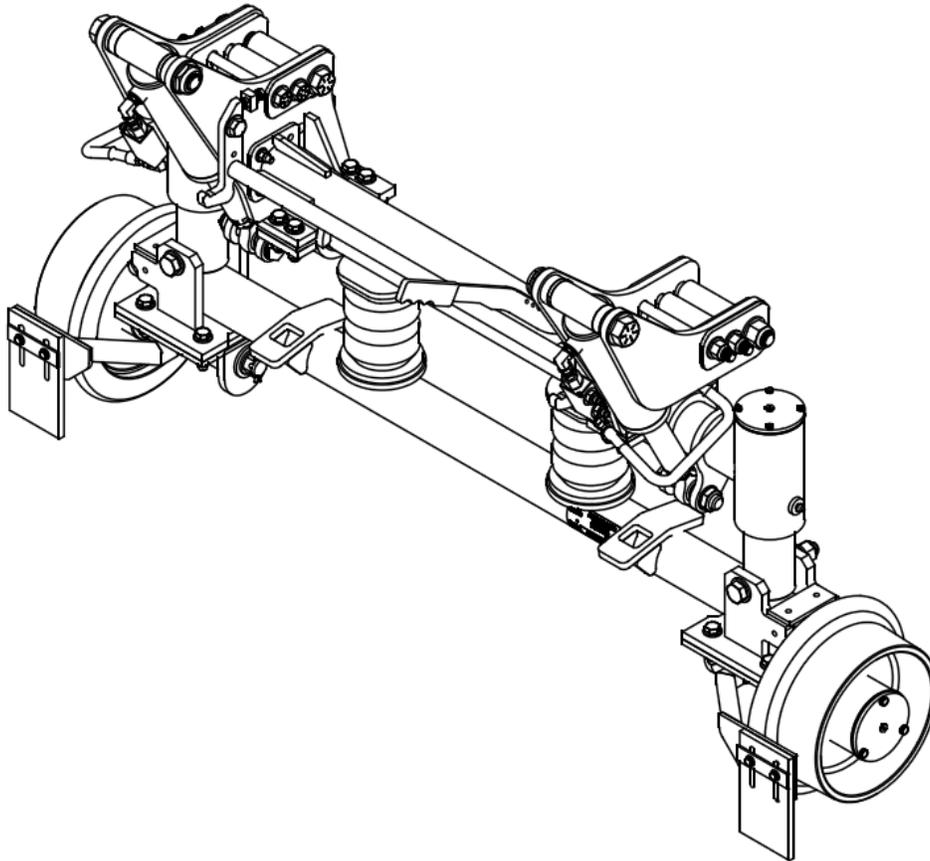


**RAFNA R-460 RAILGEAR ROTARY FRONT  
2017-PRESENT FORD F-450/550 4X2/4X4**



**INSTALLATION / OPERATIONS / SERVICE MANUAL**

## INSTALLATION SAFETY PRECAUTIONS

If any installation problems are encountered, please call G&B Specialties 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 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.
- Ensure all removed components are given to the vehicle owner after the installation of the railgear. These components must be re-installed if the railgear is removed from the vehicle.
- Railway Company rules governing rail travel must be observed at all times.
- Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating (GAWR), or the wheel or tire load ratings are exceeded.

## INSTALLATION OF RAILGEAR KIT

### FRAME MODIFICATION

The following procedure details the frame modification required prior to installation of the Rotating Front Railgear.

1. Remove the front bumper and front tow hooks if so equipped. The bumper and tow hooks will be modified and re-installed.
2. Cut the tow hook flush with face of the mounting bracket. (See Figure 1) This process is to be performed on both tow hooks.
3. On the in-board side of the driver's side frame rail, remove the connector that is attached. (This will need to be relocated) Ream out the rear most hole location where the 7/8" bolt is to be used so that it may sit straight across when inserted through frame. (Figure 2 & 3)
4. On the out-board side of the passenger's side frame rail, drill through the existing hole for the 7/8" bolt. A 15/16" drill bit may be used to complete the through hole. (Figure 4)

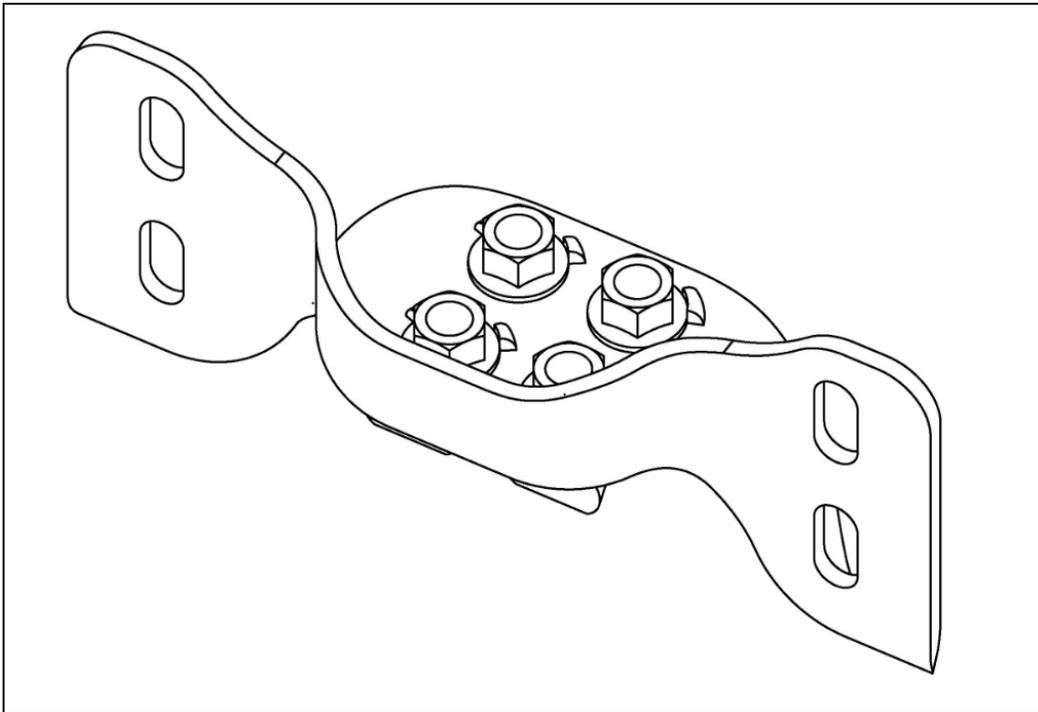


Figure 1  
Modification of Tow Hook (Driver's Side Shown)



