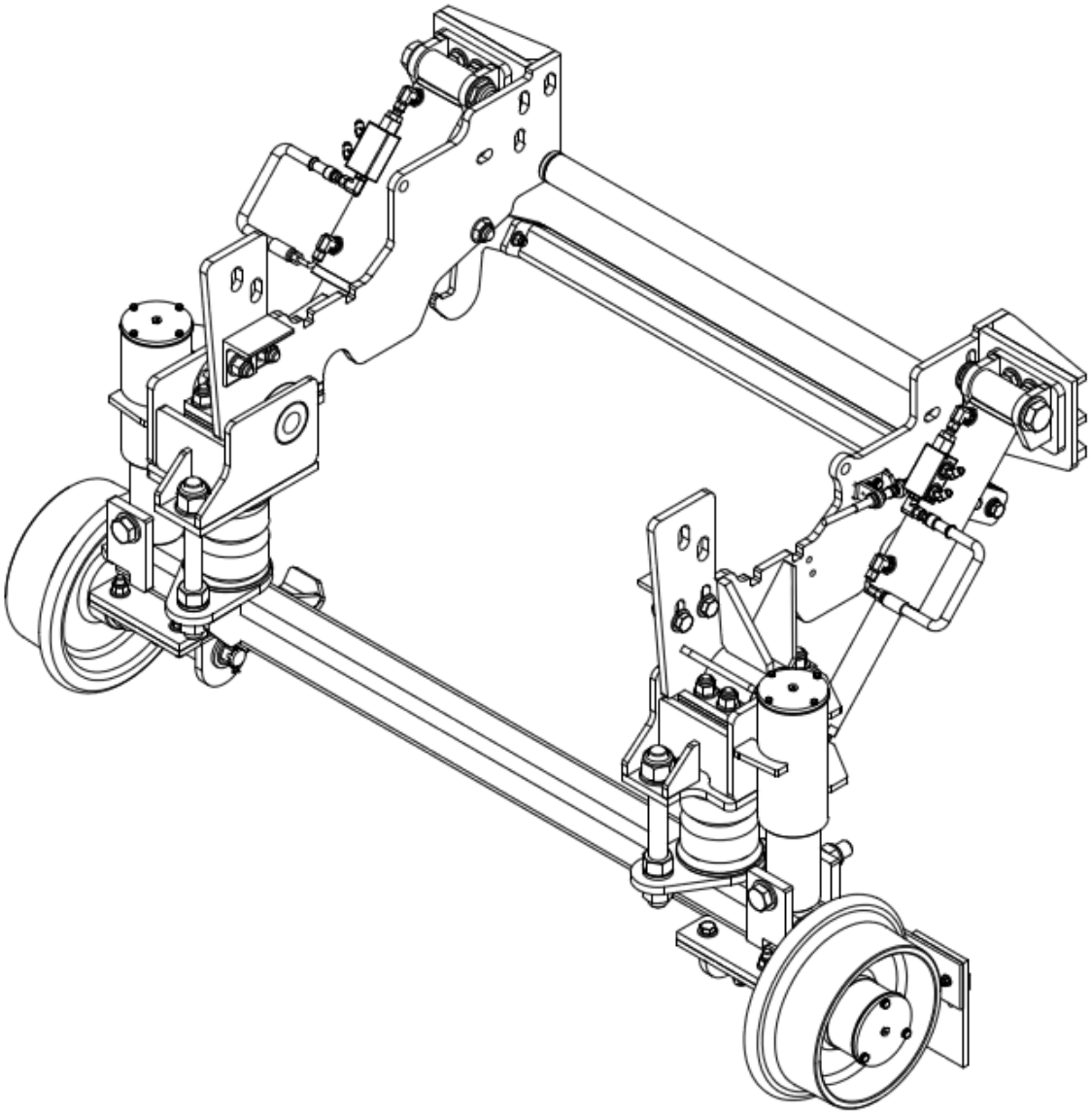
INSTALLATION OF ROTARY REAR RAILGEAR KIT
1999-PRESENT FORD F-450/550 4X2/4X4



INSTALLATION / OPERATIONS / SERVICE MANUAL

INSTALLATION 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 and operation of the equipment.
- Installation and operation 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 that 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.
- Railway company rules governing rail travel must be observed at all times.
- Ensure that the position and function of all railgear controls are known before attempting operation.
- Ensure the railgear is locked in road position before starting road travel.
- Ensure all body parts and loose clothing are clear of any moving parts of the equipment.
- If misalignment of the railgear equipment is indicated, promptly perform the alignment procedure.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- 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.

REAR RAILGEAR KIT

The following procedure details the installation of the rear railgear kit. The hardware required for the different kits are listed in the tables below.

Table 2.1 is to be used for the **HD R ear Railgear** with cable actuated lockup w/o brakes.

Table 2.1 HD Rear Railgear Kit Installation Parts

Part Number	Description	Qty	
R-20170D-HD	R-460 Rotary Rear Upper Assembly	1	R-20170-HD Assembly
R-001	10" Steel Wheel Assembly	2	
R-20120D	Rail Sweep, Drivers Side	1	
R-20120P	Rail Sweep, Passengers Side	1	
R-20233	Cable Axle Lock Assembly	1	
R-990KIT-204C	Wheel Mounting Hardware	2	
R-20136A	Operating Decals	1	
R-990KIT-282	Railgear Mounting Hardware	1	

Table 2.2 is to be used for the **HD Rear Railgear** with hydraulic actuated lockup w/o brakes.

Table 2.2 HD Rear Railgear Kit Installation Parts

Part Number	Description	Qty	
R-20170D-HD	R-460 Rotary Rear Upper Assembly	1	R-20170A-HD Assembly
R-001	10" Steel Wheel Assembly	2	
R-20120D	Rail Sweep, Drivers Side	1	
R-20120P	Rail Sweep, Passengers Side	1	
R-20234	Hydraulic Axle Lock Assembly	1	
R-990KIT-204C	Wheel Mounting Hardware	2	
R-20136	Operating Decals	1	
R-990KIT-282	Railgear Mounting Hardware	1	

Table 2.3 is to be used for the **HD Rear Railgear** with cable actuated lockup with brakes.

Table 2.3 HD Rear Railgear Kit Installation Parts

Part Number	Description	Qty	
R-20170D-HD	R-460 Rotary Rear Upper Assembly	1	R-20170B-HD Assembly
R-001	10" Steel Wheel Assembly	2	
R-20120D	Rail Sweep, Drivers Side	1	
R-20120P	Rail Sweep, Passengers Side	1	
R-20233	Cable Axle Lock Assembly	1	
R-990KIT-204D	Wheel Mounting Hardware	2	
R-20136A	Operating Decals	1	
K-B45RXR20229	Rear Brake kit	1	
R-990KIT-282	Railgear Mounting Hardware	1	

Table 2.4 is to be used for the **HD Rear Railgear** with hydraulic actuated lockup with brakes.

Table 2.4 HD Rear Railgear Kit Installation Parts

Part Number	Description	Qty	R-20170C-HD Assembly
R-20170D-HD	R-460 Rotary Rear Upper Assembly	1	
R-001	10" Steel Wheel Assembly	2	
R-20120D	Rail Sweep, Drivers Side	1	
R-20120P	Rail Sweep, Passengers Side	1	
R-20234	Hydraulic Axle Lock Assembly	1	
R-990KIT-204D	Wheel Mounting Hardware	2	
R-20136	Operating Decals	1	
K-B45RXR20229	Rear Brake kit	1	
R-990KIT-282	Railgear Mounting Hardware	1	

1. Loosen the fasteners securing the railgear support angles to the railgear mounting plates. Position and support the railgear so that the railgear mounting brackets are on either side of the rear of the vehicle frame with the blind end of the hydraulic cylinders facing the rear of the vehicle. The mounting plates should be flush with the rear of the vehicle frame and fit around the vehicle's suspension hangers.

2. The holes in the mounting plates should align with existing holes in the vehicle frame. It may be necessary to loosen the fasteners that support the railgear cross brace and/or the railgear lockup weight bar to be able to fit the railgear on the frame.

3. Ensure that there is approximately **19 3/8"** between the railgear pivot bearing center and the ground as shown and that the railgear mounting plates are level with top of the vehicle frame as shown. If this height cannot be achieved, the vehicle suspension will need to be modified. This modification is not included with the Rafna railgear.

4. Fasten each railgear mounting plate to the vehicle frame, using the supplied 5/8" and 3/4" fasteners, through the existing frame holes as shown. Tighten but do not torque these fasteners.

5. Using the mounting plates as a guide, drill the vehicle frame as shown for the remaining railgear mounting fasteners.

6. Tighten the bolts securing the railgear cross brace and/or railgear lockup bar if required. If there is a gap between these components and the railgear mounting plates it will be necessary to add flat washer shims as shown. Where possible, both sides should be shimmed equally.

7. Install the rail wheels, rail sweeps and brakes (if equipped) as shown. Fasten the rail wheels, rail sweeps and brakes (if equipped) to the wheel mounting tables with the supplied 1/2" hardware.

For rear brake installation, refer to the rear brake Installation manual for this railgear unit

8. Tighten but do not torque the 1/2" fasteners as they will be torqued following the railgear alignment procedure.

Install the railgear hydraulic system as per the Hydraulic Kit Installation manual before continuing with the following steps.

9. Follow the Rail Wheel Load Adjustment procedure detailed in the Operations, Service and Parts section of this manual.

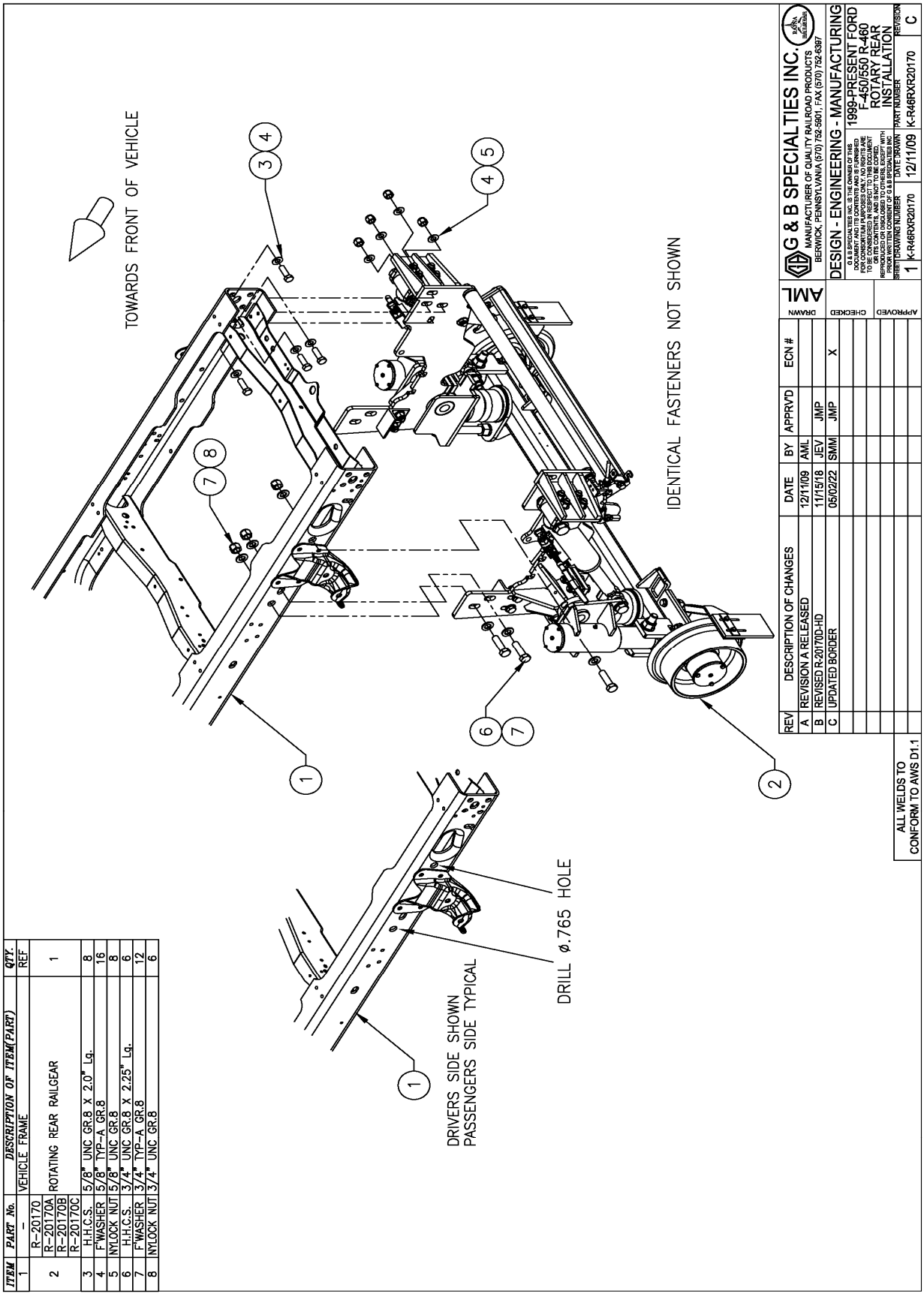
10. Follow the Railgear Alignment procedure detailed in the Operations, Service and Parts section of this manual.

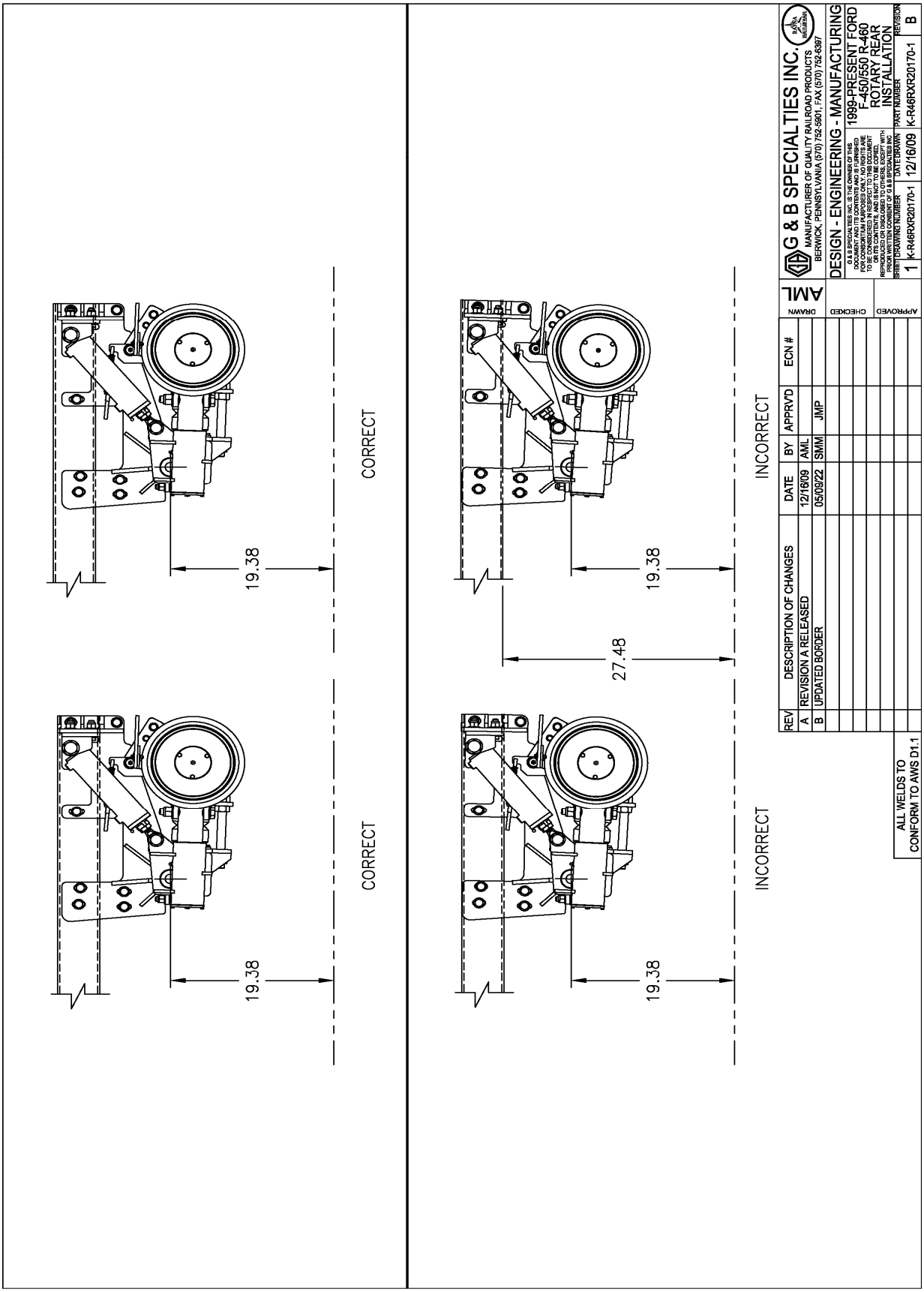
11. Follow the Railgear Lock System Adjustment Procedure detailed in the Operations, Service and Parts section of this manual.

12. Follow the Rail Sweep Adjustment procedure detailed in the Operations, Service and Parts section of this manual.

13. Torque all fasteners as detailed in the Operations, Service and Parts section of this manual.

14. Grease the railgear at all lubrication points as detailed in the Operations, Service and Parts section of this manual.


