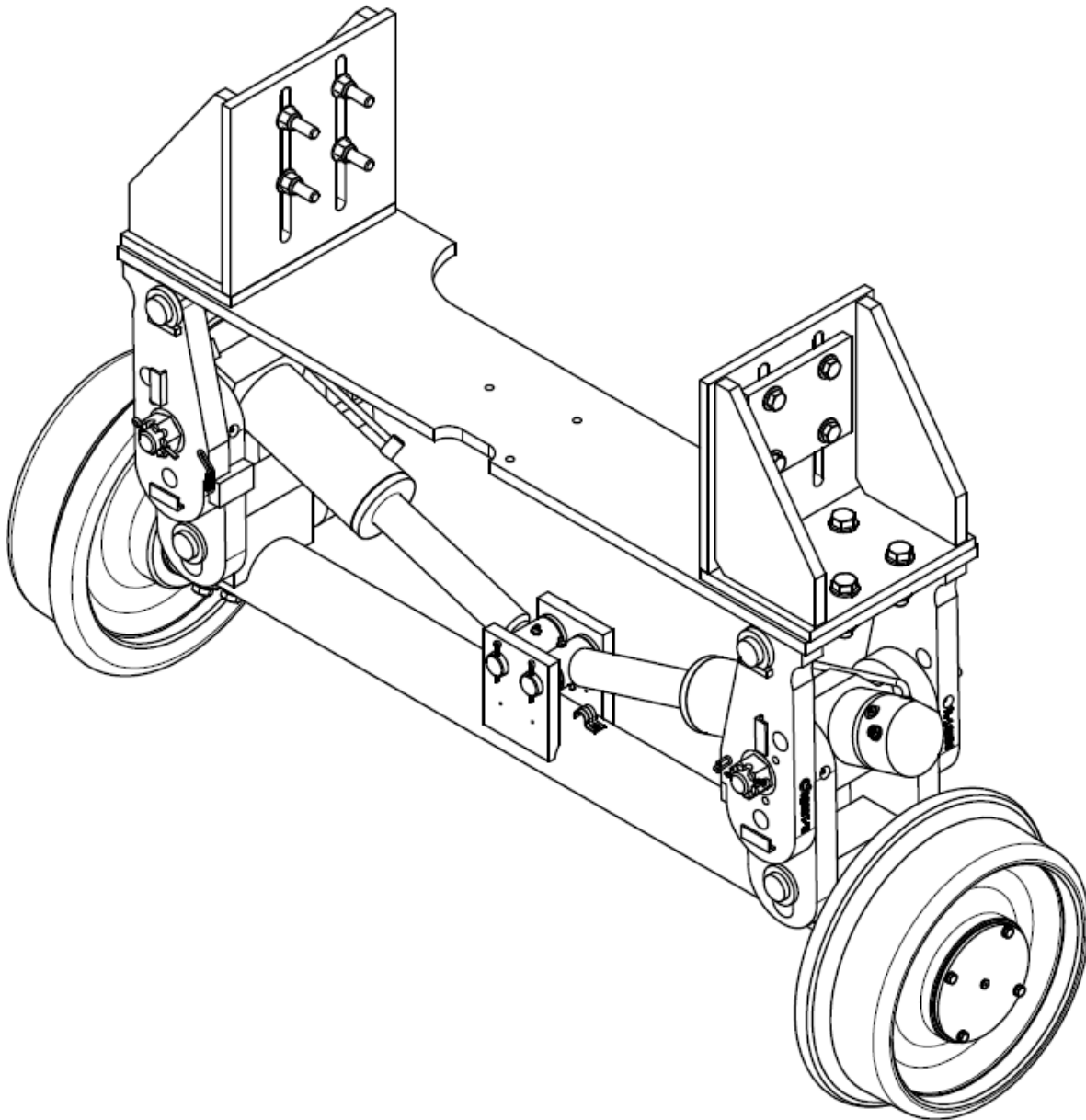


## R-1110/R-1150 REAR RAILGEAR



### INSTALLATION, OPERATIONS, SERVICE AND PARTS MANUAL

## 1.0 R-1110/1150 REAR RAILGEAR KIT

### 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 Industries 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.
- Beware of all pinch points on the railgear and keep all parts of the body clear.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear to protect the vehicle's electrical system.

## 2.0 CONTENTS

1.0	R-1110/1150 Rear Railgear Kit	2
	Safety Precautions	2
3.0	General Information	5
	Work Area	5
	Truck Condition	5
	Preliminary Installation	5
4.0	Hydraulic System Connection	7
	New Hydraulic System	7
	Existing Hydraulic System	7
5.0	Rear Railgear Installation	9
	Rear Spacer Installation	10
	Square Rear Railgear with Truck Axle	12
	Final Rear Installation	13
6.0	Optional Equipment	15
	Rail Sweeps	15
	Rail Sweep Adjustment	15
	Brakes	17
	Plumbing Installation	17
	Testing	17
	Brake Installation	19
	Air Lock Option	20
	Dual Axle Shunt	23
	Shunt Installation	24
7.0	Front to Rear Alignment	27
	Final Alignment	27
8.0	Final Checklist	28
	Installation Check List	28
	Check tire pressures	28
	Front Alignment	28
	Rear Alignment	28
	Check overall measurements	28
9.0	Installation Summary	29
	Initial Instructions	29

	Hydraulic System Connection	29
	Rear Railgear Installation	29
	Spacer installation with Front Railgear on rails in track position	29
	Square Railgear with Truck Frame	29
	Final Rear Installation	29
	Front to Rear Alignment	29
	Rail Sweeps	30
	Brakes	30
	Air-Lock	30
	Final Checklist	30
10.0	Steering Wheel Lock	31
	Installation	31
	Operation	35
	Service of Steering Wheel Lock	35
11.0	Railgear Operation and Maintenance	37
	Railgear Operation	37
	Engage Front Railgear	37
	Engage Rear Railgear	37
	On Track	37
	Removing Railgear from Track	37
	Railgear Maintenance	38
	Daily	38
	Weekly	38
	Bi-annually	38
	Lubrication	38
12.0	Parts	39

### 3.0 GENERAL INFORMATION

#### WORK AREA

The work area in which the railgear is to be installed should meet these minimum requirements to facilitate the installation and conditions that allow the work to be completed in a safe, accurate and timely manner.

- Floor - The floor should be level to provide good measurements required to check alignment of the railgear. The floor should also be sufficiently hard to prevent damage by the railgear wheels.
- Lighting - The work area should be adequately lighted.
- Space - There should be enough space to maneuver the railgear components into position and to safely work around other equipment.

#### TRUCK CONDITION

Before installation, the truck should be checked in some important areas.

- Tires - The tire pressure should be checked for the manufacturer's recommended inflation and checked for consistent pressure readings from all tires. This will ensure correct traction of the tires on the rails. In addition, the condition of the rear tires must be determined. If they are worn, they should be replaced.
- Alignment - Rear truck axle should be square with the truck frame. G&B Specialties recommends that a reputable alignment shop should check this. 0- degree thrust angle (which can be different than the manufacturer's specification) is required for proper railgear operation.
- Frame and Suspension - On a new truck these should be in good condition. On a used truck, the frame should be inspected for damage. The suspension components should also be checked for damage or wear. If any problems in these areas are not corrected, it will cause difficulty aligning and operating the railgear.
- Transverse Torque Rods - On vehicles that will regularly experience high center of gravity loads on rails, it is advised to install rear tandem control rods to limit transverse axle displacement. This is also necessary on long wheelbase vehicles to limit front tandem walking off in tight radius curves.

#### PRELIMINARY INSTALLATION

Roll the rear railgear up on the rear installation rails under the truck frame in the back. The railgear is usually installed with the safety pin offs on the rear. However, truck bodywork may dictate locating pin offs in the front.

THIS PAGE INTENTIONALLY LEFT BLANK

## 4.0 HYDRAULIC SYSTEM CONNECTION

### NEW HYDRAULIC SYSTEM

If G&B Specialties' railgear is to be the only hydraulic components and there is not an existing hydraulic system, equip the truck with a 5 to 7 GPM, 2500-PSI pump, Suction Filter and a 5-gallon reservoir. The tank should have a minimum of one suction port (3/4" NPT), one return port (1/2" NPT) and a tank filler-breather. Fill the tank with UNAX Oil Rx 46 or equivalent hydraulic oil.

Route a pressure line (SAE 100r2-8 and -8JIC swivels at each end) from the pump to the center of the front bumper. The in port of the hydraulic control valve is connected to the pressure line. The outlet port of the front hydraulic control valve is routed to the inlet port of the rear hydraulic control valve. The outlet port of the rear hydraulic control valve is connected to the return port in the hydraulic reservoir. See **Figure 2-1**. The remaining ports on the front valve are connected to the front cylinders. The bottoms of the both cylinders connect, with a tee at the valve, to the same valve port. Check that proper hose clearance is obtained to avoid chafing and shield hoses if necessary.

#### WARNING

*Be certain that front and rear valves are plumbed correctly. Each valve port is marked "INLET" or "OUTLET". Plumbing valve backwards will result in an unsafe condition, possible injury and/or damage.*

### EXISTING HYDRAULIC SYSTEM

If the truck has an existing hydraulic system, install an appropriate sized diverted valve in the pressure line after the pump and before any existing equipment valves. One-outlet routes to the existing valves and the other to the center of the front bumper. The in port of the hydraulic control valve is connected to the pressure line. The outlet port of the front hydraulic system valve is routed to the inlet port of the rear hydraulic control valve. The outlet port of the rear hydraulic control valve is connected to the return port in the hydraulic reservoir. See **Figure 2-2**. The remaining ports on the front valve are connected to the front cylinders. The bottoms of both cylinders connect, with a tee at the valve, to the same valve port. Check that proper hose clearance is obtained to avoid chafing and shield hoses if necessary. Directly after the pump, it is good practice to install a relief valve, set for the system pressure to provide overpressure protection for the pump.

**NOTE**

*Railgear valves have built in pressure reliefs and the hydraulic working pressure of the system is 2000 PSI. The front valve is pre-set to 1500 PSI at the relief and the rear valve is pre-set to 2000 PSI. All other components supplied by G&B Specialties are rated 2500 PSI. Care must be exercised that the relief pressures at the valves don't exceed this. To ensure proper system pressure, check with a gauge*

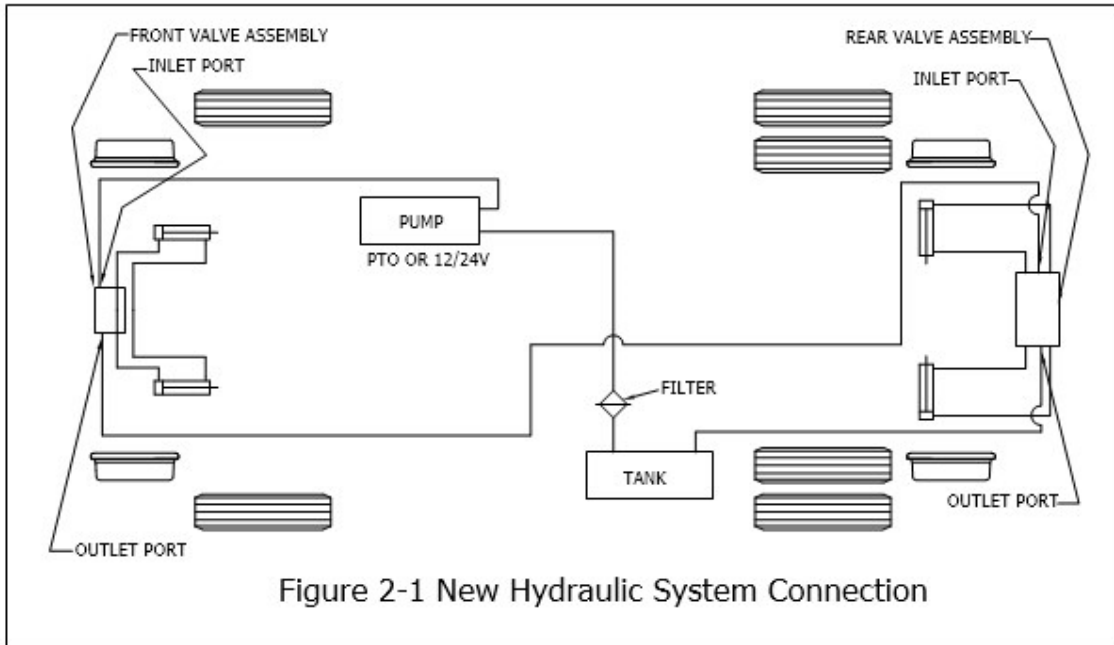


Figure 2-1 New Hydraulic System Connection

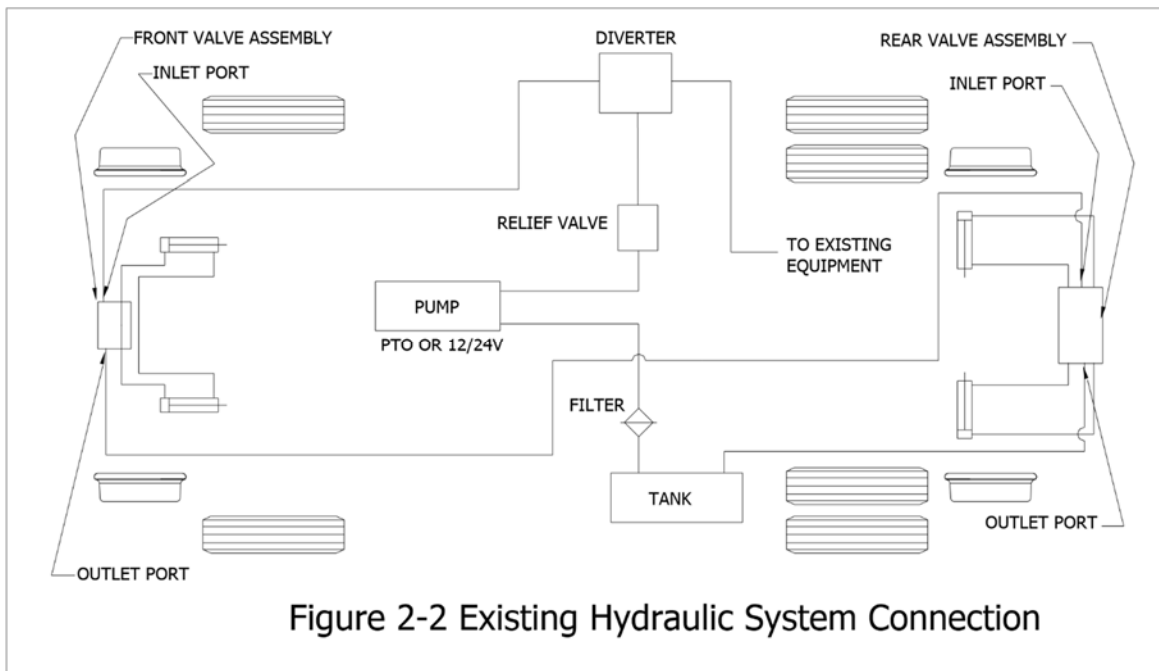


Figure 2-2 Existing Hydraulic System Connection



## 5.0 REAR RAILGEAR INSTALLATION

### Note

*It is important to check truck tire pressure (especially the rear tires) to be sure that it is at the manufacturer's recommended level.*

With the truck on the rear installation rails, position the rear railgear as close to the rear tires as practical (allowing clearance for mud flaps). The following table gives standard location and clearance guidelines for the rear railgear. Generally, it is advisable to leave a minimum of 2" clearance to any tire, spring or suspension component.

