

PARTS, SERVICE AND INSTALLATION MANUAL R-1100 REAR RAILGEAR W/ 12IN WHEELS

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.

TABLE OF CONTENTS
DESCRIPTION

SECTION	<u>DESCRIPTION</u>	PG.
	Safety Precautions.....	1
1.0	Installation.....	3
	General Information.....	3
	Work Area:.....	3
	Truck Condition.....	3
	Preliminary Installation.....	4
	Hydraulic System Connection.....	4
	New Hydraulic System.....	4
	Existing Hydraulic System.....	4
	Front Railgear Installation.....	8
	Rear Railgear Installation.....	8
	Rear Spacer Installation.....	9
	Square Rear Railgear with Truck Axle.....	11
	Final Rear Installation.....	12
	Front to Rear Alignment.....	13
	Final Alignment.....	13
2.0	Optional Equipment.....	15
	Rail Sweeps.....	15
	Units with Brakes.....	15
	Units without Brakes.....	15
	6.1.1 Rail Sweep Adjustment.....	15
	Rear Railsweep Installation (with brakes).....	16
	Brakes.....	17
	Brakes - Plumbing Installation.....	17
	Brakes - Testing.....	17
3.0	Final Checklist.....	19
	Installation Check List.....	19
	Installation Summary.....	20
	Initial Instructions.....	20
	Hydraulic System Connection.....	20
	Rear Railgear Installation.....	20
	Spacer installation with Front Railgear on rails in track position.....	20
	Square Railgear with Truck Frame.....	20
	Final Rear Installation.....	20
	Front to Rear Alignment.....	21
	Rail Sweeps.....	21
	Brakes.....	21
	Final Checklist.....	21
4.0	Appendix.....	22
5.0	Parts.....	24
	Standard Gauge.....	24
	Miscellaneous.....	27

1.0 INSTALLATION

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 manoeuvre 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.

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.

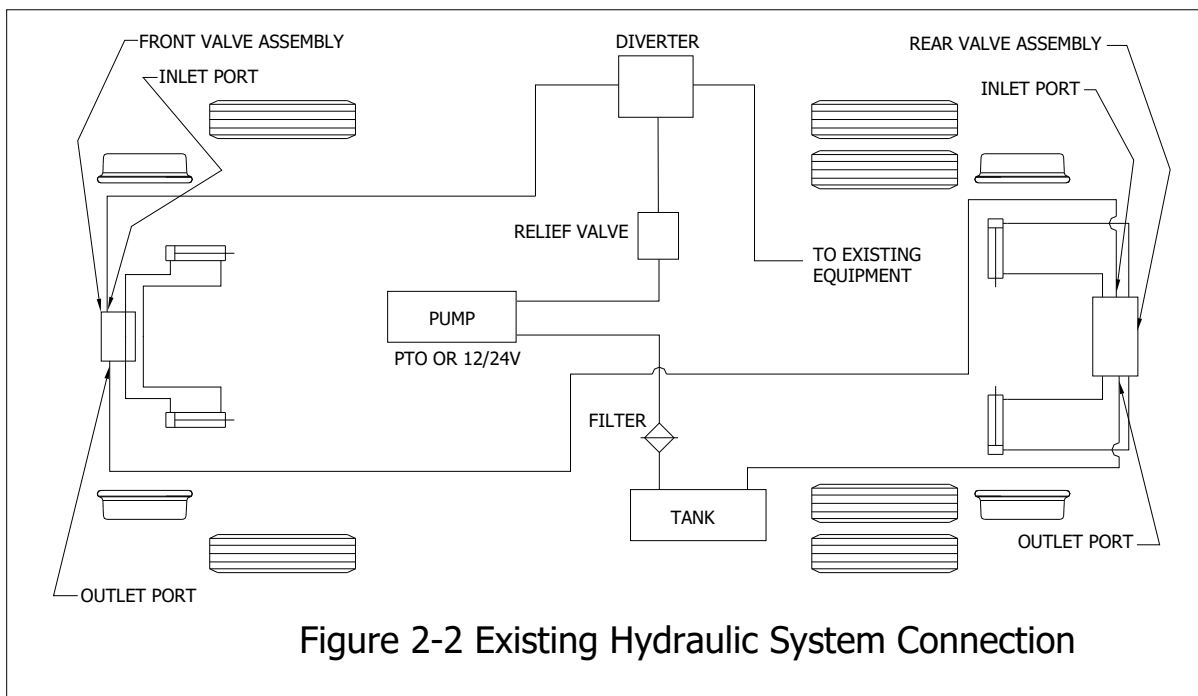
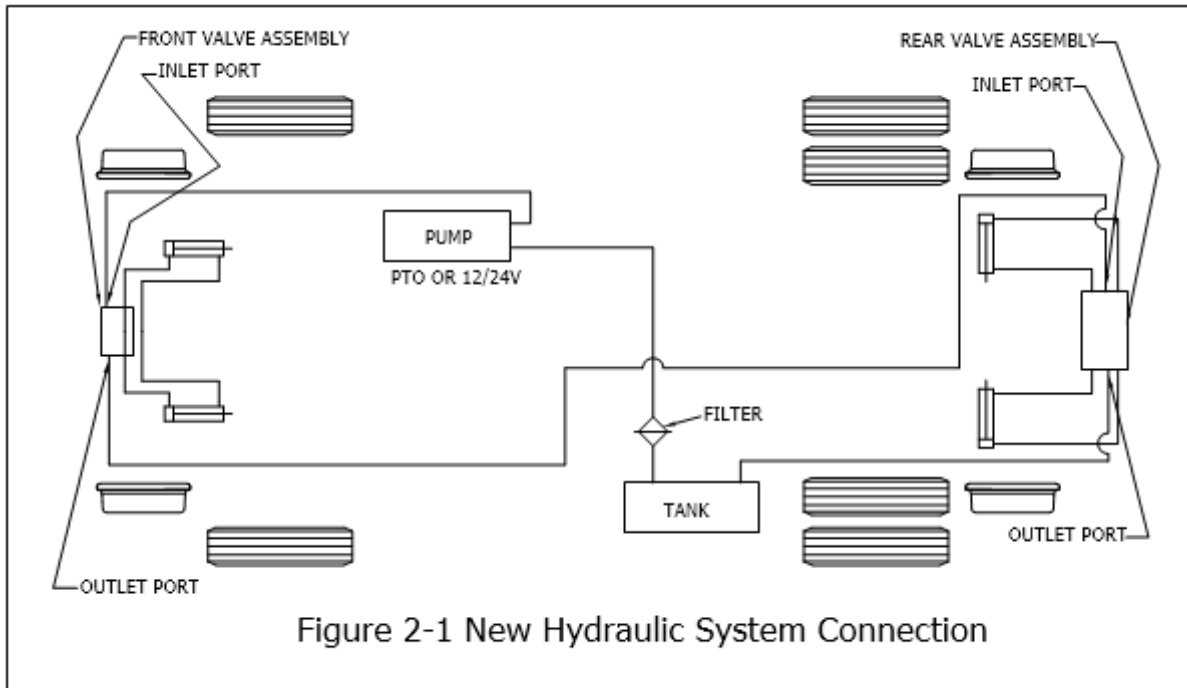
Existing Hydraulic System

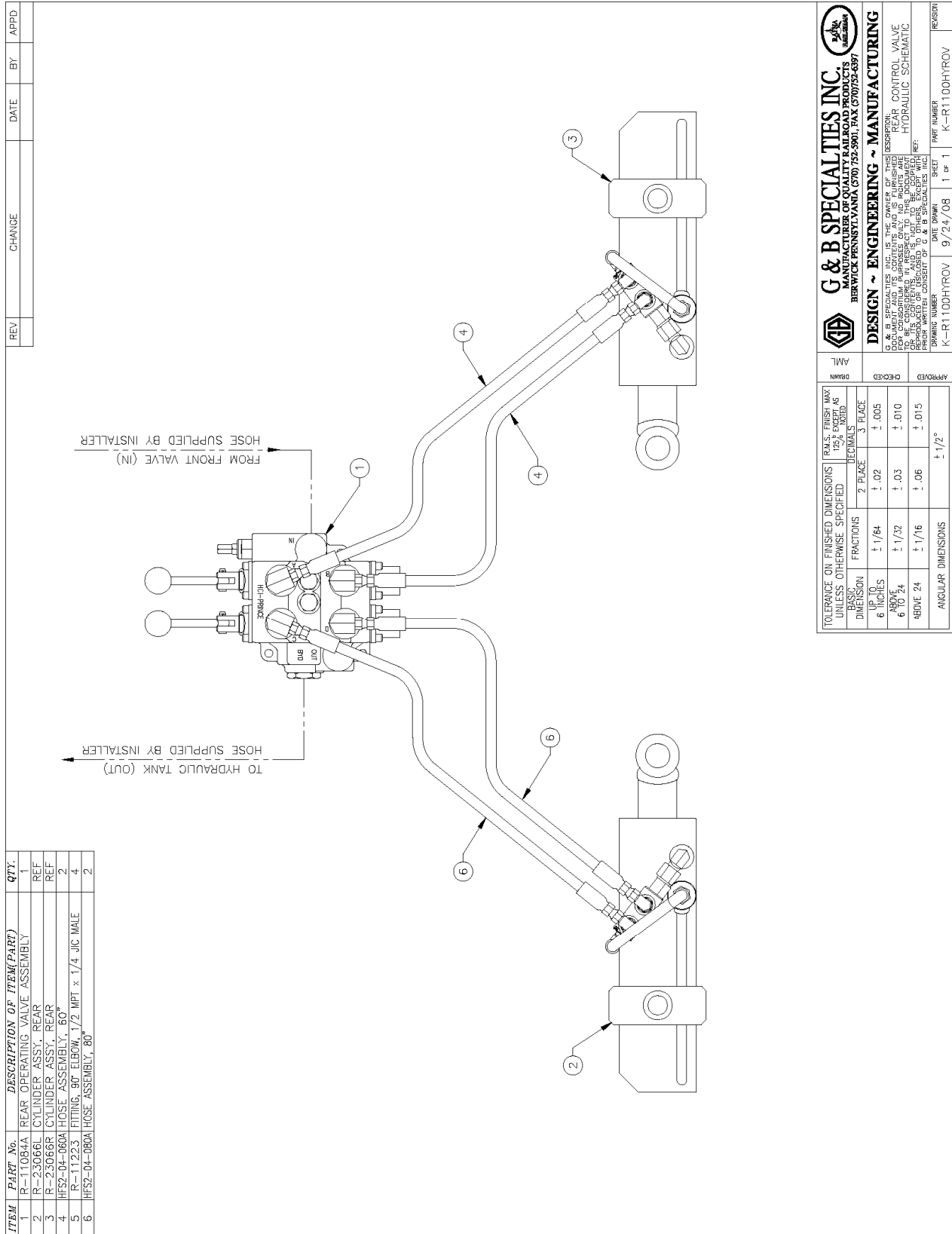
If the truck has an existing hydraulic system, install an appropriately sized diverted valve in the pressure line after the pump and before any existing equipment valves. One-outlet routes to the existing valves and the other to the center of the front bumper. The in port of the hydraulic control valve 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 2000 PSI at the relief and the rear valve is pre-set to 1500 PSI. All other components supplied by G&B Specialties are rated 2500 PSI.

