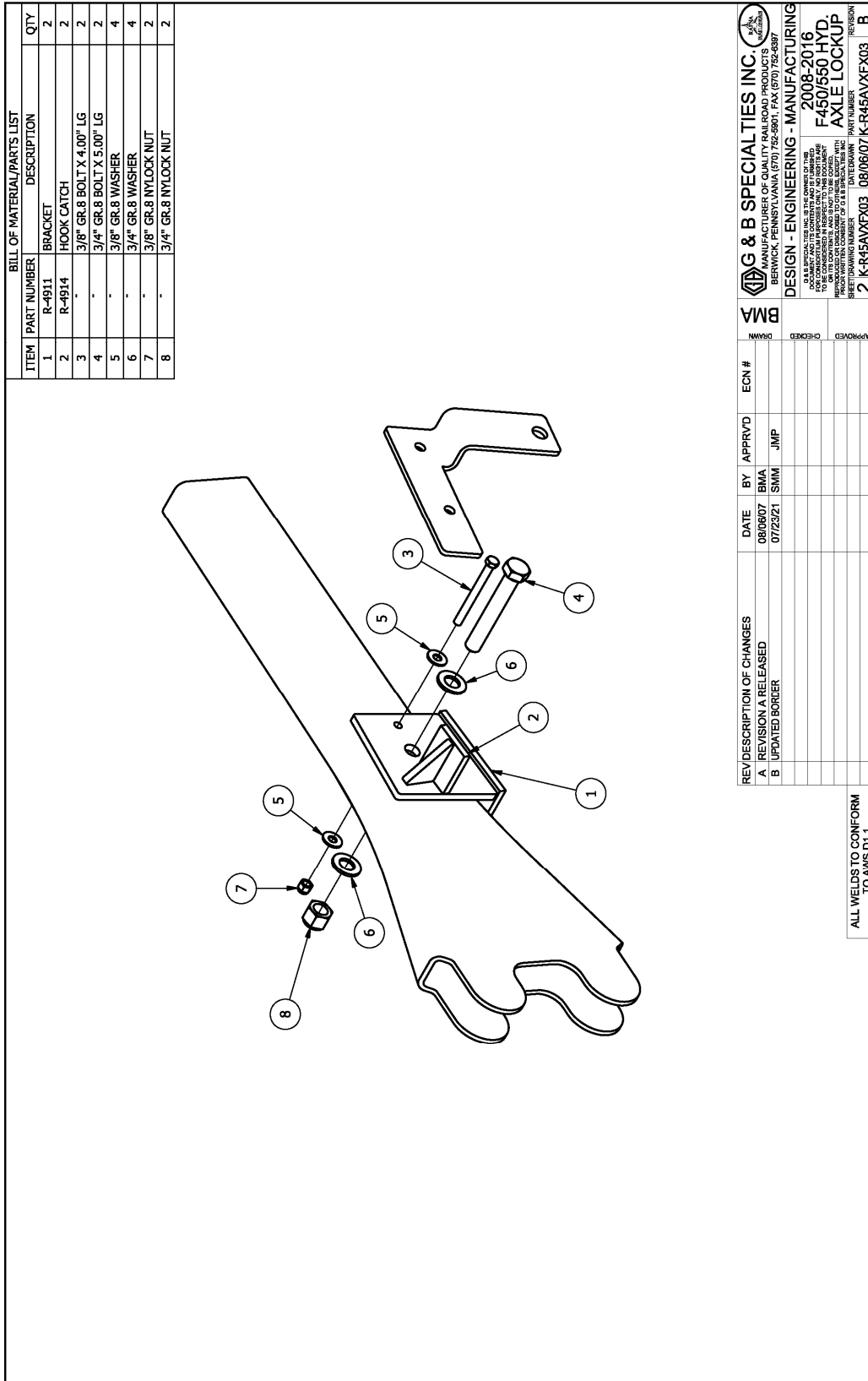