Minimum Distance From:	Single Axle	Tandem Axle
Tire to rail wheel center	15 ¼"	11 ¼"
Minimum Truck Frame Extension (from tire)	21 ¼"	17 ¼"
Overall Rail Guide Clearance (from tire)	24 ¼" x 19"	20 ¼" x 19"

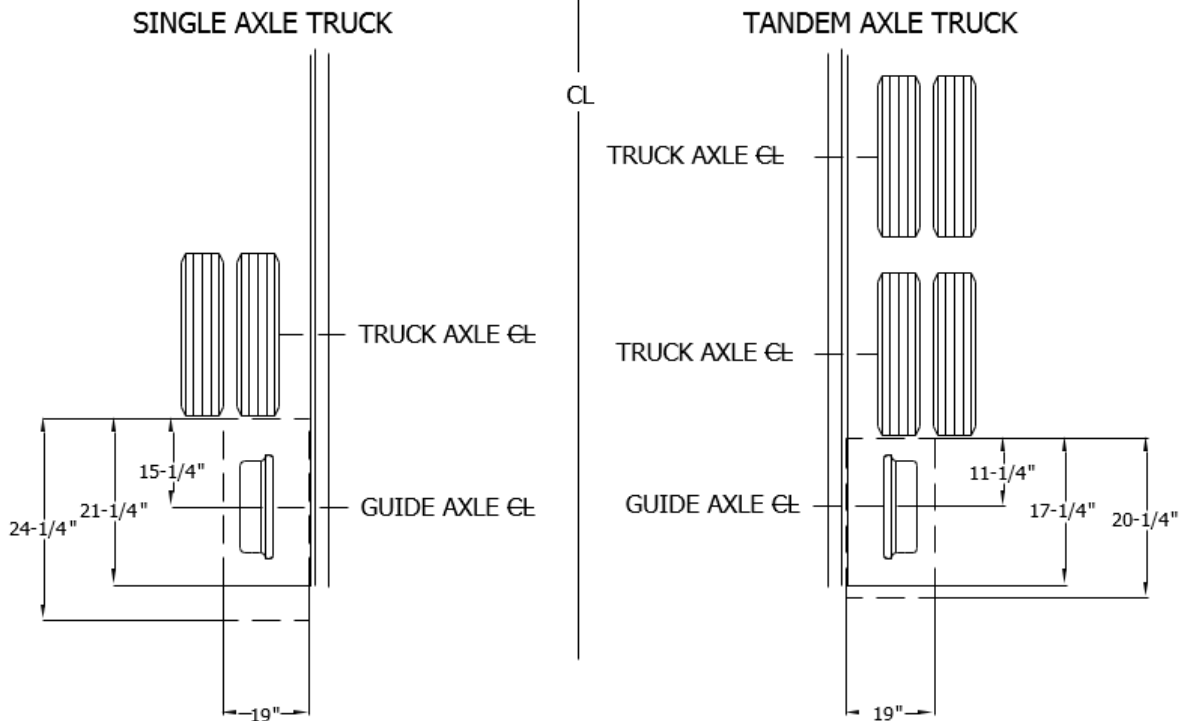


Figure 5-1

If the truck frame does not extend a minimum of 21 ¼" for a single axle or 17 ¼" for a tandem axle trucks, beyond the rear tire/mud flap, it should be extended to provide the necessary clearance for mounting the railgear.

In addition, while the railgear typically drops straight down, it can also articulate from side to side, to allow alignment of the vehicle with the rail. As such a clear space must extend out from the frame outward on either side for at least 19".

## REAR SPACER INSTALLATION

Before proceeding, place a temporary 6" x 6" x 3/8" wall steel tube spacer between the truck frame and railgear mounting plate. Actuate both rear cylinders to raise the rear railgear mounting plate to the truck frame.

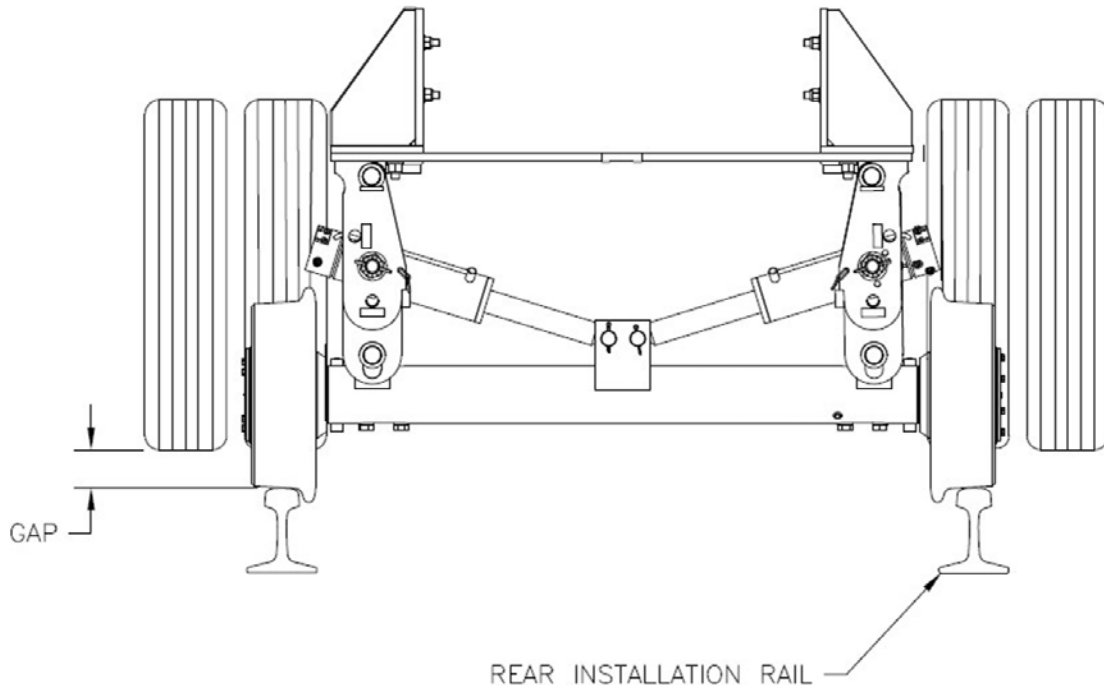


Figure 5-2

### Note

*Temporarily secure the rear railgear in place to prevent any movement during the remaining installation.*

Raise the rear mounting plate and the truck frame to lift the truck wheels off the rear installation rails. Measure the gap between the truck tires and the rear installation rails. In general, the truck spring deflection equals 6" minus this gap. To calculate the required spacer thickness, multiply the spring and tire deflection by 60%. The formula is:

$$\text{Calculated Spacer Thickness} = (6.0'' - \text{Gap}) \times .6$$

The following table shows the calculated spacer thickness for several common gaps. Use the table below as a quick reference. Please note, the actual measurements may vary slightly, and should be calculated before fabricating a spacer out of solid steel pieces. This spacer will bear the full force of the vehicle rear axle and should not be hollow.

Table 5-1

If Gap =	Spring and Tire Deflection (6.0" -Gap)	Calculated Spacer Thickness (6.0 -Gap) x .6
5"	1"	$\frac{3}{4}$ "
4"	2"	1 $\frac{1}{4}$ "
3"	3"	1 $\frac{3}{4}$ "
2"	4"	1 $\frac{3}{8}$ "
1"	5"	3"

Release the clamps holding the rear railgear mounting plate to the truck frame. Collapse the railgear to its folded position (which will lower the truck tires down to the installation rails). Replace the temporary 6" spacers with the permanent, calculated spacers, and tack in place onto the rear railgear mounting plate.

Extend the rear railgear to the rail position (which will raise the truck frame). The truck inner duals should be flat to slightly cupping the installation rails. Too much weight on these tires (truck frame too low) will cause rapid tire wear. Not enough weight (truck frame too high) will cause spin and poor braking.

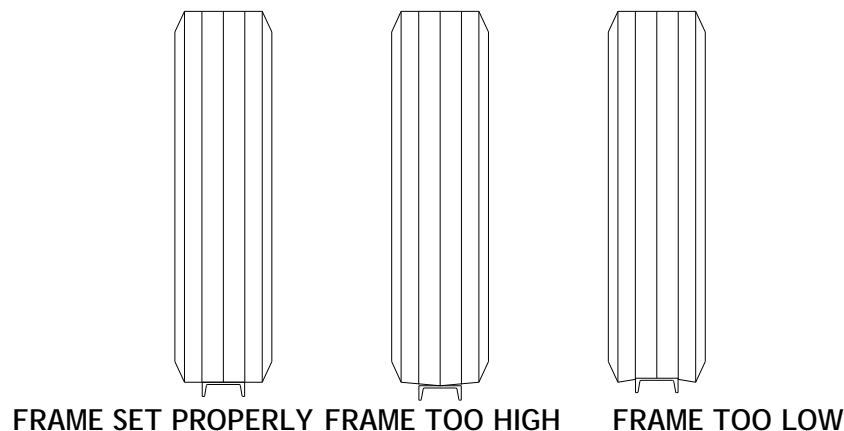


Figure 5-3

**Note**

*If necessary, adjust the spacer thickness to achieve proper tire cup on the installation rails.*

## SQUARE REAR RAILGEAR WITH TRUCK AXLE

Once the proper spacer height, and the railgear has been spaced away from the rear truck tires, the rear railgear needs to be made square with the rear truck axle. Four measurements must be taken to ensure this requirement.

- The distance from the truck axle to the Rear Railgear at both ends. Distance "A" must be equal to "B" (within 1/16").
- The diagonal distance from the truck axle to the opposite side of the Rear Railgear.

Distance "C" must equal "D" (within 1/8")

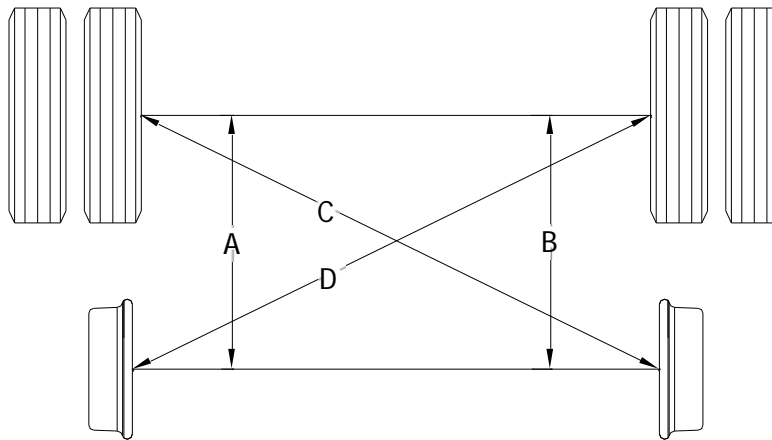


Figure 5-4

### Note

*Although the previous mounting conditions and alignment may be met, be certain that enough room exists between the rear railgear and other equipment. As previously stated, this should include a 2" clearance around the Railgear (more if equipped with remote pin offs). Also, ensure that there is clearance to remove the pin offs from their holes.*

## FINAL REAR INSTALLATION

Using the mounting plate as a template, drill four 21/32" dia. holes through the truck frame. Locate the mounting plate to allow for maximum adjustment of the rear railgear mounting plate. Bolt the mounting plate on the rear railgear mounting plate and truck frame with 5/8"-11 grade 5 bolts and Nylock nuts. Tack weld the mounting plate to the rear railgear mounting plate. If readjustments are needed later, the welds can be ground off and the rear railgear mounting plate can be slid up or down by loosening the bolts in the slots.

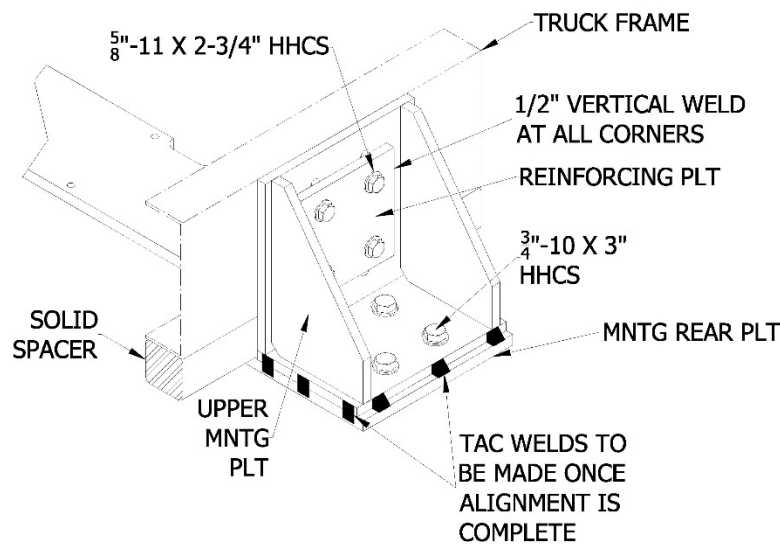


Figure 5-5

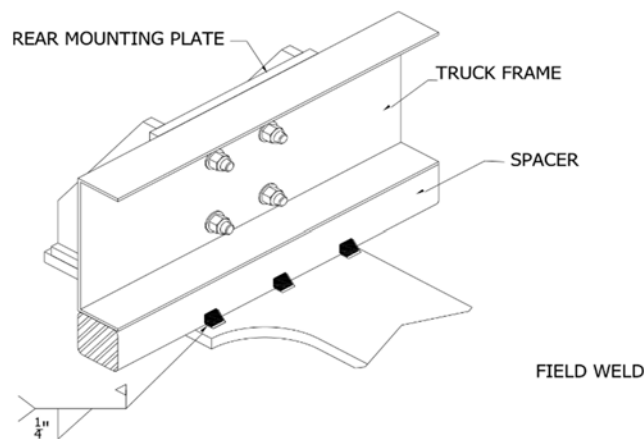


Figure 5-6 Welding Of Spacer

THIS PAGE INTENTIONALLY LEFT BLANK

## 6.0 OPTIONAL EQUIPMENT

### RAIL SWEEPS

#### Units with Brakes

On units equipped with brakes, front and/or rear, the rail sweeps are assembled on the railgear prior to shipment.

#### Units without Brakes

On units without brakes, rail sweeps are assembled to the railgear prior to shipment.

#### Rail Sweep Adjustment

Adjust the rubber sweeps so that they are slightly touching the rail head.

#### Rear Railsweep Installation (without brakes)

The rear railsweep assemblies are shipped assembled and should be parallel with the rail as shown. See pgs. 68, 69, and 92, for assemblies and parts.

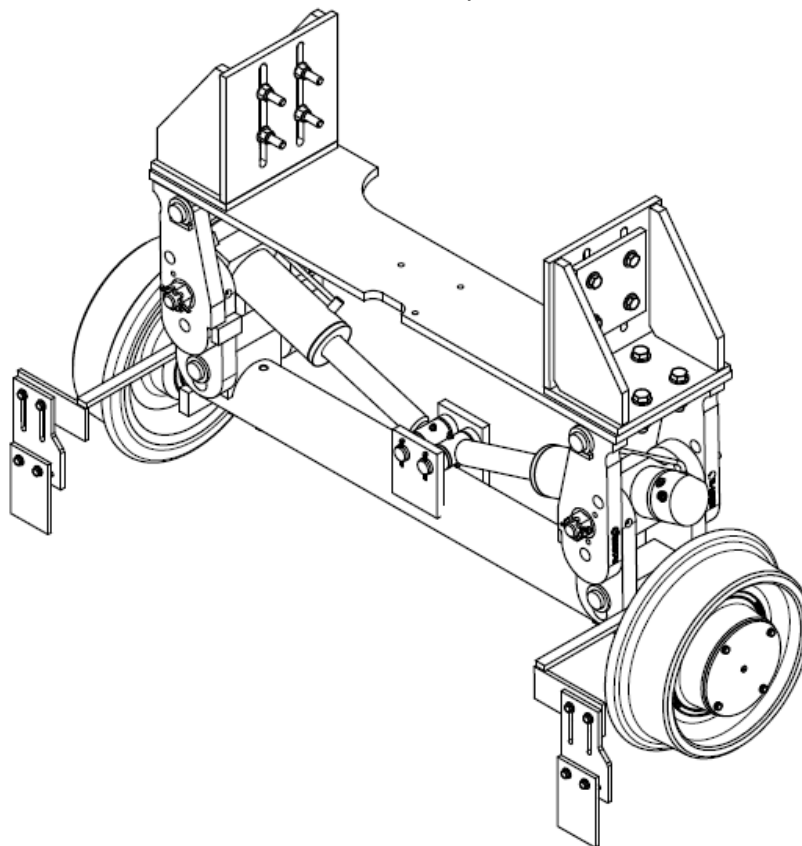


Figure 6-1

### Rear Railsweep Installation (with brakes)

The rear brake assemblies are shipped assembled along with the railsweeps. Unlike the front sweeps, they should be parallel with the rail.