Figure 2  
Connector Location and 7/8" Bolt Hole

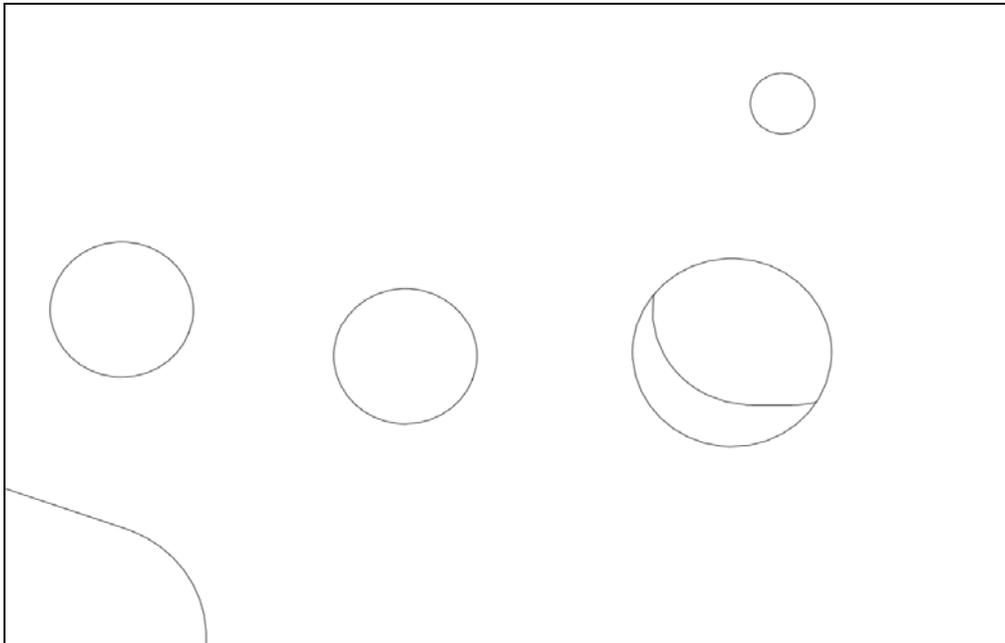


Figure 3  
Outside Frame Looking Through to Inside



Figure 4  
Passenger's Side Through Hole for 7/8" Bolt

## FRONT RAILGEAR INSTALLATION

The following procedure details the installation of the front railgear kit. The hardware required for this installation is listed in the table below.

Front Railgear Kit Installation Parts (R-20303)

Part Number	Description	Qty
R-20303	R-460 Rotary Front 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-990KIT-204C	Wheel Mounting Hardware	2
R-33281	Tow Hook Spacer	2
R-20235	Bumper Spacer	4
R-20317	M14 GR. 10.9 H.H.C.S., 90mm Lg.	8
R-20318	M14 Washer, Narrow Flat, Part 6	8
R-990KIT-277	Bumper Install Hardware Kit	1

1. Be sure to modify the vehicle frame as outlined in the Frame Modification section of this manual before attempting to install the railgear unit.
2. Loosen, but do not remove the 3/8" bolts securing the front support beam assembly to the rail gear mounting brackets.
3. Loosen, but do not remove, the (8) 1/2" bolts securing the railgear bearing caps to the upper cross frame assembly.
4. Remove the frame spacers and backer plates securing the outer support plates to the railgear mounting brackets. Retain the 5/8" and 7/8" hardware, frame spacers, and backer plates, these will all be used to mount the front railgear unit. **Use caution as the outer support plates will swing downward and free once the frame spacers are removed. New Nylock nuts are provided with the gear to be used for installation.**
5. Slide the railgear under the front frame horns and raise the unit into place. The railgear mounting brackets should sit flush with the bottom of the vehicle frame and flush to the inside of the vehicle frame.
6. The slots in the railgear mounting brackets should line up with the holes drilled in the frame during the frame modification.
7. Swing the outer support plates up into place and align the slots with the holes in the frame.
8. Ensure that the top surface of the outer support plate is level with the top surface of the railgear mounting bracket.
9. Secure the mounting brackets to the vehicle frame with the included 5/8" and 7/8" hardware, frame spacers and backer plates. Torque 5/8" to 150 ft-lbs dry and 7/8" to 200 ft-lbs dry.

10. Prep area for welding.
11. Field weld the railgear mounting brackets, both driver's side and passenger's side, to the railgear backer plates as shown.
12. Undercoat/paint any welded or unfinished areas.
13. Center the upper cross frame assembly to the railgear mounting brackets and tighten the (8) 1/2" bolts securing the railgear bearing caps to the upper cross frame assembly, do not torque at this time.
14. The railgear support beam needs to be centered between the railgear mounting brackets. If necessary, place shims between the support beam mounting plates and railgear mounting brackets as shown. An equal number of shims must be used on each side.
15. Tighten 3/8" support beam fasteners to 40 ft-lbs dry.

**Proceed to install the railgear hydraulic system as per the Hydraulic Kit Installation manual before continuing with the following steps.**

16. Follow the Railgear Lock System Installation and Adjustment Procedure detailed in the Railgear Lock System Kit Installation and Operation manual.
17. Follow the Railgear Alignment procedure detailed in the Service section of this manual.
18. Follow the Vehicle Axle Lockup Kit installation procedure detailed in the Axle Lockup Kit Installation and Operation manual.
19. Follow the Rail Sweep Adjustment procedure detailed in the Service section of this manual.
20. Torque all fasteners as detailed in the Service section of this manual.
21. Grease the railgear at all lubrication points as detailed in the Service section of this manual.
22. Modify and reinstall front bumper as required.





R:\RA\FNA NEW\DRAWINGS\IR&D\2017\_FORD\_SDP\IR460\_FrontIR\_460\_Brackets on Frame.idw

**PARTS LIST**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-20303	R460 ROTARY FRONT RAILGEAR
2	REF	-	VEHICLE FRAME
3	2	R-20305	FRAME SPACER
4	2	R-20312	FRAME SPACER
5	4	990729-800-22	H.H.C.S., 5/8" X 8" GR. 8 Z/Y
6	4	990316-062-22	NUT, 5/8" GR. 8 NYLOCK Z/Y
7	8	990600-062-002	WASHER, 5/8" FLAT Z/Y
8	2	990733-800-22	H.H.C.S., 7/8" X 8" GR. 8 Z/Y
9	2	990316-087-22	NUT, 7/8" GR. 8 NYLOCK Z/Y
10	4	990603-087-002	WASHER, 7/8" FLAT Z/Y
11	4	R-20313	PLATE, BACKER

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A REVISION A RELEASED	11/17/17	SMM	JMP	

<b>JMP</b>	<b>SMM</b>	<b>SMM</b>	<b>JMP</b>	<b>SMM</b>
APPROVED	CHECKED	DATE	DATE	DATE

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1 R46RXF20303 11/17/17 R46RXF20303 A







## R-460 ROTARY FRONT RAILGEAR KIT OPERATION 2017-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.

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.

