

## INSTALLATION OF R-490 ADJUSTABLE ROTARY FRONT RAILGEAR KIT 2019 AND UP INTERNATIONAL CV515/CHEVY SILVERADO 4500-6500

### 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 the engine is turned off and the parking brake is set.
- 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.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.

## INSTALLATION OF ROTARY FRONT RAILGEAR KIT

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

**Table 1: Rotary Front Railgear Kit Installation Parts (K-R49RXC20TRO)**

Part Number	Description	Qty
R-20500	R-490 Rotary Front Upper Assembly for CV515 (Trolley)	1
R-20502	Plate Assy, Adj. Sliding (Trolley)	2
R-20460D	R-490 Front Mounting Bracket for CV515, Driver Side	1
R-20460P	R-490 Front Mounting Bracket for CV515, Passenger Side	1
R-20421D	R-490 Front Interface Bracket for CV515, Driver Side	1
R-20421P	R-490 Front Interface Bracket for CV515, Passenger Side	1
R-001-LW	10" Light Wheel Assembly	2
R-20120D	R-490 Driver Rail Sweep	1
R-20120P	R-490 Passenger Rail Sweep	1
R-20459	Jack Bolt Bracket	2
R-20456	Aluminum Bumper for CV515	1
R-20473	Brace, Inner Support	1
R-20474	Brace, Outer Support	1
R-25108	Pin, Quick Release	2
R-20493	Brace, Front	1
K-R49PROX001	CV 515 ABS Proximity Switch Kit	1
R-32848	Wand Set, Sight 3/4" x 36" LG	1
R-990KIT-454 Railgear Mtg Kit	Hex Screw, 5/8" X 2 3/4" LG, UNC, GR.8	6
	Hex Screw, 5/8" X 3" LG, UNC, GR.8	2
	Hex Screw, 5/8" X 3 1/2" LG, UNC, GR.8	4
	Hex Screw, 5/8" X 4" LG, UNC, GR.8	4
	Hex Screw, 3/4" X 2 1/2" LG, UNC, GR.8	16
	Hex Screw, 3/4" X 3" LG, UNC, GR.8	2
	Hex Screw, 3/4" X 5 1/2" LG, UNF, GR.8	2
	Flat Washer, 5/8" Type A, GR. 8	24
	Flat Washer, 3/4" Type A, GR. 8	40
	Jam Hex Nut, 5/8" UNC, GR.8	4
	Nylock Nut, 5/8" UNC, GR.8 Std	12
	Nylock Nut, 3/4" UNC, GR.8 Std	18
	Nylock Nut, 3/4" UNF, GR.8 Std	2
R-990KIT-461 Wheel Hardware Kit	Flat Washer, 1/2" Type A, GR. 8	8
	Nylock Nut, 1/2"-20 UNF, GR.8 Std	8
R-990KIT-458 Bumper Mount- ing Hdw	Hex Screw, 1/2" x 1 3/4" LG, UNC, GR.8	4
	Flat Washer, 1/2" Type A, GR.8	8
	Nylock Nut, 1/2" UNC, GR.8	4
K-H46RXC001- PO /H-990KIT- 042 (included in R-20436)	(S-002001) Double Pilot Operated Check Valve	2
	(C5216X4X6) Hyd fitting 3/8 ORB MB X 1/4 JIC FJ, Swivel	2
	(HY-854FSO-04-06) Adapter Hydraulic	4
	(HFS2-04-010A) Hydraulic Hose Assembly, 1/4" X 10"	2
	(HY-849FSO-04-06) Adapter, Hydraulic.	2

1. Starting on driver's side, (Passenger side process will be the same) support front bumper if necessary and locate and remove the 3 non huck bolts that tie the bumper bracket into the suspension and frame. These bolts will be replaced by longer hardware. (Figure 1) Tow hooks can be placed aside as they will not be reused.
2. Place a floor jack or other appropriate support under the front end of the vehicle to relieve pressure off the leaf springs and remove the bolt holding it between the ears of the bracket. This is a fine thread bolt and will be replaced with a longer bolt in kit. (Figure 1)
3. Ensure vehicle has been ordered with the Snow Plow Prep Package by locating the three holes in the frame for the mounting of the rear bracket. If holes are not there, they will need to be drilled using the bracket as a template. (Figure 2)
4. Install bracket (R-20421D) on frame, supporting it when necessary, using the 5/8" x 3" bolt and associated hardware to mount the bracket to the frame using the rear most bolt hole of the 3 non huck bolt holes, then the 3/4" x 5 1/2" UNF bolt and associated hardware can be installed to mount the bracket to the suspension replacing the bolt that was removed on the leaf spring. (Figure 3)
5. Place Jack Bolt Bracket (R-20459) on inside frame where the tow hooks were removed and bolt to frame and bracket using the 5/8" x 3 1/2" bolts and associated hardware. (Figure 4)
6. The 5/8" x 2 3/4" bolts and associated hardware can now be inserted to mount the rear of the bracket to the frame. (Figure 5) (These are the holes that come pre-drilled when ordering the Snow Plow Prep Package, if holes are not in the frame, they will need to be drilled using the recently installed bracket as the template)
7. Install jam nuts on 5/8" x 4" bolts and screw into Jack bolt bracket.
8. Mount R-20422D to main bracket using the 3/4" x 2 1/2" bolts and associated hardware in the front two mounting holes. (Figure 5) Note: These bolts can be left loose as the bracket will be adjusted.
9. Steps 1-5 can now be repeated on passenger side of vehicle.
10. With both the Driver and Passenger mounting bracket installed, insert R-20473 (Inner Brace) into R-20474 (Outer Brace) and install inside R-20422D and P at rear most hole using 3/4" x 3" bolts and associated hardware. (Figure 5) Note: This will later get welded once installation is complete.
11. Ensure face of the mounting brackets are 90° to ground and adjust the Jack bolt that it touches the inside of the bracket and tighten jam nut. 3/4" bolts can now be tightened and torqued with brackets set.
12. With mounting brackets installed and adjusted on both driver and passenger side, position and support the railgear (R-20500) so that the top and bottom mounting holes align with the slots on the front mounting brackets as shown. (Align top mounting holes with the 3rd slot down from the top to get a good starting point (4x4 application)) Center the railgear on the slots. (Figure 5)

13. Fasten the railgear to the mounting plates using 3/4" x 2 1/2" bolts and associated hardware as shown. (Figure 5) Tighten but do not torque nuts as they will be torqued after the alignment procedure is completed.
14. Install the Adjustable Sliding Plate Assemblies (R-20502) onto the axle by using the 1/2"-20 UNF Nylock Nuts and Washers provided in this kit. **NOTE:** Aligning the hole on the ear of the axle with the front hole should put the plate flush with the end of the axle and be for Standard Gage. Extending the plate past the end of the axle and aligning with the rear hole will be for Trolley Gage. Once Gage is selected, place the Quick Release Pin (R-25108) through the holes and torque nuts to 120 ft-lbs dry. Do not Over-torque. (Figure 5 & 6)
15. Place the rail wheels below the mounting tables on the railgear axle. Place the rail sweeps in front of the rail wheels and on the bottom of the mounting tables. Fasten the rail wheels and rail sweeps to the mounting tables using the 1/2"-20 UNF Nylock Nuts and Washers supplied in the kit. (Figure 5 & 7) Tighten but do not torque the 1/2" Nuts as they will be torqued following the railgear alignment procedure.

**NOTE:**

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

16. With hydraulics properly functioning, plum in the hydraulic lockup cylinders located on the inside of the railgear.
17. Follow the Vehicle Axle Lockup Kit installation procedure detailed in the Axle Lockup Kit MIO-FAL49XR20437.
18. Engage the Vehicle's Axle Lockup and rotate the railgear to the rail position. Vehicle's tire clearance should be a minimum of 2.5" above the rail head or meet the requirements by the railroad's guidelines. If neither hold true, the 3/4" x 2 1/2" bolts need to be removed holding the railgear to the mounting brackets and the gear moved down a slot. (In the case of too much lift, the railgear would be moved up a slot)

With the vehicle now having the proper clearance, the Railgear Alignment procedure can now be preformed.

## RAILGEAR ALIGNMENT

**Note:**

*Refer to Alignment Data Sheets for Completion of Alignment  
(See Below for Blank Sheets)*

**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 \_\_\_\_\_

TREAD TO TREAD, (NOT SIDEWALL)  
OEM FRONT: \_\_\_\_\_  
OEM REAR: \_\_\_\_\_  
MODIFIED FRONT: \_\_\_\_\_  
MODIFIED 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 \_\_\_\_\_

TIRE MFG \_\_\_\_\_  
TIRE SIZE \_\_\_\_\_

MOUNTING HEIGHT FRONT:

MOUNTING HEIGHT REAR:

STOCK TURNING DIAMETER:

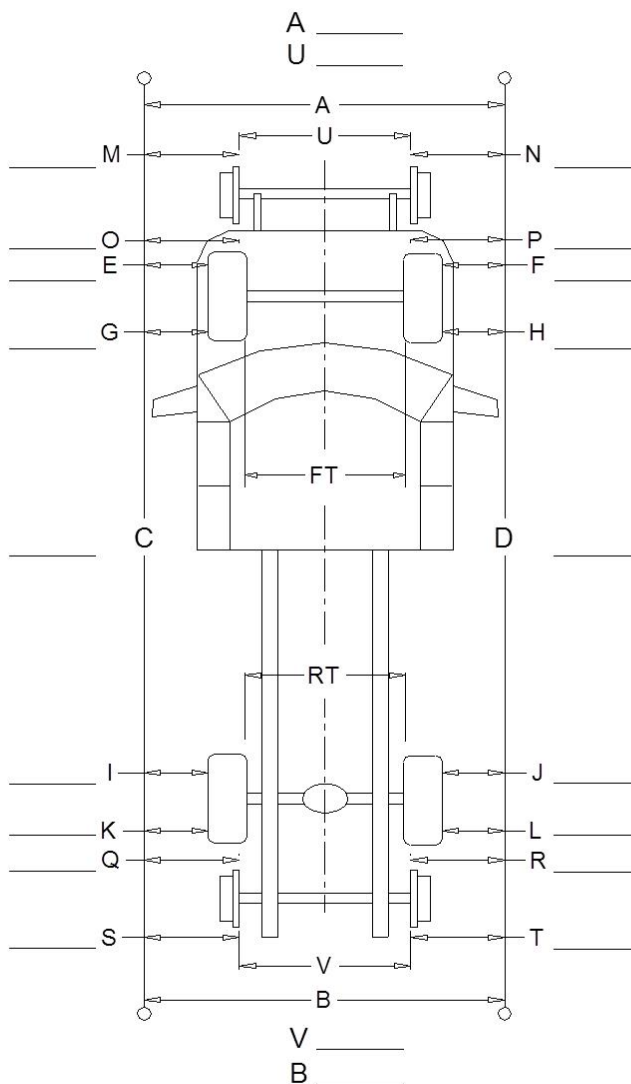
MODIFIED TURNING DIAMETER:

OEM: VEHICLE WEIGHT:

FRONT GAWR:

REAR GAWR:

MODIFIED: VEHICLE WEIGHT: \_\_\_\_\_ FRONT GAWR: \_\_\_\_\_ REAR GAWR: \_\_\_\_\_



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

U \_\_\_\_\_

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 \_\_\_\_\_

TREAD TO TREAD, (NOT SIDEWALL)  
OEM FRONT: \_\_\_\_\_  
OEM REAR: \_\_\_\_\_  
MODIFIED FRONT: \_\_\_\_\_  
MODIFIED 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 \_\_\_\_\_

TIRE MFG \_\_\_\_\_

TIRE SIZE \_\_\_\_\_

MOUNTING HEIGHT FRONT: \_\_\_\_\_

MOUNTING HEIGHT REAR: \_\_\_\_\_

STOCK TURNING DIAMETER: \_\_\_\_\_

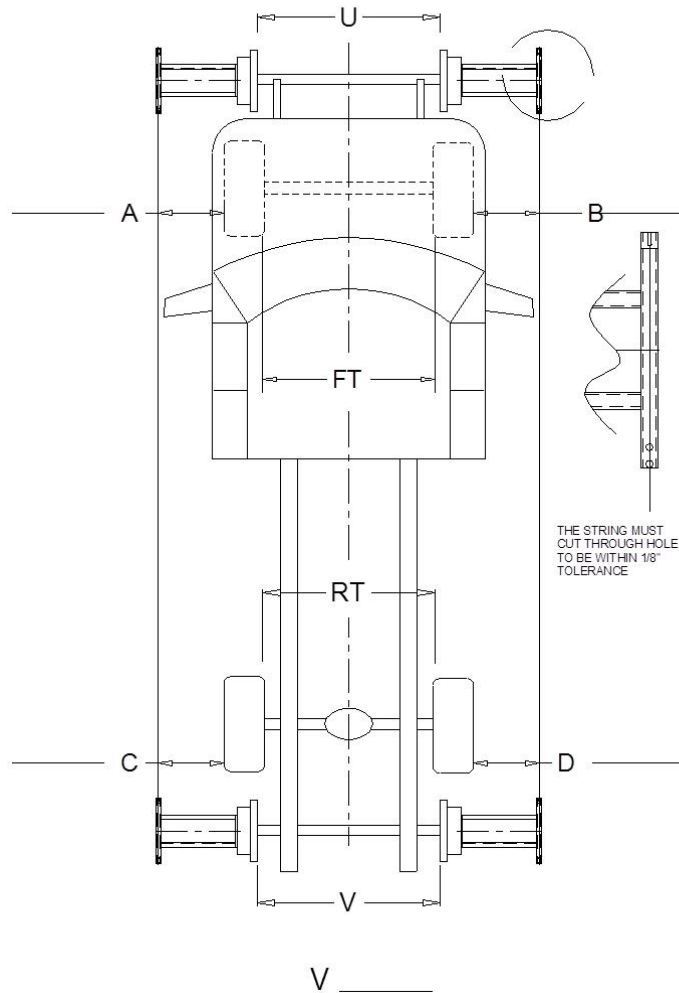
MODIFIED TURNING DIAMETER: \_\_\_\_\_

OEM: VEHICLE WEIGHT: \_\_\_\_\_

FRONT GAWR: \_\_\_\_\_

REAR GAWR: \_\_\_\_\_

MODIFIED: VEHICLE WEIGHT: \_\_\_\_\_ FRONT GAWR: \_\_\_\_\_ REAR GAWR: \_\_\_\_\_



**Railgear Alignment (Portable)**



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. Once the lateral alignment is complete, the 3/4" x 2 1/2" bolts can be torqued.

