

INSTALLATION OF REAR ADJUSTABLE HYDRAULIC BRAKE KIT ROTARY REAR R-490 RAILGEAR

SAFETY PRECAUTIONS

If any installation problems are encountered, please call G&B Specialties, Inc. 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.
- When routing hydraulic hoses, ensure that the hoses do not contact any sharp edges or hot surfaces.
- All wire connections should be soldered and heat shrink sealed to prevent future corrosion-related problems.
- All wires must be covered with protective cable loom.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.
- Do not use regular brake fluid in the rear hydraulic brake system, as it will damage the hydraulic brake pump and the brake cylinders.

INSTALLATION OF REAR ADJUSTABLE HYDRAULIC BRAKE KIT

The following procedure details the installation of the Rear Adjustable Hydraulic Brake Kit on the rear railgear. The hardware required for this installation is listed in Table 1.

Part Number	Description	Quantity
HY-719-FSO-06-04	Reducer, 3/8 Male ORB x 1/4 Female ORB	1
HY-845-FSO-04-04	TEE, 1/4 Male JIC x 1/4 Male ORB	1
HY-844-FS-04-04	TEE, 1/4" Male JIC to 1/4" Male JIC	1
HFS2-04	Hose 39" Long	1
HFS2-04	Hose 87" Long	1
HFS2-04	Hose 360" Long	1
HU04-04NJ	1/4" Female Hose Straight Coupling (Installed on hoses)	4
HU04-04MF	1/4" Male Swivel Inverted Coupling, 45° Swivel (Installed on hoses)	2

1. Ensure that the rail wheels have been installed on the rear railgear and have been set to the desired gage.
2. The brakes come installed on the rail gear from factory and are set to Standard gage. If Trolley gage is desired, please refer to the Hydraulic Brake Gage Adjustment section in the Operations portion of the manual.
3. With the brakes now adjusted for the proper gage, ensure that the brake pump has been installed per the front brake installation manual.
4. Remove the 90° fitting installed on the hydraulic brake pump and replace with the 3/8 Male ORB x 1/4 Female ORB adapter onto the pump.
5. Install the 1/4 Male JIC x 1/4 Male ORB onto the adapter.
6. Connect the loose end of the front hose to one side of the TEE.
7. Connect the loose end of the 360" hose for the rear brakes to the other side of the TEE.
8. Route the 360" hose to the rear railgear as required and connect the 1/4" Male JIC TEE fitting to the loose end of the 360" long hose.
9. For the drivers' side, connect one end of the 39" long hydraulic hose to the drivers side brake cylinder and the other end the TEE attached to the loose end of 360" hose.
10. For the passengers' side, connect one end of the 87" long hydraulic hose to the passengers side brake cylinder and the other end the TEE attached to the loose end of 360" hose.
11. Ensure that none of the hoses contact any sharp edges or hot surfaces. All hoses are to be secured leaving enough slack for the railgear to function and brakes adjusted between gage.

12. Fill the hydraulic brake system and bleed the air out:
 - a) Fill the hydraulic brake pump tank with DEXRON III (or equivalent) hydraulic fluid.
 - b) Turn on the dash switch. Depress and hold the vehicle brake pedal. The hydraulic brake pump should start.
 - c) Open the air bleed valve on each brake cylinder to allow air to escape.
 - d) Close the air bleed valve on each brake cylinder.
 - e) Release the brake pedal.
 - f) Re-fill the hydraulic brake pump tank with hydraulic fluid.
 - g) Repeat the above steps until only oil and no more air comes out of the air bleed valve.
 - h) Fill the hydraulic brake pump tank to the fill line.
13. Follow the Hydraulic Brake Relief Valve Setting procedure detailed in the Operation, Service and Parts section of this manual.
14. Follow the Brake Shoe To Rail Wheel Clearance Adjustment procedure detailed in the Operation, Service and Parts section of this manual.
15. Test the operation of the hydraulic brakes as per the Operation, Service and Parts section of this manual.

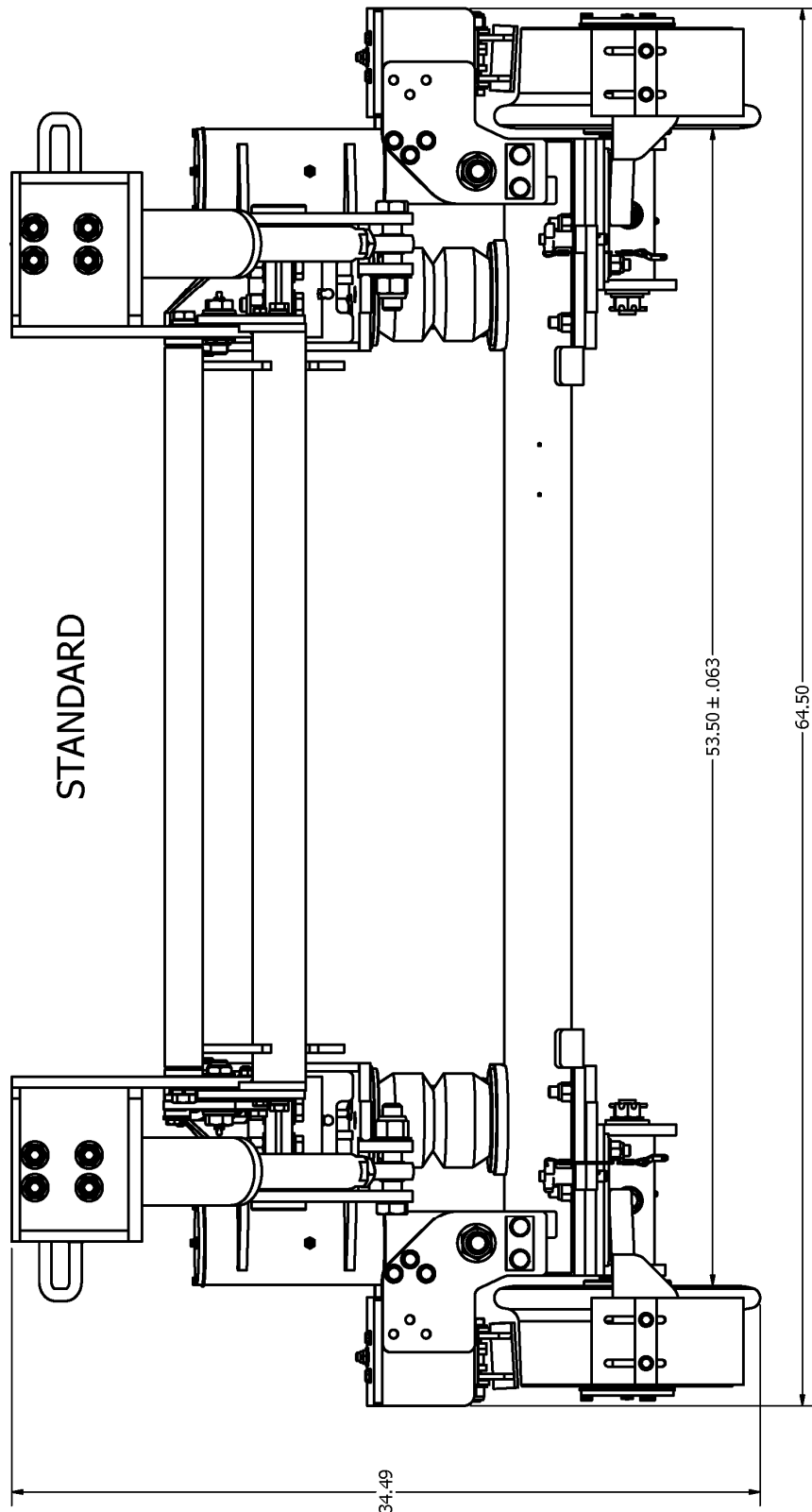


Figure 1: Brakes Installed At Standard Gage

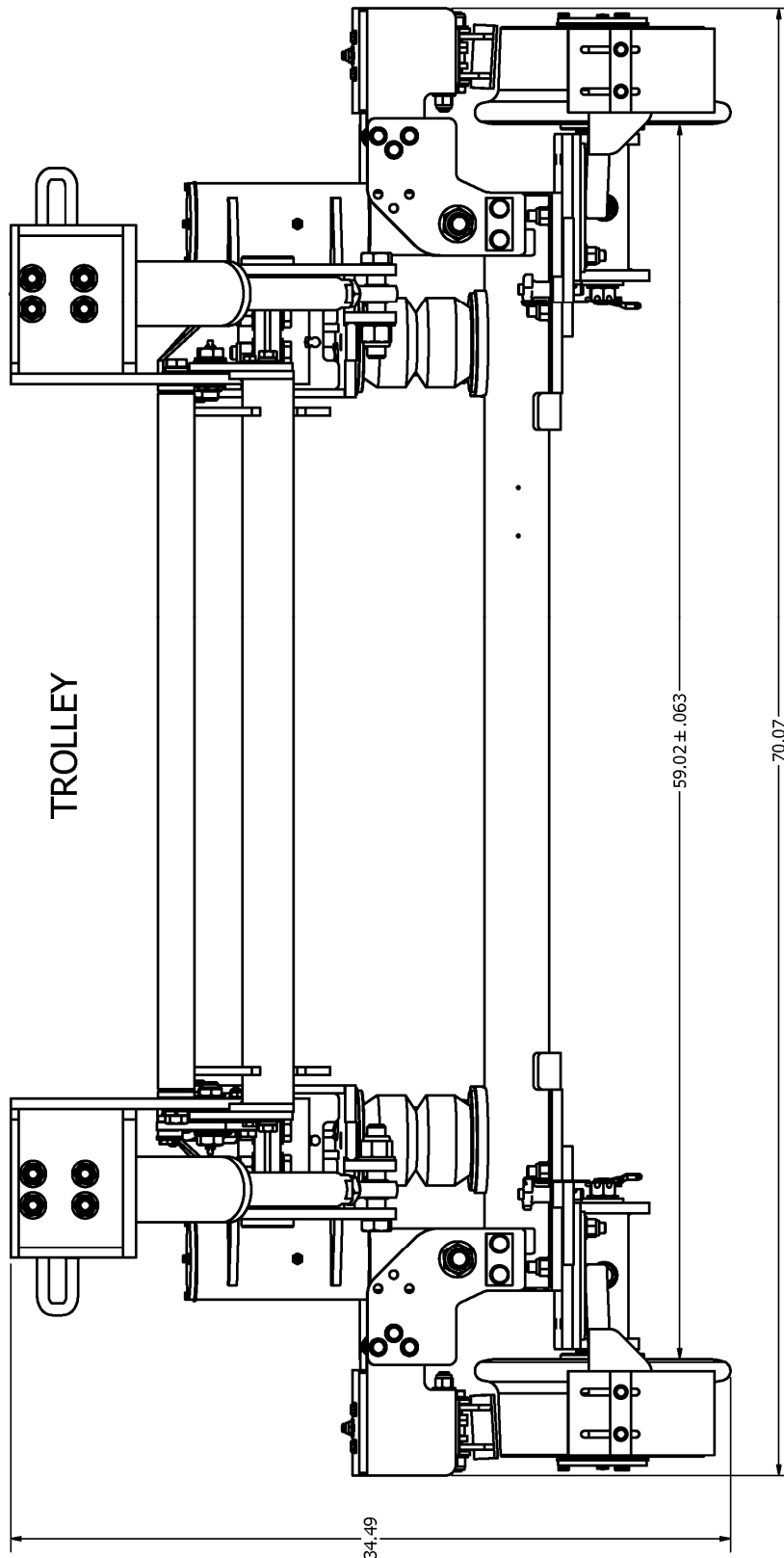


Figure 2: Brakes Installed At Trolley Gage

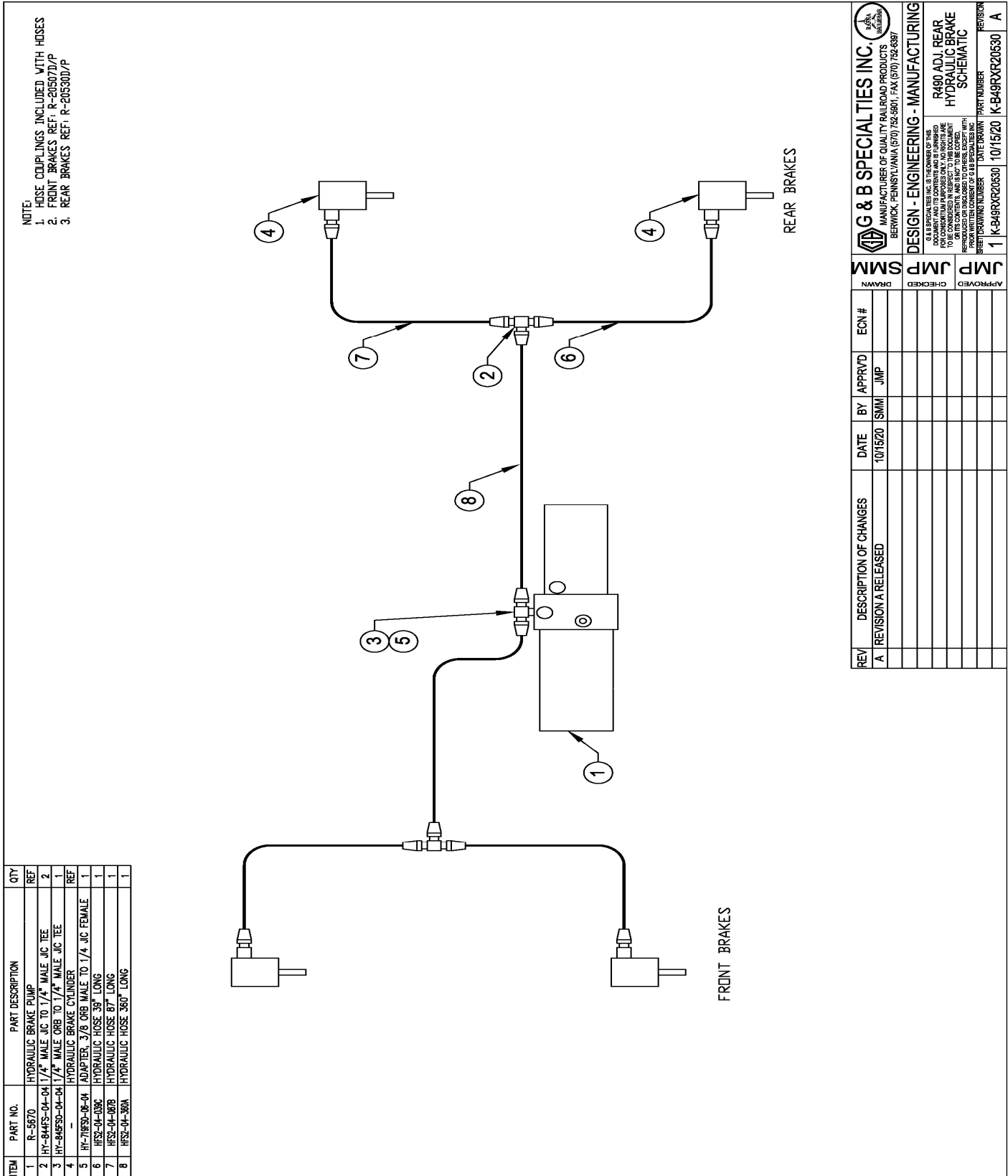


Figure 3: Adjustable Rear Brake Hydraulic Schematic

OPERATION AND SERVICE OF REAR ADJUSTABLE HYDRAULIC BRAKE KIT

SAFETY PRECAUTIONS

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



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting operation of the railgear-equipped vehicle.
- Operating instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Railway company rules governing rail travel must always be observed.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- Despite the added braking power provided by the railgear air brakes, braking distance while on rail is greater than when on road.
- Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.
- Do not use regular brake fluid in the rear hydraulic brake system, as it will damage the hydraulic brake pump and the brake cylinders.

OPERATION OF REAR HYDRAULIC BRAKE KIT

With the rear hydraulic brake kit installed on this vehicle, it may be operated as normal, however the hydraulic brake pump must be turned "Off" during road travel and "On" during rail travel. The rear hydraulic brake kit provides additional braking power when on rail. Braking distance on rail is much greater than when on road and will be adversely affected by inclement weather.

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

A dash switch is provided to turn off the power to the hydraulic brake pump, which prevents the railgear brakes from functioning during road travel. When traveling on rail, with the dash switch in the "On" position, the railgear hydraulic brakes act together with the vehicle's brakes to provide added braking power through the rail wheels.