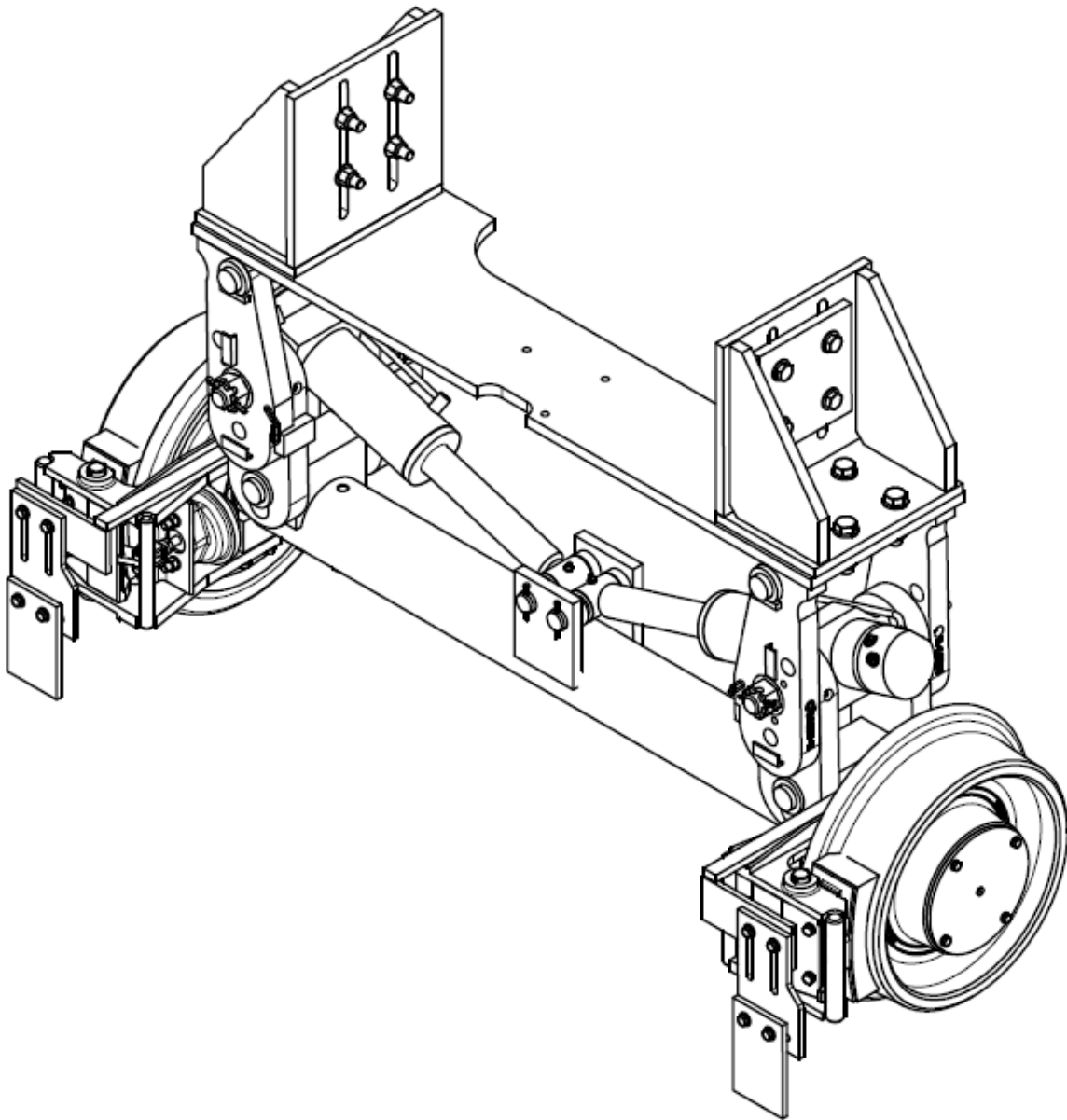


Figure 6-2



## BRAKES

### Plumbing Installation

An air toggle valve will need to be installed in the instrument panel of the vehicle. This valve disconnects the railgear brake system when not in use.

On the front valve plate assembly and rear frame bracket, a relay valve will be located. The control line feeding this relay valve comes from the control valve described above. The supply line to this relay valve comes from the check valve screwed into the air reservoir. There is a ball valve and a pressure regulator inline between the check valve and relay valve. The ball valve will disconnect the railgear brake system from the vehicle air system regardless of the position of the air toggle valve. The pressure regulator will allow adjustment of the front to rear bias, so that both axles will brake evenly and not allow one axle to lock and slide.

The railgear Cobra Brake Assembly brake chambers are connected to the delivery ports on the railgear air relay valve.

Install airlines and valves as shown in the **Air Brake Schematic**. Make certain that the front air brake pressure regulator is set to 75 PSI and the rear air brake pressure regulator is set to 30 PSI.

### Testing

Operate the vehicle on a test track. With the air toggle valve in the "on" position and the ball valves open, check that:

- (1) When the vehicle brake pedal is depressed, the railgear brake clamps the rail wheel enough to slow its rotation but not enough to stop its rotation. The rail wheels should not be allowed to lock up.
- (2) That the brakes release properly when the pedal is released.

If the brakes do not function properly, contact a service representative at G&B Specialties.

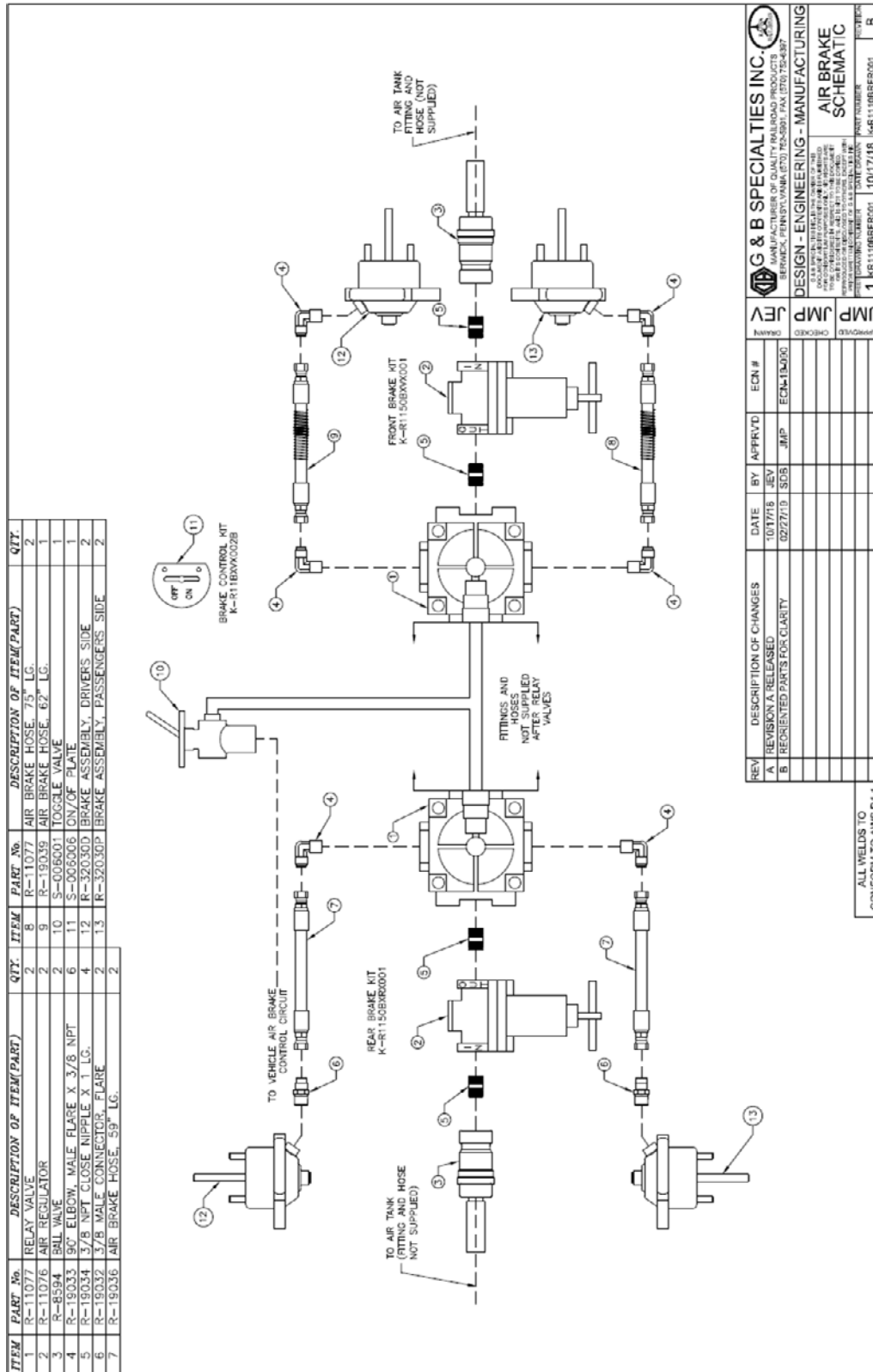


Figure 6-3

## Brake Installation

Table 6-1 Kit Components

<b>Rafna Industries Ltd.</b>				27-Feb-19
<b>HR K-R1150BXR001 AIR BRAKE KIT, REAR (R1150)</b>				Rev. C
Part Number	Description	# Req.	Remarks	Check
R-11076A	Operating Valve Assembly	1		
R-19039	Air Brake Hose, 62"	2		
R-19032	3/8 Male Connector, Flare	2		
R-32030D	Brake Assembly, Drivers Side	1		
R-32030P	Brake Assembly, Passengers Side	1		
R-16593D	Rail Sweep Assembly, Rear Driver's	1		
R-16593P	Rail Sweep Assembly, Rear Passenger's	1		
990403-050-02	Washer, 1/2" Lock Z/Y	8		
990727-200-22	Screw, 1/2" x 1 3/4" Gr. 8 Z/Y	4	R-990KIT-433	
990727-150-22	Screw, 1/2" x 1-1/4" Gr. 8 Z/Y	4		

On the Front Valve plate assembly, and rear frame bracket, relay valves will be located. The control line feeding these relay valves comes from the air toggle valve described above. The supply lines to the relay valves comes from a check valve screwed into the air reservoir. There is a ball valve and a pressure regulator inline between the check valves and each relay valve. The ball valve will disconnect the railgear brake system from the vehicle air system regardless of the position of the air toggle valve. The pressure regulator will allow adjustment of the front to rear bias, so that both axles will brake evenly and not allow one axle to lock and slide.

The railgear Cobra Brake Assembly brake chambers are connected to the delivery ports on the railgear air relay valves.

Install airlines and valves as shown in the above Air Brake Schematic. Make certain that the front air brake pressure regulator is set to 75 PSI.

It is the responsibility of the installer to supply the required air to the in-cab control valve and from the in-cab control valve to the relay valve. The hoses, fittings etc. required for this connection are not included in this kit.

See pages 66, 67, and 93, for Assembly and Parts.

1. Place brake assemblies on stub axle and bolt them fast.
2. Install railsweeps, using the longer hardware on the side of the horizontal brake assembly.
3. Proceed to plumb the brakes.
4. Adjust and test brakes as outlined.
5. Loosen the sweep plate hardware, and lower or raise the rubber sweep as required so the bottom of the sweep is just above the top of the rail head.
6. Adjust and test brakes as outlined on pg. 32.

**AIR LOCK OPTION**

The following procedure details the installation of the rear air lock kit.

**Table 6-2 Kit Components**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	R-26022	Pneumatic Locking Plate
2	2	R-26024	Pin Mounting Bracket
3	2	R-26023	Pneumatic Cylinder
4	4	R-26021	Threaded Rod
5	4	R-26011	Locking Cylinder
6	4	R-990KIT-432	Washer, 3/8" Flat
7	4		Nut, 3/8 Gr.8 Nylock Nut Z/Y
8	12		Hex Nut, 1/2" Jam Z/Y
9	4		Washer, Lock 5/16
10	4		Hex Nut, 5/16"

1. Fasten the two locking cylinders (Item 5, Fig 6-4) to the pin mounting bracket (Item 2, Fig 6-4) using two 3/8" flat washers and two 3/8" nylock nuts (Items 6 & 7, Fig 6-4) as shown in Figure 6-4.
2. Thread the threaded rods (Item 4, Fig 6-4) into one 1/2" jam nut (Item 8, Fig.6-4) until there is 3/4" of thread sticking out. Thread the guide rods into the drilled holes, making sure only 3/4" of thread is in the holes, as shown in Figure 6-4.
3. Fasten the Pneumatic Locking plate (Item 1, Fig 6-4) to the Pneumatic cylinder (Item 3, Fig 6-4) as shown in Figure 6-4.
4. Fully extend the Pneumatic cylinder and fasten the rod end of the cylinder to the pin mounting bracket using two 5/16" lock washers and two 5/16" jam nuts (Items 9 & 10, Fig 6-4) as shown in Figure 6-4.
5. Place the pin mounting bracket onto the threaded rods and thread two 1/2" hex jam nuts (Item 8, Fig 6-4) onto the threaded rods as shown in Figure 6-4.
6. Push the assembly down the guide rods until the pin plate hits the lower link arm spacers and fasten the tie plate with the two remaining jam nuts and tighten the 1/2" jam nuts.
7. Make sure that the cylinder rod end does not contact the arm when assembled. Adjust the pin plate on the cylinder rod end if there is contact.
8. Repeat same procedure for the opposite side.



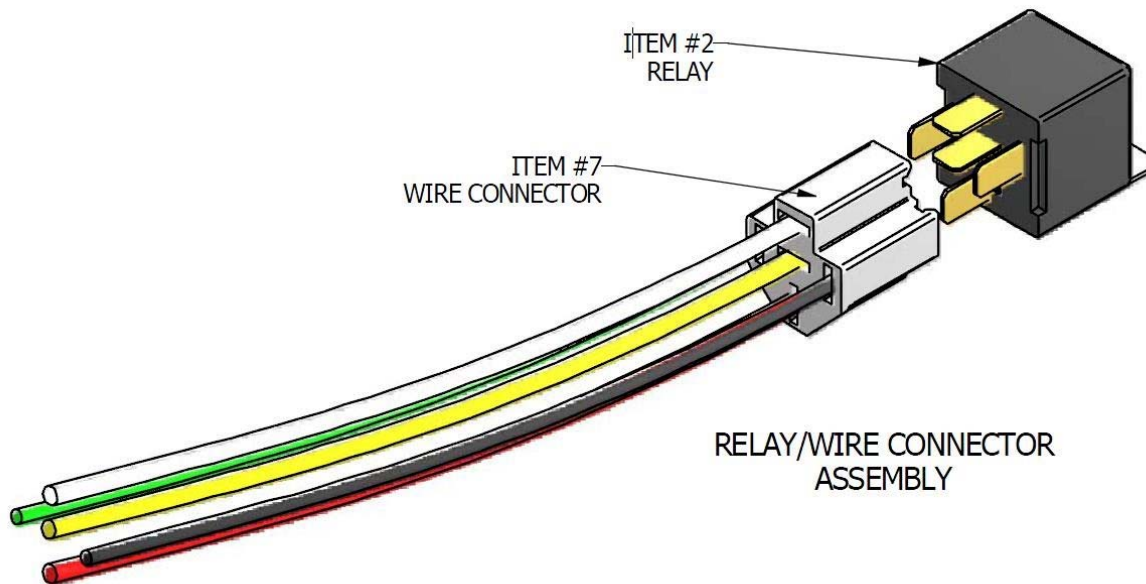


**DUAL AXLE SHUNT**

When using a dual axle shunt kit, it should be applied to both the front and rear axle. This shunt kit will provide continuity between the right and left rail wheels on each axle. It should be noted; the kit will not create continuity between the front and rear rail gear axles.

**Table 6-3 Dual Axle Shunt Components**

Item	Qty	Part Number	Description
1	1	CO-106	Pilot Switch Red
2	2	CO-124	Relay, 30 Amp Dual 87 Terminal
3	1	CO-071	Circuit Breaker, 10 Amp
4	2	R-10422	Wire Connector For Relay
5	4	R-16320	Insulator, Axle Bolt
6	4	R-16319	Washer, 1/4" Insulation
7	4	R-16316	Ring Terminal, 1/4" 16 Ga
8	4	990722-100-22	Screw, 1/4" X 1" (Use On R-1110)
9	4	990722-125-22	Screw, 1/4" X 1 1/4" (Used On R-1150)
10	1	R-16321	Dash Shunt Sticker
11	12	R-16317	Quick Disconnect Term., Ins. 1/4"
12	4	R-16318	Black Wire, 16 Ga 100 Ft.



## Shunt Installation

1. Find an ignition activated power supply on your vehicle, and install the provided fuse holder, fuse, and pilot lighted switch.
2. Mount the provided relays in a suitable location.
3. Connect the power wire from the red pilot switch, to both relays at terminal #85, via the black wires on the provided connector assemblies, and solder and heat shrink.
4. Secure the green wires coming from the #86 terminals to a suitable ground. The front and rear relays do not need to be connected to the same spot on the vehicle, but there should be continuity between grounding points.
5. Using a 12 gauge THHN stranded jumper wire, connect the Shunt/Sweep Assembly, from the #10 stud welded on shunt/sweep assembly, to the rail axle as per the WRP Shunt Connection Wiring Diagram, (K-R1115SHUNT001), provided in this manual. Be sure to connect both axles.
6. Run the white wire, coming from terminal #87 of the front relay, to the front passenger's side ring terminal, as per the drawing provided. Solder and heat shrink all connections.
7. Run the red wire, coming from terminal #30 of the front relay, to the driver's side axle ring terminal, as per the drawing provided. Solder and heat shrink all connections.
8. Do not use the yellow wire, coming from terminal #87 on the front relay (not shown in drawing). Instead wire nut or heat shrink the end of the wire to prevent it from making contact with the vehicle or railgear. The Yellow wire WILL be used on the rear relay, while the rear white wire (also not shown) will be masked off.
9. Run the yellow wire, coming from terminal #87 of the rear relay, to the driver's side rear axle ring terminal as per the drawing provided. Solder and heat shrink all connections.
10. Run the red wire, coming from terminal #30 of the rear relay, to the rear passenger's side axle ring terminal as per the drawing provided. Solder and heat shrink all connections.
11. This completes the installation of the dual axle shunt kit. When the interior switch is turned on it will pull in the relays and provide continuity between the front axle wheels and the rear axle wheels. It will not provide continuity between the front and rear rail wheels.