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.

**Note:**

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

### **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 failure. This additional rotation past vertical is called the over-center angle and is adjustable via a threaded rod end on 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:

- Unload the railgear hydraulic cylinder by raising the railgear just off rail.
- 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.
- Re-deploy the railgear to the rail position and re-check the over-center angle. Re-adjust as necessary.
- Tighten the jam nut on the hydraulic cylinder rod end.
- Repeat process for other cylinder.

- 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.

Following the over-center angle adjustment, 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. (See Figure 8)

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.

19. Once the Over Center Adjustment is set, rotate the gear to the road position and weld Lock Tab (R-20433) per drawing instructions, ensuring when welded, the lockup cylinder will engage the tab when activated. (Figure 9) Note: Depending on set Over Center Degree, trimming of the Locking Tabs may be required to get pin centered in hole and proper engagement.
20. Install Front Brace (R-20493) across the mounting brackets using the 3/4" x 2 1/2" bolts and associated hardware. Center before torquing. (Figure 5)
21. Follow the Rail Sweep Adjustment procedure.

### 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.

22. Torque all fasteners as detailed below.

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

23. Grease the railgear at all lubrication points as detailed in the Service section of this manual. (Figure 11)



24. With gear properly installed and adjusted, the gear can be tac welded to the mounting brackets using 1/4" fillet welds. (Figure 10)
25. Ensure Inner and Outer Brace is installed and weld in place using a 1/4" fillet weld. (Figure 8)
26. Proceed to International's Suggested CV Traction Control Bypass Instructions and complete.
27. Once the wiring is complete, the proximity sensor bracket (R-20480) and detection plate (R-20481) can now be welded. (Figure 10)
28. Locate an area on the bottom of the C-Channel for the proximity sensor bracket that if welded, will not interfere with the gear or the function of the vehicle. Weld bracket to C-Channel using 1/4" fillet welds. (Figure 10)
29. Install the proximity sensor (R-20485) into the mounting bracket. (Figures 5 & 10)
30. Rotate the gear to the rail position and place the detection plate on the Upper Cross Frame (R-20304) so that the proximity sensor will pick it up. (Figure 10)
31. Weld the detection plate onto the Upper Cross Frame using 1/4" fillet welds. (Figure 10)
32. After weldment, rotate gear between road and rail and ensure proximity sensor illuminates when in rail, and the light is off when in road.
33. Install Front Bumper (R-20456) onto the Railgear using the pre-mounted brackets with the supplied 1/2" x 1 3/4" bolts and associated hardware. (Figure 5)
34. Install sight wands (R-32848) onto bumper. (Figure 5)
35. Check for interference during the gears full range of motion along with the vehicle through all operating functions.



Figure 1: Non Huck Bolts for Bumper Bracket and Leaf Spring Bolt



Figure 2: Snow Plow Prep Holes in Frame

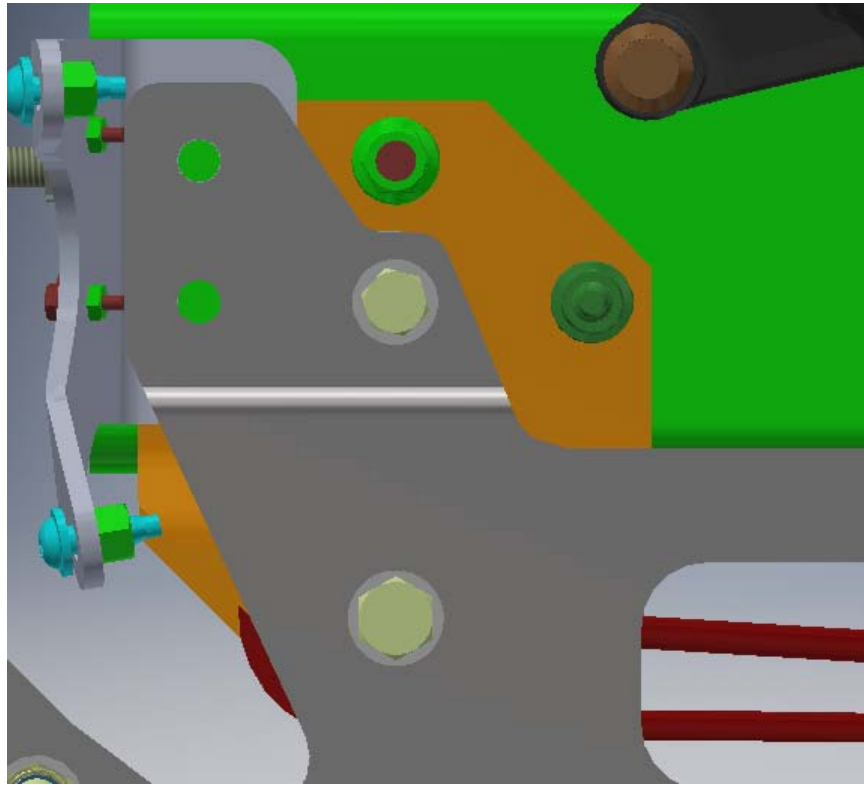


Figure 3: 5/8" x 3" Bolt Install Location

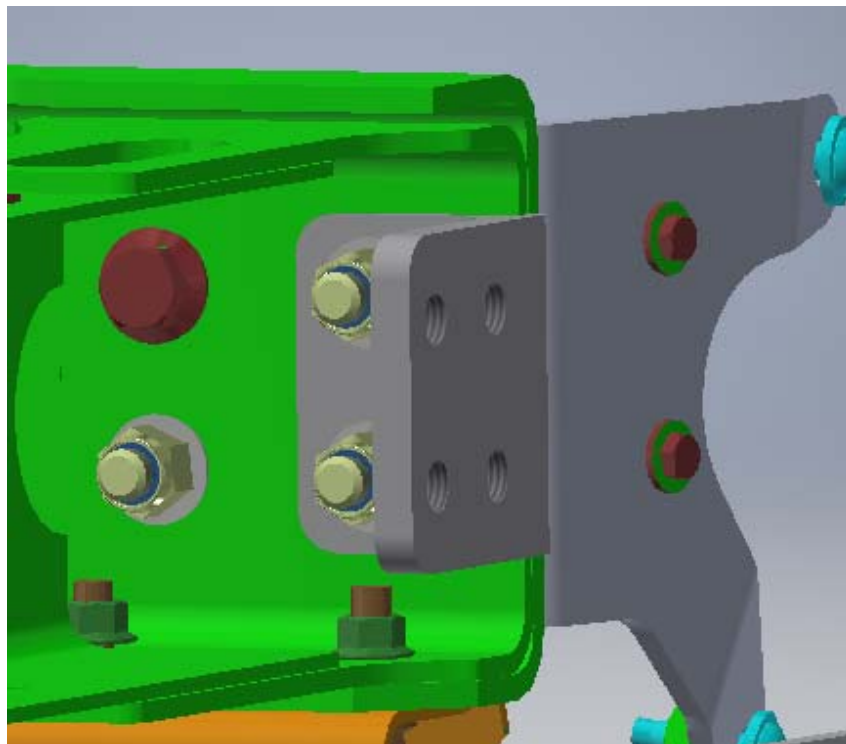


Figure 4: Jack Bolt Bracket

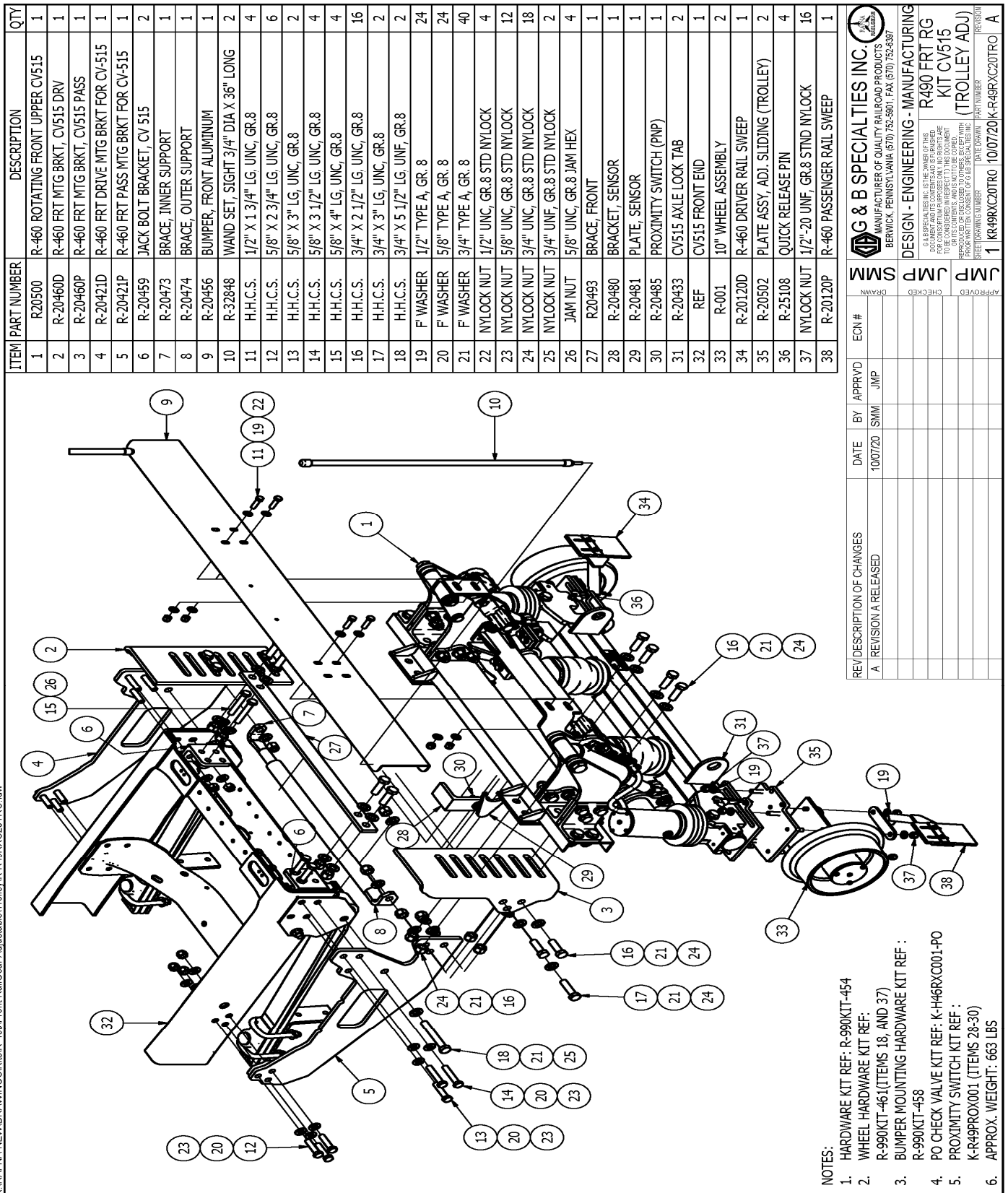
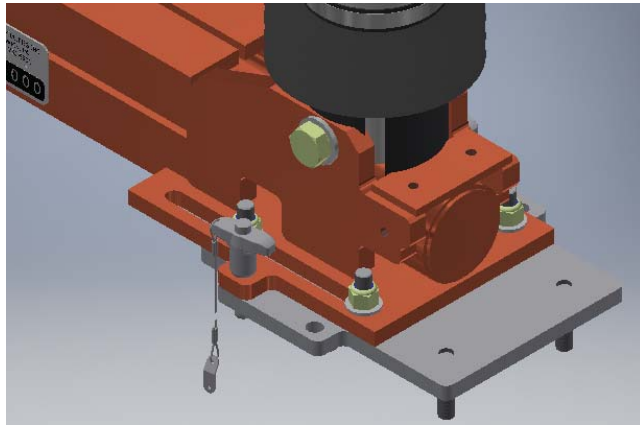
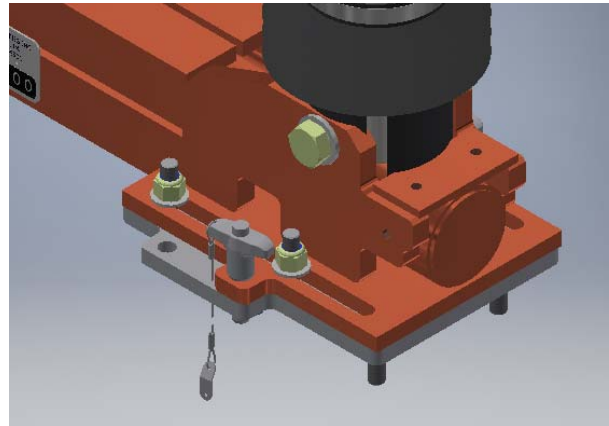


Figure 5: R-490 Rotating Front Railgear for CV515 Installed on Frame (K-R49RXC20TRO)





Trolley Gage



Standard Gage

Figure 6: Adjustable Sliding Plate Install

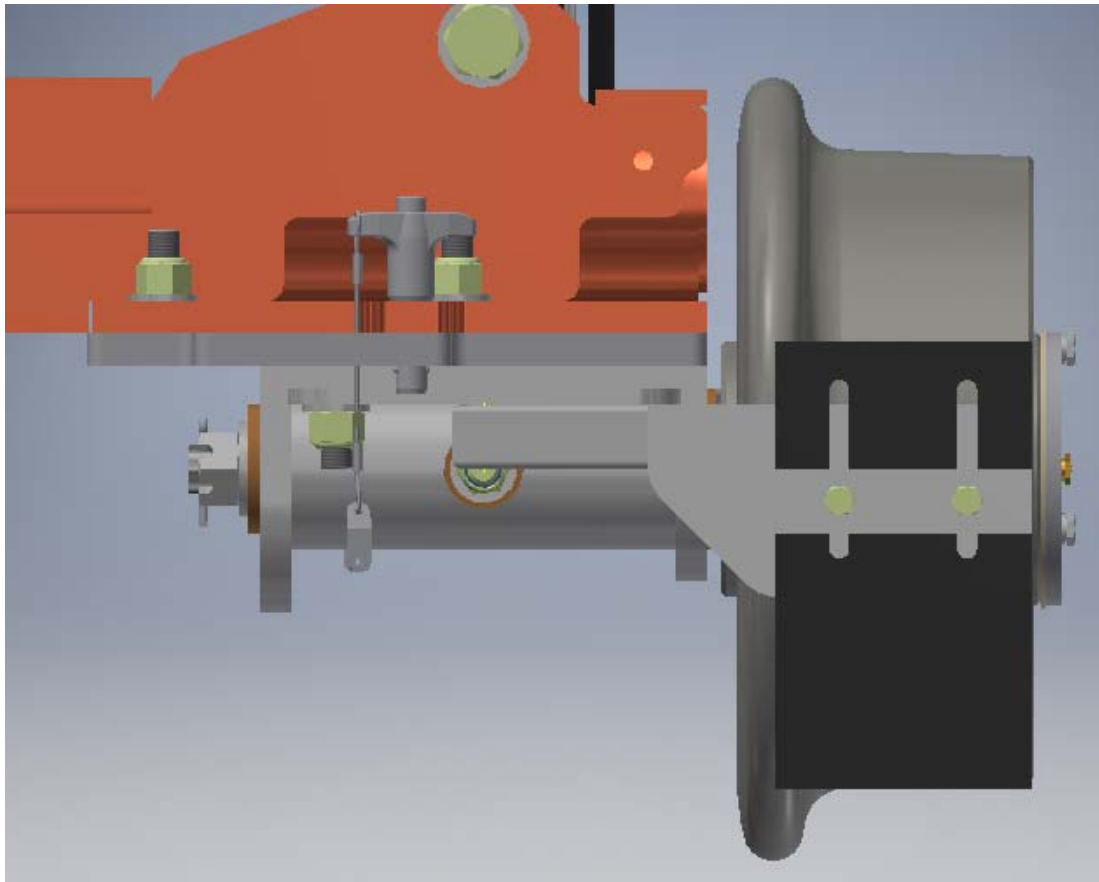


Figure 7: Wheel Installed On Adjustable Sliding Plate (Note: Figure Shown With Plate at Standard Gage)

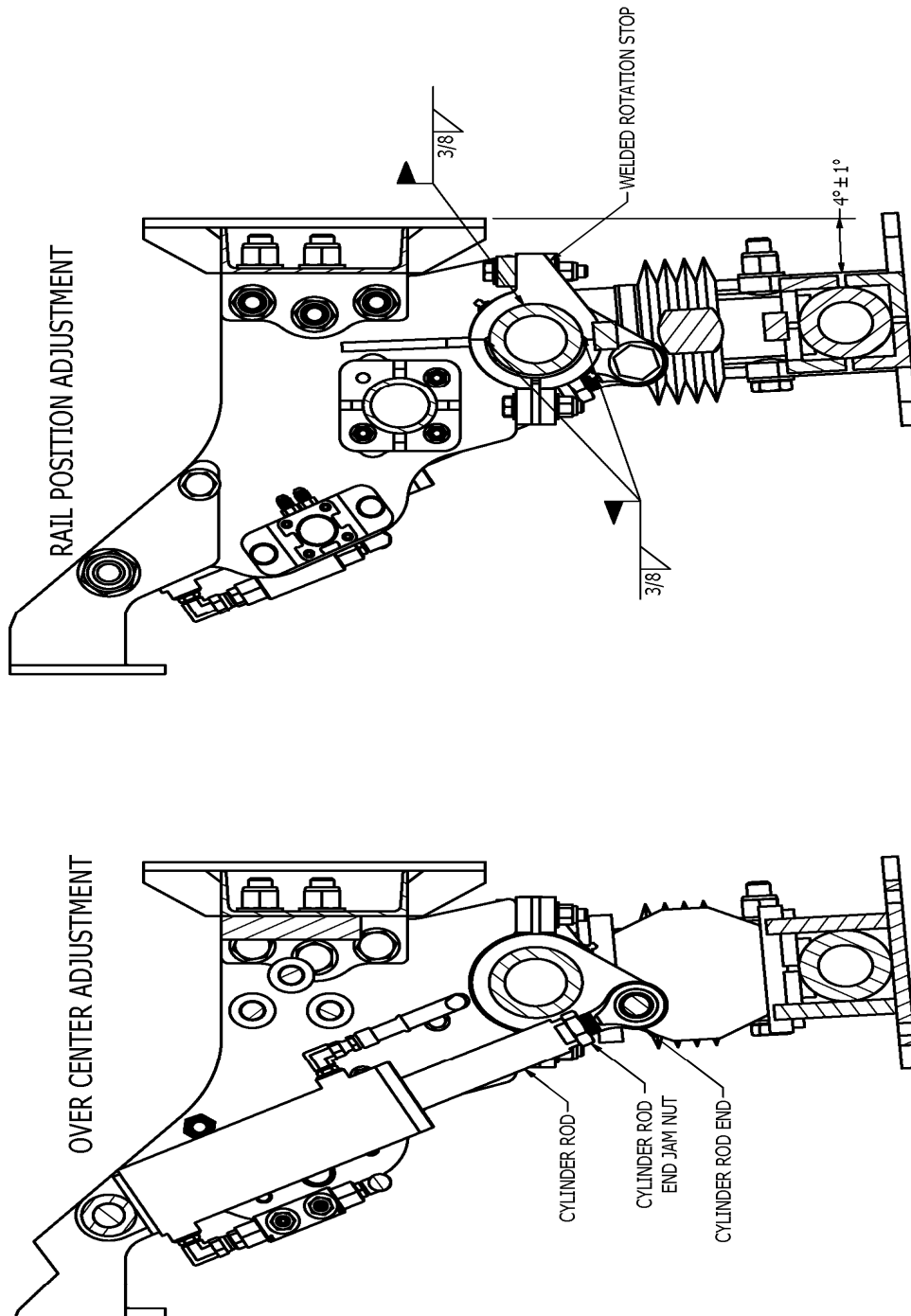


Figure 8: Over Center Stop Installation



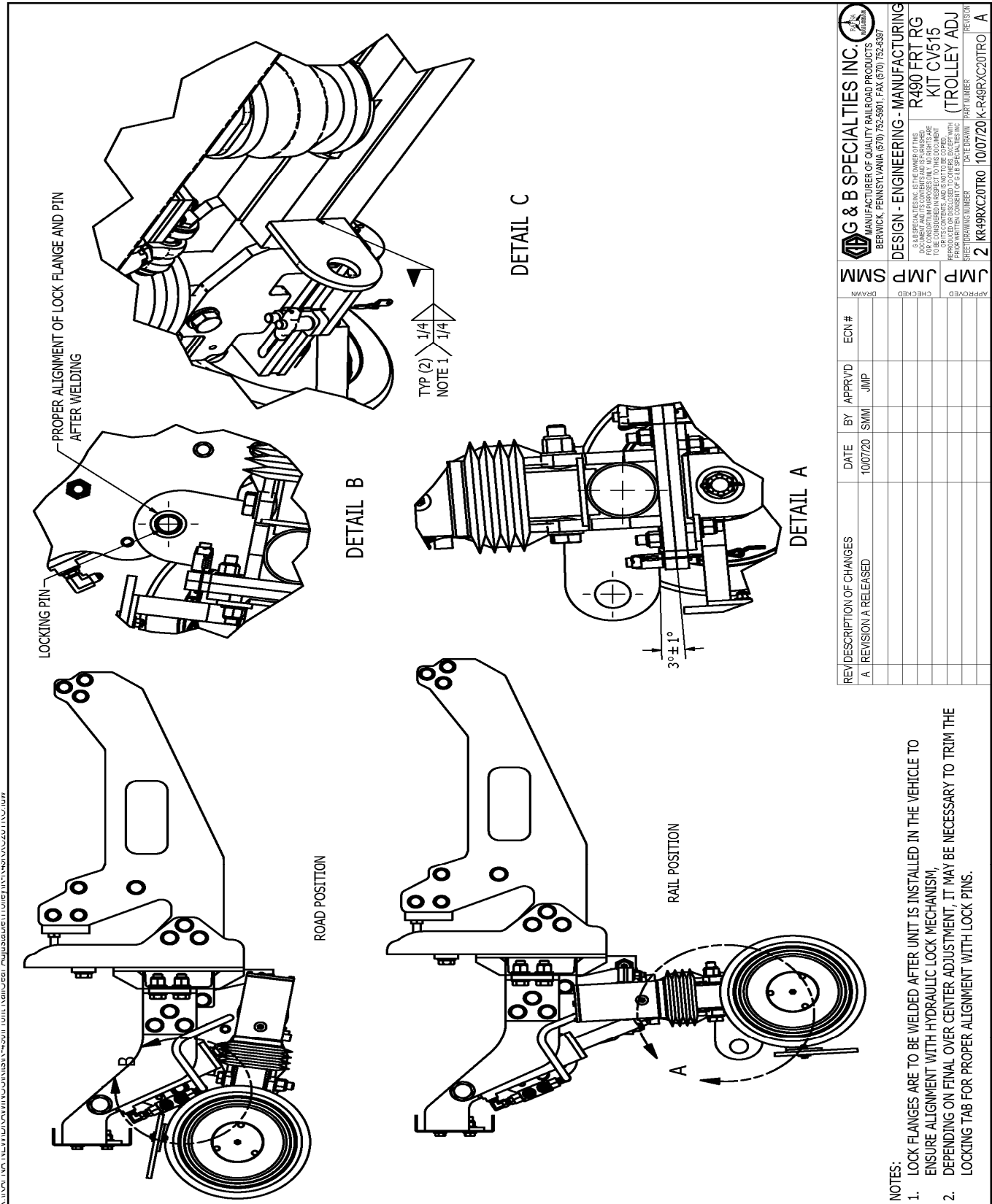
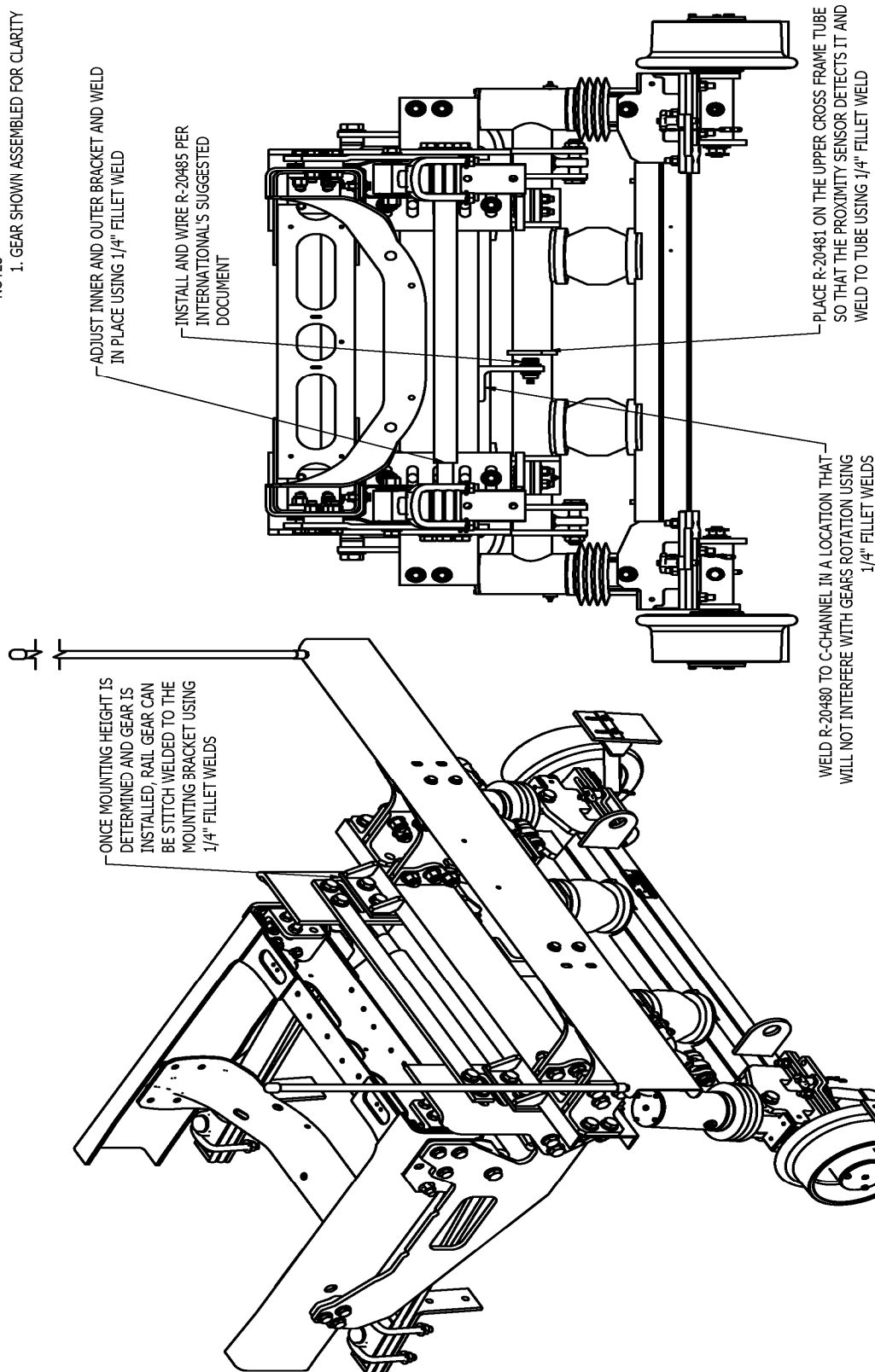


Figure 9: Weldment of R-20433



NOTES  
1. GEAR SHOWN ASSEMBLED FOR CLARITY



REVISION	DATE	BY	APPRVD	ECN #	APPROVED	DATE	BY	APPRVD	ECN #	APPROVED
A	10/07/20	SMM	JMP							
REVISION DESCRIPTION OF CHANGES										
A REVISION A RELEASED										
G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS										
BERWICK, PENNSYLVANIA (717) 752-5901 FAX (717) 752-6397										
DESIGN - ENGINEERING - MANUFACTURING										
R490 FRT RG										
KIT CV515										
(TROLLEY ADJ										
SHEET/DRAWING NUMBER										
3 KR49RXC20TRO										
DATE DRAWN										
10/07/20										
PART NUMBER										
K-R49RXC20TRO										
REVISION										
A										

Figure 10: Post Installation Weldment and Proximity Sensor Bracket

## OPERATION, SERVICE & PARTS OF R-490 ROTARY FRONT RAILGEAR KIT 2019 AND UP INTERNATIONAL CV515/CHEVY SILVERADO 4500-6500

### OPERATION, SERVICE & PARTS SAFETY PRECAUTIONS

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



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting operation of the railgear equipped vehicle.
- Operating instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Railway company rules governing rail travel must always be observed.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- If operating the railgear using the emergency hand pump, ensure that the correct manual valve over-ride is open for the desired railgear (front or rear) and desired direction of operation (raise or lower).
- Do not use the emergency hand pump to raise and lower the railgear on a routine basis. If the hydraulic pump or manifold should fail, have it repaired as soon as possible.
- Ensure the hydraulic pump has been de-energized before starting road or rail travel.



## OPERATION OF R-490 ROTARY FRONT RAILGEAR

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.

**Note:**

*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 axle locking pins. Do not force, if the lock pin cannot be disengaged, raise the railgear slightly.
3. Ensure that the locking pins are in the fully disengaged position.
4. Lower the railgear.
5. As the railgear is being deployed, it will start taking some of the vehicle's load. The railgear spring suspension should be observed compressing at least 3/4" 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 vehicles 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 engage the axle lockup pins once the railgear is rotated fully into the road position.
2. Ensure the railgear lock pins are fully engaged.
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 R-490 ROTARY FRONT RAILGEAR**

The railgear kit must be serviced regularly to avoid damage to the equipment. Table 2 below provides the Recommended Service Schedule and the detailed service procedures follow.

Grease fittings are provided at all railgear lubrication points as shown in Figure 11. 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 2: Recommended Service Schedule**

	Description	Daily	Weekly	Monthly	Every 3 Months	Every 6 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 locking mechanism 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 close proximity to rail head		✓			
10	Grease inner tubes					✓
11	Check level on hydraulic reservoir. Top off with appropriate filtered fluid			✓		
12	Inspect and grease railgear wheel bearings					✓
13	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.

**Table 3: Standard Fastener Torque Values**

Fastener Size	Fastener Torque Value (ft-lbs) Dry
1" UNC Gr. 8 Fasteners	250
¾" UNC Gr. 8 Fasteners	175
⅝" UNC Gr. 8 Fasteners	150
½" UNC Gr. 8 Fasteners	100
⅜" UNC Gr. 8 Fasteners	40
¼" UNC Gr. 8 Fasteners	12

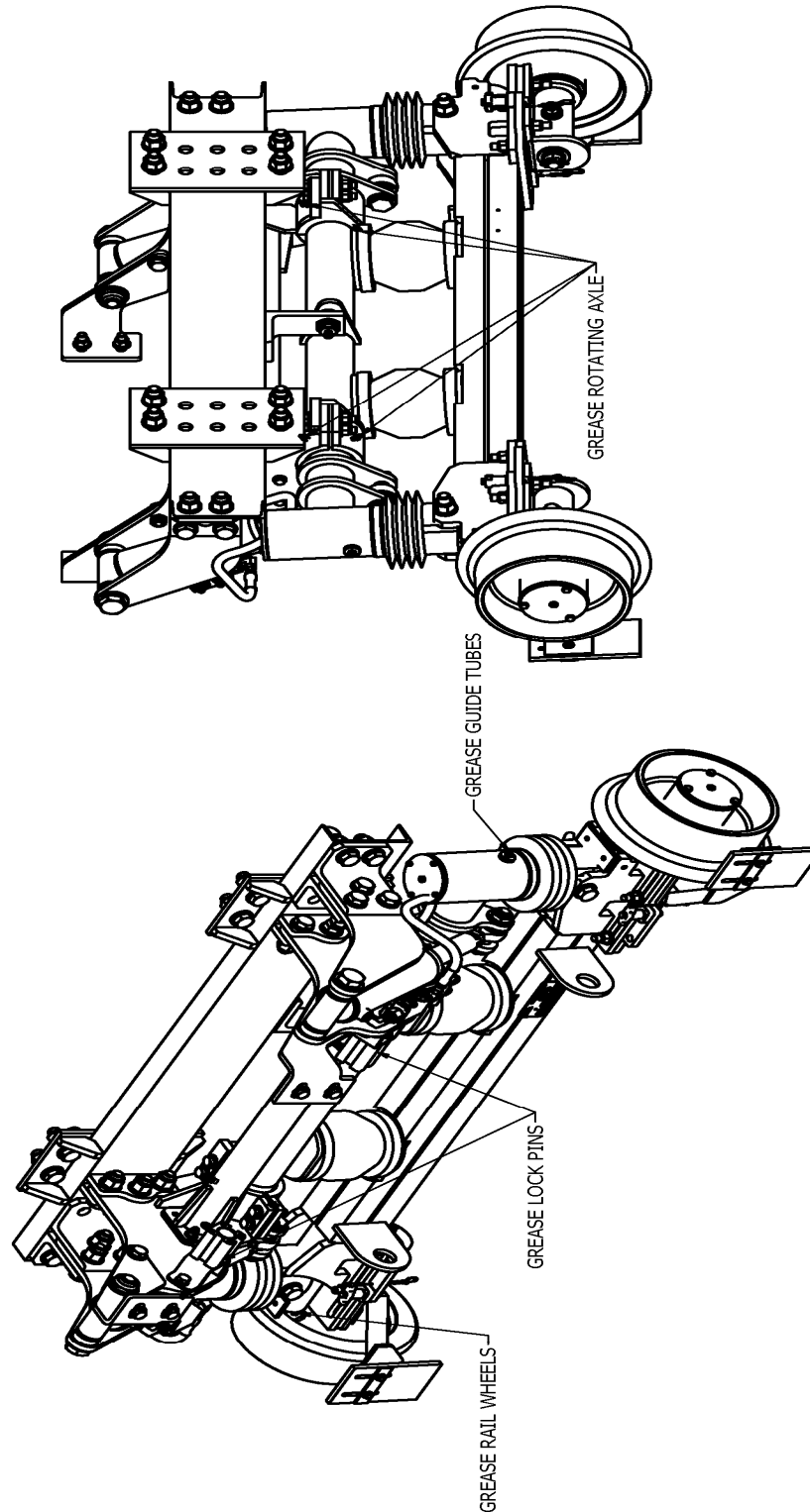


Figure 11: Railgear Lubrication Points





## 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. Loosen 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.

## VEHICLE FRONT TIRE CLEARANCE ADJUSTMENT

The vehicle front tires must remain at a minimum height above the rail to ensure sufficient clearance when traveling on rail. If the front tires are less than 2.5" from the rails when the railgear is in the rail position OR the front rail wheels are less than 7" from the ground when the railgear is in the road position, the front tire clearance must be adjusted as follows:

Determine how much the railgear must be adjusted up or down in order to obtain the correct road and rail clearance.

The railgear mounting height must be adjusted. Support the railgear and remove the 3/4" fasteners that hold the railgear on the front mounting plates. Raise the railgear (to get less lift) or lower the railgear (to get more lift) so that the next set of railgear mounting holes align with the mounting plate slots. Re-install the 3/4" fasteners and torque them to 175 ft-lbs dry. Do not over torque. Follow the Railgear Alignment procedure provided in this manual.

Ensure that the railgear will not contact any vehicle components throughout the full range of railgear and railgear suspension movement. Re-check the road and rail clearances and re-adjust if necessary.



## RAIL WHEEL GAGE ADJUSTMENT

This unit is equipped with adjustable sliding plates that allow the adjustment between Standard and Trolley gage. Both wheels must be adjusted the same before use. G&B recommends replacing the lock nuts during any adjustment procedure. Grade 8, 1/2"-20 nylock nuts are to be used. Torque spec is 120 ft-lbs dry.

Observe the railgear. If the wheel table is flush with then ends of the axle, the unit is setup for Standard Gage. If the wheel table sticks out past the ends of the axle, it is setup for Trolley Gage. To adjust from one gage to the other, the process is listed below:

1. Loosen the four 1/2" nylock nuts used to fasten the assembly to the axle.
2. Pull the Quick Release Pin used to lock in the position of the assembly.
3. Slide assembly out to the end of the slot to go to Trolley Gage, slide assembly in to end of slot to go to Standard Gage.
4. Re-insert Quick Release Pin to lock assembly in place.
5. Lower railgear to apply pressure to wheel assembly to keep everything from moving.
6. Remove the four 1/2" nylock nuts and replace with new. Nuts are 1/2"-20 Nylock nuts and should be torqued to 120 ft-lbs dry.
7. Repeat the same process for the opposite wheel.
8. If nothing was touched regarding the nuts fastening the wheel to the plate, the alignment should not have changed. **NOTE:** Depending when the alignment was last checked or if unusual wear on the rail wheels can be visually noticed, now would be a good time to re-align the wheels.

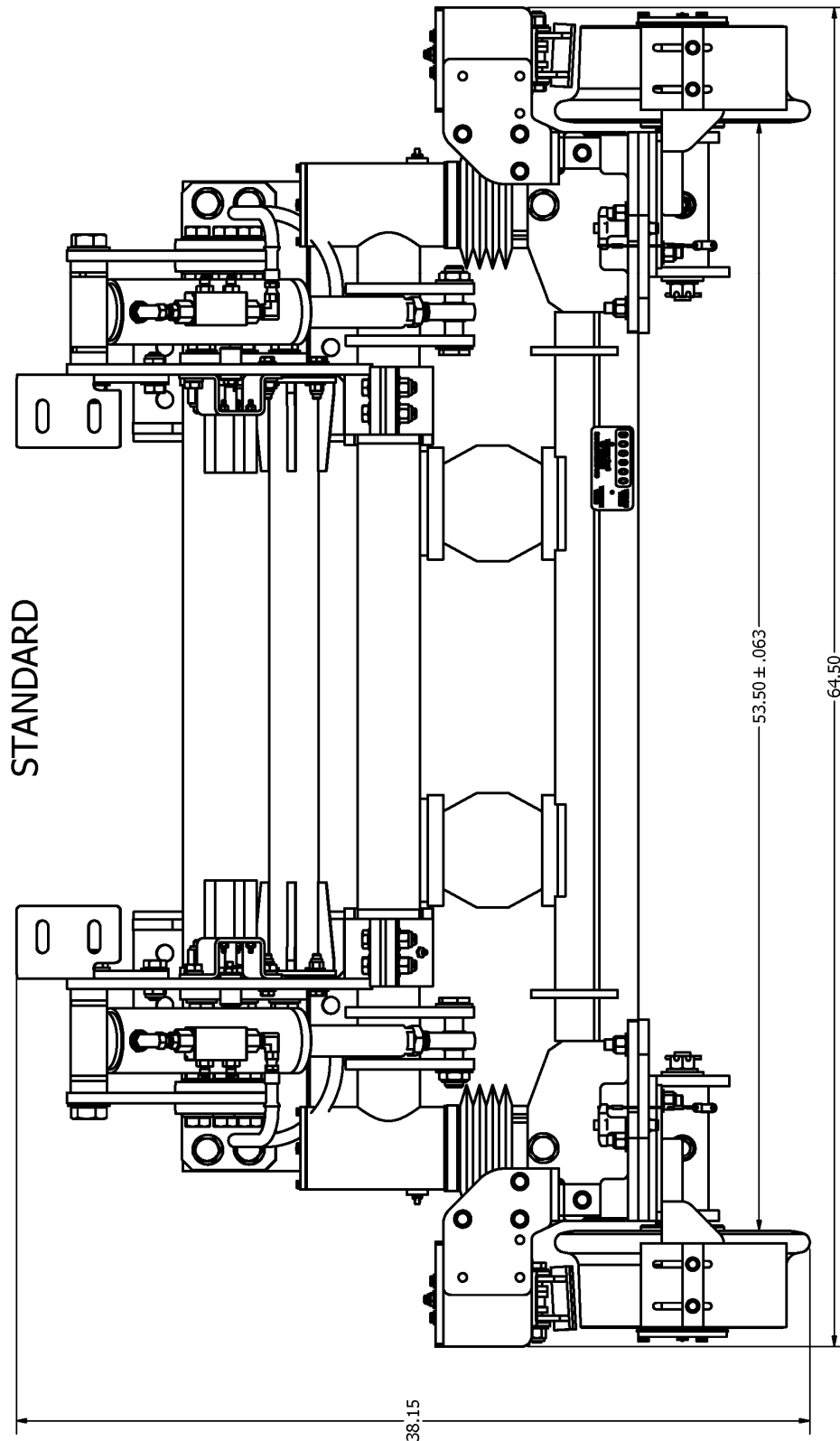


Figure 12: Gear In Standard Gage

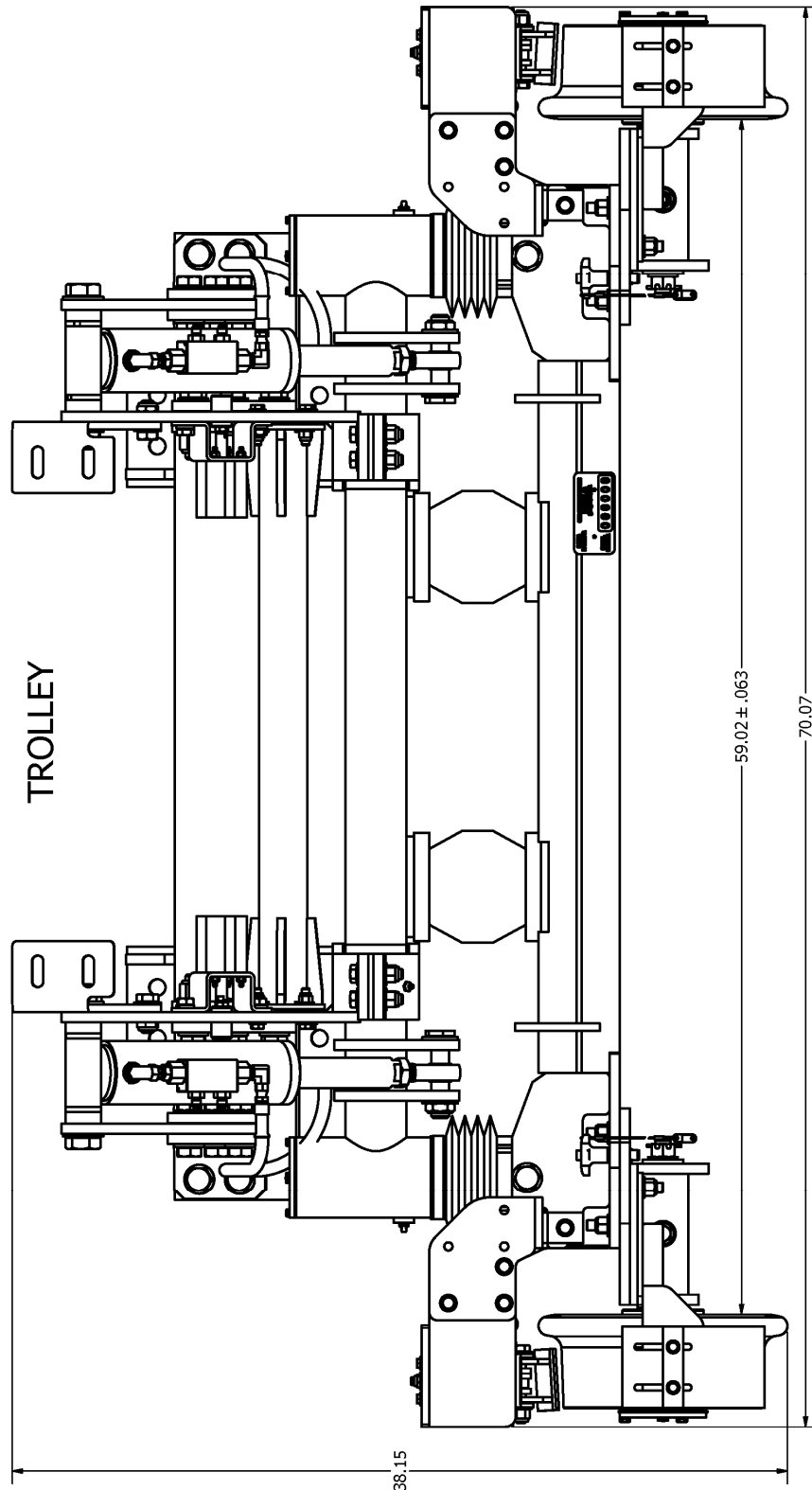


Figure 13: Gear In Trolley Gage



**PARTS OF R-490 ROTARY FRONT ADJUSTABLE TROLLEY RAILGEAR**

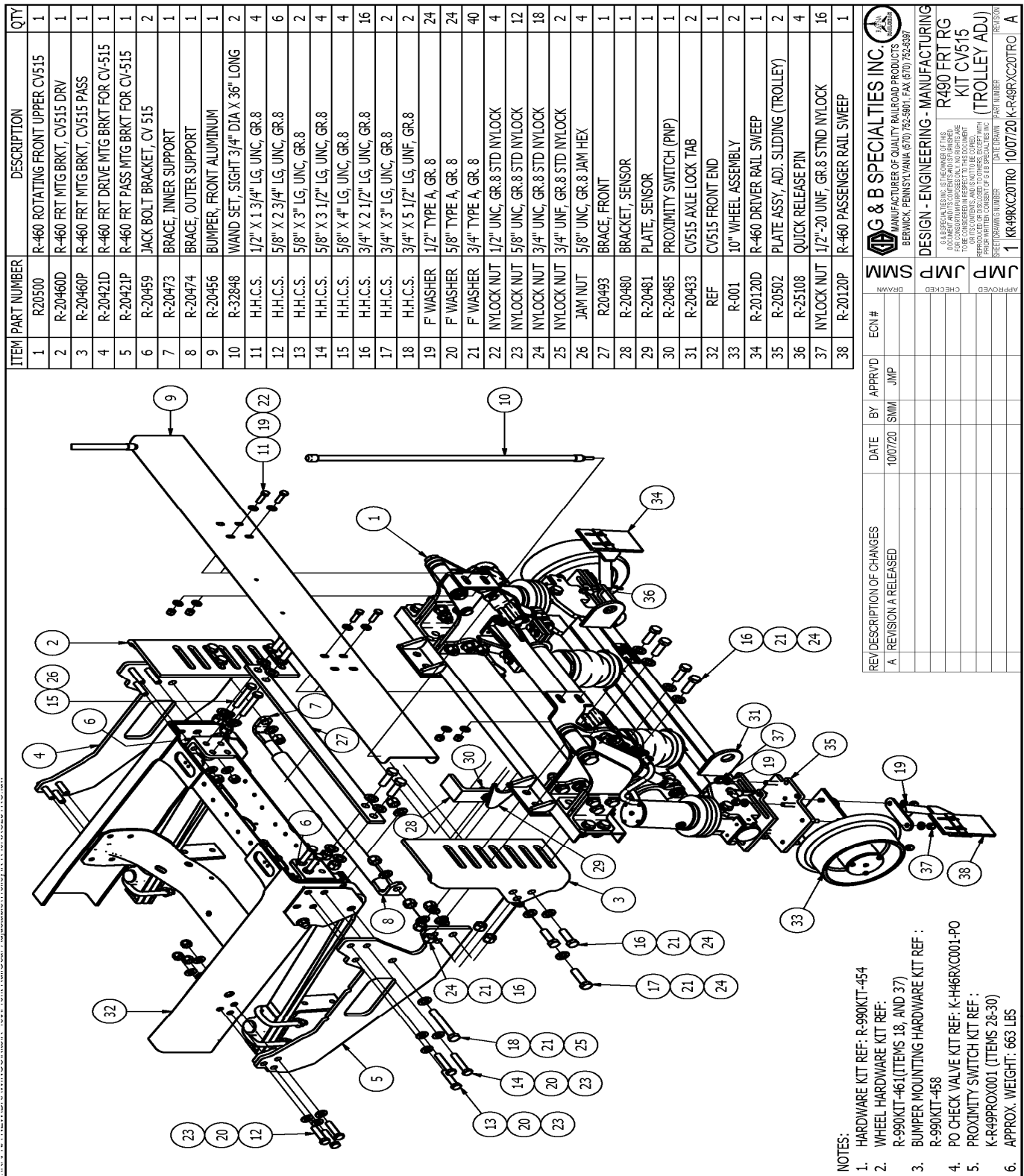


Figure 14: R-490 Rotary Front Adjustable Trolley Railgear Complete Kit Sheet #1 (K-R49RXC20TRO)

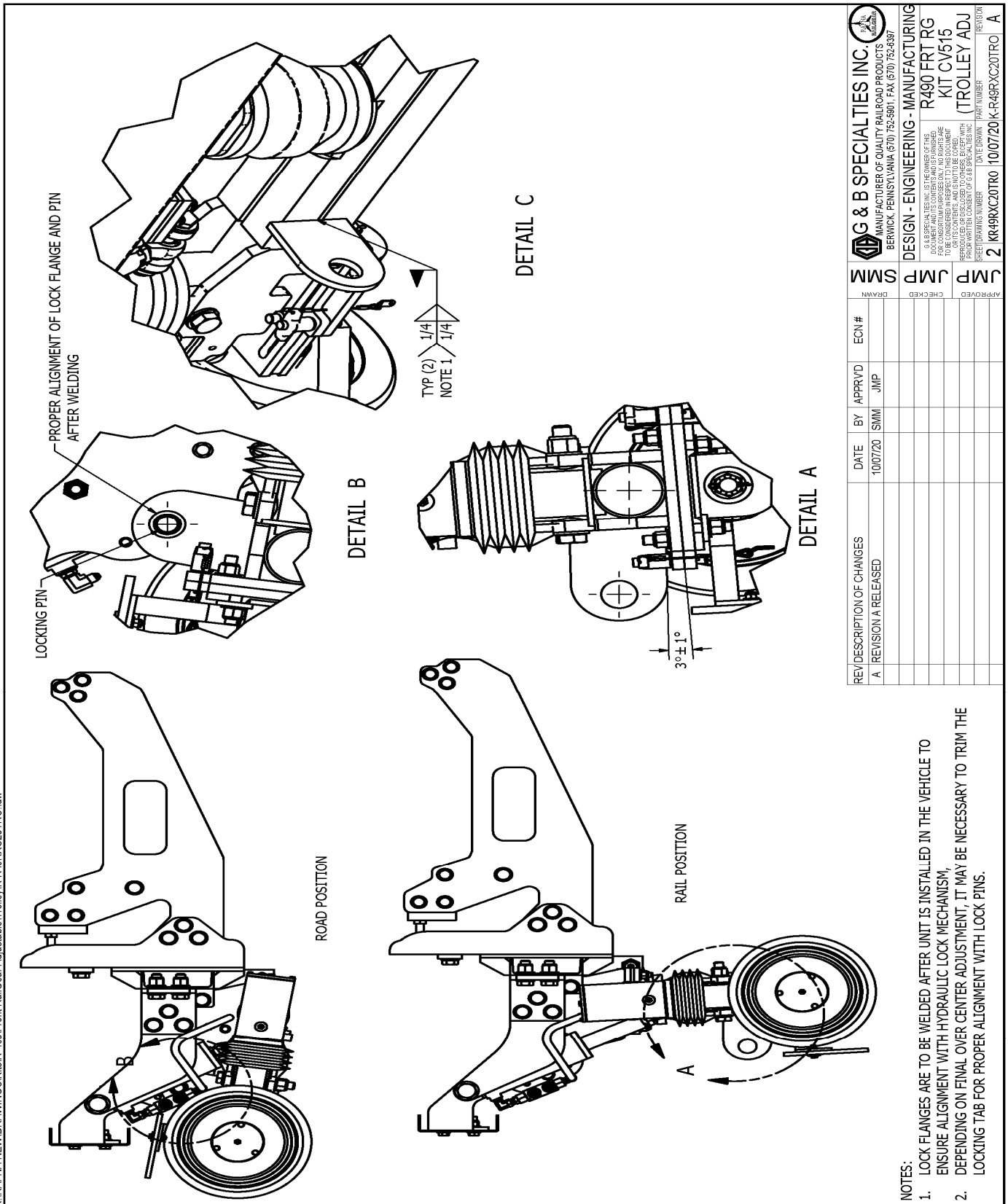


Figure 15: R-490 Rotary Front Adjustable Trolley Railgear Complete Kit Sheet #2 (K-R49RXC20TRO)



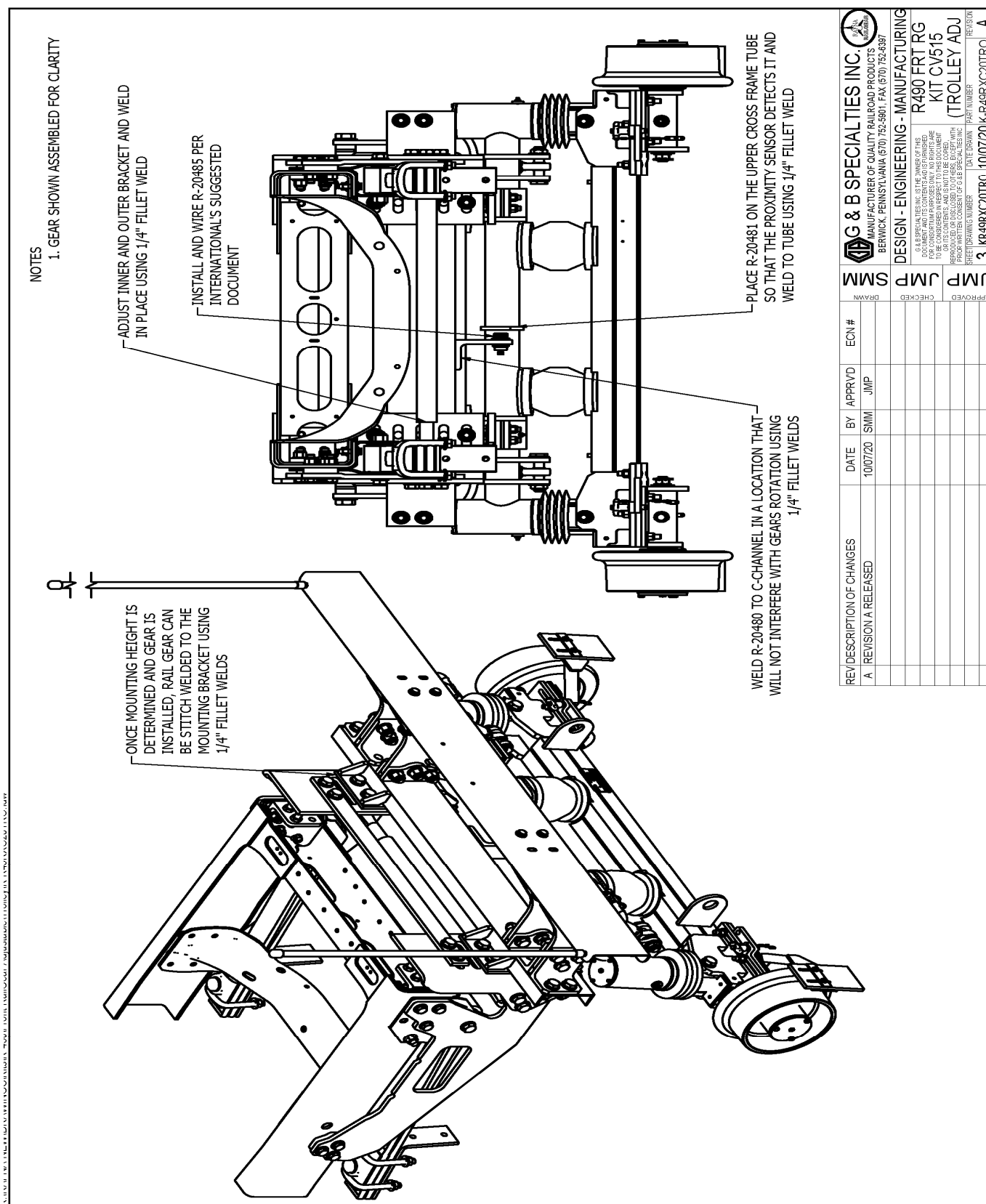
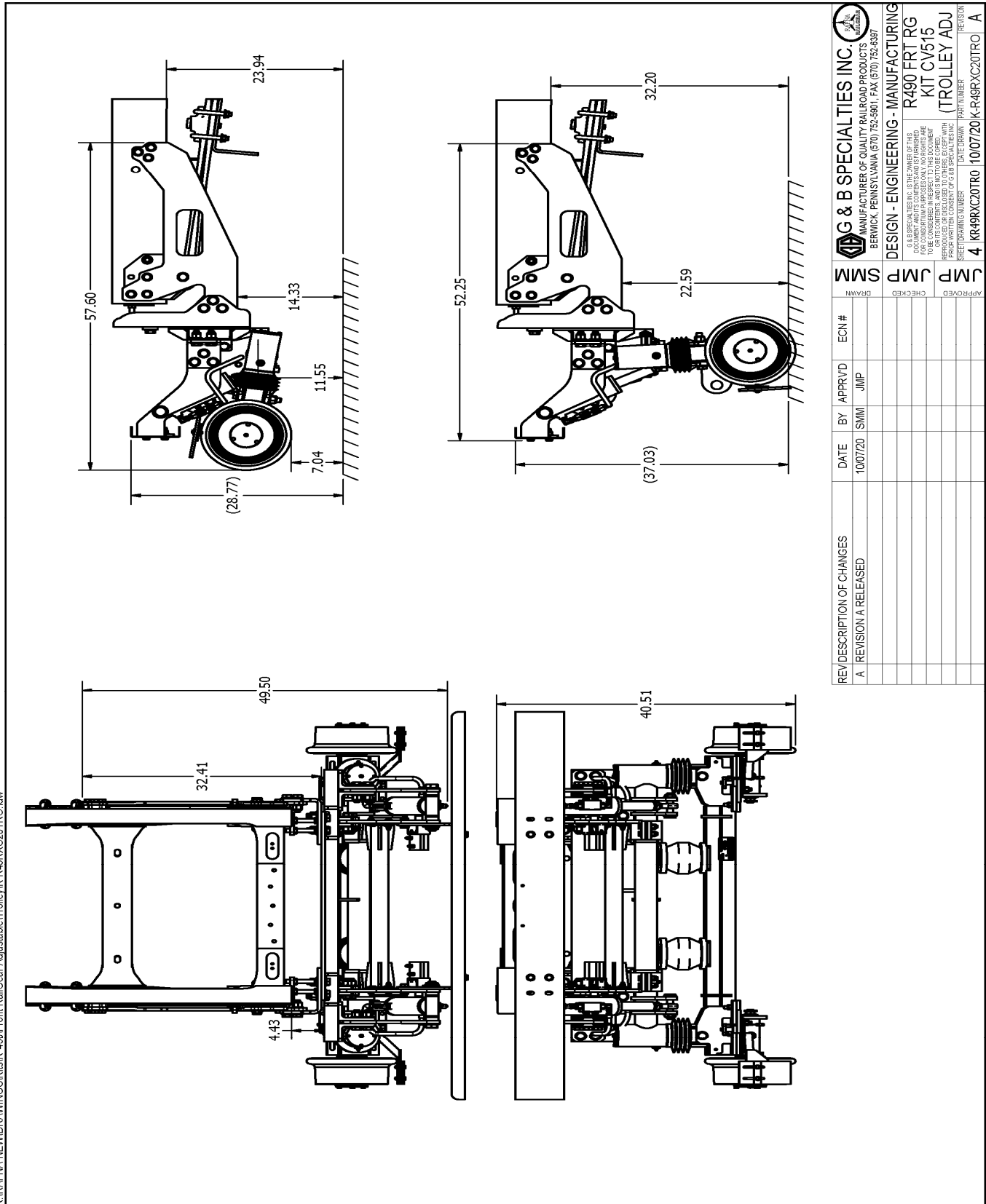


Figure 16: R-490 Rotary Front Adjustable Trolley Railgear Complete Kit Sheet #3 (K-R46RXC2020)



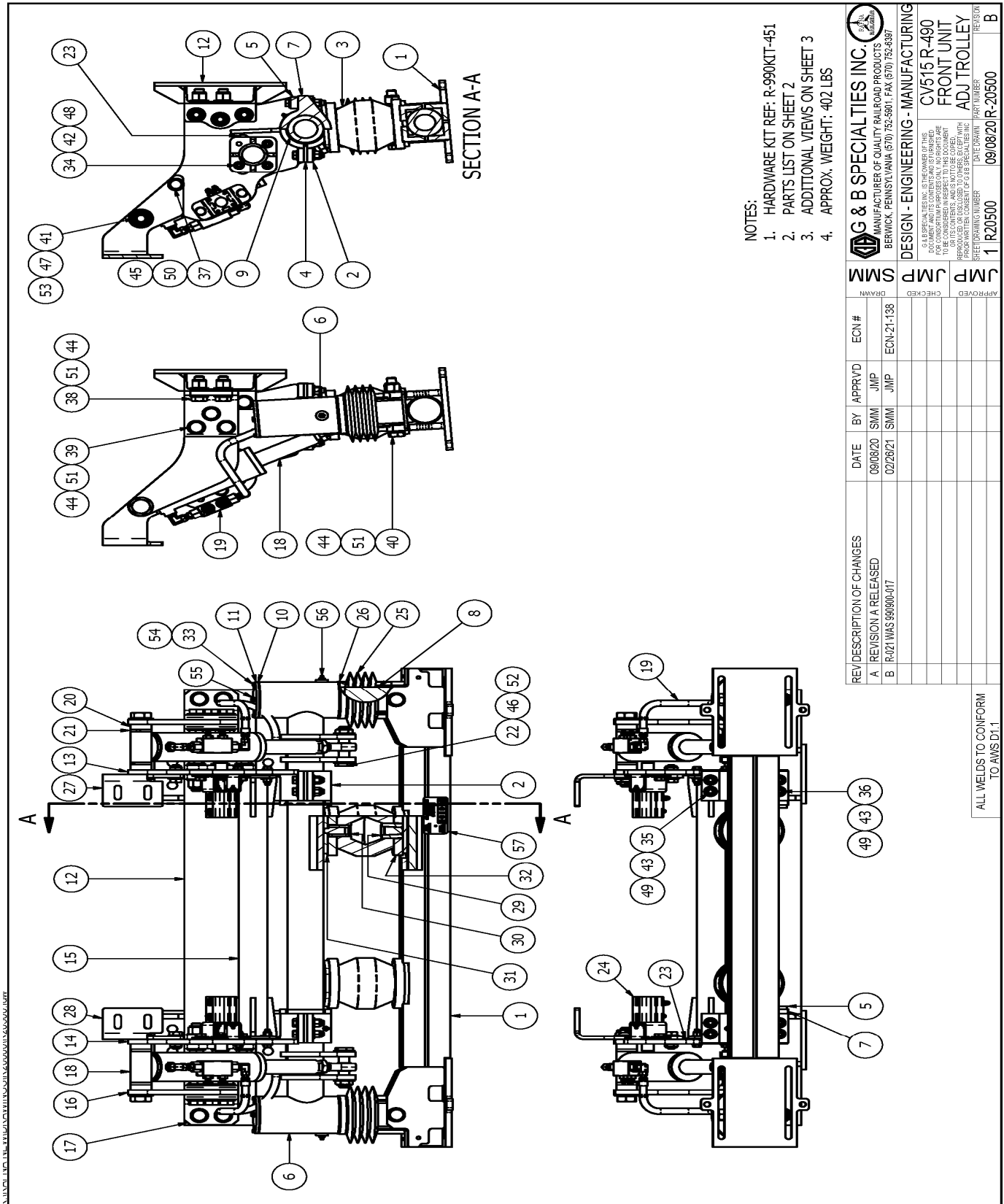
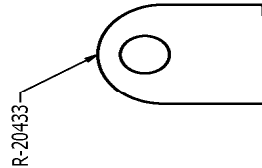
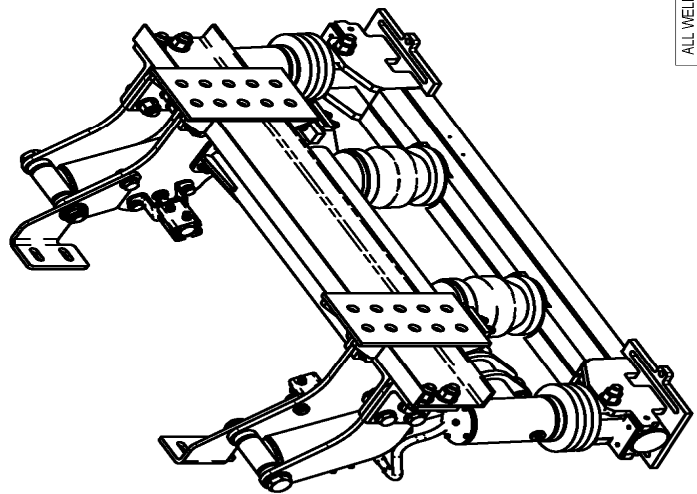


Figure 18: R-20500 Sheet #1 (R-490 Rotary Adjustable Trolley Front for CV515)



PARTS LIST				PARTS LIST				PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-20501	LOWER AXLE ASSEMBLY	1	20	R-20117A	CYLINDER TOP SPACER	4	39	H.H.C.S.	3/4" X 3" LG, UNC, GR.8	12
2	R-5710	BEARING END CAP	2	21	R-20117	SPACER 1/4"	4	40	H.H.C.S.	3/4" X 6" LG, UNC, GR.8	2
3	R-20476	TIMBREN RUBBER SPRING R-490	2	22	R-20167	PIVOT BOLT 7/8" UNC, 4" LG, GR.8	2	41	H.H.C.S.	1" X 7 1/2" LG, UNC, GR.8	2
4	R-5709	SHIM	4	23	R-22162A	SHIM	2	42	NYLOCK NUT	3/8" UNC, GR.8 STD NYLOCK	6
5	R-20101A	STOP PLATE	2	24	R-20445	HYDRAULIC LOCK KIT FOR CV515	2	43	NYLOCK NUT	1/2" UNC, GR.8 STD NYLOCK	8
6	R-20304	R-460 UPPER CROSS FRAME	1	25	R-6523	BELLOWS, 4"	2	44	NYLOCK NUT	3/4" UNC, GR.8 STD NYLOCK	18
7	R-20101	STOP ROTATION	2	26	R-604	BELLOWS CLAMP	2	45	NYLOCK JAM NUT	5/8" UNC, GR.8 JAM NYLOCK	2
8	R-20083A	INNER GUIDE ASSEMBLY	2	27	R-20455D	FRONT CROSS CHANNEL BUMPER SPRT	1	46	NYLOCK JAM NUT	7/8" UNC THIN GR.8 NYLOCK NUT	2
9	R-5708	BEARING SET, SPLIT FOR R550/R460	2	28	R-20455P	FRONT CROSS CHANNEL BUMPER SPRT	1	47	NYLOCK JAM NUT	1" UNC THIN GR.8 NYLOCK NUT	2
10	R-20085	GASKET, OUTER GUIDE TUBE CAP	2	29	R-20471	BUSHING, TIMBREN SPRING LOWER	2	48	F WASHER	3/8" TYPE A, GR. 3	12
11	R-20084	CAP OUTER GUIDE	2	30	R-20470	BUSHING, TIMBREN SPRING UPPER	2	49	F WASHER	1/2" TYPE A, GR. 3	16
12	R-20431	R-460 FRONT CROSS CHANNEL ASSY	1	31	R-20462	SPRING PLATE, UPPER	2	50	F WASHER	5/8" TYPE A, GR. 3	2
13	R-20426D	R-460 CV515 FRONT MTG BRKT DRIVE	1	32	R-20461	SPRING PLATE, LOWER	2	51	F WASHER	3/4" TYPE A, GR. 3	36
14	R-20426P	R-460 CV515 FRONT MTG BRKT PASS	1	33	R-20105	MACHINE SCREW, 10-24 X 5/8" LG	8	52	F WASHER	7/8" TYPE A, GR. 3	4
15	R-20322	SUPPORT BEAM ASSEMBLY	1	34	H.H.C.S.	3/8" X 1 3/4" LG, UNC, GR.8	6	53	F WASHER	1" TYPE A, GR. 8	4
16	R-20424	CV515 OUTER SWING ARM	2	35	H.H.C.S.	1/2" X 2 1/4" LG, UNC, GR.8	4	54	LOCK WASHER	#10 REG, SPLIT LOCK	8
17	R-20430	CV515 ANGLE	2	36	H.H.C.S.	1/2" X 3" LG, UNC, GR.8	4	55	R-021	1/8 NPT STRAIGHT GREASE ZERK RELIEF	2
18	R-22065	CYLINDER ASSY, HYDRAULIC	2	37	H.H.C.S.	5/8" X 1 1/2" LG, UNC, GR.8	2	56	990900-009	1/8 NPT ST ZERK	6
19	K-H46XC001-PO	PO CHECK KIT FOR CV515 R-460	1	38	H.H.C.S.	3/4" X 2 1/4" LG, UNC, GR.8	4	57	Z-LABEL013	RAFNA RAILGEAR SN LABEL	1

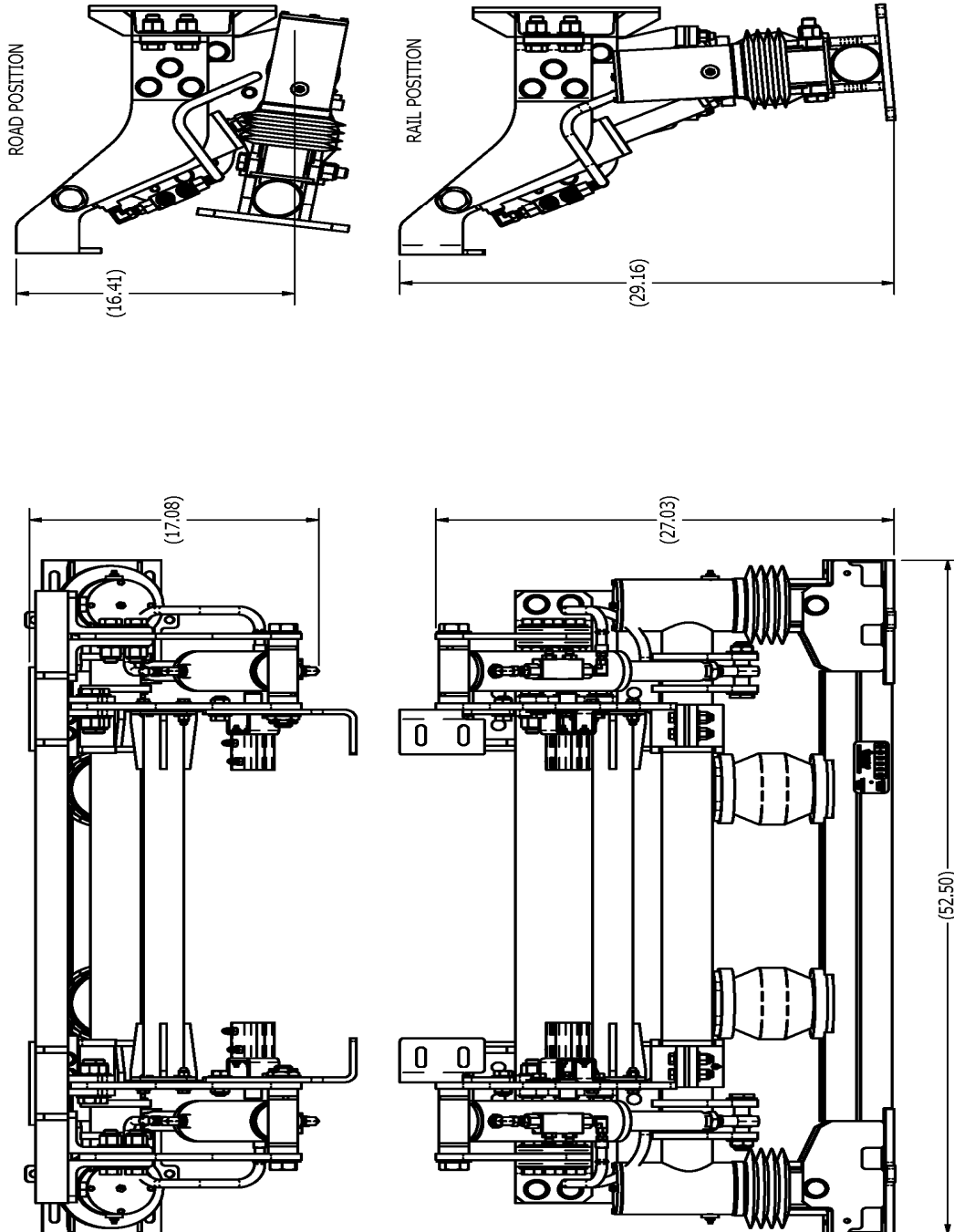


- NOTES:
1. HARDWARE KITS REF: R-990KT-451
  2. BALLOINED VIEWS ON SHEET 1
  3. ADDITIONAL VIEWS ON SHEET 3
  4. APPROX. WEIGHT: 402 LBS

NOTE:  
SEE RAILGEAR INSTALLATION  
MANUAL FOR PROPER WELDMENT

G & B SPECIALTIES INC.				G & B SPECIALTIES INC.			
MANUFACTURER OF QUALITY RAILROAD PRODUCTS				MANUFACTURER OF QUALITY RAILROAD PRODUCTS			
BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397				BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397			
DESIGN - ENGINEERING - MANUFACTURING				DESIGN - ENGINEERING - MANUFACTURING			
CV515 R-490 FRONT UNIT				CV515 R-490 FRONT UNIT			
ADJ TROLLEY				ADJ TROLLEY			
SHEET DRAWING NUMBER				SHEET DRAWING NUMBER			
DATE DRAWN				DATE DRAWN			
PART NUMBER				PART NUMBER			
REVISION				REVISION			
2 R20500				2 R20500			
09/08/20 R-20500				09/08/20 R-20500			
B				B			

Figure 19: R-20436 Sheet #2 (R-490 Rotary Front for CV515)



REVISIONS				G & B SPECIALTIES INC.			
DATE	BY	APPRVD	ECN #	DESIGN	ENGINEERING	MANUFACTURING	TESTING
09/08/20	SMM	JMP	ECN-21-138	DESIGN	ENGINEERING	MANUFACTURING	TESTING
02/26/21	SMM	JMP	ECN-21-138	DESIGN	ENGINEERING	MANUFACTURING	TESTING
ALL WELDS TO CONFORM TO AWS D1.1				CV515 R-490 FRONT UNIT ADJ TROLLEY			
				3 R20500			
				09/08/20 R-20500			
				B			

Figure 20: R-20436 Sheet #3 (R-490 Rotary Front for CV515)

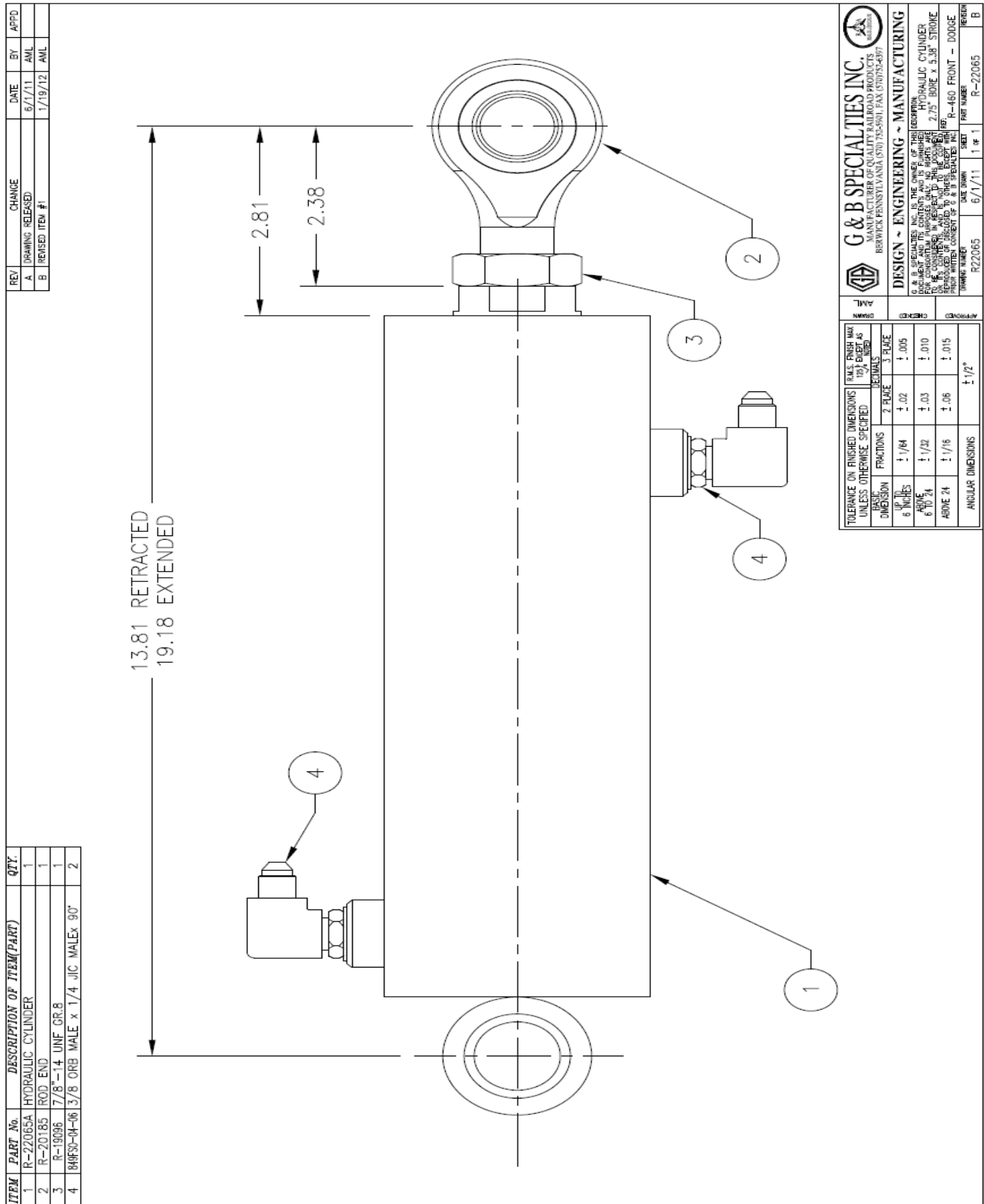


Figure 21: Hydraulic Cylinder (R-22065)



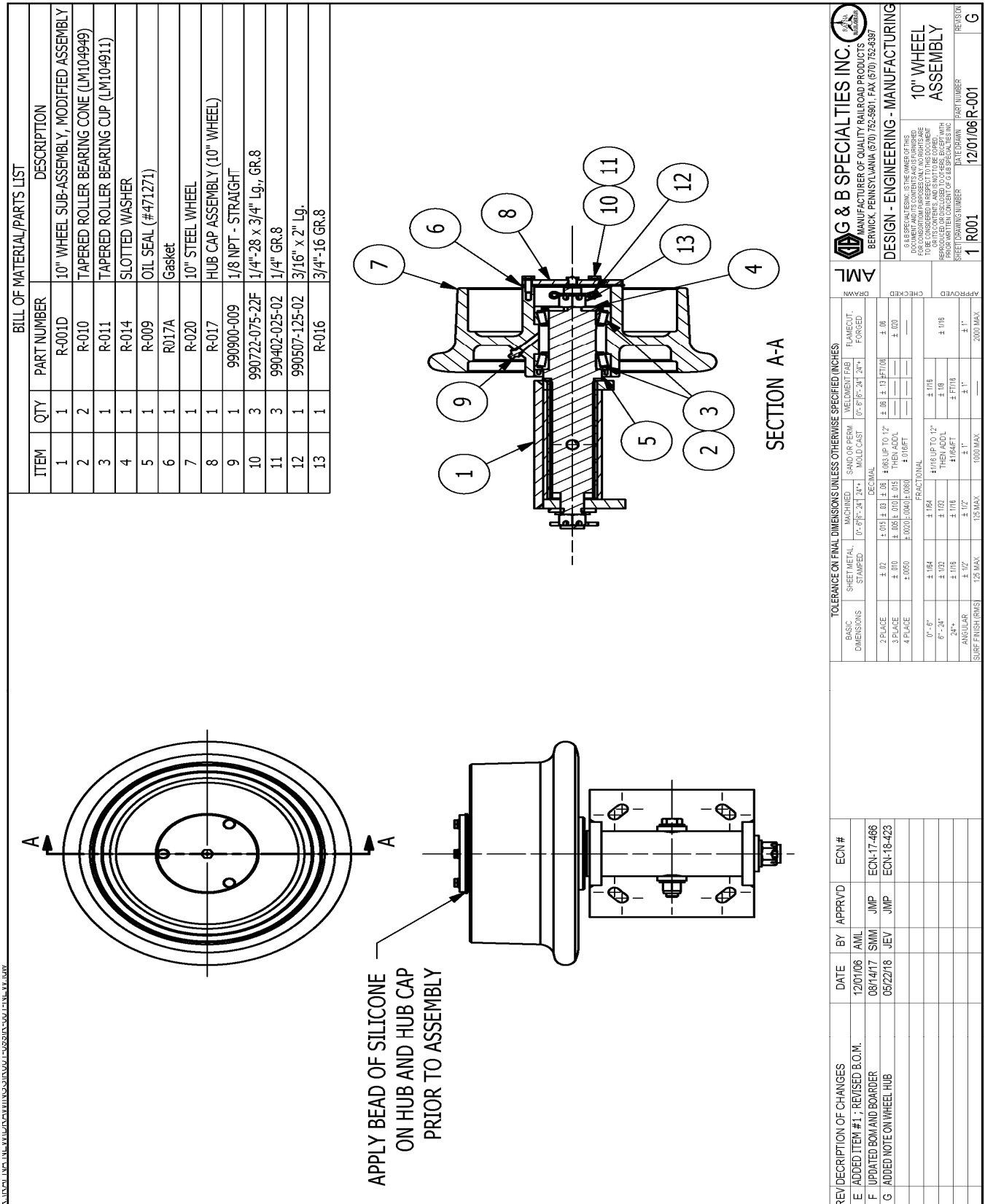
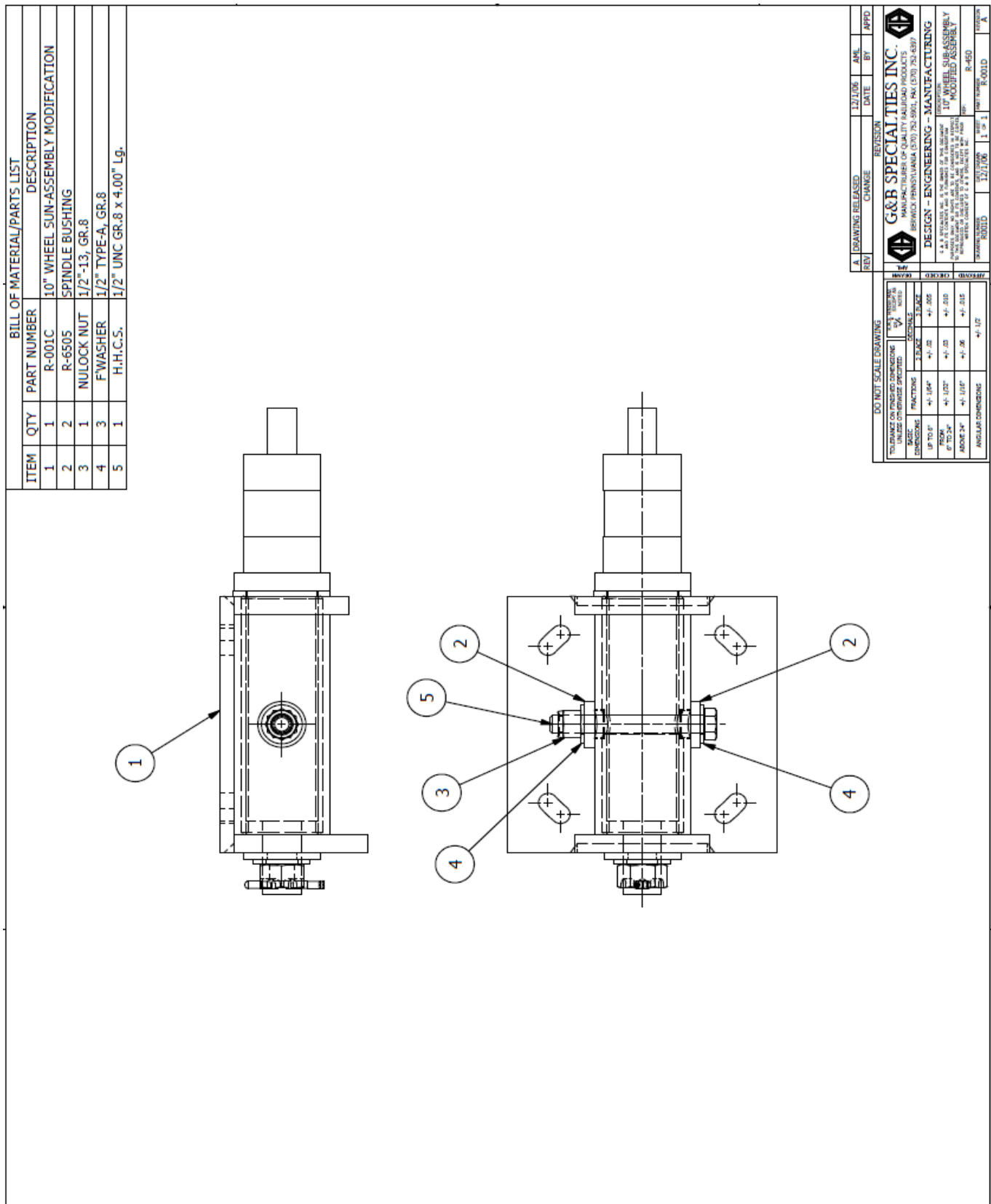
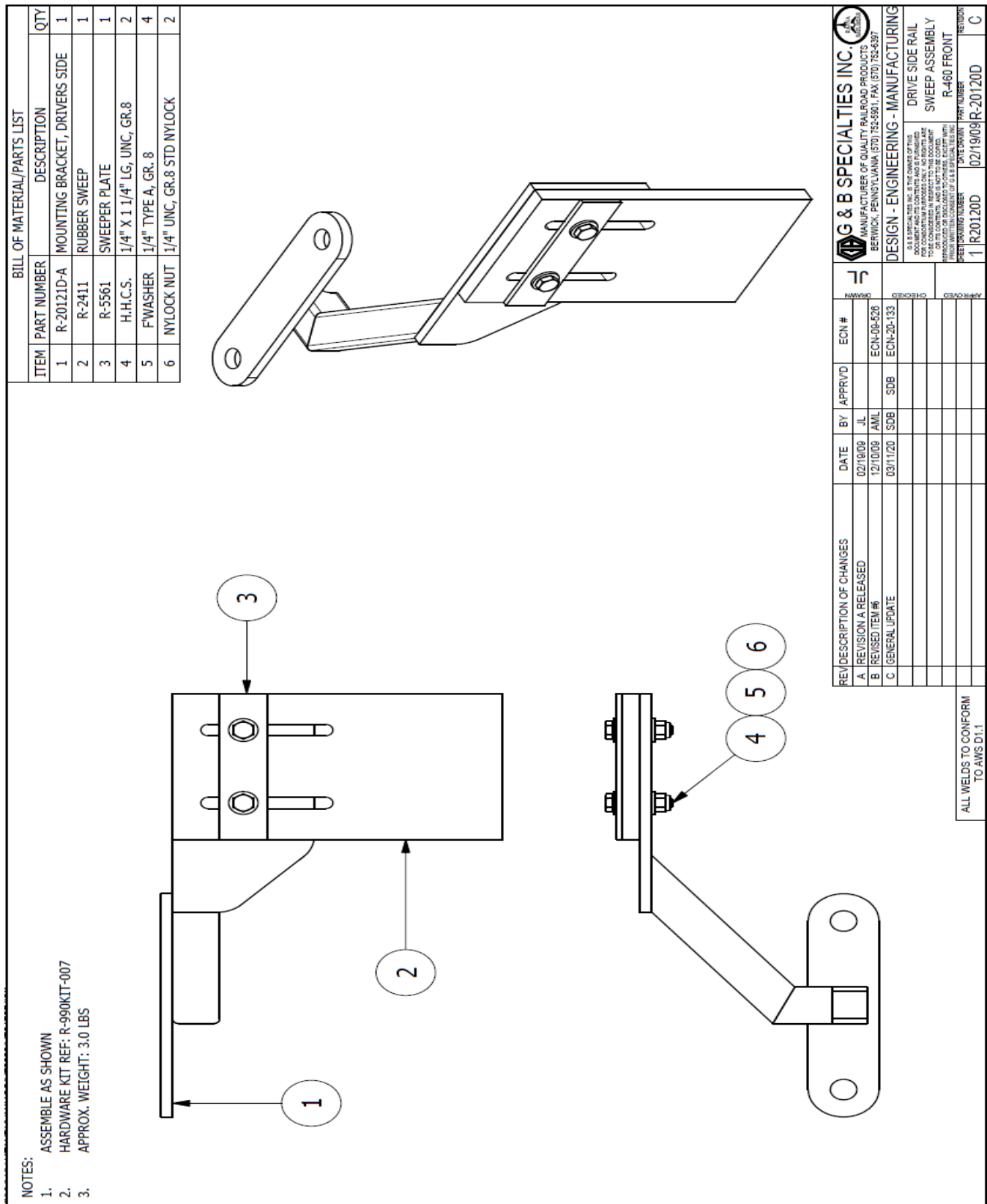


Figure 22: Rail Wheel Assembly (R-001)





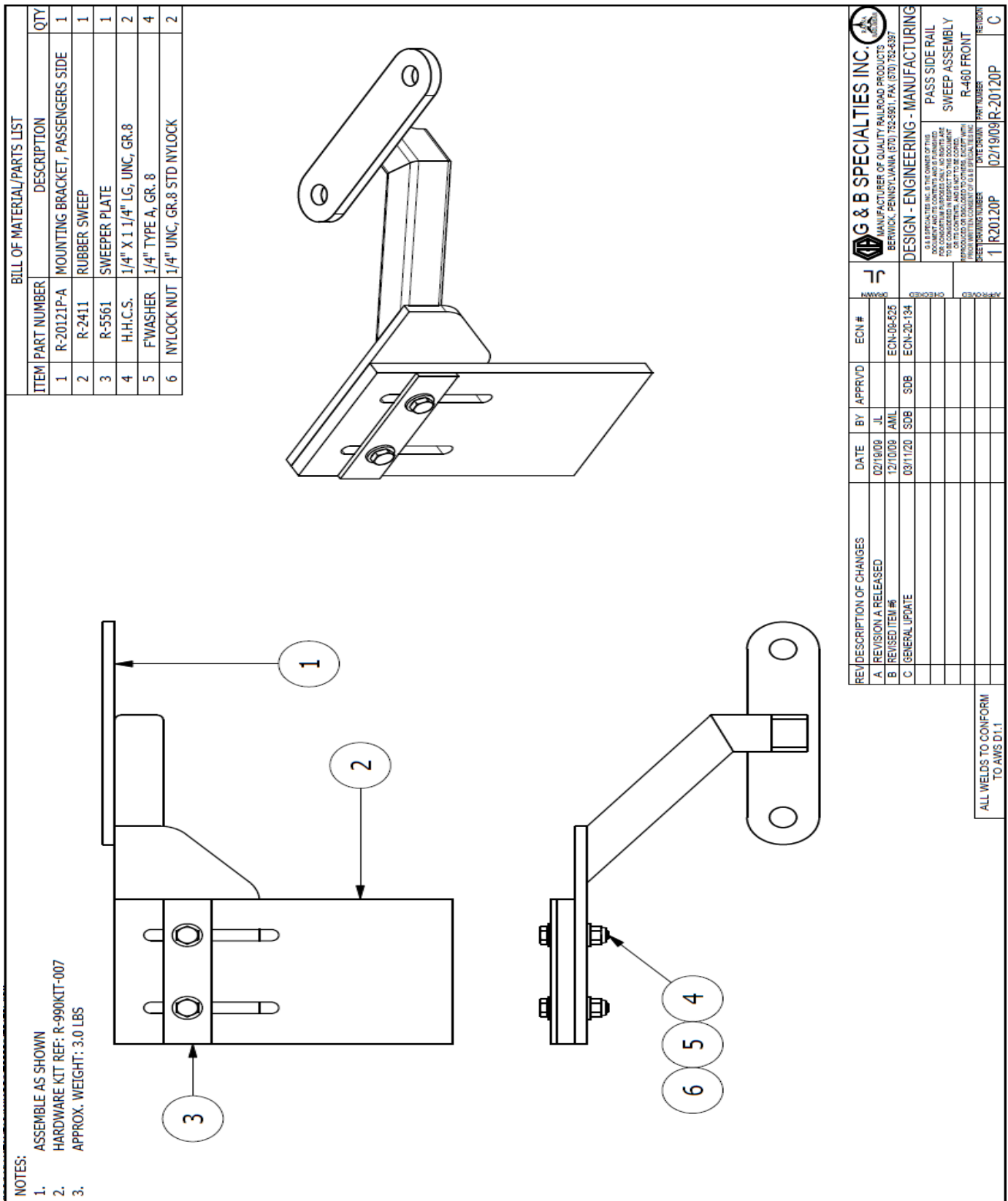


Figure 25: Passenger Side Rail Sweep (R-20120P)



<b>Rafna Industries Ltd.</b>				7-Oct-20
<b>K-R49PROX001 (ABS PROXIMITY SWITCH KIT)</b>				rev. A
<b>Vehicle Application Chart</b>				
<b>Year</b>	<b>Make</b>	<b>Model #</b>	<b>Model</b>	
2020+	INTERNATIONAL	4X4	CV515	
2020+	GM	4X4	4500	
<b>Part Number</b>	<b>Description</b>	<b># Req.</b>	<b>Remarks</b>	<b>Check</b>
R-20480	BRACKET, SENSOR	1		
R-20481	PLATE, SENSOR	1		
R-20485	PROXIMITY SWITCH (PNP)	1		
R-20486	CONNECTOR	1		
R-20487	TERMINAL	3		
R-20488	SUPRESSED RELAY	2		
R-20489	RELAY CONNECTOR	2		
R-20490	TERMINAL 280 SERIES	8		
R-20491	TERMINAL SEAL	8		
R-20492	TYPE 1 TERMINAL	1		

Legend:

1, 2, 3 = revision #

C = Item Changed

D = Item Deleted

A = Item Added

Packed By : \_\_\_\_\_

Tags : \_\_\_\_\_

Customer : \_\_\_\_\_

Date : \_\_\_\_\_

Work order : \_\_\_\_\_

Quantity : \_\_\_\_\_

Figure 26 : ABS Proximity Switch Kit (K-R49PROX001)