

INSTALLATION OF R-890 AIR BRAKE KIT

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 G&B Specialties 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.
- Use only Department of Transportation (DOT) approved air brake components when tapping into the vehicle's brake system.
- Use pipe thread sealer on all NPT connections to prevent leaks.
- It is the sole responsibility of the installer to ensure that the modified vehicle and railgear air brake systems comply with the Federal Motor Vehicle Safety Standards regulation #121 (FMVSS-121) and the Canadian Motor Vehicle Safety Standards regulation #121 (CMVSS-121). The modification to the vehicle's brake system must also comply with any federal, state/provincial and local regulations. Failure to do so may effect the vehicle's braking ability.

INSTALLATION PROCEDURE

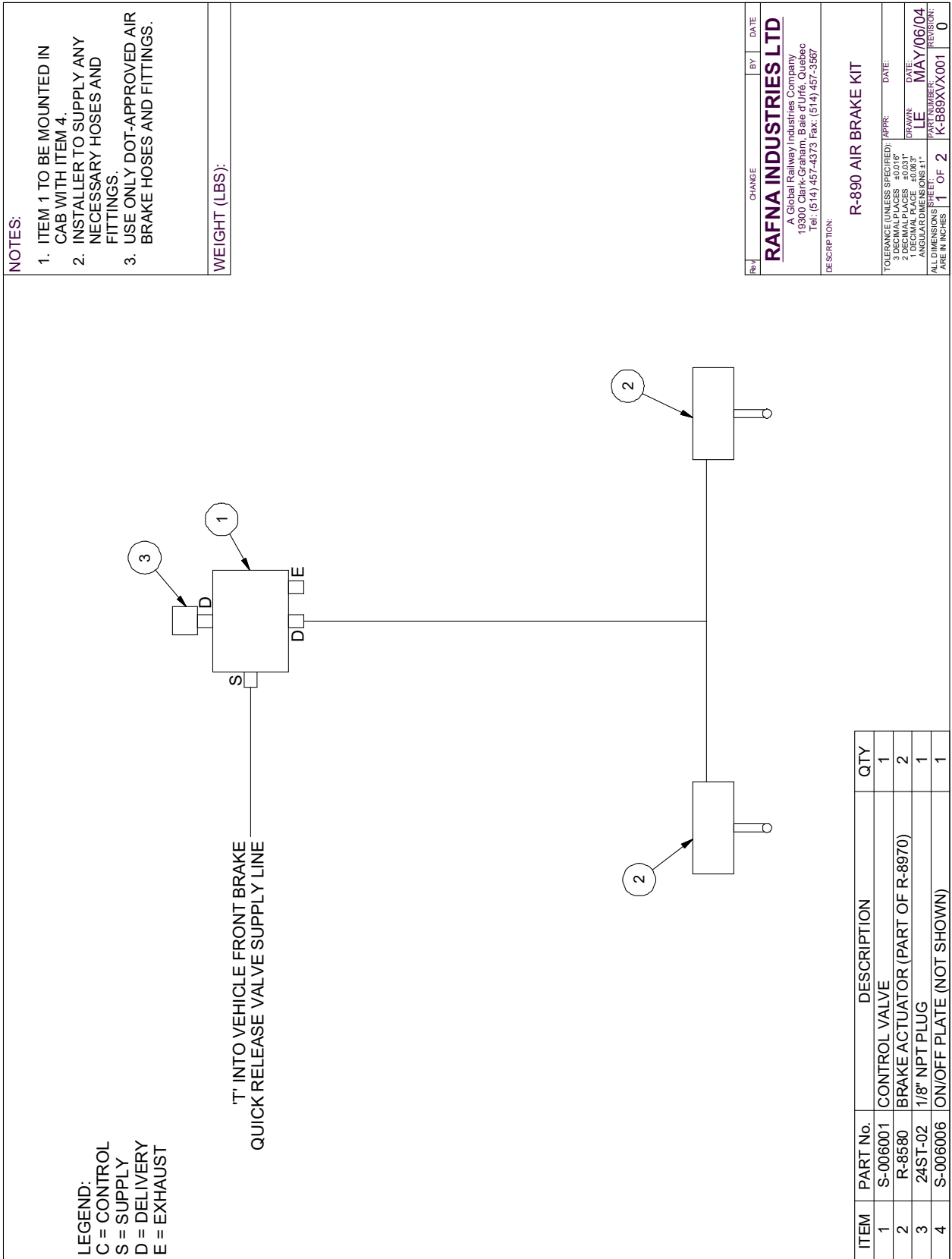
The following procedure details the installation of the Air Brake Kit on either the front or rear railgear. This kit does not fit on the rear railgear with the slew option. The hardware required for this installation is listed in Table 1. Any additional air brake hoses and fittings are to be supplied by the installer.