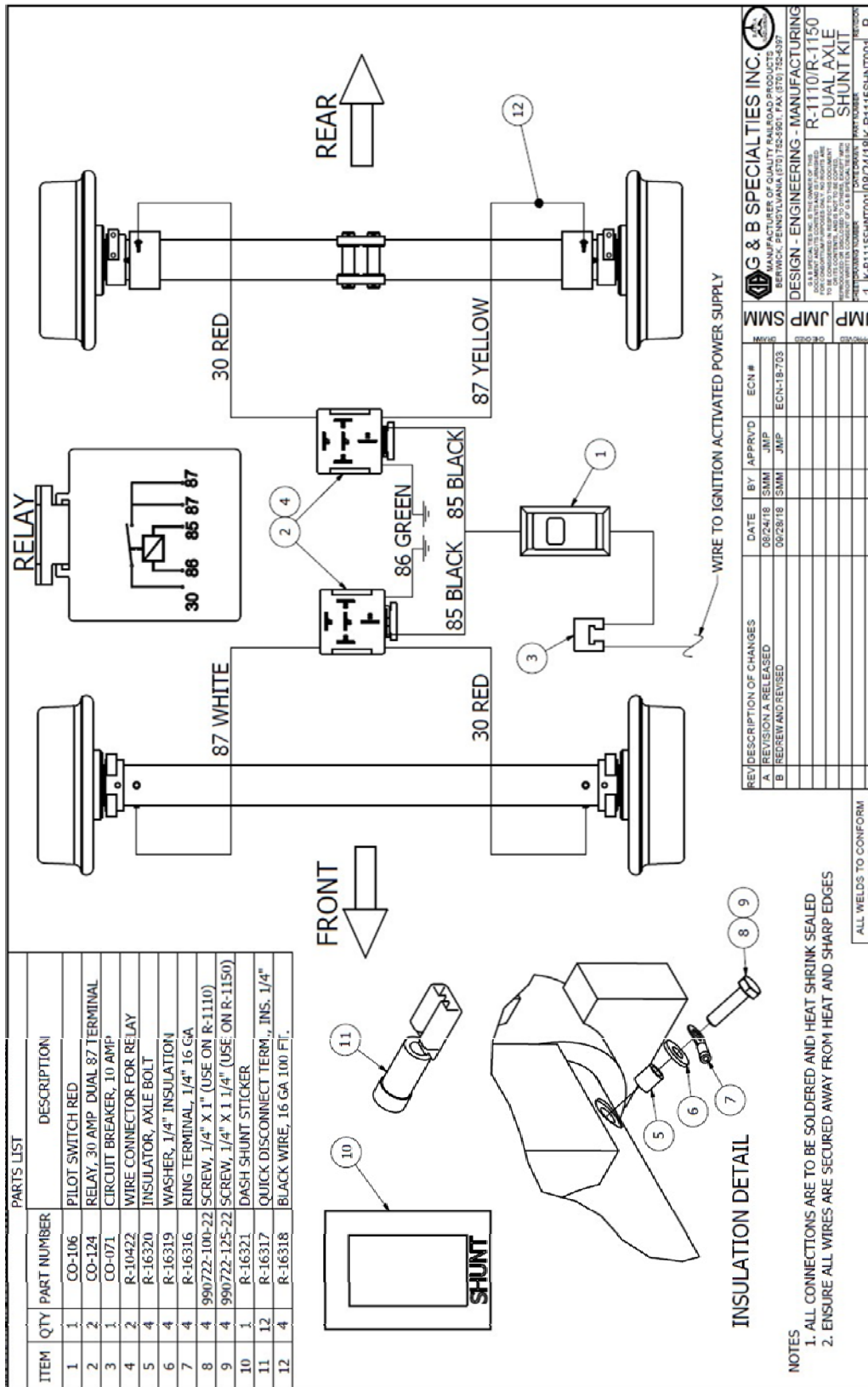


Figure 6-6 Dual Axle Shunt

THIS PAGE INTENTIONALLY LEFT BLANK

## 7.0 FRONT TO REAR ALIGNMENT

### FINAL ALIGNMENT

These final adjustments are necessary to align the front railgear to the rear railgear (which has already been aligned with the rear truck axle). The alignment of the railgear to the truck will affect the way the vehicle tracks down the rail. If the vehicle is not properly aligned the railgear may pull to one side, have excessive wheel flange wear and be prone to derailment. Four measurements need to be taken to do this final alignment and should be taken with the railgear fully deployed in the rail position

1. The distance from the Front Rail Wheel to the Rear Rail Wheel on each side in figure 7-1, distance "E" must equal to "F" (within 1/8").
2. The diagonals from the Front Rail Wheel to the Rear Rail Wheel on the opposite side.

In figure 7-1, distance "G" must be equal to "H" (within 1/4")

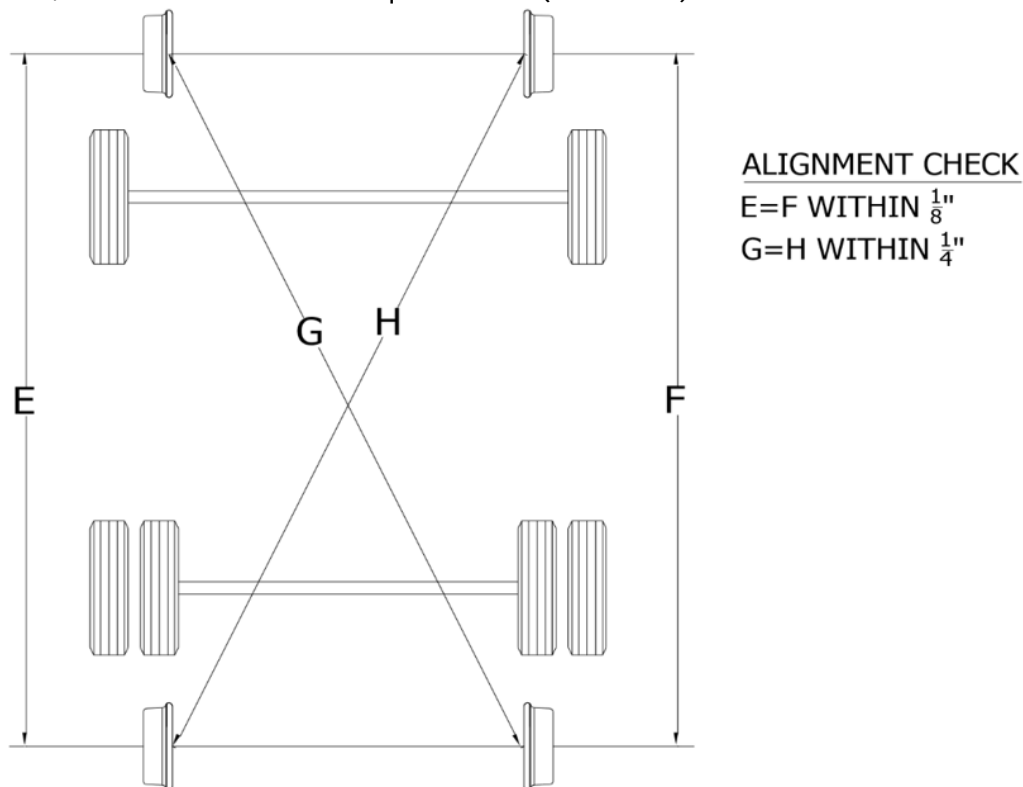


FIGURE 7-1

After the front and rear railgear have been properly aligned, complete structural welds may be applied at the locations that were previously only tacked: This includes on the front railgear, between the frame mounting brackets and frame (or frame extensions, if required), and on the front railgear between the axle tube and the lower portion of the clamp assembly.

## 8.0 FINAL CHECKLIST

- Rail test the vehicle to check for good traction and braking. An industrial siding, or some authorized track time will be required. Check that the rail wheels do not lock up and slide.
- Adjust the railgear for proper height as required.
- Cross check the rear railgear to the vehicle rear axle again.
- Weld the mounting plate to the rear frame mounting plate with two 2" welds per side.
- Welding the plates must be done, do not forget it.
- Double-check that all welds, nuts, cotter pins and fasteners are in place and installed properly.
- Route and secure all hoses and wires, making sure that there will be sufficient clearance from pinch points and exhaust.
- Check the Hydraulic reservoir for proper fill level.
- Raise the railgear to the road position and install locking pins.
- Apply the decal kit as shown on page 102, 103, and 104.

### INSTALLATION CHECK LIST

#### Check tire pressures

#### Front Alignment

- Front mounting Pin height: 25 ½"
- Rear mounting Pin height: 12 ¾"

#### Rear Alignment Single Axle Tandem Axle

- Tire rail Wheel Center 15 ¼" 11 ¼"
- Minimum truck frame extension 22 ¼" 17 ¼"
- Calculate Spacer thickness (with 6" spacer) = (6.0" -GAP) x .6

#### Check overall measurements

- Rear truck axle to rear railgear (straight) A=B (within 1/16")
- Rear truck axle to rear railgear (diagonal) C=B (within 1/8")
- Front Rail Gear to rear railgear (straight) E=F (within 1/8")
- Front Rail Gear to rear railgear (diagonal) G=H (within ¼")

## 9.0 INSTALLATION SUMMARY

### Initial Instructions

- Provide adequate work area (floor, lighting and space)
- Inspect truck condition: tire pressure and condition, frame and suspension bushings on truck, alignment and transverse torque rods
- Fabricate front and rear installation rails
- Drive truck onto installation rails

### Hydraulic System Connection

- For new hydraulic system: Install pump, PTO, tank & main hydraulic lines to Front and Rear Valves.
- For existing hydraulic systems: Install diverter valve, main relief valve and main hydraulic lines to Front and Rear valves.

### Rear Railgear Installation

- Location of Rear Railgear
- Recheck tire pressure
- Measure for location with single axle truck and tandem axle truck

### Spacer installation with Front Railgear on rails in track position

- Place 6" spacer between frame and mounting bracket then lower rail guide to track position ▪ Calculate Spacer thickness (using formula)
- Raise railgear to road position and remove temporary spacer
- Install permanent spacer and tack in position
- Lower railgear to track position and check Tire cup

### Square Railgear with Truck Frame

- Primary: Measure Rear railgear to truck axle (both sides)
- Secondary: Measure diagonal from rail wheel axle to truck axle
- Check Rail Guide clearance including lock pins 2" clearance minimum

### Final Rear Installation

- Drill holes for mounting plate, install and tighten bolts
- Tack weld mounting plate and spacers to rear mounting plate

### Front to Rear Alignment

- Measure Front to Rear Rail Wheels:  $E=F$  (within  $1/8"$ )
- Measure Front to Back diagonal:  $G=H$  (within  $1/4"$ )
- If necessary, add shims to Front railgear and tack in place
- Upon completion of alignment, weld:
- Frame mounting brackets to frame (or frame extensions)

#### Rail Sweeps

- Rail Sweep components
- Rail Sweep installation

#### Brakes

- Brake Components
- Plumbing Installation
- Testing

#### Air-Lock

- Air-Lock Components
- Air-Lock Installation

#### Final Checklist

- Rail test truck for traction and braking
- Re-adjust railgear height as required
- Cross check rear rail wheel to truck rear axle
- Weld mounting plate to mounting bracket
- Check welds, fasteners and cotter pins. Tie-strap hoses and wires.
- Top off hydraulic fluid
- Touch-up Paint
- Raise Front & Rear railgear and install locking pins
- Apply Decal Kit

## 10.0 STEERING WHEEL LOCK

All Vehicles must be using a steering wheel lock while on the rail.

Telescoping steering wheel

If steering wheel is telescoping, make sure that the steering wheel is in the minimum position or in a position such that the steering wheel lock can be easily applied.

### INSTALLATION

Table 10.1 Steering Wheel Lock Kit Components

Part Number	Description	Qty
S-001050	Steering Wheel Lock	1
S-001040	Steering Wheel Lock Decal	1
R-16610	Speed Decal	1

1. Ensure the front wheels are pointing straight ahead and the steering wheel is centered before installation.
2. The steering wheel lock consists of one steering wheel lock patch with RAFNA logo and three adhesive back strips.
3. Without removing the protective backing, position one adhesive back strip on top of the steering column cover and another on the steering wheel. The strips should be close enough together so that the patch will cover both when the steering wheel lock is engaged. Ensure that the adhesive back strips do not interfere with any devices, such as the hazard light button on the steering column cover or the air bag cover on the steering wheel. Modify the adhesive back strips as required to clear any obstructions. Mark their locations on the steering column cover and the steering wheel.
4. Without removing the protective backing, position the third adhesive back strip in a convenient location on the dash (so that it does not interfere with the view and/or operation of the vehicle). This adhesive back strip will serve as a holder when the steering wheel lock is disengaged. Mark the location.
5. Scuff the three areas previously marked with medium / fine sand paper. The areas should be free of dust, dirt, and any oily residue. Thoroughly clean the areas with denatured alcohol or a similar non-oil-based degreaser that will not react with the plastic. Let the degreaser dry.
6. Take care when placing the adhesive back strips; once they are applied, they should not be removed. Do not touch the adhesive with your fingers. Removing the adhesive back strips once installed or touching the adhesive may cause poor adhesion.

7. Peel off the protective backing from the adhesive back strips. Firmly press them into place as previously located. Do not disturb the adhesive back strips for 24 to 30 hours to allow the adhesive to fully cure.
8. Store the steering wheel lock patch on the adhesive back strip located on the dash.
9. Stick the steering wheel lock decal in a highly visible spot on the dashboard.
10. Stick the maximum speed decal in a highly visible spot, within clear sight of the operator, on the dashboard.





**R-16610 THIS VEHICLE IS EQUIPPED WITH  
A RAIL CONVERSION UNIT  
RAFNA MODEL  
R-1110/R-1150  
30 MPH / 48 KM/H**

**RECOMMENDED MAXIMUM SPEED ON RAIL**  
Railway company rules governing rail travel must be observed at all times.

## OPERATION

The following procedure details the steering wheel lock operation.

1. Placing The Vehicle On The Track:
  - a) Engage the steering wheel lock after both the front and rear railgear are fully deployed and prior to rail travel.
  - b) Turn the steering wheel until the front tires point straight ahead.
  - c) Position the patch portion of the steering wheel lock onto the adhesive back strips affixed to the steering wheel and steering column cover. Press firmly into place. When installed on the adhesive back strips the patch should restrict the steering wheel from turning.
2. Traveling On Rail:
  - a) The steering wheel lock must be engaged at all times while on rail.
3. Removing The Vehicle From The Track:
  - a) Disengage the steering wheel lock after both the front and rear Railgear are fully retracted in the road position and prior to road travel.
  - b) Firmly grasp the steering wheel lock patch's d-ring and peel it off the adhesive back strips.
  - c) Store the patch on the adhesive back strip which serves as the holder located on the dash.

## SERVICE OF STEERING WHEEL LOCK

Take care when removing the Patch. Due to certain plasticizers in the steering wheel steering column cover and dash, along with the vehicle's operating environment, the adhesive back strips may peel off and be removed. If the adhesive back strips do peel off, replace the strips with new ones at the earliest convenience.

THIS PAGE INTENTIONALLY LEFT BLANK

## 11.0 RAILGEAR OPERATION AND MAINTENANCE

### RAILGEAR OPERATION

Check to be sure that the railgear is in good operating condition. Inspections should include:

All air and hydraulic fittings	All air and hydraulic hoses
Brake operation	Railgear parts for damage
Rail wheel wear	Hydraulic fluid level

#### Engage Front Railgear

1. Drive truck into position to line up front Railgear with the rail.
2. Engage trucks parking brake to prevent the truck from rolling.
3. Engage PTO or electric pump.
4. Remove locking pins.
5. Engage front Railgear.
6. Stow the pins in locking hole.

#### Engage Rear Railgear

1. If the Railgear has air brakes, turn the valve on.
2. Engage the PTO or electric pump.
3. Remove the locking pins.
4. Engage the Railgear.
5. When the Railgear is fully extended, replace the locking pins.

#### On Track

- ✦ Do not exceed **30 MPH** while on track. All railroad rules should be observed
- ✦ Be aware that some railgear is designed so that it does not operate crossing circuits
- ✦ Reduce speed at crossings, curves, branch lines, switches and frogs
- ✦ Traction is reduced on track; tire damage may result if the wheels are allowed to spin
- ✦ Braking distance is increased while on track. Do not slide the truck tires or wheels on rail
- ✦ Do not exceed rated load of equipment

#### Removing Railgear from Track

1. Be sure that the PTO is engaged
2. Engage the truck parking brake
3. Leave the truck running and in neutral
4. Remove Locking Pins
5. Lift both sets of railgear
6. Both sets of railgear must have the locking pins reinstalled
7. Disengage the switch that controls the railgear Air Brakes
8. Disengage the truck PTO before moving truck

## RAILGEAR MAINTENANCE

If your hi-rail vehicle is heavily used or operated under extreme conditions, the inspections listed below may need to be performed more frequently than stated.

