

## INSTALLATION, OPERATIONS & SERVICE MANUAL R-1130 FRONT RAILGEAR

### 1.0 INSTALLATION

#### 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.
- 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 in order to protect the vehicle's electrical system.

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## GENERAL INFORMATION

### Work Area:

The work area in which the railgear is to be installed should meet these minimum requirements in order 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 in order 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.

## PRELIMINARY INSTALLATION

Remove front truck bumper.

Bolt/Weld the Frame Extension to the truck frame as req'd. Make sure that tilt cabs or hoods will clear the frame extensions. Trim the brackets and gusset as necessary. All truck frame extensions that have bolt on brackets must use 5/8"-11 bolts minimum, hardened steel washers and grade-8 prevailing torque locknuts. All of the grade-8 hardware should be tightened to the manufacturer's specifications. Check that the frame extensions are level and square with the truck frame.

In normal applications, mount the front valve plate assembly between the front frame extensions (with the hydraulic valve underside and the handle facing forward) and weld valve plate in place. In case this is not possible, mount the valve plate in the most appropriate and easily accessible location.

**NOTE:**

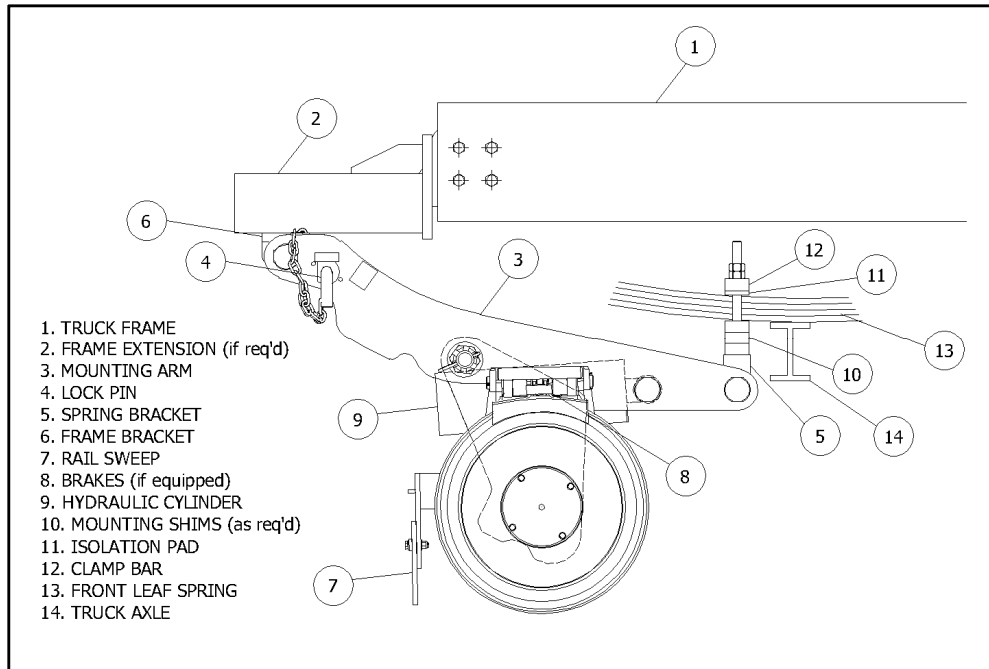
*If the vehicle has been supplied with an integral extended front frame then frame extensions will not be required. The front valve plate can be welded directly to the extended front frame.*

## FRONT RAILGEAR INSTALLATION

**NOTE:**

**Before starting the Front Railgear installation, check the spacing on the front tires on your vehicle. There must be a minimum spacing of 65" between the front tires. If there is not, contact G&B Specialties for further assistance.**

With the front railgear under the truck, spacer thickness can be determined. Spacers may be needed to place the front railgear at the proper mounting height. Measure the ground clearance of the front spring just in front of the axle beam. The correct distance from the ground to the center of the rear-mounting pin should be 12 ¾". In order to obtain this 12 ¾" distance, 1" spacers should be used between the spring and the spring bracket. There are 1" spacers provided with the front railgear. The top spacer is used for clamping purposes only and doesn't affect mounting height. Spacers can be added or removed as required to allow for proper mounting height. If additional spacers are required, beyond what is supplied with the railgear, it is to be the responsibility of the installer to fabricate and supply as req'd.



The req'd spacers are to be placed between the spring bracket and the underside of the truck spring. After lifting the Link Arms into place, attach the spring brackets to the truck spring, using two  $\frac{3}{4}$ "-10 hex nuts per stud. Push the spring brackets against the axle beam and tighten the hex nuts onto the top spacer to cage the springs.

The front railgear can now be actuated with the hydraulic system, which will raise the front of the Link Arms to the frame extensions. The frame needs to be raised just enough to touch the frame extensions or truck frame.

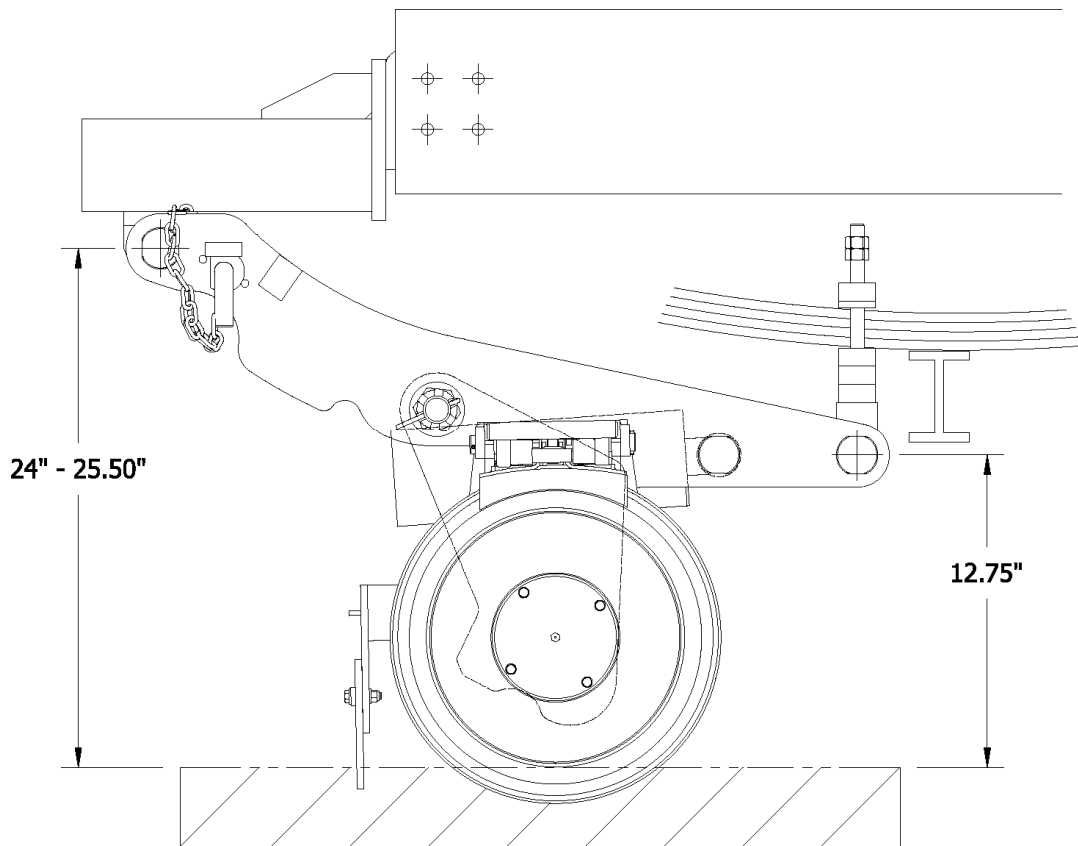
**CAUTION - Do not raise all the way to lift truck frame and raise the front truck tires.**

In order to install the front of the front railgear at the correct height, the center of the front mounting pins must be located 24"-25  $\frac{1}{2}$ " from the ground (with the truck steering tires on the ground). If necessary, shim the frame-mounting bracket to obtain the proper measurement. All shims should be load bearing members, do not use thin wall tubing. If necessary, a different frame-mounting bracket can be used to obtain the proper mounting height.

Check for interference with the truck frame, springs, steering gear or other truck components, with the railgear. Front mounting pin ground clearance may be reduced to as low as 24" in order to provide for proper fit.

**!WARNING!**  
**! Before rotating front gear, ensure axle is positioned correctly or damage to the cylinders could occur. (figure 1.2.1)**





**NOTE:**

*If the vehicle has been supplied with an integral extended front frame then frame extensions are not necessary. The frame-mounting bracket can be brought up to the extended frame as show. Follow all instructions for finding the proper ground clearance with frame extensions. Solid or load bearing spacers may be required to obtain the proper ground clearance to the front mounting pin.*

**Clearance Note:**

*Proper clearance will allow the railgear to move up and down with the truck's front suspension. As the truck tire bumps on the road, the truck spring allows the front axle to move upward. Since the railgear is attached to the spring just forward of the front axle, sufficient clearance must be allowed to prevent interference with other truck parts. The front mounting pin does not move in relation with the truck frame because it is fastened to the frame extension or the truck frame. As the front mounting pin does not move and the rear-mounting pin does, the railgear effectively rotates around the front mounting pin. Therefore, the part of the railgear near the rear mounting pin moves more than the part near the front mounting pin and attention needs to be paid to possible clearance problems that this movement may cause.*

## FRONT RAILGEAR ALIGNMENT

The front railgear is now ready to be aligned and squared. Three measurements need to be taken in order to insure that everything is properly aligned.

