

## INSTALLATION OF R-460 CABLE ACTUATED FRONT AXLE LOCK KIT 2017 AND UP F-450/550 4x4, 4x2

### 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 to protect the vehicle's electrical system.

**AXLE LOCK-UP INSTALLATION**
**Front Railgear Kit Installation Parts**

Part Number	Description	Qty
R-12029D	L-Bracket Weldment Drivers Side	1
R-12029P	L-bracket Weldment Passengers Side	1
R-5653	Insulator Washer	4
R-4912-A	Hook	2
R-12018	Spacer	2
R-12031	Support Bracket	2
R-4911	Bracket	2
R-4914	Hook Catch	2
R-20319	Support Bracket, Pull Cable	2
R-20150	Clevis	2
R-20143	Pin, Clevis	2
R-12032	Washer, Fuel Cooler Spacer	1
R-20320	Clevis Tab	2
P-00058	Cable, Pull	2
P-00014	Bolt, Adaptor	2
P-00018D	Mounting Bracket, Pull Cable, Drivers Side	1
P-00018P	Mounting Bracket, Pull Cable, Passengers Side	1
R-33285	Bumper Spacer	4
990727-150-22	Screw, 1/2" x 1 1/2" Gr. 8 H.H.C.S.	8
990316-050-22	Nut, 1/2" Gr. 8 Hex Nylock Z/Y	8
R-LABEL001	Pull to Unlock Placard	2
990506-100-02	Cotter Pin, 1/8" x 1" Z/Y	2
990600-050-002	Washer, 1/2" Flat Z/Y	18
990310-050-22F	Nut, 1/2"-20 Gr. 8 Hex Jam Z/Y	2
R-990KIT-277	Nut, 1/2" Gr. 8 Hex Nylock Z/Y	10
	Washer, 1/2" Flat Z/Y	20
	Screw, 1/2" x 3 1/2" Gr. 8 H.H.C.S.	8
	Screw, 1/2" x 3 1/4" Gr. 8 H.H.C.S.	2
R-990KIT-116A	Screw, 3/8" x 4" Gr. 8 H.H.C.S.	2
	Washer, 3/8" Flat Z/Y	6
	Nut, 3/8" Gr. 8 Hex Nylock Z/Y	4
	Washer, 1/2" Flat Z/Y	8
	Screw, 3/4" x 5" Gr. 8 H.H.C.S.	2
	Screw, 3/4" x 5 1/2" Gr. 8 H.H.C.S.	2
	Nut, 1/2" Gr. 8 Hex Nylock Z/Y	2
	Washer, 3/4" Flat Z/Y	10
	Nut, 3/4" Gr. 8 Hex Nylock Z/Y	6
	Washer, 1/4" Flat Z/Y	2
	Nut, 1/4" Gr. 8 Hex Nylock Z/Y	2
Cotter Pin, 1/8" x 2" Z/Y	2	

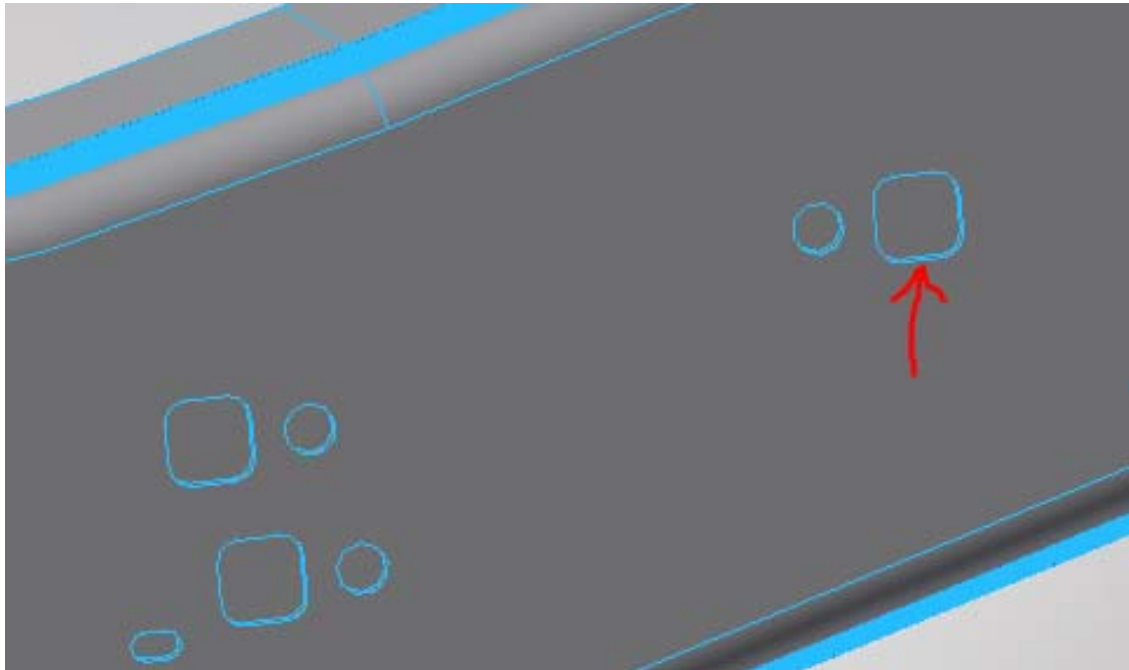
The front axle lock kit is to be positioned just rearward of the vehicle's front suspension springs. Mounting holes in the hook hanger and bracket will align with some existing holes in the vehicle frame and suspension arm, respectively. The axle lock hook is designed to swing toward the front of the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