### Daily

- Visually inspect for hydraulic fluid leaks
- Visually inspect all hoses for wear or damage
- Visually inspect railgear units for damaged or worn parts
- Check and make sure that all threaded fasteners are secured
- Inspect wheel flanges for excessive wear
- Ensure that the railgear unit hydraulic system and brakes (if equipped) are in good operating condition

### Weekly

Perform standard daily inspection points as listed above, and then check the following:

- Grease and lubricate all grease fittings on front and rear railgear and guide wheels
- Check level of hydraulic oil and all other fluids.
- Check air pressure in tires and inflate to proper inflation pressure (if required).

### Bi-annually

Perform standard daily and weekly inspection points as listed above, and then check the following:

- Remove the hubcaps from the rail wheels and inspect for deterioration or loss of wheel bearing grease
- Clean the strainer / filter in the hydraulic power unit tank
- Rail test for proper traction and adjust as needed
- Rail test for proper braking and adjust as needed
- Check Railgear alignment

## LUBRICATION

Grease fittings are provided at all railgear lubrication points. The recommended lubricant for all lubrication points on this railgear is Esso Lonax EP2 grease or equivalent. In cold weather, -20F or colder, Shell Darina XL102 or equivalent may be used.









PARTS LIST		DESCRIPTION	
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	SEE TAB	SEE TAB
2	1	R-16586	1150 REAR AXLE ASSEMBLY

R-1110-50 OPTIONS			
ASSEMBLY NUMBER	LOCK-UP	PART NUMBER	PART DESCRIPTION
R-1110-50	MANUAL PINS	R-1110R-UPPER	R-1110/1150 REAR UPPER ASSY
R-1110-50AIR	AIR LOCK	R-1110R-UPAIR	R-1110/1150 REAR UPPER-AIR

**NOTES:**

1. DRILL TWO 1/8" HOLES SPACED AT 2-5/16" APART FOR SERIAL TAG.
2. HOSES NOT SHOWN FOR CLARITY
3. ALL INSTALLED HOSES AND FITTINGS TO BE CAPPED/PLUGGED PRIOR TO SHIPPING

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	06/24/18	JEV	JMP	ECN-18-077
B	UPDATED HARDWARE LENGTH IN ITEM 1	06/20/18	SMM	JMP	ECN-18-063
C	ADDED NOTE 3 AND DRAWING UPDATED	06/20/18	JEV	JMP	ECN-18-810
D	UPDATED MODEL	10/16/18	JEV	JMP	ECN-18-810
E	ADDED NOTE 3 TO DRAWING	11/6/18	SMM	JMP	ECN-18-803
F	UPDATED VIEW TO SHOW HOSE CLIPS	11/12/18	SMM	JMP	ECN-18-835

ALL WELDS TO CONFORM TO AWS D1.1		DATE: 08/24/18		REV: 1		PART NUMBER: R111050		DESCRIPTION: SEE TAB	
----------------------------------	--	----------------	--	--------	--	----------------------	--	----------------------	--

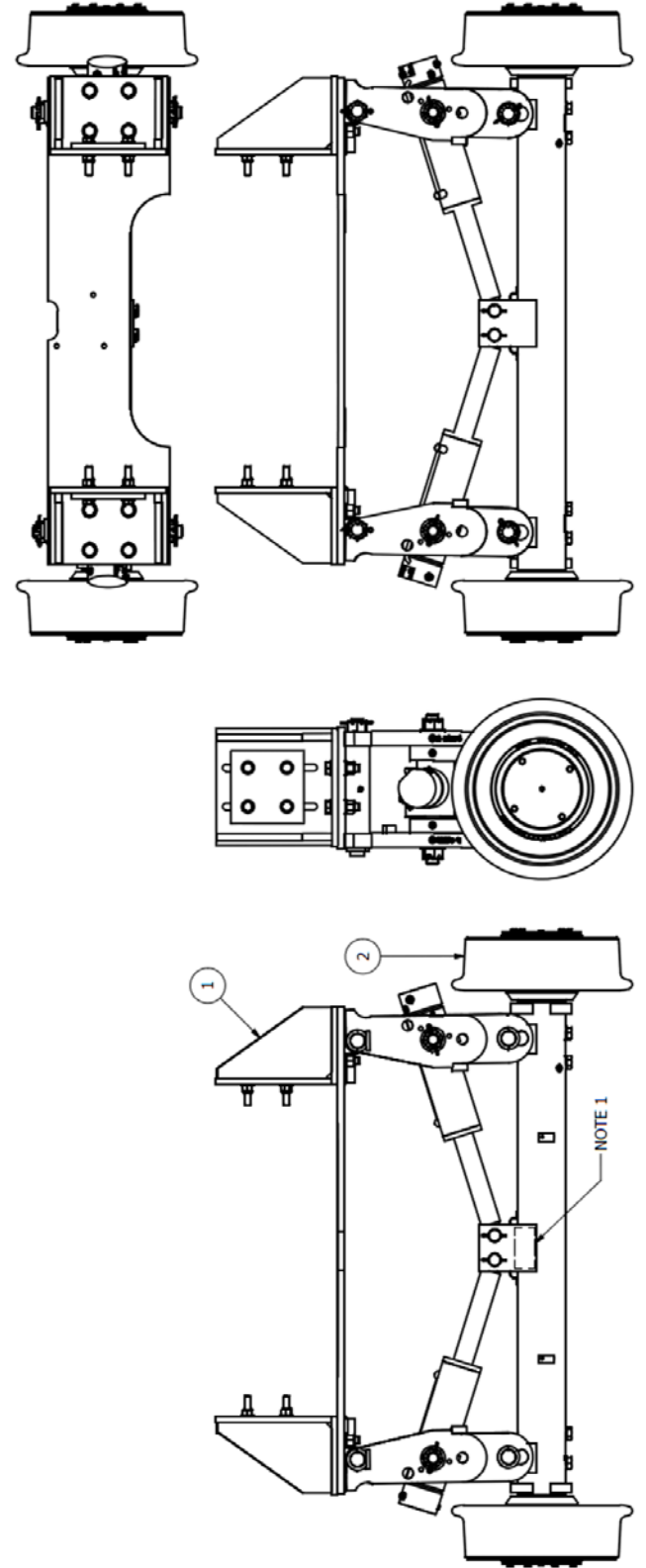
  

<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397		<b>DESIGN - ENGINEERING - MANUFACTURING</b> R-1150 REAR ASSEMBLY INS OPTIONS	
--------------------------------------------------------------------------------------------------------------------------------------------	--	---------------------------------------------------------------------------------	--

PARTS LIST		R-1110-55 OPTIONS	
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	SEE TAB	SEE TAB
2	1	R-16586NON	1150 REAR AXLE ASSEMBLY

ASSEMBLY NUMBER	LOCK-UP	PART NUMBER	PART DESCRIPTION
R-1110-55	MANUAL PINS	R-1110R-UPPER	R-1110/1150 REAR UPPER ASSY
R-1110-55AIR	AIR LOCK	R-1110R-UPAIR	R-1110/1150 REAR UPPER-AIR

**NOTES:**

1. DRILL TWO 1/8" HOLES SPACED AT 2-5/16" APART FOR SERIAL TAG.
2. HOSES NOT SHOWN FOR CLARITY
3. ALL INSTALLED HOSES AND FITTINGS TO BE CAPPED/PLUGGED PRIOR TO SHIPPING

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	08/24/18	JEV		
B	UPDATED HARDWARE LENGTH IN ITEM 1	09/20/18	SMW	JMP	ECN-18-679
C	ADDED NOTE 3 AND DRAWING UPDATED	09/26/18	JEV	JMP	ECN-18-686
D	UPDATED MODEL	10/16/18	JEV	JMP	ECN-18-812
E	ADDED NOTE 3 TO DRAWING	11/06/18	SMW	JMP	ECN-18-896
F	UPDATED VIEW TO SHOW HOSE CLIPS	11/12/18	SMW	JMP	ECN-18-937

REV	DESCRIPTION	DATE	BY	APPRVD	ECN #
JMP	MANUFACTURER OF QUALITY RAILROAD PRODUCTS				
JMP	DESIGN - ENGINEERING - MANUFACTURING				
JMP	R-1150 REAR ASSEMBLY NON INS OPTIONS				
JMP	08/24/18				

ALL WELDS TO CONFORM TO AWS D1.1



PARTS LIST				PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	R-16533	PIN ASSEMBLY	14	8	990312-125-02	NUT, HEX, SLOTTED, 1 1/4-7 UNC
2	1	R-16558	UPPER REAR BACK PASS LINK	15	8	990511-250-02	COTTER PIN, 1/4" X 2-1/2" Z/Y
3	1	R-16536	UPPER REAR FRONT PASS LINK	16	16	990600-075-002	WASHER, 3/4" FLAT NARROW
4	1	R-16559	UPPER REAR BACK DRIVER LINK	17	2	R-11198	SUPPORT PLATE
5	1	R-16555	UPPER REAR FRONT DRIVER LINK	18	8	990729-350-12	5/8-11 GR 5 HEX CAP Z/Y ZINC YELLOW
6	4	R-16534	LINK, LOWER (SLOTTED)	19	8	990316-062-12	NUT, 5/8" NYLOCK GR 5 Z/C
7	2	R-16550	PIN ASSEMBLY	20	4	990603-125-002	WASHER, 1-1/4" FLAT WASHER NARROW TYPE B.
8	1	R-16587L	REAR CYLINDER LEFT HAND	21	8	990316-075-22	NUT, 3/4" NYLOCK
9	1	R-16587R	REAR CYLINDER RIGHT HAND	22	12	990900-009	1/8 NPT ST Zerk
10	1	R-16588	UPPER REAR PLATE ASSY	23	2	R-16549	PIVOT WASHER
11	2	R-16582	UPPER MOUNTING BRKT REAR UNIT	24	4	R-16597	3/16 ORB MALE TO 1/4 JIC MALE FITTING
12	8	990731-300-22	3/4-10 UNC GR 8 HEX Z/Y ZINC YELLOW	25	1	H-990KIT-027	HYDRAULIC HOSE KIT
13	16	990600-062-002	WASHER, 5/8" FLAT NARROW				

REV	DESCRIPTION OF CHANGES	DATE	BY	APPROV'D	ECN #
A	REVISION A RELEASED	08/24/18	JEV	JMP	ECN-18-043
B	REVISED CYLINDER PIN AND COTTER	09/18/18	SMI	JMP	ECN-18-043
C	UPDATED MOUNTING HARDWARE	11/01/18	SMI	JMP	ECN-18-043

NOTES:  
 1. HOSES NOT SHOWN FOR CLARITY  
 2. ASSEMBLE HOSES TO FITTINGS AND ZIP TIE TO HYDRAULIC RETURN PRIOR TO ASSY. OF RAILGEAR

REV	DESCRIPTION OF CHANGES	DATE	BY	APPROV'D	ECN #
1	DESIGN - ENGINEERING - MANUFACTURING	08/24/18	JMP	JMP	R-1110/1150
1	UPPER REAR ASSEMBLY	08/24/18	JMP	JMP	R-1110/1150

PARTS LIST				PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	R-16533	PIN ASSEMBLY	14	8	990312-125-02	NUT, HEX, SLOTTED, 1 1/4-7 UNC
2	1	R-16608	UPPER REAR BACK PASS LINK	15	8	990511-250-02	COTTER PIN, 1/4" X 2-1/2" ZY
3	1	R-16556	UPPER REAR FRONT PASS LINK	16	16	990600-075-002	WASHER, 3/4" FLAT NARROW
4	1	R-16609	UPPER REAR BACK DRIVER LINK	17	2	R-11198	SUPPORT PLATE
5	1	R-16555	UPPER REAR FRONT DRIVER LINK	18	8	990729-350-12	5/8-11 GR 5 HEX CAP ZY ZINC YELLOW
6	4	R-16534	LINK, LOWER (SLOTTED)	19	8	990316-062-12	NUT, 5/8" NYLOCK GR 5 Z/C
7	2	R-16550	PIN ASSEMBLY	20	4	990603-125-002	WASHER, 1-1/4" FLAT WASHER NARROW TYPE, B
8	1	R-16587L	REAR CYLINDER LEFT HAND	21	8	990316-075-22	NUT, 3/4" NYLOCK
9	1	R-16587R	REAR CYLINDER RIGHT HAND	22	12	990900-009	1/8 NPT ST Zerkl
10	1	R-16588	UPPER REAR PLATE ASSY	23	2	R-16549	PIVOT WASHER
11	2	R-16582	UPPER MINTING BRKT REAR UNIT	24	4	R-16597	3/16 ORB MALE TO 1/4 JIC MALE FITTING
12	8	990731-300-22	3/4-10 UNC GR 8 HEX ZY ZINC YELLOW	25	1	H-990KIT-027	HYDRAULIC HOSE KIT
13	16	990600-062-002	WASHER, 5/8" FLAT NARROW				

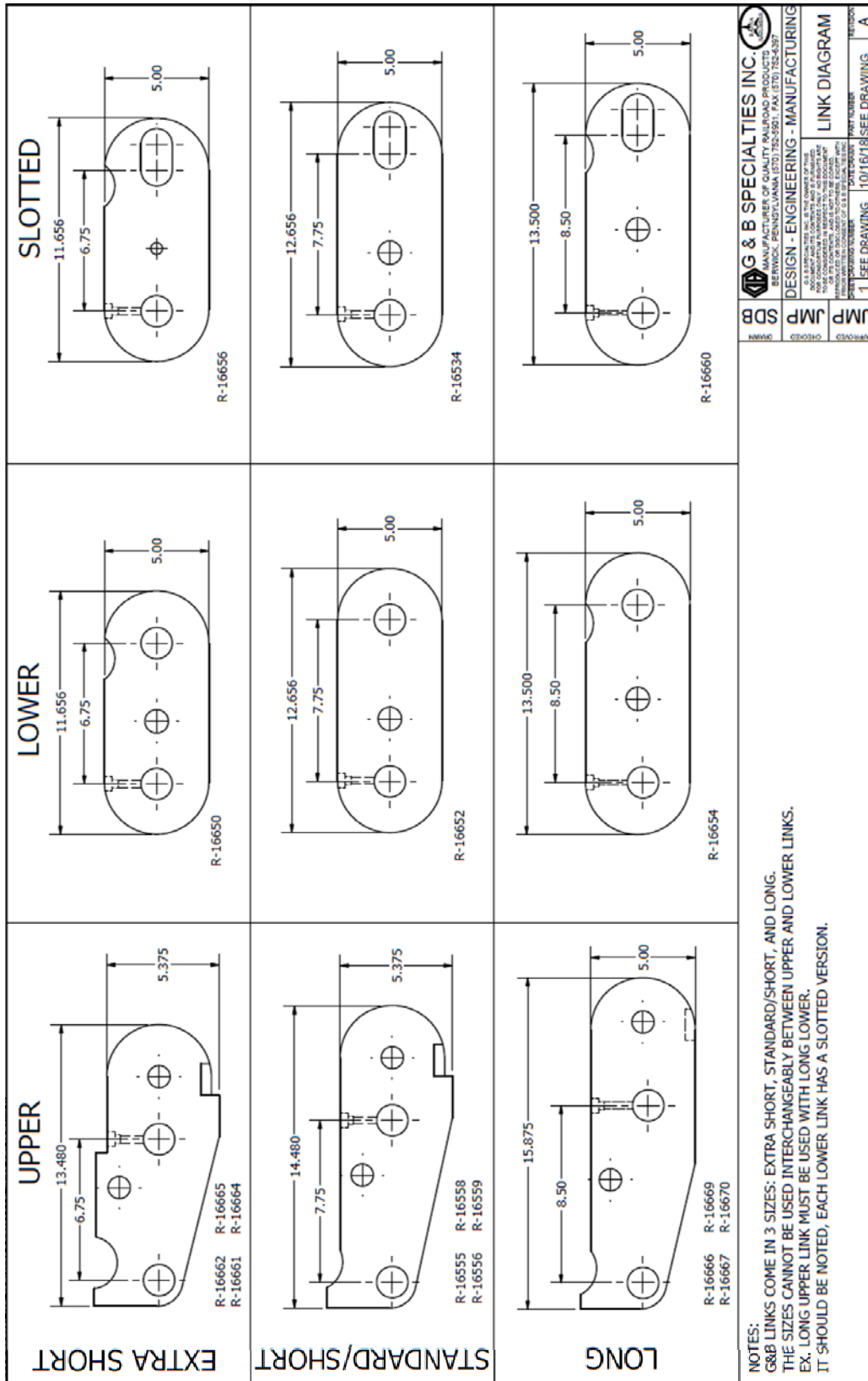
REV	DESCRIPTION OF CHANGES	DATE	BY	APPROVD	ECN #
A	REVISION A RELEASED	08/24/18	JEV	JMP	ECN-18-464
B	REMOVED CYLINDERS PIN AND COTTER	09/18/18	SMN	JMP	ECN-18-465
C	UPDATED MOUNTING HARDWARE	11/01/18	SMN	JMP	ECN-18-466

NOTES:  
 1. HOSES NOT SHOWN FOR CLARITY  
 2. ASSEMBLE HOSES TO FITTINGS AND ZIP TIE TO HYDRAULIC RETURN PRIOR TO ASSY. OF RAILGEAR