Figure 2

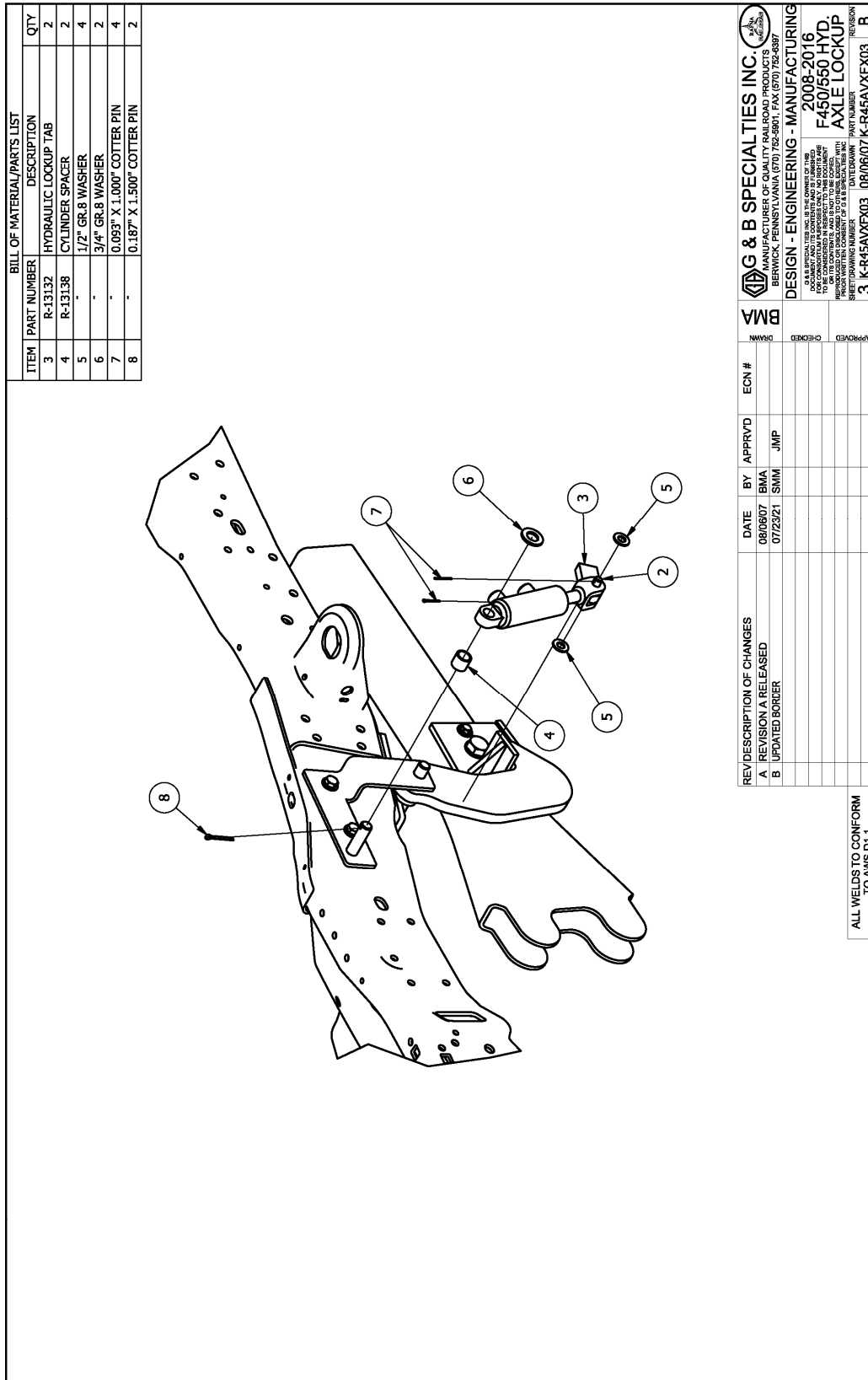