### To align to Link Arms, check:

- (1) That they are parallel with each other and the truck frame.

The distance between the Link Arms should be the same at the front mounting pin as it is at the rear-mounting pin. This prevents the railgear from binding during up and down movements. In addition, the distance from the truck frame to the Link Arms should be uniform on both sides of the railgear.

- (2) That they are the same distance forward.

Measure the distance from the front mounting pin to the common point on the truck frame. If the measurements are off, square the railgear by loosening the nuts on spring hanger and move the appropriate distance, then re-tighten.

### To check the spring bracket location, check:

- (3) That the spring bracket to truck axle is the same on both sides.

Measure the distance from each spring hanger back to the truck axle. Since the forward position of the Link Arms has been verified in step (2), an off measurement here probably means that the truck axle is miss-aligned and needs to be corrected.

After these alignment checks and after ensuring that there is sufficient clearance, the frame mounting brackets can be tack welded to the frame extensions.

**NOTE:**  
***Do not attach welding ground clamp to the railgear wheels. This will cause arcing across the bearings and lead to premature bearing failure.***

Raise the front rail wheels just above the floor, making sure there is enough room to slide the front installation rails under the railgear wheels.



Because the railgear axle assembly is not fixed to the pivot arms, the rail wheels will need to be centered. To center, measure the distance from the inside of the rail wheels to the truck frame. If the measurements are off, slide the axle assembly in the appropriate direction and re-check rail wheel to truck frame distances. With the axle tube now centered, tack weld the axle tube to the outer pivot arms.

The front railgear is now ready to be lowered onto the installation rails. When the railgear is completely lowered, the front truck tires should be about 2” off the top of the installation rails. If the railgear will not lift the truck, check that the system pressure relief valve is set high enough that the front hydraulic control valve relief is set high enough. Check that the cylinders are not cross plumbed. As a final review, recheck the center alignment of the railgear wheels to the truck frame. If it is off, break the tacks between the outer pivot arms and the axle tube, move the axle tube to the correct position and retack.

**!CAUTION!**

This railgear unit is shipped with an adjustable axle (Std/Brd Gg) as standard equipment. It is important that the axle be rotated to the proper location, as indicated by the alignment decal, prior to any welding.

## FINAL FRONT INSTALLATION

Ensure that the hex nuts on the spring hangers are tight and secured with Loctite Red. Remove the excess stud length from both spring hangers. Leave approx 1” of threaded above hex nuts. If these studs are not trimmed, they may cause a clearance problem with other parts of the truck.

- Weld inboard side of outside pivot arms to axle tube all the way around.
- Fully weld, on all sides, front mounting blocks / cross tubes to truck frame.
- If shims were required, fully weld shims into place on all sides for each shim location.

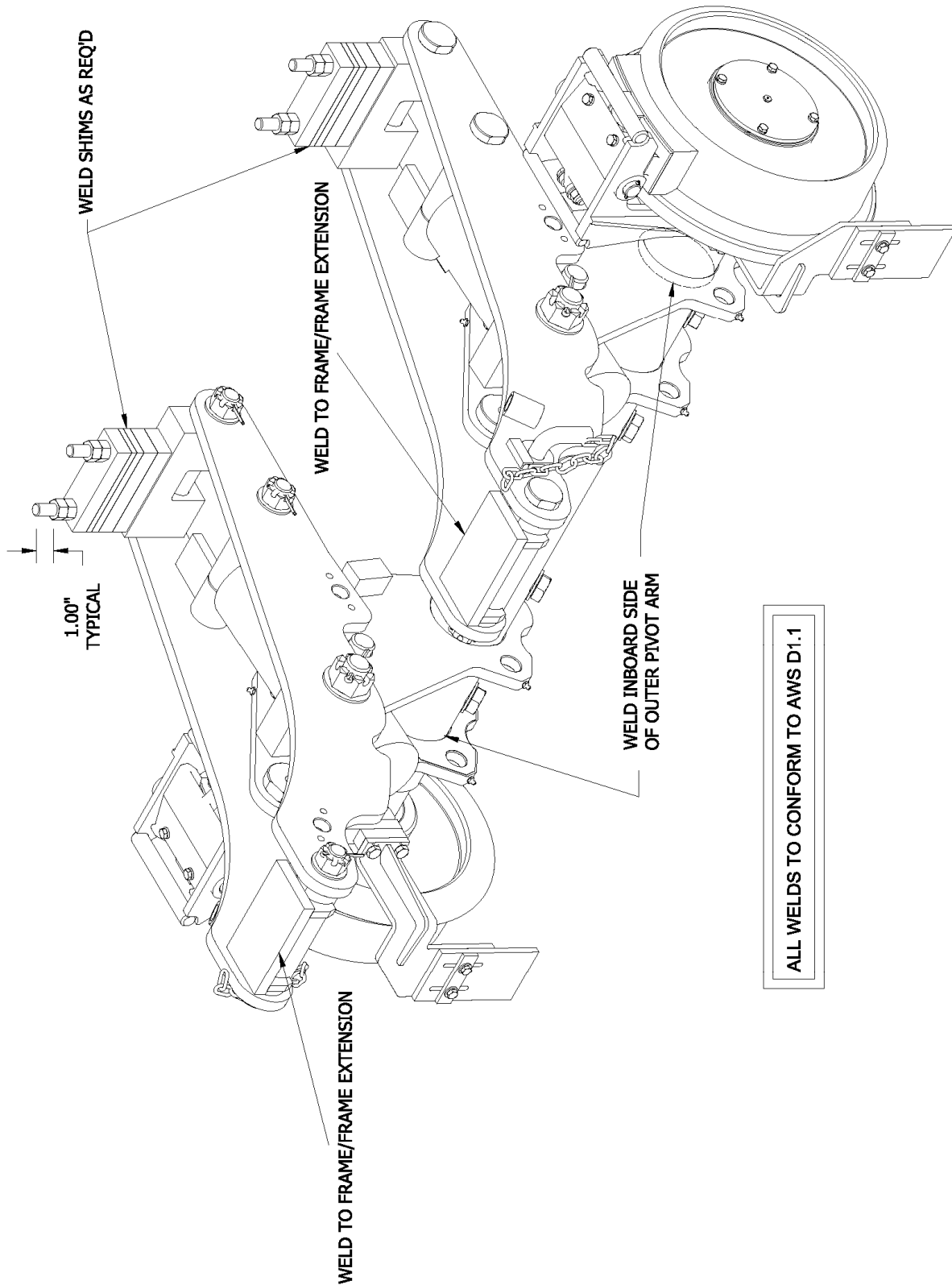


Figure 1.4

## HYDRAULICS

### 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, one return port and a tank filler-breather. Fill the tank with UNAX Oil Rx 46 or equivalent hydraulic oil.

Route a pressure line 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. 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!**

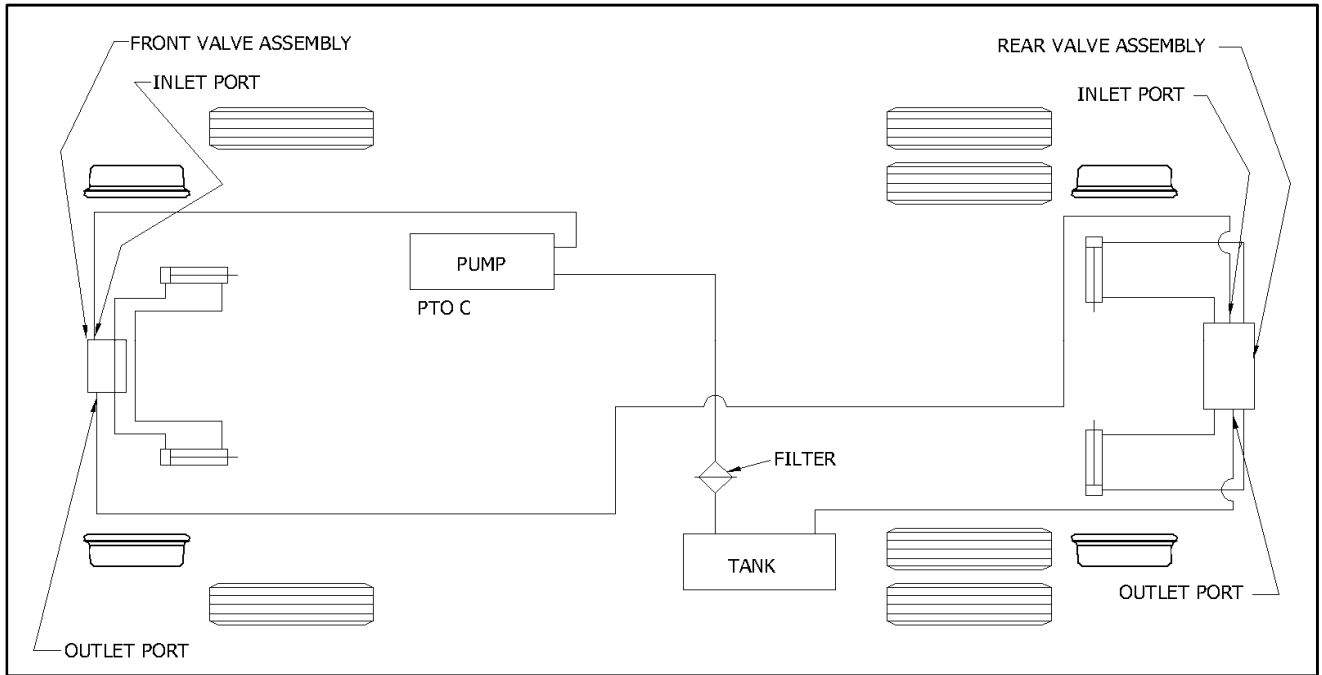
**Be certain that front and rear valves are plumbed correctly. Each valve port is marked "INLET" or "OUTLET". Plumbing valve backwards will result in an unsafe condition, possible injury and/or damage.**