REV	DESCRIPTION	DATE	BY	APPROVD	ECN #
JMP	UPPER AIR ASSY	08/24/18	R1110RUPAIR	JMP	ECN-18-464
JMP	UPPER AIR ASSY	08/24/18	R1110RUPAIR	JMP	ECN-18-465
JMP	UPPER AIR ASSY	08/24/18	R1110RUPAIR	JMP	ECN-18-466





PARTS LIST		R-16586 OPTIONS	
ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-16547	WELDMENT, AXLE	1
2	R-16591	STUB AXLE ASSY. REAR	2
3	SEE TAB	SEE TAB	2
4	990731-500-22	SCREW, 0.750 X 5.000 GR 8 HEX Z/Y	4
5	990403-075-02	WASHER, 0.750 X-DUTY LOCK Z/Y	4
6	990900-007	FITTING, 0.125 45 DEG PTF	2
7	R-16551	PIN, CYLINDER	2
8	990509-200-02	COTTER PIN, 3/16" X 2" Z/Y	4

ASSEMBLY NUMBER	INSULATION	PART NUMBER	PART DESCRIPTION
R-16586	INS	R-16578	HHCS 1/4-20 X 1 1/4" NYLON
R-16586NON	NON INS	990722-125-12	HHCS 1/4-20 X 1 1/4"

NO WELDING ON AXLE TUBE  
OUTBOARD OF SHUNT BOLT

TORQUE BOLTS TO 200 FT-LBS

**NOTES:**  
1. INSTALL ALL INSULATORS ON STUB AXLE BEFORE PRESSING INTO AXLE TUBE  
2. CHECK FOR ZERO CONTINUITY AFTER ASSEMBLY

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A. REVISION A RELEASED	09/18/17	SMM		
B. REVISED BILL OF MATERIAL	10/31/17	JEV	JMP	ECN-17-254
C. CHANGED BORDER	06/07/18	JEV	JMP	ECN-18-451
D. ADDED CYLINDER PIN AND COTTER	06/19/18	SMM	JMP	ECN-18-455
E. REMOVED NOTE ABOUT SILICONE	10/17/19	SDG	JMP	ECN-18-814
F. UPDATED VIEW TO SHOW HOSE CLIPS	11/12/18	SMM	JMP	ECN-18-832

REV	DATE	BY	APPRVD	ECN #
SMM				
JMP				
JMP				
JMP				

<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397	<b>DESIGN - ENGINEERING - MANUFACTURING</b>
REAR AXLE R-1150 ASSY OPTIONS	
1	R16586
1	06/19/17/SEE TAB
F	F



PARTS LIST		R-16586 OPTIONS	
ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-16568	STUB AXLE ASSY	2
2	R-16311P	SADDLE, PASS SIDE BRAKE	1
3	R-16311D	SADDLE, DRIVER SIDE BRAKE	1
4	R-16302	AXLE WELDMENT, REAR	1
5	SEE TAB	SEE TAB	2
6	990403-062-02	WASHER, 5/8" XDUTY LOCK Z/Y	4
7	990729-4W-22	SCREW, 5/8" X 4" GR 8 HEX CAP Z/Y	2
8	990729-5W-22	SCREW, 5/8" X 5" GR 8 HEX CAP Z/Y	2
9	990900-H07	FITTING, 0.125 65 DEG	2
10	R-16310	PIN, CYLINDER	2
11	990509-2W-02	COTTER PIN, 3/16" X 2" Z/Y	4

ASSEMBLY NUMBER	INSULATION	PART NUMBER	PART DESCRIPTION
R-16308	INS	R-16578	HHCS 1/4-20 X 1.1/4" NYLON
R-16308NON	NON INS	990722-125-12	HHCS 1/4-20 X 1.1/4"

**NOTES**

- INSTALL ALL INSULATORS ON STUB AXLE BEFORE PRESSING INTO AXLE TUBE
- CHECK FOR ZERO CONTINUITY AFTER ASSEMBLY

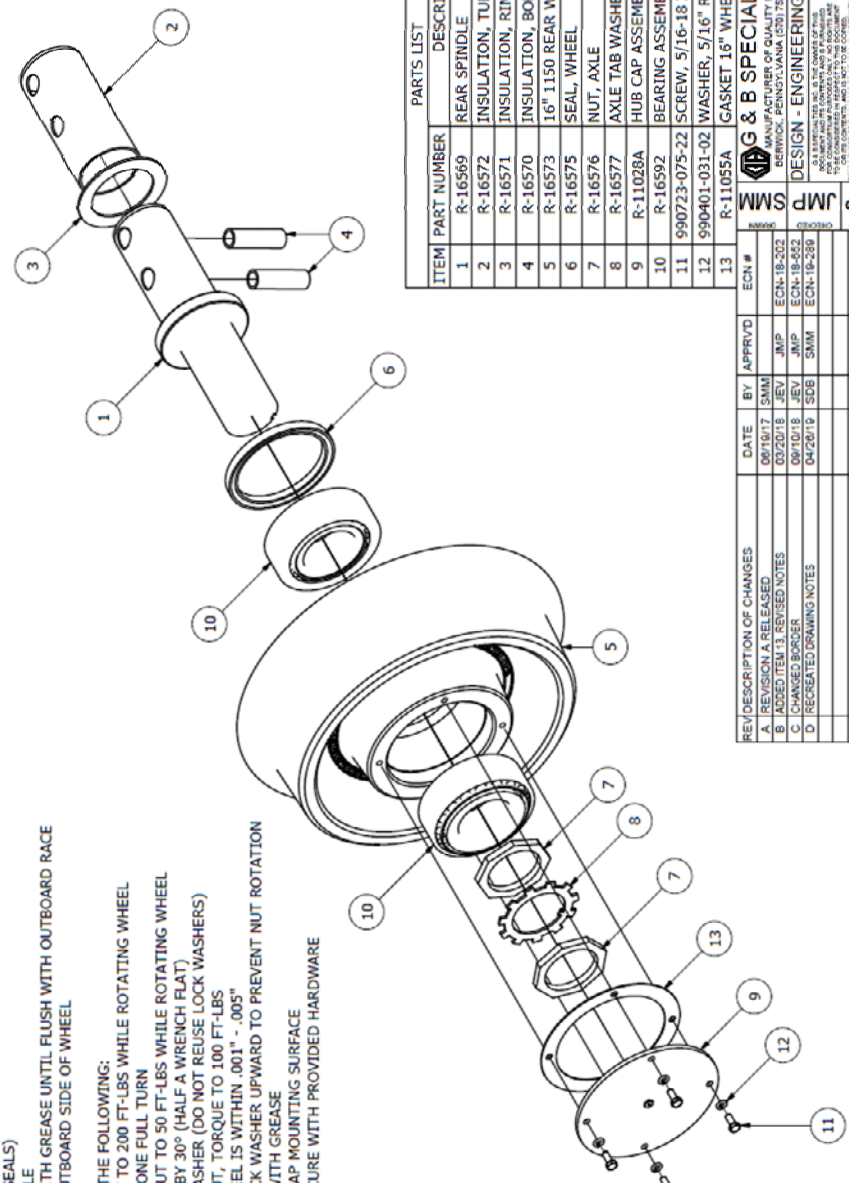
REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	04/17/18	JMP	JMP	ECN-18-002
B	REVISED ITEMS 2 & 3 ADDED TO 8 & 11	06/18/18	SMM	JMP	ECN-18-816
C	REMOVED NOTE ABOUT SILICONE REVISED #4	10/17/19	SDB	JMP	ECN-18-816
D	UPDATED VIEW TO SHOW HOSE CLIPS	11/12/18	SMM	JMP	ECN-18-920

DESIGNATION	DATE	BY	APPRVD	ECN #
JMP	04/17/18	JMP	JMP	ECN-18-002
SMM	06/18/18	SMM	JMP	ECN-18-816
SDB	10/17/19	SDB	JMP	ECN-18-816
JMP	11/12/18	SMM	JMP	ECN-18-920

ALL WELDS TO CONFORM TO AWS D1.1



**NOTES:**

1. ALL BEARINGS MUST BE PACKED WITH GREASE ENSURING COMPLETE COVERAGE
2. INSTALL BEARING INTO FLANGE (INBOARD) SIDE OF WHEEL
3. PACK WHEEL WITH GREASE, COMPLETELY COATING BACK SIDE OF BEARING
4. INSTALL GREASE SEAL. BY TAPPING GENTLY WITH HAMMER, UNTIL FLUSH WITH HUB (DO NOT REUSE GREASE SEALS)
5. INSTALL WHEEL ONTO AXLE
6. PACK BEARING CAVITY WITH GREASE UNTIL FLUSH WITH OUTBOARD RACE
7. INSERT BEARING INTO OUTBOARD SIDE OF WHEEL
8. INSTALL FIRST AXLE NUT
9. SET END PLAY BY DOING THE FOLLOWING:
  - A. TIGHTEN AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
  - B. LOOSEN AXLE NUT ONE FULL TURN
  - C. RETIGHTEN AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
  - D. LOOSEN AXLE NUT BY 30° (HALF A WRENCH FLAT)
10. INSTALL TABBED LOCK WASHER (DO NOT REUSE LOCK WASHERS)
11. INSTALL SECOND AXLE NUT, TORQUE TO 100 FT-LBS
12. VERIFY END PLAY OF WHEEL IS WITHIN .001" - .005"
13. BEND THREE TABS OF LOCK WASHER UPWARD TO PREVENT NUT ROTATION
14. FILL OUTBOARD CAVITY WITH GREASE
15. APPLY SILICONE TO HUBCAP MOUNTING SURFACE
16. INSTALL HUBCAP AND SECURE WITH PROVIDED HARDWARE

PARTS LIST		QTY
ITEM	PART NUMBER	DESCRIPTION
1	R-16569	REAR SPINDLE
2	R-16572	INSULATION, TUBE
3	R-16571	INSULATION, RING
4	R-16570	INSULATION, BOLT
5	R-16573	16" 1150 REAR WHEEL
6	R-16575	SEAL, WHEEL
7	R-16576	NUT, AXLE
8	R-16577	AXLE TAB WASHER
9	R-11028A	HUB CAP ASSEMBLY
10	R-16592	BEARING ASSEMBLY
11	990723-075-22	SCREW, 5/16-18 X 3/4" HEX Z/Y
12	990401-031-02	WASHER, 5/16" REG LOCK Z/Y
13	R-11055A	GASKET 16" WHEEL

REV/DESCRIPTION OF CHANGES	DATE	BY	APPROV'D	ECN #
A. REVISION A RELEASED	06/19/17	SMM	JMP	ECN-18-202
B. ADDED TEXT 'I' REVISION NOTES	09/20/18	JEV	JMP	ECN-18-552
C. CHANGED BORDER	09/10/18	JEV	JMP	ECN-18-552
D. RECREATED DRAWING NOTES	04/28/19	SCB	SMM	ECN-19-258

JMP	JMP	JMP	JMP	JMP
DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING
1150 REAR STUB AXLE ASSEMBLY	1150 REAR STUB AXLE ASSEMBLY	1150 REAR STUB AXLE ASSEMBLY	1150 REAR STUB AXLE ASSEMBLY	1150 REAR STUB AXLE ASSEMBLY
1 R16591	1 R16591	1 R16591	1 R16591	1 R16591
06/19/17R-16591	06/19/17R-16591	06/19/17R-16591	06/19/17R-16591	06/19/17R-16591
D	D	D	D	D

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



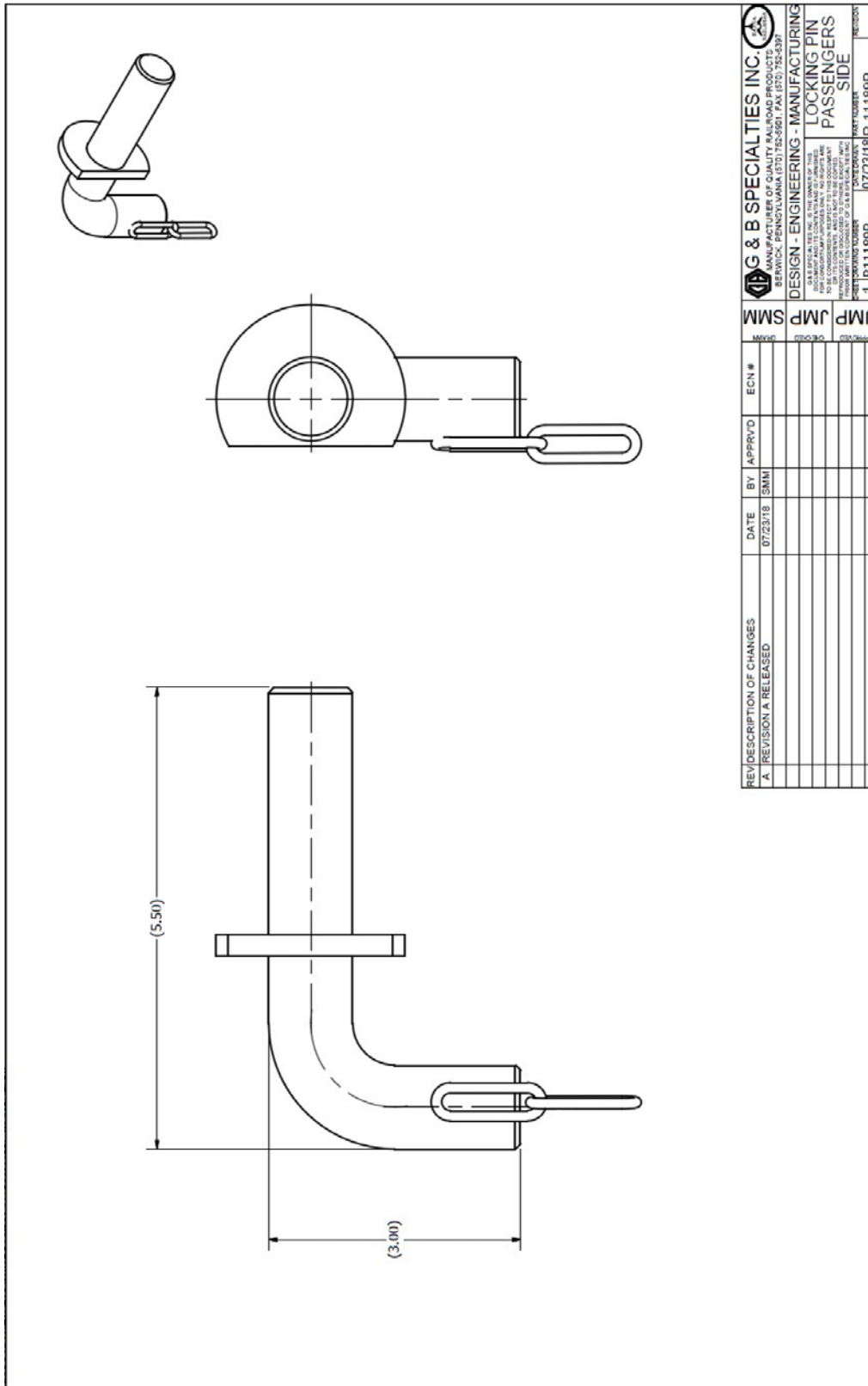




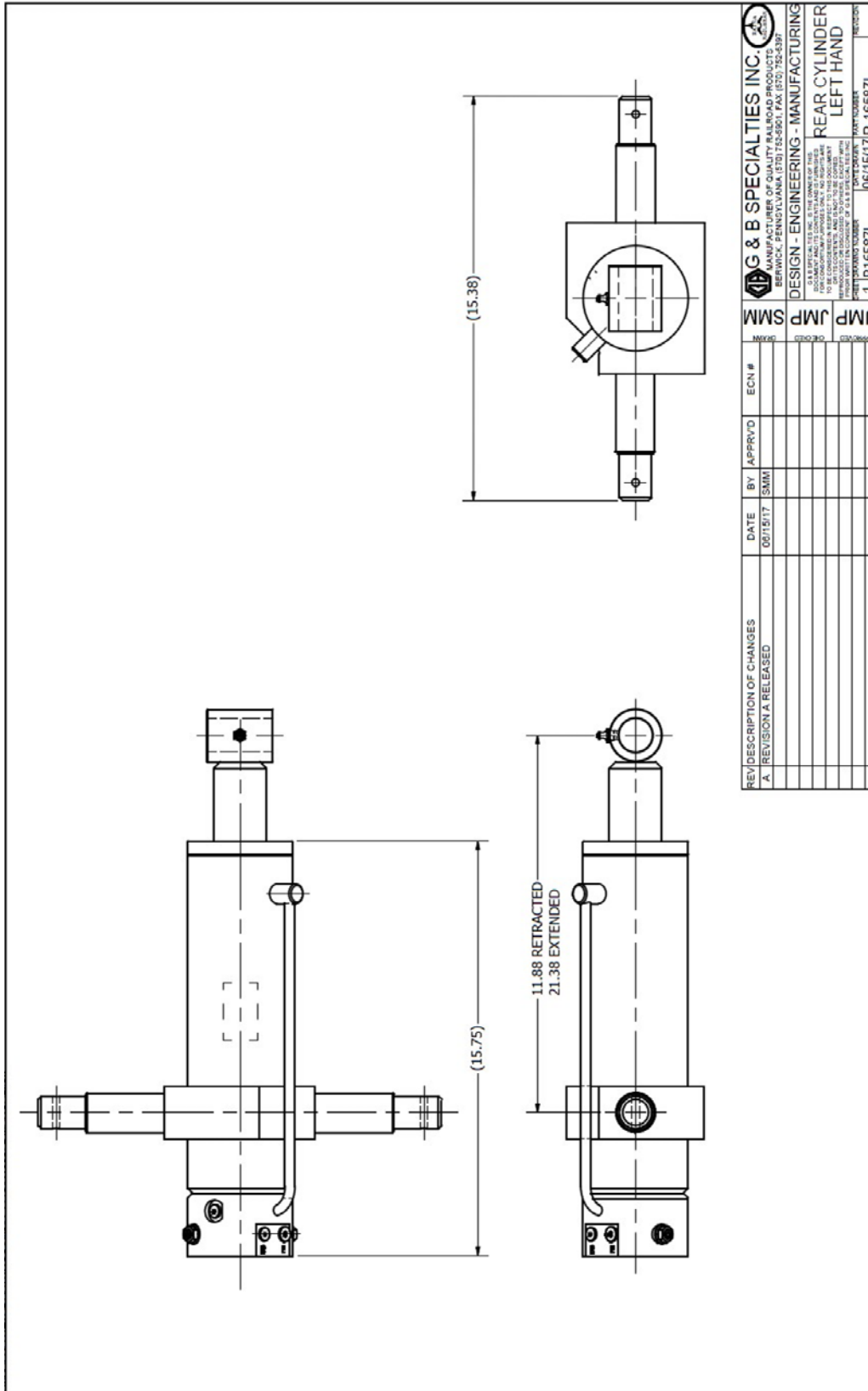


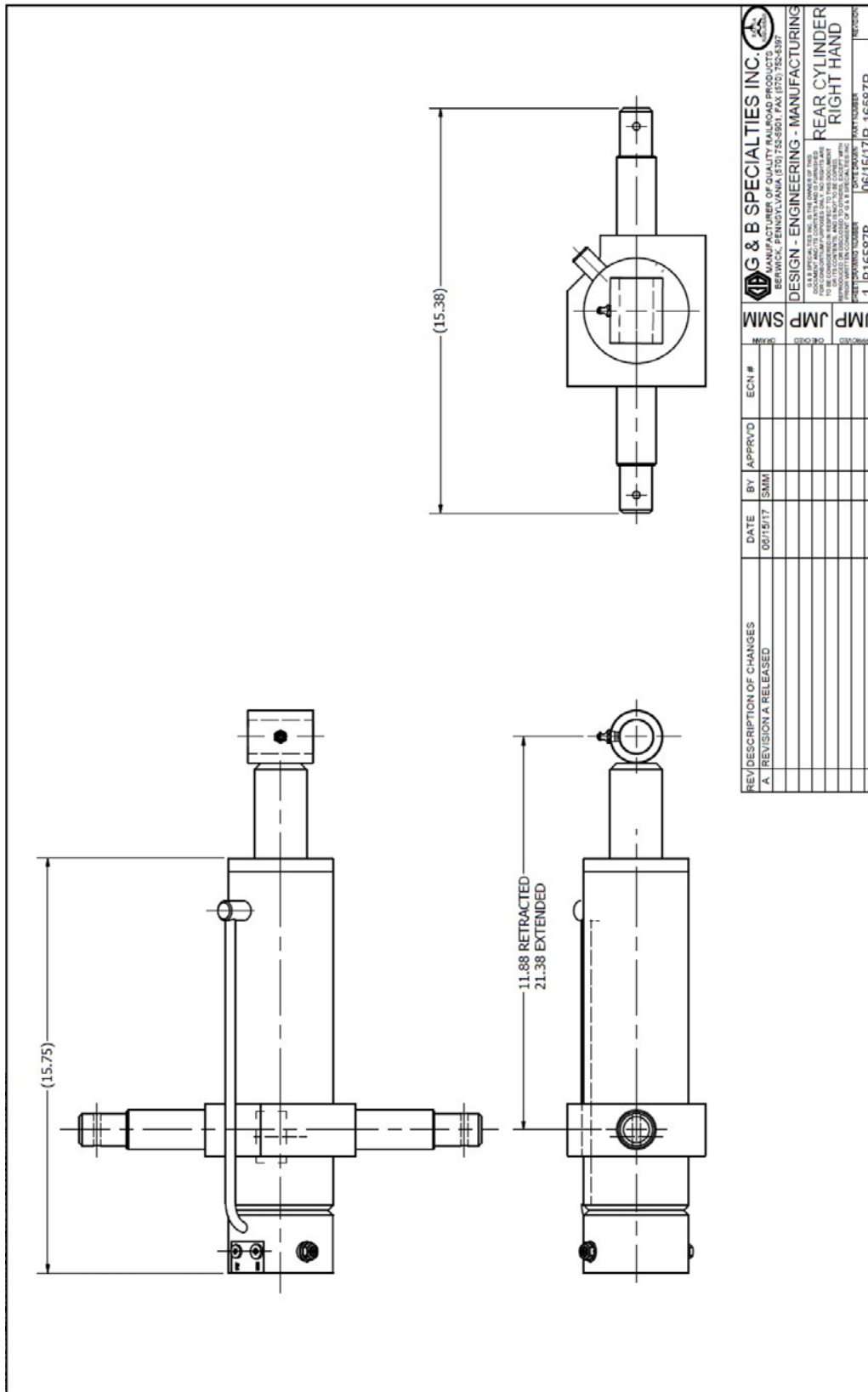






<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397		<b>DESIGN - ENGINEERING - MANUFACTURING</b> <b>LOCKING PIN</b> <b>PASSENGERS</b> <b>SIDE</b>		<b>1</b>   <b>R11189P</b>   <b>07/23/18</b>   <b>R-11189P</b>	
REVISION DESCRIPTION OF CHANGES A. REVISION A RELEASED	DATE 07/23/18	BY SMM	APPROVD SMM	ECN #	PART NUMBER 1072318R-11189P





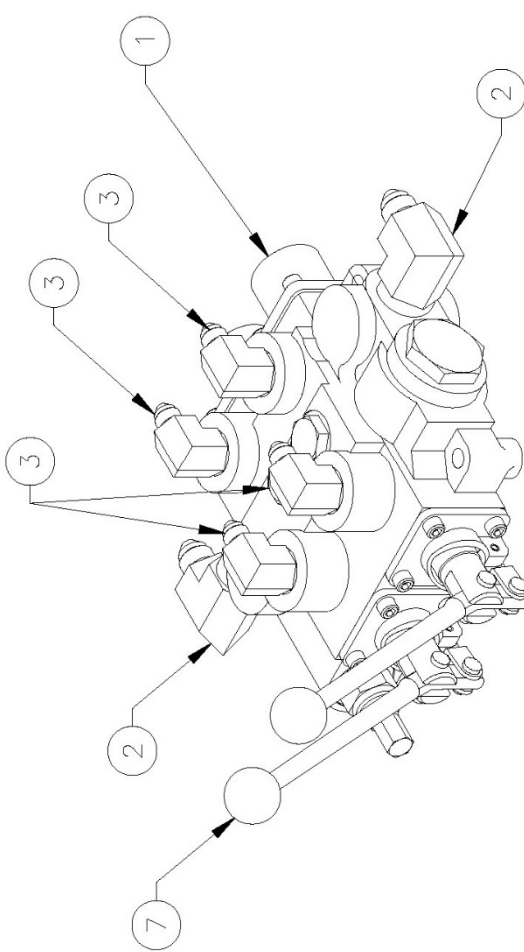


REV	CHANGE	DATE	BY	APPD
A	RELEASE DRAWING	10/7/08	AML	

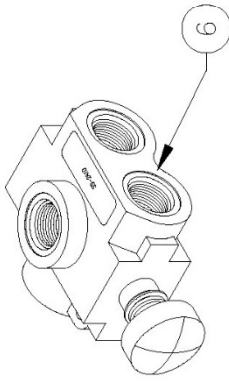
  

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-11084	OPERATING VALVE, REAR	1
2	R-11222	90° ELBOW, 1/2 JIC x 3/4 MPT	2
3	R-11223	90° ELBOW, 1/4 JIC x 1/2 MPT	4
4	R-11225	VINYL CAP, 1/4 JIC	4
5	R-11226	VINYL CAP, 1/2 JIC	2
6	R-11086	DIVERTER VALVE	1
7	R-11084B	OPERATING VALVE HANDLE	2





TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		R.A.S. FINISH MAX 1/2" DEPTH AS SPECIFIED	
BASIC DIMENSION	FRACTIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
UP TO 6 INCHES	± 1/64	± .02	± .005
6 TO 30 INCHES	± 1/32	± .03	± .010
ABOVE 30 INCHES	± 1/16	± .06	± .015
ANGULAR DIMENSIONS	± 1/2°		

**NOTES:**

- ASSEMBLE FITTINGS WITH LOCTITE THREAD SEALANT

**G & B SPECIALTIES INC.**  
MANUFACTURER OF QUALITY RAID ROAD PRODUCTS  
BERWICK PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397

**DESIGN ~ ENGINEERING ~ MANUFACTURING**

G & B SPECIALTIES INC. IS THE OWNER OF THIS DESCRIPTION. FOR CONCEPTUAL PURPOSES ONLY. NO RIGHTS ARE RESERVED. THIS DRAWING AND ITS CONTENTS ARE THE PROPERTY OF G & B SPECIALTIES INC. AND IS TO BE USED ONLY FOR THE PROJECT AND PART IDENTIFIED HEREIN. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN CONSENT OF G & B SPECIALTIES INC. IS PROHIBITED.

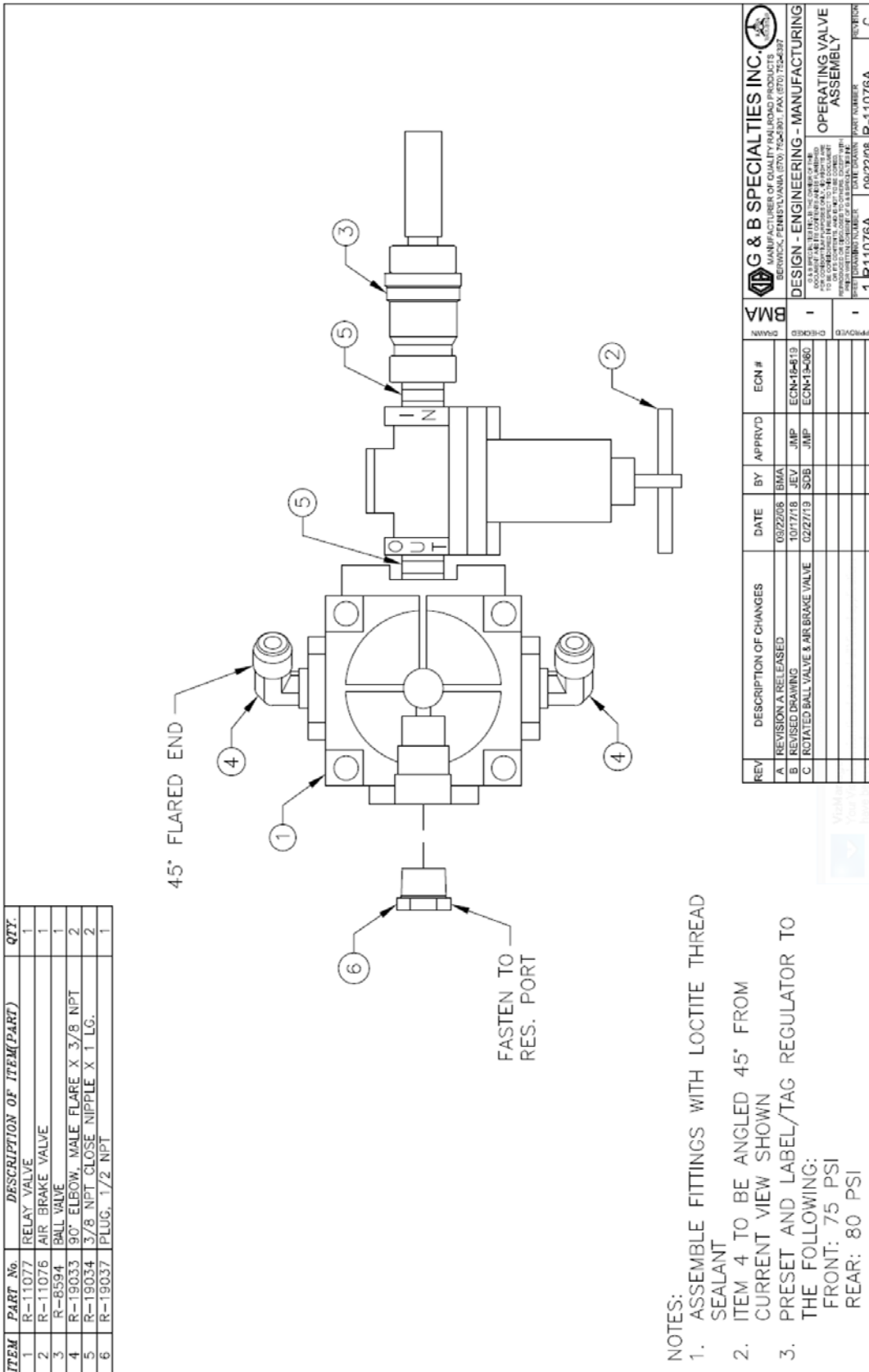
DRAWING NUMBER: R-1100

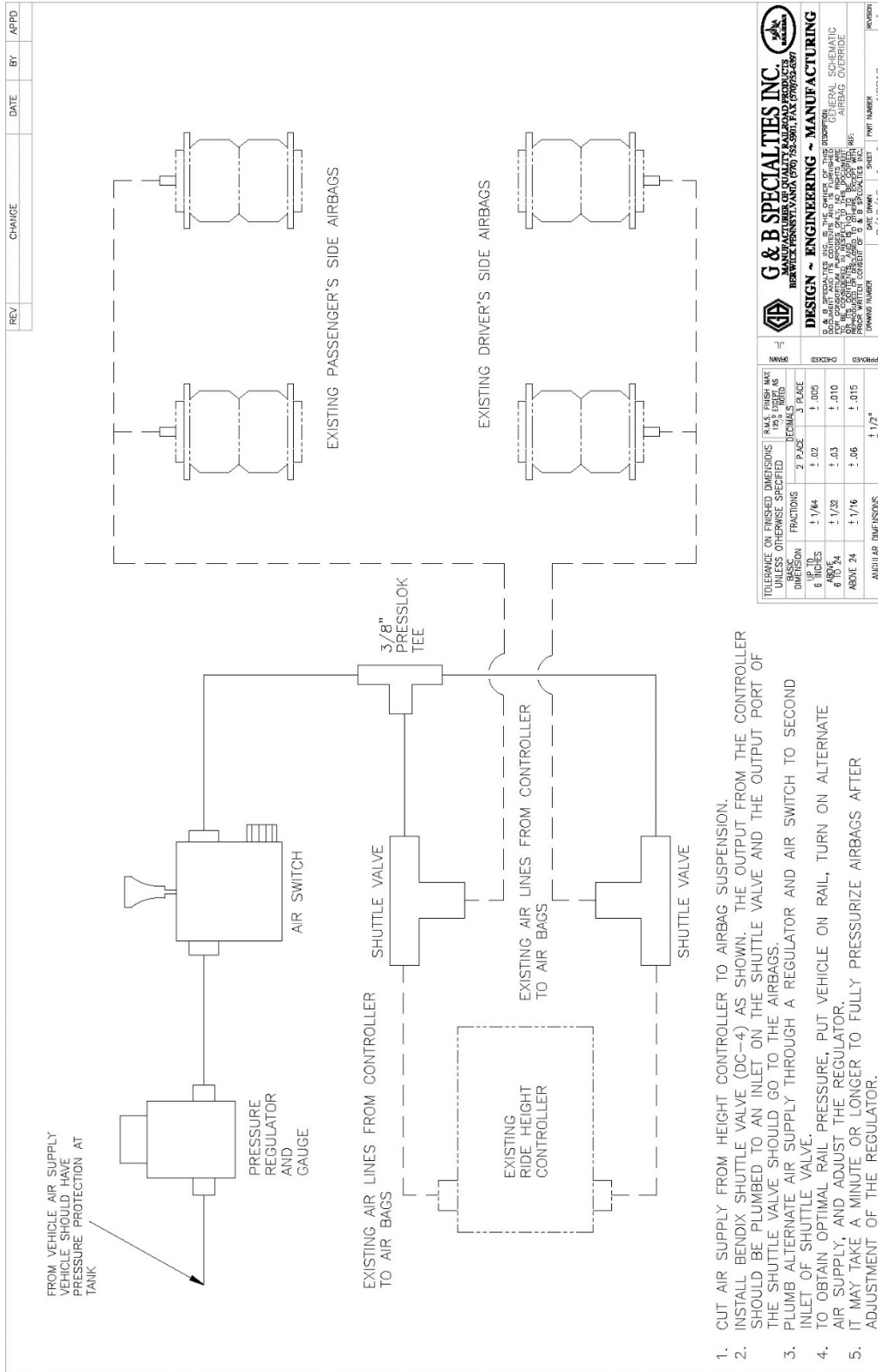
DATE DRAWN: 10/7/08

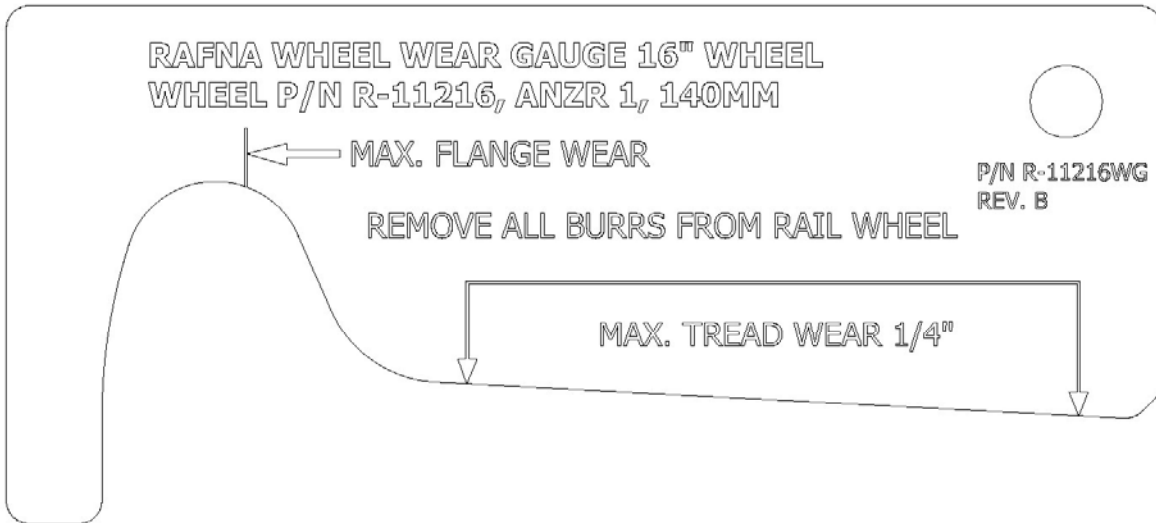
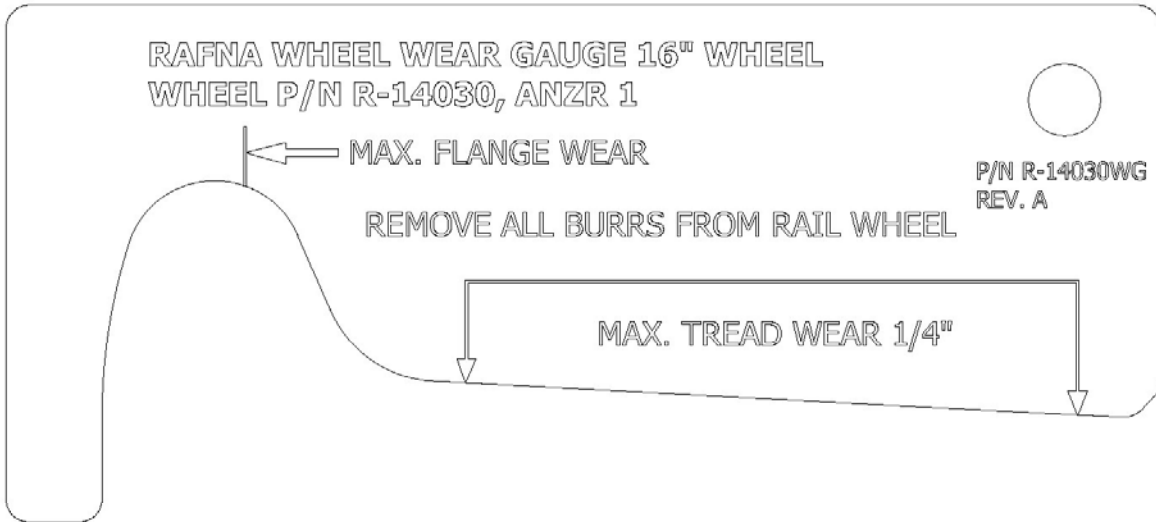
SHEET: 1 OF 1

REVISION: A


APPROVED: \_\_\_\_\_  
DRAWN: \_\_\_\_\_  
CHECKED: \_\_\_\_\_








**GAUGES ARE NOT SHOWN TO SCALE**



**OPERATION OF RAFNA GUIDE WHEEL UNIT**



**R-11210-1**

**TO PLACE VEHICLE ON RAIL:**


1. Drive vehicle on crossing, centering it over tracks.
2. Once centered over tracks, remove front and rear safety pins.
3. Lower rear wheels first:
  - A. If rear is not completely centered (within 4"), rear rail wheels will center truck on rail
  - B. With the rear wheels fully extended and properly seated on rail, install safety pin into lower hole on both sides.
4. Center front rail wheels over rail:
  - A. If front is not completely centered over rail, maneuver truck so that it is.
  - B. Front vehicle wheels must be straight ahead.
  - C. Lower front rail wheels until cylinders are fully retracted. Front rail unit incorporates an over-center design.
  - D. Install front safety pins in rail position.
5. Check all rail wheel flanges to assure they are seated properly on rail.
6. Ensure that the rear safety pins are installed properly.
7. Engage vehicle steering wheel lock.

**SAFE OPERATING SPEEDS ON RAIL WILL BE GOVERNED BY TRACK CONDITIONS AND EXISTING RAILROAD RULES AND REGULATIONS. UNDER NO CIRCUMSTANCES SHOULD THIS VEHICLE BE OPERATED OVER 30MPH WHILE ON TRACK.**

**RAFNA RAILGEAR, G&B SPECIALTIES (570) 752-5901 BERWICK, PA**

**TO REMOVE VEHICLE FROM RAIL:**

1. Drive vehicle on to crossing.
2. Either front or rear unit may be activated first.
3. Front Unit:
  - A. Remove safety pins.
  - B. Retract front rail wheels completely.
  - C. Re-install safety pins.
4. Rear Unit:
  - A. Remove safety pins.
  - B. Retract rear rail wheels completely.
  - C. Re-install safety pins.
5. Check to ensure that all safety pins are in their proper location.
6. Disengage steering wheel lock.




**OPERATION INSTRUCTIONS:**

1. REMOVE SAFETY PINS.
2. ACTIVATE VALVE:

**A. PUSH - RAIL POSITION**  
**B. PULL - ROAD POSITION**

3. REPLACE SAFETY PINS IN PROPER LOCATION.

**R-11210-2**



**OPERATION INSTRUCTIONS:**

1. REMOVE SAFETY PINS.
2. ACTIVATE VALVE:


**A. PUSH - RAIL POSITION**  
**B. PULL - ROAD POSITION**

3. REPLACE SAFETY PINS IN PROPER LOCATION.

**R-11210-2**

**LOCKING PINS**

PULL TO OPEN      PUSH TO CLOSE



**REAR RAILGEAR R-11210-4**

**R-11210 REV C**

**INSPECTION AND MAINTENANCE OF RAFNA GUIDE WHEEL UNIT**

DAILY:

1. Visually inspect railgear unit for hydraulic leaks, loose fasteners, and excessive wear.
2. Spin all four rail wheels and note any bearing noise or resistance.
3. Check hydraulic fluid level.
4. Check rail wheel flanges for irregular wear.

Weekly:

1. Grease all fittings on front and rear railgear units:
  - A. Twentyfour (24) on front unit
  - B. Fifteen (15) on rear unit
2. Inspect bearing grease every 2,000 miles or 6 months (whichever comes first)
3. Inspect bearings and grease cavity by removing hubcaps. Unless bearing problem is suspected, the bearings do not need to be removed or repacked.
4. Install new hubcap gasket. If necessary replace hubcaps.

R-11210-5

**THINK FIRST** R-11210-6  
DRIVE WITH CARE!

R-11210-A REV C

**CAUTION**

RELIEF VALVE SETTINGS:  
FRONT: 2000 PSI, 2500 PSI MAX.  
REAR: 1500 PSI, 2000 PSI MAX.  
DO NOT BOTTOM-OUT RELIEFS. IF ADJUSTED,  
R-11210-7

**CAUTION**

RELIEF VALVE SETTINGS:  
FRONT: 2000 PSI, 2500 PSI MAX.  
REAR: 1500 PSI, 2000 PSI MAX.  
DO NOT BOTTOM-OUT RELIEFS. IF ADJUSTED,  
R-11210-7

**SAFETY FIRST**

R-11210-9

RAFNA  
RAIL-GUIDE WHEEL

LOCK STEERING WHEEL ONLY WHEN  
FRONT WHEELS ARE PARALLEL TO RAIL

R-11210-10

RAILGEAR VEHICLE COMPLETED BY: \_\_\_\_\_

WITH RAILGEAR INSTALLED AND FINISHED  
BODY, THIS VEHICLE HAS \_\_\_\_\_ LBS OF  
AVAILABLE PAYLOAD.

DATE OF COMPLETION OF RAILGEAR  
INSTALLATION: \_\_\_\_\_ mo \_\_\_\_\_ yr

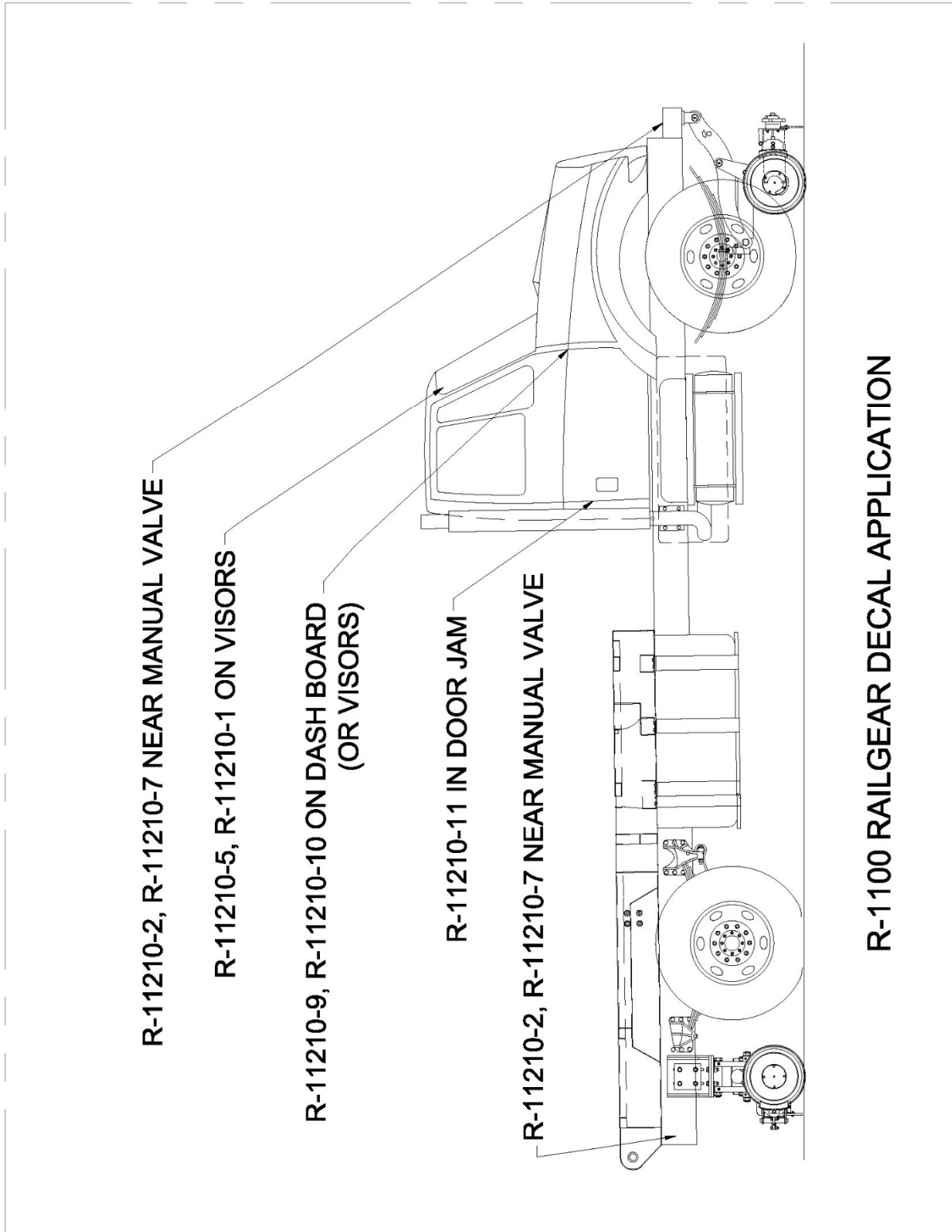
**CAUTION:**

THIS VEHICLE HAS SPECIAL DESIGN AND EQUIPMENT  
FEATURES FOR OFF-HIGHWAY USE. IT HANDLES  
DIFFERENTLY FROM ORDINARY PASSENGER VEHICLES IN  
DRIVING CONDITIONS WHICH MAY OCCUR ON AND OFF  
HIGHWAY.

WEIGHT AND LOCATION OF PAYLOAD MAY ALSO AFFECT  
THE HANDLING OF THIS VEHICLE.

PRIOR TO OPERATION, PLEASE READ THIS VEHICLES  
OWNERS MANUAL, THE RAIL GEAR OPERATIONS, AND  
SERVICE MANUAL.

R-11210-11



VEHICLE MAKE: \_\_\_\_\_ VEHICLE MODEL: \_\_\_\_\_

VEHICLE YEAR: \_\_\_\_\_ VEHICLE VIN #: \_\_\_\_\_

VEHICLE UNIT #: \_\_\_\_\_

FRONT RAILGEAR SERIAL #: \_\_\_\_\_

REAR RAILGEAR SERIAL #: \_\_\_\_\_

**ALIGN REAR RAILGEAR**

**A1 & A2 MUST BE EQUAL WITHIN 1/16"**

A1 = \_\_\_\_\_

A2 = \_\_\_\_\_

**B1 & B2 MUST BE EQUAL WITHIN 1/8"**

B1 = \_\_\_\_\_

B2 = \_\_\_\_\_

**ALIGN FRONT RAILGEAR TO REAR**

**C1 & C2 MUST BE EQUAL WITHIN 1/8"**

C1 = \_\_\_\_\_

C2 = \_\_\_\_\_

**D1 & D2 MUST BE EQUAL WITHIN 1/4"**

D1 = \_\_\_\_\_

D2 = \_\_\_\_\_

**RAIL WHEEL FLANGE TO GROUND CLEARANCE**

LEFT FRONT \_\_\_\_\_

RIGHT FRONT \_\_\_\_\_

LEFT REAR \_\_\_\_\_

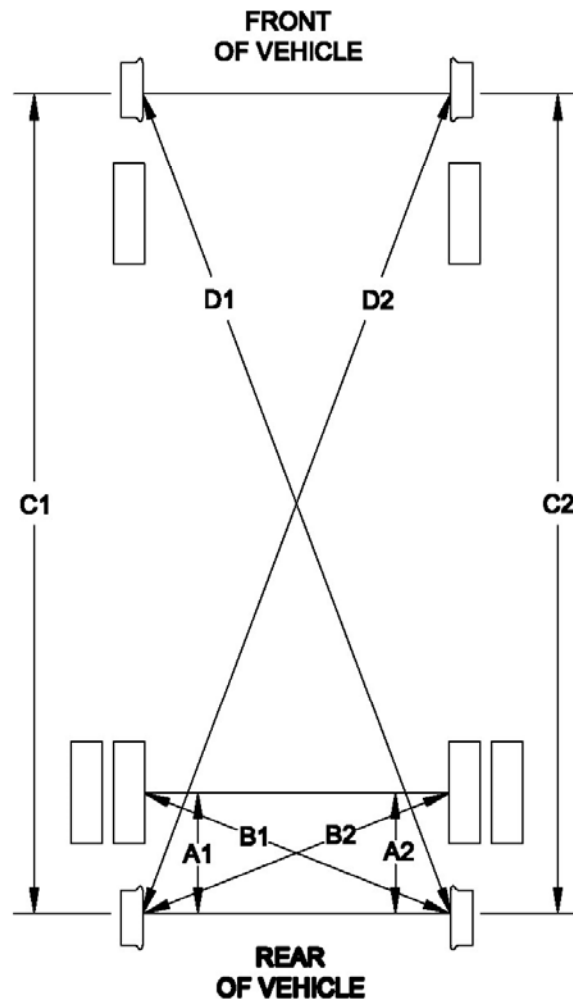
RIGHT REAR \_\_\_\_\_



VEHICLE WHEEL



RAIL WHEEL



INSTALLER/INSPECTOR SIGNATURE: \_\_\_\_\_