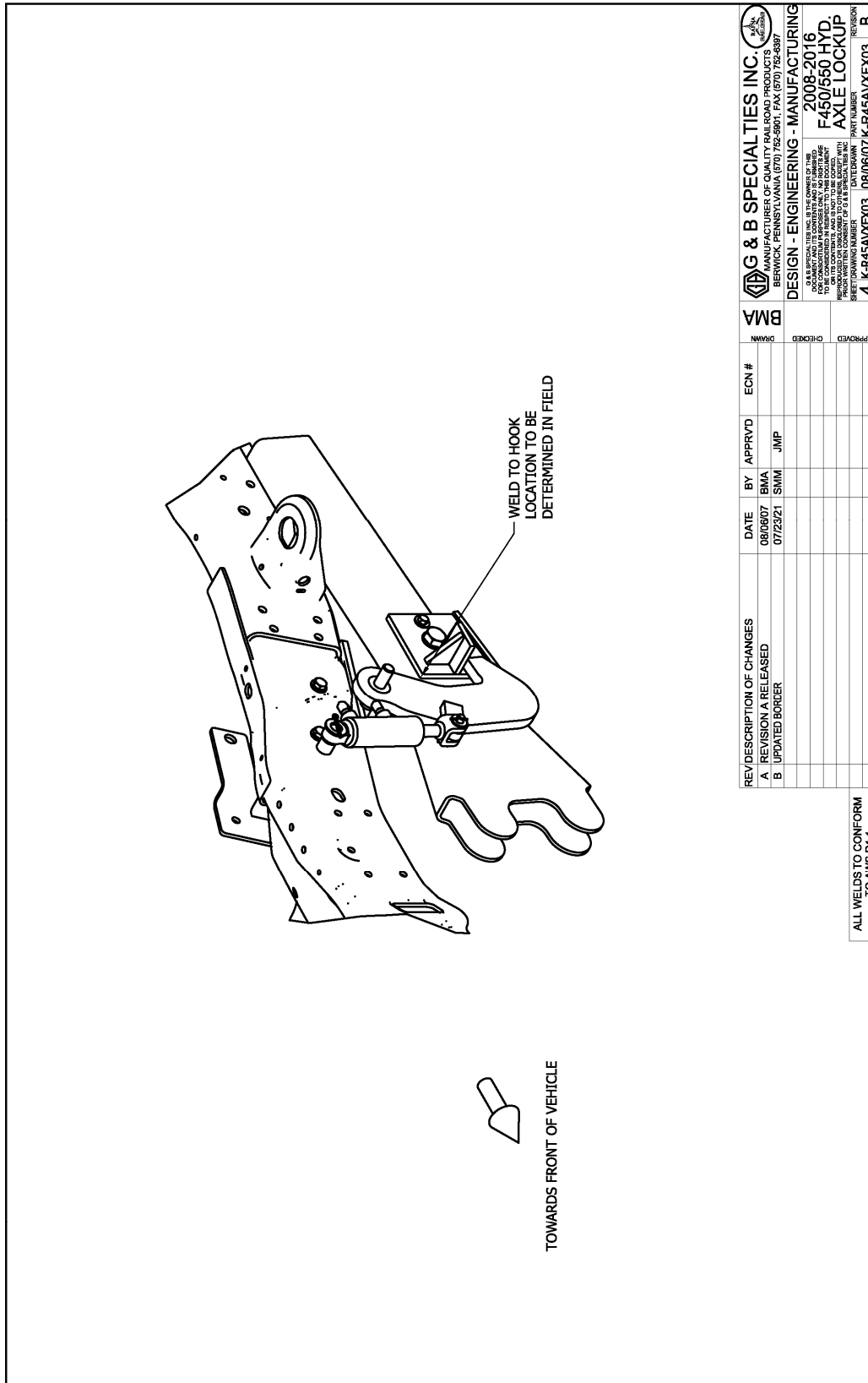