TOWARDS FRONT OF VEHICLE
IDENTICAL FASTENERS NOT SHOWN
DRILL ø.765 HOLE
DRIVERS SIDE SHOWN
PASSENGERS SIDE TYPICAL
ALL WELDS TO CONFORM TO AWS D1.1
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
1999-PRESENT FORD F-450/550 R-460 ROTARY REAR INSTALLATION
SHEET 1
DRAWING NUMBER K-R46RXR20170
DATE DRAWN 12/11/09
PART NUMBER K-R46RXR20170
REVISION C
DRAWN AML
CHECKED
APPROVED
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 12/11/09 | AML
B | REVISED R-20170D-HD | 11/15/18 | JEV | JMP
C | UPDATED BORDER | 05/02/22 | SMM | JMP | X
ITEM | PART No. | DESCRIPTION OF ITEM (PART) | QTY.
1 | - | VEHICLE FRAME | REF
2 | R-20170, R-20170A, R-20170B, R-20170C | ROTATING REAR RAILGEAR | 1
3 | H.H.C.S. | 5/8" UNC GR.8 X 2.0" Lg. | 8
4 | F"WASHER | 5/8" TYP-A GR.8 | 16
5 | NYLOCK NUT | 5/8" UNC GR.8 | 8
6 | H.H.C.S. | 3/4" UNC GR.8 X 2.25" Lg. | 6
7 | F"WASHER | 3/4" TYP-A GR.8 | 12
8 | NYLOCK NUT | 3/4" UNC GR.8 | 6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CORRECT
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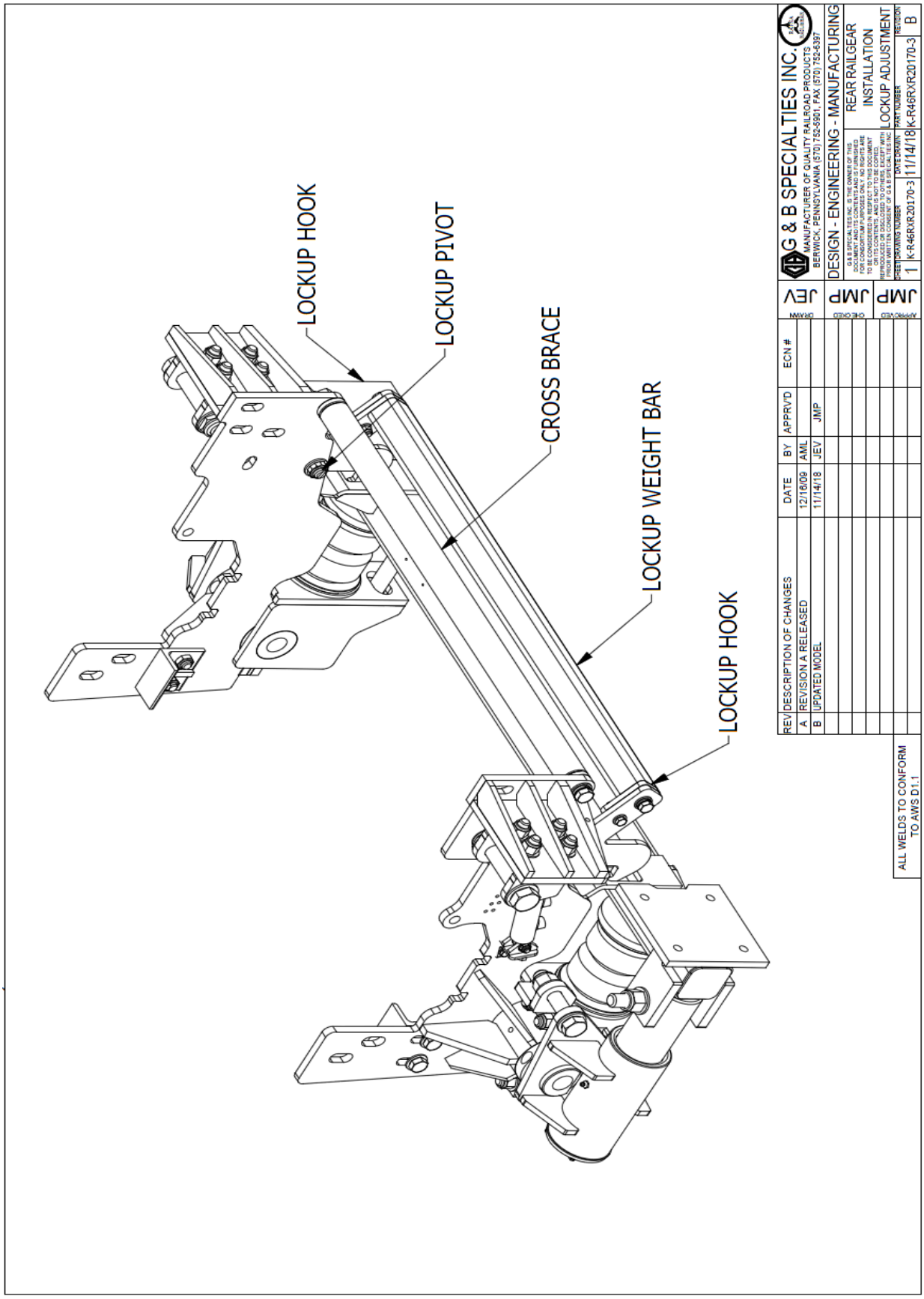
ALL WELDS TO CONFORM TO AWS D1.1
REV
DESCRIPTION OF CHANGES
DATE
BY
APPR'D
ECN #
A
REVISION A RELEASED
12/16/09
AML
B
UPDATED BORDER
05/09/22
SMM
JMP
DRAWN
AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 ; FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
1999-PRESENT FORD F-450/550 R-460 ROTARY REAR INSTALLATION
SHEET 1
DRAWING NUMBER K-R46RXR20170-1
DATE DRAWN 12/16/09
PART NUMBER K-R46RXR20170-1
REVISION B


LOCKUP HOOK
LOCKUP PIVOT
CROSS BRACE
LOCKUP WEIGHT BAR
LOCKUP HOOK
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 12/16/09 AML
B UPDATED MODEL 11/14/18 JEV JMP
G & B SPECIALTIES INC.
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DESIGN - ENGINEERING - MANUFACTURING
REAR RAILGEAR INSTALLATION
LOCKUP ADJUSTMENT
DRAWN JEV
CHECKED JMP
APPROVED JMP
DRAWING NUMBER K-R46RXR20170-3
DATE 11/14/18
PART NUMBER K-R46RXR20170-3
REVISION B
SHEET 1
ALL WELDS TO CONFORM TO AWS D1.1

RAILGEAR LOCK SYSTEM INSTALLATION

The railgear lock system provides automatic mechanical locking hooks for the road position and an over-center hydraulic lock for the rail position

The rear railgear axle lock should not be adjusted until the railgear over-center adjustment has been made as this can affect the engagement of the railgear lock.

Installation

The main components of the rail gear lock system are assembled and installed to the rear railgear unit at the factory.

Adjustment - Cable Actuated

1. Lower the rear railgear unit until the hook supports welded to the rear axle are clear of the lockup hooks.

2. Ensure that rear railgear lockup weight bar is free to move thru its entire range of motion, that the pivot points are properly greased and that all lockup components are free of any obstructions that would hinder movement.

3. Adjust the actuating cable at the point where it is secured to the cable support that is bolted to the railgear mounting bracket. Loosen the nuts securing the cable to the mounting bracket and slide the cable to lengthen or shorten the movement of the actuating arm.

4. Tighten cable adjusting bolts.

5. Raise the rear railgear slowly, as the rear axle raises the hook supports should push the lockup hooks back and out of the way. Both lock up hooks should contact both hook supports at the same time. Once the rear axle is completely raised the lockup hooks should automatically engage the hook supports.

6. Repeat steps 1 thru 5 until the rear lockup is engaging properly.

7. Once the lockup hook engagement has been set, disengage the rear lockup by pulling on the handle for the actuating cable. The actuator arm should push the lockup hooks back and out of the way of the hook supports.

8. Lower rear railgear unit to ensure that there is no unwanted contact with any vehicle or railgear components.

Adjustment - Hydraulic Actuated

1. Lower the rear railgear unit until the hook supports welded to the rear axle are clear of the lockup hooks.

2. Ensure that rear railgear lockup weight bar is free to move thru its entire range of motion, that the pivot points are properly greased and that all lockup components are free of any obstructions that would hinder movement.

3. Adjust the actuating cylinder by loosening the jam nut securing the cylinder rod to the clevis. Using the flats on the end of the cylinder rod, turn the rod to lengthen or shorten the movement of the actuating arm.

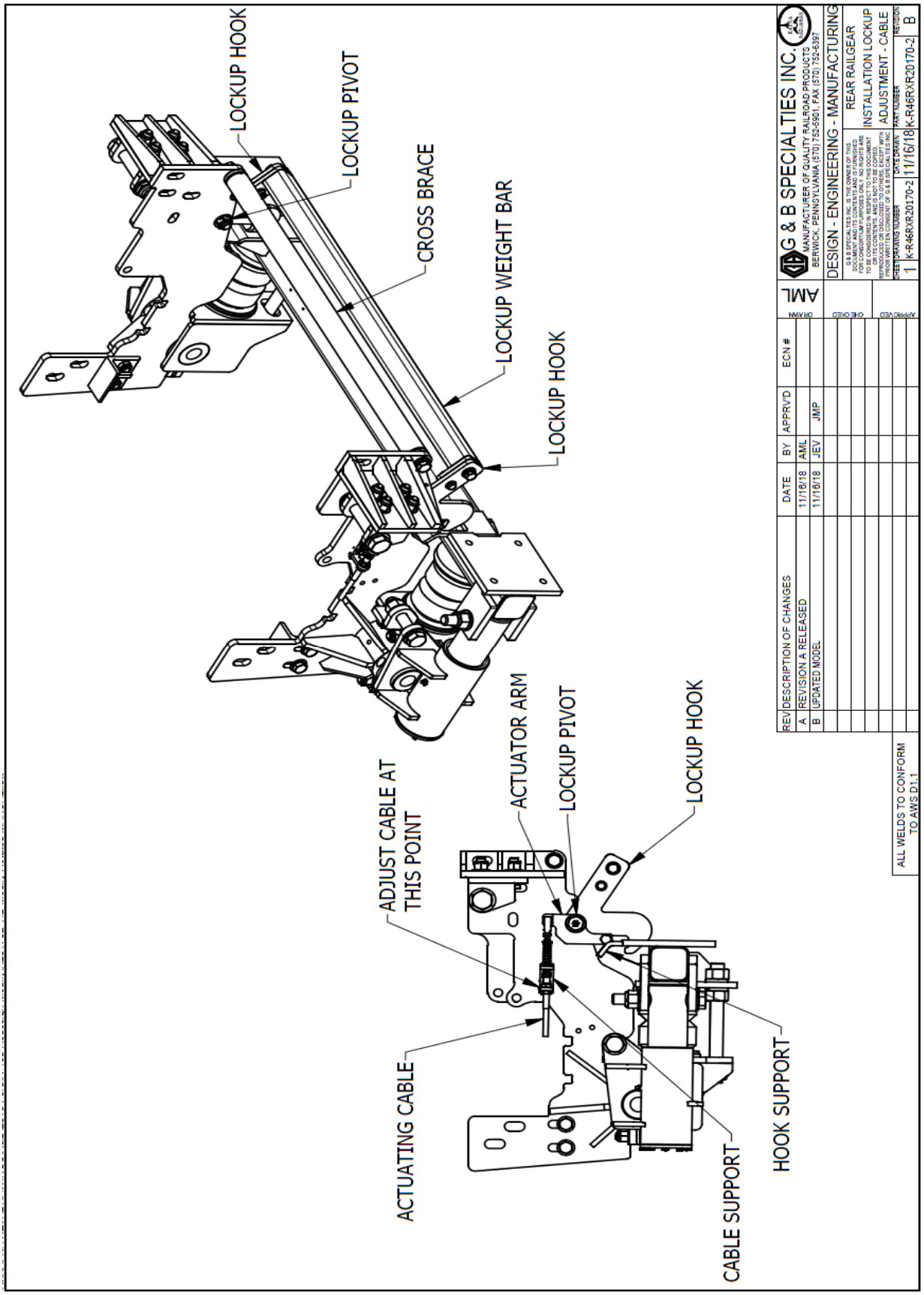
4. Raise the rear railgear slowly, as the rear axle raises the hook supports should push the lockup hooks back and out of the way. Both lock up hooks should contact both hook supports at the same time. Once the rear axle is completely raised the lockup hooks should automatically engage the hook supports.

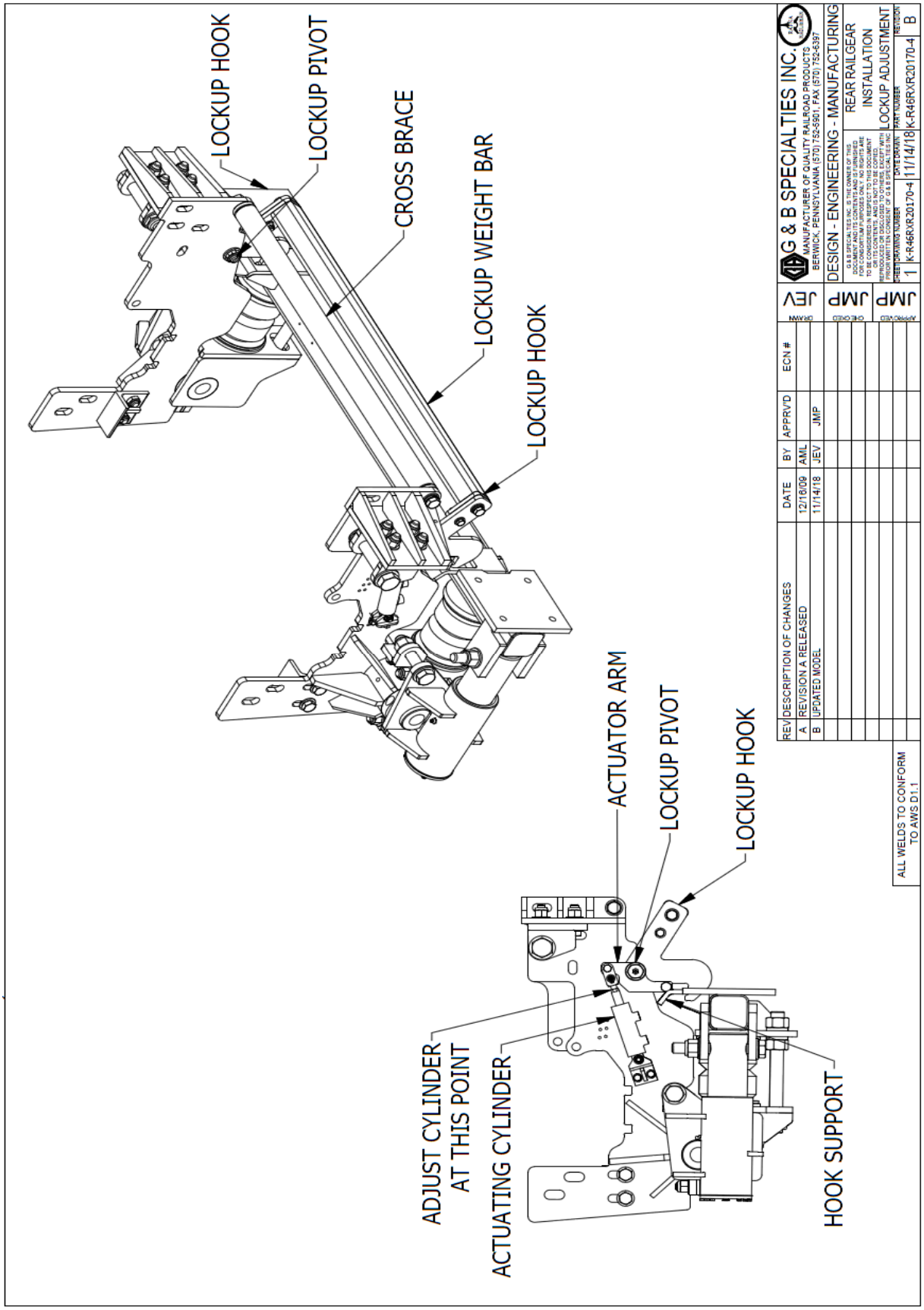
5. Repeat steps 1 thru 5 until the rear lockup is engaging properly.

6. Once the lockup hook engagement has been set, disengage the rear lockup by activating the lockup cylinder. The actuator arm should push the lockup hooks back and out of the way of the hook supports.

7. Lower rear railgear unit to ensure that there is no unwanted contact with any vehicle or railgear components.

8. Tighten actuating cylinder jam nut.


LOCKUP HOOK
LOCKUP PIVOT
CROSS BRACE
LOCKUP WEIGHT BAR
LOCKUP HOOK
ADJUST CABLE AT THIS POINT
ACTUATOR ARM
LOCKUP PIVOT
LOCKUP HOOK
ACTUATING CABLE
CABLE SUPPORT
HOOK SUPPORT
ALL WELDS TO CONFORM TO AWS D1.1
REV DESCRIPTION OF CHANGES DATE BY APPR'D ECN #
A REVISION A RELEASED 11/16/18 AML
B UPDATED MODEL 11/16/18 JEV JMP
DR'WN AML
CHK'D
APPROV'D
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
REAR RAILGEAR
INSTALLATION LOCKUP
ADJUSTMENT - CABLE
SHEET 1 DRAWING NUMBER K-R46RXR20170-2 DATE DRAWN 11/16/18 PART NUMBER K-R46RXR20170-2 REVISION B


LOCKUP HOOK
LOCKUP PIVOT
CROSS BRACE
LOCKUP WEIGHT BAR
LOCKUP HOOK
ACTUATOR ARM
LOCKUP PIVOT
LOCKUP HOOK
ADJUST CYLINDER AT THIS POINT
ACTUATING CYLINDER
HOOK SUPPORT
ALL WELDS TO CONFORM TO AWS D1.1
REV DESCRIPTION OF CHANGES DATE BY APPR'D ECN #
A REVISION A RELEASED 12/18/09 AML
B UPDATED MODEL 11/14/18 JEV JMP
DRAWN JEV
CHECKED JMP
APPROVED JMP
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DESIGN - ENGINEERING - MANUFACTURING
REAR RAILGEAR INSTALLATION
LOCKUP ADJUSTMENT
SPEED/DRAWING NUMBER 1 K-R46RXR20170-4
PART NUMBER 11/14/18 K-R46RXR20170-4
REVISION B

OPERATION OF R-460 ROTARY REAR RAILGEAR KIT 1999-PRESENT FORD F-450/550 4X2/4X4

OPERATION SAFETY PRECAUTIONS

If any operating, services 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 be observed at all times.
- Ensure that the position and function of all railgear controls are known before attempting operation.
- Ensure the railgear is locked in road position before starting road travel.
- Ensure all body parts and loose clothing are clear of any moving parts of the equipment.
- If misalignment of the railgear equipment is indicated, promptly perform the alignment procedure.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- 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.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.