### Placing The Vehicle on Rail - To Lower The Railgear:

1. Engage the vehicle front axle lock. Follow the Axle Lockup Kit Operation procedure detailed in the Axle Lockup Kit Installation and Operation and Service manual.
2. Disengage the railgear mechanical lock up hook. Do not force, if the lock cannot be disengaged, raise the railgear slightly.
3. Hold the lock lever in the disengaged position, ensure that the lock up hook is in the fully disengaged position.
4. Lower the railgear and release the lock lever once the railgear has rotated past the road locked position.
5. 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.
6. Continue lowering the railgear until the hydraulic cylinders are fully extended. In this position, the railgear should be about 2°-3° over center and the vehicle front tires should be approximately 2"-3" above the rail.
7. Ensure that the vehicle front axle lock is fully engaged.

### Removing The Vehicle from Rail - To Raise the Railgear:

1. Raise the railgear and release the lock pin actuator once the railgear has rotated past the rail locked position.
2. Raise the railgear fully. The railgear lock up hook should engage automatically.
3. Disengage the vehicle front axle lock as per the Axle Lockup Kit Operation procedure detailed in the Axle Lockup Kit Installation and Operation and Service manual.

**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.

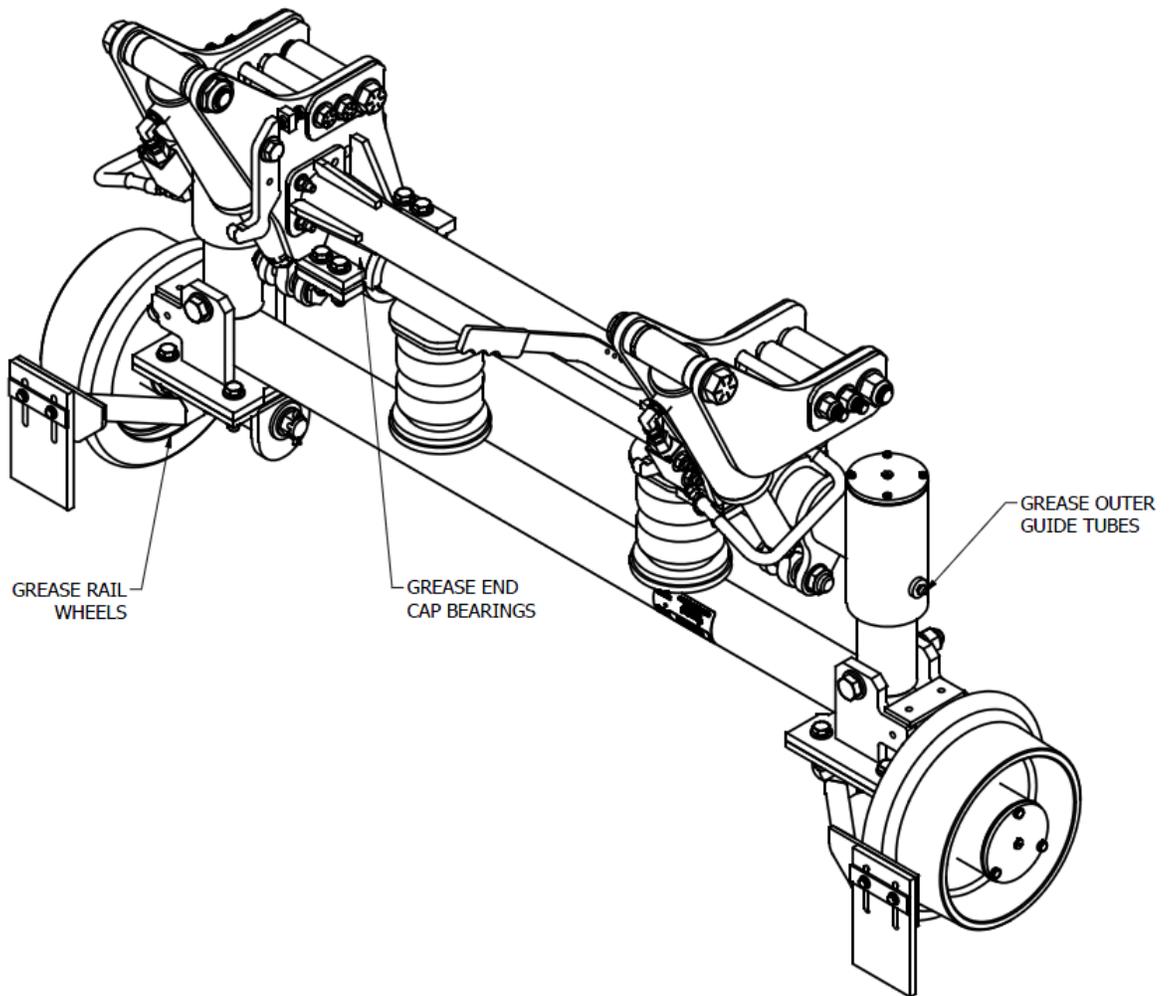
**Table 1: Recommended Service Schedule**

Service Required	Daily	Weekly	Monthly	3 Months	6 Months	12 Months
Visually inspect the railgear for damaged or worn parts	✓	✓	✓	✓	✓	
Check for loose rail wheels and fasteners (re-torque if required)	✓	✓	✓	✓	✓	
Ensure railgear lock pin is functioning correctly	✓	✓	✓	✓	✓	
Ensure the vehicle is in good operating condition	✓	✓	✓	✓	✓	
Inspect the rail wheel flanges for wear (use Rafna wear gauge)				✓	✓	
Inspect all hydraulic components for leaks or wear	✓	✓	✓	✓	✓	
Check and adjust rail sweeps			✓	✓	✓	
Grease railgear inner and outer guide tubes		✓	✓	✓	✓	
Grease railgear inner tube lower pivot point			✓	✓	✓	
Grease railgear locking pin			✓	✓	✓	
Check and adjust rail wheel bearing end-play			✓	✓	✓	
Grease rail wheel bearings (every 3000 rail kms or 1900 rail				✓	✓	✓
Check and adjust rail wheel load						✓
Check and adjust rail wheel alignment						✓
Check and repack rail wheel bearings						✓