Figure 3



G & B SPECIALTIES INC. 535 WEST 3RD STREET BERWICK, PENNSYLVANIA (PA) 17622-5901 TEL: (570) 752-5901 FAX: (570) 752-6397		DESIGN - ENGINEERING - MANUFACTURING 2008-2016 F450/650 HYD. AXLE LOCKUP	
BMA APPROVED DRAWN		SHEET/DRAWING NUMBER: 4 K-R45AVXF03 DATE DRAWN: 08/06/07 PART NUMBER: K-R45AVXF03 REVISION: B	
REV/DESCRIPTION OF CHANGES A. REVISION A RELEASED B. UPDATED BORDER	DATE 08/06/07 07/23/21	BY BMA SMM	APPROVD JMP
			ECN #

ALL WELDS TO CONFORM TO AWS D1.1

Figure 4

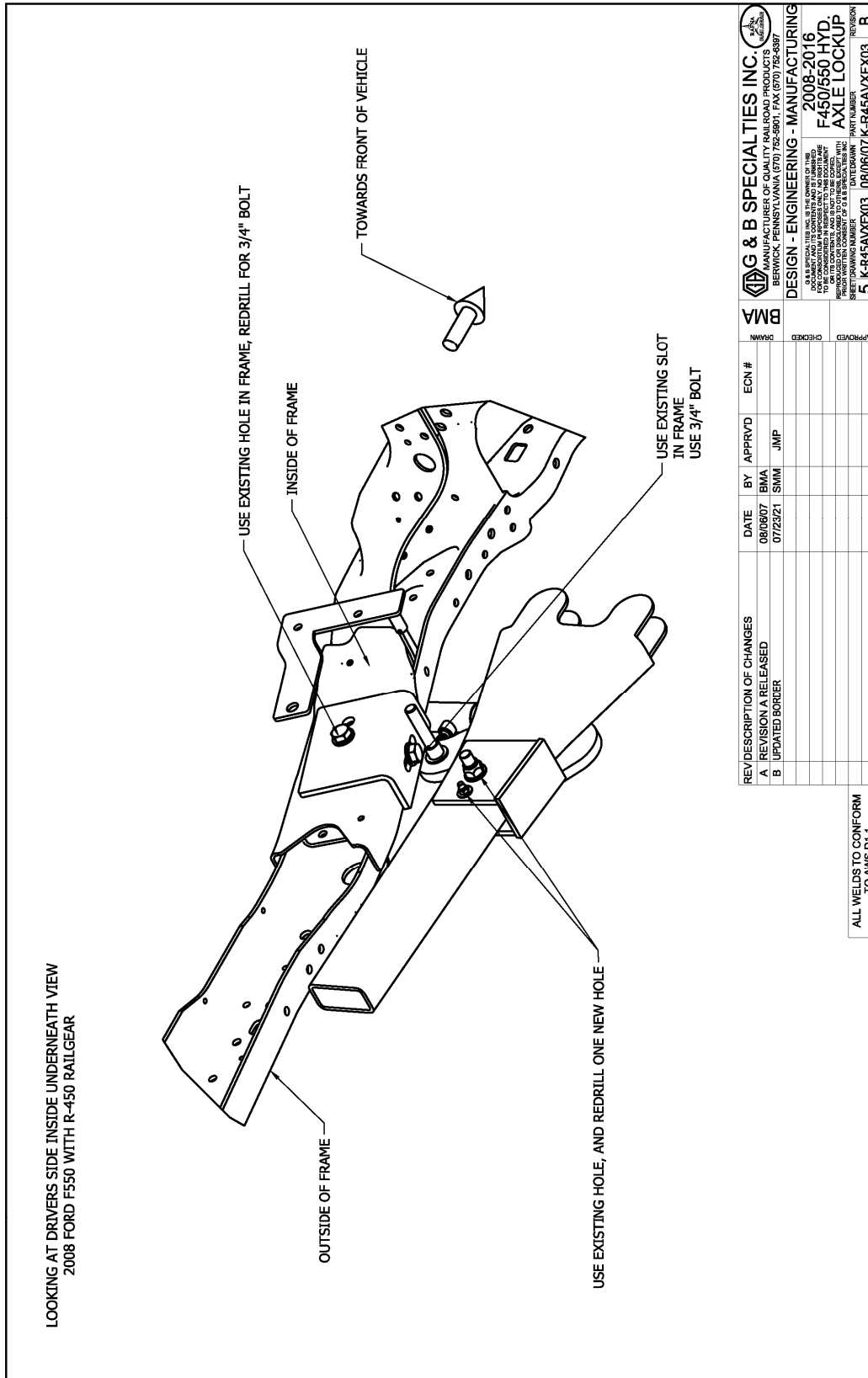


Figure 5

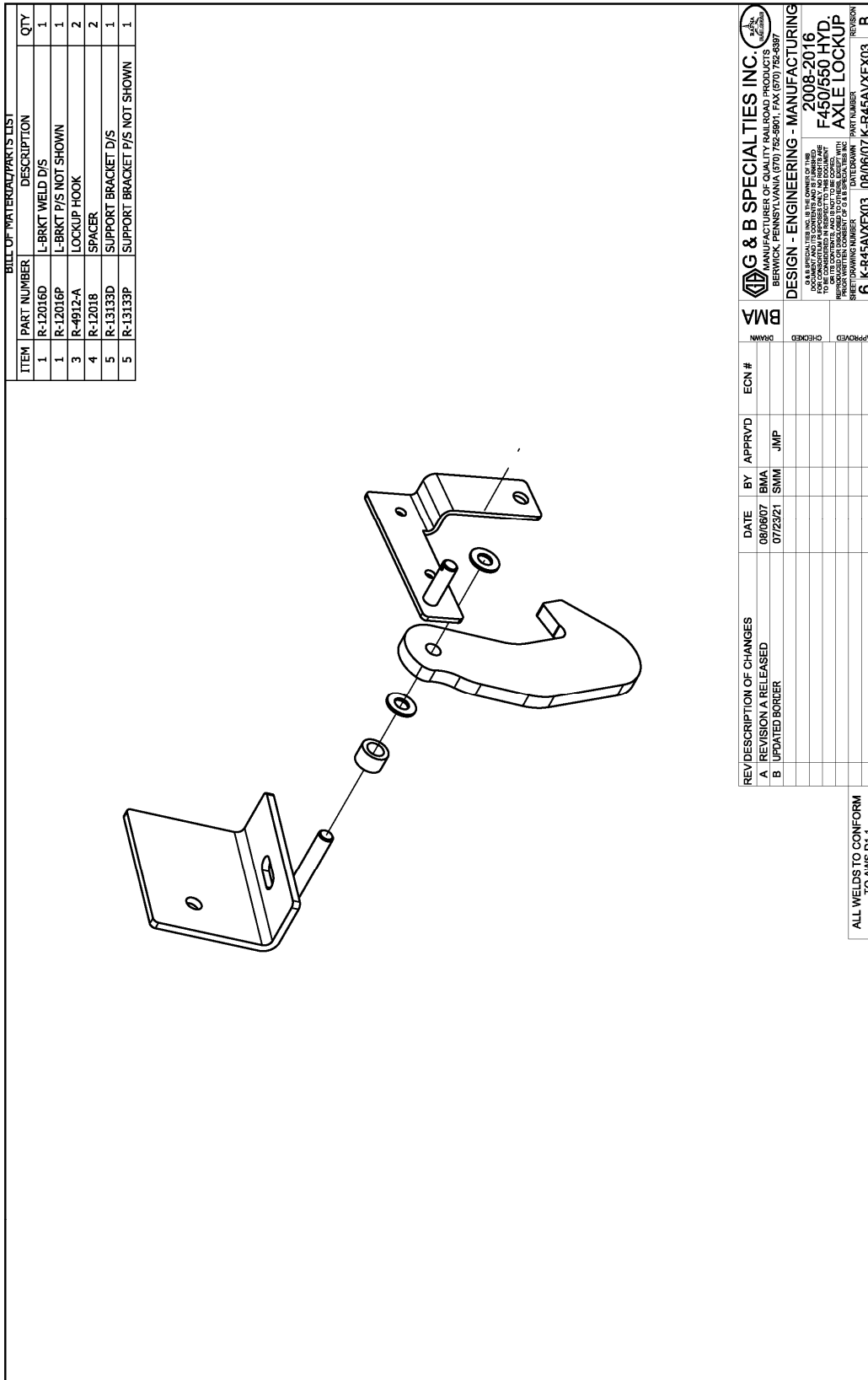


Figure 6

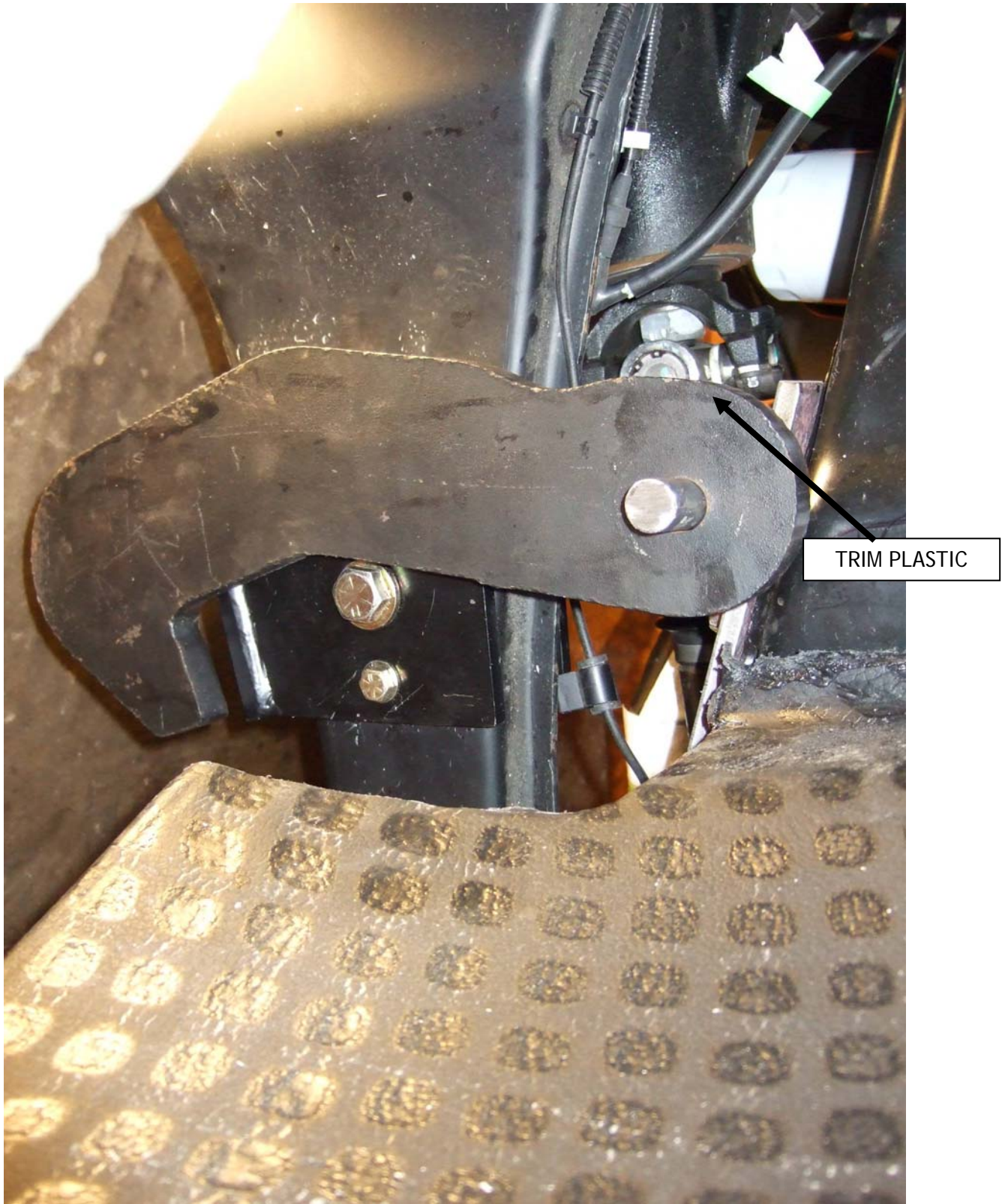


Figure 7



Figure 8

INSTALLATION OF HYDRAULIC KIT FOR PTO APPLICATIONS

The following procedure details the installation of the hydraulic kit. The hardware required for this installation is listed in Table 1.