OPERATION OF RAILGEAR KIT

With the railgear kit installed on this vehicle, it may be operated as normal, however the vehicle has decreased ground clearance and angles of approach and departure due to the railgear. Caution must be used when operating the vehicle.

Placing The Vehicle on Rail – To Lower The Railgear (Cable Lock):

1. Disengage the railgear axle lock by pulling on the locking cable handle. Do not force the locking cable. If the axle lock cannot be disengaged, raise the railgear slightly.

2. Hold the locking cable handle in the disengaged position.

3. Lower the railgear and release the locking cable handle once the railgear has rotated past the road locked position.

4. As the railgear is being deployed, it will start taking some of the vehicle's load. The railgears spring suspension should be observed compressing under this load.

5. Continue lowering the railgear until the hydraulic cylinders are fully extended. In this position, the railgear should be about 2º-3º over center.

Removing The Vehicle from Rail – To Raise The Railgear (Cable Lock):

1. Raise the railgear fully. The railgear lock hooks should engage the axle and lock automatically.

2. Verify that the railgear axle lock has engaged properly.

Placing The Vehicle on Rail – To Lower The Railgear (Hydraulic Lock):

1. Disengage the railgear axle lock by opening the ball valve for the railgear axle lock.

2. Raise the rear railgear, this will cause the lockup cylinder to activate and open the railgear lockup. Close the ball valve.

3. Lower the railgear.

4. As the railgear is being deployed, it will start taking some of the vehicle's load. The railgears spring suspension should be observed compressing under this load.

5. Continue lowering the railgear until the hydraulic cylinders are fully extended. In this position, the railgear should be about 2º-3º over center.

Removing The Vehicle From Rail – To Raise The Railgear (Hydraulic Lock):

1. Open the ball valve for the railgear axle lock. Lower the railgear, this will cause the lockup cylinder to activate and close the railgear lockup. Close the ball valve.

2. Raise the railgear fully. The railgear lock hooks should engage the axle and lock automatically.

3. Verify that the railgear axle lock has engaged properly.

SERVICE OF RAILGEAR KIT

The railgear 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.

Figure 1 provides the Non-Standard Fastener Torque Values. Table 2 provides Standard Fastener Torque Values for all other fasteners.

Grease fittings are provided at all railgear lubrication points as shown in Figure 2. The recommended lubricant for all lubrication points on this railgear is MYSTIK JT-6 LOW TEMP grease or equivalent. In cold weather areas/seasons, SHELL DARINA XL102 or equivalent may be used.

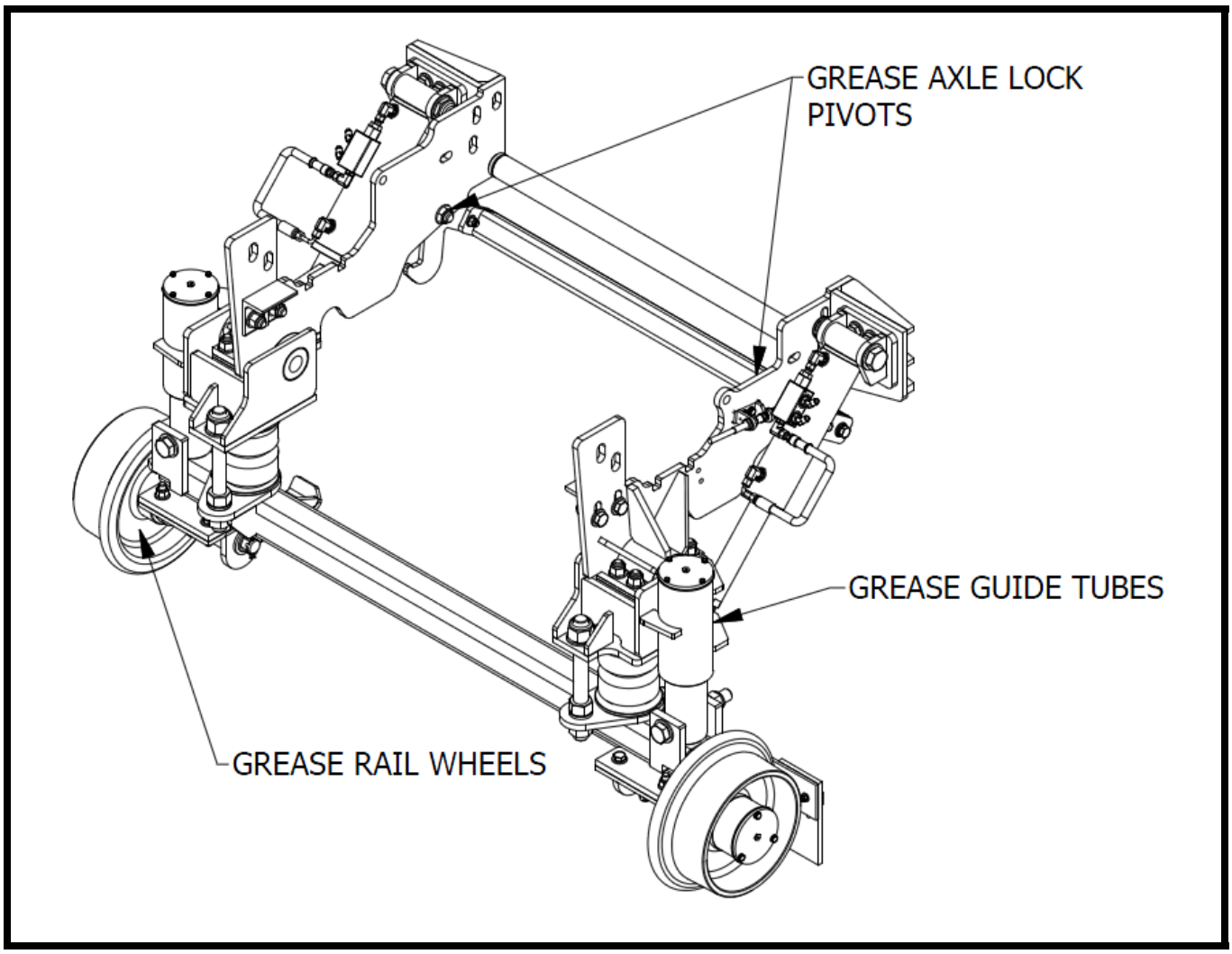
	Description	Daily	Weekly	Monthly	3Months	6 Months	12 Months
1	Visually inspect the railgear prior to use for damaged or worn parts	✓					
2	Check for loose wheels and fasteners	✓					
3	Ensure the rail gear lock-up system is functioning properly in both the road and rail positions.	✓					
4	Check and adjust truck tire pressure as per requirements	✓					
5	Ensure the vehicle is in good operating condition based on the vehicle operating and maintenance instructions	✓					
6	Check and adjust rail wheel end play (0.005" max.)						✓
7	Inspect railgear wheel flanges for wear. Use the "RAFNA Wheel Flange Indicator" for measurement		✓				
8	Inspect all hydraulic fittings and hoses for leaks or wear	✓					
9	Inspect rail sweeps for proximity to rail head	✓					
10	Grease hydraulic cylinder pivot points			✓			
11	Grease inner tube lower pivot points			✓			
12	Grease inner tubes			✓			
13	Lubricate locking mechanism			✓	✓	✓	
14	Check level on hydraulic reservoir. Top off with appropriate filtered fluid	✓					
15	Inspect and grease railgear wheel bearings						✓
16	Check and correct rail wheel alignment, if gear is removed or damaged, or every 12 months						✓

Note:

For continuous service at ambient temperatures above 40°C (105°F), more frequent lubrication is required.

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



Railgear Lubrication Points

RAILGEAR OVER-CENTER ADJUSTMENT

The railgear is designed to rotate slightly past vertical into the rail position in order to provide a secondary safety feature in the event of a hydraulic and / or lock pin failure. This additional rotation past vertical is called the over-center angle and is adjustable via a threaded rod end on the end of the hydraulic cylinder. The location of the railgear in the road position is also a function of the over-center adjustment, however, DO NOT use the over-center adjustment to adjust the road position of the railgear. This will have adverse effects on the over-center safety feature.

The over-center angle is defined as the angle between the vertical edge of the outer guide tubes and the vertical. It can be measured with the vehicle on a level section of rail with the railgear in the rail position using an angle meter. The over-center angle must be between 2°-3° past vertical. If this is not the case, adjust as follows:

1. Unload the railgear hydraulic cylinder by raising the railgear just off rail.

2. Loosen the jam nut on the hydraulic cylinder rod end and adjust the rod to increase or decrease the over-center angle. Note that the cylinder rod can be turned instead of turning the rod end.

3. Re-deploy the railgear to the rail position and re-check the over-center angle. Re-adjust as necessary.

4. Tighten the jam nut on the hydraulic cylinder rod end.

5. Repeat process for other cylinder.

6. Both cylinders should be adjusted so that both cylinders have the same amount of stroke over center. This will help to eliminate any binding or twisting of the railgear when deployed to the rail position.

7. Following the over-center angle adjustment, the railgear may contact the vehicle if not enough clearance was left during installation. Check the railgear clearance to all vehicle components throughout the full range of railgear and railgear suspension movement. If there is interference with the vehicle bumper, it can be trimmed and reinforced as required.

8. With the railgear fully raised to the road position, ensure that the railgear lock has properly engaged.

RAIL WHEEL BEARING ADJUSTMENT

The rail wheel bearings require periodic adjustment to keep the endplay within specification. If the rail wheel bearings are not correctly adjusted, failure may occur and will not be covered under the railgear warranty. Check and adjust the bearing endplay with the railgear in the road position and with the rail wheels free to turn.

Use a magnetic base dial gauge to measure the endplay of each rail wheel bearing. The bearing endplay must be between 0.001" and 0.005". If this is not the case, adjust as follows:

1. Remove the rail wheel hubcap and gasket by removing the three 1/4" bolts and 1/4" lock washers. Remove and discard the cotter pin from the 3/4" slotted spindle nut.

2. Ensure the wheel-bearing cavity is full of grease.

3. While rotating the rail wheel forward, torque the spindle nut to 20 ft-lbs. Then loosen the spindle nut and re-torque it to 6 ft-lbs. Re-check and re-adjust the bearing endplay if required. If no torque wrench is available, tighten the spindle nut until the rail wheel is difficult to turn by hand. Then loosen the spindle nut and retighten it just until no loose can be felt in the bearings. Re-adjust the bearing endplay with a torque wrench as soon as possible.

4. Install a new 3/16" x 2" long cotter pin through the spindle nut. Tighten the spindle nut slightly if needed to insert the cotter pin.

5. Re-install the hubcap and gasket using the 1/4" bolts and new 1/4" split lock washers. Blue Loctite can be used on the bolts as an added safety measure. Tighten and torque the 1/4" fasteners to 12 ft-lbs dry. Do not over torque.

RAIL SWEEP ADJUSTMENT

The distance between the rail sweep rubber and the rail is adjustable and should be maintained at approximately 1/8". To adjust the rail sweep rubber, with the railgear in the rail position, loosen the two 1/4" fasteners that secure the rail sweep rubber to the rail sweep bracket. Slide the rail sweep rubber up or down for the correct clearance. Tighten and torque the 1/4" fasteners to 12 ft-lbs dry. Do not over torque.

RAIL WHEEL LOAD ADJUSTMENT

During rail travel, the railgear removes a predetermined portion of the vehicle's load from the vehicle's wheels and carries it on the rail wheels. A minimum amount of load must be maintained on the rail wheels in order to avoid derailment. Likewise, a minimum amount of load must be maintained on the vehicle wheels in order to provide traction for acceleration and braking.

The rail wheel load should be adjusted following the installation of the railgear once the vehicle has had all of its permanent load (service body, crane, welders, etc) installed. The rail wheel load requires periodic checks, however it should only require re-adjustment if the railgear is moved, the vehicle equipment is changed, or the vehicle suspension settles or is changed. As non-permanent load is added to and/or removed from the vehicle, the rail wheel load will change also. This is acceptable as long as the weight ratings of the vehicle, axles, wheels, tires and railgear are not exceeded and as long as the minimum rail wheel load is maintained.

The rail wheel load must be a minimum of **700-1400 lbs** with approx. 3/4" - 1" of railgear spring compression and is checked as described below using a hydraulic bottle jack equipped with a gauge. If the gauge on the hydraulic bottle jack reads in pounds per square inch (psi), use Table 3 along with the jack bore diameter to convert this reading to pounds (lbs). If the gauge reads in pounds, then no conversion is required.

Check each rail wheel load as follows:

1. Place the vehicle on a straight and level section of rail with the railgear lowered to the rail position. Ensure the railgear is taking load through the tread of the rail wheel and not on the flange of the rail wheel. The vehicle should only be carrying the permanently attached load (service body, crane, etc) and any always carried non-attached load (welders, etc) during this procedure. Do not include the operator or passengers. Ensure the vehicle tires have been inflated to the manufacturer's recommended air pressure and that they are not in contact with any obstructions except the rails.

2. Place the hydraulic bottle jack on a solid surface beneath the rail wheel spindle housing and jack the rail wheel off the rail.

3. Insert a piece of paper between the rail and the rail wheel. Lower the jack until the rail wheel squeezes the paper so that it cannot be pulled out.

4. Slowly jack up the rail wheel while pulling on the paper and observe the jack gauge. When the paper can be pulled out, stop jacking.

5. Record the load or pressure reading on the jack gauge.

Table 3: Rail Wheel Load vs Jack Pressure and Bore

Jack Pressure (PSI)	Jack Cylinder Bore Diameter (inches)								
	7/8	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8
540	320	370	420	480	540	600	660	730	800
560	340	390	440	500	560	620	690	760	830
580	350	400	460	510	580	640	710	780	860
600	360	410	470	530	600	660	740	810	890
620	370	430	490	550	620	690	760	840	920
640	380	440	500	570	640	710	790	870	950
660	400	460	520	590	660	730	810	890	980
680	410	470	530	600	680	750	830	920	1010
700	420	480	550	620	700	780	860	950	1040
720	430	500	570	640	720	800	880	970	1070
740	440	510	580	660	740	820	910	1000	1100
760	460	520	600	670	760	840	930	1030	1130
780	470	540	610	690	780	860	960	1060	1160
800	480	550	630	710	800	890	980	1080	1190
820	490	570	640	730	820	910	1010	1110	1220
840	510	580	660	740	830	930	1030	1140	1250
860	520	590	680	760	850	950	1060	1160	1280
880	530	610	690	780	870	970	1080	1190	1310
900	540	620	710	800	890	1000	1100	1220	1340
920	550	640	720	820	910	1020	1130	1240	1370
940	570	650	740	830	930	1040	1150	1270	1400
960	580	660	750	850	950	1060	1180	1300	1430
980	590	680	770	870	970	1090	1200	1330	1460
1000	600	690	790	890	990	1110	1230	1350	1480
1020	610	700	800	900	1010	1130	1250	1380	1510
1040	630	720	820	920	1030	1150	1280	1410	1540
1060	640	730	830	940	1050	1170	1300	1430	1570
1080	650	750	850	960	1070	1200	1330	1460	1600
1100	660	760	860	980	1090	1220	1350	1490	1630
1120	670	770	880	990	1110	1240	1370	1520	1660
1140	690	790	900	1010	1130	1260	1400	1540	1690
1160	700	800	910	1030	1150	1280	1420	1570	1720
1180	710	810	930	1050	1170	1310	1450	1600	1750
1200	720	830	940	1060	1190	1330	1470	1620	1780
1220	730	840	960	1080	1210	1350	1500	1650	1810
1240	750	860	970	1100	1230	1370	1520	1680	1840
1260	760	870	990	1120	1250	1400	1550	1700	1870
1280	770	880	1010	1130	1270	1420	1570	1730	1900
1300	780	900	1020	1150	1290	1440	1600	1760	1930
1320	790	910	1040	1170	1310	1460	1620	1790	1960
1340	810	920	1050	1190	1330	1480	1640	1810	1990
1360	820	940	1070	1210	1350	1510	1670	1840	2020
1380	830	950	1080	1220	1370	1530	1690	1870	2050
1400	840	970	1100	1240	1390	1550	1720	1890	2080
1420	850	980	1120	1260	1410	1570	1740	1920	2110
1440	870	990	1130	1280	1430	1590	1770	1950	2140
1460	880	1010	1150	1290	1450	1620	1790	1980	2170
1480	890	1020	1160	1310	1470	1640	1820	2000	2200
1500	900	1040	1180	1330	1490	1660	1840	2030	2230
1520	910	1050	1190	1350	1510	1680	1870	2060	2260
1540	930	1060	1210	1370	1530	1710	1890	2080	2290
1560	940	1080	1230	1380	1550	1730	1910	2110	2320
1580	950	1090	1240	1400	1570	1750	1940	2140	2350
1600	960	1100	1260	1420	1590	1770	1960	2160	2380
1620	970	1120	1270	1440	1610	1790	1990	2190	2410
1640	990	1130	1290	1450	1630	1820	2010	2220	2440
1660	1000	1150	1300	1470	1650	1840	2040	2250	2460
1680	1010	1160	1320	1490	1670	1860	2060	2270	2490
1700	1020	1170	1340	1510	1690	1880	2090	2300	2520
1720	1030	1190	1350	1530	1710	1900	2110	2330	2550
1740	1050	1200	1370	1540	1730	1930	2140	2350	2580

Rail Wheel Load (lbs)

Adjust each rail wheel load as follows:

There are two rubber springs on the railgear located between each railgear outer tube assembly and the railgear axle and is held in place by the inner guide tube.

Do not use the threaded rod to adjust rail wheel loads

1. Raise the railgear to the full locked road position.

2. Support the railgear unit with a floor jack.

3. Loosen the bolts holding the railgear mounting brackets to the vehicle frame

4. To decrease wheel load, move the entire railgear unit up, to increase wheel load move the entire railgear unit down.

5. Tighten, but do not torque, the railgear mounting bolts and lower the railgear to the rail position and re-check the rail wheel loads. The rear railgear springs should be observed compressing approx. 3/4"-1".