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

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



**Railgear Lubrication Points**

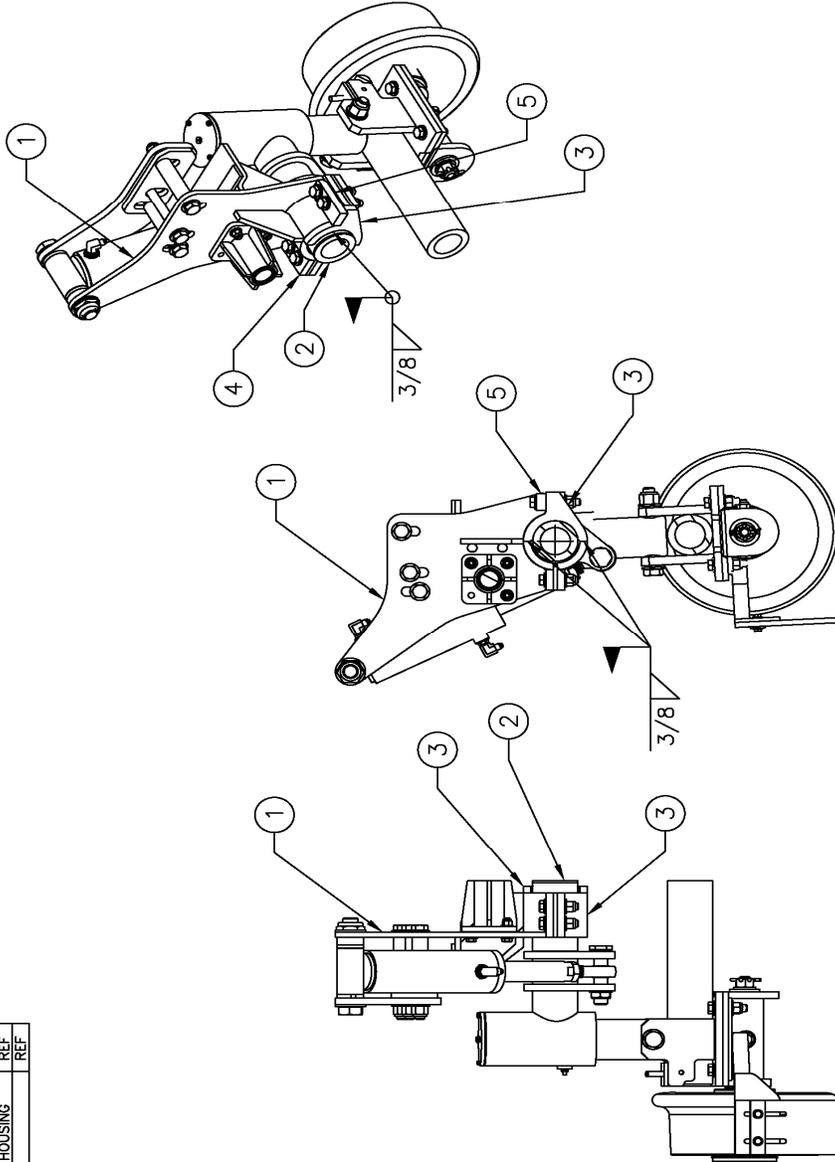
## RAILGEAR OVER-CENTER ADJUSTMENT

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 lock 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 end out to increase the over-center angle or in to 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 up hook properly engages the catch plate.

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	—	PASSENGERS SIDE MOUNTING BRACKET	REF.
2	—	UPPER AXLE	REF.
3	R-20101	ROTATION STOP	2
4	—	PASSENGERS SIDE BEARING HOUSING	REF.
5	—	STOP PLATE	REF.



\*PASSENGERS SIDE SHOWN  
DRIVERS SIDE TYPICAL\*

- NOTES:
1. RAILGEAR SHOULD BE IN THE LOCKED RAIL POSITION AND 2'-3" OVER CENTER.
  2. ROTATION STOP SHOULD BE FLUSH AGAINST BEARING HOUSING AND THE STOP PLATE.
  3. WELD ROTATION STOP TO UPPER AXLE.

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**DESIGN - ENGINEERING - MANUFACTURING**

2017-PRESENT FORD  
F-450/550/R-460  
ROTATION STOP  
PART NUMBER  
1 K-R46RXF20303-10 A

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	EON #
A	REVISION A RELEASED	04/22/22	SMMI		

ALL WELDS TO  
CONFORM TO AWS D1.1

**Over Center Stop Installation**

## RAIL WHEEL BEARING ADJUSTMENT

The rail wheel bearings require periodic adjustment in order 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.

## RAILGEAR ALIGNMENT

The railgear must be correctly aligned 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 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 bearing caps to 40 ft-lbs dry. Do not over torque.

**Ensure that the railgear over-center adjustment has been made before continuing**

Once the alignment is complete, it will be necessary to install the rotation stops. The rotation stops also act as a type of shaft collar to keep the railgear from losing lateral alignment. Rotate the railgear down to the rail position, place the rotation stops on the upper axle as shown and weld in place.

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 bumper, it can be trimmed and reinforced as required. 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. If there is interference with any other vehicle components, please call G&B Specialties, Inc. for technical assistance.

**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"

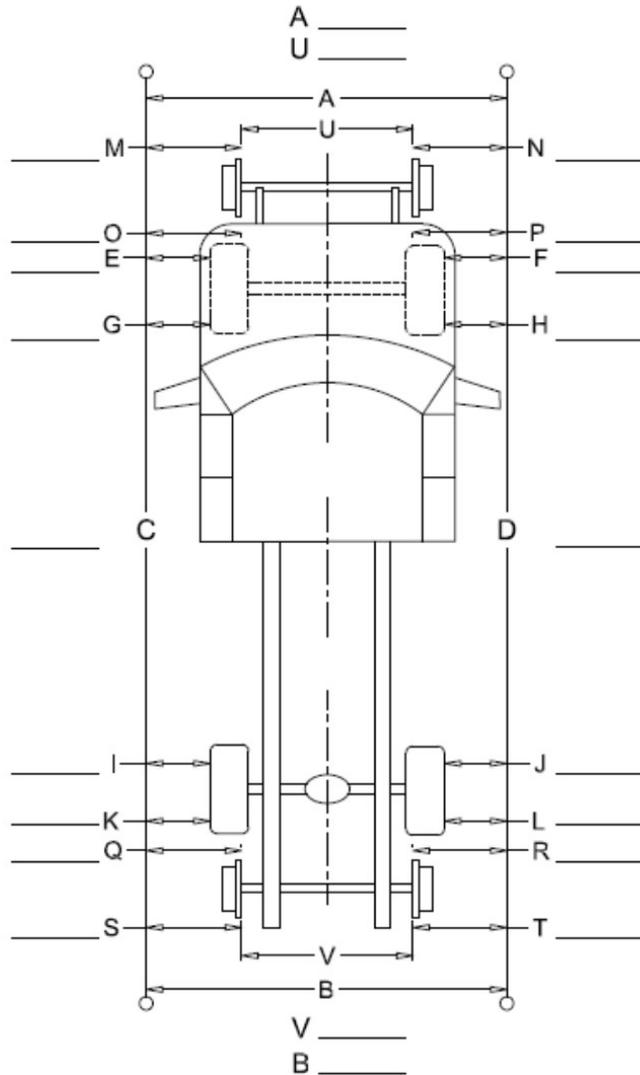
ADJUST RAILGEAR LATERAL ALIGNMENT  
 M & O MUST EQUAL N & P WITHIN 1/8"  
 Q & S MUST EQUAL R & T WITHIN 1/8"

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"

**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: \_\_\_\_\_

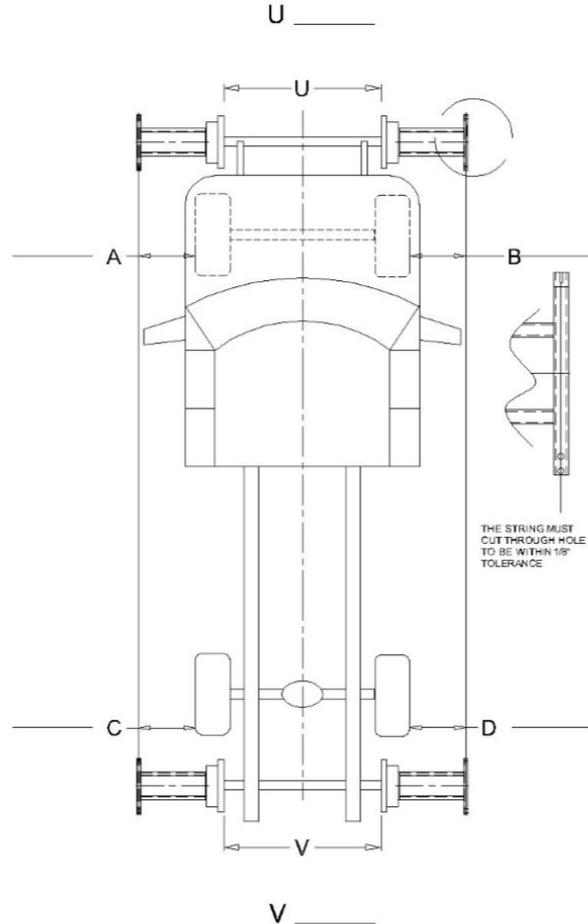
ADJUST RAILGEAR LATERAL ALIGNMENT  
 A MUST EQUAL B WITHIN 1/8"  
 C MUST EQUAL D WITHIN 1/8"

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 CLEAR-  
 ANCE  
 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

**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.

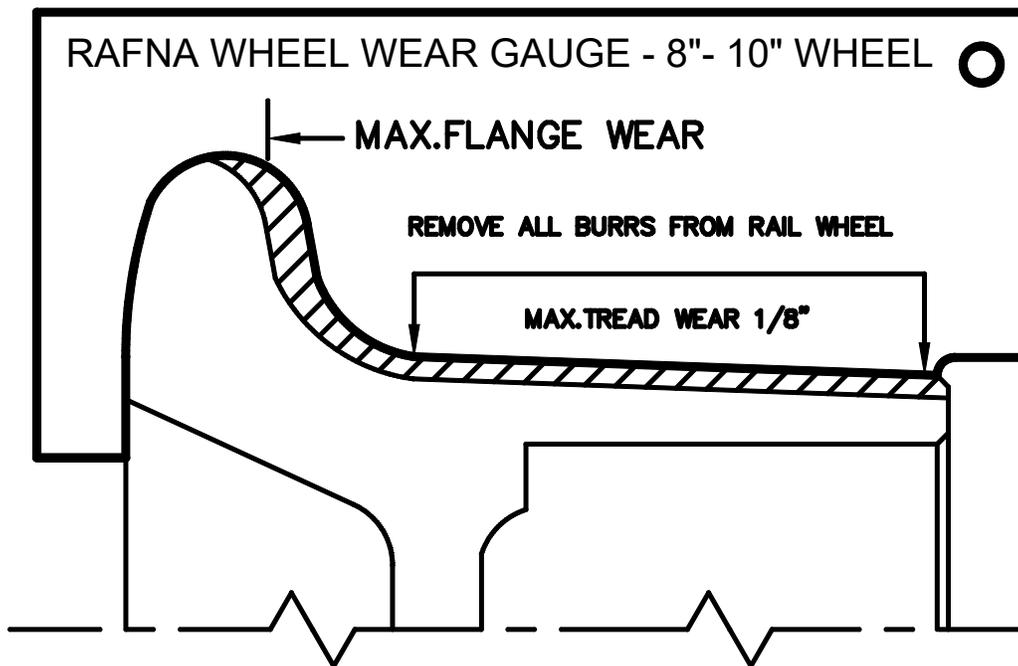
**Flange Wear Limits:**

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.

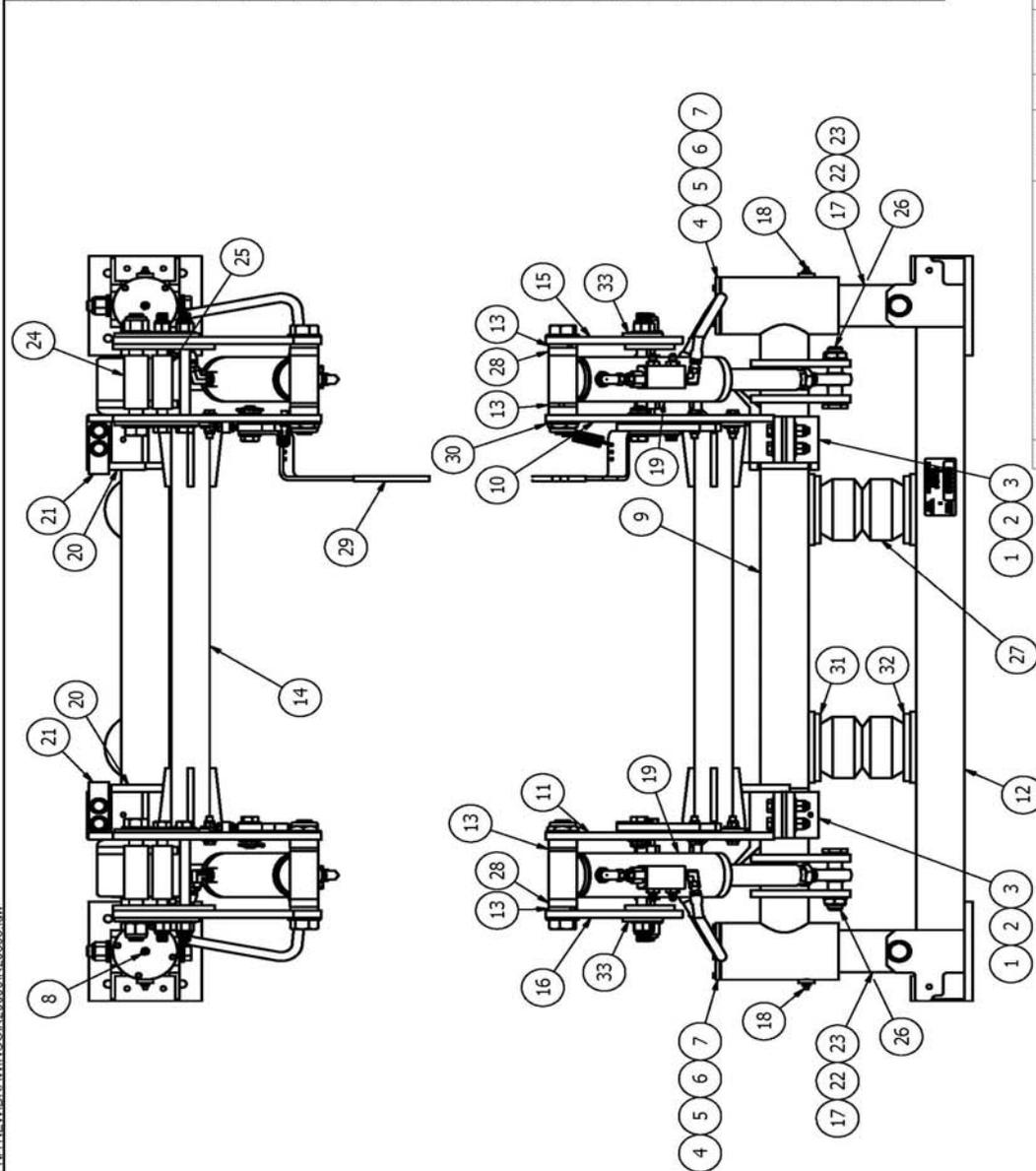
NOMINAL RAIL WHEEL DIAMETER (INCHES)	MIN. ALLOWABLE WHEEL DIAMETER (INCHES)
10	9 3/4





PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	R-5710	BEARING CAP
2	2	R-5708	SPLIT BEARING
3	4	R-5709	SHIM
4	2	R-20085	GASKET, OUTER GUIDE TUBE CAP
5	2	R-20084	CAP, OUTER GUIDE TUBE
6	8	R-20105	MACHINE SCREW
7	8	990401-010-12	#10, GR. 5 LOCK WASHER
8	2	R-021	FITTING, GREASE RELIEF
9	1	R-20304	UPPER CROSS FRAME
10	1	R-20309D	MOUNTING BRKT., DRIVERS SIDE
11	1	R-20309P	MOUNTING BRKT., PASS SIDE
12	1	R-20110	FRONT AXLE
13	4	R-20117	SPACER, 1/4"
14	1	R-20322	FRONT SUPPORT BEAM ASSY.
15	1	R-20306D	OUTER SUPPORT PLATE, D.S.
16	1	R-20306P	OUTER SUPPORT PLATE, P.S.
17	2	R-20083A	INNER GUIDE
18	3	990900-009	1/8 NPT ST ZERK
19	2	R-22065	HYDRAULIC CYLINDER
20	2	R-20101	ROTATION STOP
21	2	R-20101A	STOP PLATE
22	2	R-6523	BELLOWS
23	2	R-604	CLAMP, BELLOW
24	2	R-20312	FRAME SPACER
25	2	R-20305	FRAME SPACER
26	2	R-20167	LOWER PIVOT BOLT
27	2	R-5683	TIMBREN 540/75 SPRING
28	2	R-20315	SPACER, 1/2"
29	1	R-23132	LOCK-UP ASSEMBLY
30	1	R-28039	MODIFIED FLAT WASHER
31	2	R-23039	SPRING PLATE, UPPER
32	2	R-23040	SPRING PLATE, LOWER
33	2	R-20313	PLATE, BACKER



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

DESIGN - ENGINEERING - MANUFACTURING

REV/DESCRIPTION OF CHANGES  
A REVISION A RELEASED  
B REDESIGNED ASSEMBLY

DATE 11/06/17  
BY 12/5/17  
APPROVD SMMI JMP  
SMMI JMP

ECN # ECN-17-621

REVISED BY: THE OWNER OF THIS PRODUCT. THIS DRAWING IS FOR CONSTRUCTION PURPOSES ONLY. NO RIGHTS ARE RESERVED IN THIS DRAWING OR ITS CONTENTS, AND NO LIABILITY SHALL BE ASSUMED BY G&B SPECIALTIES INC. FOR ANY DAMAGE TO PROPERTY OR PERSONS ARISING FROM THE USE OF THIS DRAWING.

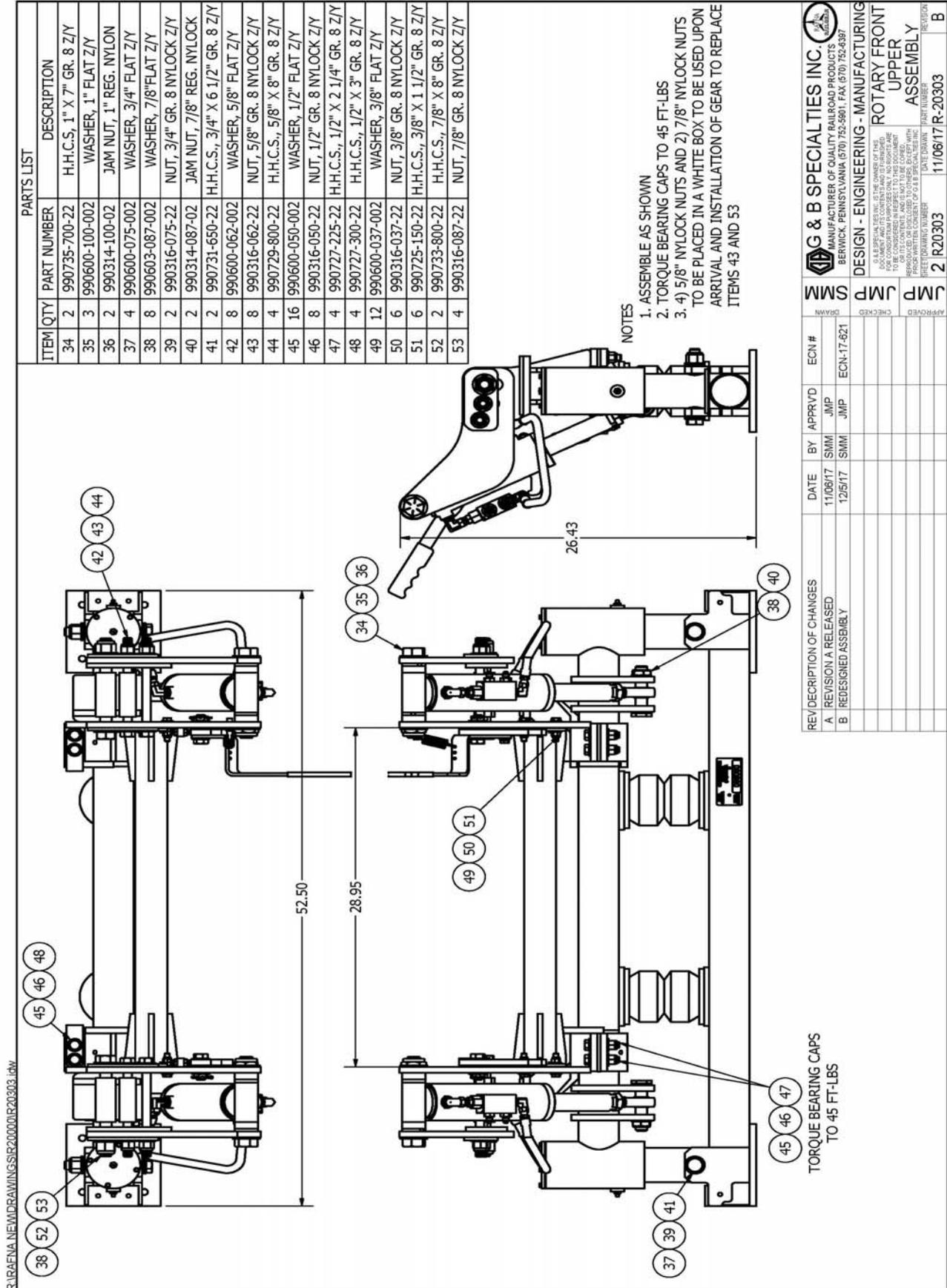
DATE DRAWN 11/06/17  
PART NUMBER R-20303

REVISED BY: B

ESTIMATED WEIGHT : 320LBS

NOTES  
1. ASSEMBLE AS SHOWN  
2. TORQUE BEARING CAPS TO 45 FT-LBS  
3. SEE SHEET #2 FOR FASTENERS

R:\RAFENA\_NEWDRAWINGS\R200001R20303.dwg



ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-23131	R-460 UPPER UNIT ASSY	1
2	990314-062-22	NUT, 5/8" REG HEX JAM NYLON GR 8	2
3	H.H.C.S.	3/8" UNC GR.8 x 1.50"	2
4	R-28047P	PIVOT BOLT	1
5	R-28044A	FLANGE BEARING	2
6	R-28042	LOCK-UP HOOK ASSY	2
7	PWASHER	5/8" TYPEA	4
8	L'WASHER	3/8"	1
9	H.H.C.S.	3/8" UNC GR.8	1
10	R-28046C	LOCK-UP HANDLE ASSY	1
11	R28048.iam		1
12	R-10473	SPRING POST	1
13	HYDRAULIC ADAPTER	3/8 ORB MALE x 1/4 JIC FEMALE, STRAIGHT, SWIVEL	2
14	S-002002	SINGLE PC CHECK VALVE	2
15	HYDRAULIC ADAPTER	3/8 ORB MALE x 1/4 JIC MALE, 90	2
16		HYDRAULIC HOSE ASSY, 11"	2
17	R-28047D	PIVOT BOLT	1
18	HYDRAULIC ADAPTER	3/8 ORB MALE x 1/4 JIC MALE, STRAIGHT	4
19	HEX NUT	3/8" UNC GR.8 JAM	5

REF: HYDRAULIC KIT #H-990KIT-050  
REF: HARDWARE KIT #R-990KIT-352

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	DRAWN
A REVISION A RELEASED	04/19/13	AML		ECN-22-080	
B REVISED MOUNTING HARDWARE	02/09/22	SMM	JMP		

SHEET/DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1 R23132	04/19/13	R-23132	B

SECTION A-A

ALL WELDS TO CONFORM TO AWS D1.1

**G & B SPECIALTIES INC.**  
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BERWICK, PENNSYLVANIA (717) 752-5901, FAX (717) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

R-460 LOCKUP ASSEMBLY





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	

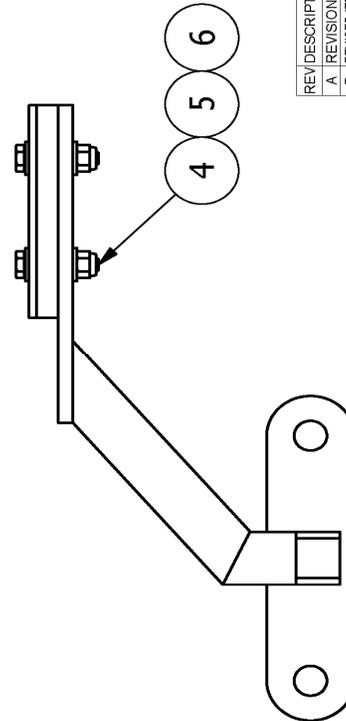
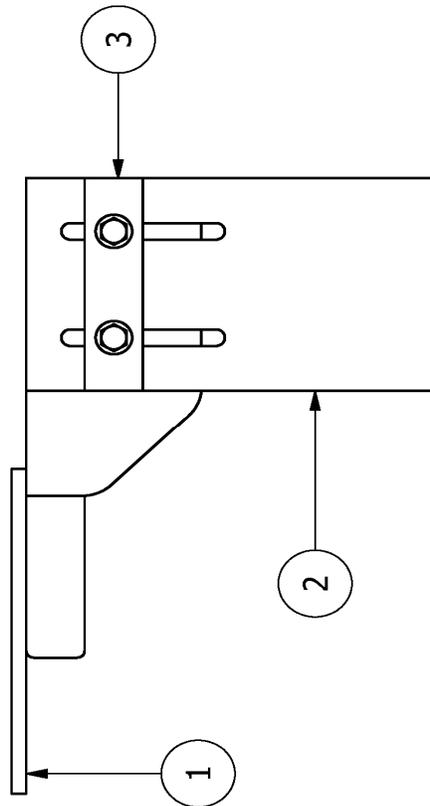
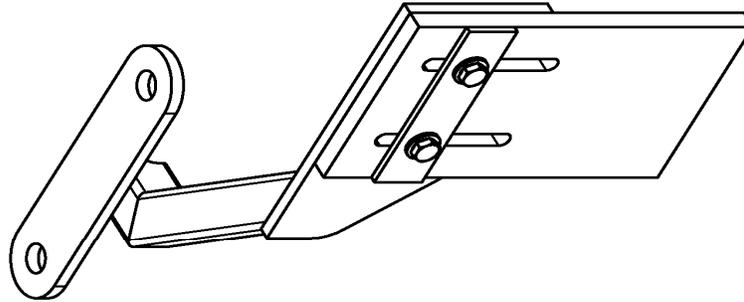
REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	APPROVED	CHECKED	DRAWN
A	REVISION A RELEASED	12/01/06	AML	JMP	ECN-21-456			
B	UPDATED BORDER	07/16/21	SMM	JMP				

<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (717) 752-5901, FAX (717) 752-6397		<b>10" WHEEL SUB ASSEMBLY, MODIFIED</b>
DESIGN - ENGINEERING - MANUFACTURING		10" WHEEL SUB ASSEMBLY, MODIFIED
ALL WELDS TO CONFORM TO AWS D1.1		PART NUMBER
1 R001D		12/01/06/R-001D
AML		REVISION
APPROVED		B

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	FWASHER	1/4" TYPE A, GR. 8	4
6	NYLOCK NUT	1/4" UNC, GR.8 STD NYLOCK	2



- NOTES:
- ASSEMBLE AS SHOWN
  - HARDWARE KIT REF: R-990KIT-007
  - APPROX. WEIGHT: 3.0 LBS

REV/DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	DRAWN	CHECKED	APPROVED
A REVISION A RELEASED	02/19/09	JL		ECN-09-526			
B REVISED ITEM #6	12/10/09	AMIL		ECN-20-133			
C GENERAL UPDATE	03/11/20	SDB	SDB				

**G & B SPECIALTIES INC.**  
MANUFACTURER OF QUALITY RAILROAD PRODUCTS  
BERWICK, PENNSYLVANIA (570) 752-5801 FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

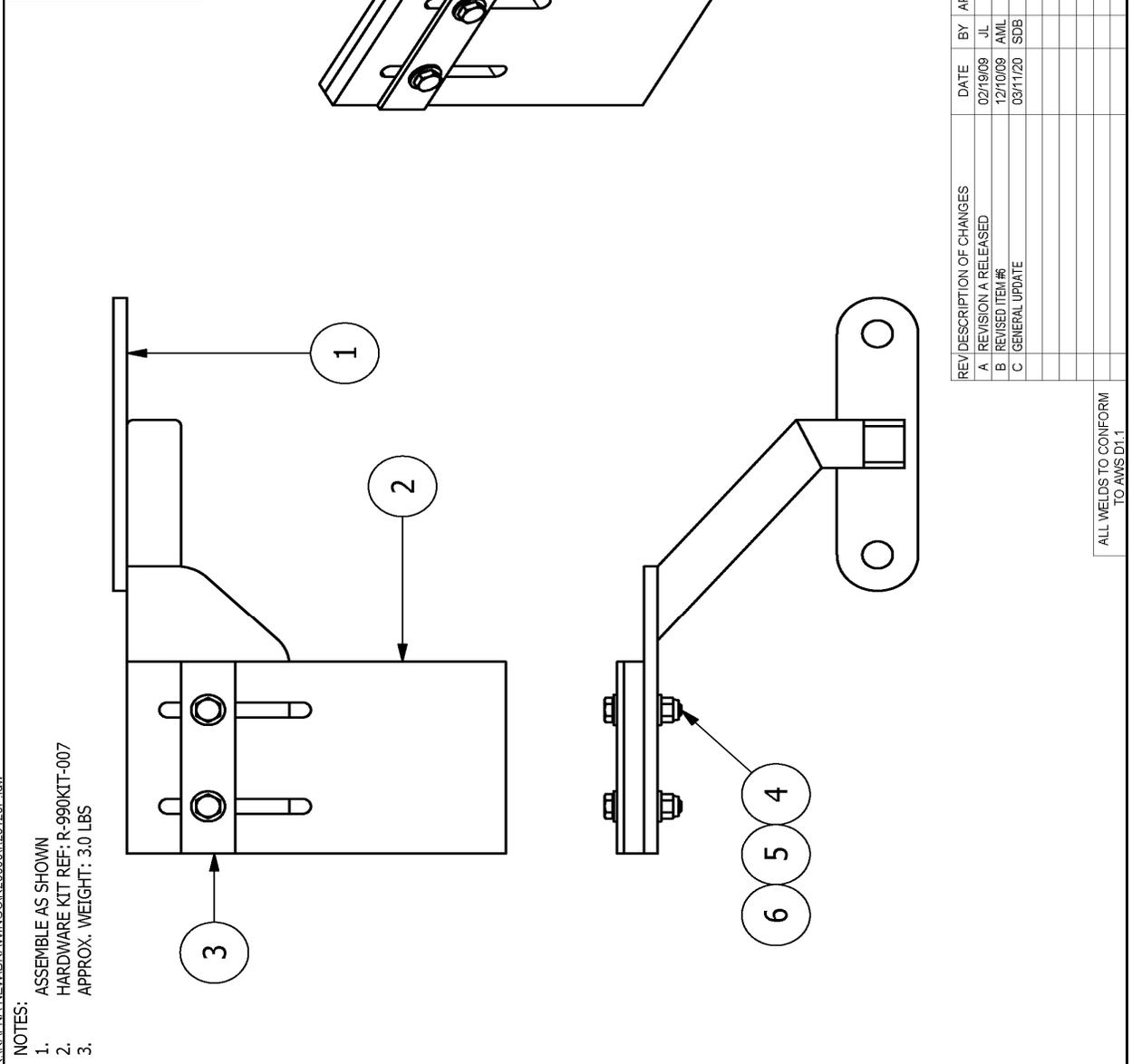
DRIVE SIDE RAIL  
SWEEP ASSEMBLY  
R-460 FRONT

DATE DRAWN: 02/19/09  
PART NUMBER: R-20120D  
PRECISION: C

ALL WELDS TO CONFORM TO AWS D1.1

**BILL OF MATERIAL/PARTS LIST**

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2012IP-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	APPRY/D	ECN #	APPROVED	CHECKED	DATE DRAWN	PART NUMBER	REVISION
A REVISION A RELEASED	02/19/09	JL		ECN-09-525					
B REVISED ITEM #6	12/10/09	AML		ECN-20-134					
C GENERAL UPDATE	03/11/20	SDB							
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<b>G &amp; B SPECIALTIES INC.</b> MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397 <b>DESIGN - ENGINEERING - MANUFACTURING</b> PASS SIDE RAIL SWEEP ASSEMBLY R-460 FRONT									
SHEET DRAWING NUMBER: 1   R20120P								DATE DRAWN: 02/19/09   PART NUMBER: R-20120P   REVISION: C	

ALL WELDS TO CONFORM TO AWS D1.1