Table 1: Hydraulic Kit Installation Parts

Part Number	Description	Qty
S-802020	Operating Valve	2
R-559-11	Operating Valve Handle	2
R-8594	Front Ball Valve	1
849FSO-04-06	1/4" Male JIC to 3/8" Male O-Ring Boss 90°	4
844FS-04-04	1/4" Male JIC to 1/4" Male JIC Tee	2
HU04-04NJ	1/4" Female JIC Straight Coupler (Installed on Hoses)	8
HFS2-04	Hydraulic Hose 35" Long	4
-	Hydraulic Hose (Supplied By Installer)	N/A
-	Hydraulic Coupler (Supplied By Installer)	N/A

1. Disconnect the two hydraulic lines from the passenger's side cylinder on the front railgear and connect the two 3/8" JIC T-fittings to each port on the cylinder.
2. Connect four 90-degree 3/8" ORB to 1/4" JIC fittings to the axle lockup cylinders.
3. Reconnect the two lines to the T-fittings on the cylinder.
4. From the axle lockup cylinders, run four 35" long hydraulic hoses to two 1/4" JIC T-fittings.
5. Connect a 90" long hydraulic hose from the free fitting on the rod end of the left railgear hydraulic cylinder to an 844 FS 06-06 T-fitting (5). (See illustration below)
6. From this T-fitting run a 35" long hydraulic hose (13) to the rod end of each axle lock-up hydraulic cylinder.
7. Ensure that none of the hoses contact any sharp edges or hot surfaces. Secure these hoses in place with tie-wraps. Ensure that there is enough slack in the hoses for the railgear to function.
8. Adjust the operating valve relief valve pressure as per the procedure in the Hydraulic Kit Operation, Service and Parts manual.
9. Test the operation of the controls. Refer to the operation procedure in the Railgear Kit and Hydraulic Kit Operation, Service and Parts manuals.

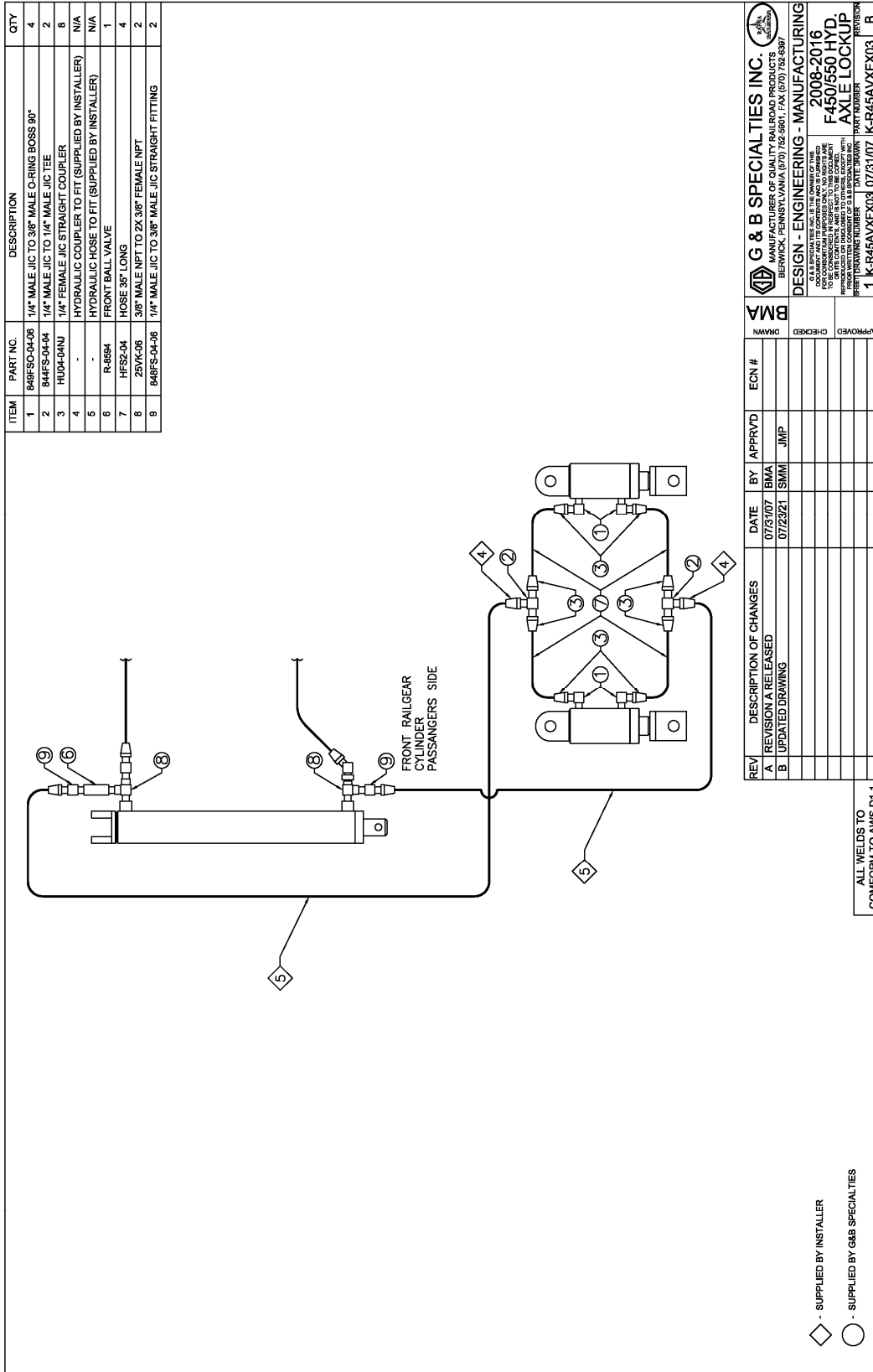


Figure 9

OPERATION OF R-450 FRONT HYDRAULIC AXLE LOCK KIT 2008-2016 FORD F-450/F-550 4X4, 4X2

OPERATION SAFETY PRECAUTIONS

If any installation problems are encountered, please call G&B Specialties for technical assistance before continuing with the installation process.



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting installation of the equipment.
- Installation instructions provided below only address the RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Do not start the vehicle with the power steering hoses disconnected. Reconnect all hoses and secure the power steering cooler if the vehicle is started.
- Ensure all removed components are given to the vehicle owner after the installation of the railgear. These components must be re-installed if the railgear is removed from the vehicle.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.
- When routing hydraulic hoses, ensure that the hoses do not contact any sharp edges or hot surfaces.

HYDRAULIC FRONT AXLE LOCK OPERATION

With the Front Axle Lock kit installed on this vehicle, it may be operated as normal.

Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.

Refer to the Railgear Kit Operation, Service and Parts manual for information on the mechanical operation, service and parts of the railgear.

PLACING VEHICLE ON RAIL

1. Open ball valve to allow hydraulic fluid to axle lockup cylinders.
2. Grasp the proper control valve lever for the axle lock-up located at the front of the vehicle. (Lever will control both axle lock-up hooks) Push lever to engage axle lock-up hooks.
3. Visually inspect that both axle lock-up hooks have fully engaged the hook catches welded to the front suspension arms.
4. Close ball valve to put fluid back to the railgear cylinders.
5. Proceed to lower the front railgear unit.
6. As the front rail wheels engage the rail, the front of the vehicle will begin to rise.
7. Continue to lower the front railgear unit until the cylinders are fully extended and the railgear lock up hook has engaged.
8. With the front railgear unit in the fully locked rail position, the front tires should be approximately 2" to 3" above the rail head.

REMOVING VEHICLE FROM RAIL

1. Disengage the railgear lock and raise the railgear to the full locked road position.
2. Open ball valve to allow hydraulic fluid to the axle lockup cylinders.
3. Grasp the proper control valve lever for the axle lock-up located at the front of the vehicle. (Lever will control both axle lock-up hooks) Pull lever to disengage axle lock-up hooks.
4. Visually inspect that both axle lock-up hooks have fully retracted from the hook catches welded to the front suspension arms.
5. Close ball valve.

FRONT HYDRAULIC AXLE LOCK ADJUSTMENT

The front hydraulic axle lock is adjusted when the vehicle is resting on its tires in its minimum loaded condition with the railgear in the road position and the axle lock engaged. For the axle lock to function properly there are three adjustments to be made:

1. There should be a clearance of 1/8" to 3/8" between the hooking surface of each hook and hook catch. If the clearance is larger than 3/8", steel shims can be welded to the bottom of the hook catch. If the clearance is less than 1/8", any previously installed shims can be removed. If there are no shims to remove, the hook catch can be cut off the bracket and re-welded higher up on the bracket using a 3/8" all around fillet weld.

2. The rear vertical edge of each hook should rest flat against the forward edge of the hook catch when the axle lock is fully engaged. This can be adjusted by cutting the hook catch off the bracket and re-welding it in place using a 3/8" all around fillet weld.
3. Each hook must clear the suspension arm by at least 1/2" through its full range of motion. The hooks can be moved inboard and outboard on the hook hanger pivot post by adjusting the number of plastic washers on each side of the hook.
4. Paint all welded areas after the axle lock is properly adjusted.
5. Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.

SERVICE OF AXLE LOCK KIT

The Axle Lock kit must be serviced regularly to avoid damage to the equipment. Table 1 below provides the Recommended Service Schedule and Table 2 provides Standard Fastener Torque Values.

Table 1: Recommended Service Schedule

Service Required	Daily	Weekly	Monthly	3 Months	6 Months
Inspect front axle lock fasteners (re-torque if required)	✓	✓	✓	✓	✓
Inspect hydraulic fittings and check for hydraulic leaks	✓	✓	✓	✓	✓
Check / adjust front axle lock hook clearance (see procedure)					✓

Table 2: Standard Fastener Torque Values

Fastener Size	Fastener Torque Value (ft-lbs) Dry
1" UNC Gr. 8 Fasteners	250
3/4" UNC Gr. 8 Fasteners	175
5/8" UNC Gr. 8 Fasteners	150
1/2" UNC Gr. 8 Fasteners	100
3/8" UNC Gr. 8 Fasteners	40
1/4" UNC Gr. 8 Fasteners	12