6. Re-adjust the rail wheel loads if necessary. The recommended minimum wheel load for this railgear unit is 700-1400 lbs at 3/4"-1" spring compression.

7. Once the proper rail wheel weight has been reached, raise the railgear until the rail wheels are off the rails and torque the rail gear mounting bolts. Torque the 5/8" bolts to 150 ft-lbs dry and the 3/4" bolts to 175ft-lbs dry. Do not over torque.

8. Slide the railgear support angles up against the bottom of the vehicle frame. Torque the 5/8" mounting bolts to 150 ft-lbs dry.

9. Following the rail wheel load adjustment, the railgear may contact the vehicle if not enough clearance was left during installation. Check the railgear clearance to all vehicle components throughout the full range of railgear and railgear suspension movement. If there is interference with the vehicle exhaust system, it can be modified to suit, ensuring any exhaust system modifications conform to applicable laws and regulations.

RAILGEAR ALIGNMENT

The railgear must be correctly aligned in order to perform properly, safely, and avoid excessive wear and derailment. The rail wheels can be independently aligned for toe-in/toe-out and the railgear can be adjusted side to side (laterally) on the vehicle. A parallel line system and the following procedure should be used to perform the railgear alignment.

The rail wheel loads should be checked and adjusted, the vehicle should have had a four-wheel alignment (with the complete railgear package installed on the vehicle and any suspension modifications done) and the tires should be properly inflated prior to performing the railgear alignment.

The railgear alignment is done with the vehicle on a straight and level section of rail with the railgear in the rail position and the vehicle wheels pointing straight ahead. The individual rail wheel alignment should be done first, followed by the lateral alignment of the railgear.

Each rail wheel is aligned by loosening the four 1/2" fasteners that secure it to the railgear axle. The rail wheel is then turned into alignment. The four 1/2" fasteners should then be tightened and torqued to 100 ft-lbs dry. Do not over torque.

Lateral alignment is achieved by loosening the shaft collars and sliding the lower half of the railgear unit in the pivot bearings. It may be necessary to loosen the bearing caps slightly to ease the adjustment process. Once the railgear is in alignment, tighten the shaft collars and tighten the bearing caps to 45 ft-lbs dry. Do not over torque.

Following the railgear alignment, the railgear may contact the vehicle if not enough clearance was left during installation. Check the railgear clearance to all vehicle components throughout the full range of railgear and railgear suspension movement. If there is interference with the vehicle exhaust system, it can be modified to fit, ensuring any exhaust system modifications conform to applicable laws and regulations.

RAFNA RAILGEAR ALIGNMENT RACK DATA

GAS OR DIESEL VIN#_____

VEHICLE MAKE:_____ VEHICLE MODEL:_____ VEHICLE YEAR:_____
DOOR STICKER GVWR:_____ DOOR STICKER GAWR FRT:_____ DOOR STICKER GAWR RR_____
RAILGEAR S/N: FRT_____ RR_____ VEHICLE UNIT #,S/N:_____
RAILGEAR TYPE:_____ INSTALLER: _____ DATE: _____

SET UP PARALLEL STRING LINES
A & B MUST BE EQUAL WITHIN 1/32"
C & D MUST BE EQUAL WITHIN 1/32"

ADJUST STRING LINES AROUND VEHICLE
E, F, G, & H MUST BE EQUAL WITHIN 1/16"
I, J, K, & L MUST BE EQUAL WITHIN 1/16"
(E, F, G, & H MAY NOT EQUAL I, J, K, & L)

ADJUST RAIL WHEEL ALIGNMENT
M & O MUST BE EQUAL WITHIN 1/16"
N & P MUST BE EQUAL WITHIN 1/16"
Q & S MUST BE EQUAL WITHIN 1/16"
R & T MUST BE EQUAL WITHIN 1/16"

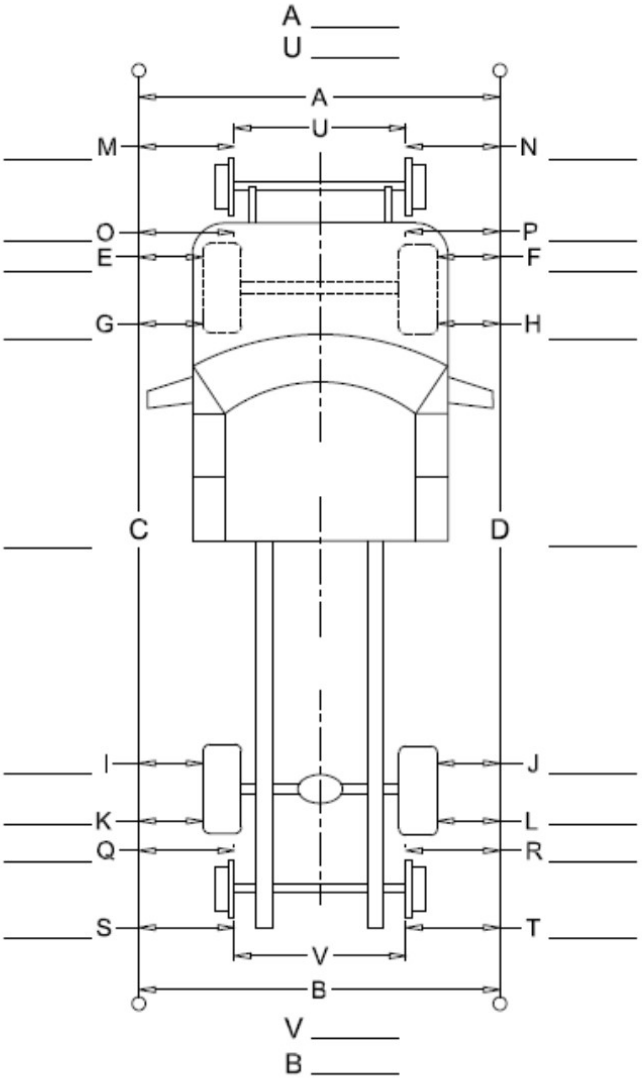
ADJUST RAILGEAR LATERAL ALIGNMENT
M & O MUST EQUAL N & P WITHIN 1/8"
Q & S MUST EQUAL R & T WITHIN 1/8"

ENSURE THAT U & V ARE BETWEEN
53– 7/16" AND 53—9/16"

OVER-CENTER ANGLE (DEGREE)
FRONT_____
REAR _____

RAIL WHEEL LOADS (LBS)
LEFT FRONT _____RIGHT FRONT_____
LEFT REAR _____ RIGHT REAR _____

RAIL WHEEL FLANGE TO GROUND CLEARANCE
LEFT FRONT _____RIGHT FRONT_____
LEFT REAR _____ RIGHT REAR _____



MOUNTING HEIGHT FRONT: _____ MOUNTING HEIGHT REAR: _____

STOCK TURNING DIAMETER: _____ **MODIFIED** TURNING DIAMETER: _____

OEM: VEHICLE WEIGHT: _____ FRONT GAWR: _____ REAR GAWR: _____

MODIFIED: VEHICLE WEIGHT: _____FRONT GAWR: _____REAR GAWR:_____

FAX COMPLETED FORM TO JAKE SANUTE AT FAX # 570-802-0491

MAY 31, 2018 REV "D"

Railgear Alignment Rack

RAFNA RAILGEAR PORTABLE ALIGNMENT DATA

GAS OR DIESEL VIN#_____

VEHICLE MAKE:_____ VEHICLE MODEL:_____ VEHICLE YEAR:_____
DOOR STICKER GVWR:_____ DOOR STICKER GAWR FRT:_____ DOOR STICKER GAWR RR_____
RAILGEAR S/N: FRT_____ RR_____ VEHICLE UNIT #,S/N:_____
RAILGEAR TYPE:_____ INSTALLER: _____ DATE: _____

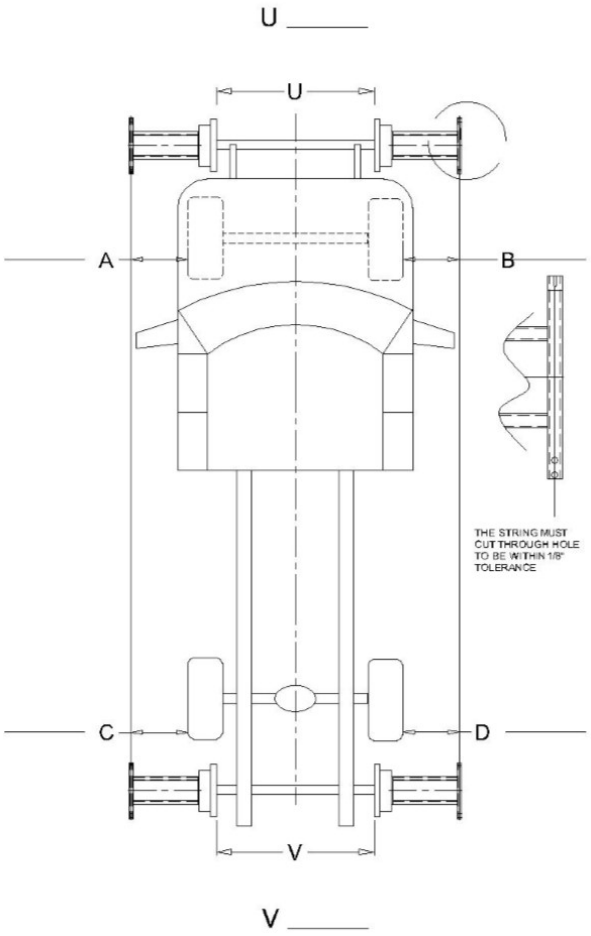
ADJUST RAILGEAR LATERAL ALIGNMENT
A MUST EQUAL B WITHIN 1/8"
C MUST EQUAL D WITHIN 1/8"

ENSURE THAT U & V ARE BETWEEN
53– 7/16" AND 53—9/16"

OVER-CENTER ANGLE (DEGREE)
FRONT_____
REAR _____

RAIL WHEEL LOADS (LBS)
LEFT FRONT _____RIGHT FRONT_____
LEFT REAR _____ RIGHT REAR _____

RAIL WHEEL FLANGE TO GROUND CLEARANCE
LEFT FRONT _____RIGHT FRONT_____
LEFT REAR _____ RIGHT REAR _____



MOUNTING HEIGHT FRONT: _____ MOUNTING HEIGHT REAR: _____

STOCK TURNING DIAMETER: _____ **MODIFIED** TURNING DIAMETER: _____

OEM: VEHICLE WEIGHT: _____ FRONT GAWR: _____ REAR GAWR: _____

MODIFIED: VEHICLE WEIGHT: _____FRONT GAWR: _____REAR GAWR:_____

FAX COMPLETED FORM TO JAKE SANUTE AT FAX # 570-802-0491

MAY 31, 2018 REV B

Railgear Alignment Portable

REAR RAILGEAR SPRING REPLACEMENT

Please take caution when working with the springs on this railgear unit. the springs contain a small amount of preload.

1. Ensure that all weight has been removed from the railgear unit by either raising the rear railgear until the rail wheels are off the ground or lowering the railgear to the rail position and lifting the rear of the vehicle off the ground.

2. It is recommended that only one spring at a time be replaced. As it may be difficult to compress both springs at once for reassembly while the railgear unit is mounted to the truck.

3. Remove the inner guide pivot bolt. Inspect for damage and replace if necessary. (It may be necessary to compress the rear spring to ease the removal of the inner guide bolt. To compress the rear spring, tighten the nut on the top of the threaded rod until the inner guide pivot bolt can be removed.)

4. Slowly loosen the threaded rod top nut to release the preload on the spring. Continue to loosen the nut until the spring becomes loose.

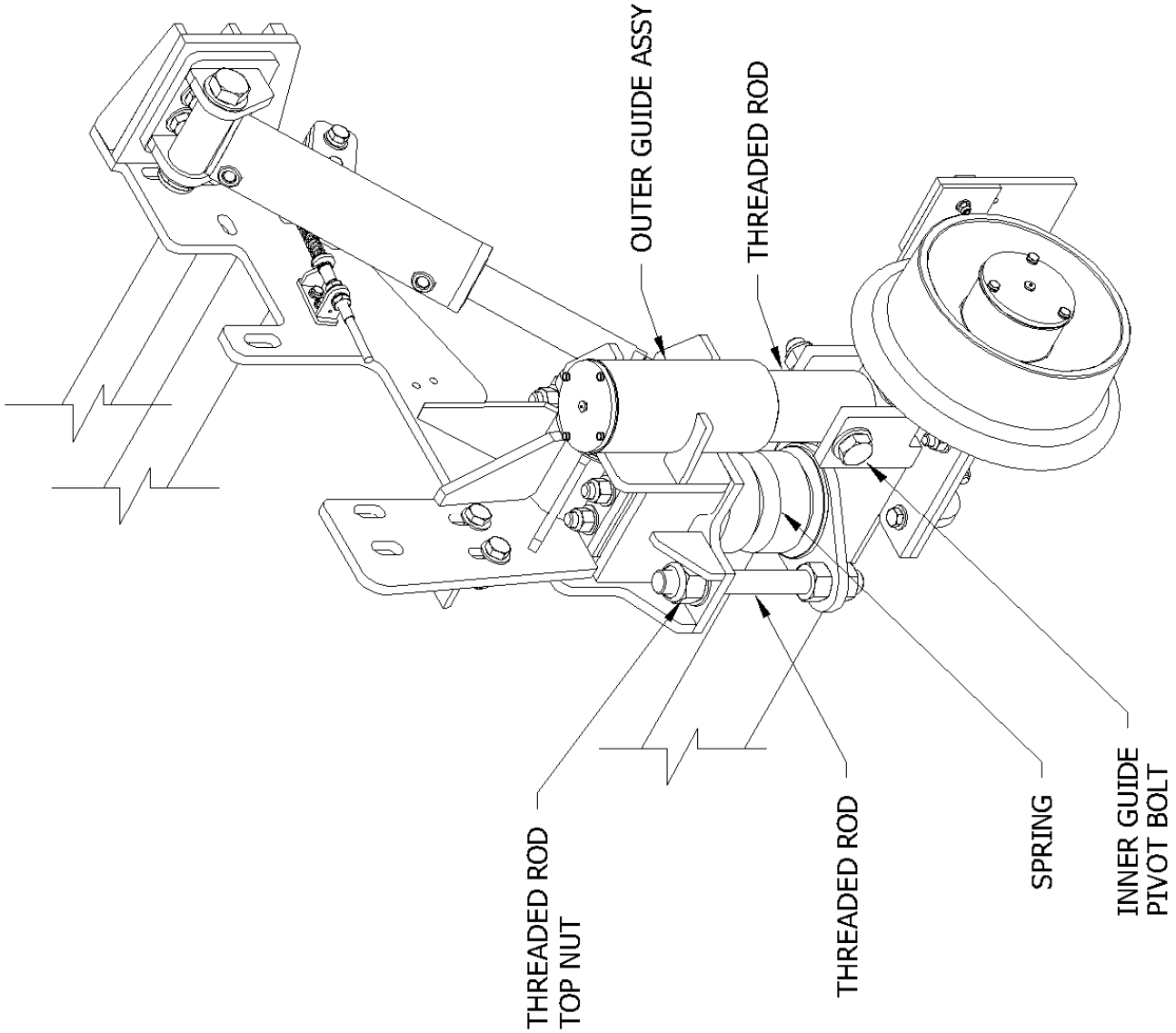
5. Remove the old spring and insert new spring. Ensure that the spring spacers have also been installed, 1 on the top and 1 on the bottom of the spring.

6. Slowly tighten the threaded rod top nut until the inner guide pivot bolt can be installed. It may be necessary to over compress the spring using the threaded rod as this may allow the inner and outer guide to align with less binding.

7. Install the inner guide pivot bolt. Torque to 100 ft-lbs dry. Do not over torque.

8. Slowly loosen the threaded rod top. The threaded rod top nut should be tight against the outer guide assembly but not so tight as to add any additional preload to the spring.

9. Repeat steps 1 thru 9 for opposite spring.


OUTER GUIDE ASSY
THREADED ROD
THREADED ROD
TOP NUT
THREADED ROD
SPRING
INNER GUIDE
PIVOT BOLT

WHEEL WEAR STANDARDS AND RECOMMENDATIONS

At the present time, G&B produces 8", 10", 12", 14", and 16" steel wheels. Each size has a different flange and tread thickness, which dictates the allowable wear. Although the following numbers are recommended limits, risk of failure is increased when not followed. Rail gauge can be supplied by G&B Specialties for 8", 10", 12", 14", and 16" rail wheels. They are used as go/no go gauges. When placed on rail wheels they will indicate how much wear is still permissible or if the rail wheels need to be replaced.