To Operate The Vehicle On Rail:

1. Turn the "Railgear Brake Pump" dash switch to the "On" position.
2. Proceed with rail travel. The railgear hydraulic brakes will function with the vehicle brakes when the vehicle brake pedal is depressed.

To Operate The Vehicle On Road:

1. Turn the "Railgear Brake Pump" dash switch to the "Off" position.
2. Proceed with road travel. The railgear hydraulic brakes will remain in-active.

SERVICE OF REAR HYDRAULIC BRAKE KIT

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

Do not torque the 1/2" fasteners that pass through the brake shoe linkage. These fasteners must remain slightly loose to allow the hydraulic brakes to function freely. Table 2 provides all other Standard Fastener Torque Values.

Table 1: Recommended Service Schedule

Service Required	Initial 100 km (62 Miles) of road and/or rail	Monthly	6 Months	Yearly
Inspect hydraulic brake kit fasteners (re-torque if required)	✓		✓	✓
Inspect all hydraulic fittings and hoses for leaks and wear	✓		✓	✓
Check oil in hydraulic reservoir (fill if required)	✓	✓		✓
Check / adjust brake shoe to rail wheel clearance (see procedure)	✓		✓	✓

Table 2: Standard Fastener Torque Values

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

BRAKE SHOE TO RAIL WHEEL CLEARANCE ADJUSTMENT

The clearance between the brake shoe and the rail wheel must be correctly adjusted to prevent brake drag and to ensure proper braking ability. Check and adjust the brake shoe to rail wheel clearance as follows:

1. With the hydraulic brake dash switch turned "Off" and the railgear hydraulic brakes in the retracted position, visually inspect the railgear hydraulic brake components for excessive damage and/or wear and measure the brake shoe to rail wheel clearance.

Acceptable Brake Shoe To Rail Wheel Clearance

1/8" - 1/4"

2. If the brake shoe to rail wheel clearance is not within specifications, adjust as follows:
 - Loosen the jam nut above the clevis on the clevis push rod.
 - Turn the clevis push rod to adjust the clevis up to increase the clearance or down to decrease the clearance.
 - When moving the clevis down on the clevis push rod, do not move the clevis down beyond the point at which the inside bottom face of the clevis is flush with the end of the push rod. Replace the brake shoe and re-adjust.
 - Tighten the jam nut above the clevis on the clevis push rod.
3. Re-check the brake shoe to rail wheel clearance and re-adjust as necessary.

HYDRAULIC BRAKE RELIEF VALVE SETTING

The hydraulic brake pump is equipped with one relief valve located on the hydraulic pump body. This relief valve protects the entire hydraulic brake system from over pressurization. The relief valve will require adjustment at installation and if ever there appears to be inadequate hydraulic pressure to operate the hydraulic brakes or if the rail wheels are found to skid when the brakes are applied.

1. Disconnect the hydraulic hose from the pump.
2. Install a hydraulic pressure gauge (up to 3000 PSI) between the disconnected hydraulic hose and the pump port. The pressure gauge will indicate the relief valve setting when the pump is loaded.
3. Turn the "Railgear Brake Pump" dash switch to the "On" position and depress the vehicle brake pedal so that activating the brakes creates a load on the pump. The pressure reading on the pressure gauge should climb to 700 PSI.
4. If the pressure is not correct, release the brake pedal and adjust the relief valve on the pump accordingly. Loosen the lock nut and turn the setscrew in to increase the pressure or out to decrease the pressure. Re-check the pressure.
5. Once the correct pressure on the pump relief valve is obtained, ensure that the lock nut on the relief valve is tightened. Release the pressure in the system and remove the pressure gauge. Reconnect the hydraulic hose.
6. Ensure that the hydraulic hoses are connected properly and that the hydraulic brakes are functioning properly.