### Existing Hydraulic System

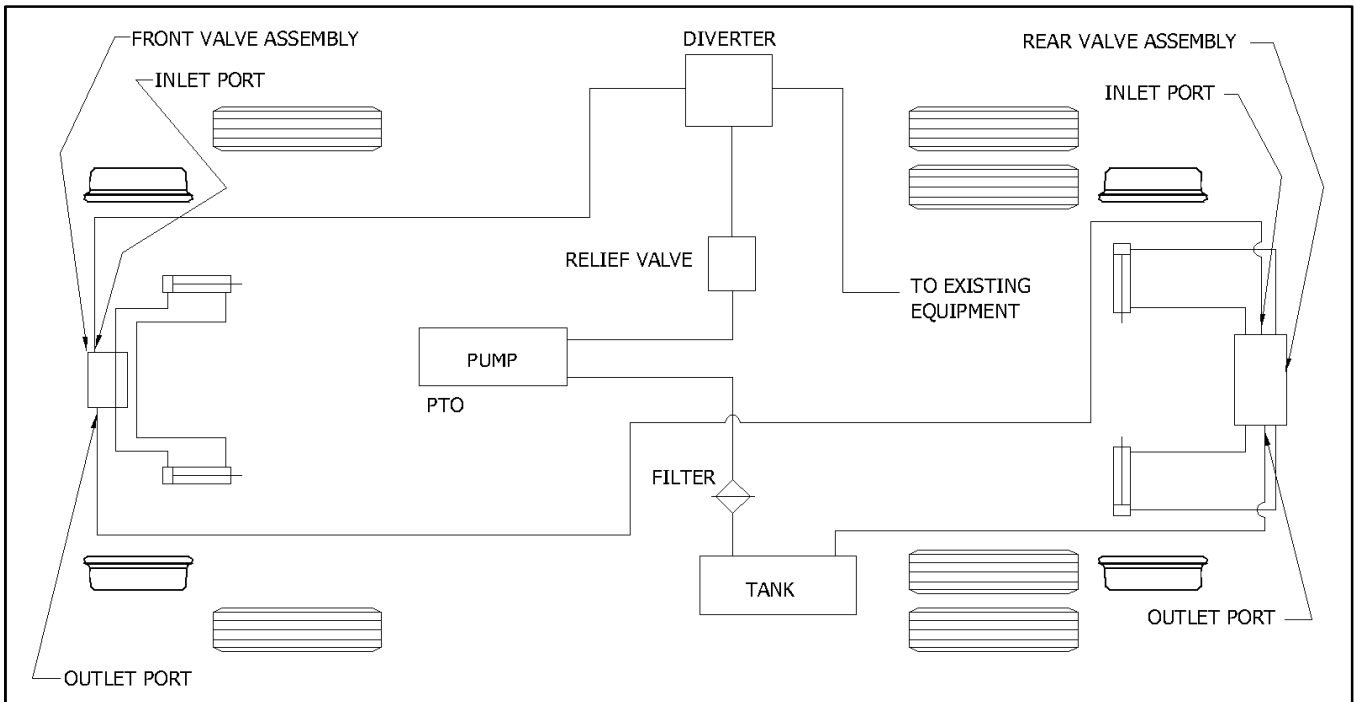
If the truck has an existing hydraulic system, install an appropriate sized diverter valve in the pressure line after the pump and before any existing equipment valves. One-outlet routes to the existing valves and the other to the center of the front bumper. The in port of the hydraulic control valve 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. 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 preset to 2000 PSI at the relief and the rear valve is preset to 1500 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**



**New Hydraulic Installation (figure 2.0)**



**Existing Hydraulic Installation (figure 2.1)**

## **RAILSWEEP INSTALLATION**

### **Units with Brakes**

On units equipped with brakes, front and/or rear, the rail sweeps attach to the brake housing as shown in front brake kit installation manual.

### **Units without Brakes**

On units without brakes, the front rail sweeps are supplied loose with the unit and need to be welded to the front railgear axle as shown.

### **Rail Sweep Adjustment**

Adjust the rubber sweep by loosening the bolts securing the sweep plate to the rail sweep bracket. Lower or raise the rubber sweep as required so that the bottom of the sweep is just above the top of the rail head. Tighten sweep plate bolts.

The sweeps should be adjusted with the front railgear unit in the fully lowered rail position with the sweep mounting bracket parallel to the running surface of the rail.

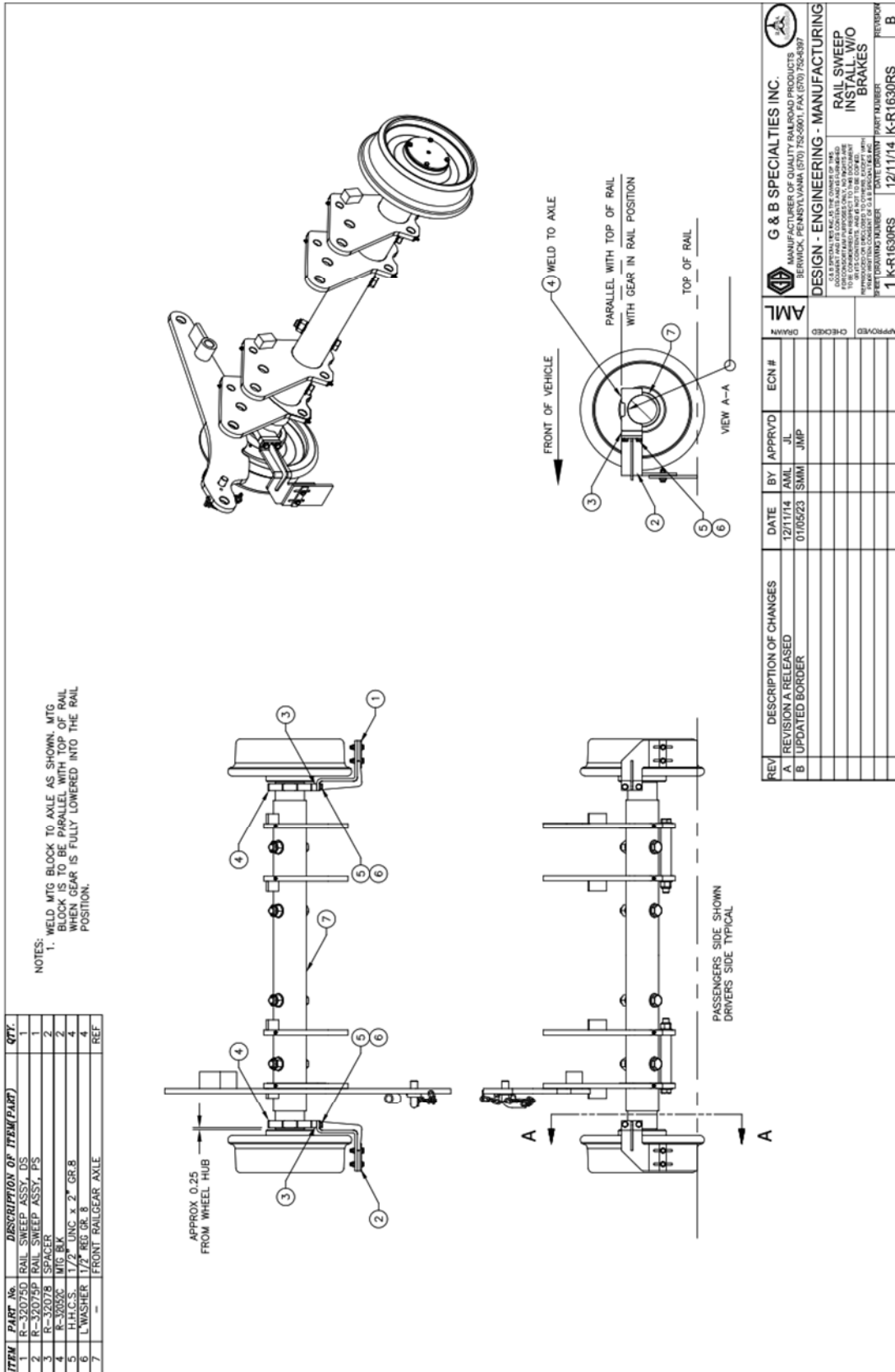


Figure 3.1

## 2.0 OPERATION

### DAILY INSPECTION

#### Daily Inspection

Check to be sure that the railgear is in good operating condition.