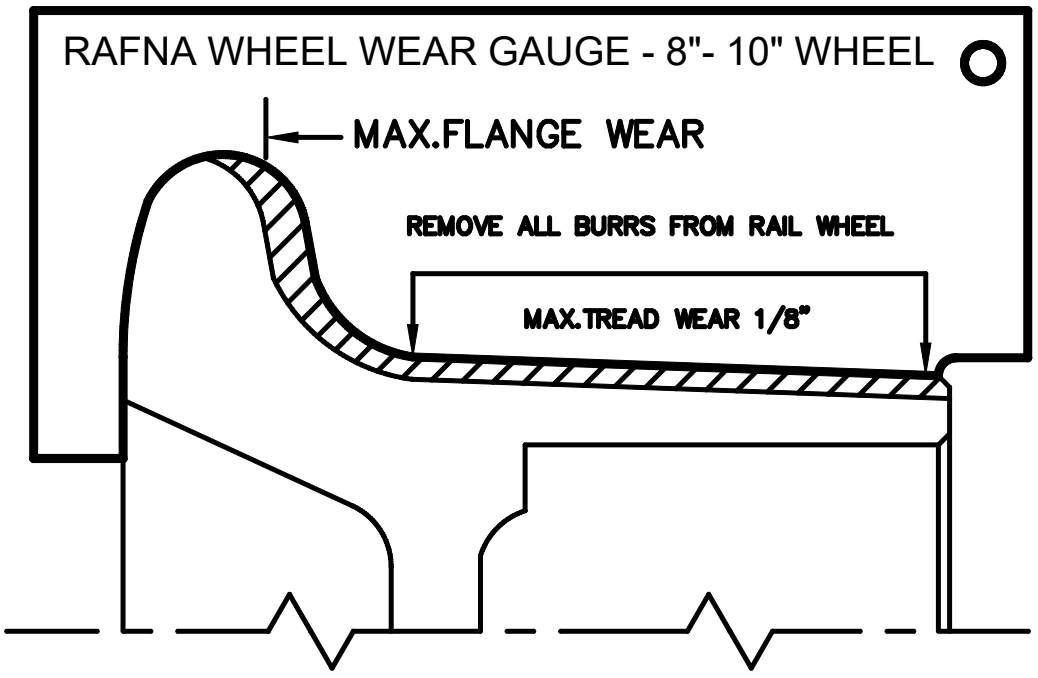
The gauge for the R-460 model railgear can be ordered using the following part number; S-001200

- **Rail wheel failure can result in equipment damage or failure, personal injury, or death.**

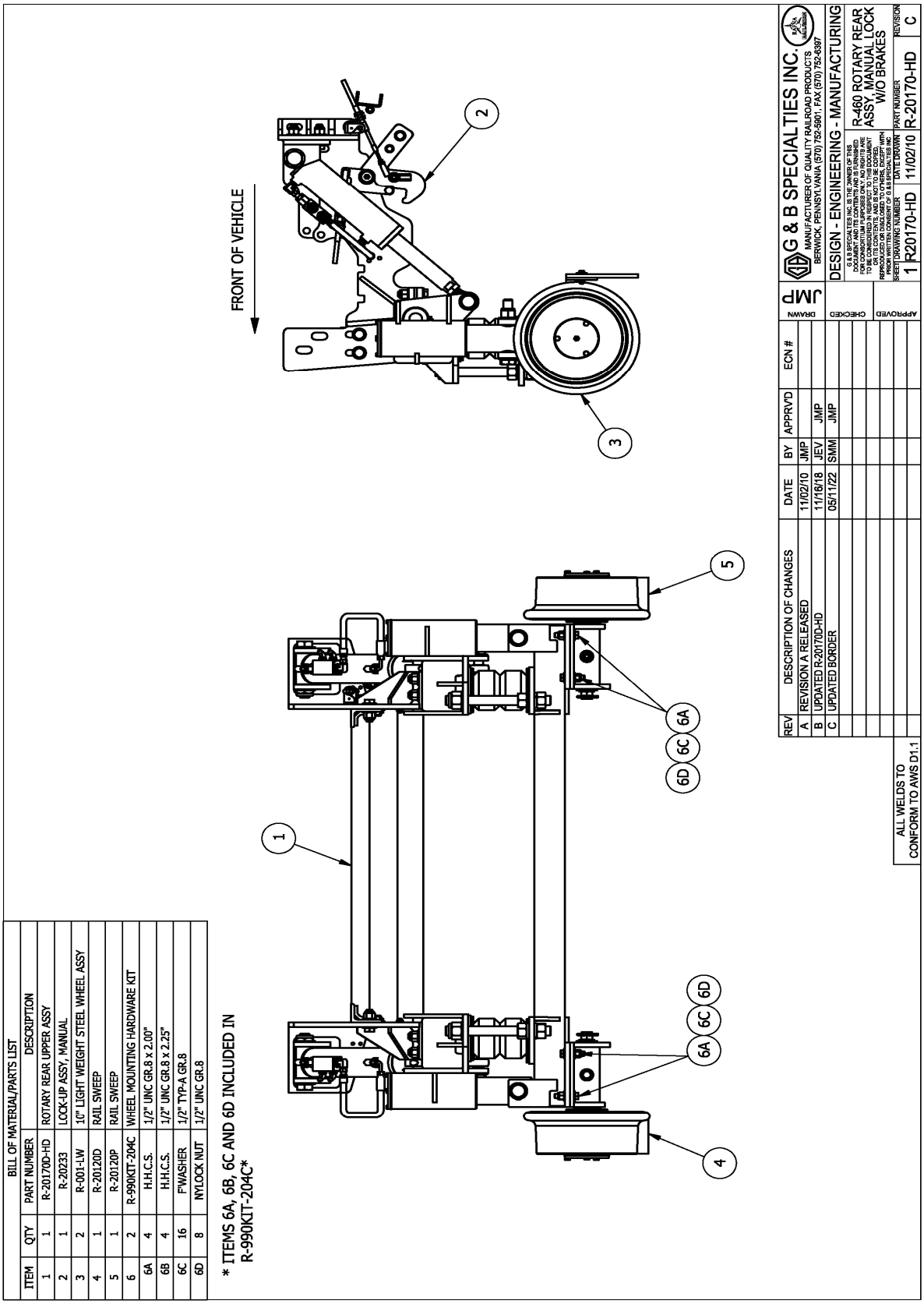
Flange Wear Limits:
The maximum flange wear is indicated on the rail wheel gauge. When the gauge is placed on the rail wheel, if a gap is seen between the gauge and the maximum flange wear line, the rail wheel needs to be replaced.

Tread Wear Limits:
For tread wear, use the following chart in conjunction with the appropriate rail wheel gauge.

NOMINAL RAIL WHEEL DIAMETER (INCHES)	MIN. ALLOWABLE WHEEL DIAMETER (INCHES)
10	9 3/4



PARTS



BILL OF MATERIAL/PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-20170D-HD	ROTARY REAR UPPER ASSY
2	1	R-20233	LOCK-UP ASSY, MANUAL
3	2	R-001-LW	10" LIGHT WEIGHT STEEL WHEEL ASSY
4	1	R-20120D	RAIL SWEEP
5	1	R-20120P	RAIL SWEEP
6	2	R-990KIT-204C	WHEEL MOUNTING HARDWARE KIT
6A	4	H.H.C.S.	1/2" UNC GR.8 x 2.00"
6B	4	H.H.C.S.	1/2" UNC GR.8 x 2.25"
6C	16	F'WASHER	1/2" TYP-A GR.8
6D	8	NYLOCK NUT	1/2" UNC GR.8

* ITEMS 6A, 6B, 6C AND 6D INCLUDED IN R-990KIT-204C*

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	11/02/10	JMP		
B	UPDATED R-20170D-HD	11/16/18	JEV	JMP	
C	UPDATED BORDER	05/11/22	SMM	JMP	

DRAWN JMP | CHECKED | APPROVED

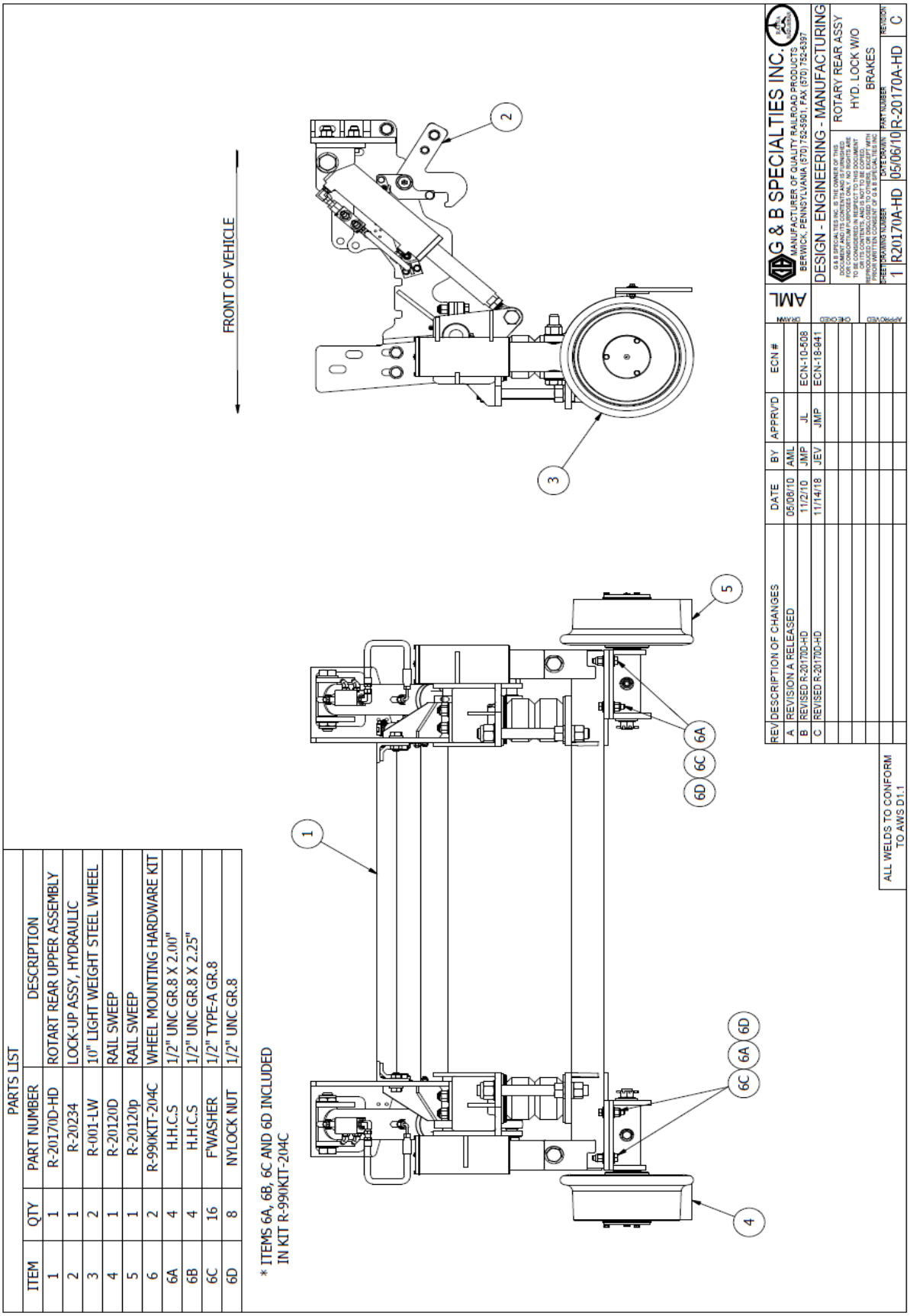
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

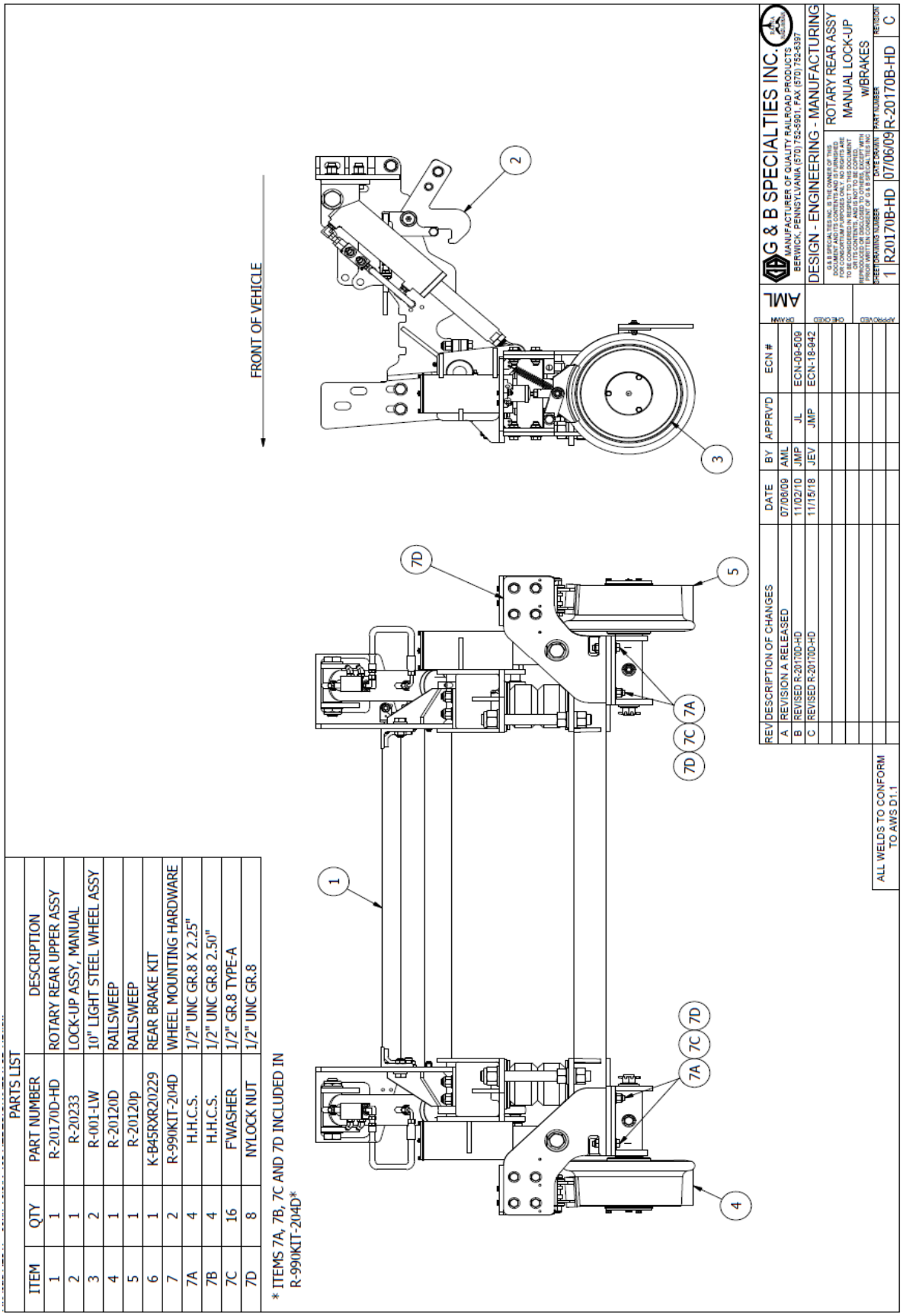
DESIGN - ENGINEERING - MANUFACTURING

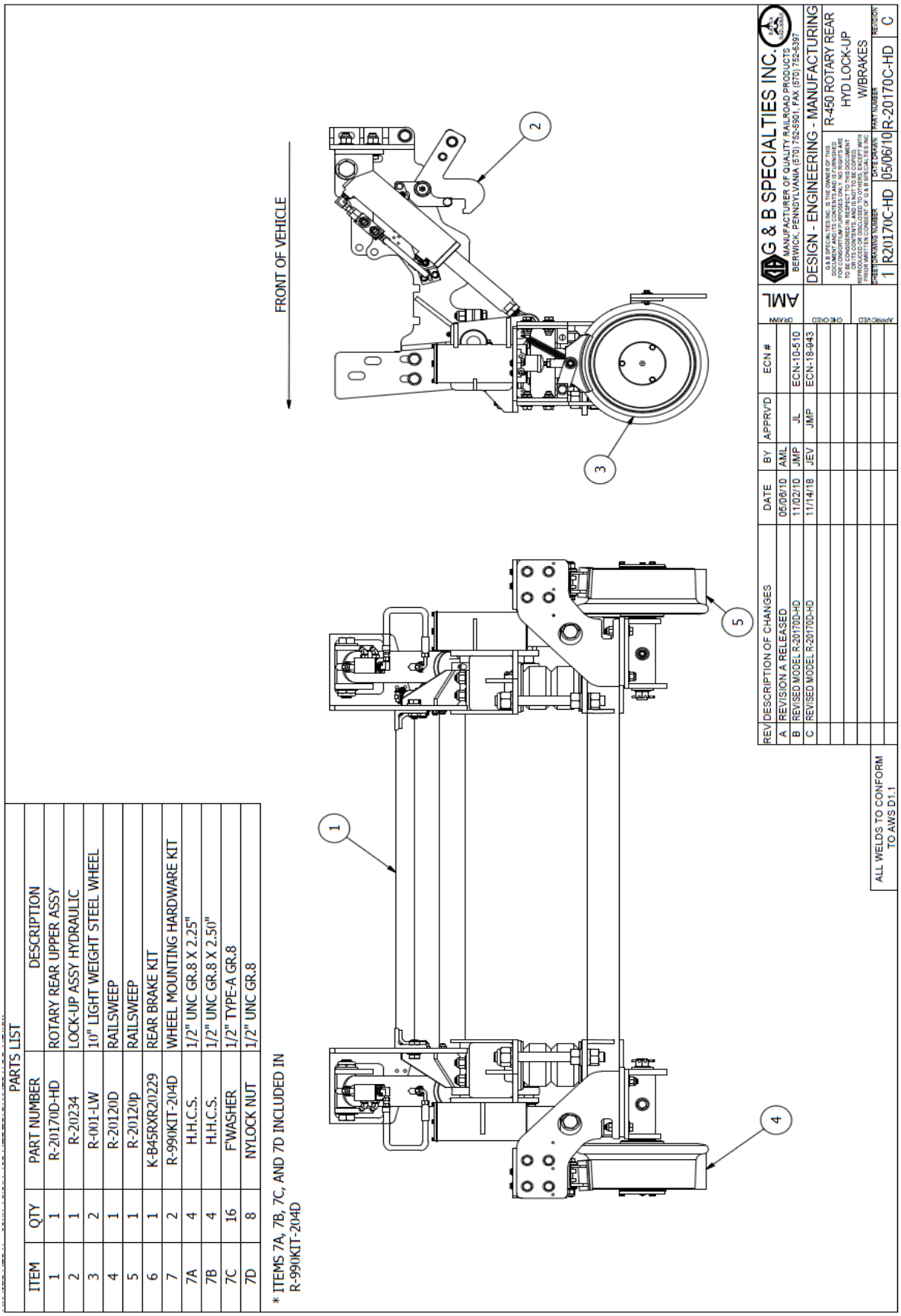
R-460 ROTARY REAR ASSY, MANUAL LOCK W/O BRAKES