HYDRAULIC BRAKE GAGE ADJUSTMENT

The hydraulic brakes are capable of being adjusted from Standard Gage to Trolley Gage. The gage of the brakes will depend on what gage the rail wheels are set to. If the adjusting plates on the wheels sit relatively flush with the ends of the axle, the railgear is setup for Standard Gage. If the adjusting plates stick out past the ends of the axle, the railgear is setup for Trolley Gage. **NOTE:** Brakes will come set to Standard Gage from factory. To go from one gage to another, please see steps below:

1. Determine if the railgear is currently setup for Standard Gage or Trolley Gage.
2. On each side of the brake bracket there are three 3/8" x 1 1/4" bolts fastening the brake arm to the bracket. Remove these bolts.
3. To go to Trolley Gage, pull the brake arm out and align the further most outside holes with the inside holes on the brake arm. To go to Standard Gage, push the brake arm in and align the rear holes on the brake bracket with the inside holes on the brake arm.
4. Re-install the 3/8" hardware. Check condition of lock washers and replace is necessary.
5. Repeat process for opposite side.
6. Ensure brake hoses do not contact any sharp areas/surfaces and will not be pinched in operation of the railgear.
7. Test brakes for proper brake function.

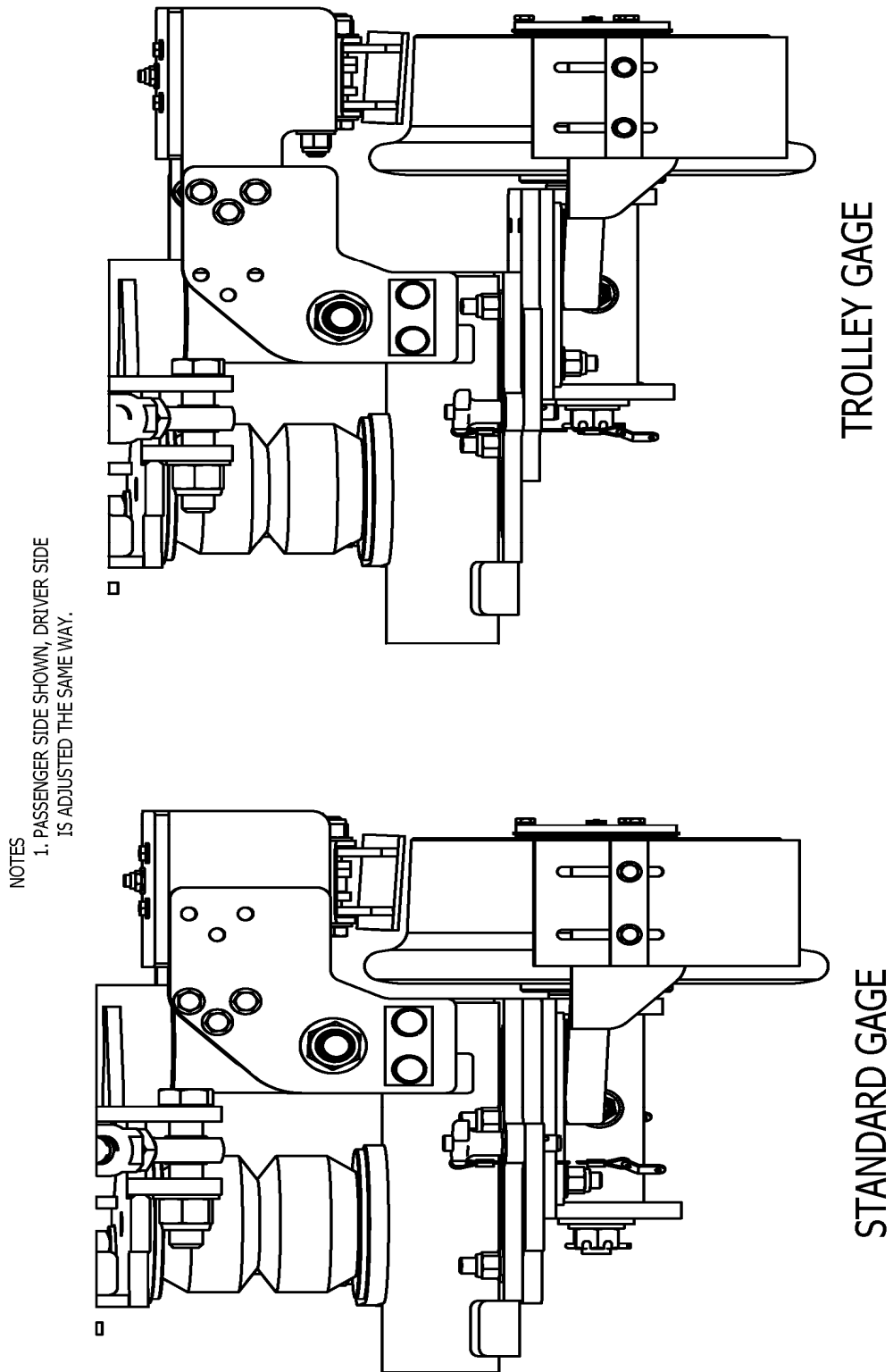


Figure 4: Brake Adjusted to Standard and Trolley Gage

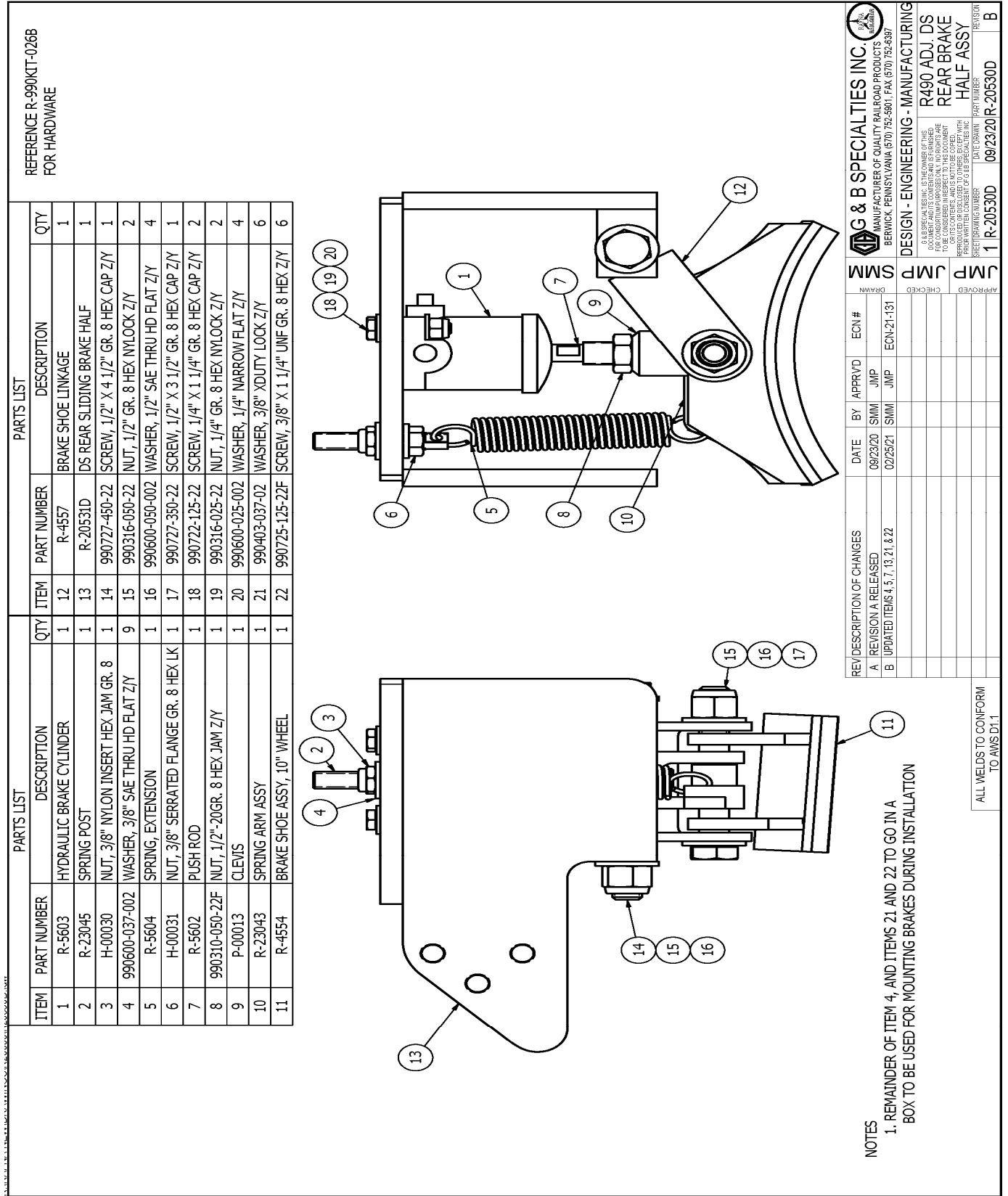


Figure 6: DS Brake Half Assembly R-20530D

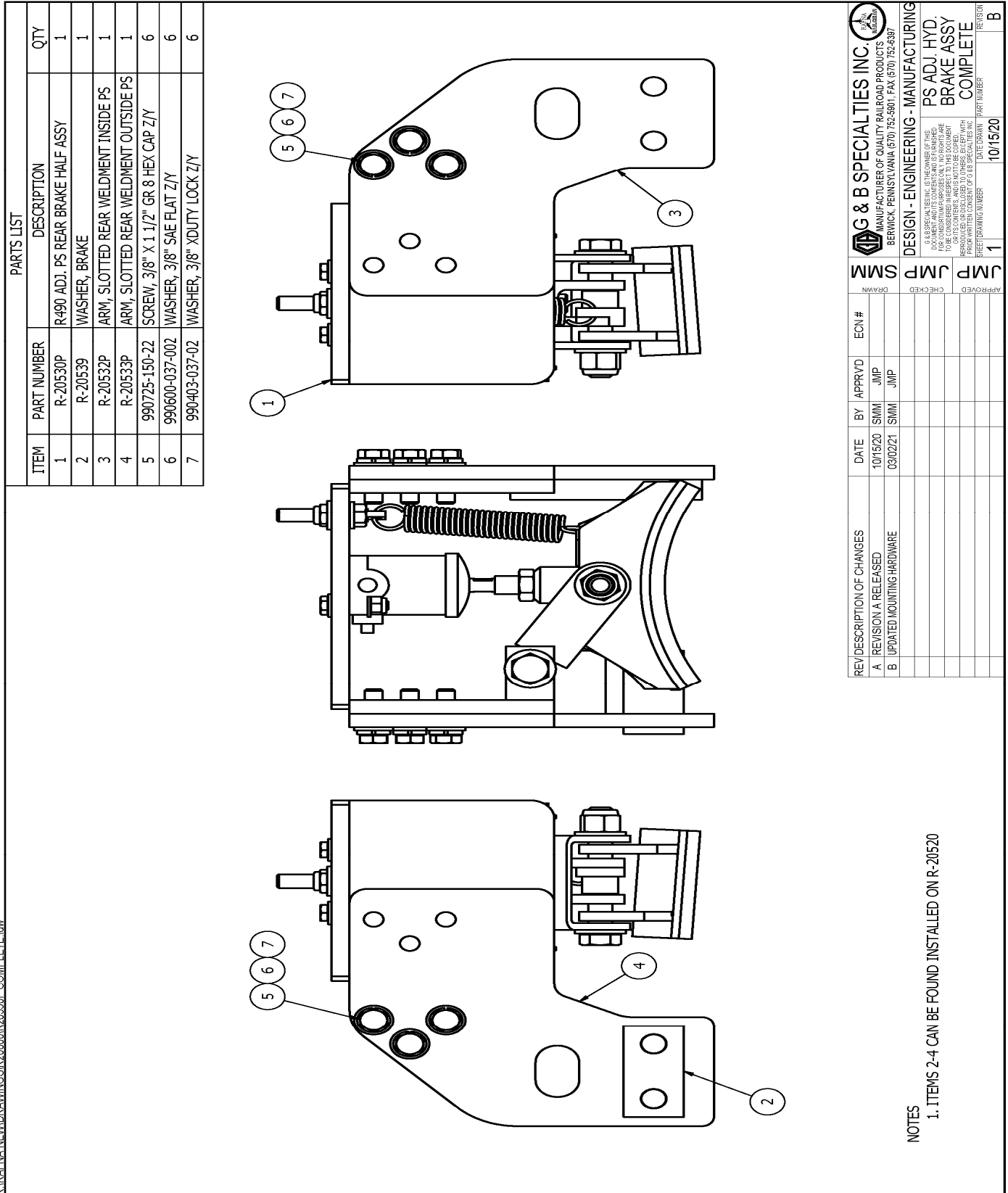


Figure 7: PS Complete Brake Assembly