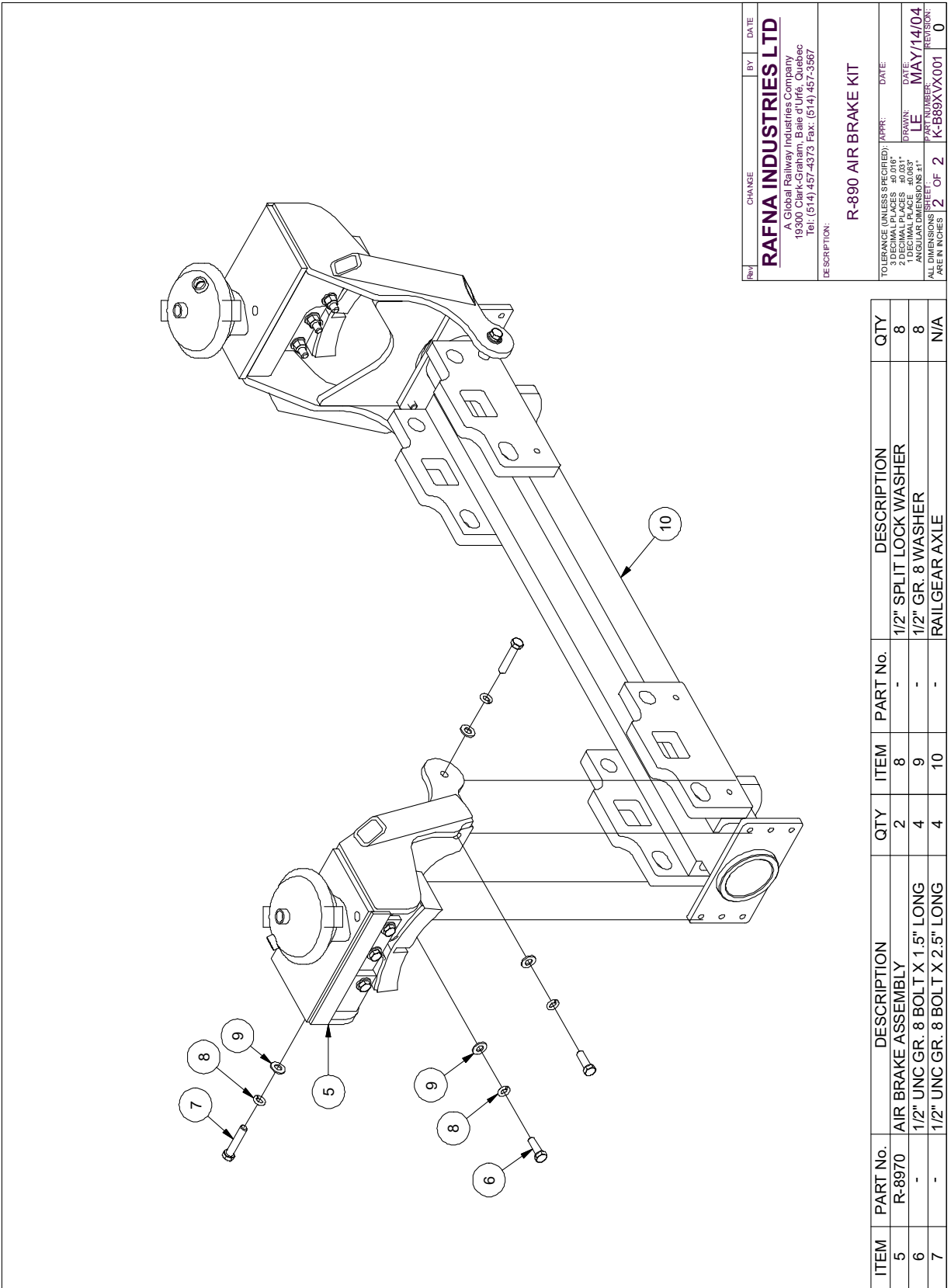
Table 1: Air Brake Kit Installation Parts

Part Number	Description	Quantity
R-8970	Air Brake Assembly	2
S-006001	Control Valve	1
S-006006	On/Off Plate	1
HY-24ST-02	1/8" NPT Plug	1
R-11076A	Operating Valve Assembly	1
R-19039	Air Brake Hose 62"	2
R-19032	3/8" Connector, Male NPT to Male Flare	2
-	1/2" UNC Gr. 8 Bolt x 2.5" Long	4
-	1/2" UNC Gr. 8 bolt x 1.5" Long	4
-	1/2" Split Lock Washer	8
-	1/2" Gr. 8 Washer	8