1. Remove fuel cooler from inside frame. Hoses should not have to be removed, just bolts taken out to be free of the frame. Use one of the existing mounting points for our bracket. Clip will need to be removed from square hole. See (Fig.1) for location.
2. Pop out wiring clips, grounding stud, etc. on top of the frame so that the bracket will sit flat on the frame. A brake clip and a grounding stud are located on the bracket for re-installation. The pop rivet can be removed from the brake clip and installed on the bracket with supplied hardware. See Fig. 2 for clip and pop rivet.
3. Find the slotted hole on top of the frame. Take the bracket R-12029D (Driver's Side) and align the locating slug on the bracket with the slot in the frame. When done correctly, the slug should drop into the slot on the frame and the bracket will sit against the top and outer surfaces of the frame. See (Fig. 3).
4. With the bracket on the frame, center punch the slot on the bracket. Remove the bracket and drill a 49/64" hole. Hole should line up with the existing square hole where we removed the clip from earlier. Check with supplied 3/4" bolt to ensure the bolt sits parallel and is not angled. The hole may need to be reamed to ensure this. The hole on the outside of the frame can also be obtained by drilling the square hole on the inside of the frame through to the outside. The bracket is slotted for this reason. Ensure the bolt sits straight and not on an angle. Once the hole is in place and bolt sits parallel, re-install fuel cooler leaving out the clip we removed. Install bracket to frame, using R-12032 and 3/4" hardware as shown in Fig. 3 & 4. See Fig. 9 for proper install reference. (Passenger side will need the hole drilled through to the inside of the frame. There are no holes present on the passenger side.)
5. On the radius arm, you will see a slotted hole with a hole next to it. Take the R-4915 and place it on the radius arm with the larger hole in the bracket aligned with the slot, positioned closest to the hole side of the slot. See (Fig.8) Place 3/4" bolt that was supplied through the bracket and radius arm to hold the bracket and with the bracket against the bottom of the radius arm, mark the center of the small hole of the bracket on frame. You may also mark the center of the hole on the inside of the frame. Drill a 13/32" hole through the radius arm, or on the inside and outside where marked. With the hole drilled, install bracket using the 3/4" and 3/8" hardware supplied in kit. See (Fig. 3 & 5) for reference. Ensure not to over-tighten bolts and deform the radius arm.
6. Assemble the hook, R-4912-A, and bracket, R-12031, onto the all thread stud as shown in Fig. 4. If lateral adjustment is required, the supplied spacer can be trimmed down, or washers can be added into assembly to maintain proper clearance with the frame, suspension arm, and hook. Nylock nut should be tightened enough to secure hook, but not hinder it from swinging.

7. Position each clevis tab, R-20320, (Approximately) before the 3" radius on hook (Adjustment may need to be made to ensure proper function, see Fig. 6). Tack weld each tab to each hook temporarily.
8. Install the actuating cables for the axle lockup as shown (Fig. 6). Run cable through bracket, R-20319, and adjust position on R-12301. Once in place, tighten jam nuts on the pull cable and tack R-20319 to R-12301. (A C-Clamp may also be used for testing purposes) Test the pull cable to ensure when pulled, the hook will follow accordingly. Adjustment may need to be made to R-20319. Once functioning properly, weld permanent R-20319 to R-12301 and the clevis tab. Route cables to the front of the vehicle and mount as shown using the pull cable mounting brackets (Fig. 7).

**Do not install the hook catch or make any adjustment to the lockup hook engagement until all the vehicle's permanent load has been installed as the vehicle equipment will affect the vehicles ride height and therefore the axle lock hook engagement.**

9. 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. Tack weld each hook catch to each bracket.
10. With the axle lock-up cables installed, engage the lock-up so that both cables are fully extended. Ensure that the hook will fully engage the hook catch. If the hook/hook catch engagement needs to be adjusted; the hook catch can be removed and tack welded in a different location. The engagement can also be adjusted by loosening the 1/2" jam nut on the adapter bolt and adjusting the adapter bolt in or out to increase or decrease the engagement. Tighten jam nut.
11. Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.
12. Fully weld the hook catch to the suspension arm bracket.
13. Paint all areas that were welded or heated.
14. Test the operation of the front axle lock.