Inspections should include:

All air and hydraulic fittings  
Brake operation  
Rail wheel wear

All air and hydraulic hoses  
Railgear parts for damage  
Hydraulic fluid level

### PLACING TRUCK ON RAILS

#### Lower Rear Guide Wheels

1. If the Railgear has brakes, turn brake switch on.
2. Engage the hydraulic system for the railgear unit.
3. Remove the safety pin-off pins.
4. Lower wheels and engage rail.
5. You can use the valve handles independently to lower one side at a time to engage the rail, at which point you can then lower the opposite side. This will cause your vehicle to side-shift and align itself with the rail.
6. When both wheels are fully down and properly engaging rail, replace safety pin-off pins.

#### 4.1.2 Lower Front Guide Wheels

7. If necessary, position the truck to line up the front guide-wheels with the rail.
8. Ensure that the hydraulic system for the railgear unit is engaged.
9. Check and make sure that the front guide wheels line up with the rail.
10. Remove lock pin.
11. Push valve handle to lower wheels and engage rail.
12. If equipped, ensure lock for rail position is engaged.

#### NOTE:

As a standard, the front railgear unit is designed to operate rotated over center and does not require a railgear lock when in rail position. Depending on options, the front railgear unit may have an optional lock in the rail position. If this is the case ensure that the lock is engaged when in the rail position

## REMOVING TRUCK FROM RAIL

13. Engage railgear hydraulic system.
14. Disengage lock pins (if applicable) for the railgear unit being operated.
15. Lift both sets of Railgear (there is no preference for removal order).
16. Ensure all lock pins are engaged on both units in highway position.
17. Disengage the switch that controls the Railgear brakes (if applicable).
18. Disengage the railgear hydraulic system.

## WHILE ON RAIL

**Do not exceed posted track speed limit, and at no time exceed 30 MPH while on the track**

- Be aware that some hi-rail gear is insulated, and will not operate the crossing circuits.
- **It is the responsibility of the operator to know if your hi-rail equipped vehicle has insulated or non- insulated wheels.**
- All railroad rules and safety guidelines should be observed.
- Reduce speed while in reverse and/or at all crossings, curves, branch lines, switches and frogs.
- Traction is reduced on the track. Tire damage may result from spinning wheels on track.
- Braking distance is increased on the track. Do not slide tires or guide wheels on track.
- Do not exceed the maximum rated capacity of the equipment.



## 3.0 MAINTENANCE

### MAINTENANCE INTERVALS

If your hi-rail vehicle is high-use or operated under extreme conditions, the levels of 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:

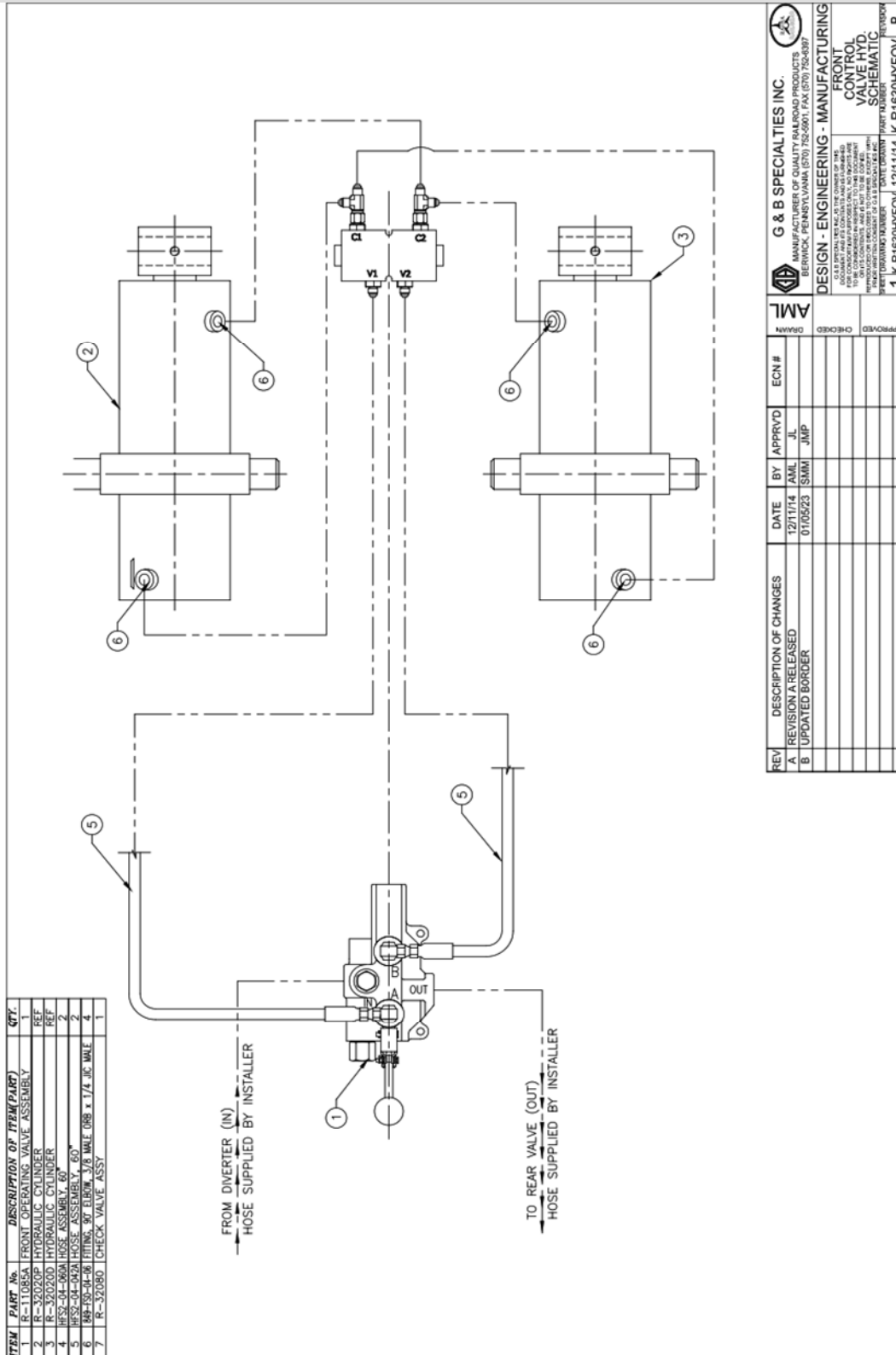
- Remove the hubcaps from the rail wheels and inspect for deterioration or loss of wheel bearing grease
- Clean the strainer / filter in the hydraulic power unit tank
- Rail test for proper traction and adjust as appropriate
- Rail test for proper braking and adjust as appropriate
- Check Railgear alignment

### 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.

## 4.0 PARTS/SCHEMATICS

### STANDARD/BROAD GAUGE



ESTIMATED WEIGHT: 860LBS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-32001P	OUTER SUPPORT ARM ASSY, PS
2	1	R-32002P	INNER SUPPORT ARM ASSY, PS
3	4	R-32046	PIVOT BOLT
4	2	R-32018	SPRING HANGER
5	1	R-32008P	HYDRAULIC CYLINDER
6	6	R-32015	SPACER, 1"
7	2	R-32016	SPACER, 1/2"
8	4	R-32018B	THRD ROD
9	2	R-32017	RUBBER PAD
10	2	R-32063	PIVOT BLOCK ASSY
11	1	R-32054	FRONT AXLE ASSY, ADJ, NON-INS
12	1	R-32001D	INNER SUPPORT ARM ASSY, DS
13	1	R-32002D	OUTER SUPPORT ARM ASSY, DS
14	1	R-32000D	HYDRAULIC CYLINDER
15	6	R-32006	MTG PIN
16	6	HEX NUT	1-1/8" UNC, SLOTTED
17	4	FWASHER	1-1/2" TYPE-A
18	8	HEX NUT	1/2" UNC
19	4	GREASE ZERK	1/8 NPT ST Zerk
20	4	HEX NUT	1-1/2" UNC, SLOTTED
21	4	COTTER PIN	1/4" x 3"
22	6	COTTER PIN	3/16" x 2-1/2"
23	6	FWASHER	1-1/8" TYPE-A
24	4	R16514	SCREW, 1/4" X 1/2" HALF DOG SOCKET SET

REF: HARDWARE KIT R-990KIT-386

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	AML
A REVISION A RELEASED	08/12/14	AML		ECN-198-512	
B ADDED SET SCREW AND UPDATED HANGER	08/21/19	SMM	JMP	ECN-198-512	

ALL WELDS TO CONFORM TO AWS D1.1

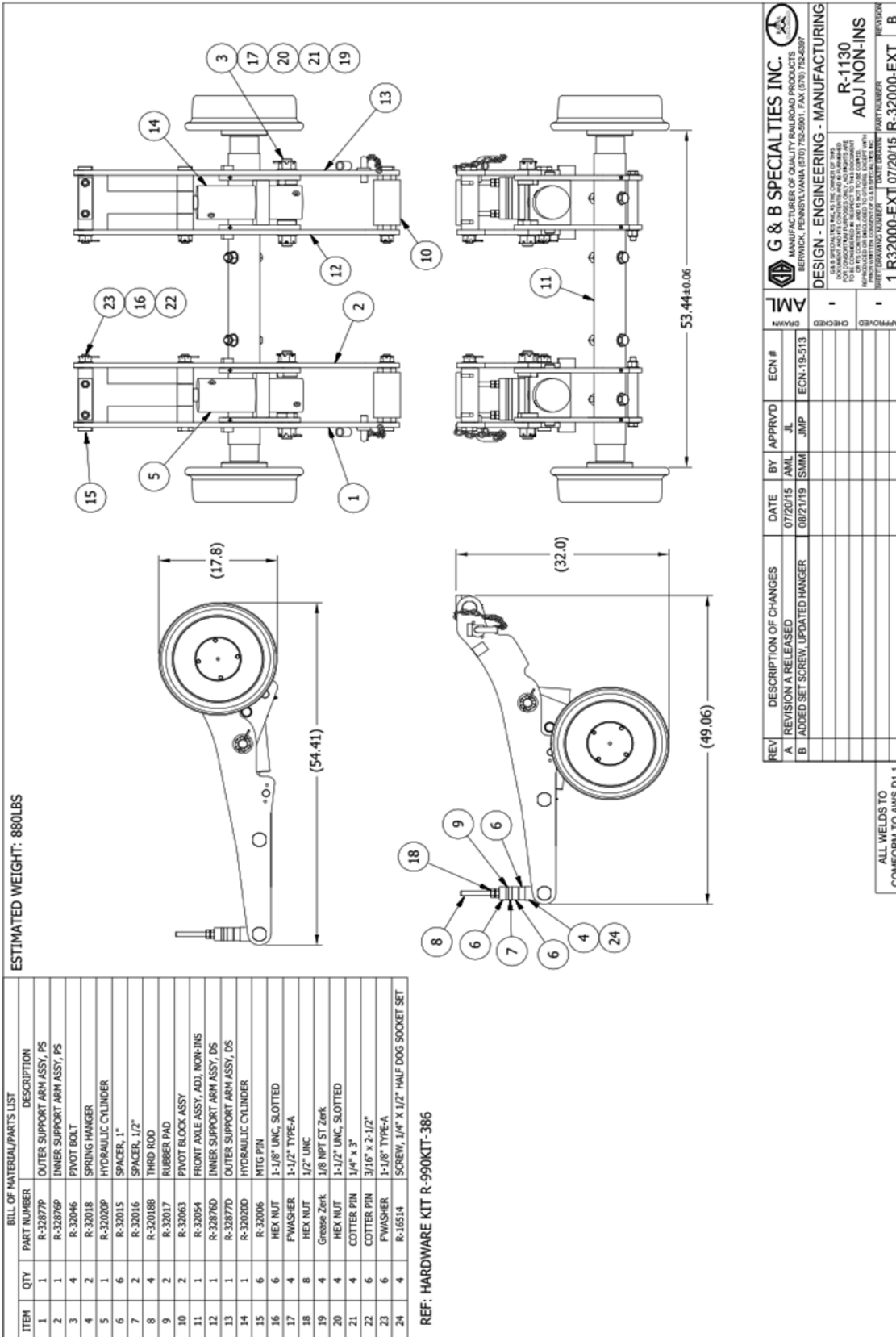
1 R32000 08/12/14 R-32000

DESIGN - ENGINEERING - MANUFACTURING

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

ADJ NON-INS

**R-32000 (NON-INSULATED ASSY)**



**R-32000-EXT (NON-INSULATED EXTENDED ARM ASSY)**

G&B Specialties Inc. 535 West 3<sup>rd</sup> Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397  
 US Field Service: 570-441-6988; CAN Field Service 570-854-0482; www.rafna.com

ESTIMATED WEIGHT: 860LBS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-32001P	OUTER SUPPORT ARM ASSY, PS
2	1	R-32002P	INNER SUPPORT ARM ASSY, PS
3	4	R-32046	PIVOT BOLT
4	2	R-32018	SPRING HANGER
5	1	R-32009P	HYDRAULIC CYLINDER
6	6	R-32015	SPACER, 1"
7	2	R-32016	SPACER, 1/2"
8	4	R-32018B	THRD ROD
9	2	R-32017	RUBBER PAD
10	2	R-32063	PIVOT BLOCK ASSY
11	1	R-32302	FRONT AXLE ASSY, ADJ, INS
12	1	R-32002D	INNER SUPPORT ARM ASSY, DS
13	1	R-32001D	OUTER SUPPORT ARM ASSY, DS
14	1	R-32000D	HYDRAULIC CYLINDER
15	6	R-32006	MTG PIN
16	6	HEX NUT 1-1/8" UNC, SLOTTED	
17	4	FWASHER 1-1/2" TYPE-A	
18	8	HEX NUT 1/2" UNC	
19	4	Grease Zerk 1/8 NPT ST Zerk	
20	4	HEX NUT 1-1/2" UNC, SLOTTED	
21	4	COTTER PIN 1/4" x 3"	
22	6	COTTER PIN 3/16" x 2-1/2"	
23	6	FWASHER 1-1/8" TYPE-A	
24	4	SCREW, 1/4" X 1/2" HALF DCG SOCKET SET	

REF: HARDWARE KIT R-990KIT-386

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	05/04/15	AML	JL	ECN-19-514
B	ADDED SET SCREWS, UPDATED HANGERS	08/21/19	SMM	JMP	

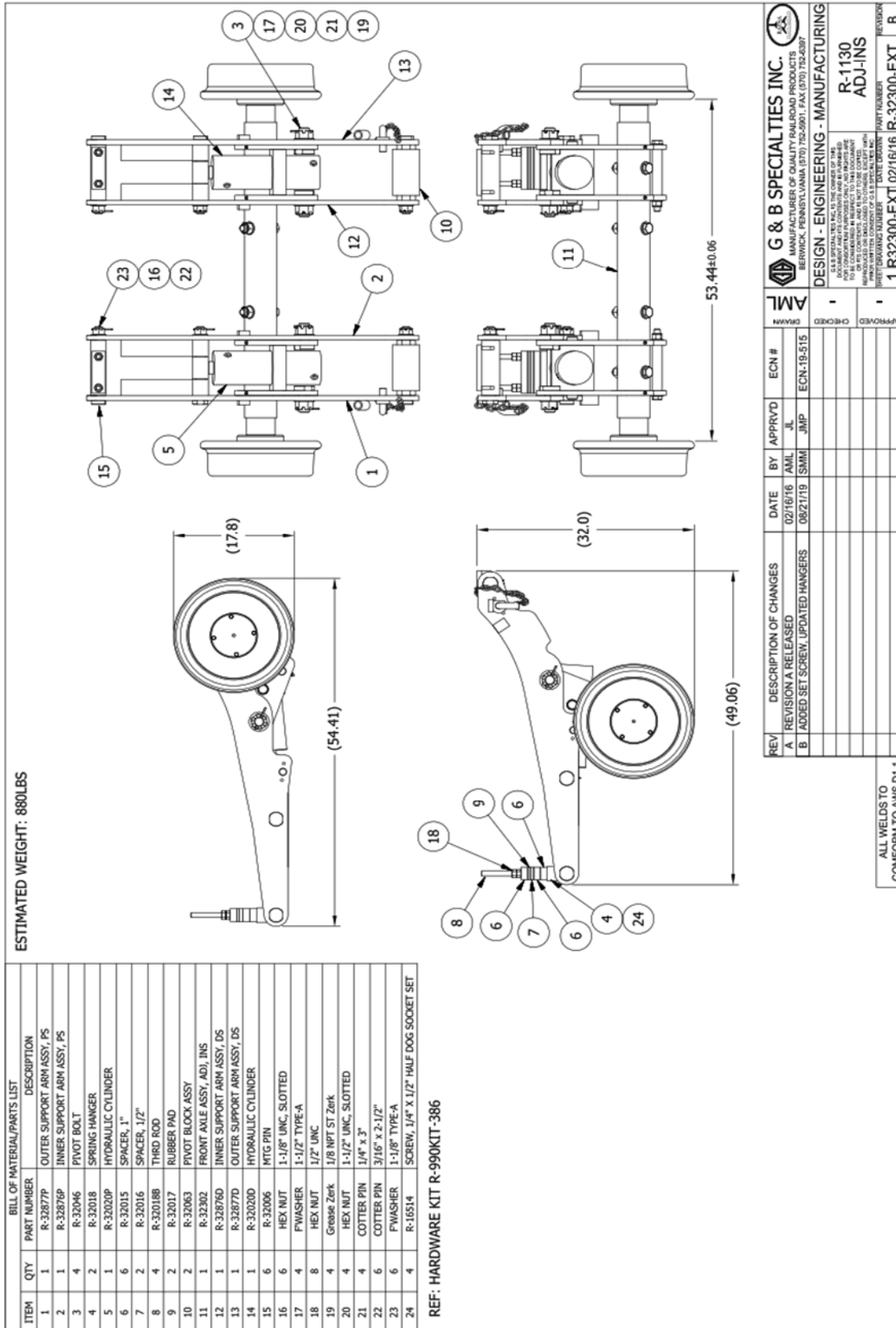
  

APPROVED	CHECKED	DATE ORDER	PART NUMBER	REVISION
		05/04/15	R-32300	B

**R-32300 (INSULATED ASSY)**

G&B Specialties Inc. 535 West 3<sup>rd</sup> Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397

US Field Service: 570-441-6988; CAN Field Service 570-854-0482; [www.rafna.com](http://www.rafna.com)



**R-32300-EXT (INSULATED EXTENDED ARM ASSY)**

**REF HARDWARE KIT: R-990KIT-275**  
**REF HARDWARE KIT: R-990KIT-385**

BILL OF MATERIAL/PARTS LIST	
ITEM	DESCRIPTION
2	4 R-14081 AXLE BOLT
3	2 R-31002 STUB AXLE ASSY, NON-INS
4	2 R-14087 SET SCREW
5	4 R-14088 LOCK NUT
6	2 R-32049 PIVOT ARM ASSY
7	2 R-32050 PIVOT ARM ASSY
8	2 R-32007 SPACER
9	1 R-32062 ALIGNMENT DECAL
10	8 FWASHER 1" TYPE-A GR.8
11	2 HEX NUT 1/2" UNC GR.8 JAM
12	2 LWASHER 1/2" GR.8
13	2 FWASHER 1/2" TYPE-A GR.8
14	12 GREASE ZERK 1/8 NPT
15	1 GREASE ZERK 1/8 NPT RELIEF
16	2 NYLOCK NUT 7/8" UNC GR.8 x 10.50"
17	2 H.H.C.S.
18	4 FWASHER 7/8" TYPE-A GR.8

**ASSEMBLY PROCEDURE**

1. ASSEMBLE ITEM #9 TO THE INSIDE OF ITEM #6 AS SHOWN
2. ASSEMBLE ITEMS #1, #6, #7 AND #8 AS SHOWN
3. ASSEMBLE ITEMS #1, AND #3 AS SHOWN

ESTIMATED WEIGHT: 650LBS

**R-32054 (NON-INSULATED AXLE ASSY)**

**G&B Specialties Inc.** 535 West 3<sup>rd</sup> Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397  
US Field Service: 570-441-6988; CAN Field Service 570-854-0482; [www.rafna.com](http://www.rafna.com)

ALL WELDS TO CONFORM TO AWS D1.1

-23-

**REF HARDWARE KIT: R-990KIT-275**  
**REF HARDWARE KIT: R-990KIT-385**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-14075A	AXLE TUBE
2	4	R-14081	AXLE BOLT
3	2	R-14071	STUB AXLE ASSY, INS
4	2	R-14087	SET SCREW
5	4	R-14088	LOCK NUT
6	2	R-32049	PIVOT ARM ASSY
7	2	R-32050	PIVOT ARM ASSY
8	2	R-32007	SPACER
9	1	R-32062	ALIGNMENT DECAL
10	8	F'WASHER	1" TYPE-A GR.8
11	2	HEX NUT	1/2" UNC GR.8 JHM
12	2	L'WASHER	1/2" GR.8
13	2	F'WASHER	1/2" TYPE-A GR.8
14	12	GREASE ZERK	1/8 NPT
15	1	GREASE ZERK	1/8 NPT RELIEF
16	2	NYLOCK NUT	7/8" UNC GR.8
17	2	H.H.C.S.	7/8" UNC GR.8 x 10.50"
18	4	F'WASHER	7/8" TYPE-A GR.8

**ASSEMBLY PROCEDURE**

- ASSEMBLE ITEM #9 TO THE INSIDE OF ITEM #6 AS SHOWN
- ASSEMBLE ITEMS #1, #6, #7 AND #8 AS SHOWN
- ASSEMBLE ITEMS #1 AND #3 AS SHOWN

**R-32302 (INSULATED AXLE ASSY)**

**ESTIMATED WEIGHT: 650LBS**

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

**DESIGN - ENGINEERING - MANUFACTURING**

ALL SPECIALS ARE TO THE ORDER OF AHS.  
FOR CONTRACTS AND APPROVALS, ALL REQUESTS  
FOR QUOTES, PARTS, AND INFORMATION, PLEASE  
CONTACT US AT THE CONTACT INFORMATION  
BELOW. WE WILL BE GLAD TO ASSIST YOU.  
TRADE SHOWS: CONTACT US AT THE CONTACT  
INFORMATION BELOW.

1 R32302 05/04/15 R-32302

APPROVED: [Signature]

DESIGNED: [Signature]

CHECKED: [Signature]

DATE: 05/04/15

BY: AML

APPRVD: JL

ECN #:

DESCRIPTION OF CHANGES:

REVISION A RELEASED

REV: A

ALL WELDS TO CONFORM TO AWS D1.1





**NOTES:**

- ASSEMBLE AS SHOWN.
- BEARINGS ARE TO BE PACKED WITH GREASE AT ASSEMBLY
- BEARING TORQUE PROCEDURE:
  - While rotating the rail wheel forward, torque the bearing nut to 20 ft-lbs., loosen nut and repeat.
  - Loosen the bearing nut and re-torque to 6 ft-lbs.
  - Check bearing end play with a magnetic dial indicator.
  - If bearing end play is not within the required specification, bearings should be re-torqued following the procedure outlined in steps A thru C.
- APPLY BEAD OF SILICONE ON HUB AND HUB CAP PRIOR TO ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-11062B	BEARING CONE	2
2	R-11091	OIL SEAL	1
3	R-14056	HUBCAP ASSY	1
4	R-11055	GASKET	1
5	L-WASHER	5/16" GR.8	4
6	H.C.S.	5/16" UNC GR.8 x 1"	4
7	R-11002	LOCK WASHER	1
8	R-11056	OUTER NUT	1
9	R-11057	LOCK WASHER	1
10	R-11003	INNER SPINDLE NUT	1
11	R-14055	BEARING WASHER	1
12	GREASE ZERK	1/8 NPT	1
13	R-14072	STUB AXLE	1
14	R-14030	16" CAST STEEL WHEEL, SHORT HUB, NON-INS	1
15	R-11062A	BEARING CLIP	2

HARDWARE KIT REF: R-990KIT-274

REV/DESCRIPTION OF CHANGES	DATE	BY	APPROVD	ECN #
A. REMOVED GR. RELIEF FIT FROM BOM	01/21/14	AML		
B. UPDATED ITEM TO	01/13/17	SMM		
C. ADDED NOTE TO WHEEL HUB	05/23/18	JEV	JMP	ECN-18-429
D. SPLIT BALLIONS, UPDATED BOM DESCRIPTIONS	07/26/19	SDB	JMP	ECN-19-483

AML	MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397
	DESIGN - ENGINEERING - MANUFACTURING
	STUB AXLE ASSY NON-INS
1	R31002
	01/21/14/R-31002
	D

**R-31002 (NON-INSULATED STUB AXLE ASSY)**

G&B Specialties Inc. 535 West 3<sup>rd</sup> Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397

US Field Service: 570-441-6988; CAN Field Service 570-854-0482; [www.rafna.com](http://www.rafna.com)



BILL OF MATERIAL/PARTS LIST	
ITEM	DESCRIPTION
1	BEARING
2	OIL SEAL
3	HUBCAP ASSEMBLY
4	GASKET
5	LOCK WASHER
6	OUTER NUT
7	LOCK WASHER
8	SPINDLE NUT INNER
9	BEARING WASHER
10	WHEEL INSULATED W/ BEARING CAPS
11	STUB AXLE
12	LOCK WASHER
13	H.H.C.S 5/16" X 1.00" HEX HEAD SCREW
14	GREASE ZERK 1/8 NPT ST ZERK

**NOTES:**

- ASSEMBLE AS SHOWN.
- BEARINGS ARE TO BE PACKED WITH GREASE AT ASSEMBLY
- BEARING TORQUE PROCEDURE:
  - While rotating the rail wheel forward, torque the bearing nut to 20 ft-lbs., loosen nut and repeat
  - Loosen the bearing nut and re-torque to 6 ft-lbs.
  - Check bearing end play with a magnetic dial indicator. End play should be within 0.001"-0.005"
  - If bearing end play is not within the required specification, bearings should be re-torqued following the procedure outlined in steps A thru C.
- APPLY BEAD OF SILICONE ON HUB AND HUB CAP PRIOR TO ASSEMBLY

NOTE 4

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A. REMOVED GR. RELIEF FIT. FROM BOM	07/15/09	JMP		
B. REVISED ITEM 11	09/03/09	AML		ECN-09-305
C. REVISED ITEM 11	01/16/17	SMM		ECN-17-041
D. ADDED NOTE ON WHEEL HUB	05/23/18	JEV	JMP	ECN-18-430

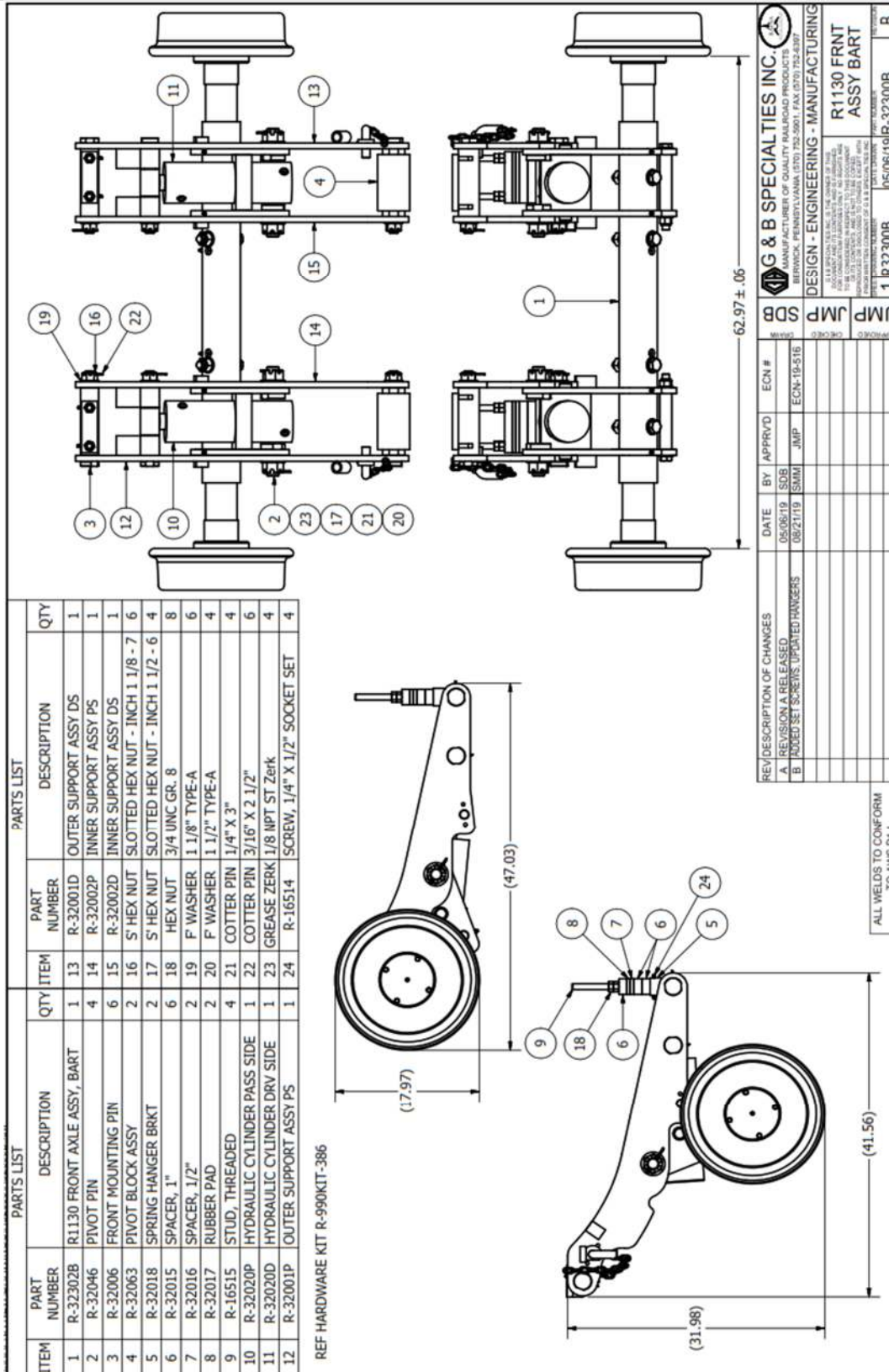
  

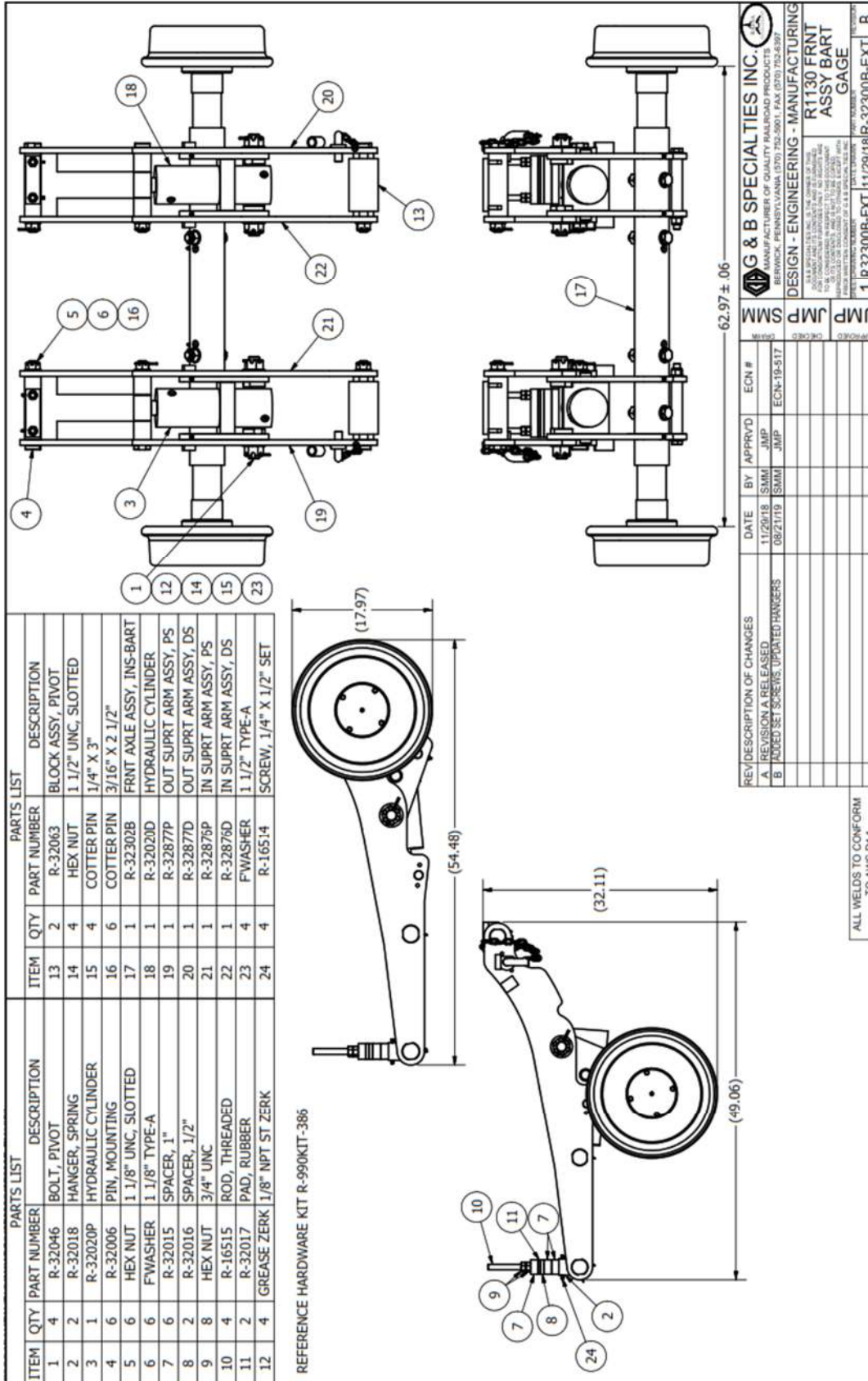
<b>JMP</b>	<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA 2701 752-5901 FAX (570) 752-6397
<b>DESIGN - ENGINEERING - MANUFACTURING</b>	<b>FRONT WHEEL ASSEMBLY INSULATED</b>
DATE OF APPROVAL: 07/15/09	REV. NUMBER: R-14071
1 R14071	07/15/09/R-14071
D	D

**R-14071 (INSULATED STUB AXLE ASSY)**

G&B Specialties Inc. 535 West 3<sup>rd</sup> Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397

US Field Service: 570-441-6988; CAN Field Service 570-854-0482; [www.rafna.com](http://www.rafna.com)

**BART GAUGE**




REFERENCE HARDWARE KITS:  
R-990KIT-275  
R-990KIT-385

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-140768	R1130 FRONT AXLE TUBE, BART
2	8	FWASHER	1" TYPE-A
3	2	HEX NUT	1/2" UNC JAM
4	2	L'WASHER	1/2" LOCK WASHER
5	2	R-14087	SCREW, SET
6	12	GREASE ZERK	1/8 NPT ST ZERK
7	1	GREASE ZERK	1/8 NPT ST ZERK RELIEF
8	2	R-32049	PIVOT ARM ASSEMBLY
9	2	R-32050	PIVOT ARM ASSEMBLY
10	2	R-32007	SPACER
11	2	NYLOCK NUT	7/8" UNC
12	2	H.H.C.S.	7/8" UNC X 10 1/2" GR. 8
13	1	R-32062	ALIGNMENT DECAL
14	2	R-14071BART	FRONT STUB AXLE ASSY, BART
15	4	R-14081	BOLT, AXLE
16	4	R-14088	NUT, LOCK
17	2	FWASHER	1/2" TYPE-A
18	4	FWASHER	7/8" TYPE-A

ASSEMBLY PROCEDURE:  
1. ASSEMBLE ITEM #13 TO THE INSIDE OF ITEM #8 AS SHOWN  
2. ASSEMBLE ITEMS #1, #8, #9 AND #10 AS SHOWN  
3. ASSEMBLE ITEMS #1 AND #14 AS SHOWN

ESTIMATED WEIGHT : 650.LBS

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	EON #
A. REVISION A RELEASED	11/28/18	SMM	JMP	

ALL WELDS TO CONFORM TO AWS D1.1

REVISIONS:

REV	DESCRIPTION	DATE	BY	APPRVD
1	R32302B	11/28/18	R	A



**NOTES:**

1. ALL BEARINGS MUST BE PACKED WITH GREASE ENSURING COMPLETE COVERAGE
2. INSTALL BEARING INTO THE FLANGE (INBOARD) SIDE OF WHEEL
3. PACK 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 GREASE INTO SPACE BETWEEN BEARINGS AND AXLE UNTIL FLUSH WITH OUTBOARD RACE
7. INSERT BEARING INTO OUTBOARD SIDE OF WHEEL
8. INSTALL INNER AXLE NUT
9. SET END PLAY BY DOING THE FOLLOWING:
  - A. TIGHTEN INNER AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
  - B. LOOSEN INNER AXLE NUT ONE FULL TURN
  - C. RETIGHTEN INNER AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
  - D. LOOSEN INNER AXLE NUT BY 30° (HALF A WRENCH FLAT).
10. INSTALL LOCK WASHER ENSURING THAT PIN IN AXLE NUT IS ALIGNED WITH A HOLE IN THE LOCK WASHER
11. INSTALL TABBED LOCK WASHER (DO NOT REUSE LOCK WASHERS)
12. INSTALL OUTER AXLE NUT, TORQUE TO 100 FT-LBS
13. VERIFY END PLAY OF WHEEL IS WITHIN .001" - .005"
14. BEND THREE TABS OF LOCK WASHER UPWARD TO PREVENT NUT ROTATION
15. FILL OUTBOARD CAVITY WITH GREASE
16. INSTALL HUBCAP AND SECURE WITH PROVIDED HARDWARE

**HARDWARE KIT: R-990KIT-274**

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-110628	BEARING	2
2	R-11051	OIL SEAL	1
3	R-14056	HUBCAP ASSEMBLY	1
4	R-11055	GASKET	1
5	LOCK WASHER	WASHER, 5/16" X 1.00" UNC Z/Y	4
6	H.H.C.S.	SCREW, 5/16" X 1.00" UNC Z/Y	4
7	R-11002	TABBED LOCK WASHER	1
8	R-11056	AXLE NUT, OUTER	1
9	R-11057	AXLE LOCK WASHER	1
10	R-11003	AXLE NUT, INNER	1
11	R-14055	BEARING WASHER	1
12	GREASE ZERK	1/8" NPT ST ZERK	1
13	R-14515	WHEEL INSULATED W/ RACES	1
14	R-140728	STUB AXLE, FRONT-BART	1

**REVISIONS:**

REV	DESCRIPTION OF CHANGES	DATE	BY	APPROVD	ECN #
A	REVISION A RELEASED	11/28/18	JMP	JMP	ECN-19-305
B	RECREATED DRAWING NOTES	05/07/19	SDB	JMP	

**ALL WELDS TO CONFORM TO AWS D1.1**

**G & B SPECIALTIES INC.**  
MANUFACTURER OF QUALITY RAILROAD PRODUCTS  
BERWICK, PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397  
DESIGN - ENGINEERING - MANUFACTURING

**FRONT STUB AXLE ASSY (BART 1)**

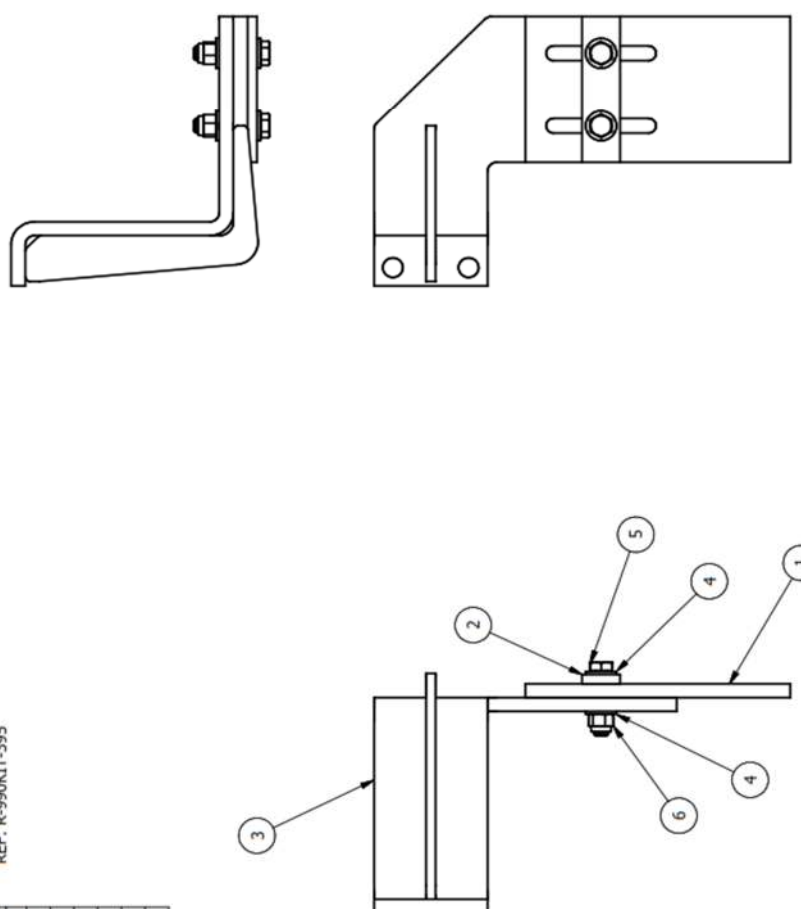
DATE PREPARED: 11/28/18  
DATE CHECKED: 11/28/18  
DATE APPROVED: 11/28/18

PREPARED BY: JMP  
CHECKED BY: SDB  
APPROVED BY: JMP

MISCELLANEOUS

REF: R-990KIT-395

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2411B	RUBBER SWEEP	1
2	R-5561A	SWEEPER PLATE	1
3	R-32079D	BRKT ASSY, DS	1
4	F'WASHER	3/8" GR.8	4
5	H.H.C.S.	3/8" UNC GR.8 x 1.75"	2
6	NYLOCK NUT	3/8" UNC GR.8	2



ALL WELDS TO CONFORM TO AWS D11

REV/DESCRIPTION OF CHANGES	DATE	BY	APPROVD	ECN #	MRG	CHKD	MRG/CHKD	REV
A REVISION A RELEASED	12/08/14	AML	JL					
B REVISED SWEEP TO R-2411B	02/06/15	JMP						

AML

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

DESIGN - ENGINEERING - MANUFACTURING

RAILSWEEP  
ASSY DRIVERS  
SIDE

1 R32075D 12/08/14 R-32075D B

R-32075D

BILL OF MATERIAL/PARTS LIST		DESCRIPTION	
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-2411B	RUBBER SWEEP
2	1	R-5561A	SWEEPER PLATE
3	1	R-32079P	BRKT ASSY, DS
4	4	FWASHER	3/8" GR.8
5	2	H.H.C.S.	3/8" UNC GR.8 x 1.75"
6	2	NYLOCK NUT	3/8" UNC GR.8

REF: R-990KIT-395

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	CHECKED	DATE DRAWN	PART NUMBER	REV/DRAW
A	REVISION A RELEASED	12/08/14	AML	JL						
B	REVISED SWEEP	02/06/15	JMP							

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

**DESIGN - ENGINEERING - MANUFACTURING**  
FOR ALL INFORMATION CONTACT THE DESIGN/ENGINEERING DEPARTMENT  
 FOR CONSTRUCTION INFORMATION CONTACT THE CONSTRUCTION DEPARTMENT  
 FOR SALES INFORMATION CONTACT THE SALES DEPARTMENT

1 R32075P 12/08/14 R-32075P

**RAILSWEEP  
 ASSY PASS  
 SIDE**

**R-32075P**







## OPERATION OF RAFNA GUIDE WHEEL UNIT



### 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.

### 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.

**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 50MPH WHILE ON TRACK.**

**RAFNA RAILGEAR, G&B SPECIALTIES (570) 752-5801**

**BERWICK, PA R-11210-1**



### 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



**R-11210 REV C**

R-11210-A REV C

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

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

R-11210-5

DAILY:

1. Visually inspect railgear unit for hydraulic leaks, loose fasteners, and excessive wear.
- y. 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.

**SAFETY FIRST**  
R-11210-9  
RAFNA  
WABTEC

**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

**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