1. Refer to the Railgear Kit and Hydraulic Kit Operation, Service and Parts manuals to lower the railgear so that the rail wheels are just touching the ground. This will provide more working space and make installation of the air brake assemblies easier.
2. Ensure that the vehicle's parking brake is engaged and that the vehicle is blocked from rolling, then drain the vehicle's air system.
3. Align each air brake assembly on each end of the railgear axle as shown. Each air brake assembly should be to the exterior of each axle end plate. The holes in the side of each air brake assembly should line up with the top two threaded holes on each axle end plate. The holes on the front and rear of each air brake assembly should line up with the threaded holes in the axle lugs.
4. Using two 1/2" x 1.5" long bolts, two 1/2" lock washers and two 1/2" washers, fasten the side of each air brake assembly to each axle end plate.
5. Using two 1/2" x 2.5" long bolts, two 1/2" lock washers and two 1/2" washers, fasten the front and rear of each air brake assembly to the axle lugs.
6. Torque the 1/2" mounting fasteners to 100 ft-lbs dry. Do not over-torque. Do not torque the 1/2" fasteners which pass through the brake linkage as they must remain loose to allow the brakes to function freely.
7. Choose an appropriate location within the vehicle's cab and install the air brake control valve with the accompanying on/off plate.

8. Locate the vehicle's front brake quick release valve air supply line. Using appropriate DOT-approved air brake hose and fittings, "T" into this supply line as close to the vehicle cab and the air brake control valve as possible and connect the hose to the supply port of the air brake control valve.
9. Using appropriate DOT-approved air brake hose and fittings and connect a hose from one of the two delivery ports on the air brake control valve to the air brake actuators on the railgear. Use a "T" fitting to split the airflow to the two air brake actuators.
10. Using the supplied 1/8" NPT plug, plug the unused delivery port of the control valve.
11. Ensure that the air brake hoses are clear of any hot and/or sharp edges. Tie back the air brake hoses to the railgear and/or vehicle frame, ensuring that there is enough slack in the hoses to accommodate the movement of the railgear.
12. Refer to the Air Brake Kit Operation, Parts and Service manual to adjust the air brake shoe clearance.
13. Re-charge the vehicle's air brake system, turn on the air brake control valve, and apply the vehicles brakes repeatedly while checking for air leaks.
14. Statically test the railgear air brake system function. With the air brake control valve in the "On" position the railgear air brakes should function together with the vehicle's brakes. With the air brake control valve in the "Off" position the railgear air brakes should be inactive when the vehicle's brakes are applied and released.
15. Raise the railgear to the road position. Ensure that the railgear is locked in place.





Rev	CHANGE	BY	DATE
RAFNA INDUSTRIES LTD			
A Global Railway Industries Company 19300 Chalk-Gratigny, Baie d'Urfe, Quebec Tel: (514) 437-4373 Fax: (514) 437-3367			
DESCRIPTION:			
R-890 AIR BRAKE KIT			
TOLERANCE (UNLESS SPECIFIED):		APPR:	DATE:
3 DECIMAL PLACES ±0.018"			
2 DECIMAL PLACES ±0.031"		DRAWN:	DATE:
ANGULAR DIMENSIONS ±1°		LE	MAY/14/04
ALL DIMENSIONS SHEET:	PART NUMBER:	REVISON:	
2 OF 2	K-B89XVX001	0	

ITEM	PART No.	DESCRIPTION	QTY	ITEM	PART No.	DESCRIPTION	QTY
5	R-8970	AIR BRAKE ASSEMBLY	2	8	-	1/2" SPLIT LOCK WASHER	8
6	-	1/2" UNC GR. 8 BOLT X 1.5" LONG	4	9	-	1/2" GR. 8 WASHER	8
7	-	1/2" UNC GR. 8 BOLT X 2.5" LONG	4	10	-	RAILGEAR AXLE	N/A

OPERATION, SERVICE AND PARTS OF AIR 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 G&B Specialties railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Railway company rules governing rail travel must be observed at all times.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- Despite the added braking power provided by the railgear air brakes, braking distance while on rail is greater than when on road.
- Do not turn the air brake control valve "On" or "Off" while the vehicle service brakes are applied.
- 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.

OPERATION OF AIR BRAKE KIT

With the air brake kit installed on this vehicle, it may be operated as normal, however the railgear air brakes must be turned "Off" during road travel and "On" during rail travel. The railgear air 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 mounted railgear air brake control valve is provided to turn "Off" and isolate the railgear air brakes from the vehicle's air brakes while on road. When travelling on rail, with the air brake control valve in the "On" position, the railgear air brakes act together with the vehicle's air brakes to provide added braking power through the rail wheels.

To Operate The Vehicle On Road:

1. Engage the vehicle parking brake and release the vehicle service brakes.
2. Turn the dash mounted railgear air brake control valve to the "Off" position. **Do not turn the control valve "Off" while the vehicle service brakes are applied.**
3. Apply the vehicle service brakes and release the vehicle parking brakes.
4. Proceed with road travel. The railgear air brakes will remain inactive.

To Operate The Vehicle On Rail:

1. Engage the vehicle parking brake and release the vehicle service brakes.
2. Turn the dash mounted railgear air brake control valve to the "On" position. **Do not turn the control valve "On" while the vehicle service brakes are applied.**
3. Apply the vehicle service brakes and release the vehicle parking brakes.
4. Proceed with rail travel. The railgear air brakes will function with the vehicle air brakes when the vehicle brake pedal is pressed.

SERVICE OF AIR BRAKE KIT

The air 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 ½" fasteners which pass through the brake linkage. These fasteners must remain slightly loose to allow the air 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 use	Daily	Weekly	Monthly
Inspect air brake kit fasteners (re-torque if required)		✓	✓	✓
Check air brake kit for air leaks (repair if required)		✓	✓	✓
Check / adjust brake shoe to rail wheel clearance (see procedure)				✓
Check brake shoe wear (see procedure)				✓

Table 2: Standard Fastener Torque Values

Fastener Size	Fastener Torque Value (ft-lbs) Dry
1" UNC Gr. 8 Fasteners	250
¾" UNC Gr. 8 Fasteners	175
5/8" UNC Gr. 8 Fasteners	150
½" UNC Gr. 8 Fasteners	100
3/8" UNC Gr. 8 Fasteners	40
¼" UNC Gr. 8 Fasteners	12

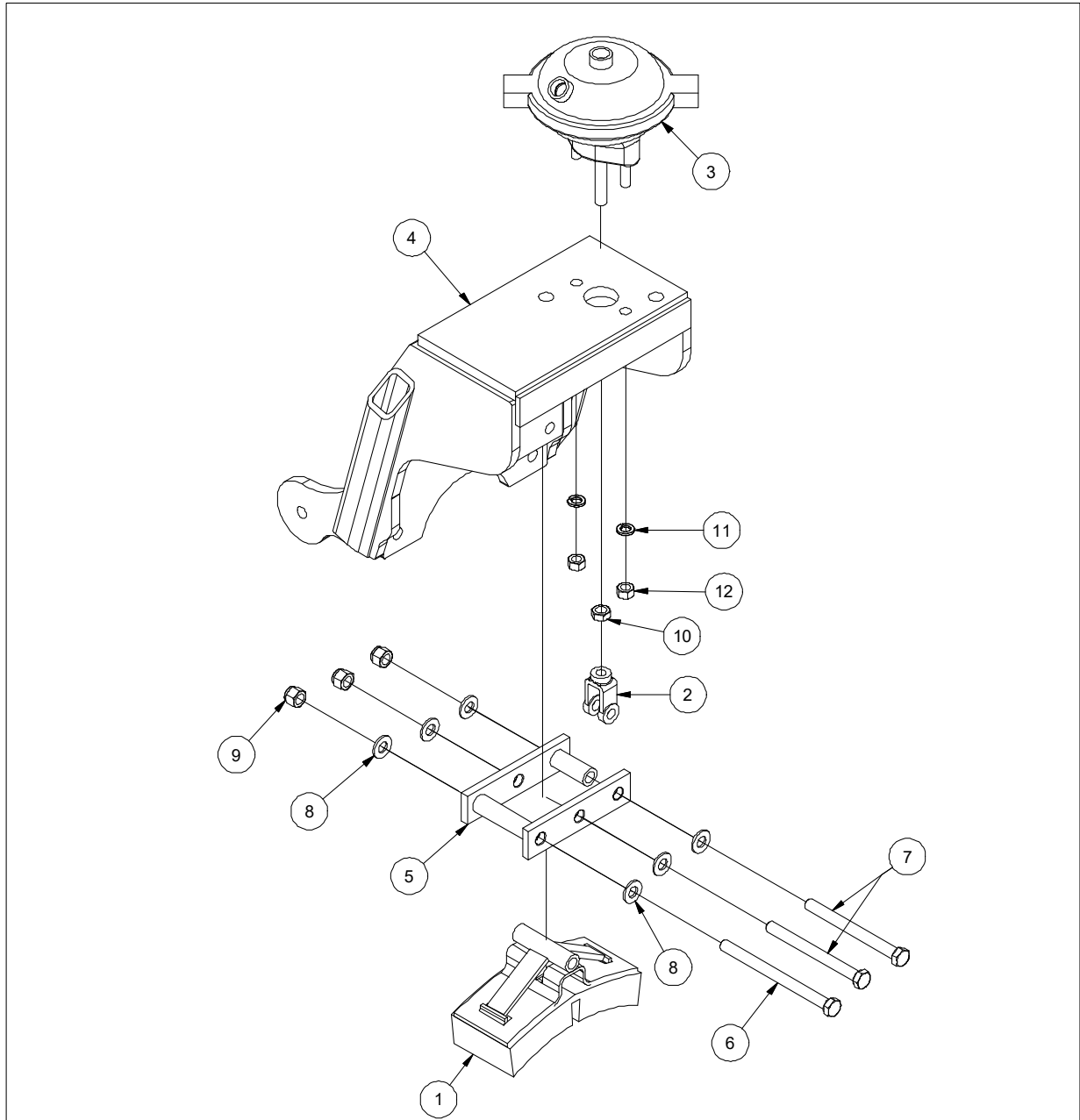
BRAKE SHOE TO RAIL WHEEL CLEARANCE ADJUSTMENT

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 air brake control valve turned "Off" and the railgear air brakes in the retracted position, visually inspect the railgear air brake components for excessive damage and/or wear and measure the brake shoe to rail wheel clearance.

Acceptable Brake Shoe To Rail Wheel Clearance	$\frac{1}{8}'' - \frac{1}{4}''$
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2. If the brake shoe to rail wheel clearance is not within specifications, adjust as follows:
 - a) Loosen the jam nut above the yoke on the air brake actuator rod.
 - b) Disconnect the yoke from the brake linkage by removing the bolt.
 - c) Turn the yoke on the air brake actuator rod up to increase the clearance or down to decrease the clearance. Note that due to the leverage ratio on the brake linkage, the yoke must be moved up or down twice the desired distance of the brake shoe.
 - d) When moving the yoke down on the brake actuator rod, do not move the yoke down beyond the point at which the inside bottom face of the yoke is flush with the end of the actuator rod. This is the wear limit of the brake shoe. Replace the brake shoe and re-adjust.
 - e) Re-install the yoke onto the linkage. Do not torque the $\frac{1}{2}''$ fasteners which pass through the brake linkage. These fasteners must remain slightly loose to allow the air brakes to function freely.
 - f) Tighten the jam nut above the yoke on the air brake actuator rod.
3. Re-check the brake shoe to rail wheel clearance and re-adjust as necessary.

PARTS OF AIR BRAKE KIT


ITEM	PART No.	DESCRIPTION	QTY
1	R-5599A	BRAKE SHOE ASSEMBLY	1
2	R-5601	YOKE	1
3	R-8580	BRAKE ACTUATOR	1
4	R-8971	BRAKE HOUSING	1
5	R-8977	LINK ASSEMBLY	1
6	-	1/2" UNC GR. 8 BOLT X 6.5" LONG	1
7	-	1/2" UNC GR. 8 BOLT X 5.5" LONG	2
8	-	1/2" GR. 8 WASHER	6
9	-	1/2" UNC GR. 8 NYLOCK NUT	3
10	-	1/2" UNF JAM NUT	1
11	-	7/16" LOCK WASHER (INCL W/R-8580)	2
12	-	7/16" UNC NUT (INCL W/R-8580)	2

Rev	CHANGE	BY	DATE
RAFNA INDUSTRIES LTD			
A Global Railway Industries Company 19300 Clark-Graham, Baie d'Urfé, Quebec Tel: (514) 457-4373 Fax: (514) 457-3567			
DESCRIPTION:			
AIR BRAKE ASSEMBLY			
TOLERANCE (UNLESS SPECIFIED):		APPR:	DATE:
3 DECIMAL PLACES ±0.016"			
2 DECIMAL PLACES ±0.031"		DRAWN:	DATE:
1 DECIMAL PLACE ±0.063"		LE	MAY/17/04
ANGULAR DIMENSIONS ±1°		PART NUMBER:	REVISION:
ALL DIMENSIONS ARE IN INCHES		R-8970	0
SHEET:	1 OF 1		