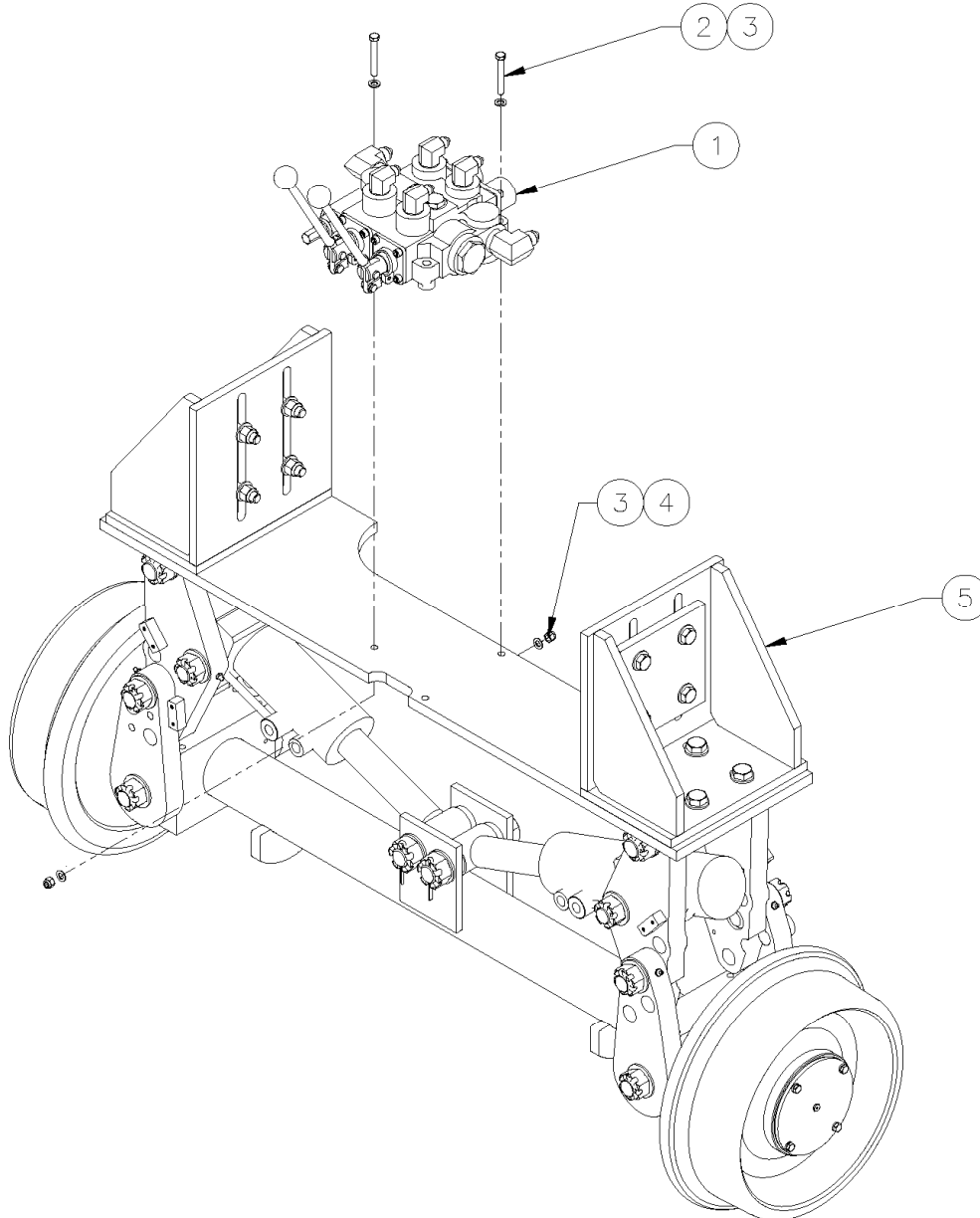
Care must be exercised that the relief pressures at the valves don't exceed this. To ensure proper system pressure, check with a gauge





ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-11084A	REAR OPERATING VALVE ASSEMBLY	1
2	H.H.C.S.	3/8" UNC GR.8 X 2.75" Lg	2
3	F'WASHER	3/8" TYPE-B GR.8 NARROW	4
4	NYLOCK NUT	3/8" UNC GR.8	2
5	-	R-1100 REAR UNIT	REF

REV	CHANGE	DATE	BY	APPD



TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		R.A.S. FINISH MAX 125µ EXCEPT AS NOTED	
BASIC DIMENSION	FRACTIONS	DECIMALS	
		2 PLACE	3 PLACE
UP TO 6 INCHES	± 1/64	± .02	± .005
ABOVE 6 TO 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS		± 1/2°	

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DRAWN: AVML CHECKED: APPROVED:	DESCRIPTION: REAR OPERATING VALVE INSTALLATION	DATE DRAWN: 9/23/08	SHEET: 1 of 1
DRAWING NUMBER: K-R1100ROVI	PART NUMBER: K-R1100ROVI	REVISION: B	

FRONT RAILGEAR INSTALLATION

Install front railgear per front railgear installation manual.

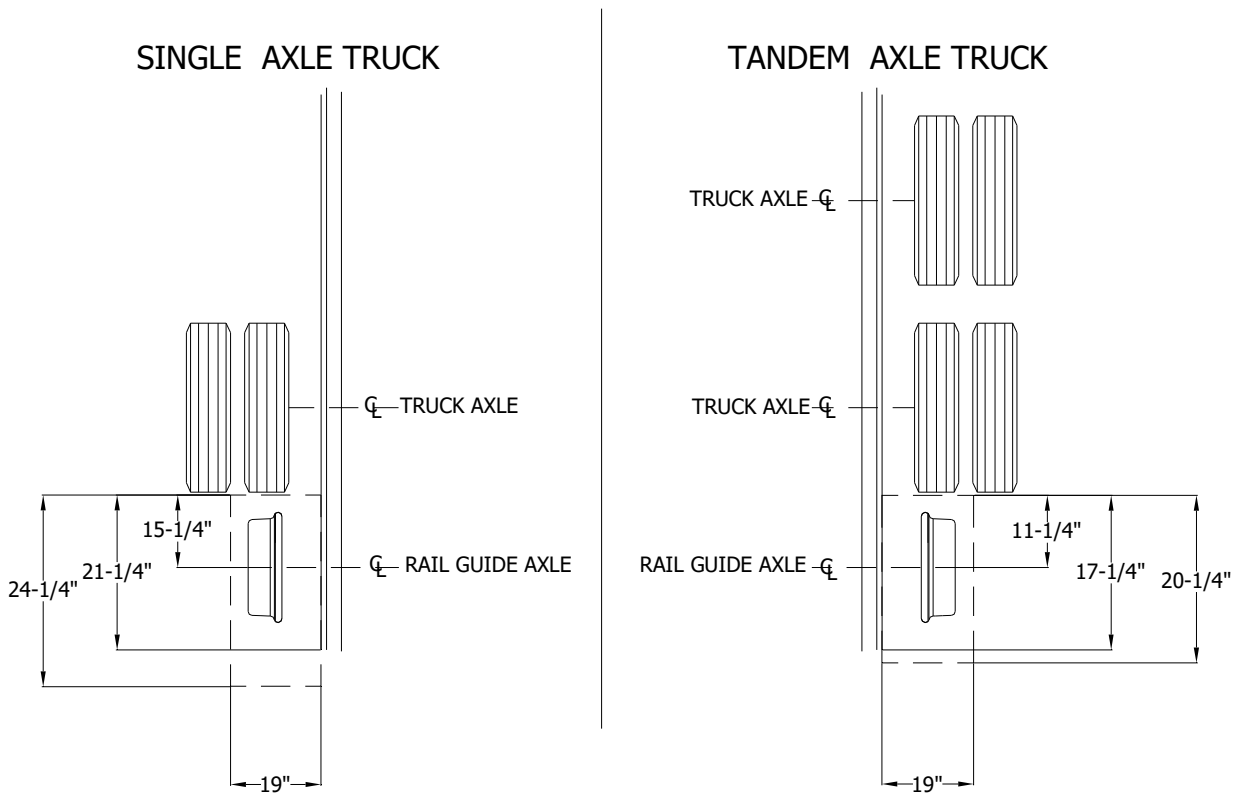
REAR RAILGEAR INSTALLATION

NOTE

It is important to check truck tire pressure (especially the rear tires) be sure that the tire pressure is brought to 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, 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"

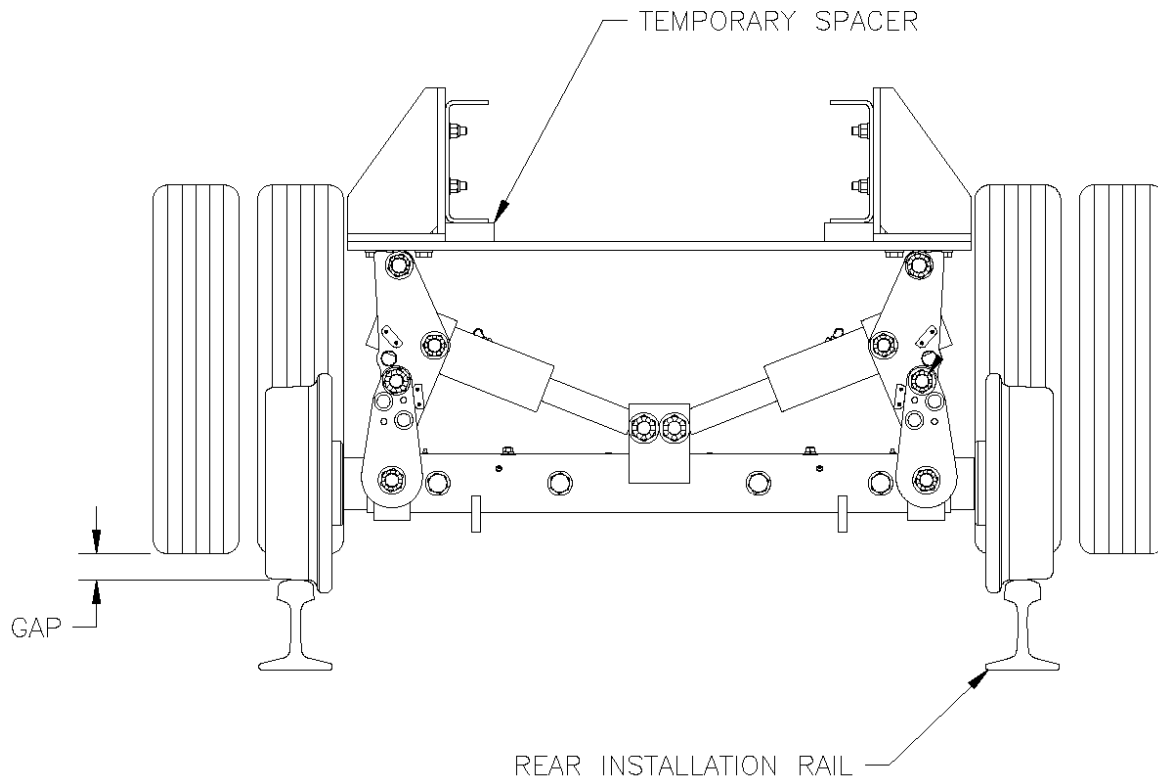


If the truck frame does not extend a minimum of 21 ¼" for a single axle or 17 ¼" for a tandem axle trucks, it should be extended to provide the necessary clearance for mounting the railgear.

In addition, because the railgear typically drops straight down, but can also articulate from side to side to allow alignment of the vehicle with the rail, a clear space must extend out from the frame outward on either side of 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.



NOTE

With the rear railgear in position, temporarily secure it 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. 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:

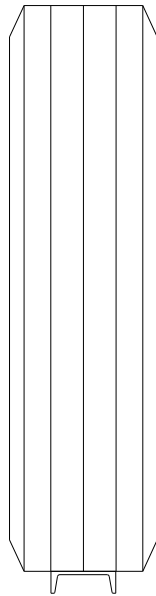
$$\text{Calculated Spacer Thickness} = (6.0'' - \text{Gap}) \times .6$$

The following table shows the calculated spacer thickness given a certain gap. (This table is given as an example. The actual gaps may include fractions and the spacer thickness will need to be calculated for that specific gap)

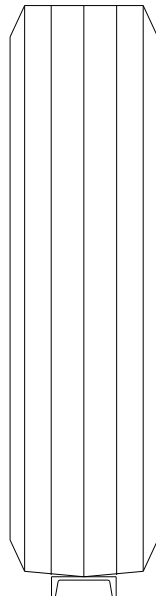
If Gap =	Spring and Tire Deflection (6.0" -Gap)	Calculated Spacer Thickness (6.0 -Gap) x .6
5"	1"	3/4"
4"	2"	1 1/4"
3"	3"	1 3/4"
2"	4"	2 3/8"
1"	5"	3"

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 tire to the installation rails). Replace the temporary 6" spacers with the permanent calculated spacers and tack in place onto the rear railgear mounting plate. These permanent spacers should be solid steel pieces because the wheel will experience the full structural loads seen by the Rear frame.