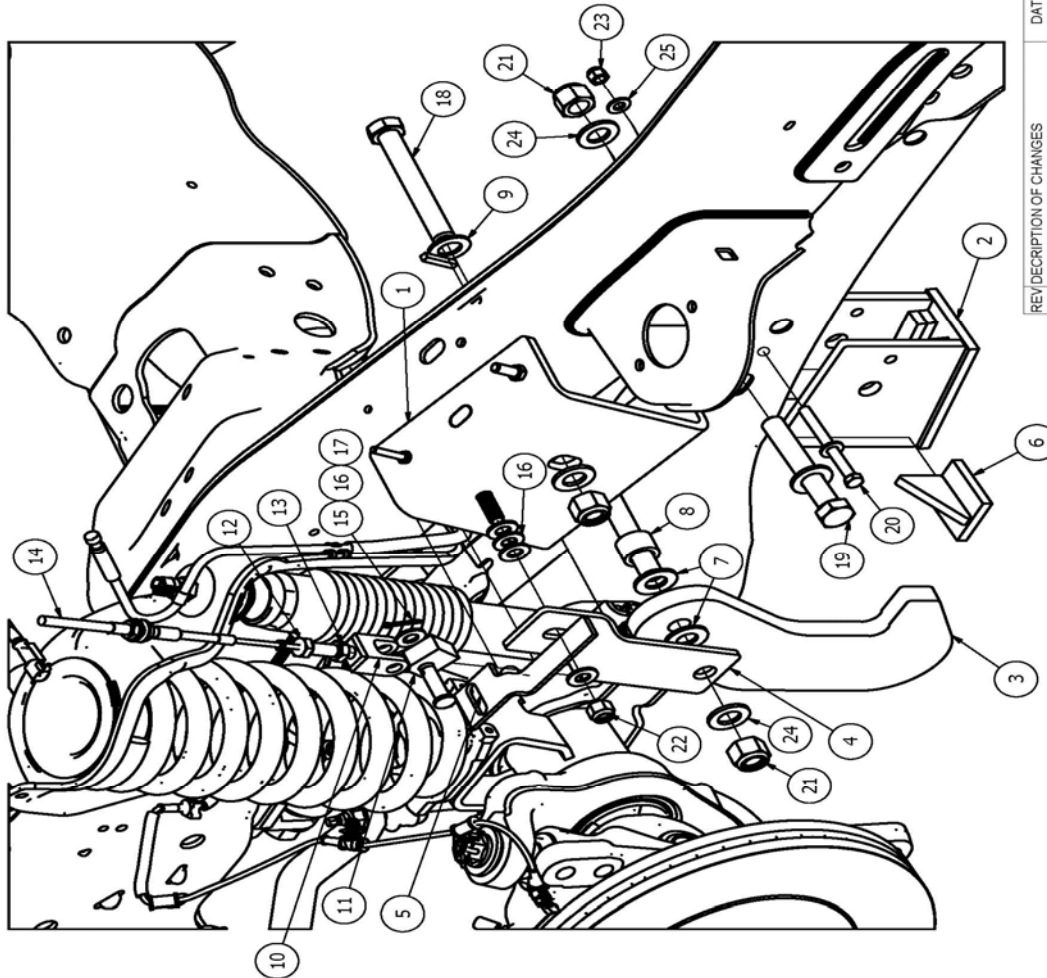
**Figure 1**



**Figure 2**

**PARTS LIST**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-12029D	L-BRACKET WELDMENT DS
2	1	R-4911	RADIUS ARM BRACKET
3	1	R-4912-A	HOOK
4	1	R-12031	SUPPORT BRACKET
5	1	R-20319	PULL CABLE SUPPORT BRACKET
6	1	R-4914	HOOK CATCH
7	2	R-5635	INSULATOR WASHER
8	1	R-12018	SPACER
9	1	R-12032	WASHER, FUEL COOLER SPACER
10	1	R-20150	CLEVIS
11	1	R-20320	TAB, CLEVIS
12	1	P-00014	BOLT, ADAPTOR
13	1	990310-050-22F	NUT, 1/2" -20 GR 8 JAM NUT
14	1	P-00058	CABLE, PULL
15	1	R-20143	PIN, CLEVIS
16	5	990600-050-002	WASHER, 1/2" FLAT Z/Y
17	1	990506-100-02	COTTER PIN, 1/8" X 1" Z/Y
18	1	990731-550-22	SCREW, 3/4" X 5 1/2" GR 8 H.H.C.S
19	1	990731-500-22	SCREW, 3/4" X 5" GR 8 H.H.C.S
20	1	990725-400-22	SCREW, 3/8" X 4" GR 8 H.H.C.S
21	3	990316-075-22	NUT, 3/4" GR 8 NYLOCK Z/Y
22	1	990316-050-22	NUT, 1/2" GR 8 NYLOCK Z/Y
23	1	990316-037-22	NUT, 3/8" GR 8 NYLOCK Z/Y
24	4	990600-075-002	WASHER, 3/4" FLAT Z/Y
25	1	990600-037-002	WASHER, 3/8" FLAT Z/Y



REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	EON #
A REVISION A RELEASED	12/12/17	SMM	JMP	

APPROVED	CHECKED	DATE DRAWN	PART NUMBER
JMP	JMP	12/12/17	R46AVFX05
JMP	JMP		R46AVFX05
JMP	JMP		R46AVFX05

DESIGN - ENGINEERING - MANUFACTURING	MANUFACTURING	INSPECTION	ASSEMBLY
SMM	JMP	JMP	JMP

REVISION	DATE	DESCRIPTION
1	12/12/17	AXLE LOCK UP ASSEMBLY

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**Figure 3**

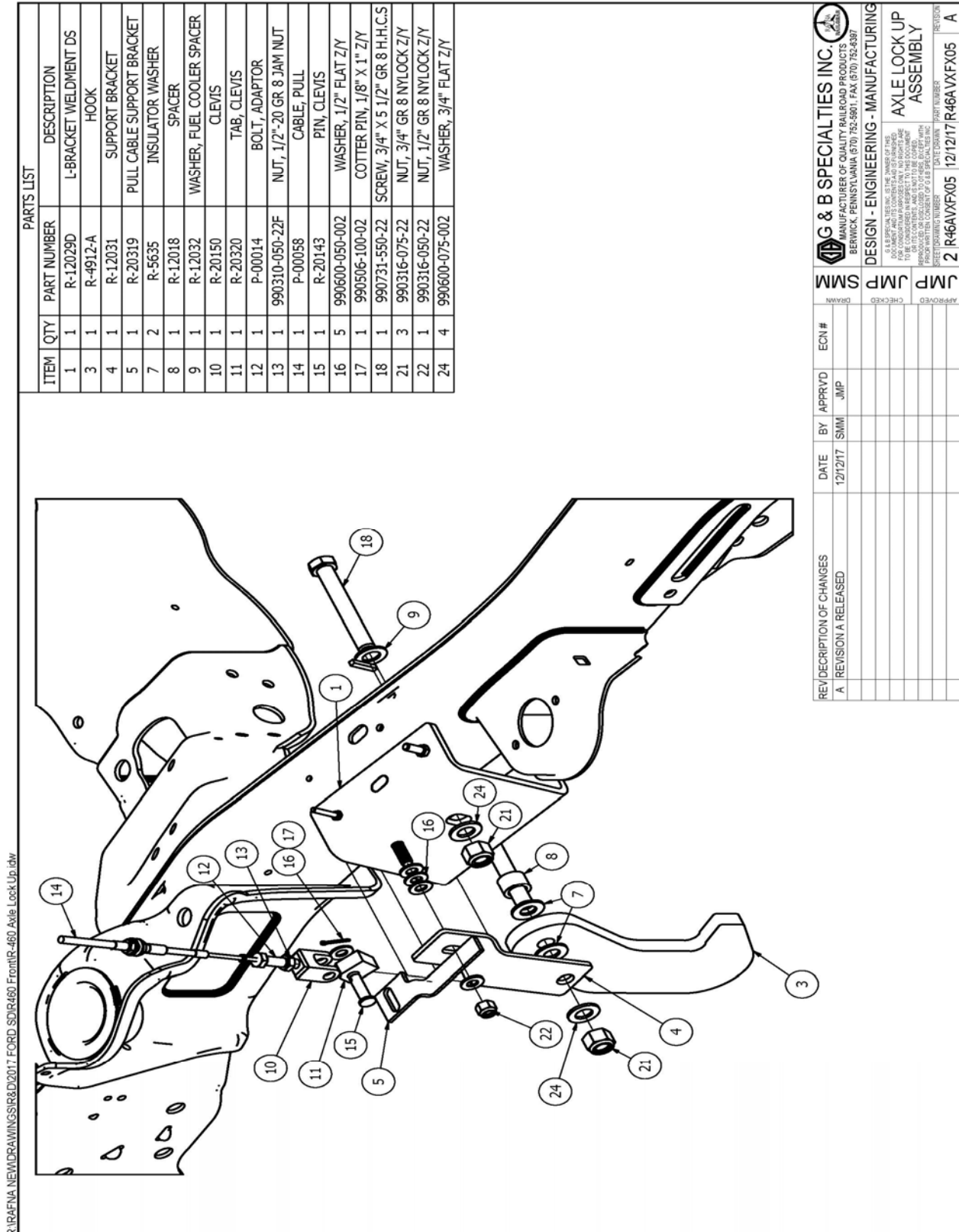
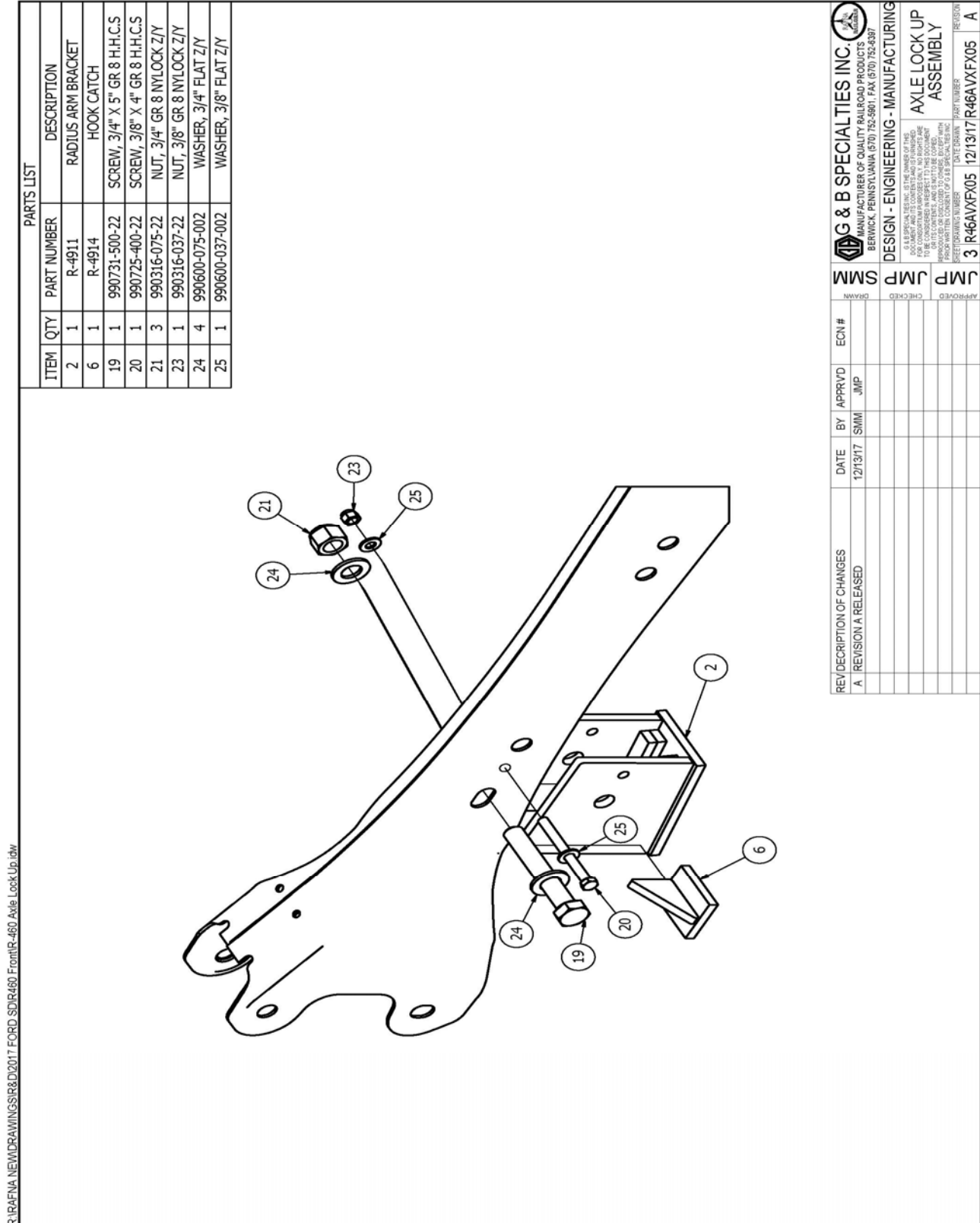