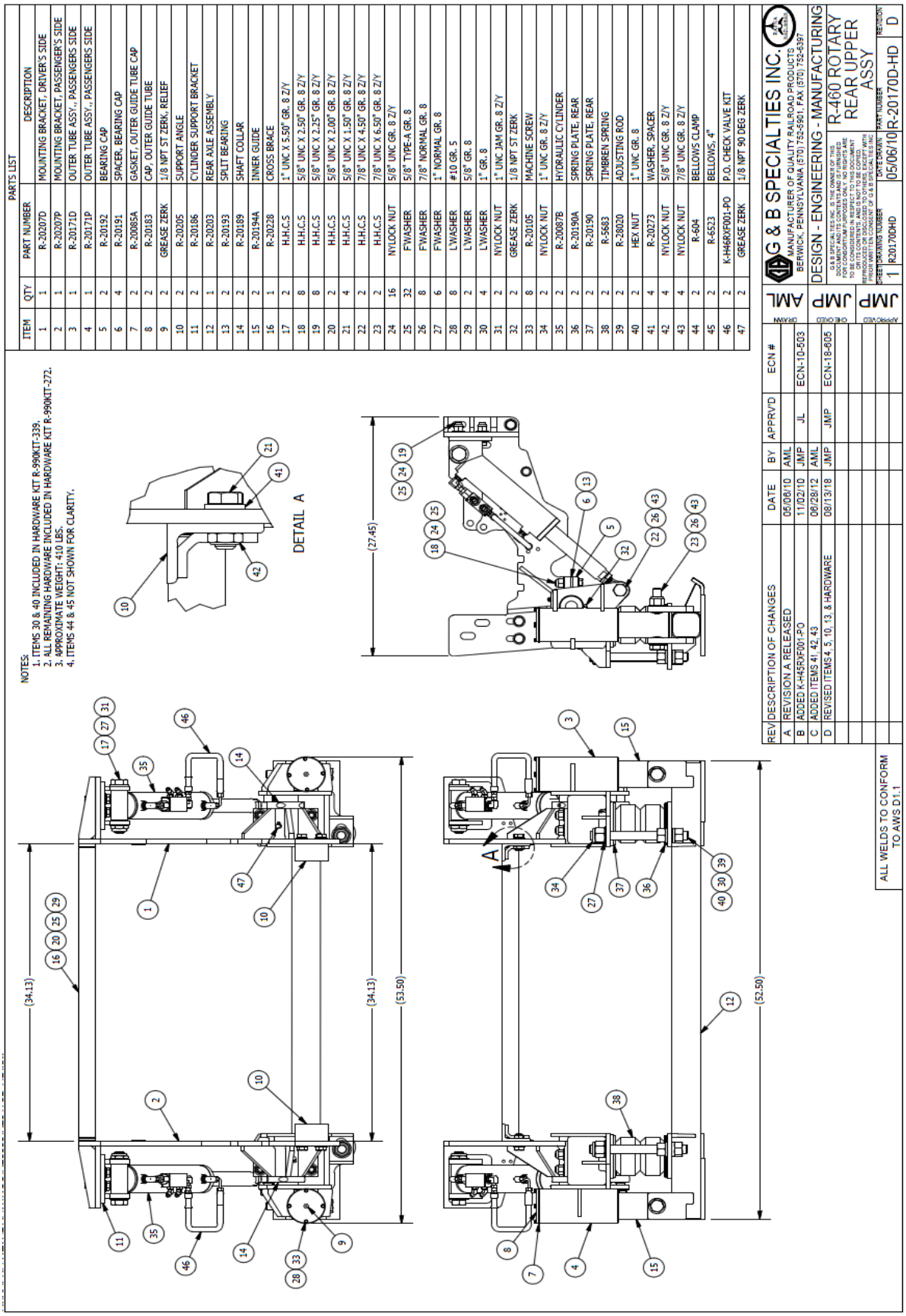
SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	R20170-HD	11/02/10	R-20170-HD	C

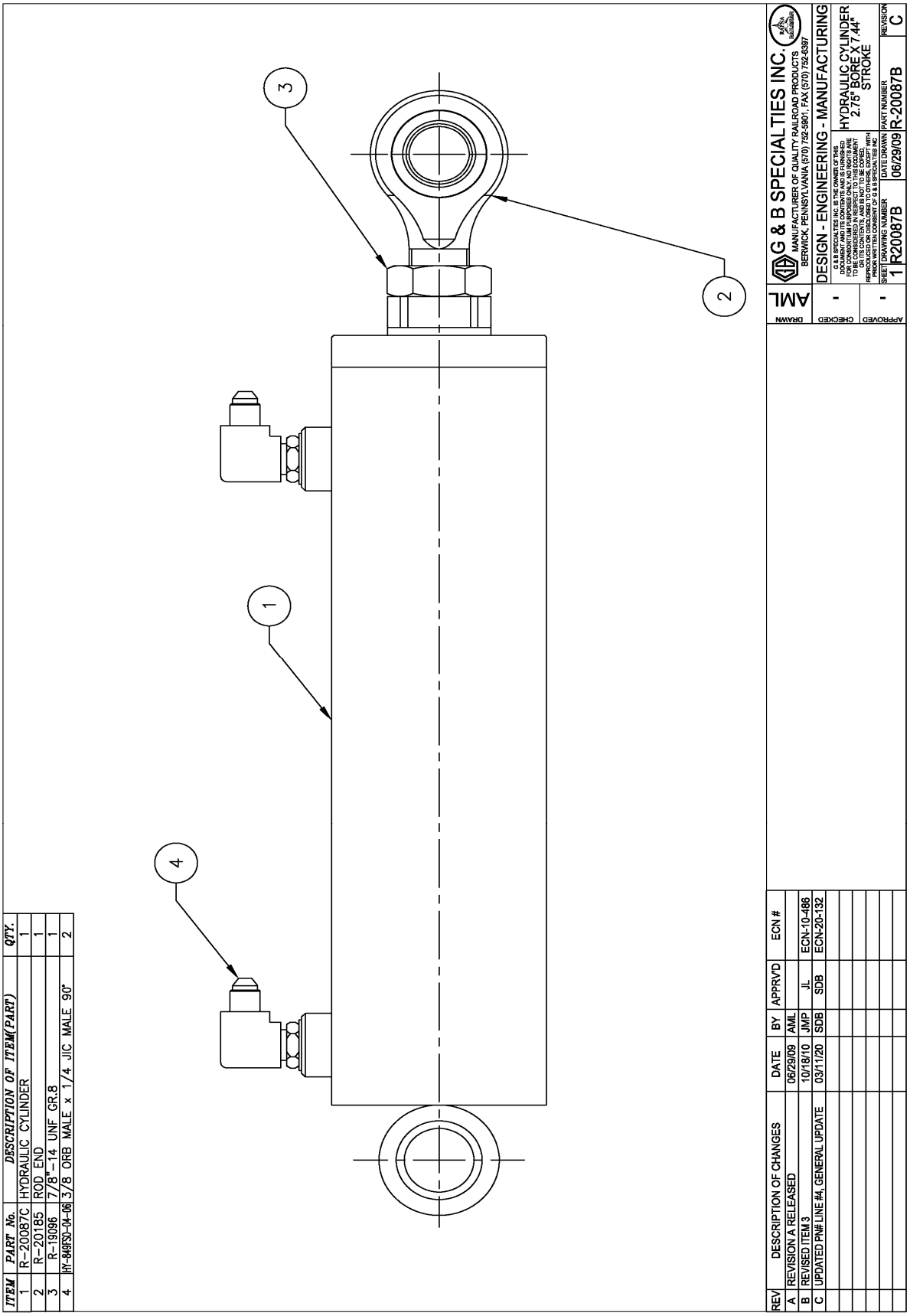
ALL WELDS TO CONFORM TO AWS D1.1


FRONT OF VEHICLE
1
2
3
4
5
6A
6C
6D
* ITEMS 6A, 6B, 6C AND 6D INCLUDED IN KIT R-990KIT-204C
PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20170D-HD | ROTART REAR UPPER ASSEMBLY
2 | 1 | R-20234 | LOCK-UP ASSY, HYDRAULIC
3 | 2 | R-001-LW | 10" LIGHT WEIGHT STEEL WHEEL
4 | 1 | R-20120D | RAIL SWEEP
5 | 1 | R-20120p | RAIL SWEEP
6 | 2 | R-990KIT-204C | WHEEL MOUNTING HARDWARE KIT
6A | 4 | H.H.C.S | 1/2" UNC GR.8 X 2.00"
6B | 4 | H.H.C.S | 1/2" UNC GR.8 X 2.25"
6C | 16 | FWASHER | 1/2" TYPE-A GR.8
6D | 8 | NYLOCK NUT | 1/2" UNC GR.8
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 05/06/10 | AML | | |
B | REVISED R-20170D-HD | 11/2/10 | JMP | JL | ECN-10-508
C | REVISED R-20170D-HD | 11/14/18 | JEV | JMP | ECN-18-941
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
ROTARY REAR ASSY
HYD. LOCK W/O BRAKES
SHEET 1
DRAWING NUMBER R20170A-HD
DATE DRAWN 05/06/10
PART NUMBER R-20170A-HD
REVISION C
ALL WELDS TO CONFORM TO AWS D1.1


PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20170D-HD | ROTARY REAR UPPER ASSY
2 | 1 | R-20233 | LOCK-UP ASSY, MANUAL
3 | 2 | R-001-LW | 10" LIGHT STEEL WHEEL ASSY
4 | 1 | R-2012 0D | RAILSWEEP
5 | 1 | R-2012 0p | RAILSWEEP
6 | 1 | K-B45RXR20229 | REAR BRAKE KIT
7 | 2 | R-990KIT-204D | WHEEL MOUNTING HARDWARE
7A | 4 | H.H.C.S. | 1/2" UNC GR.8 X 2.25"
7B | 4 | H.H.C.S. | 1/2" UNC GR.8 2.50"
7C | 16 | FWASHER | 1/2" GR.8 TYPE-A
7D | 8 | NYLOCK NUT | 1/2" UNC GR.8
* ITEMS 7A, 7B, 7C AND 7D INCLUDED IN R-990KIT-204D*
FRONT OF VEHICLE
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 07/06/09 | AML | | | DR'AWN
B | REVISED R-20170D-HD | 11/02/10 | JMP | JL | ECN-09-509 | CHK'D
C | REVISED R-20170D-HD | 11/15/18 | JEV | JMP | ECN-18-942 | APPROVED
ALL WELDS TO CONFORM TO AWS D1.1
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
ROTARY REAR ASSY
MANUAL LOCK-UP
w/BRAKES
SHEET | DRAWING NUMBER | DATE | PART NUMBER | REVISION
1 | R20170B-HD | 07/06/09 | R-20170B-HD | C

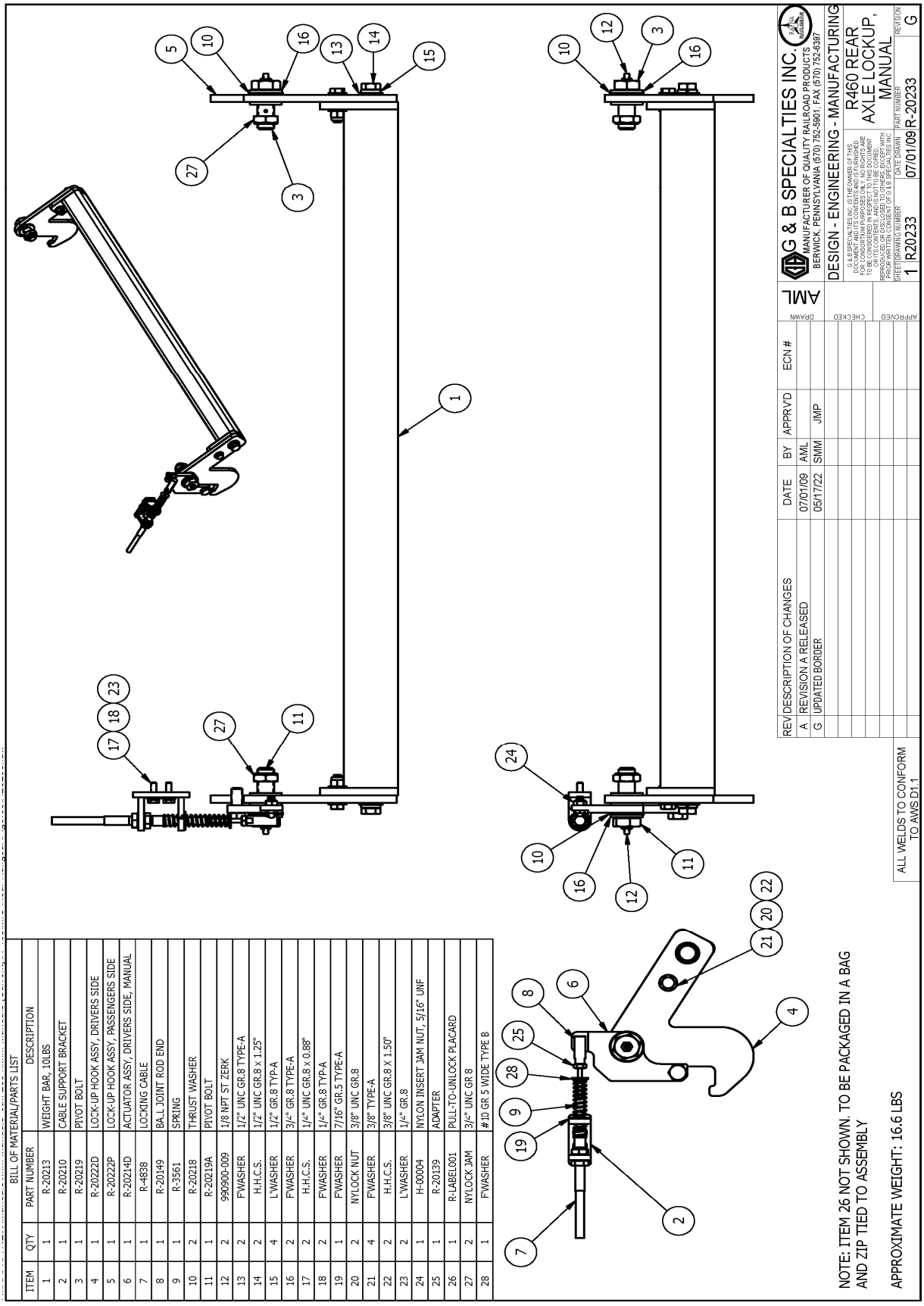

FRONT OF VEHICLE
1
2
3
4
5
PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20170D-HD | ROTARY REAR UPPER ASSY
2 | 1 | R-20234 | LOCK-UP ASSY HYDRAULIC
3 | 2 | R-001-LW | 10" LIGHT WEIGHT STEEL WHEEL
4 | 1 | R-20120D | RAILSWEEP
5 | 1 | R-20120p | RAILSWEEP
6 | 1 | K-B45RXR20229 | REAR BRAKE KIT
7 | 2 | R-990KIT-204D | WHEEL MOUNTING HARDWARE KIT
7A | 4 | H.H.C.S. | 1/2" UNC GR.8 X 2.25"
7B | 4 | H.H.C.S. | 1/2" UNC GR.8 X 2.50"
7C | 16 | F'WASHER | 1/2" TYPE-A GR.8
7D | 8 | NYLOCK NUT | 1/2" UNC GR.8
* ITEMS 7A, 7B, 7C, AND 7D INCLUDED IN R-990KIT-204D
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 05/06/10 | AML | | |
B | REVISED MODEL R-20170D-HD | 11/02/10 | JMP | JL | ECN-10-510
C | REVISED MODEL R-20170D-HD | 11/14/18 | JEV | JMP | ECN-18-943
ALL WELDS TO CONFORM TO AWS D1.1
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-450 ROTARY REAR
HYD LOCK-UP
W/BRAKES
PART NUMBER
1 R20170C-HD
05/06/10
R-20170C-HD
REVISION
C