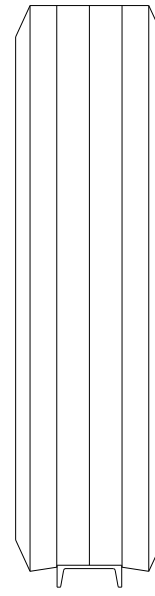
Extend the rear railgear to the rail position (which will raise the truck frame). The truck inner duals should be flat to slightly cupping the installation rails. Too much weight on these tires (truck frame too low) will cause rapid tire wear. Not enough weight (truck frame too high) will cause spin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



FRAME SET PROPERLY



FRAME TOO HIGH



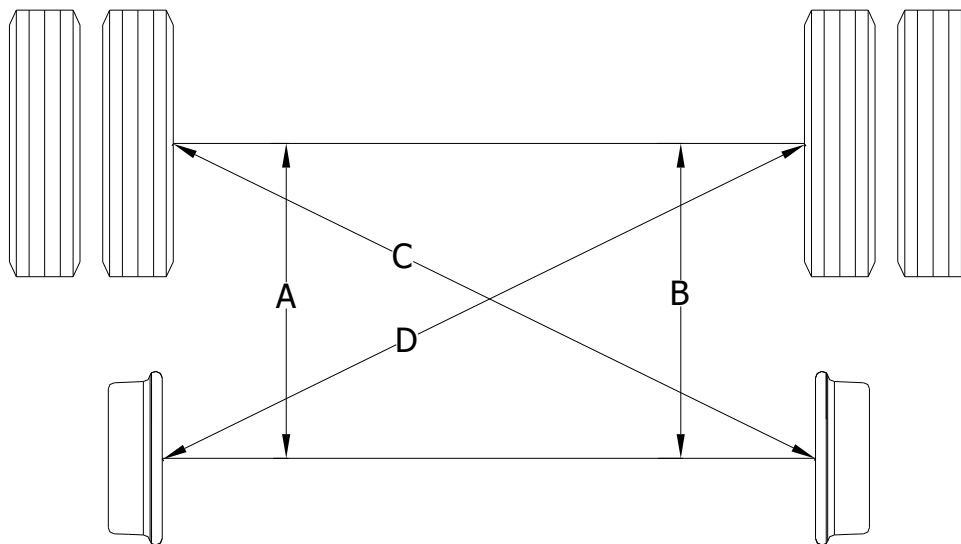
FRAME TOO LOW

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

SQUARE REAR RAILGEAR WITH TRUCK AXLE

Once the proper height and tire to railgear location has been achieved, the rear railgear needs to be made square with the rear truck axle. Four measurements must be taken to ensure this requirement.

1. The distance from the truck axle to the Rear Railgear at both ends. Distance "A" must be equal to "B" (within 1/16").
2. The diagonal distance from the truck axle to the opposite side of the Rear Railgear. Distance "C" must equal "D" (within 1/8")



NOTE

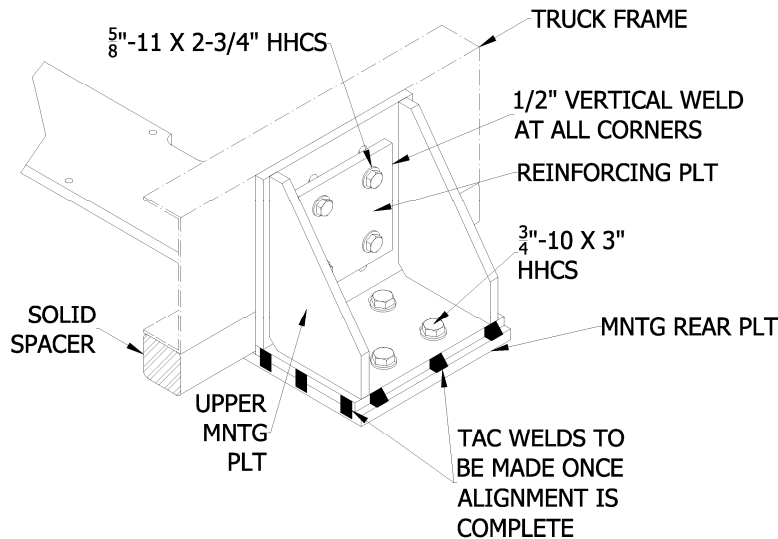
Although the previous mounting conditions and alignment may be met, be certain that enough room exists between the rear railgear and other equipment. In general, this should include a 2" clearance around the Railgear (more if equipped with remote pin offs). Also, ensure that there is clearance to remove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

FINAL REAR INSTALLATION

NOTE

If more than 1/16" of space exists between the truck frame and the rear railgear mounting plate, it will be necessary to install shim plates to center the railgear. These should be 12"x12" shims of the proper thickness, with equal thickness on both sides.

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 (through the shims, if necessary) and truck frame with 5/8"-11 grade 8 bolts and Nylok nuts. Tack Weld the mounting plate to the rear railgear Mounting Plate. If re-adjustments 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.



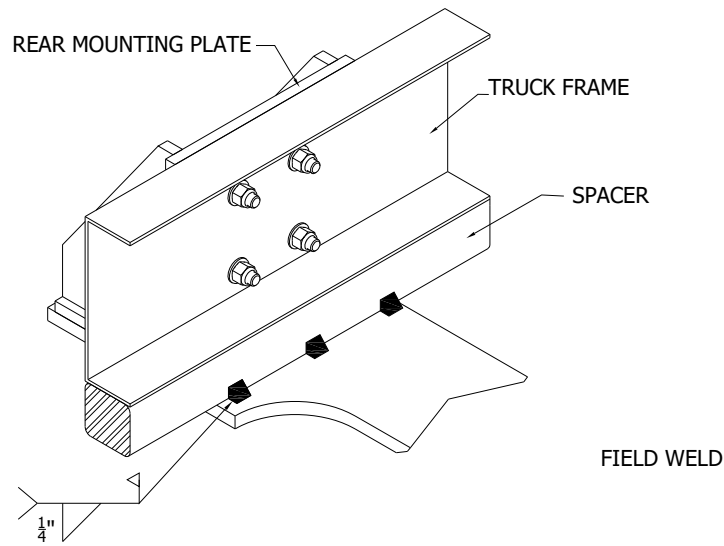


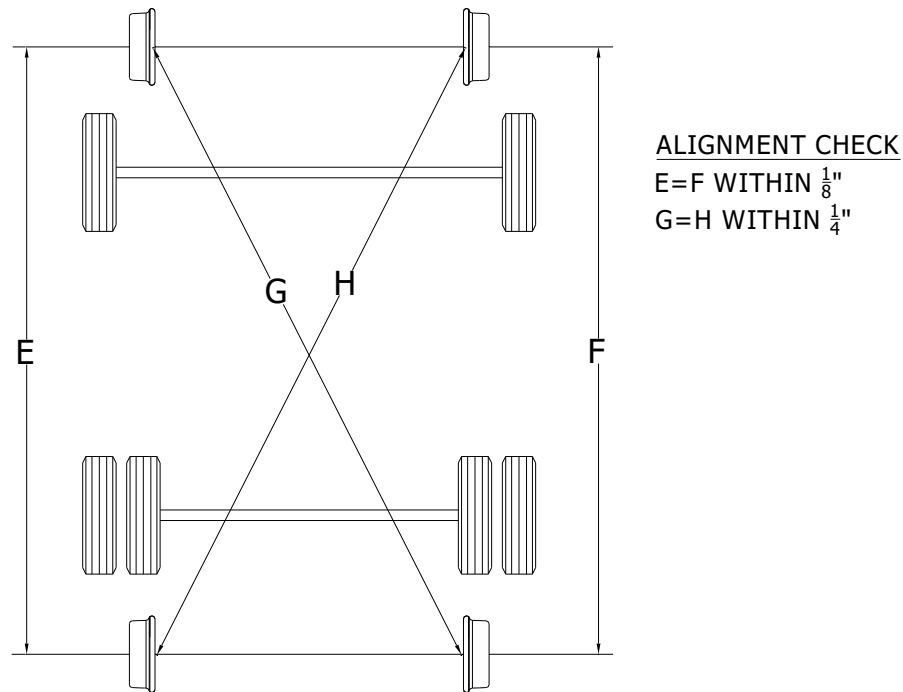
FIGURE 4-6 WELDING OF SPACER

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 5-1, 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 5-1, distance "G" must be equal to "H" (within 1/4"))



After the front and rear railgear have been properly aligned, complete structural welds may be applied at the locations that were previously only tacked:

- On the front railgear, between the frame mounting brackets and frame (or frame extensions, if required).
- On the front railgear between the axle tube and the lower portion of the clamp assembly.

2.0 OPTIONAL EQUIPMENT

RAIL SWEEPS

Units with Brakes

On units equipped with brakes, front and/or rear, the rail sweeps are integrated into the brake assemblies.

Units without Brakes

On units without brakes, the front rail sweeps are supplied loose with the unit and are to be welded to the front axle tube as shown. The front rail sweeps should be located and welded to the front railgear axle when the unit is in the rail position and the rubber sweep should be perpendicular to the rail head.

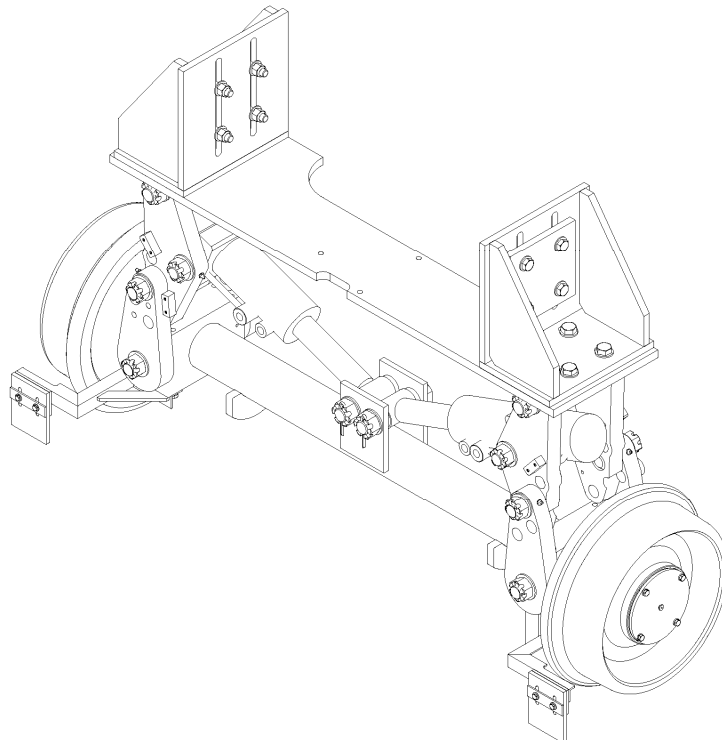
The rear rail sweeps are bolted to the rear axle as shown.

6.1.1 Rail Sweep Adjustment

Adjust the rubber sweep so that it is slightly touching the rail head.

Rear Railsweep Installation (without brakes)

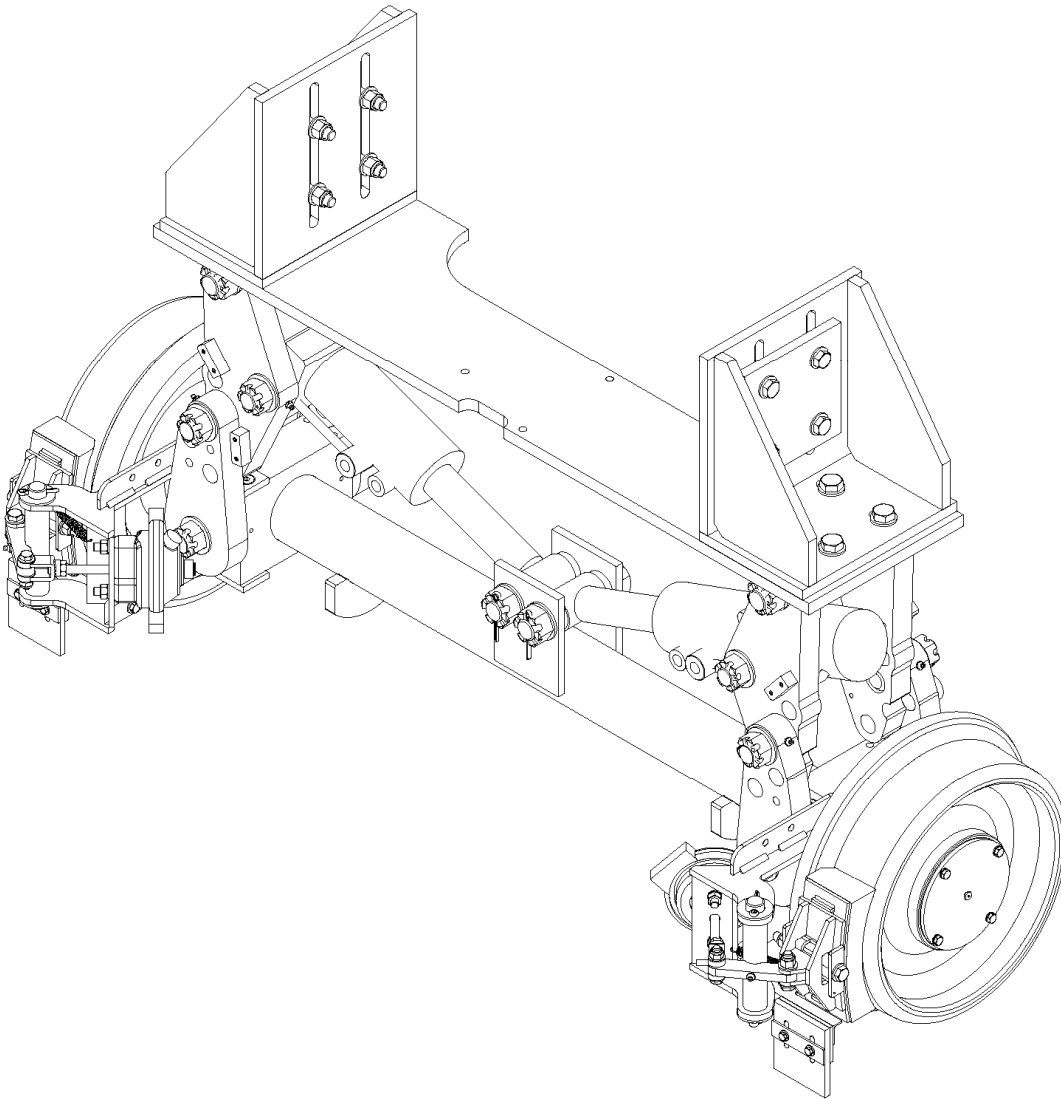
The rear railsweep assemblies are shipped loose and are to be located and bolted to the rear axle assembly as shown when the unit is in the rail position and should be parallel with the rail as shown.



Rear Railsweep Installation (with brakes)

The rear brake assemblies are shipped loose and are to be located and bolted to the rear axle assembly as shown when the unit is in the rail position and should be parallel with the rail as shown.

The rear brakes should not be installed until after all the rear railgear unit is installed and aligned to the truck and the proper rear railgear weight is achieved.



BRAKES

NOTE

If the rear brake kit was purchased, please see rear brake installation manual for complete details on how to install. This is used to give a brief over-view of the procedure.

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.

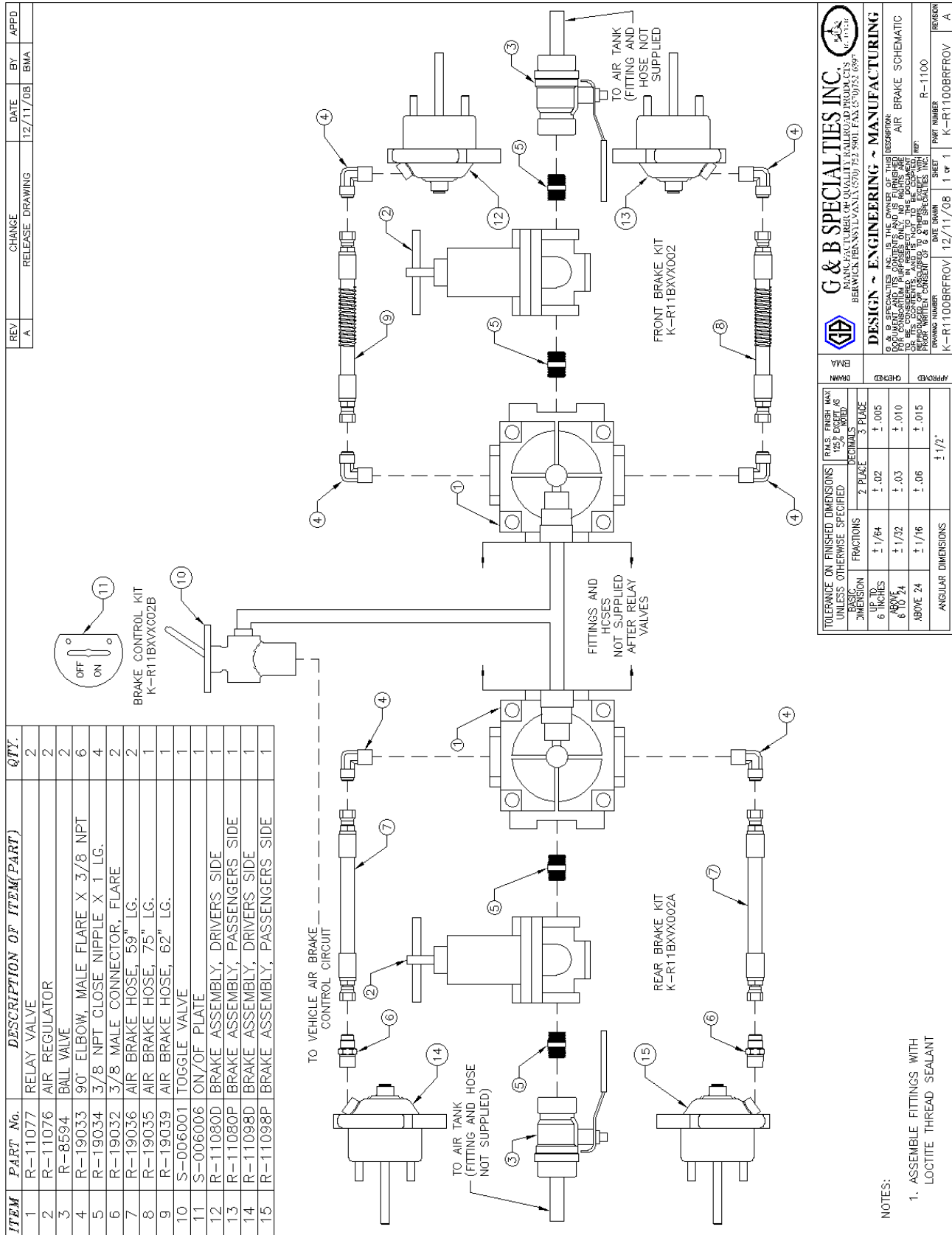
Install airlines and valves as shown in **Air Brake Schematic**. Make certain that the front air brake pressure regulator is set to 75 PSI and the rear air brake pressure regulator is set to 30 PSI.

Brakes - 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.



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NOTES: 1. ASSEMBLE FITTINGS WITH LOCTITE THREAD SEALANT																								

3.0 FINAL CHECKLIST

INSTALLATION CHECK LIST

- Rail test the vehicle to check for good traction and braking. A good 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.
- Check tire pressures
- Front Alignment
 - Front mounting Pin height: 22" - 23 ½"
 - Rear mounting Pin height: 10 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")

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 ¼")
- 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

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

4.0 APPENDIX

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 on the rail
- 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

Daily Inspection

- Hydraulic fittings and hoses for leaks
- Check that slotted nuts are secured with cotter pins
- All hoses should be secured away from moving parts and exhaust system
- Check for rail wheel wear and flange wear

During operation, listen for unusual noises or vibrations

Weekly Inspection

- Grease all fittings on railgear. There are 6 locations on the front railgear and 14 locations on the rear railgear
- Check the hydraulic fluid level. Fill with Union Oil Rx 46 or equal
- Inspect the bearing grease every 200 miles or 6 months or whichever comes first
- Remove the hubcaps from the rail wheels; inspect for deterioration or loss of bearing grease. Unless a bearing problem is suspected, the cavity may be topped off with suitable bearing grease without removing and repacking the bearings
- Check the alignment by watching the way the vehicle tracks on the rail. It should float from one side to the other and not crowd to one side of the track

Annual Inspection

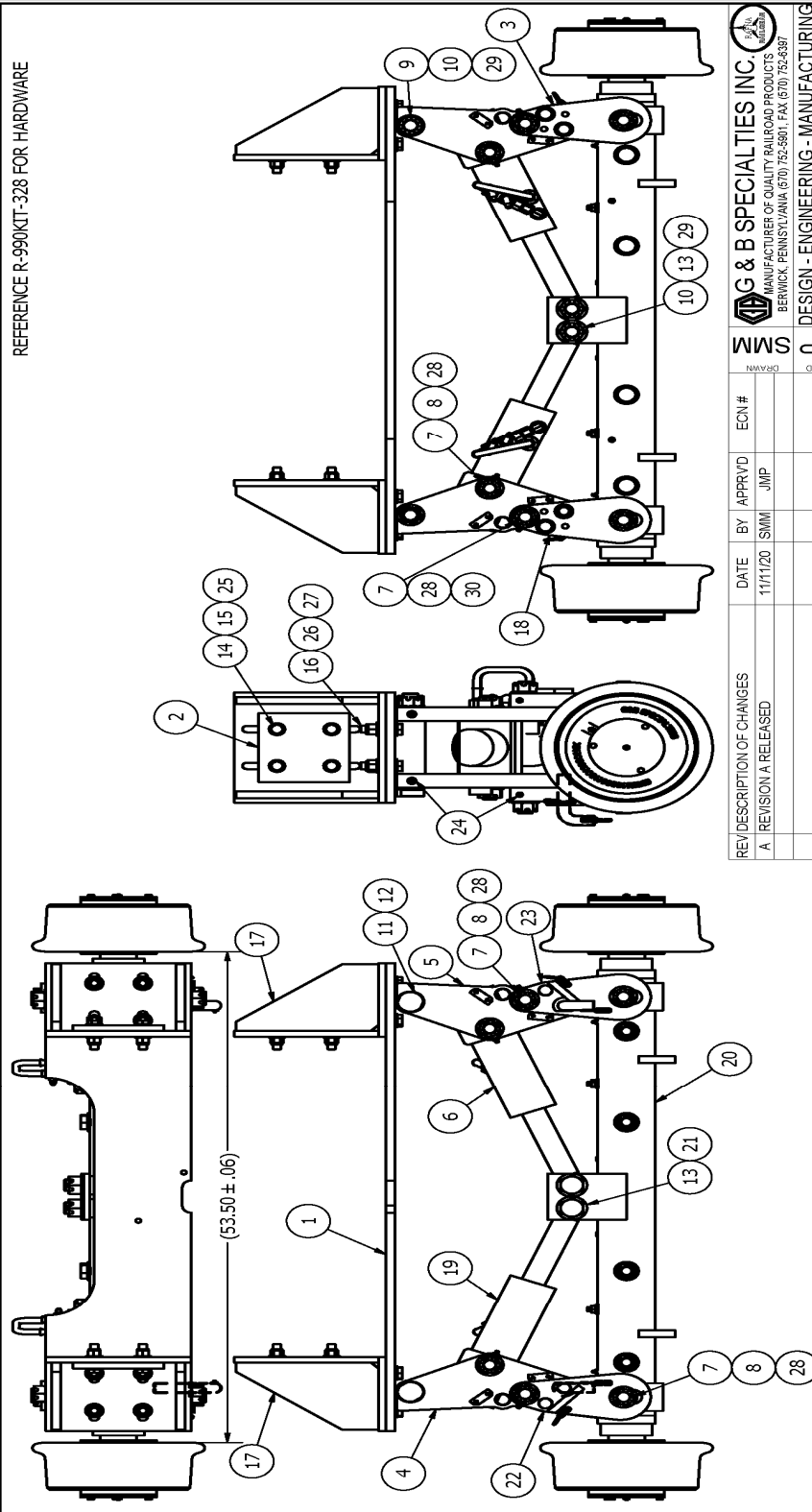
- Replace the hydraulic oil filter
- Repack wheel bearings
- Replace wheel bearing seals

5.0 PARTS

STANDARD GAUGE

PARTS LIST			PARTS LIST			PARTS LIST				
ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION		
1	R-11004	UPPER FRAME ASSEMBLY	1	11	R-11007A	WASHER PIVOT BOLT	2	21	R-14082	LOWER PIVOT BOLT
2	R-11054	SUPPORT PLATE	2	12	R-11006	PIVOT BOLT	2	22	R-32870	LOWER LINK, MANUAL PIN-OFF
3	R-23082	LOWER LINK ASSEMBLY, P.S.	1	13	990600-125-002	WASHER, 1 1/4" NARROW FLAT Z/Y	4	23	R-32871	LOWER LINK, MANUAL PIN-OFF
4	R-11196D	UPPER LINK D.S.	2	14	990729-275-12	SCREW, 5/8" X 2 3/4" GR 5 HEX CAP Z/Y	8	24	990900-009	FITTING, 1/8" STR PTF
5	R-11196P	UPPER LINK P.S.	2	15	990316-062-12	NUT, 5/8" GR 5 HEX NYLOCK Z/Y	8	25	990600-062-002	WASHER, 5/8" NARROW FLAT Z/Y
6	R-23066L	HYDRAULIC CYLINDER ASSY	1	16	990731-300-22	SCREW, 3/4" X 3" GR 8 HEX Z/Y	8	26	990600-075-002	WASHER, 3/4" SAE FLAT Z/Y
7	990312-112-02	NUT, 1 1/8" HEX SLIT Z/Y	12	17	R-11005	MOUNTING BRACKET, UPPER FRAME	2	27	990316-075-22	NUT, 3/4" GR 8 HEX NYLOCK Z/Y
8	990600-112-002	WASHER, 1 1/8" NARROW FLAT Z/Y	12	18	R-23083	LOWER LINK ASSEMBLY, D.S.	1	28	990507-200-02	COTTER PIN, 5/32" X 2" Z/C
9	R-11007	WASHER, PIVOT BOLT	2	19	R-23066R	HYDRAULIC CYLINDER ASSY	1	29	990510-250-02	COTTER PIN, 7/32" X 2 1/2" Z/Y
10	990312-125-02	NUT, 1 1/4" REG HEX SLIT Z/Y	4	20	R-31041	REAR AXLE ASSY, ADJ, INSULATED	1	30	R-11008	WASHER

REFERENCE R-990KIT-328 FOR HARDWARE



R-31040 (INSULATED, MANUAL PIN ASSY)

REVISIONS	DATE	BY	APPROVED	ECN #
A	11/11/20	SMM	JMP	
REVISION DESCRIPTION				
A	REVISION A RELEASED			

DESIGN - ENGINEERING - MANUFACTURING

R1100 REAR, INS, SLOTTED, 12" WHEEL

APPROVED: JMP
CHECKED: SMP
DRAWN: SMM

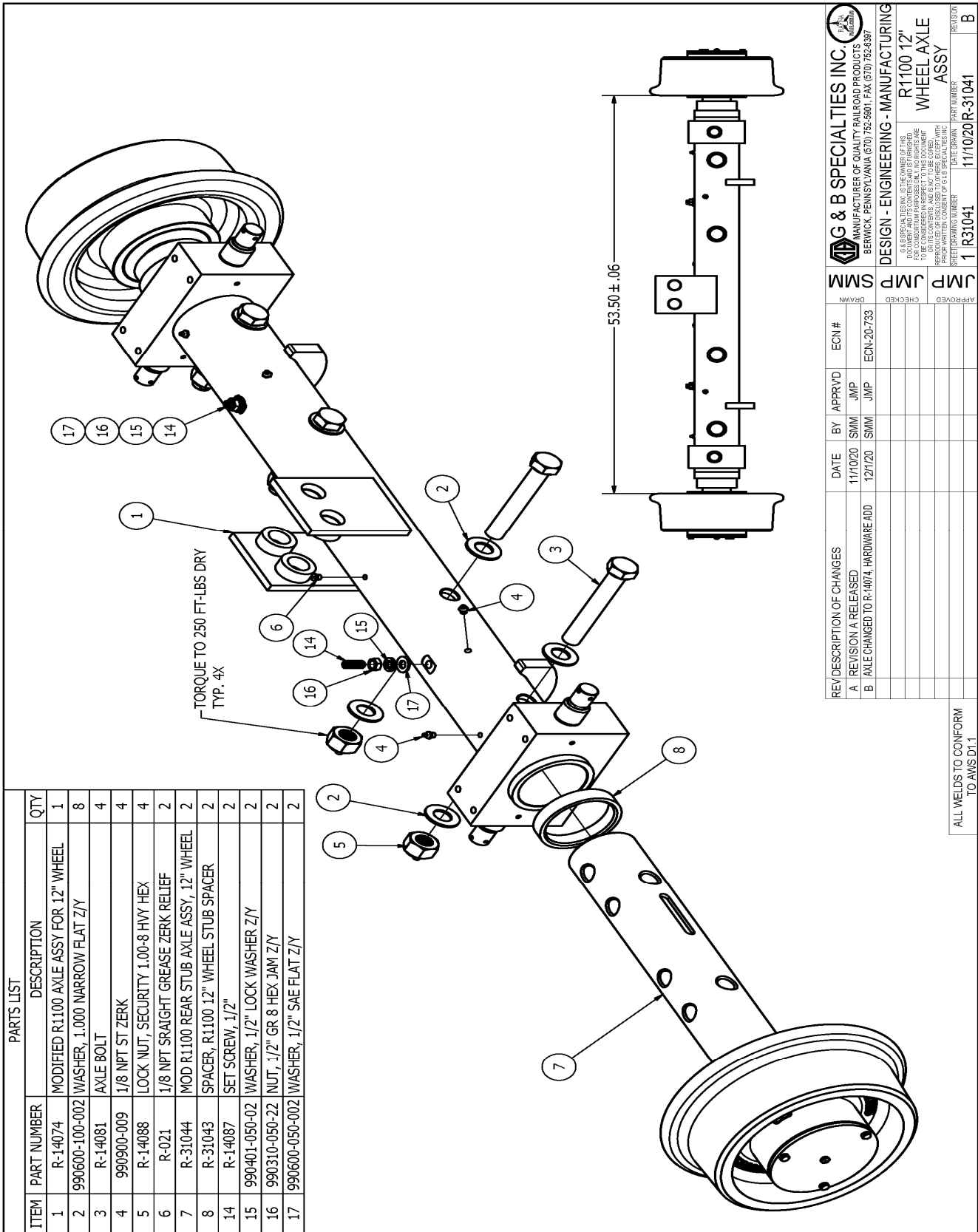
G & B SPECIALTIES INC. BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397

MANUFACTURER OF QUALITY RAILROAD PRODUCTS

G & B SPECIALTIES INC. IS THE OWNER OF THIS DOCUMENT. IT IS TO BE USED ONLY FOR THE PROJECT AND FOR WHICH IT WAS DEVELOPED. IT IS TO BE CONSIDERED IN RESERVE. THIS DOCUMENT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF G & B SPECIALTIES INC.

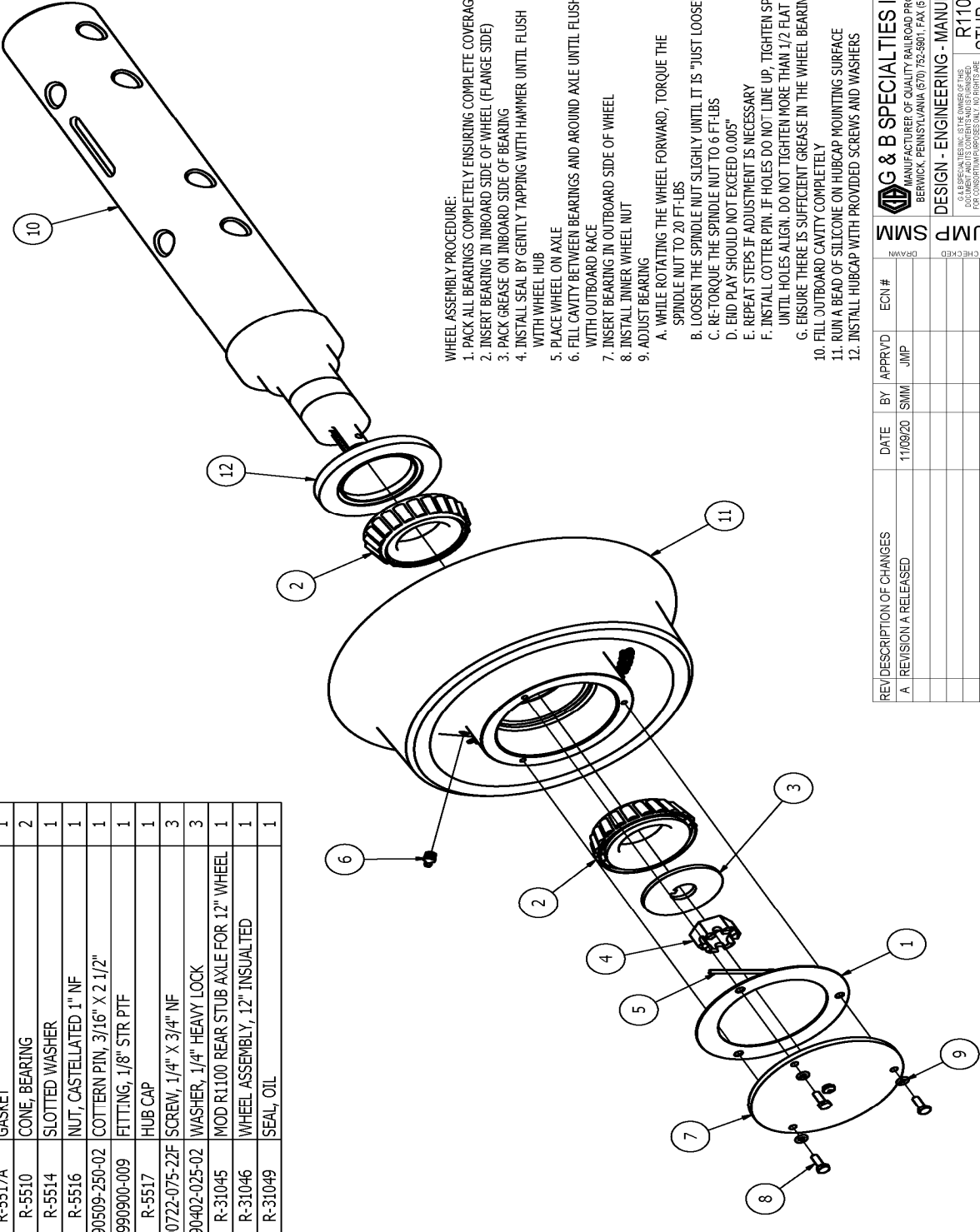
REV: 001

1 | R31040 | 11/11/20 | R-31040 | A



R-31041 (INSULATED AXLE ASSY)

PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-5517A	GASKET	1
2	R-5510	CONE BEARING	2
3	R-5514	SLOTTED WASHER	1
4	R-5516	NUT, CASTELLATED 1" NF	1
5	990509-250-02	COTTERN PIN, 3/16" X 2 1/2"	1
6	990900-009	FITTING, 1/8" STR PTF	1
7	R-5517	HUB CAP	1
8	990722-075-22F	SCREW, 1/4" X 3/4" NF	3
9	990402-025-02	WASHER, 1/4" HEAVY LOCK	3
10	R-31045	MOD R1100 REAR STUB AXLE FOR 12" WHEEL	1
11	R-31046	WHEEL ASSEMBLY, 12" INSUALTED	1
12	R-31049	SEAL, OIL	1



WHEEL ASSEMBLY PROCEDURE:

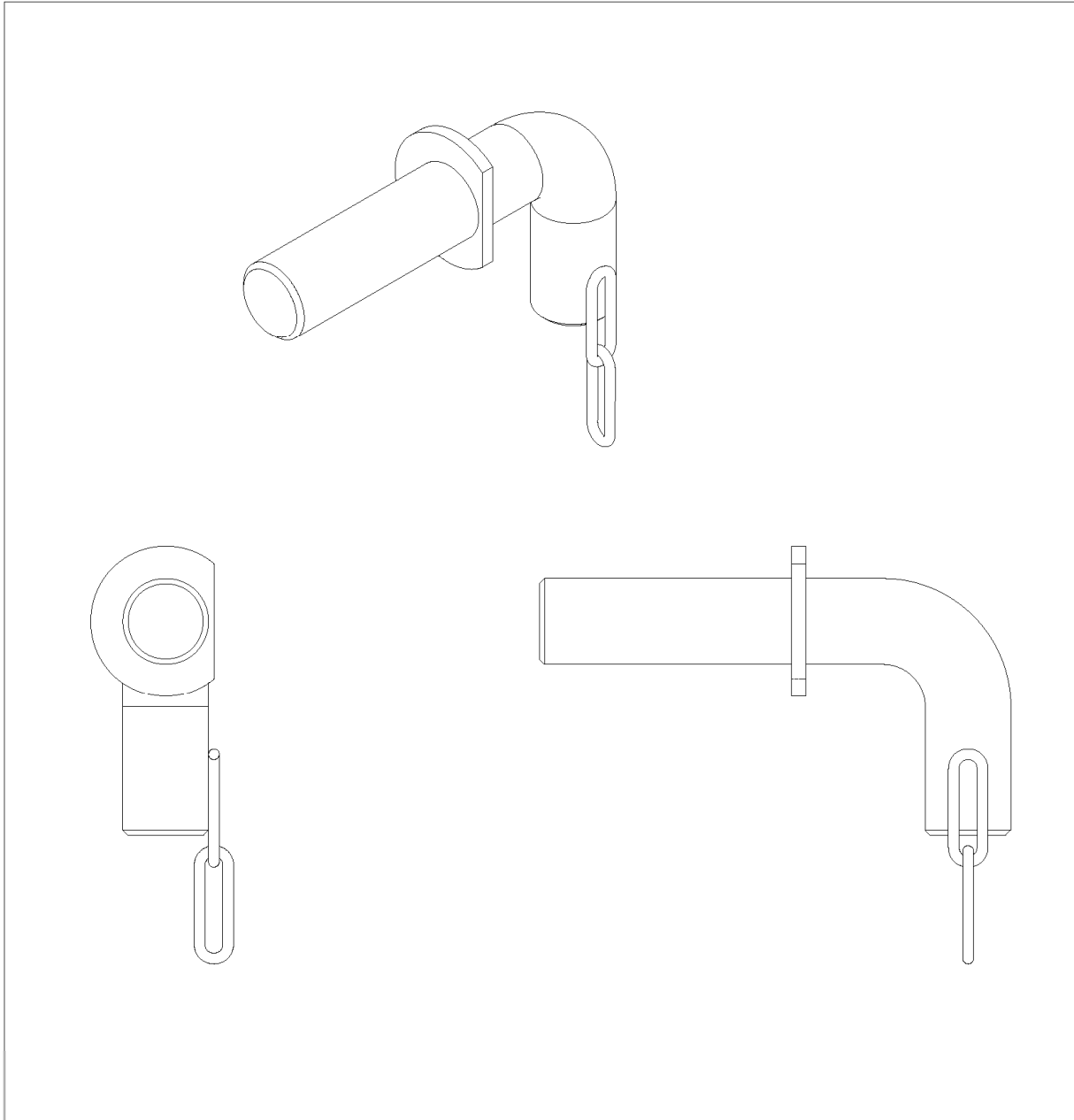
1. PACK ALL BEARINGS COMPLETELY ENSURING COMPLETE COVERAGE
2. INSERT BEARING IN INBOARD SIDE OF WHEEL (FLANGE SIDE)
3. PACK GREASE ON INBOARD SIDE OF BEARING
4. INSTALL SEAL BY GENTLY TAPPING WITH HAMMER UNTIL FLUSH WITH WHEEL HUB
5. PLACE WHEEL ON AXLE
6. FILL CAVITY BETWEEN BEARINGS AND AROUND AXLE UNTIL FLUSH WITH OUTBOARD RACE
7. INSERT BEARING IN OUTBOARD SIDE OF WHEEL
8. INSTALL INNER WHEEL NUT
9. ADJUST BEARING
 - A. WHILE ROTATING THE WHEEL FORWARD, TORQUE THE SPINDLE NUT TO 20 FT-LBS
 - B. LOOSEN THE SPINDLE NUT SLIGHTLY UNTIL IT IS "JUST LOOSE"
 - C. RE-TORQUE THE SPINDLE NUT TO 6 FT-LBS
 - D. END PLAY SHOULD NOT EXCEED 0.005"
 - E. REPEAT STEPS IF ADJUSTMENT IS NECESSARY
 - F. INSTALL COTTER PIN. IF HOLES DO NOT LINE UP, TIGHTEN SPINDLE NUT UNTIL HOLES ALIGN. DO NOT TIGHTEN MORE THAN 1/2 FLAT OF THE NUT.
 - G. ENSURE THERE IS SUFFICIENT GREASE IN THE WHEEL BEARING CAVITY
10. FILL OUTBOARD CAVITY COMPLETELY
11. RUN A BEAD OF SILICONE ON HUBCAP MOUNTING SURFACE
12. INSTALL HUBCAP WITH PROVIDED SCREWS AND WASHERS



R-31044 (INSULATED STUB AXLE ASSY)

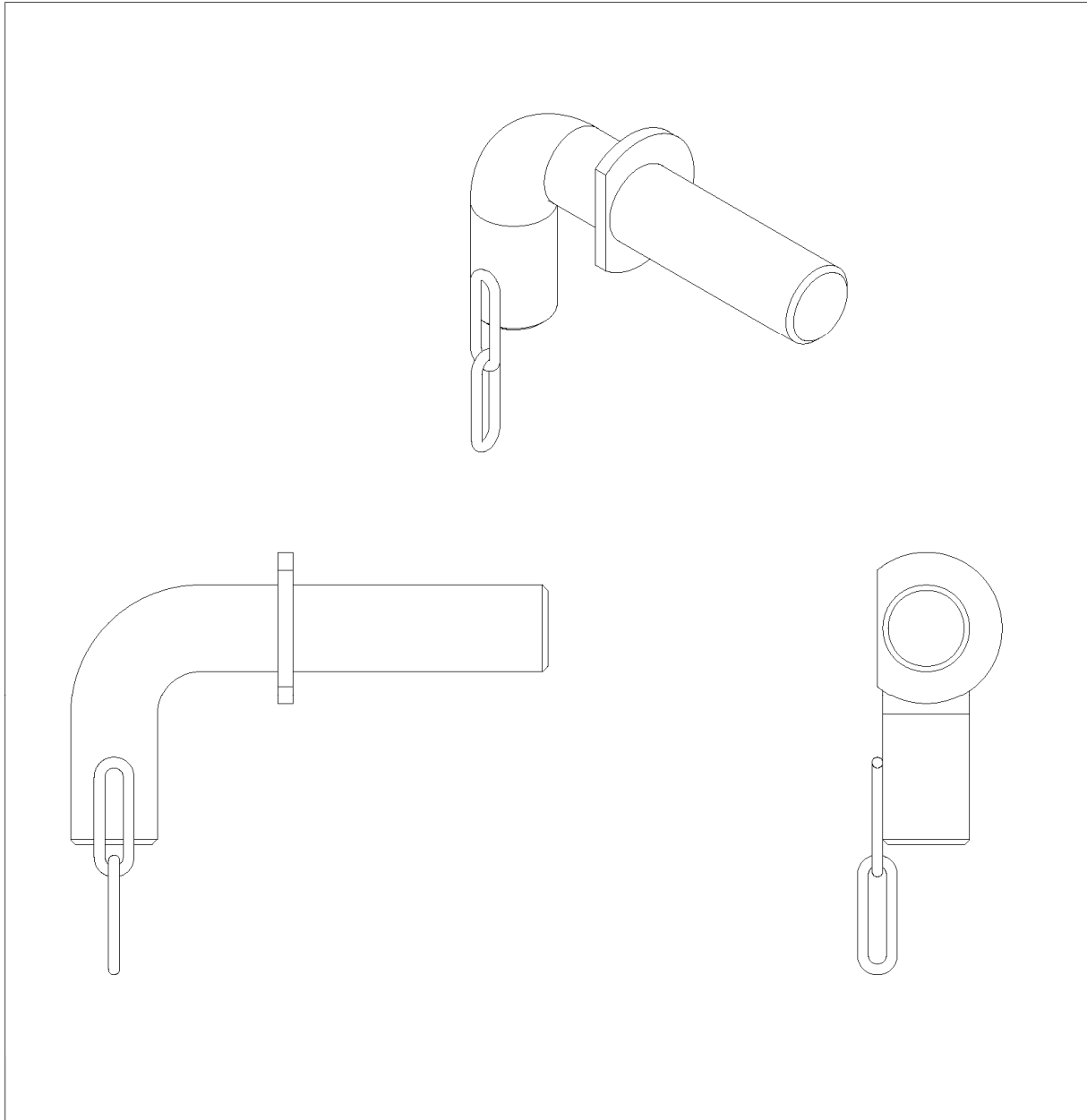
REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	DATE DRAWN	PART NUMBER	REVISION
A	REVISION A RELEASED	11/09/20	SMM	JMP				11/09/20/R-31044	A


SMM	JMP	JMP	JMP	JMP
DRAWN	CHECKED	APPROVED	RELEASED	REVISION

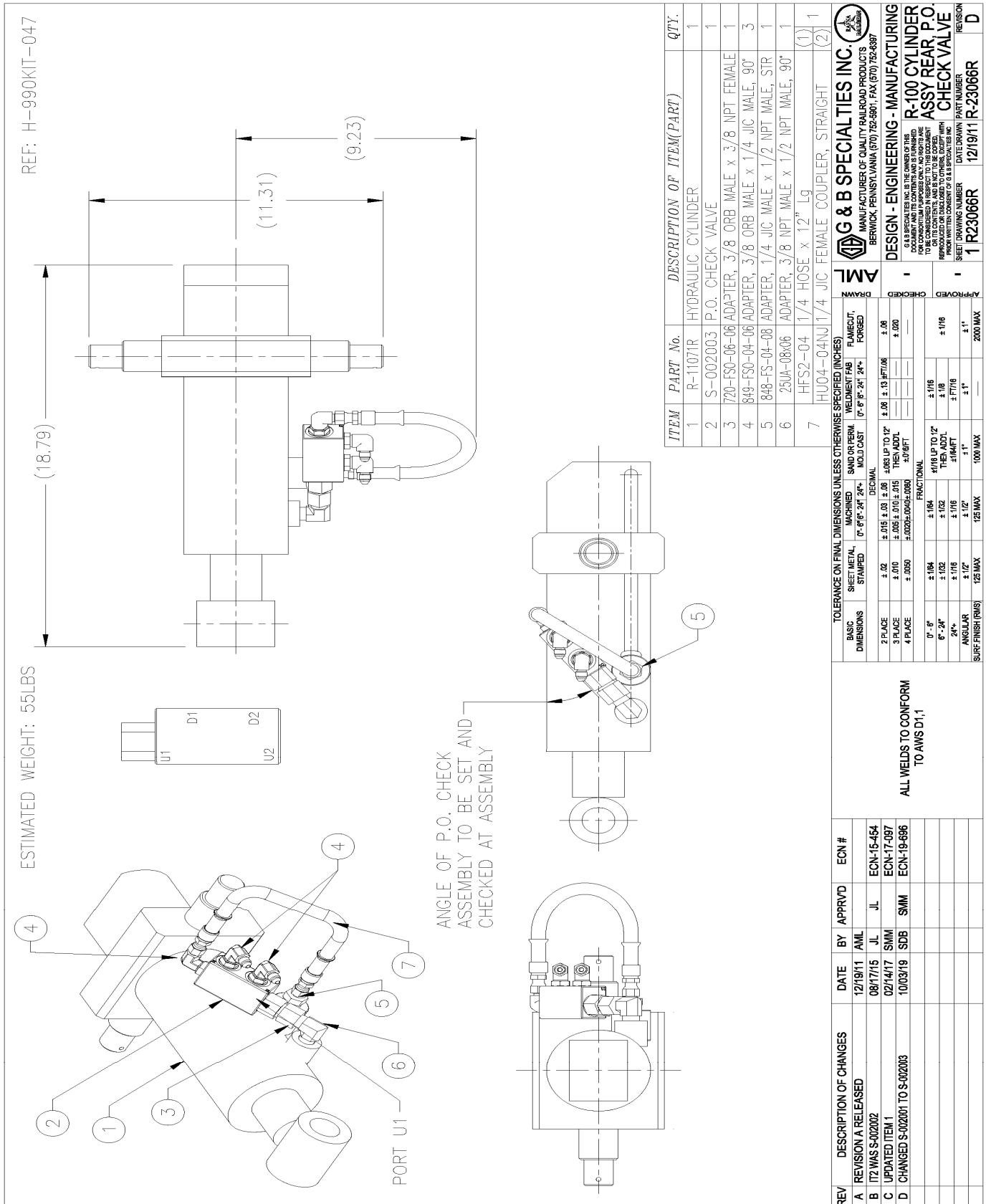
G & B SPECIALTIES INC.	DESIGN - ENGINEERING - MANUFACTURING
MANUFACTURER OF QUALITY RAILROAD PRODUCTS	R1100 REAR STUB AXLE, 12" WHEEL ASSY
BERWICK, PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397	

MISCELLANEOUS


DO NOT SCALE DRAWING				DRAWN AML	 G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK PENNSYLVANIA (570)752-5901, FAX (570)752-6397		
TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		R.M.S. FINISH MAX 125 ^h EXCEPT AS NOTED					
BASIC DIMENSIONS	FRACTIONS	DECIMALS		CHECKED	DESIGN ~ ENGINEERING ~ MANUFACTURING <small>G & B SPECIALTIES INC. THE OWNER OF THIS DOCUMENT AND ITS CONTENTS AND IS FURNISHED FOR CONSORTIUM PURPOSES ONLY. NO RIGHTS ARE TO BE CONSIDERED IN RESPECT TO THIS DOCUMENT OR ITS CONTENTS, AND IS NOT TO BE COPIED, REPRODUCED OR DISCLOSED TO OTHERS, EXCEPT WITH PRIOR WRITTEN CONSENT OF G & B SPECIALTIES INC.</small>	DESCRIPTION: LOCKING PIN W/ CHAIN DRIVERS SIDE	
		2 PLACE	3 PLACE				REF:
UP TO 6 INCHES	+/- 1/64	+/- .02	+/- .005	APPROVED	DRAWING NUMBER R11015	DATE DRAWN SHEET OF PART NUMBER R-11015	REVISION
ABOVE 6" TO 24"	+/- 1/32	+/- .03	+/- .010				
ABOVE 24"	+/- 1/16	+/- .06	+/- .015				
ANGULAR DIMENSIONS		+/- 1/2'					



DO NOT SCALE DRAWING				DRAWN AML	G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK PENNSYLVANIA (570)752-5901, FAX (570)752-6397	
TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		R.M.S. FINISH MAX EXCEPT AS NOTED 125 ^h				
BASIC DIMENSIONS	FRACTIONS	DECIMALS		CHECKED	DESIGN ~ ENGINEERING ~ MANUFACTURING <small>G & B SPECIALTIES INC. THE OWNER OF THIS DOCUMENT AND ITS CONTENTS AND IS FURNISHED FOR CONSORTIUM PURPOSES ONLY. NO RIGHTS ARE TO BE CONSIDERED IN RESPECT TO THIS DOCUMENT OR ITS CONTENTS, AND IS NOT TO BE COPIED, REPRODUCED OR DISCLOSED TO OTHERS, EXCEPT WITH PRIOR WRITTEN CONSENT OF G & B SPECIALTIES INC.</small>	
UP TO 6 INCHES	+/- 1/64	2 PLACE	3 PLACE			
ABOVE 6" TO 24"	+/- 1/32	+/- .02	+/- .005			
ABOVE 24"	+/- 1/16	+/- .03	+/- .010			
ANGULAR DIMENSIONS		+/- 1/2		APPROVED	DESCRIPTION: LOCKING PIN PASSENGERS SIDE W/ CHAIN	REF:
DRAWING NUMBER R11016		DATE DRAWN	SHEET OF	PART NUMBER R-11016	REVISION	



REF: H-990KIT-047

ESTIMATED WEIGHT: 55LBS

ANGLE OF P.O. CHECK ASSEMBLY TO BE SET AND CHECKED AT ASSEMBLY

ALL WELDS TO CONFORM TO AWS D1.1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	12/19/11	AML		
B	IT2 WAS S-002002	08/17/15	JL	JL	ECN-15-454
C	UPDATED ITEM 1	02/14/17	SMM		ECN-17-097
D	CHANGED S-002001 TO S-002003	10/03/19	SDB	SMM	ECN-19-696

TOLERANCE ON FINAL DIMENSIONS UNLESS OTHERWISE SPECIFIED (INCHES)	SHEET METAL	MACHINED	SAW OR FORM	WELDMENT FAB	PLAQUE	FORGED
BASIC DIMENSIONS	±.015	±.010	±.015	±.015	±.015	±.015
2 PLACE	±.015	±.010	±.015	±.015	±.015	±.015
3 PLACE	±.010	±.008	±.010	±.010	±.010	±.010
4 PLACE	±.005	±.003	±.005	±.005	±.005	±.005
5 PLACE	±.003	±.002	±.003	±.003	±.003	±.003
6 PLACE	±.002	±.001	±.002	±.002	±.002	±.002
7 PLACE	±.001	±.000	±.001	±.001	±.001	±.001
8 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
9 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
10 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
11 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
12 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
13 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
14 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
15 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
16 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
17 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
18 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
19 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
20 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
21 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
22 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
23 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
24 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
25 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
26 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
27 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
28 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
29 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
30 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
31 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
32 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
33 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
34 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
35 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
36 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
37 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
38 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
39 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
40 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
41 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
42 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
43 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
44 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
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62 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
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69 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
70 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
71 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
72 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
73 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
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79 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
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97 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
98 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
99 PLACE	±.000	±.000	±.000	±.000	±.000	±.000
100 PLACE	±.000	±.000	±.000	±.000	±.000	±.000

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-11071R	HYDRAULIC CYLINDER	1
2	S-002003	P.O. CHECK VALVE	1
3	720-F50-06-06	ADAPTER, 3/8 ORB MALE x 3/8 NPT FEMALE	1
4	849-F50-04-06	ADAPTER, 3/8 ORB MALE x 1/4 JIC MALE, 90°	3
5	848-F5-04-08	ADAPTER, 1/4 JIC MALE x 1/2 NPT MALE, STR	1
6	25UA-08x06	ADAPTER, 3/8 NPT MALE x 1/2 NPT MALE, 90°	1
7	HFS2-04	1/4 HOSE x 12" Lg	(1)
	HU04-04NJ	1/4 JIC FEMALE COUPLER, STRAIGHT	(2)

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	12/19/11	AML		
B	IT2 WAS S-002002	08/17/15	JL	JL	ECN-15-454
C	UPDATED ITEM 1	02/14/17	SMM		ECN-17-097
D	CHANGED S-002001 TO S-002003	10/03/19	SDB	SMM	ECN-19-696

DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING	DESIGN - ENGINEERING - MANUFACTURING
CHECKED	CHECKED	CHECKED	CHECKED
APPROVED	APPROVED	APPROVED	APPROVED
DRAWN	DRAWN	DRAWN	DRAWN

AMERICAN RAILROAD ENGINEERING	AMERICAN RAILROAD ENGINEERING	AMERICAN RAILROAD ENGINEERING	AMERICAN RAILROAD ENGINEERING
1	R23066R	12/19/11	R-23066R
1	R23066R	12/19/11	R-23066R
1	R23066R	12/19/11	R-23066R
1	R23066R	12/19/11	R-23066R

REF: H-99JKIT-047

ESTIMATED WEIGHT: 55LBS

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-11071L	HYDRAULIC CYLINDER	1
2	S-002003	P.O. CHECK VALVE	1
3	720-FS0-06-06	ADAPTER, 3/8 ORB MALE x 3/8 NPT FEMALE	1
4	849-FS0-04-06	ADAPTER, 3/8 ORB MALE x 1/4 JIC MALE, 90°	3
5	848-FS-04-08	ADAPTER, 1/4 JIC MALE x 1/2 NPT MALE, STR	1
6	25UA-08x06	ADAPTER, 3/8 NPT MALE x 1/2 NPT MALE, 90°	1
7	HFS2-04	1/4 HOSE x 12" Lg	(1)
	HU04-04NU	1/4 JIC FEMALE COUPLER, STRAIGHT	(2)

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	TOLERANCE ON FINAL DIMENSIONS UNLESS OTHERWISE SPECIFIED (INCHES)	
						SHEET METAL	WELDMENT FAB
A	REVISION A RELEASED	12/19/11	AML			MACHINED	FLAMECUT,
B	IT2 WAS S-002002	08/17/15	JL	JL		SAND OR PERM. MOLD CAST	FORGED
C	UPDATED ITEM 1	02/14/17	SMM			0" - 6" 24°	
D	CHANGED S-002001 TO S-002003	10/03/19	SDB	SMM		6" - 24°	
						2 PLACE	±.02
						3 PLACE	±.010
						4 PLACE	±.0050
						0" - 6"	±.016
						6" - 24°	±.032
						ANGULAR	±.116
						±1°	±.12°
						SURF FINISH (RMS)	125 MAX
						±1/16 UP TO 1/2"	±.116
						THEN ADDL.	±.116
						±1/16 FT	±.11°
						±.1"	±.1°
						±.0010-0.0040-0.0080	±.016 FT
						±.083 UP TO 1/2"	±.001
						THEN ADDL.	±.001
						±.016 FT	±.001
						±.013 #F7/16F	±.001
						±.006	±.001

ALL WELDS TO CONFORM TO AWS D1.1

DESIGN - ENGINEERING - MANUFACTURING

R-1100 CYLINDER ASSY REAR, P.O. CHECK VALVE

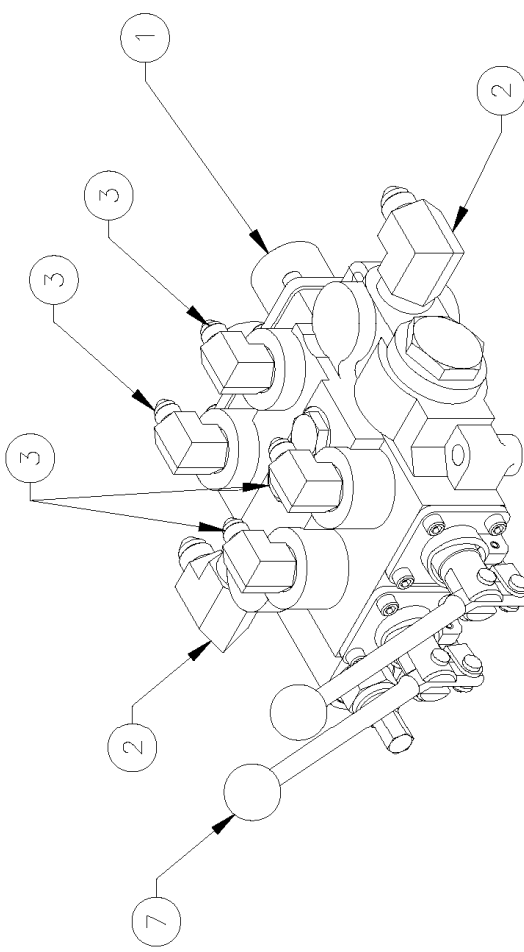
DATE DRAWN PART NUMBER
12/19/11 R-23066L

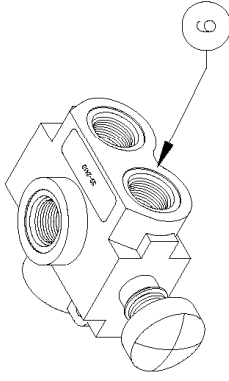
SHEET DRAWING NUMBER
1 R23066L

REVISION
D

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






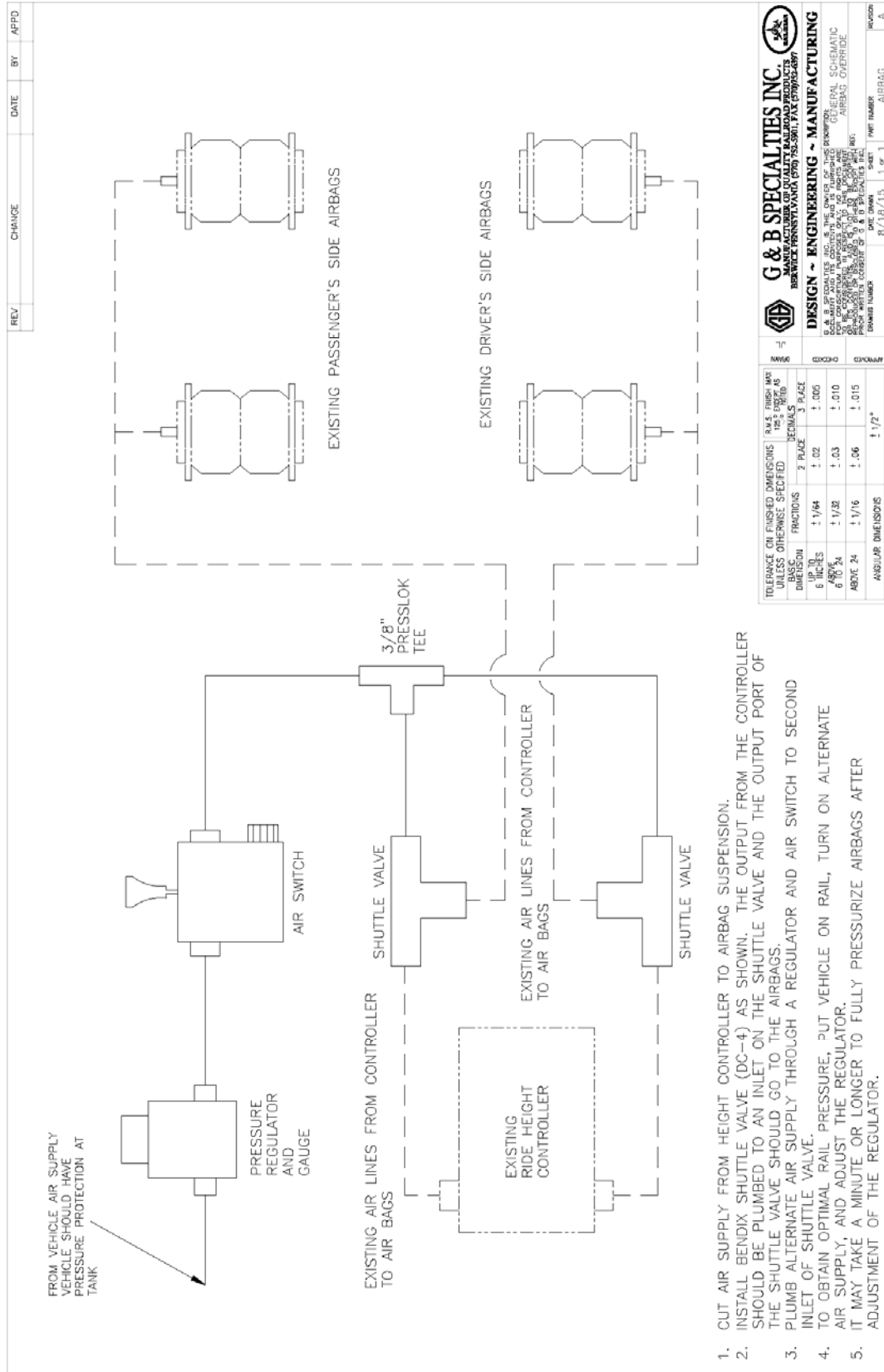
NOTES:
1. ASSEMBLE FITTINGS WITH
LOCTITE THREAD SEALANT

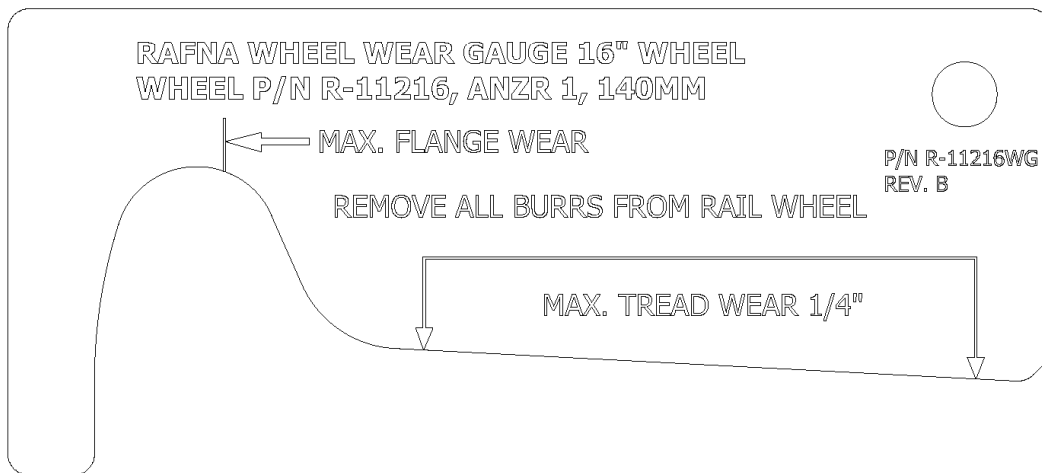
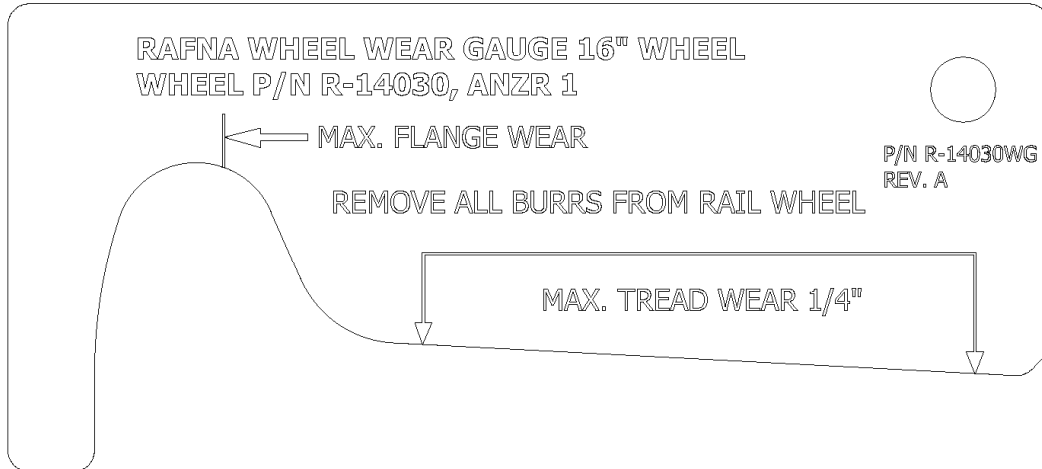
TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		R.A.S. FINISH MAX. 12% EXCEPT AS NOTED	
BASIC DIMENSION	FRACTIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
6 INCHES	± 1/64	± .02	± .005
6 TO 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS	± 1/2°		

DRAWING NUMBER	DATE DRAWN	SHEET	PART NUMBER	REVISION
		1 of 1	R-1100	A

DRAWN	CHECKED	APPROVED
AML		

G & B SPECIALTIES INC.	DESIGN ~ ENGINEERING ~ MANUFACTURING
 G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397	DESIGN ~ ENGINEERING ~ MANUFACTURING G & B SPECIALTIES INC. IS THE OWNER OF THIS DESCRIPTION. FOR CONSULTATION PURPOSES ONLY. NO RIGHTS ARE REAR HYDRAULIC COMPONENTS OR THIS CONTENTS. ADDRESS TO THE COMPANY REF: G & B SPECIALTIES INC.





GAUGES ARE NOT SHOWN TO SCALE



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 30MPH WHILE ON TRACK.

RAFNA RAILGEAR, G&B SPECIALTIES

(570) 752-5901

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.
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.



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

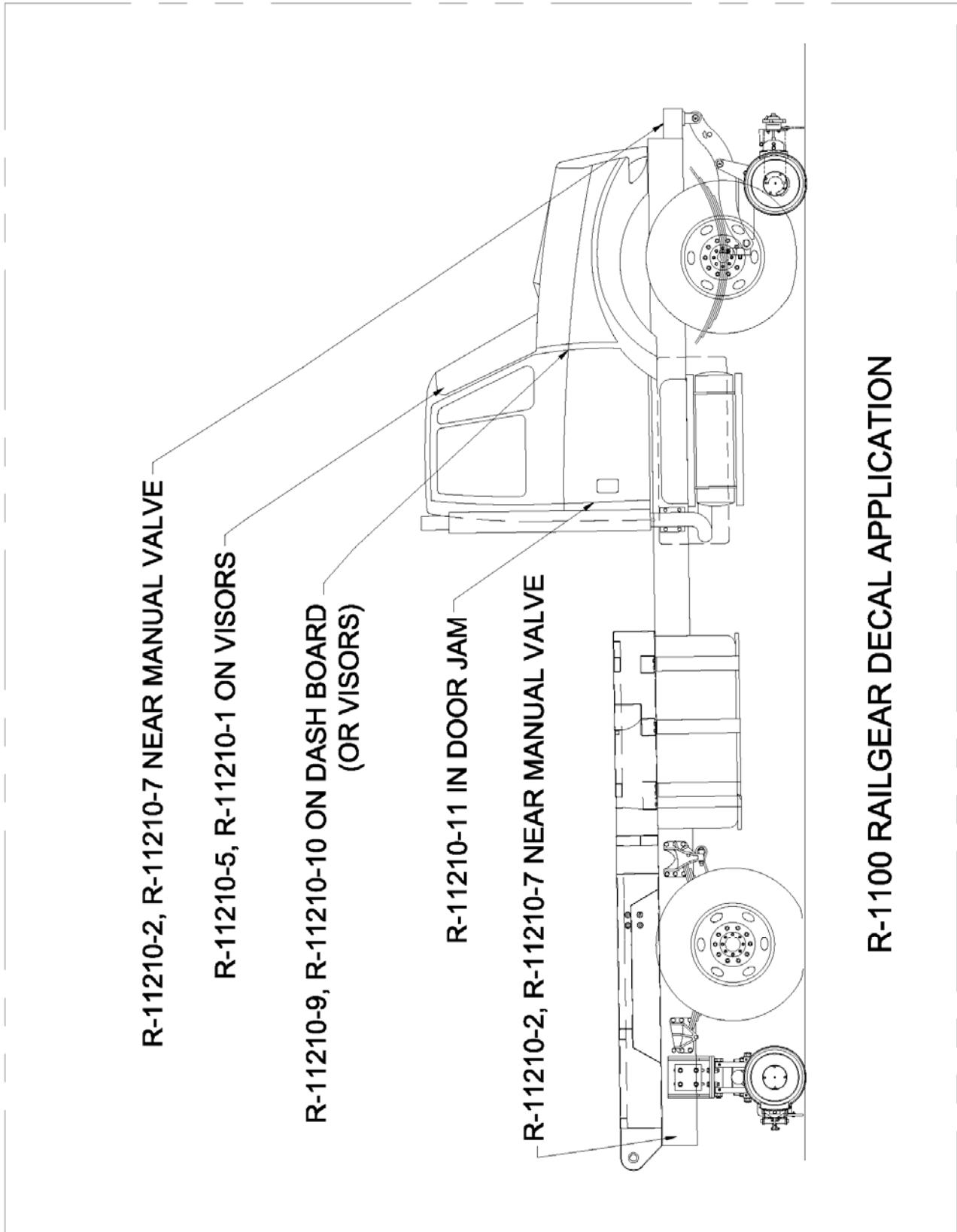
CAUTION:

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



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 _____

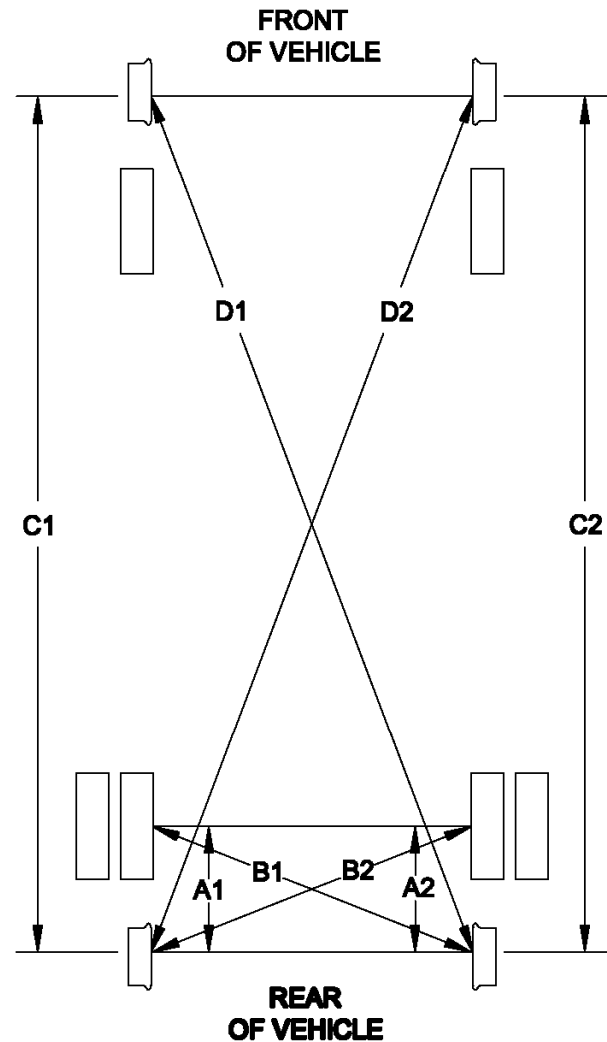
RIGHT REAR _____



VEHICLE WHEEL



RAIL WHEEL



INSTALLER/INSPECTOR SIGNATURE: _____