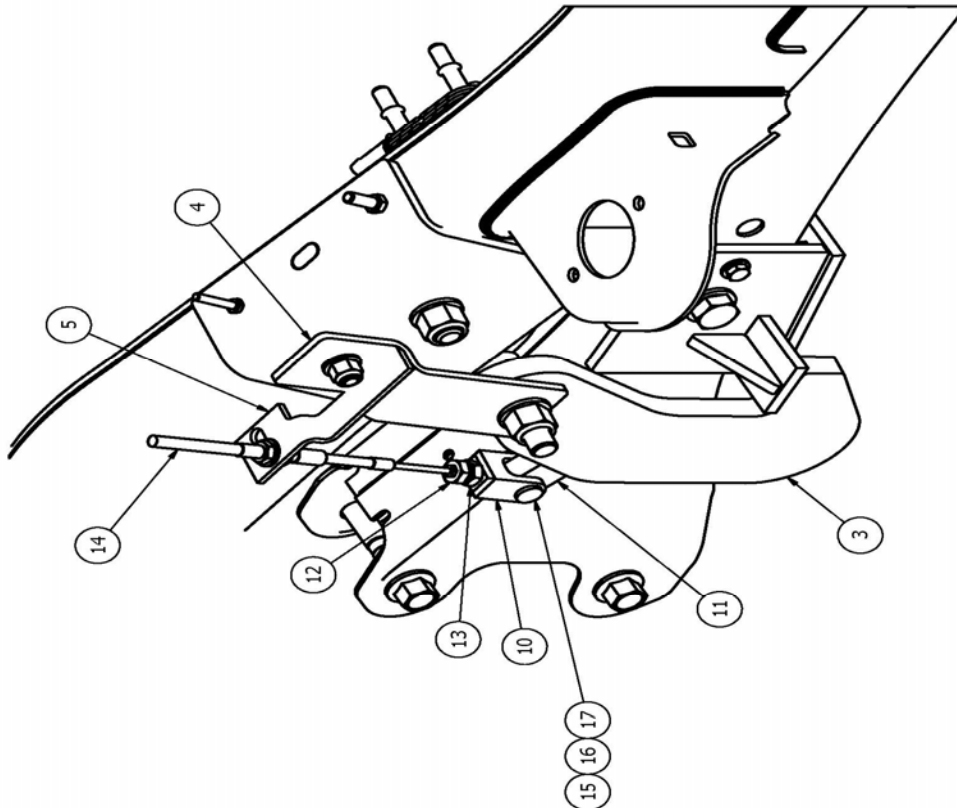
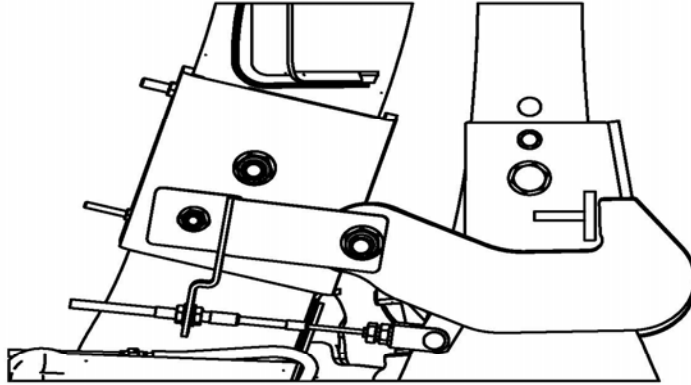
Figure 4





PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	R-4912-A	HOOK
4	1	R-12031	SUPPORT BRACKET
5	1	R-20319	PULL CABLE SUPPORT BRACKET
10	1	R-20150	CLEVIS
11	1	R-20320	TAB, CLEVIS
12	1	P-00014	BOLT, ADAPTOR
13	1	990310-050-22F	NUT, 1/2"-20 GR 8 JAW NUT
14	1	P-00058	CABLE, PULL
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16	5	990600-050-002	WASHER, 1/2" FLAT Z/Y
17	1	990506-100-02	COTTER PIN, 1/8" X 1" Z/Y



REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	CHECKED	DATE DRAWN	PART NUMBER	REVISION
A REVISION A RELEASED	12/13/17	SMM	JMP					4 R46AVXFX05	A

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	CHECKED	DATE DRAWN	PART NUMBER	REVISION
A REVISION A RELEASED	12/13/17	SMM	JMP					4 R46AVXFX05	A

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	CHECKED	DATE DRAWN	PART NUMBER	REVISION
A REVISION A RELEASED	12/13/17	SMM	JMP					4 R46AVXFX05	A

**G & B SPECIALTIES INC.**  
MANUFACTURER OF QUALITY RAILROAD PRODUCTS  
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

PULL CABLE  
INSTALLATION

DATE DRAWN: 12/13/17  
PART NUMBER: 4 R46AVXFX05  
REVISION: A

Figure 6

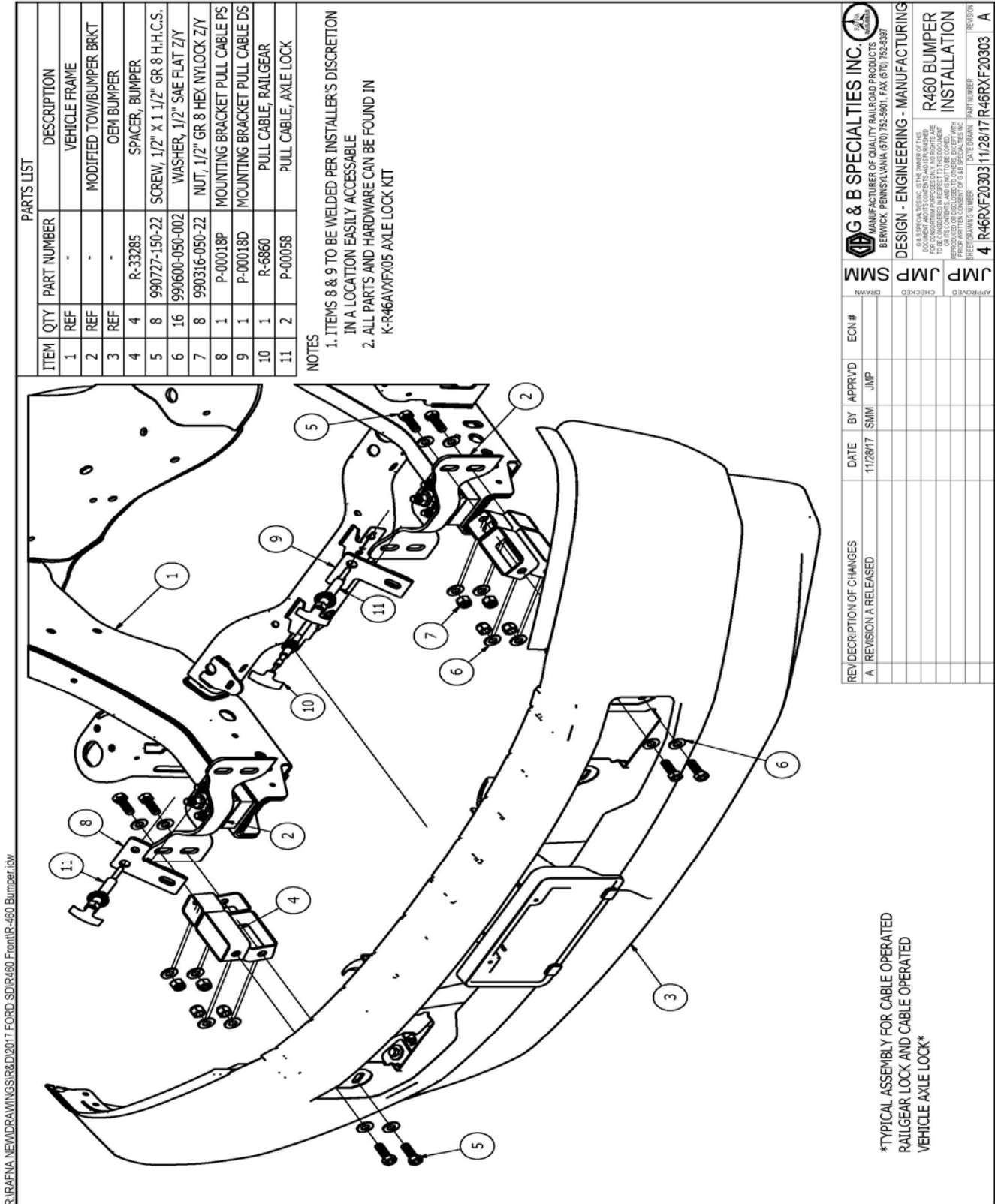
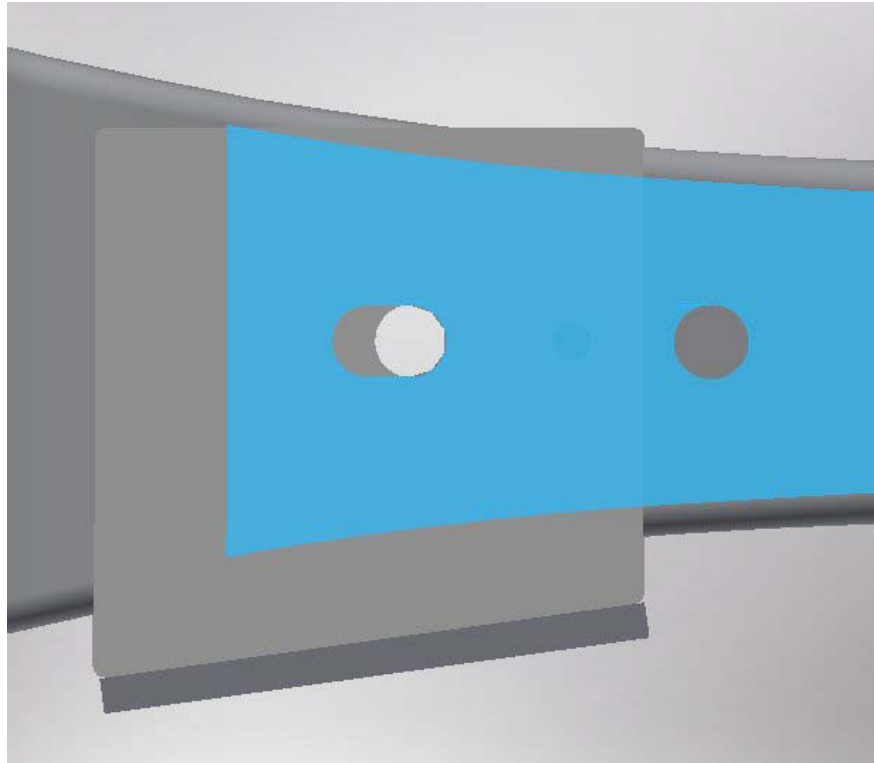
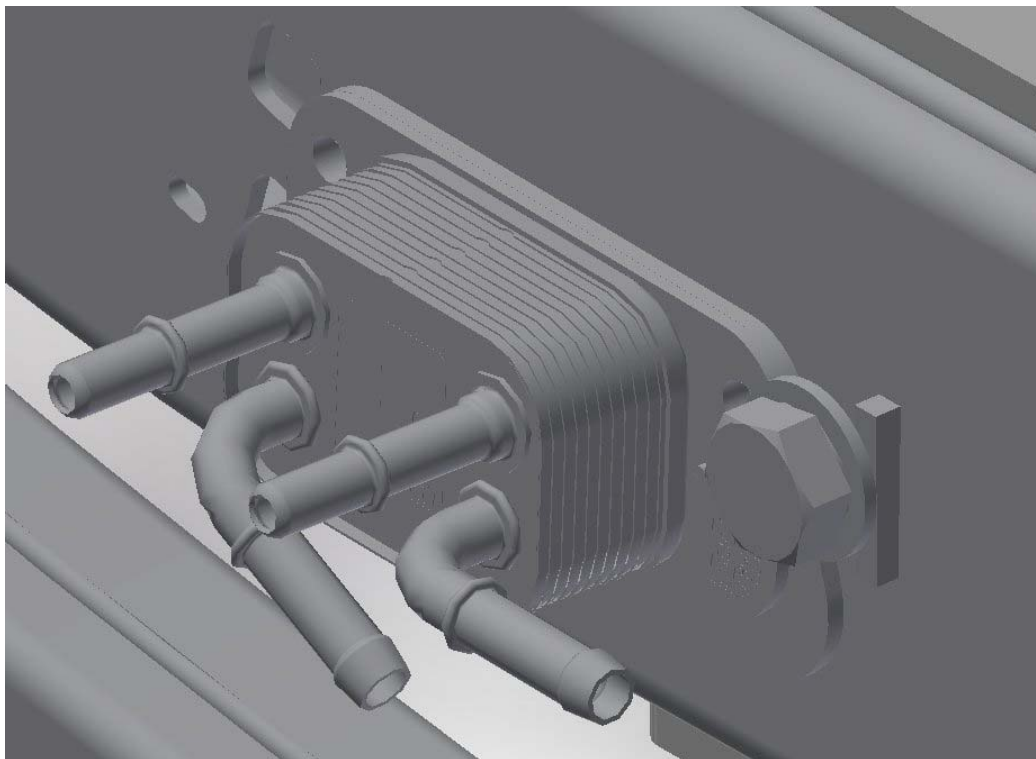


Figure 7



**Figure 8**



**Figure 9**

## OPERATION AND SERVICE OF R-460 CABLE ACTUATED FRONT AXLE LOCK KIT 2017 AND UP F-450/550 4x4, 4x2

### SAFETY PRECAUTIONS

If any operating, service or parts problems are encountered, please call G&B Specialties, Inc. for technical assistance.



- 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 operation of the railgear equipped vehicle.
- Operating instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Railway company rules governing rail travel must be observed at all times.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- 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.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear to protect the vehicle's electrical system

## AXLE LOCK-UP OPERATION

When on rail, the front tires should be approximately 2" to 3" above the rail head. This dimension may vary depending on the load that the vehicle is carrying.

## PUMP OPERATED RAILGEAR UNITS

### Placing Vehicle on Rail

1. Ensure that the in-cab pump power switch is on.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and push the cable in toward the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully engaged the hook catches welded to the front suspension arms.
4. Proceed to lower the front railgear unit.
5. As the front rail wheels engage the rail. The front of the vehicle will begin to rise.
6. Continue to lower the front railgear unit until the cylinders are fully extended and the railgear lock up hook has engaged.
7. With the front railgear unit in the fully locked rail position the front tires should be approximately 2" to 3" above the rail head, depending on vehicle load.

### Removing Vehicle from Rail

1. Disengage the railgear lock and raise the railgear to the full locked road position.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and pull the cable out away the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully retracted from the hook catches welded to the front suspension arms.

## PTO OPERATED RAILGEAR UNITS

### Placing Vehicle on Rail

1. Ensure that the PTO is engaged and diverted for railgear operation.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and push the cable in toward the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully engaged the hook catches welded to the front suspension arms.
4. Proceed to lower the front railgear unit.
5. As the front rail wheels engage the rail. The front of the vehicle will begin to rise.
6. Continue to lower the front railgear unit until the cylinders are fully extended and the railgear lock up hook has engaged.
7. With the front railgear unit in the fully locked rail position the front tires should be approximately 2" to 3" above the rail head, depending on vehicle load.

### Removing Vehicle from Rail

1. Disengage the railgear lock and raise the railgear to the full locked road position.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and pull the cable out away the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully retracted from the hook catches welded to the front suspension arms.

## AXLE LOCK-UP SERVICE

The front axle lock kit must be serviced regularly to avoid damage to the equipment. Table 1 below provides the Recommended Service Schedule and the detailed service procedures follow.

Do not torque the 3/8" or 3/4" fasteners that connect the bracket to the suspension arm; these fasteners should only be tightened sufficiently to hold the bracket on the suspension arm without deforming the suspension arm. Table 2 provides all other 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)					✓
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

## FRONT AXLE LOCK ADJUSTMENT

The front 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 1/4" between the hooking surface of each hook and hook catch. If the clearance is larger than 1/4", 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 3/8"-1/2" through its full range of motion.

Paint all welded areas after the axle lock is properly adjusted.

Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.