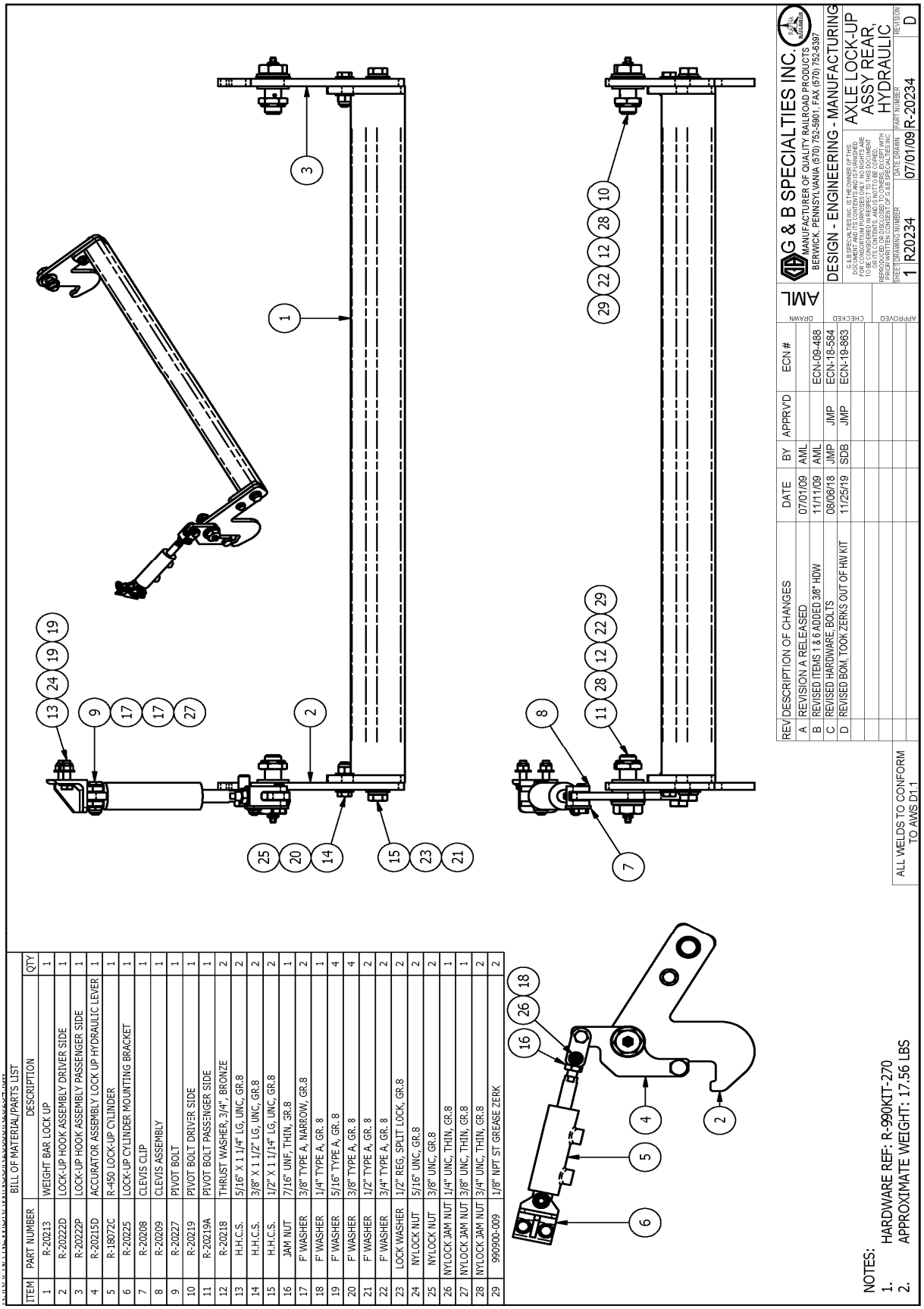

PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20207D | MOUNTING BRACKET, DRIVER'S SIDE
2 | 1 | R-20207P | MOUNTING BRACKET, PASSENGER'S SIDE
3 | 1 | R-20171D | OUTER TUBE ASSY., PASSENGERS SIDE
4 | 1 | R-20171P | OUTER TUBE ASSY., PASSENGERS SIDE
5 | 2 | R-20192 | BEARING CAP
6 | 4 | R-20191 | SPACER, BEARING CAP
7 | 2 | R-20085A | GASKET, OUTER GUIDE TUBE CAP
8 | 2 | R-20183 | CAP, OUTER GUIDE TUBE
9 | 2 | GREASE ZERK | 1/8 NPT ST ZERK, RELIEF
10 | 2 | R-20205 | SUPPORT ANGLE
11 | 2 | R-20186 | CYLINDER SUPPORT BRACKET
12 | 1 | R-20203 | REAR AXLE ASSEMBLY
13 | 2 | R-20193 | SPLIT BEARING
14 | 2 | R-20189 | SHAFT COLLAR
15 | 2 | R-20194A | INNER GUIDE
16 | 1 | R-20228 | CROSS BRACE
17 | 2 | H.H.C.S | 1" UNC X 5.50" GR. 8 Z/Y
18 | 8 | H.H.C.S | 5/8" UNC X 2.50" GR. 8 Z/Y
19 | 8 | H.H.C.S | 5/8" UNC X 2.25" GR. 8 Z/Y
20 | 2 | H.H.C.S | 5/8" UNC X 2.00" GR. 8 Z/Y
21 | 4 | H.H.C.S | 5/8" UNC X 1.50" GR. 8 Z/Y
22 | 2 | H.H.C.S | 7/8" UNC X 4.50" GR. 8 Z/Y
23 | 2 | H.H.C.S | 7/8" UNC X 6.50" GR. 8 Z/Y
24 | 16 | NYLOCK NUT | 5/8" UNC GR. 8 Z/Y
25 | 32 | FWASHER | 5/8" TYPE-A GR. 8
26 | 8 | FWASHER | 7/8" NORMAL GR. 8
27 | 6 | FWASHER | 1" NORMAL GR. 8
28 | 8 | L'WASHER | #10 GR. 5
29 | 2 | L'WASHER | 5/8" GR. 8
30 | 4 | L'WASHER | 1" GR. 8
31 | 2 | NYLOCK NUT | 1" UNC JAM GR. 8 Z/Y
32 | 2 | GREASE ZERK | 1/8 NPT ST ZERK
33 | 8 | R-20105 | MACHINE SCREW
34 | 2 | NYLOCK NUT | 1" UNC GR. 8 Z/Y
35 | 2 | R-20087B | HYDRAULIC CYLINDER
36 | 2 | R-20190A | SPRING PLATE, REAR
37 | 2 | R-20190 | SPRING PLATE, REAR
38 | 2 | R-5683 | TIMBREN SPRING
39 | 2 | R-28020 | ADJUSTING ROD
40 | 2 | HEX NUT | 1" UNC GR. 8
41 | 4 | R-20273 | WASHER, SPACER
42 | 4 | NYLOCK NUT | 5/8" UNC GR. 8 Z/Y
43 | 4 | NYLOCK NUT | 7/8" UNC GR. 8 Z/Y
44 | 2 | R-604 | BELLOWS CLAMP
45 | 2 | R-6523 | BELLOWS, 4"
46 | 2 | K-H45RDXF001-PO | P.O. CHECK VALVE KIT
47 | 2 | GREASE ZERK | 1/8 NPT 90 DEG ZERK
NOTES:
1. ITEMS 30 & 40 INCLUDED IN HARDWARE KIT R-990KIT-339.
2. ALL REMAINING HARDWARE INCLUDED IN HARDWARE KIT R-990KIT-272.
3. APPROXIMATE WEIGHT: 410 LBS.
4. ITEMS 44 & 45 NOT SHOWN FOR CLARITY.
DETAIL A
(27.45)
(34.13)
(34.13)
(53.50)
(52.50)
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRV'D | ECN #
A | REVISION A RELEASED | 05/06/10 | AML | | |
B | ADDED K-H45RDXF001-PO | 11/02/10 | JMP | JL | ECN-10-503
C | ADDED ITEMS 41, 42, 43 | 08/28/12 | AML | | |
D | REVISED ITEMS 4, 5, 10, 13, & HARDWARE | 08/13/18 | JMP | JMP | ECN-18-805
DRAWN AML
CHECKED JMP
APPROVED JMP
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-460 ROTARY REAR UPPER ASSY
SHEET 1
DRAWING NUMBER R-20170DHD
DATE DRAWN 05/06/10
PART NUMBER R-20170D-HD
REVISION D
ALL WELDS TO CONFORM TO AWS D1.1

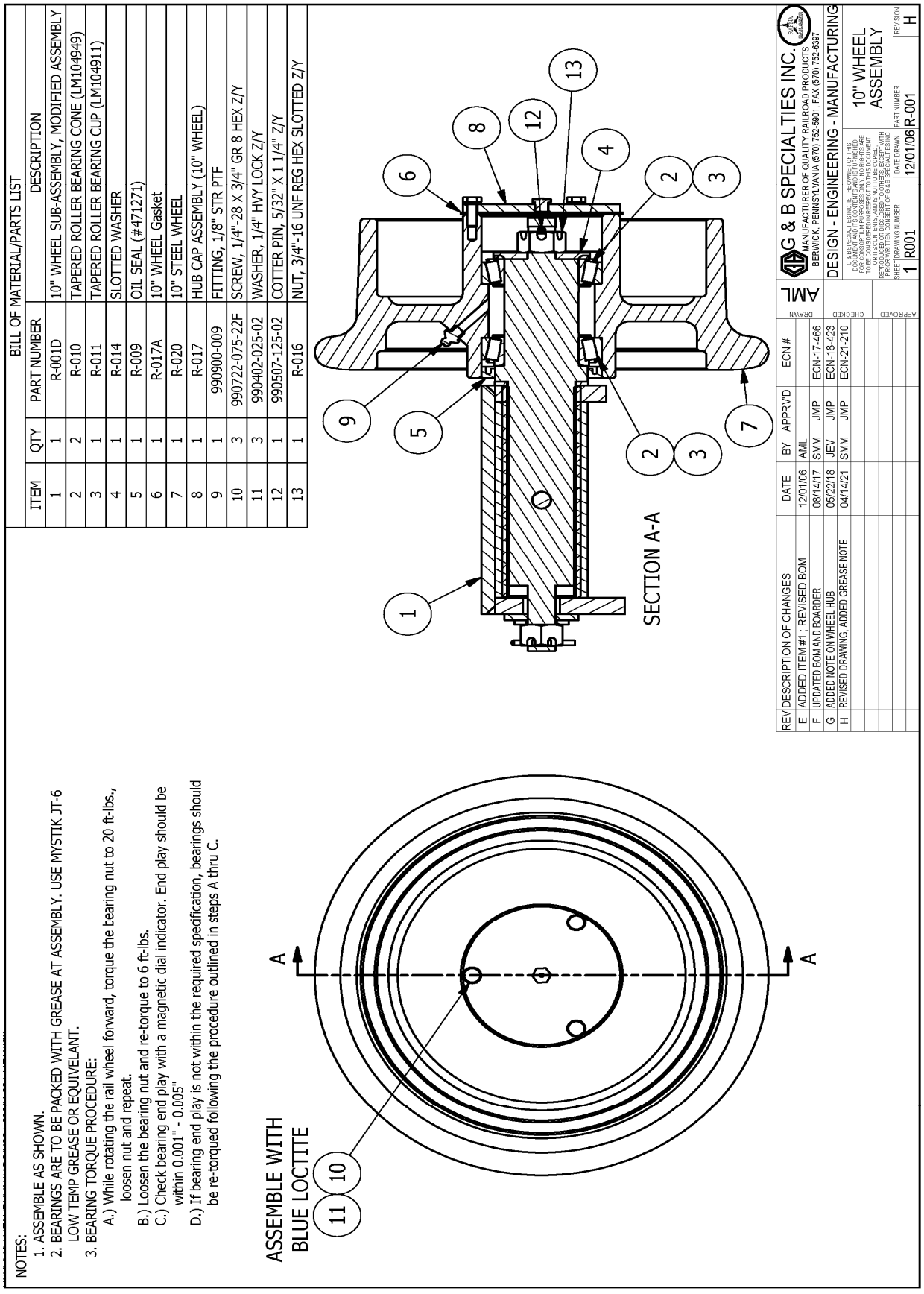


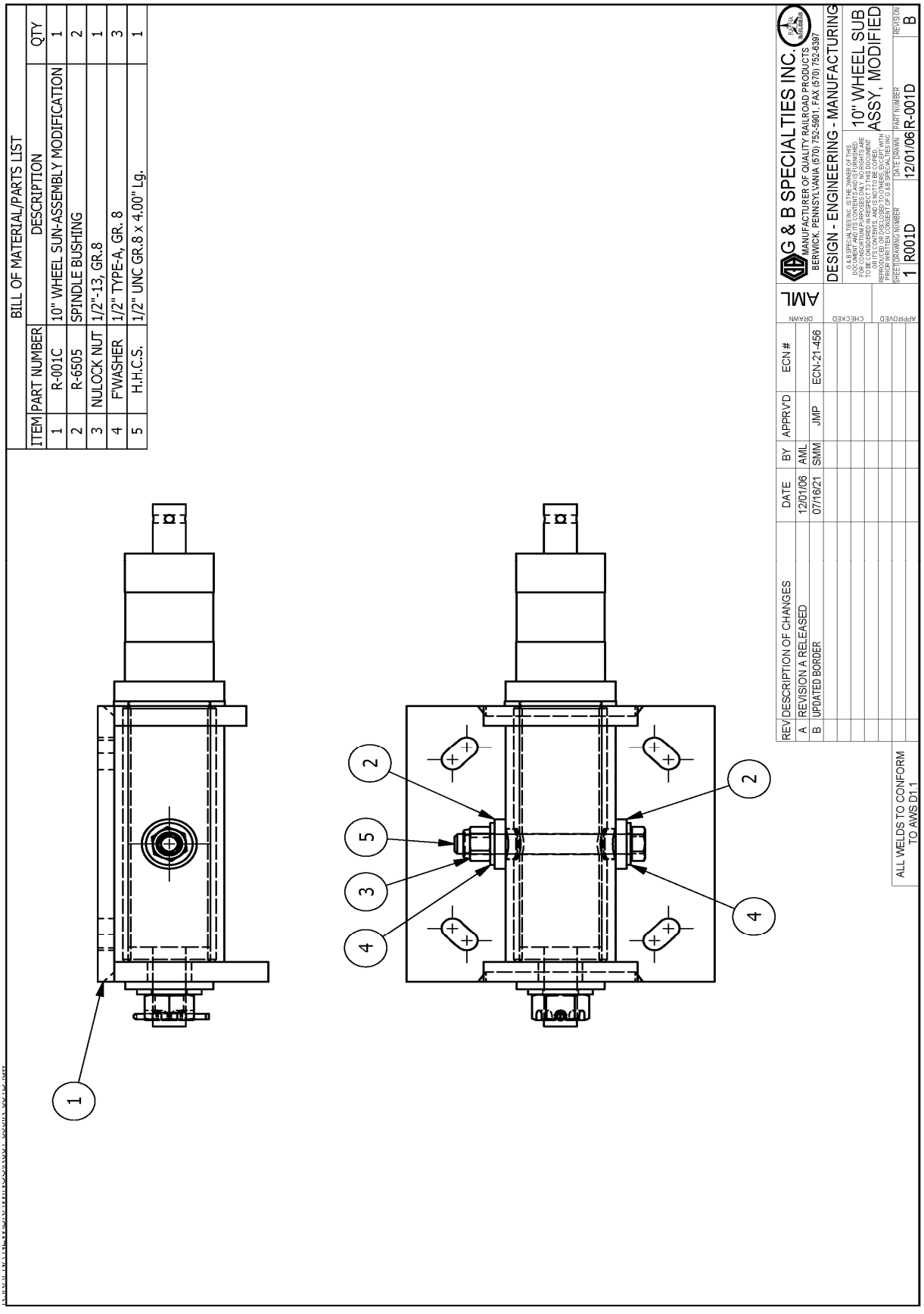
ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-20087C	HYDRAULIC CYLINDER	1
2	R-20185	ROD END	1
3	R-19096	7/8"-14 UNF GR.8	1
4	HY-9607SO-04-06	3/8 ORB MALE x 1/4 JIC MALE 90°	2

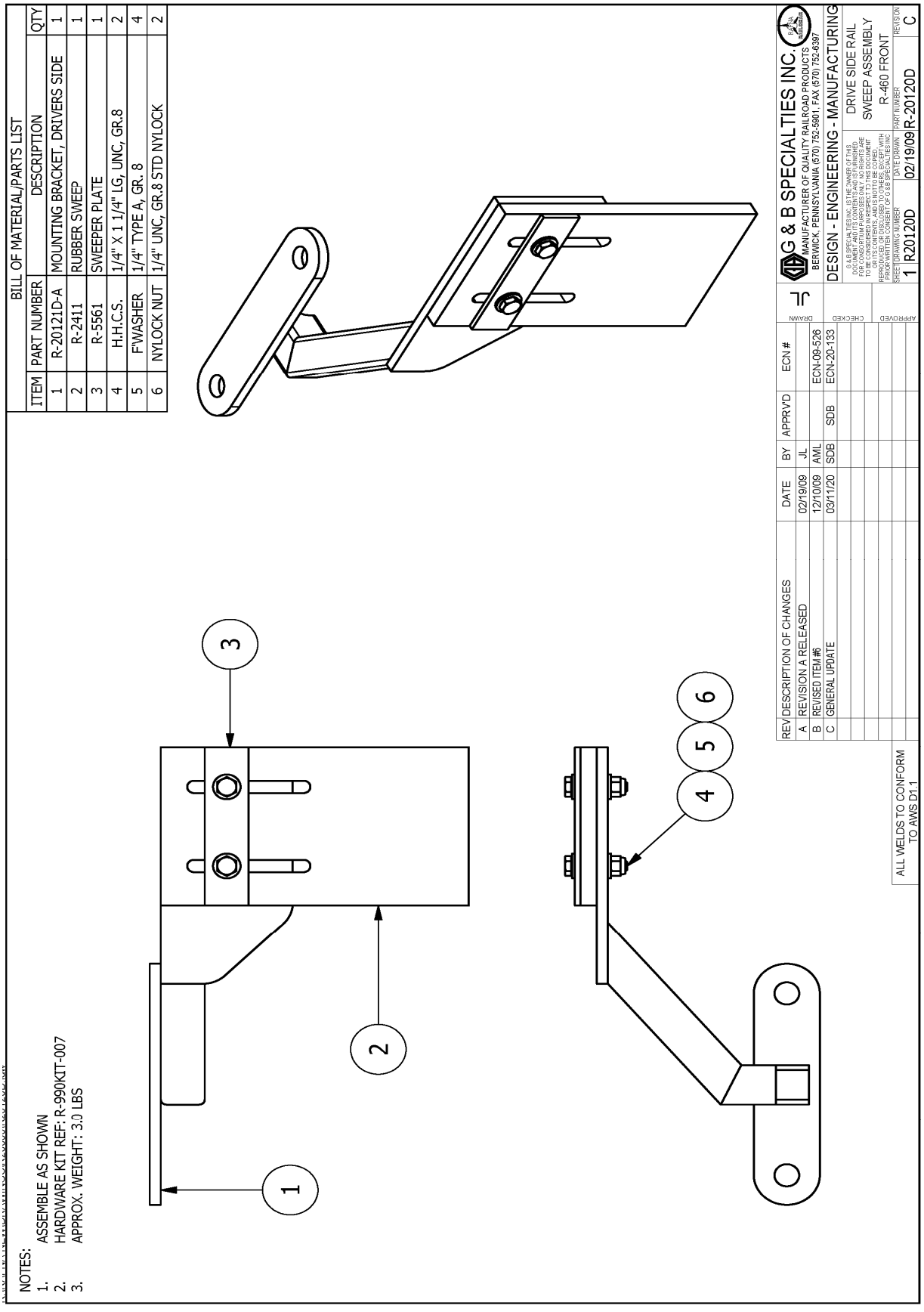
REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	06/29/09	AML		
B	REVISED ITEM 3	10/18/10	JMP	JL	ECN-10-486
C	UPDATED P/N# LINE #4, GENERAL UPDATE	03/11/20	SDB	SDB	ECN-20-132

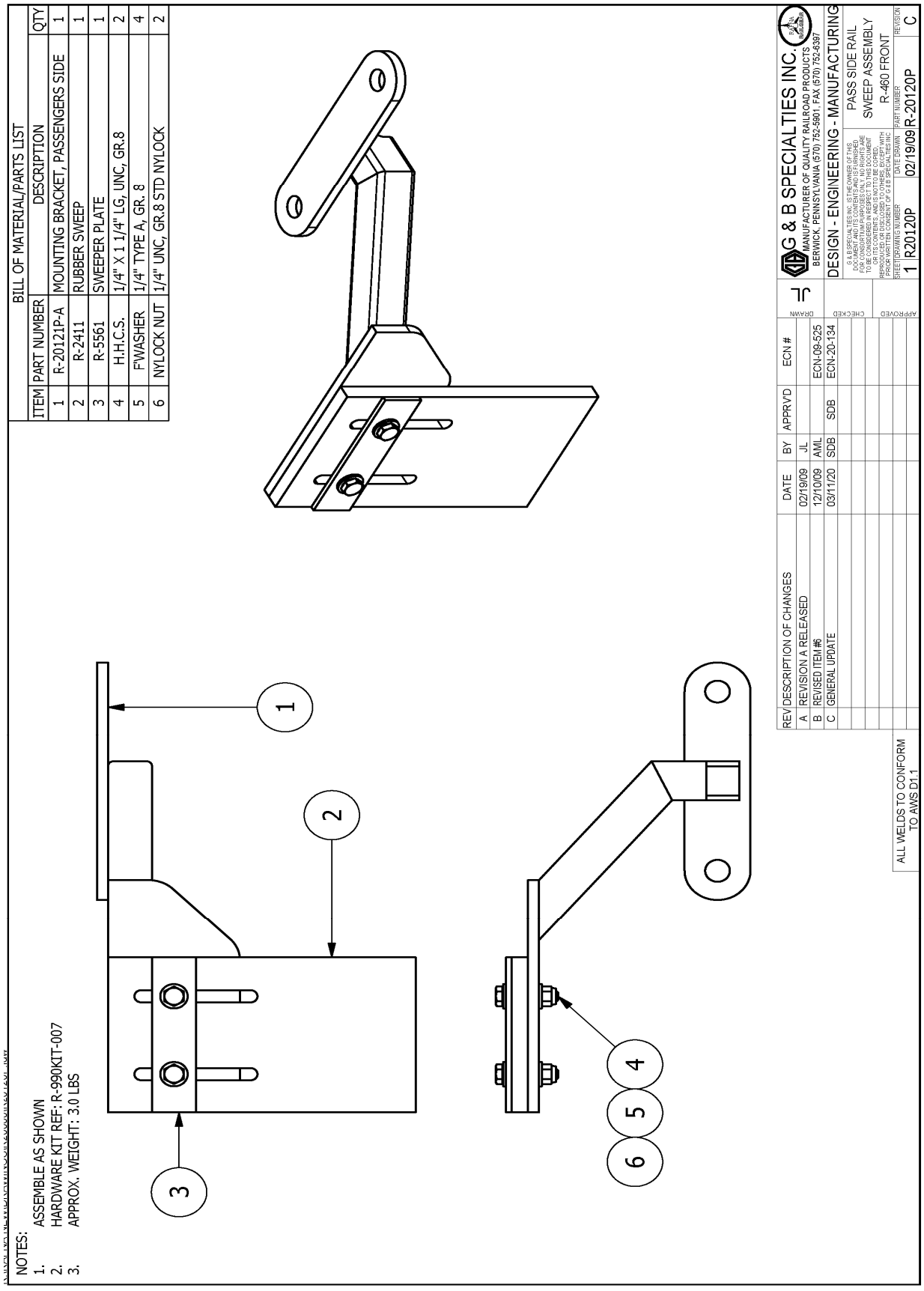

BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20213 | WEIGHT BAR, 10LBS
2 | 1 | R-20210 | CABLE SUPPORT BRACKET
3 | 1 | R-20219 | PIVOT BOLT
4 | 1 | R-20222D | LOCK-UP HOOK ASSY, DRIVERS SIDE
5 | 1 | R-20222P | LOCK-UP HOOK ASSY, PASSENGERS SIDE
6 | 1 | R-20214D | ACTUATOR ASSY, DRIVERS SIDE, MANUAL
7 | 1 | R-4838 | LOCKING CABLE
8 | 1 | R-20149 | BALL JOINT ROD END
9 | 1 | R-3561 | SPRING
10 | 2 | R-20218 | THRUST WASHER
11 | 1 | R-20219A | PIVOT BOLT
12 | 2 | 990900-009 | 1/8 NPT ST ZERK
13 | 2 | FWASHER | 1/2" UNC GR.8 TYPE-A
14 | 2 | H.H.C.S. | 1/2" UNC GR.8 x 1.25"
15 | 4 | L'WASHER | 1/2" GR.8 TYP-A
16 | 2 | FWASHER | 3/4" GR.8 TYPE-A
17 | 2 | H.H.C.S. | 1/4" UNC GR.8 x 0.88"
18 | 2 | FWASHER | 1/4" GR.8 TYP-A
19 | 1 | FWASHER | 7/16" GR.5 TYPE-A
20 | 2 | NYLOCK NUT | 3/8" UNC GR.8
21 | 4 | FWASHER | 3/8" TYPE-A
22 | 2 | H.H.C.S. | 3/8" UNC GR.8 X 1.50"
23 | 2 | L'WASHER | 1/4" GR.8
24 | 1 | H-00004 | NYLON INSERT JAM NUT, 5/16" UNF
25 | 1 | R-20139 | ADAPTER
26 | 1 | R-LABEL001 | PULL-TO-UNLOCK PLACARD
27 | 2 | NYLOCK JAM | 3/4" UNC GR 8
28 | 1 | FWASHER | #10 GR 5 WIDE TYPE B
NOTE: ITEM 26 NOT SHOWN. TO BE PACKAGED IN A BAG AND ZIP TIED TO ASSEMBLY
APPROXIMATE WEIGHT: 16.6 LBS
ALL WELDS TO CONFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'VD | ECN #
A | REVISION A RELEASED | 07/01/09 | AML | | |
G | UPDATED BORDER | 05/17/22 | SMM | JMP | |
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R460 REAR AXLE LOCKUP, MANUAL
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R20233 | 07/01/09 | R-20233 | G


BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-20213 | WEIGHT BAR LOCK UP | 1
2 | R-20222D | LOCK-UP HOOK ASSEMBLY DRIVER SIDE | 1
3 | R-20222P | LOCK-UP HOOK ASSEMBLY PASSENGER SIDE | 1
4 | R-20215D | ACCURATOR ASSEMBLY LOCK UP HYDRAULIC LEVER | 1
5 | R-18072C | R-450 LOCK-UP CYLINDER | 1
6 | R-20225 | LOCK-UP CYLINDER MOUNTING BRACKET | 1
7 | R-20208 | CLEVIS CLIP | 1
8 | R-20209 | CLEVIS ASSEMBLY | 1
9 | R-20227 | PIVOT BOLT | 1
10 | R-20219 | PIVOT BOLT DRIVER SIDE | 1
11 | R-20219A | PIVOT BOLT PASSENGER SIDE | 1
12 | R-20218 | THRUST WASHER, 3/4", BRONZE | 2
13 | H.H.C.S. | 5/16" X 1 1/4" LG, UNC, GR.8 | 2
14 | H.H.C.S. | 3/8" X 1 1/2" LG, UNC, GR.8 | 2
15 | H.H.C.S. | 1/2" X 1 1/4" LG, UNC, GR.8 | 2
16 | JAM NUT | 7/16" UNF, THIN, .SR.8 | 1
17 | F' WASHER | 3/8" TYPE A, NARROW, GR.8 | 2
18 | F' WASHER | 1/4" TYPE A, GR. 8 | 1
19 | F' WASHER | 5/16" TYPE A, GR. 8 | 4
20 | F' WASHER | 3/8" TYPE A, GR. 8 | 4
21 | F' WASHER | 1/2" TYPE A, GR. 8 | 2
22 | F' WASHER | 3/4" TYPE A, GR. 8 | 2
23 | LOCK WASHER | 1/2" REG, SPLIT LOCK, GR.8 | 2
24 | NYLOCK NUT | 5/16" UNC, GR.8 | 2
25 | NYLOCK NUT | 3/8" UNC, GR.8 | 2
26 | NYLOCK JAM NUT | 1/4" UNC, THIN, GR.8 | 1
27 | NYLOCK JAM NUT | 3/8" UNC, THIN, GR.8 | 1
28 | NYLOCK JAM NUT | 3/4" UNC, THIN, GR.8 | 2
29 | 990900-009 | 1/8" NPT ST GREASE ZERK | 2
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 07/01/09 | AML | | ECN-09-488
B | REVISED ITEMS 1 & 6 ADDED 3/8" HDW | 11/11/09 | AML | | ECN-18-584
C | REVISED HARDWARE, BOLTS | 08/06/18 | JMP | JMP | ECN-19-863
D | REVISED BOM, TOOK ZERKS OUT OF HW KIT | 11/25/19 | SDB | JMP |
DRAWN AML
CHECKED
APPROVED
ALL WELDS TO CONFORM TO AWS D1.1
NOTES:
1. HARDWARE REF: R-990KIT-270
2. APPROXIMATE WEIGHT: 17.56 LBS
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
AXLE LOCK-UP ASSY REAR, HYDRAULIC
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R20234 | 07/01/09 | R-20234 | D


BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-001D | 10" WHEEL SUB-ASSEMBLY, MODIFIED ASSEMBLY
2 | 2 | R-010 | TAPERED ROLLER BEARING CONE (LM104949)
3 | 1 | R-011 | TAPERED ROLLER BEARING CUP (LM104911)
4 | 1 | R-014 | SLOTTED WASHER
5 | 1 | R-009 | OIL SEAL (#471271)
6 | 1 | R-017A | 10" WHEEL Gasket
7 | 1 | R-020 | 10" STEEL WHEEL
8 | 1 | R-017 | HUB CAP ASSEMBLY (10" WHEEL)
9 | 1 | 990900-009 | FITTING, 1/8" STR PTF
10 | 3 | 990722-075-22F | SCREW, 1/4"-28 X 3/4" GR 8 HEX Z/Y
11 | 3 | 990402-025-02 | WASHER, 1/4" HVY LOCK Z/Y
12 | 1 | 990507-125-02 | COTTER PIN, 5/32" X 1 1/4" Z/Y
13 | 1 | R-016 | NUT, 3/4"-16 UNF REG HEX SLOTTED Z/Y
NOTES:
1. ASSEMBLE AS SHOWN.
2. BEARINGS ARE TO BE PACKED WITH GREASE AT ASSEMBLY. USE MYSTIK JT-6 LOW TEMP GREASE OR EQUIVELANT.
3. BEARING TORQUE PROCEDURE:
A.) While rotating the rail wheel forward, torque the bearing nut to 20 ft-lbs., loosen nut and repeat.
B.) Loosen the bearing nut and re-torque to 6 ft-lbs.
C.) Check bearing end play with a magnetic dial indicator. End play should be within 0.001" - 0.005"
D.) If bearing end play is not within the required specification, bearings should be re-torqued following the procedure outlined in steps A thru C.
ASSEMBLE WITH BLUE LOCTITE
SECTION A-A
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
E | ADDED ITEM #1 ; REVISED BOM | 12/01/06 | AML | | |
F | UPDATED BOM AND BOARDER | 08/14/17 | SMM | JMP | ECN-17-466
G | ADDED NOTE ON WHEEL HUB | 05/22/18 | JEV | JMP | ECN-18-423
H | REVISED DRAWING, ADDED GREASE NOTE | 04/14/21 | SMM | JMP | ECN-21-210
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 - FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
10" WHEEL ASSEMBLY
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R001 | 12/01/06 | R-001 | H


BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-001C | 10" WHEEL SUN-ASSEMBLY MODIFICATION | 1
2 | R-6505 | SPINDLE BUSHING | 2
3 | NULOCK NUT | 1/2"-13, GR.8 | 1
4 | F'WASHER | 1/2" TYPE-A, GR. 8 | 3
5 | H.H.C.S. | 1/2" UNC GR.8 x 4.00" Lg. | 1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'VD | ECN #
A | REVISION A RELEASED | 12/01/06 | AML | | ECN-21-456
B | UPDATED BORDER | 07/16/21 | SMM | JMP |
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 , FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
10" WHEEL SUB ASSY, MODIFIED
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R001D | 12/01/06 | R-001D | B
ALL WELDS TO CONFORM TO AWS D1.1
1
2
3
4
5


BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-20121D-A | MOUNTING BRACKET, DRIVERS SIDE | 1
2 | R-2411 | RUBBER SWEEP | 1
3 | R-5561 | SWEEPER PLATE | 1
4 | H.H.C.S. | 1/4" X 1 1/4" LG, UNC, GR.8 | 2
5 | F'WASHER | 1/4" TYPE A, GR. 8 | 4
6 | NYLOCK NUT | 1/4" UNC, GR.8 STD NYLOCK | 2
NOTES:
1. ASSEMBLE AS SHOWN
2. HARDWARE KIT REF: R-990KIT-007
3. APPROX. WEIGHT: 3.0 LBS
REV DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A REVISION A RELEASED | 02/19/09 | JL | | ECN-09-526
B REVISED ITEM #6 | 12/10/09 | AML | | ECN-20-133
C GENERAL UPDATE | 03/11/20 | SDB | SDB
DRAWN JL
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
DRIVE SIDE RAIL
SWEEP ASSEMBLY
R-460 FRONT
SHEET 1 | DRAWING NUMBER R20120D | DATE DRAWN 02/19/09 | PART NUMBER R-20120D | REVISION C
ALL WELDS TO CONFORM TO AWS D1.1
1
2
3
4
5
6


BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-20121P-A | MOUNTING BRACKET, PASSENGERS SIDE | 1
2 | R-2411 | RUBBER SWEEP | 1
3 | R-5561 | SWEEPER PLATE | 1
4 | H.H.C.S. | 1/4" X 1 1/4" LG, UNC, GR.8 | 2
5 | F'WASHER | 1/4" TYPE A, GR. 8 | 4
6 | NYLOCK NUT | 1/4" UNC, GR.8 STD NYLOCK | 2
NOTES:
1. ASSEMBLE AS SHOWN
2. HARDWARE KIT REF: R-990KIT-007
3. APPROX. WEIGHT: 3.0 LBS
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 02/19/09 | JL | | |
B | REVISED ITEM #6 | 12/10/09 | AML | | ECN-09-525
C | GENERAL UPDATE | 03/11/20 | SDB | SDB | ECN-20-134
DRAWN
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
PASS SIDE RAIL
SWEEP ASSEMBLY
R-460 FRONT
SHEET | SPAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R20120P | 02/19/09 | R-20120P | C
ALL WELDS TO CONFORM TO AWS D1.1
1
2
3
4
5
6

R-460 Pre-Delivery Check List

This checklist is provided to help ensure that the railgear is properly installed and adjusted prior to the vehicle being put in service. **In order to register this railgear installation, please fax a completed copy of both this form and the railgear alignment sheet to G&B Specialties, Inc. Service Manager at 570-802-0491.**

Railgear Model:		Vehicle Year:	
Railgear Serial No.:	Frt	Vehicle Make:	
	Rr	Vehicle Model:	
Date Received:		Vehicle VIN/Unit #:	
Date Completed:		End User:	

Railgear Checks

1. _____ Rail wheel bearing end play adjusted (see manuals for procedure)
2. _____ Rail sweeps adjusted (see manuals for procedure)
3. _____ Rail wheel load adjusted (see manuals & fill out values on alignment sheet)
4. _____ Rail wheel alignment performed (attach copy of alignment sheet)
5. _____ Vehicle front tires clearance minimum 1.5" on rail
6. _____ Axle lock-up system clears all possible obstructions (wheels turned and straight)
7. _____ Axle lock-up system engage/disengage smoothly/properly
8. _____ Rear railgear lock system adjusted (see manual for procedure)
9. _____ Front & rear railgear lock systems engage/disengage smoothly
10. _____ Railgear components clear all vehicle component thru full range of motion
11. _____ Railgear operating decals installed next to controls
12. _____ Railgear pump decal installed next to dash switch (if required)
13. _____ Steering wheel lock decal installed on dash
14. _____ Steering wheel lock installed
15. _____ All railgear joints lubricated (see manuals for lubrication points)

Wheel Kit Checks

16. _____ Wheel and spacer lug nuts tightened (see manuals for specifications)
17. _____ Wheel lug nut torque value decals installed on wheels
18. _____ Wheels & tires clear all vehicle components thru full range of motion
19. _____ Rear tires are centered on rail head (inside tread measures no more than 56.5")

Hydraulic Checks

20. _____ Flow from PTO adjusted between 3-5 gpm (if equipped)
21. _____ Air bled from railgear hydraulic system
22. _____ Pump tank filled as required with hydraulic fluid (if required)
23. _____ Brake system operates properly and there are no leaks (if required)
24. _____ Brake pump relief valve adjusted (see manuals for procedure)
25. _____ Railgear relief valve(s) adjusted (see manuals for procedure) (if required)
26. All hydraulic hoses clear of hot / sharp edges and tied back
27. No hydraulic oil leaks – at pump, manifold, hoses, fittings, and cylinders

Electrical Checks

28. _____ Pump ground wire installed (if required)
29. _____ All connections soldered and heat shrink sealed (no crimps)
30. _____ Split loom used to protect all exposed wiring
31. _____ All wires clear of hot / sharp edges and tied back

Miscellaneous Checks

32. _____ All welded / heated / bare metal painted
33. _____ Exterior railgear controls operate railgear correctly
34. _____ All fasteners are tightened (see manuals for specifications)
35. _____ Vehicle track tested
36. _____ Vehicle road tested at highway speeds
37. _____ All railgear manuals are placed in the vehicle for the operator

Installed By: _____ Inspected By: _____

Company: _____ Company: _____

Notes: