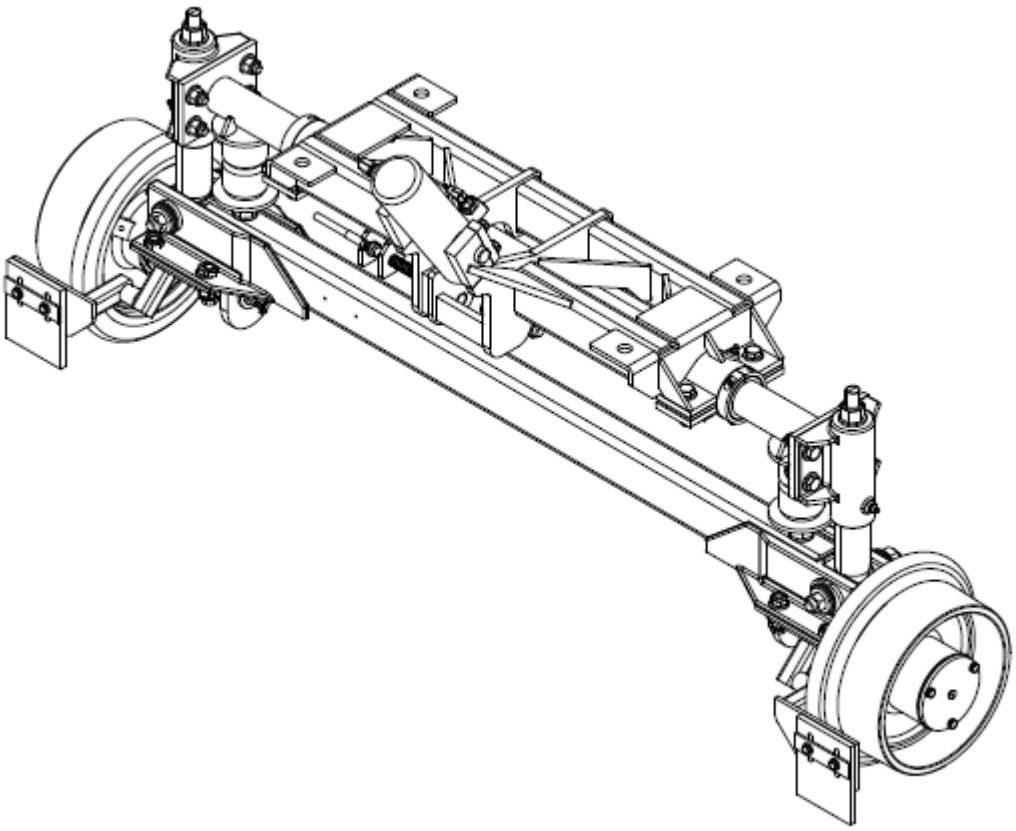
Wabtec Components LLC.
G&B Specialties, Inc.

MIO-R290FORD17 Rev P

RAFNA R-290 RAILGEAR

2017 and Up Ford F-250/350

Standard/In-Cab/Full In-Cab/Manual Valves



INSTALLATION / OPERATIONS / SERVICE MANUAL

G&B Specialties Inc. 535 West 3rd Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397
US Field Service: 570-441-6988; CAN Field Service 570-854-0482**; www.rafna.com**

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Table of Contents

RAFNA "CUSHION-RIDE" RAILGEAR

OPERATION, SERVICE AND PARTS MANUALS & INSTALLATION MANUALS

READ THESE MANUALS BEFORE INSTALLING THE RAILGEAR EQUIPMENT AND/OR BEFORE OPERATING THE RAILGEAR EQUIPPED VEHICLE

THIS SET OF MANUALS IS FOR RAILGEAR SERIAL NUMBERS:

_____ & _____

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1.0 GENERAL RAILGEAR INFORMATION

SAFETY PRECAUTIONS

If any 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 all manuals completely before attempting operation of the railgear equipped vehicle or service or installation of the railgear.
- Generic instructions provided below only address RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Ensure that the position and function of all railgear controls are known before attempting operation.
- Railway company rules governing rail travel must be observed at all times.
- Rail travel speed should always be in conformance with railway company regulations and should be reduced during inclement weather, passing through road crossings, switches, frogs, bridges, and curves. Curves of greater than 20 degrees should be negotiated with extreme caution. Operation of this vehicle at unsafe speeds could result in derailment.
- Ensure the railgear is locked in road or rail position before starting road or rail travel respectively.
- This vehicle will not operate crossing signals. At level crossings, ensure that no other vehicles are approaching and flag the crossing to ensure safety. Use caution when approaching and traversing level crossings.
- 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.
- 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 equipment.

- If misalignment of the railgear equipment is indicated, promptly perform the alignment procedure. Note that excessively worn rail wheels, vehicle pulling to one side while on rail, and vibration through the vehicle while on rail are indicators of railgear misalignment.

- Following the first 100 km (62 miles) of combined road and rail travel, the vehicle road wheel and spacer lug nuts should be re-torqued as per the Road Wheels and Tires Kit Operation, Service, and Parts manual if applicable.

- On newly installed railgear, following the first eight (8) hours of rail travel, inspect the rail wheel bearing end-play as per the Railgear Kit Operation, Service, and Parts manual. During this time, the bearings will have seated and may require adjustment of end-play. If the end-play is not in accordance with specifications, bearing failure could occur and would not be covered under warranty. Also check for sufficient grease in the wheel bearings.

- If the vehicle was derailed or involved in an accident, a thorough inspection of the complete railgear package for damaged parts should be carried out before the vehicle is put back in service.

GENERAL RAILGEAR INFORMATION

The RAFNA railgear is a hydraulically operated road-to-rail conversion system. The front and rear railgear are mounted to the vehicle frame and hydraulically raise and lowered via a 12 VDC electric hydraulic pump or an alternative hydraulic pump (e.g. PTO driven pump). During road travel, the front and rear railgear are mechanically locked in the road position. During rail travel, the front and rear railgear are locked in rail position via hydraulic check valves or mechanical locks, depending on model. A steering wheel lock keeps the vehicle front wheels straight during rail travel. The railgear's spring suspension system ensures constant rail wheel to rail contact and a comfortable ride. Propulsion and braking on rail is provided by the vehicle original systems through the vehicle's wheels contact with the rail. Additional on rail braking may be provided by an optional rail wheel brake package.

The RAFNA railgear is supplied with a group of Operation, Service, and Part Manuals and Installation Manuals which are specific to the railgear, mounting, hydraulic, wheel, steering wheel lock, and/or other or optional kits ordered. As a group, the manuals provide all the information relative to the particular railgear package. The group of manuals may not be interchangeable with other railgear equipped vehicles due to different options and/or applications. If replacement manuals need to be ordered, the railgear serial number and/or the kit numbers must be provided to G&B Specialties.

All the manuals should be read in their entirety before any installation or operation is attempted. This will ensure that all the information is covered.

All manuals use the "Driver's Seat" orientation convention. All directions, i.e. right, left, front and back, are from sitting in the driver's seat of the vehicle.

The railgear serial numbers, model numbers, and dates of manufacture for both the front and rear railgear should be recorded below for future reference. This information is stamped on the railgear identification plate riveted to each railgear.

	Front Railgear Info	Rear Railgear Info
Serial Number:	_____	_____
Model Number:	_____	_____
Date of Manufacture:	_____	_____

TECHNICAL SERVICE BULLETINS

Any changes and/or additional procedures that are issued for this equipment can be found in the G&B Specialties Technical Service Bulletins. These technical service bulletins are available on the RAFNA web site (www.rafna.com) as well as from G&B Specialties directly.

GENERAL INSTALLATION INFORMATION

The installation procedure consists of installing various supplied kits. Each kit is supplied with an Installation Manual as well as an Operation, Service and Parts Manual. Consult the respective kit manuals for installation instructions. The kits should be installed in the following order, as applicable:

- Road Wheels & Tires Kit
- Steering Wheel Lock Kit
- Front & Rear Mounting Kits
- Front & Rear Railgear Kits
- Front Axle Lock-up Kit
- Hydraulics Kit
- Rail Wheel Brakes Kit
- Option Kits

Ensure the serial numbers on the railgear on the vehicle match the serial numbers on this set of manuals and then ensure this entire set of manuals is given to the operator upon delivery of the vehicle.

GENERAL OPERATION INFORMATION

The following are only general operation instructions. For detailed operation instructions, consult the Operation, Service and Parts Manual provided with each individual kit.

Placing the Vehicle on Rail – General Info:

1. Prior to using the railgear equipment the following items should be inspected:
   - Inspect the condition of steel or rubber tread rail wheels if applicable
   - Check for damaged or worn parts
   - Check for loose wheels and/or fasteners
   - Check for leaking or damaged hydraulic hoses, fittings, cylinders, etc.
   - Check for leaking or damaged air brake hoses, fittings, chambers, etc. if applicable
   - Check for proper lubrication at the specified intervals
   - Ensure the vehicle is in good operating condition as per the manufacturer's operating guide

2. At a level crossing, reverse the vehicle onto and parallel to the rails so that the rear railgear rail wheels are aligned directly over the rails and the front railgear rail wheels are somewhat aligned with the rails.

3. Deploy the rear railgear as per the Railgear Kit Operation, Service, and Parts manual.

4. Reverse the vehicle until the front railgear rail wheels are aligned with the rails.

5. Deploy the front railgear and front axle lock-up (if applicable) as per the Railgear Kit and Front Axle Lock-up Kit Operation, Service and Parts manuals.

6. If applicable, turn on the rail wheel brake system as per the Rail Wheel Brake Kit Operation, Service, and Parts manual.

7. Engage the steering wheel lock as per the Steering Wheel Lock Kit Operation, Service and Parts manual.

Driving the Vehicle on Rail – General Info:

Before and while driving the vehicle on rail, the following general guidelines, as well as those in all the Operation, Service and Parts manuals, must be followed.

1. The vehicle may be driven on rail as normal however without steering and at reduced speeds.

2. Braking ability on rail is considerably reduced and the brakes must be applied gradually to avoid skidding the vehicle wheels.

3. Ensure that both the front and rear railgear are fully deployed.

4. Ensure that the railgear lock systems are engaged.

5. Ensure that the vehicle front axle lock-up is engaged if applicable.

6. Ensure that the steering wheel lock is engaged.

7. Ensure that the rail wheel brake system is turned on if applicable.

8. Ensure that the railgear hydraulic pump is turned off if applicable.

Removing the Vehicle from Rail – General Info:

1. Remove the vehicle from rail at a level crossing or other suitable location.

2. Retract the front railgear and front axle lock-up (if applicable) as per the Railgear Kit and Front Axle Lock-up Kit Operation, Service and Parts manuals.

3. Retract the rear railgear as per the Railgear Kit Operation, Service and Parts manual.

4. Turn off the rail wheel brake system as per the Rail Wheel Brake Kit Operation, Service and Parts manual.

5. Disengage the steering wheel lock as per the Steering Wheel Lock Kit Operation, Service and Parts manual.

6. Drive the vehicle carefully off the rails and onto the road.

GENERAL SERVICE INFORMATION

If any technical service issues arise, please contact the G&B Specialties, Inc. Also, please find attached the G&B Specialties Limited Warranty policy and procedures.

GENERAL PARTS INFORMATION

For general parts orders, please contact the G&B Specialties, Inc.

G&B Specialties, Inc.

LIMITED WARRANTY

G&B Specialties warranty covers a period of TWELVE (12) months after the date of the railgear's entry into service. This warranty applies to the Railgear itself, along with the hydraulic pump/motor assembly provided with our R-290 Railgear. The warranty asserts that each new railgear sold will be free from defects in material and workmanship under normal use and service. G&B Specialties' obligation under this warranty is limited to repairing or replacing at its factory, or other locations as designated by the company. Any defective part or parts must be returned within 30 days of the date of failure or notice of defect for factory inspection or as designated by G&B Specialties, Inc.

Equipment or parts not manufactured by G&B Specialties, but which are furnished in connection with G&B Specialties products are covered directly and solely by the warranty of the original equipment manufacturer supplying them.

The obligation of G&B Specialties under this warranty is limited to the replacement of parts that appear to be defective after review and inspection by our firm or designated representative. This warranty does not oblige G&B Specialties to bear the Customer's cost of labor or transportation charges concerning the return of defective parts. However, if found to be defective the outbound direct ground freight on the part will be prepaid to locations within continental United States and Canada by G&B Specialties, Inc. The warranty does not cover normal wear parts such as rail wheels, guide tubes, bearings, seals, rail sweeps or responsibility for customer's claims arising from abuse, misuse, neglect, or alteration of the railgear. All claims are subject to inspection of said parts by our firm.

This warranty is in lieu of other warranties, expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose and any liability for special or consequential damages.

PRODUCT IMPROVEMENT LIABILITY DISCLAIMER

G&B Specialties, Inc. reserves the right to make any changes in or improvements on its products without incurring any liability or obligation whatever and without being required to make any corresponding changes or improvements in products previously manufactured or sold.

IMPORTANT NOTICE

This warranty will be considered void if G&B Specialties Installation instructions or Service and Maintenance schedule is not followed according to the detailed instructions contained in both our Installation Manual and our Operation and Service Manual.

Rev. date: 8/31/07

WARRANTY POLICIES AND PROCEDURES FOR INSTALLERS AND CUSTOMERS

Installers & Customer Warranty:

To prevent unnecessary delays or misunderstandings in handling Installers' or Customers' warranty claims, it is required that all warranty requests be authorized prior to any repairs, modifications or adjustments being started.

Warranty information and authorization can be obtained from G&B Specialties.

G&B Specialties' warranty will not apply if the railgear or any of its components have been modified or replaced without the written consent of the company.

Additional Billing, Installers & Customers:

If during installation, it is found that incorrect parts have been shipped, G&B Specialties will cover all costs involved in replacing these parts and return of incorrectly shipped parts.

All warranty claims concerning short / incorrect shipment of parts or accessories must be made within 30 days of delivery.

To maintain control over extra or additional billing due to incorrect shipments, only the Engineering Manager or Customer Service Manager can issue a Purchase Order authorizing replacement parts, shipping or work to be performed by an outside source.

Warranty Claim information and requirements:

G&B Specialties will require the following information at time of claim as well as the a properly filled out **"Warranty Claim Form"** reference "Warranty Form v#2 04/01"

Information Required:

1) Customer Purchase Order number.
2) G&B Specialties railgear serial number.
3) Vehicle unit number.
4) Vehicle VIN number.
5) Purchaser of G&B Specialties railgear.
6) Date of purchase.
7) Name of end user.
8) Company requesting warranty claim.
9) Ship to Address.
10) Bill to Address.

On approval of warranty claim, and where return of parts is requested by G&B Specialties, the Installer or Customer will issue a Purchase Order to G&B Specialties, Inc. to cover the defective parts and out bound freight for part values exceeding $50.00 US and $75.00 CDN. G&B Specialties will in turn ship all required parts pre-paid ground direct to the Installer or Customer. On receipt of claimed warranty parts, G&B Specialties or their sub supplier will inspect defective parts and if deemed warranty, a credit will be issued to the Installer or Customer. If claimed warranty parts are not received within 30 days, a credit will not be issued.

Labor Warranty and /or additional labor charges:

Either the G&B Specialties Warranty or any of G&B Specialties sub-suppliers does not cover labor or additional labor charges such as travel.

Faulty Railgear Installations:

If a warranty claim arises due to incorrect installation by an installer who has not followed the written instructions as outlined in our manual or as trained by either G&B Specialties Customer Service or Sales Department, warranty claims will not be honored.

Parts Warranty:

G&B Specialties manufactured parts will be warranted and replaced if found to be defective due to poor materials or workmanship for up to one year from date of the railgear's entry into service. Parts not manufactured by G&B Specialties, Inc. will be covered by the Original Equipment Manufacturer's warranty. Based on the OEM's investigation of the warranty claim against their manufactured component their decision will stand.

WARRANTY CLAIM FORM

This form must be completed prior to starting any warranty work Warranty #

Customer		Date	
Tel/Fax		Railgear S/N	
Vehicle No.		Vehicle VIN	
End User		Date of Purchase	
P.O. Number		Ref #	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	

Shipping instructions:

Standard **Ground**	Special Air

Standard 5 days +	Select 3 days	Expedition 2-3 day	Express 2 days

Shipper: Way Bill #

PART No.	QUANTITY	DESCRIPTION

PROBLEM DESCRIPTION

Required Documentation from the Customer (For issuing Credit)

Description of G&B Specialties Parts (Ordered or Used)	Invoice #	Total Claimed $	US/CAD

G&B SPECIALTIES approved by: _____ DATE:_____

CUSTOMER'S REPRESENTATIVE: _____ DATE:_____

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CAUTION
WARNING

PLEASE READ ALL OF THE FOLLOWING TSBs & BULLETINS PRIOR TO INSTALLATION

TECHNICAL REFERENCE BULLETIN RAFNA RAILGEAR			
ISSUE DATE:	**6/23/14**	**TRB NUMBER:**	**TRB-062314**

HAZARD / URGENCY RATING	
X	**DANGER - Physical harm is possible if TSB is not observed or followed**
X	**WARNING - Equipment damage is possible if TSB is not observed or followed**
X	**CAUTION - Essential issue affecting operation, service, parts or installation**
X	**INFORMATIONAL - Advisory which may be of interest**

APPLICABLE EQUIPMENT:

ALL RAFNA RAIL GEAR MODELS

SUMMARY:

UNCONTROLLED RE-USE OF RAILGEAR HARDWARE

IMPACT:

EXCESSIVE REUSE OF ASSEMBLY/INSTALLATION HARDWARE CAN CAUSE THE HARDWARE TO LOOSEN AND OR FAIL UNDER CERTAIN CIRCUMSTANCES.

ACTION:

ANY **NYLOCK NUT** THAT IS REMOVED FROM ANY PART OR COMPONENT OF ANY RAFNA RAILGEAR UNIT, FOR ANY REASON, IS TO BE REPLACED WITH A NEW, EQUIVALENT **NYLOCK NUT**. SUBSTITUTION OF THE ORIGINAL NUT IS NOT ACCEPTABLE…. i.e….A NYLOCK NUT IS TO BE REPLACED WITH AN EQUIVALENT NYLOCK NUT AND **SUBSTITUTING ANY OTHER TYPE OF LOCK NUT IS NOT ACCEPTABLE.**

ANY STOVER **NUT (CROWN NUT, TOP LOCK NUT, DEFORMED THREAD NUT)** THAT IS REMOVED FROM ANY PART OR COMPONENT OF ANY RAFNA RAILGEAR UNIT, FOR ANY REASON, IS TO BE REPLACED WITH A NEW, EQUIVALENT **STOVER NUT (CROWN NUT, TOP LOCK NUT, DEFORMED THREAD NUT) ALONG WITH THE BOLT/SCREW BEING USED WITH THAT NUT**. SUBSTITUTION OF THE ORIGINAL NUT IS NOT ACCEPTABLE…. i.e….A STOVER NUT IS TO BE REPLACED WITH AN EQUIVALENT STOVER NUT AND **SUBSTITUTING ANY OTHER TYPE OF LOCK NUT IS NOT ACCEPTABLE.**

TECHNICAL SERVICE BULLETIN RAFNA RAILGEAR		
ISSUE DATE: June 17, 2013		**TSB NUMBER: TSB-190**
HAZARD / URGENCY RATING		
X	**DANGER - Physical harm is possible if TSB is not observed or followed**	
X	**WARNING - Equipment damage is possible if TSB is not observed or followed**	
X	**CAUTION - Essential issue affecting operation, service, parts or installation**	
X	**INFORMATIONAL - Advisory which may be of interest**	

APPLICABLE EQUIPMENT:

R290 Railgear

SUMMARY:

Wear at the Inner Guide Tube Axle Guide Tube Pin area on the Axle has been found at various degrees of wear depending upon age of unit and amount of Maintenance performed on Railgear.

IMPACT:

Excessive wear in this area can lead to an axle failure.

ACTION:

Inspect this area as follows to determine the amount of wear acceptable before axle change is required:

Primary method of Inspection

Inspect vehicle as close to actual use by means of, rail, alignment rack, two by fours or steel tubing.
Deploy railgear and observe or measure axle movement at the Axle Guide Pin Location.

You can have 1/8" of wear in both the up and down direction from center line of the Axle Guide Pin.
This would be a total of 1/8" up from center and 1/8" down from center, for a total of ¼" wear.
If the ¼" wear is all up from center or all down from center, then this would not be acceptable. If axle is out of specifications replace with Axle R-2930.
Pin should show no wear. If pin shows wear replace with P/N, R990KIT-353.

Alternate method for inspection

Lower Railgear until it is resting on the ground without any load being applied to it. Remove 5/32" cotter pin and slide bellows out of the way, then remove Guide Tube Pin. Now inspect axle and pin for wear. Replace pin and cotter pin and proceed to other end of axle and repeat inspection process. Inspection process for pin wear and axle wear is as follows:

If pin shows wear replace with P/N, R990KIT-353.
Use Alternate Method of Inspection drawing which shows limits of wear for slots and holes.
Use appropriate measuring tools to perform the required measurement. Measuring tools will vary from location to location. If Axle is out of specifications replace with Axle R-2930.

If Axle is out of specification replace with Axle R-2930.
If Guide Tube Pin, P/N R-2949 has any wear replace with R290 Axle Repair Kit, P/N R990KIT-353

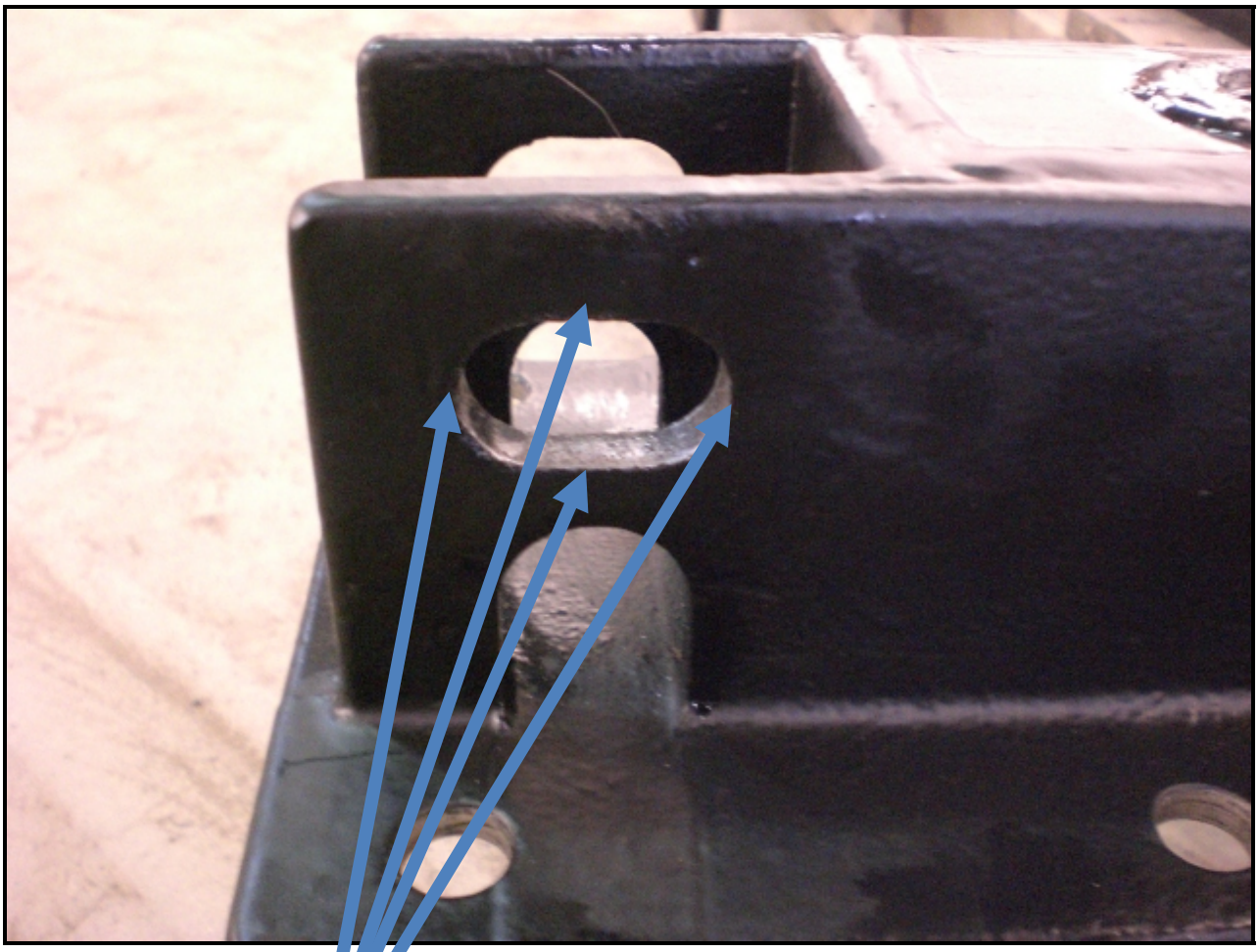
Attached to this TSB is a revised copy of G&B Specialties FRA Inspection for R290 Railgear. This revised FRA Inspection form is issued to ensure that the (Rafna) G&B Specialties R290 Railgear is inspected and serviced correctly. Items of concern which can create premature wear and failure to the axle in the area of the guide pin, but not limited to, are as follows:

- **Improper over center adjustment of the Railgear, over center must be 2°~3° Max.**
- **Hi-Rail wheel loads should be set at 450/550lbs. Min/750lbs. Max.**
- **Wheel wear must be checked using P/N S-001200; wear on wheel must fall within specifications called out on Wear Gauge.**
- **The GVWR of the vehicle must be maintained to ensure that the R290 is not overloaded**.

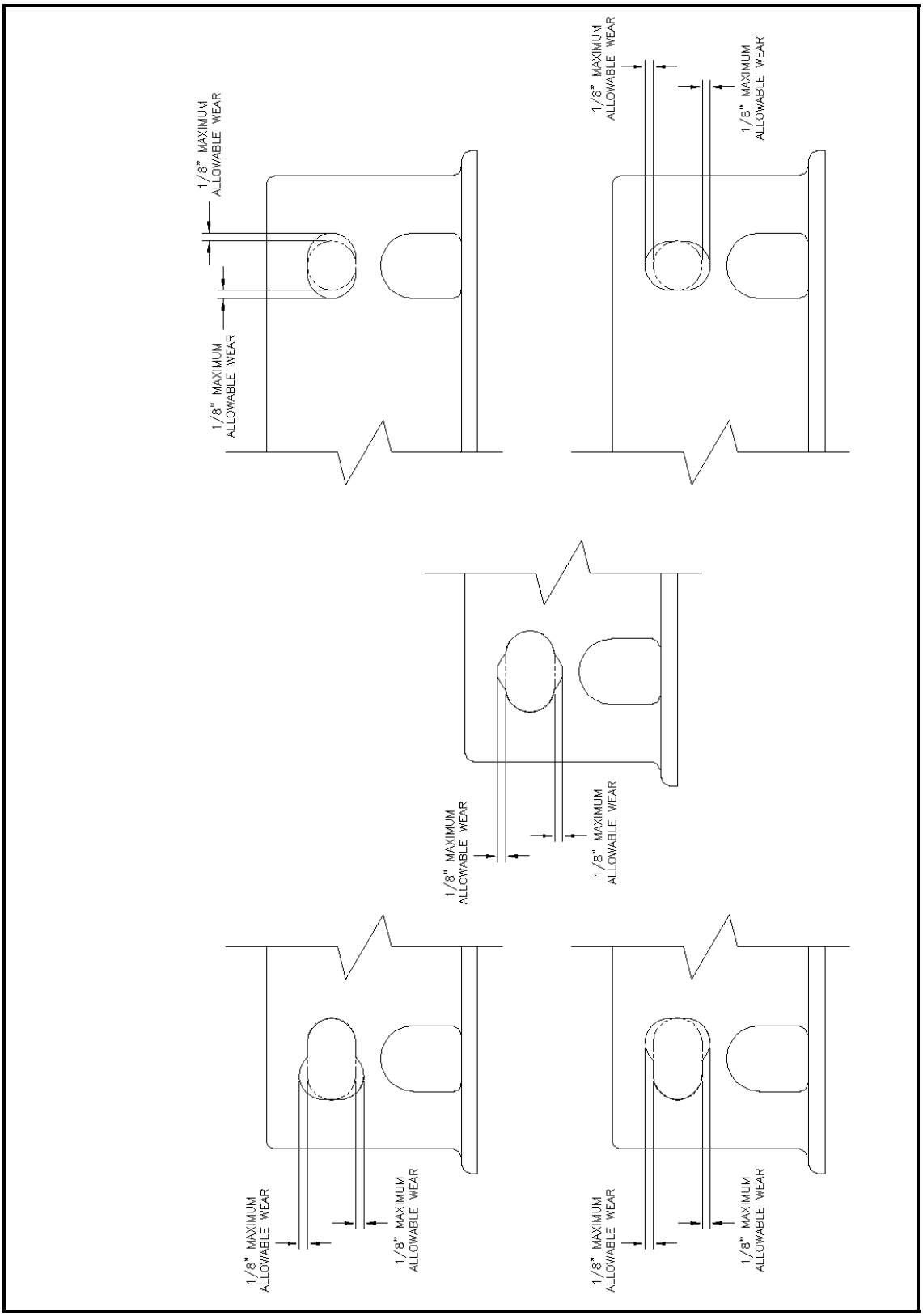
G&B Specialties contact number for replacement parts:
Phone 570-752-5901 Ext 135

G&B Specialties contact number for Technical assistance:
USA Phone Number, 570-752-5901 Ext 127
Cell Number 570-441-6988

G&B Specialties contact number for Technical assistance:
Canada Phone Number 570-854-0482



AREA SUBJECT TO WEAR


1/8" MAXIMUM ALLOWABLE WEAR
1/8" MAXIMUM ALLOWABLE WEAR
1/8" MAXIMUM ALLOWABLE WEAR
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TECHNICAL SERVICE BULLETIN RAFNA RAILGEAR			
ISSUE DATE:	**6/23/14**	**TSB NUMBER:**	**TSB-192**

HAZARD / URGENCY RATING	
X	**DANGER - Physical harm is possible if TSB is not observed or followed**
X	**WARNING - Equipment damage is possible if TSB is not observed or followed**
X	**CAUTION - Essential issue affecting operation, service, parts or installation**
X	**INFORMATIONAL - Advisory which may be of interest**

APPLICABLE EQUIPMENT:

R-290

SUMMARY:

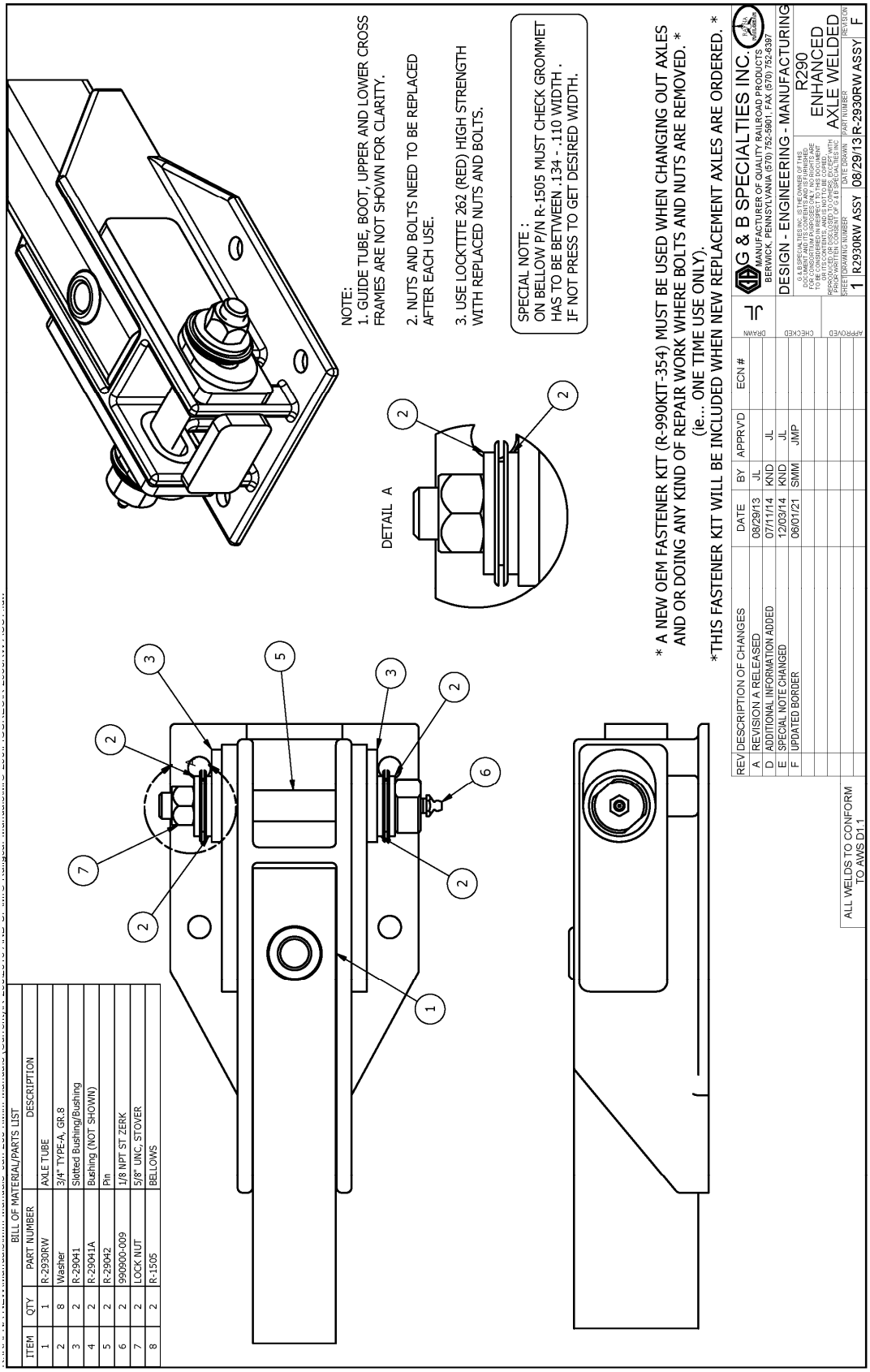
When the axle Stover nut is used too many times, it loses the ability to maintain the proper torque. If the Stover nut is used too many times it is prone to loosening and falling off. For this reason, a onetime application is being required.
Due to size variance of the grommets on the bellows it is necessary to compress to dimensions shown to maintain a consistent distance across the head of the axle bolt and the axle Stover nut. After the grommet has been compressed an additional washer must be added to also maintain a consistent distance.

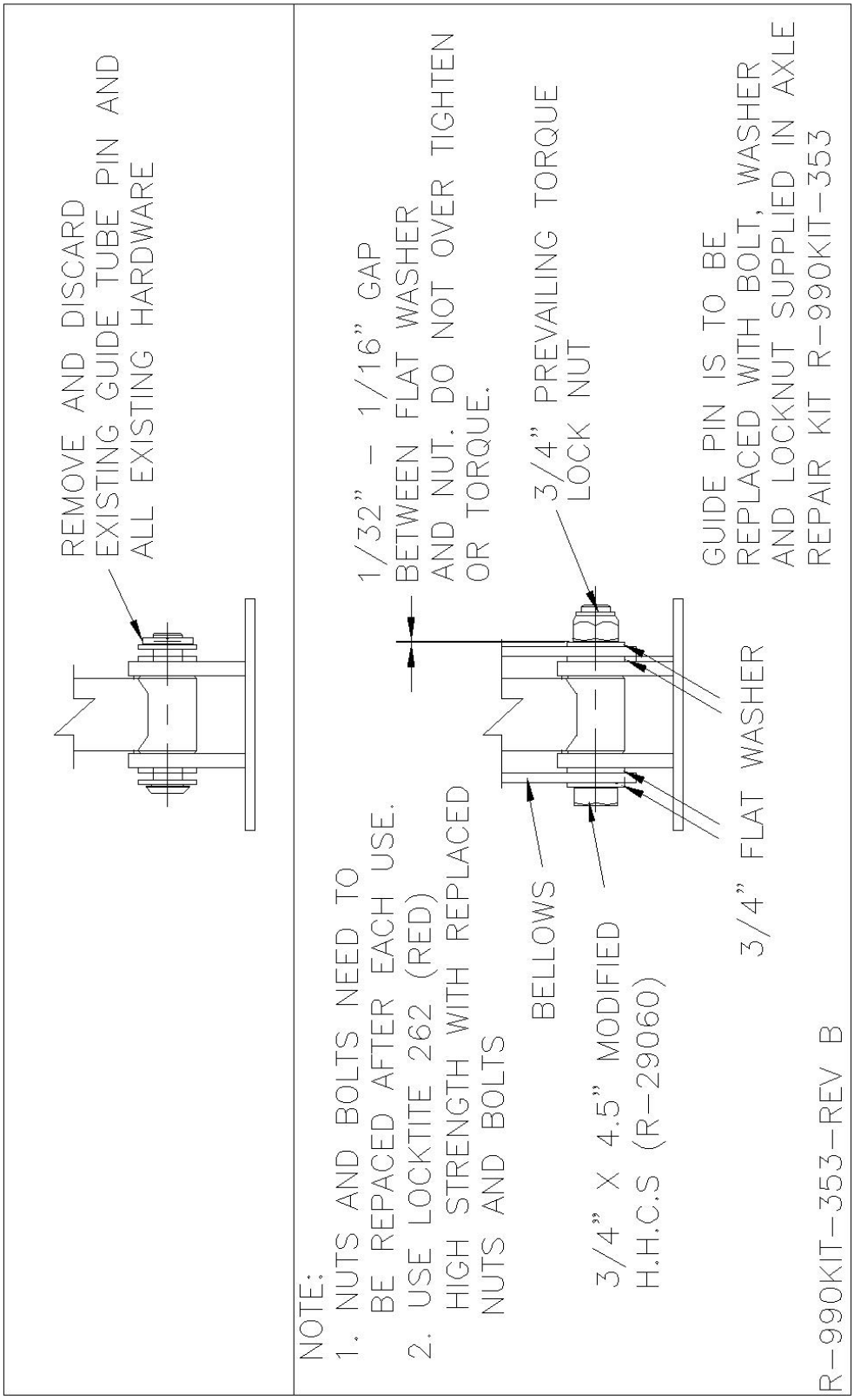
IMPACT:

Failure to replace the nuts and bolts can cause the nut to fall off and the axle bolt to fall out of the axle.
Failure to maintain the proper assembly distance between the axle Stover nut and the head of the bolt can cause either too much or too little movement in the axle bushings.

ACTION:

New OEM fastener kit (R-990KIT-345) must be used when changing out axles and or doing any kind of repair work where bolts and nuts are removed. This fastener kit will be included when new replacement axles are ordered.
Axle Stover nut and bolt will be a one use only application. When new nuts and bolts are replaced use red high strength lock tight.
The grommets on the bellows will have to be compressed within tolerances listed on drawing number R2930RW ASSY (see sheet below). An additional washer is to be added between the bushing and the compressed bellows as shown below.


NOTE:
1. GUIDE TUBE, BOOT, UPPER AND LOWER CROSS FRAMES ARE NOT SHOWN FOR CLARITY.
2. NUTS AND BOLTS NEED TO BE REPLACED AFTER EACH USE.
3. USE LOCKTITE 262 (RED) HIGH STRENGTH WITH REPLACED NUTS AND BOLTS.
SPECIAL NOTE :
ON BELLOW P/N R-1505 MUST CHECK GROMMET HAS TO BE BETWEEN .134 - .110 WIDTH .
IF NOT PRESS TO GET DESIRED WIDTH.
DETAIL A
* A NEW OEM FASTENER KIT (R-990KIT-354) MUST BE USED WHEN CHANGING OUT AXLES AND OR DOING ANY KIND OF REPAIR WORK WHERE BOLTS AND NUTS ARE REMOVED. *
(ie... ONE TIME USE ONLY).
*THIS FASTENER KIT WILL BE INCLUDED WHEN NEW REPLACEMENT AXLES ARE ORDERED. *
ALL WELDS TO CONFORM TO AWS D1.1
BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-2930RW | AXLE TUBE
2 | 8 | Washer | 3/4" TYPE-A, GR.8
3 | 2 | R-29041 | Slotted Bushing/Bushing
4 | 2 | R-29041A | Bushing (NOT SHOWN)
5 | 2 | R-29042 | Pin
6 | 2 | 990900-009 | 1/8 NPT ST ZERK
7 | 2 | LOCK NUT | 5/8" UNC, STOVER
8 | 2 | R-1505 | BELLOWS
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 08/29/13 | JL
D | ADDITIONAL INFORMATION ADDED | 07/11/14 | KND | JL
E | SPECIAL NOTE CHANGED | 12/03/14 | KND | JL
F | UPDATED BORDER | 06/01/21 | SMM | JMP
DRAWN
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R290
ENHANCED
AXLE WELDED
SHEET 1
DRAWING NUMBER R2930RW ASSY
DATE DRAWN 08/29/13
PART NUMBER R-2930RW ASSY
REVISION F



ALTERNATE INSPECTION METHOD

2.0 WHEEL KIT & TIRE PRESSURE MONITORING SYSTEM

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 of the equipment.
- Installation instructions provided below only address the RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- The road wheels and tires must be installed before the railgear is installed to obtain correct height measurements.
- Do not hit the wheel adapter with any hard objects as this could dent the adapter and cause vibrations when driving. If the adapters do not easily slide onto the hubs, lightly sand the hub and the inside of the adapter.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear to protect the vehicle's electrical system.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- With the installation of the vehicle road wheels and tires, it is recommended to recalibrate the vehicle's speedometer.

INSTALLATION OF ALUMINUM WHEELS AND TIRES

The following procedure details the installation of the wheels and tires required for the vehicle's tires to ride correctly on the rails and avoid contact with the vehicle.

Aluminum Wheel and Tire Installation Kit (for 4 or 5 wheel)

Part Number	Description	Qty
R-32250	20" Aluminum Wheel	4 or 5
R-32196	165 ft.-lbs Torque Decal	4 or 5
R-32195	GOODYEAR Tire 275/65/R20	REF
R-2699	Turning Stop Block 2016 VEHICLES AND OLDER	2
R-2699C	Turning Stop Block 2017 VEHICLES	2

1. Remove the original front and rear wheels.

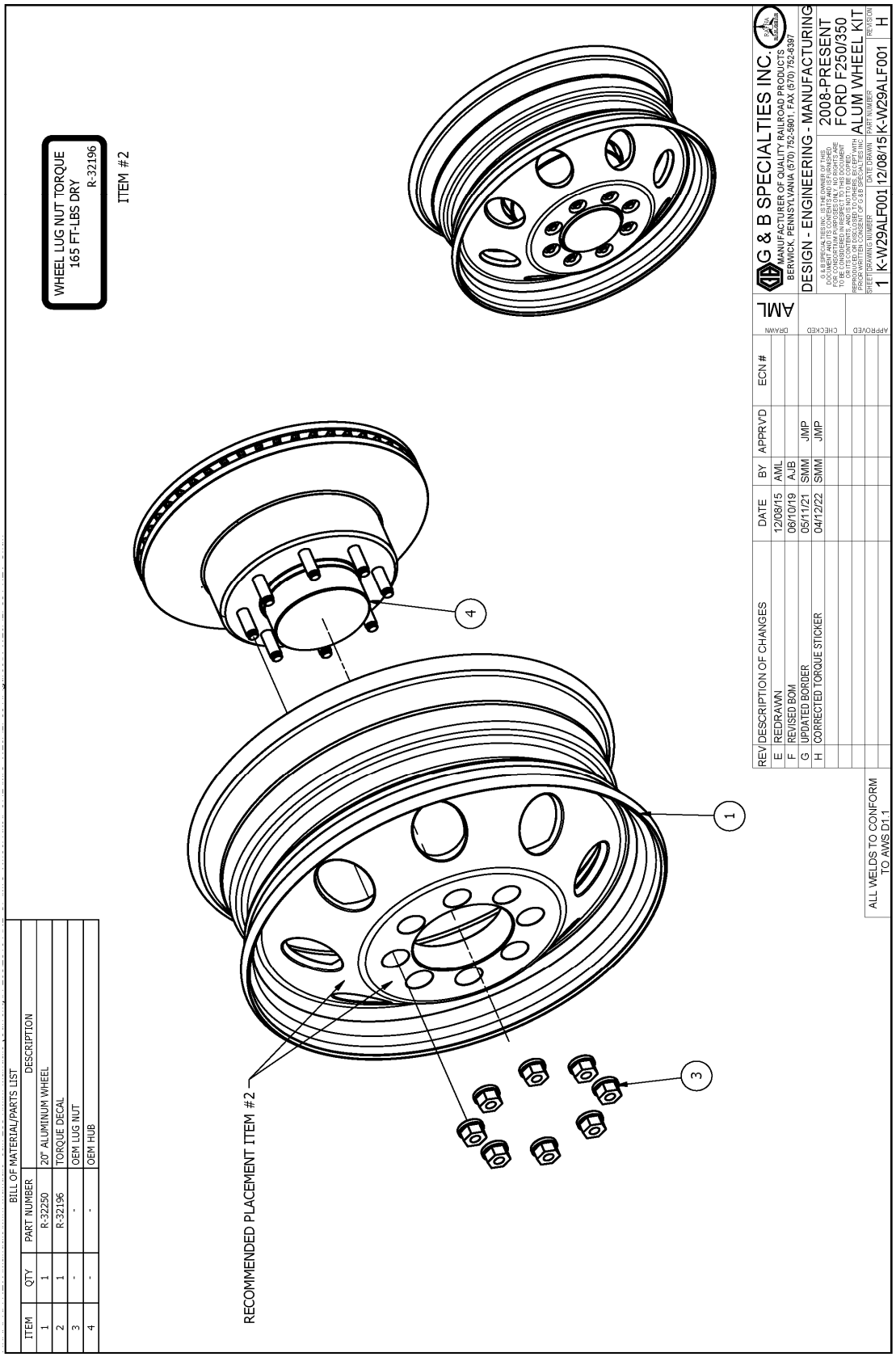
2. Based on rail contact area and load carrying capacity, G&B Specialties Inc. suggests the use of Goodyear Wrangler A/T Adventure w/ Kevlar (275/65/R20) tires for all wheels on the railgear equipped vehicle. However, at the installer's and/or railroad's discretion, an equivalently sized and rated tire may be used. Mount and balance the tires on the supplied wheels. Install TPMS sensors if required.

3. Affix the supplied wheel torque decals to the outside face of the wheels.

4. A new location must be found for the spare wheel. It cannot be mounted under the cargo box due to interference with the rear railgear.

5. Install the wheels:
   a) Mount the wheels on the OEM hubs. No wheel adapter is necessary.
   b) Using the OEM lug nuts, tighten and then torque to 165 ft.-lbs dry. Do not over torque.

6. Install the front wheel turning stop blocks:
   a) Position the turning stop blocks over the original turning stops on the steering knuckle. To verify their position is correct, fully turn the steering wheel until the front hub contacts the knuckle. The boss on the hub should contact the turning stop block squarely on. Repeat for the other side.
   b) Fully weld the turning stop blocks to the steering knuckles once their position is correct.



Aluminum Wheel Installation

INSTALLATION OF STEEL WHEELS AND TIRES

The following procedure details the installation of the wheels and tires required for the vehicle's tires to ride correctly on the rails and avoid contact with the vehicle.

Steel Wheel and Tire Installation Kit (for 4 or 5 wheel)

Part Number	Description	Qty
R-2986	Wheel Adapter Assembly	4
S-201502	19.5" x 6.75" Steel Wheel 5.60" Offset	4 or 5
S-001015I	300 ft.-lbs Wheel & 165 ft.-lbs Spacer Decal	4 or 5
R-G622	Goodyear G-622 RSD/225/70R19.5 (Not Supplied)	REF
S-201602	M20 x 1.5 Two-Piece Flanged Nut	32
R-2699	Turning Stop Block use on 2016 and older vehicles	2
R-2699C	Turning Stop Block use on 2017 vehicles	2

1. Remove the original front and rear wheels.

2. Based on rail contact area and load carrying capacity, G&B Specialties Inc. suggests the use of Goodyear G-622 RSD/225/70R19.5 tires for all wheels on the railgear equipped vehicle. However, at the installer's and/or railroad's discretion, an equivalently sized and rated tire may be used. Mount and balance the tires on the supplied wheels. Install TPMS sensors if required.

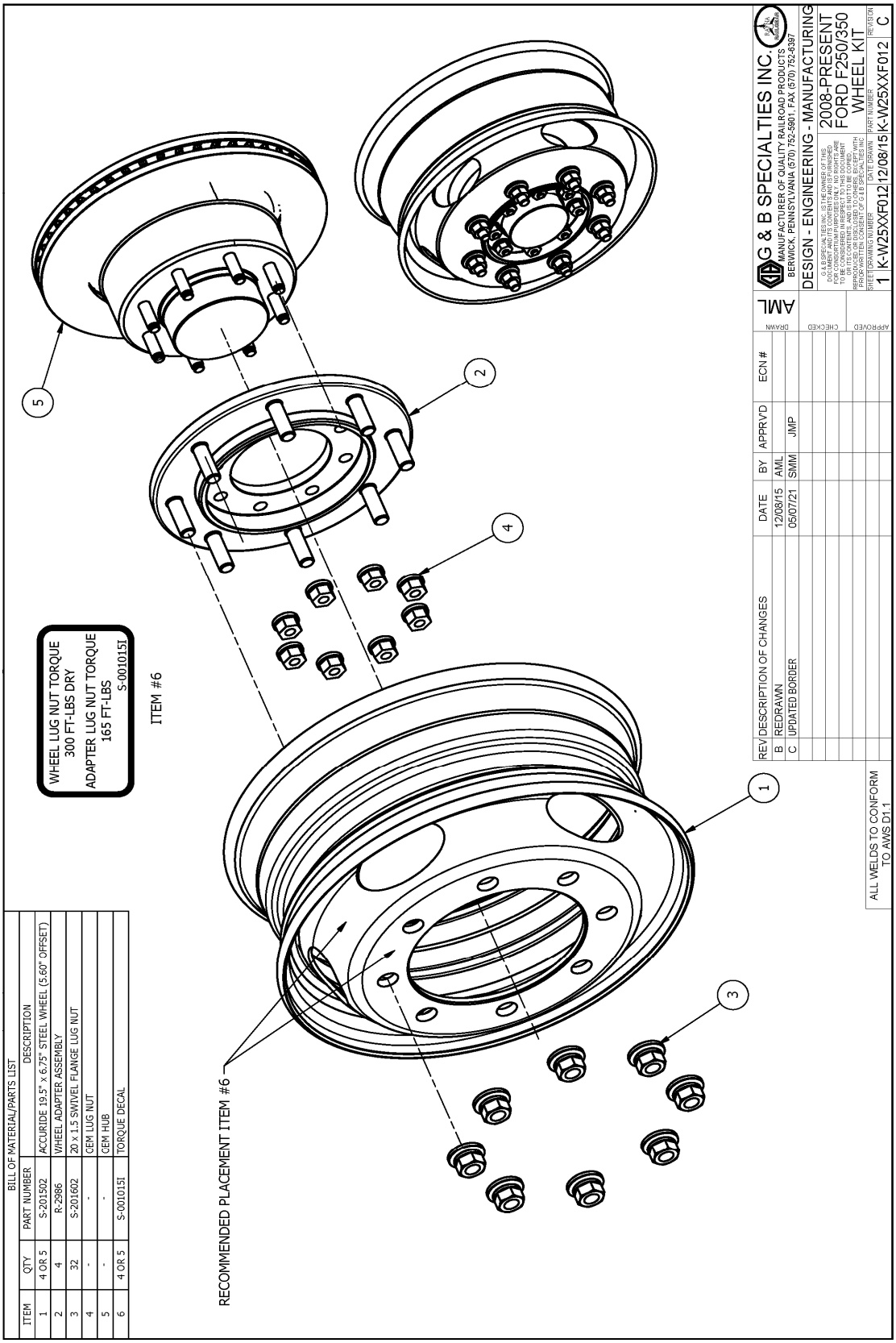
3. Affix the supplied wheel and adapter torque decals to the outside face of the wheels.

4. A new location must be found for the spare wheel and the necessary brackets fabricated. It cannot be mounted under the cargo box due to interference with the rear railgear.

5. Install the wheel adapters:
   a) Start with one wheel adapter on one hub of the vehicle.
   b) Where fitted, remove all brake drum / disc retaining clips installed on the wheel studs. These clips will prevent the wheel adapter from seating properly.
   c) Place the wheel adapter on the hub over the OEM wheel studs and fasten in place using the OEM wheel lug nuts.
   d) Tighten and then torque the OEM wheel lug nuts which hold the adapter to the hub to 165 ft.-lbs dry as per the torque sequence provided. Do not over torque.

6. Install the wheels:
   a) Mount the wheels on the wheel adapters with the supplied two-piece flanged nuts.
   b) Tighten and then torque the two-piece flanged nuts to 300 ft.-lbs dry as per the torque sequence provided. Do not over torque.

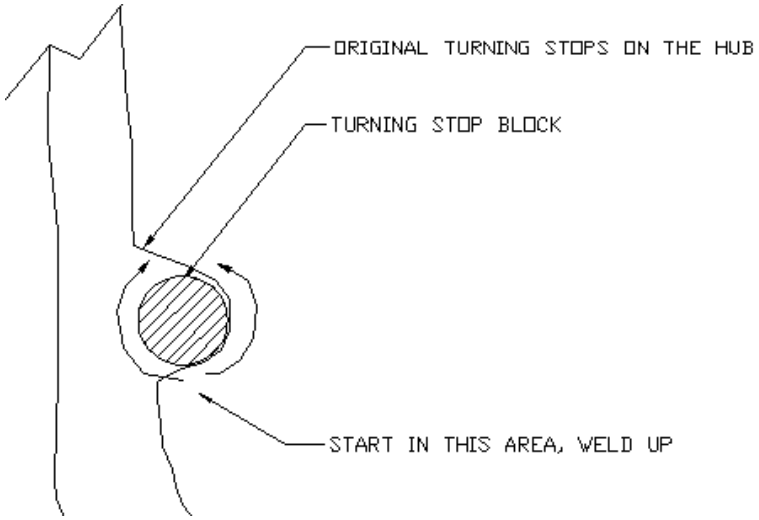
7. Install the front wheel turning stop blocks:
   c) Position the turning stop blocks over the original turning stops on the steering knuckle. To verify their position is correct, fully turn the steering wheel until the front hub contacts the knuckle. The boss on the hub should contact the turning stop block squarely on. Repeat for the other side.
   d) Fully weld the turning stop blocks to the steering knuckles once their position is correct.

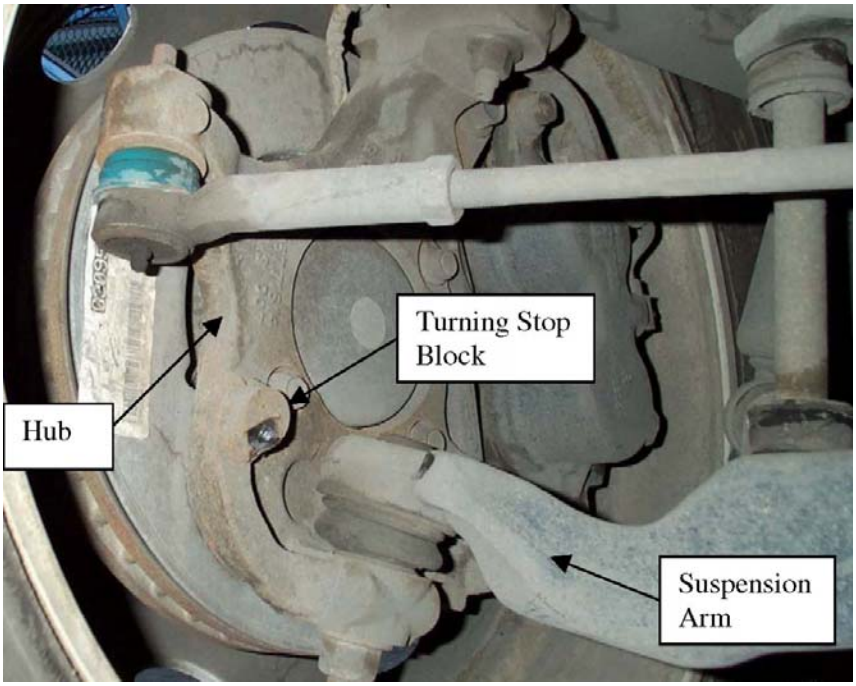


Steel Wheel Installation

TURNING STOP BLOCK WELDING PROCEDURE

1. Grind and clean face on original turning stop on the hub.
2. Use 1/8" 11018 Low Hydrogen welding rod.
3. Heat range should be approximately 90 to 125 Amps for vertical up welding.
4. Refer to sketch, start weld at bottom and weld vertical for 180 degrees, repeat for other side to apply 360 degrees of weld.
5. After passenger's side is complete, do the drivers side in the same fashion. Welding can start on either driver's side or passenger's side.





BRAKE LINE MODIFICATION

1. Due to the modified wheel track on the railgear equipped vehicle, both front and rear tire and wheel clearances must be checked. With the wheels, tires, supplied adapters, and supplied turning stop blocks installed on the vehicle, ensure that the wheels, tires, and/or balance weights do not contact the vehicle suspension or steering components, the brake lines, the ABS lines and/or any other component/obstruction throughout the entire range of motion of the steering and suspension. It may be necessary to add or remove material from the turning stop blocks and/or to relocate brake lines, ABS lines, and/or other equipment to gain adequate clearances. Ensure that any vehicle modifications are done in accordance with the vehicle manufacturer's or their representative's approval.

2. The front brake lines (driver/passenger side) need to be adjusted to maintain the proper clearance between the brake line and tire/wheel assembly.
   (Refer to Figure 1, Figure 2, and Figure 3)

   a. Using a tube bender, bend the brake line at the brake calliper approximately 15 – 20 degrees away from the wheel. (Figure 1).

   b. Bend the brake line support bracket towards the coil spring, leaving a small amount of room between the coil spring and bracket without touching (Figure 2) (Figure 3).

   c. Check for interference, insure that the brake line tubing and hoses clear the vehicle wheel when the tires are in the straight position, and that the brake line and ABS line are not stretched throughout the entire range of motion when turning the wheels all the way left, or all the way right.

3. Bigger tires will cause your speedometer to register a speed that is slower than your actual speed.

4. The vehicle will need to have a wheel alignment done. After the wheel kit is installed and the railgear is hung.

5. The tire pressure sensors (if equipped) will need to be calibrated to learn new position. For this wheel kit, follow the OEM recommendations as outlined in the vehicles owner manual.

Figure 1
BRAKE LINE BENT AT APPROX. 15-20 DEGREES

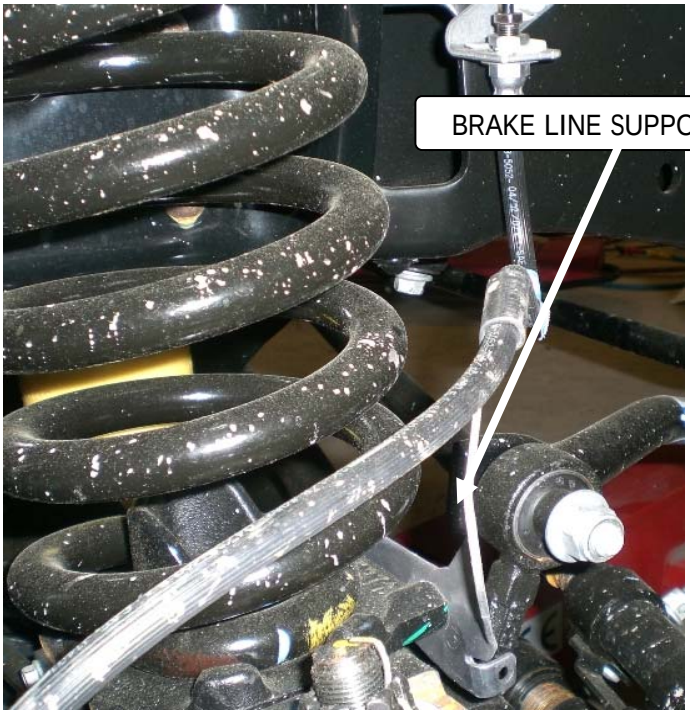


Figure 2
Support Bracket – before bending

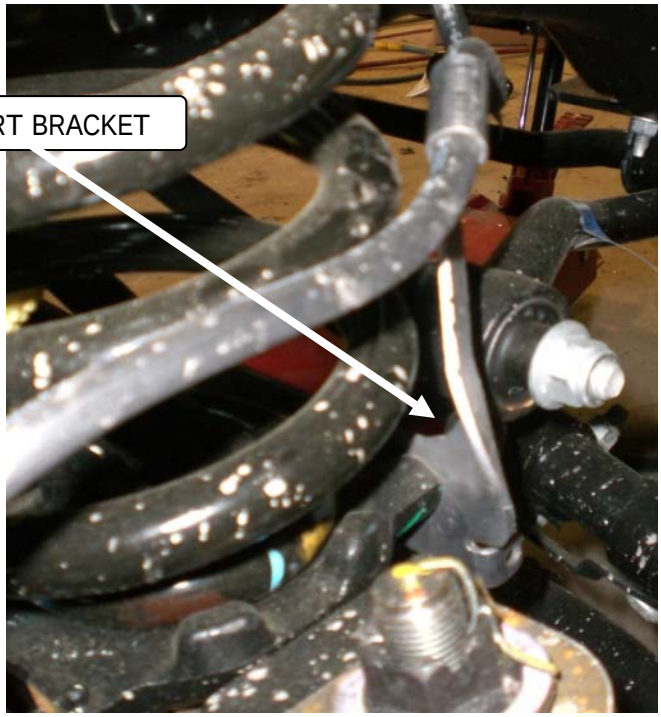


Figure 3
Support Bracket – after bending

INSTALLATION OF TIRE PRESSURE MONITORING SYSTEM

The following procedure details the installation of the tire pressure sensor on the 19.5" steel wheels provided with the RAFNA Railgear equipment. The hardware required for this installation for one sensor and one wheel is listed in the table below.

Tire Pressure Monitoring Sensor Installation Kit

Part Number	Description	Qty
S-201502	19.5" x 6.75" Steel Wheel 5.60" Offset	REF
R-10110A	OEM FORD Tire Pressure Monitoring Sensor	REF
R-21080	Valve Stem Adapter	1
R-10056	Nut	1
R-10057	Adapter Grommet	1
R-10058	Washer	1
R-10059	Washer	1
R-10037	TPS Sticker	1

The OEM TPMS Sensors will be reused but not the OEM valve stems as they are a snap-in style that will not mount to the steel wheels supplied with RAFNA Wheel Modification Kit. A screw-on type valve stem that is secured to the steel wheel with a nut on the outside of the wheel is required and is supplied with this kit and is to be used with the OEM TPMS Sensor. See Figure 7 for Aluminum wheel TPMS installation.

1. Remove the OEM sensor assembly from the OEM wheel.

2. Remove the OEM valve stem from the OEM TPMS sensor, by removing the screw securing the valve stem to the sensor, as shown. The valve stem and screw will not be reused. (Figure 1)

3. Remove the nut and rubber grommet from the valve stem adapter supplied with this kit, as shown. The nut and rubber grommet will not be reused. (Figure 2)

4. Assemble the valve stem adapter to the OEM sensor as shown, using the screw supplied with the valve stem adapter. It is recommended that the screw be torqued to 12 in-lbs. (Figure 3 & 4)

5. Assemble the backer washer and adapter grommet to the valve stem adapter as shown. (Figure 3)

6. Attach the TPMS sensor to the 19.5"steel wheel, as shown, using the supplied washer and hex nut. **The valve stem hex nut should be torqued to 25-30 in. lbs.** This is to maintain the proper operation of the sensor and to maintain and air tight seal with the wheel. (Figure 5 & 6)

Spare Tire

The OEM spare tire does not contain a tire pressure sensor. An extra OEM sensor will be shipped with this kit if ordered. The same installation process should be followed as in the previous section.

Tire Inflation

The recommended tire inflation is 85psi.

This is only a recommended inflation pressure. The proper tire pressure should be determined by the operator of the vehicle, depending on vehicle load and operating conditions.

Programming the TPMS

It will be necessary to reprogram the vehicles computer to read the new sensor.

Contact your local FORD dealer for the correct procedure on reprogramming the TPMS or refer to the vehicles OEM manual for programming instructions.

Tire Rotation

When performing a tire rotation as part of the vehicle standard maintenance schedule, it will be necessary to re-set the TPMS so that the vehicles computer knows the location of the moved sensors.

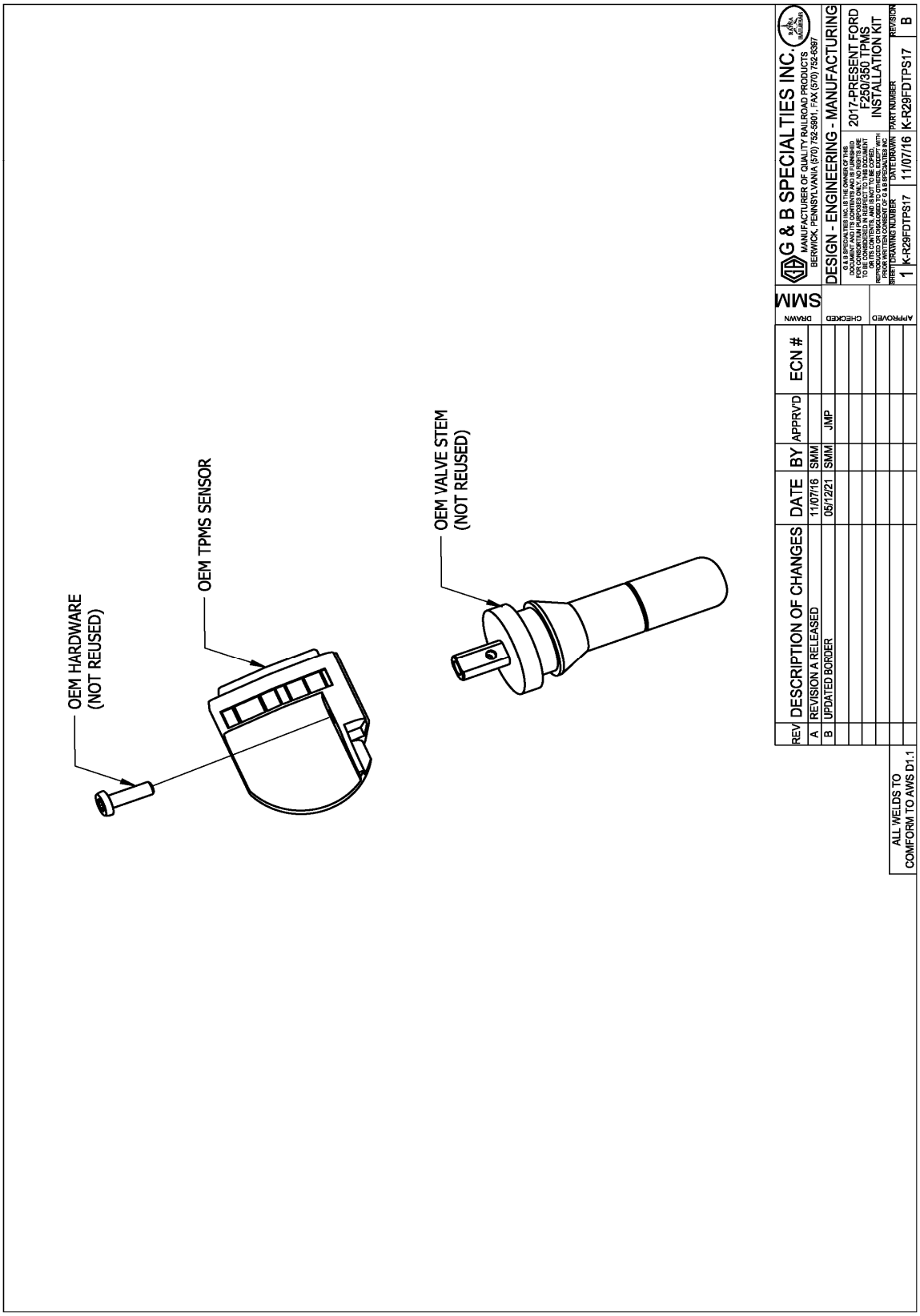
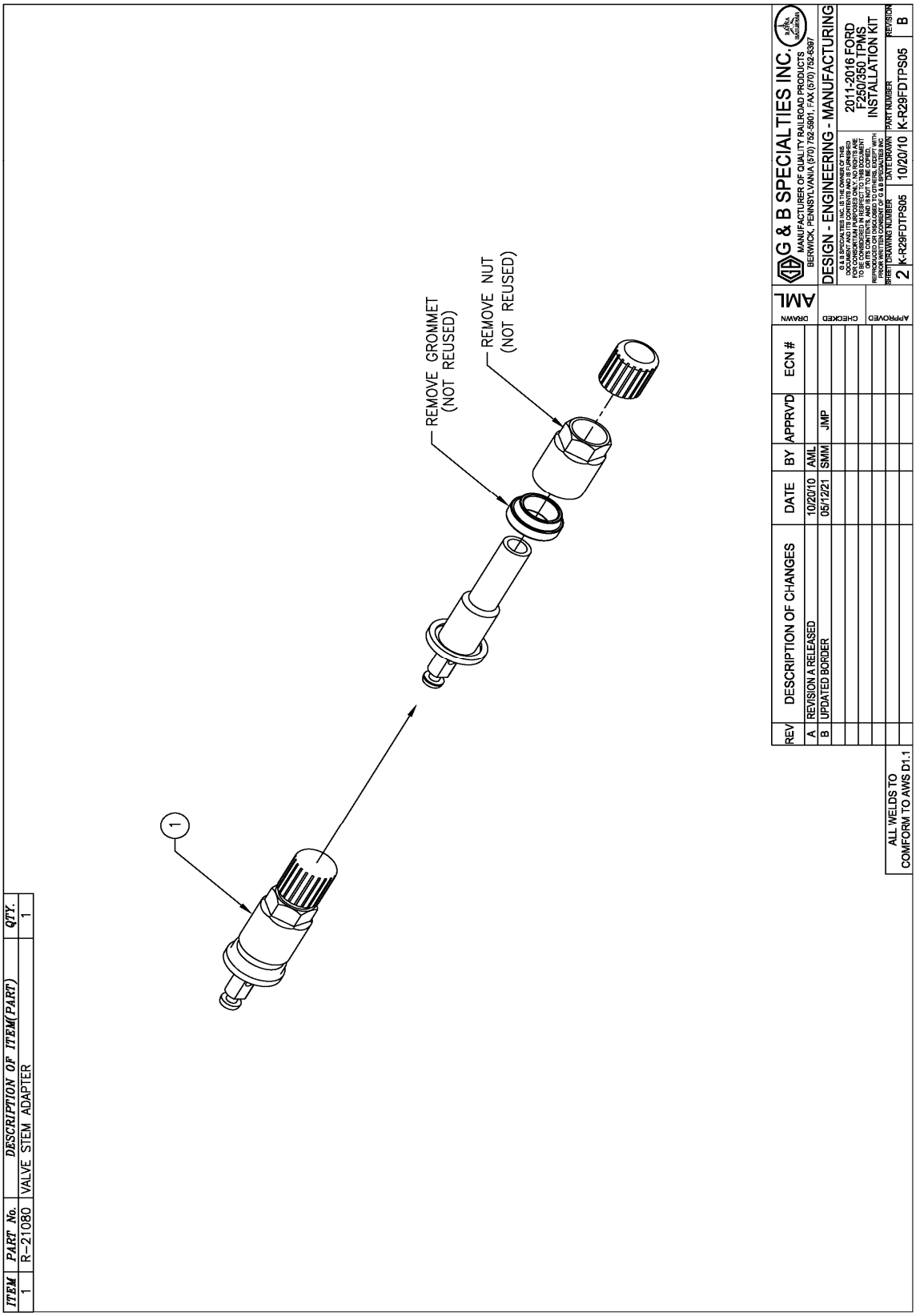

OEM HARDWARE
(NOT REUSED)
OEM TPMS SENSOR
OEM VALVE STEM
(NOT REUSED)
REV DESCRIPTION OF CHANGES DATE BY APPR'D ECN #
A REVISION A RELEASED 11/07/16 SMM
B UPDATED BORDER 05/12/21 SMM JMP
DRAWN SMM
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5801 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
2017-PRESENT FORD F250/350 TPMS INSTALLATION KIT
SHEET 1 OF 1
PART NUMBER K-R29FDTPS17
REVISION B
11/07/16
ALL WELDS TO COMFORM TO AWS D1.1

Figure 1


REMOVE GROMMET
(NOT REUSED)
REMOVE NUT
(NOT REUSED)
1
ITEM | PART No. | DESCRIPTION OF ITEM(PART) | QTY.
1 | R-21080 | VALVE STEM ADAPTER | 1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 10/20/10 | AML | | |
B | UPDATED BORDER | 05/12/21 | SMM | JMP | |
DRAWN AML
CHECKED
APPROVED
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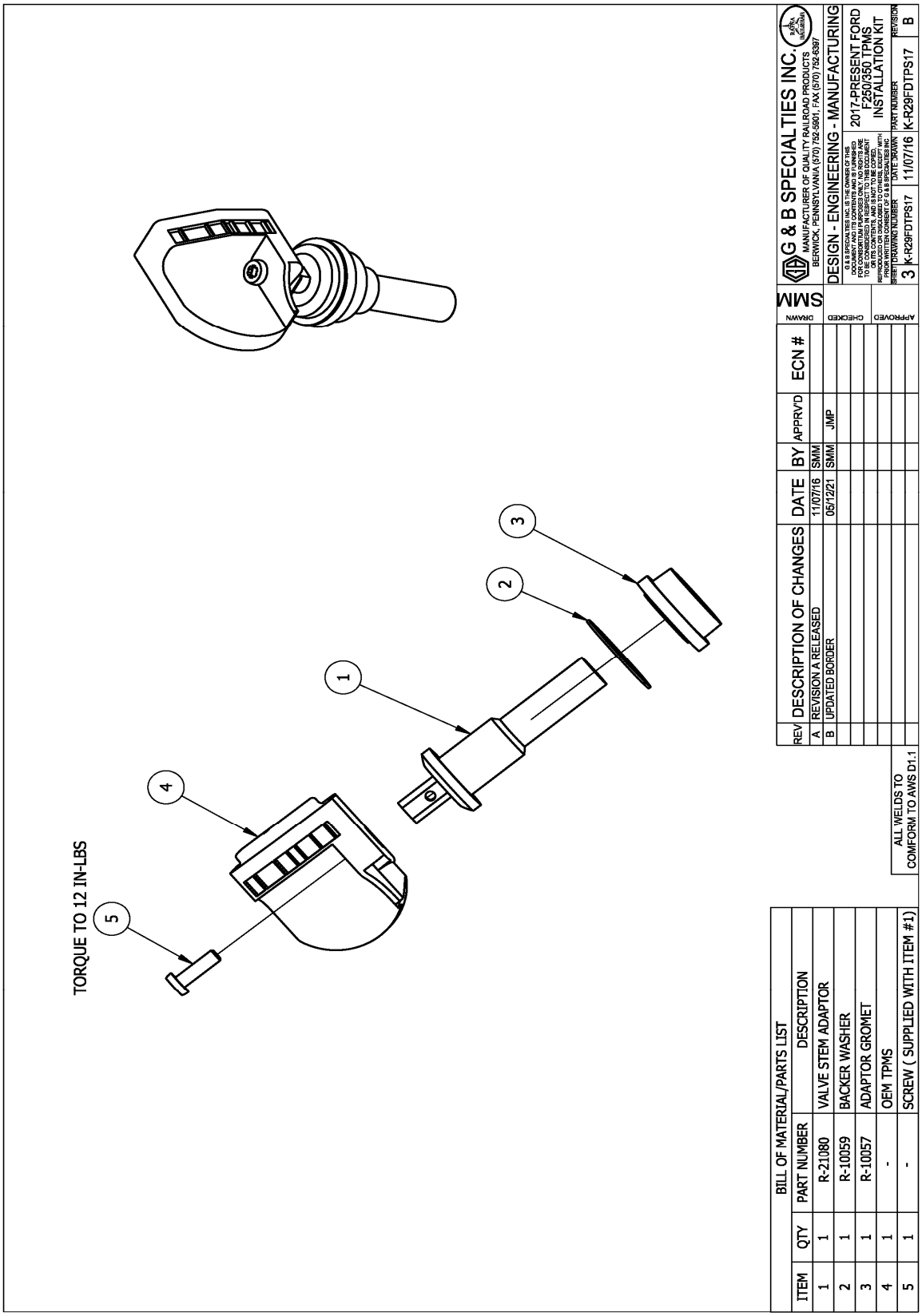
DESIGN - ENGINEERING - MANUFACTURING
2011-2016 FORD F250/350 TPMS INSTALLATION KIT
SHEET 2
DRAWING NUMBER K-R29FDTPS05
DATE 10/20/10
PART NUMBER K-R29FDTPS05
REVISION B
ALL WELDS TO COMFORM TO AWS D1.1

Figure 2


TORQUE TO 12 IN-LBS
1
2
3
4
5
BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-21080 | VALVE STEM ADAPTOR
2 | 1 | R-10059 | BACKER WASHER
3 | 1 | R-10057 | ADAPTOR GROMET
4 | 1 | - | OEM TPMS
5 | 1 | - | SCREW (SUPPLIED WITH ITEM #1)
ALL WELDS TO COMFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'VD | ECN #
A | REVISION A RELEASED | 11/07/16 | SMM | | |
B | UPDATED BORDER | 05/12/21 | SMM | JMP | |
DRAWN SMM
CHECKED
APPROVED
G & B SPECIALTIES INC.
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DESIGN - ENGINEERING - MANUFACTURING
2017-PRESENT FORD F250/350 TPMS INSTALLATION KIT
SHEET 3
DRAWING NUMBER K-R29FDTPS17
DATE DRAWN 11/07/16
PART NUMBER K-R29FDTPS17
REVISION B

Figure 3

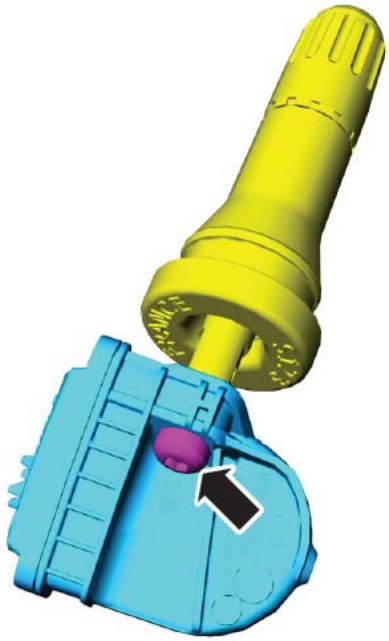
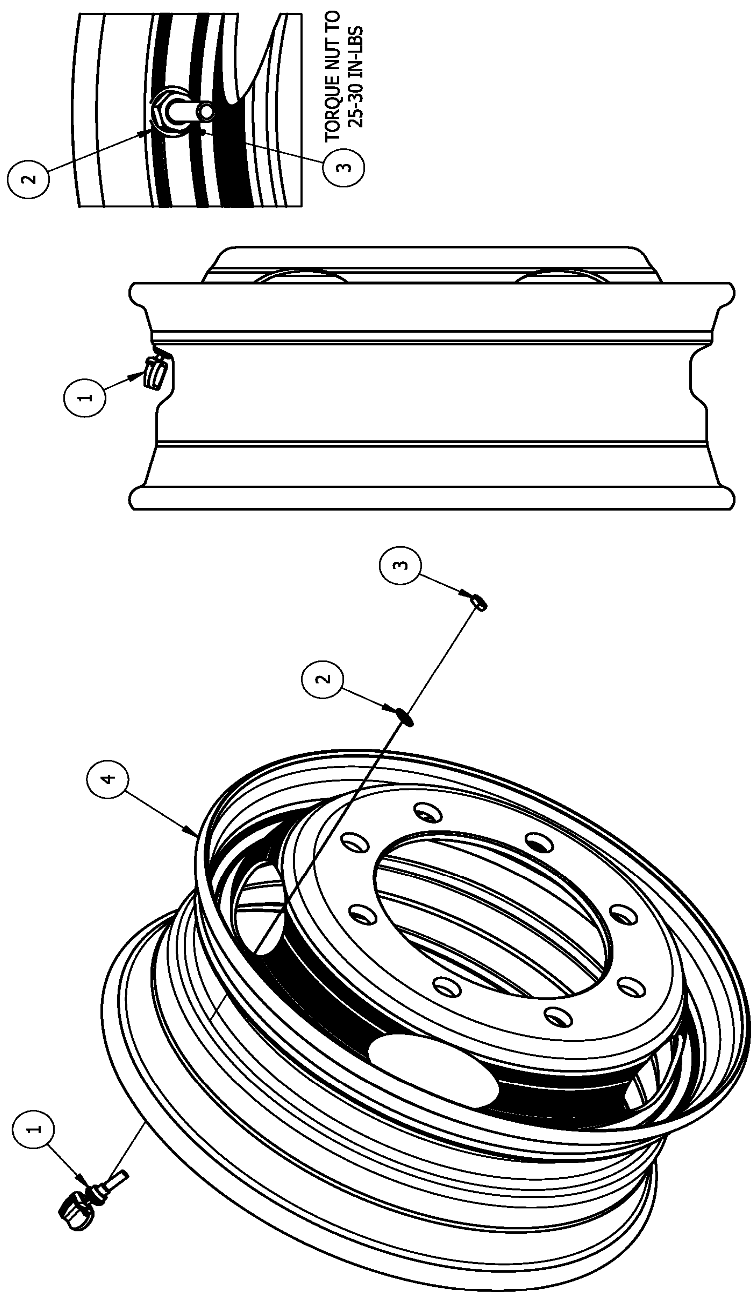


Figure 4
TORQUE TO 12 IN-LBS

Figure 5



ITEM	QTY	PART NUMBER	DESCRIPTION
		BILL OF MATERIAL/PARTS LIST	
1	-	-	MODIFIED SENSOR ASSEMBLY
2	1	R-10058	BEVELED WASHER
3	1	R-10056	HEX NUT
4	1	S-201502	19.5" STEEL WHEEL

ALL WELDS TO
COMFORM TO AWS D1.1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	11/07/16	SMM		
B	UPDATED BORDER	05/12/21	SMM	JMP	

DRAWN: SMM
CHECKED:
APPROVED:

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

DESIGN - ENGINEERING - MANUFACTURING

2017-PRESENT FORD
F250/350 TPMS
INSTALLATION KIT

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
4	K-R29FDTPS17	11/07/16	K-R29FDTPS17	B

Figure 6

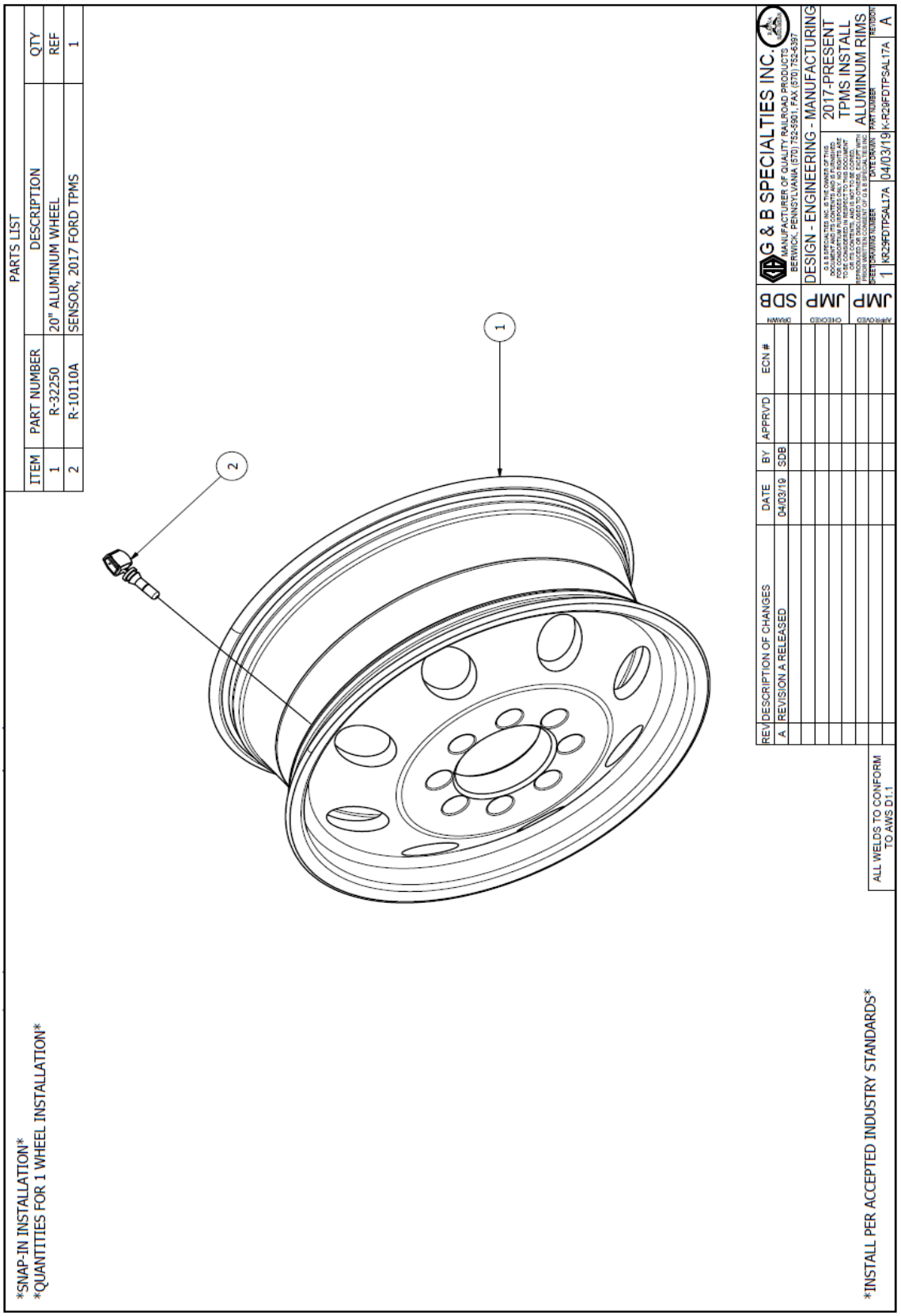

PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-32250 | 20" ALUMINUM WHEEL | REF
2 | R-10110A | SENSOR, 2017 FORD TPMS | 1
1
2
SNAP-IN INSTALLATION
QUANTITIES FOR 1 WHEEL INSTALLATION
INSTALL PER ACCEPTED INDUSTRY STANDARDS
ALL WELDS TO CONFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 04/03/19 | SDB
DRAWN SDB
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
2017-PRESENT
TPMS INSTALL
ALUMINUM RIMS
SHEET 1 | DRAWING NUMBER K829FDTPSAL17A | DATE DRAWN 04/03/19 | PART NUMBER K-R29FDTPSAL17A | REVISION A

Figure 7

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.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- This vehicle has an increased turning radius and decrease stability and braking ability. Use caution when operating both on road and rail.
- Following the first 25 miles (40 km) of road and rail travel, the road wheel and adapter lug nuts must be re-torqued. Refer to the service section of this manual for the procedure.
- Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.

Operation of Wheel Kit

With the wheels and tires installed on this vehicle, it may be operated as normal, however caution must be used as the vehicle now has an increased turning.

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.

Service of Wheel Kit

The wheels and tires must be serviced regularly to avoid damage to the equipment. See Table 1 below for Service Recommendations.

If ever vibrations are felt through the vehicle, inspect the balance and alignment of the road wheels and tires.

Warning/Caution

- Never use anti-seize on studs or lug nuts.
- Hand torque to specifications, do not use pneumatic tools.
- Always inspect the condition of the wheel before and after service.
- Loose lug nuts can lead to metal fatigue and ultimately to wheel failure or broken studs.

Table 1: Recommended Service Schedule

Service Required	Initial 100 km (65 Miles) of road and/or rail use	Daily	Weekly	Monthly	3 Months
Ensure vehicle is in good operating condition as per Mfg. Spec.		✓			
Check and adjust tire pressure per specification			✓		
Check wheel lug nut torque 65 miles after service or as specified	✓				✓
Check wheel adapter lug nut torque	✓				✓

Torque Service/Specification per manufacture recommendation

Accuride Steel Wheel Torque Specification: 300 ft-lbs dry
Steel Wheel Adapter Torque Specification: 165 ft-lbs dry
Recommended Tire Pressure: 85 psi

Aluminum Wheel Torque Specification: 165 ft-lbs dry*
Recommended Tire Pressure: 85 psi

3.0 FRONT & REAR MOUNTING KIT

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.
- Do not start the vehicle with the power steering hoses disconnected. Reconnect all hoses and secure the power steering cooler if the vehicle is started.
- 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 to protect the vehicle's electrical system.
- 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 Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.

INSTALLATION OF FRONT MOUNTING KIT

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

Front Mounting Kit Installation Parts

Part Number	Description	Qty
R-33279D	Mounting Bracket – Drivers Side	1
R-33277P	Mounting Bracket – Passengers Side	1
R-33283	Frame Extension	2
R-33285	Bumper Spacer	8
R-33281	Tow Hook Spacer, 1”	2
R-2960A	Railgear Mounting Shim – 1”	2
R-2631	Railgear Mounting Shim – 2”	2
R-2960	Railgear Mounting Shim – ½”	4
R-33284	Frame Extension Spacer	2
R-990KIT-209A	3/4” UNC GR.8 Bolt x 2.50” Lg.	4
	3/4” UNC GR.8 Bolt x 3.50” Lg.	4
	3/4” UNC GR.8 Bolt x 4.50” Lg.	4
	3/4” Flat Washer, GR.8 – Type-A	8
	3/4” UNC GR.8 Nylon Insert Lock Nut	4
	5/8” UNC GR.8 Bolt x 6.50” Lg.	8
	5/8” Flat Washer, GR.8 – Type-A	16
	5/8” UNC GR.8 Nylon Insert Lock Nut	8
	1/2" UNC GR.8 Bolt X 1.50” Lg.	16
	1/2” Flat Washer, GR.8 – Type-A	32
	1/2” UNC GR.8 Nylon Insert Lock Nut	16
R-051	Side Wand Set	1

Frame Modification (Figure 1)

2. Remove the front bumper and front tow hooks if so equipped. Remove the retaining clip and relocate to avoid rubbing on the mounting brackets.

    a.) Remove front compatibility brackets from front frame horns.

3. Retain the front bumper and tow hooks for re-installation.

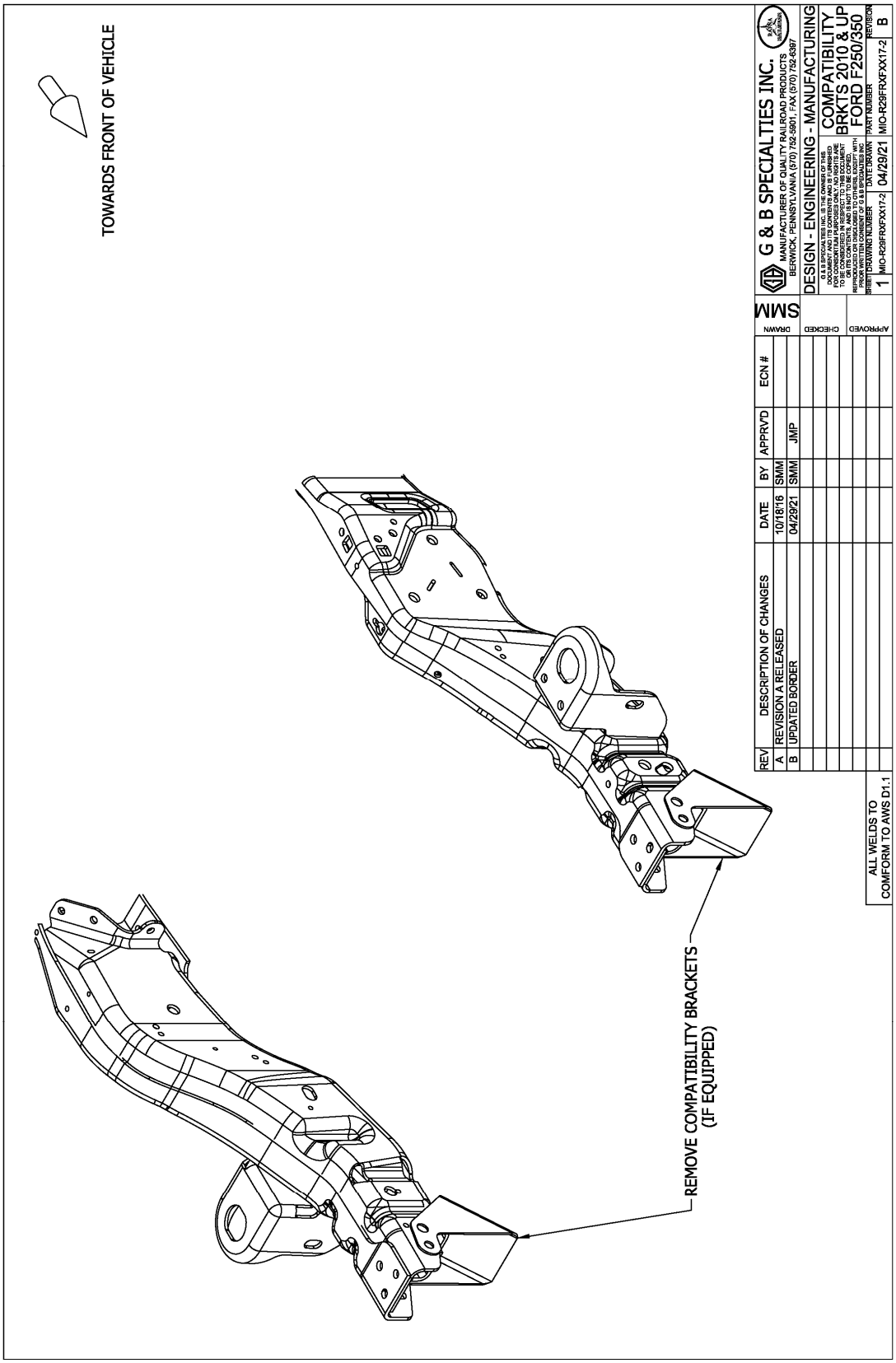
4. On the in-board side of the driver side frame rail, drill out the three existing holes to 11/16" diameter. Drill all three holes thru to the out-board side of the frame and thru the out-board frame rail.

5. On the in-board side of the passenger side frame rail, drill out the first two existing holes to 11/16" diameter. Drill the first two holes thru to the out-board side of the frame and thru the out-board frame rail.

6. Using the passenger side mounting bracket as a template, align the first two holes in the frame with the second and third holes in the mounting bracket. Make sure that the mounting bracket is tight up against the bottom of the frame and inside frame rail and secure bracket to frame with c-clamp.

7. Transfer the location of the last hole in the mounting bracket to the in-board side of the passenger side frame rail. Drill an 11/16" diameter hole thru to the out-board side of the frame and thru the out-board frame rail.

8. Drill the existing three holes in the top of the driver side frame rail to 9/16” diameter.


TOWARDS FRONT OF VEHICLE
REMOVE COMPATIBILITY BRACKETS
(IF EQUIPPED)
ALL WELDS TO
COMFORM TO AWS D1.1
REV
DESCRIPTION OF CHANGES
DATE
BY
APPRV'D
ECN #
A
REVISION A RELEASED
10/18/16
SMM
JMP
B
UPDATED BORDER
04/29/21
SMM
DRAWN
SMM
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
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COMPATIBILITY
BRKTS 2010 & UP
FORD F250/350
SHEET
1
PART NUMBER
MIO-R29FRXFXX17-2
04/29/21
MIO-R29FRXFXX17-2
REVISION
B

Figure 1

Bracket Assembly – Driver Side (Figure 2 & 3)

1. Insert frame extension into frame and align with first two holes in the frame and with the holes in the top of the frame. Place factory tow hook back in its original location with the addition of the tow hook spacers and fasten loosely the frame extension to the tow hook with supplied metric hardware.

2. Assemble the railgear mounting bracket to truck frame and frame extension using 5/8" bolts, flat washers and nylon insert lock nuts. Insert middle bolt first to hold bracket in place. Insert R-33284 into frame extension and insert the rear most bolt through spacer. (Spacer may need to be ground to fit depending on tolerances) Make sure that the mounting bracket is tight up against the bottom of the frame and frame extension and the inside frame rail. Finish installing bracket and torque all 5/8" fasteners to 150 ft.-lbs dry.

3. Through the window in the bottom of the mounting bracket, tighten and torque tow hook bolts to 150 ft.-lbs dry.

4. Repeat steps 1 thru 3 for passenger side.

5. The supplied mounting shims are to be used as required when mounting the railgear to the front mounting brackets.

Front Bumper Bracket Mounting (Figure 4 & 5)

1. Attach bumper spacers as shown using 1/2" x 1-1/2" bolts, flat washers and nylon insert lock nuts.

2. Attach OEM bumper to spacers as shown using 1/2" x 1-1/2" bolts, flat washers and nylon insert lock nuts.

3. Torque all 1/2" fasteners to 100 ft-lbs dry.

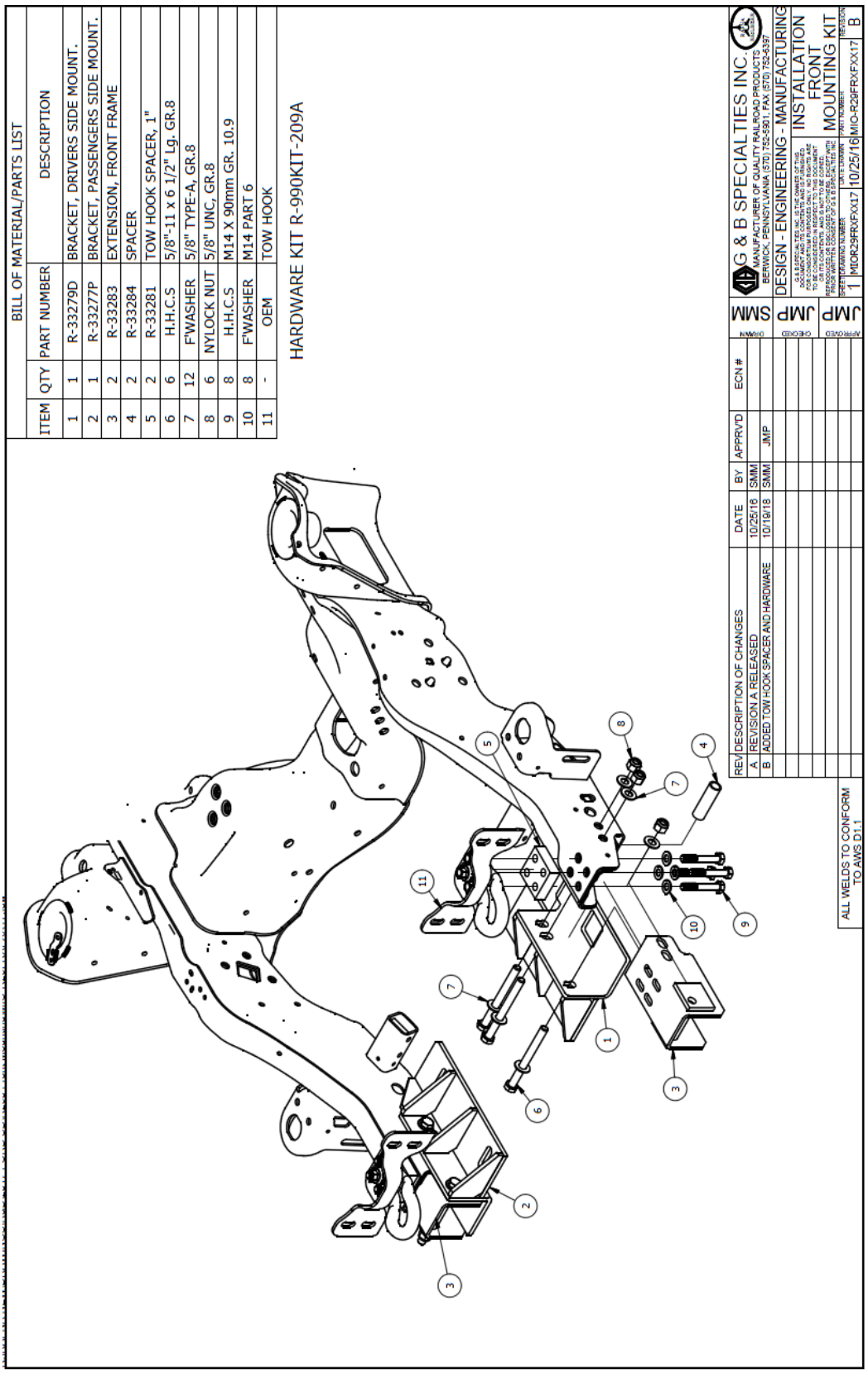
BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-33279D | BRACKET, DRIVERS SIDE MOUNT.
2 | 1 | R-33277P | BRACKET, PASSENGERS SIDE MOUNT.
3 | 2 | R-33283 | EXTENSION, FRONT FRAME
4 | 2 | R-33284 | SPACER
5 | 2 | R-33281 | TOW HOOK SPACER, 1"
6 | 6 | H.H.C.S | 5/8"-11 x 6 1/2" Lg. GR.8
7 | 12 | F'WASHER | 5/8" TYPE-A, GR.8
8 | 6 | NYLOCK NUT | 5/8" UNC, GR.8
9 | 8 | H.H.C.S | M14 X 90mm GR. 10.9
10 | 8 | F'WASHER | M14 PART 6
11 | - | OEM | TOW HOOK
HARDWARE KIT R-990KIT-209A
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRV'D | ECN #
A | REVISION A RELEASED | 10/25/16 | SMM | |
B | ADDED TOW HOOK SPACER AND HARDWARE | 10/19/18 | SMM | JMP |
DRAWN SMM
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
INSTALLATION
FRONT
MOUNTING KIT
DRAWING NUMBER 1 MIOR29FRXFXX17
PART NUMBER MIO-R29FRXFXX17
DATE 10/25/16
REVISION B
ALL WELDS TO CONFORM TO AWS D1.1

Figure 2

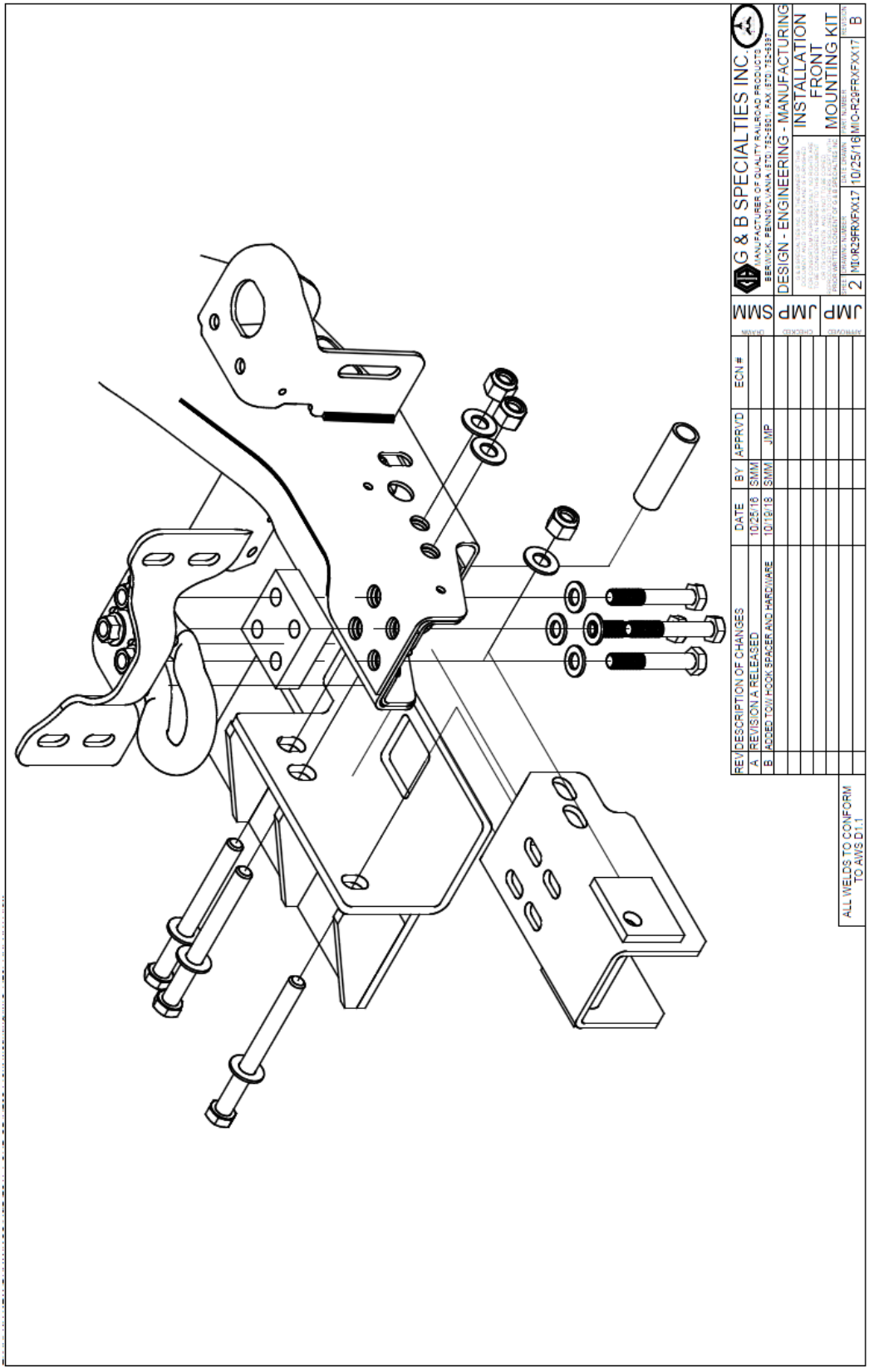
G & B SPECIALTIES INC.
DESIGN - ENGINEERING - MANUFACTURING
INSTALLATION
FRONT
MOUNTING KIT
MIO-R29FRXFXX17
B
10/25/16
SMM
JMP
JMP
REV
DESCRIPTION OF CHANGES
DATE
BY
APPR'VD
ECN #
A
REVISION A RELEASED
10/25/18
SMM
JMP
B
ADDED TOW HOOK SPACER AND HARDWARE
10/19/18
SMM
ALL WELDS TO CONFORM TO AWS D1.1

Figure 3

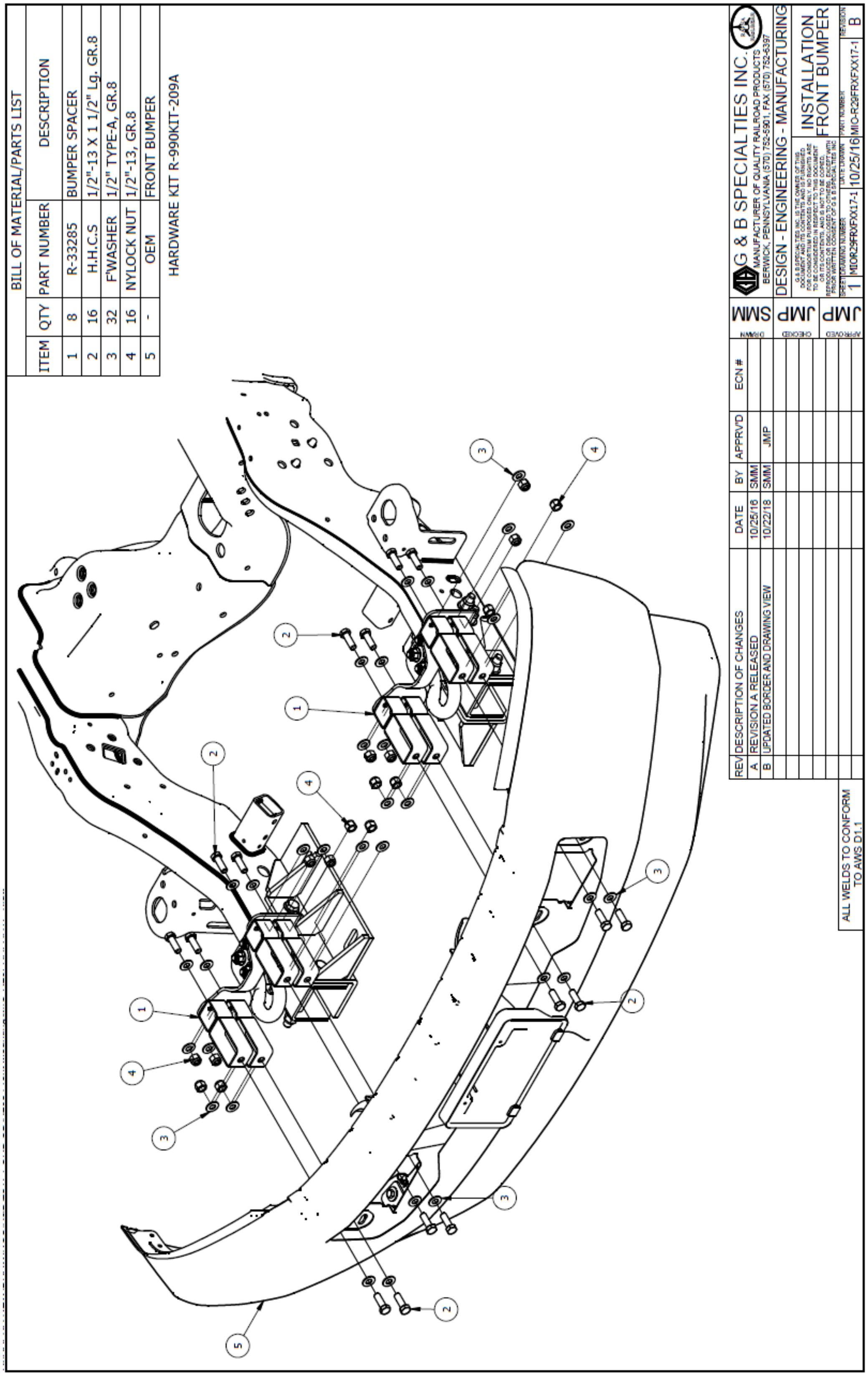
BILL OF MATERIAL/PARTS LIST
ITEM QTY PART NUMBER DESCRIPTION
1 8 R-33285 BUMPER SPACER
2 16 H.H.C.S 1/2"-13 X 1 1/2" Lg. GR.8
3 32 F'WASHER 1/2" TYPE-A, GR.8
4 16 NYLOCK NUT 1/2"-13, GR.8
5 - OEM FRONT BUMPER
HARDWARE KIT R-990KIT-209A
G & B SPECIALTIES INC.
DESIGN - ENGINEERING - MANUFACTURING
INSTALLATION
FRONT BUMPER
REV DESCRIPTION OF CHANGES DATE BY APPRV'D ECN #
A REVISION A RELEASED 10/25/16 SMM
B UPDATED BORDER AND DRAWING VIEW 10/22/18 SMM JMP
SMM
JMP
JMP
1 MIOR29FRXFXX17-1 10/25/16 MIO-R29FRXFXX17-1 B
ALL WELDS TO CONFORM TO AWS D1.1

Figure 4

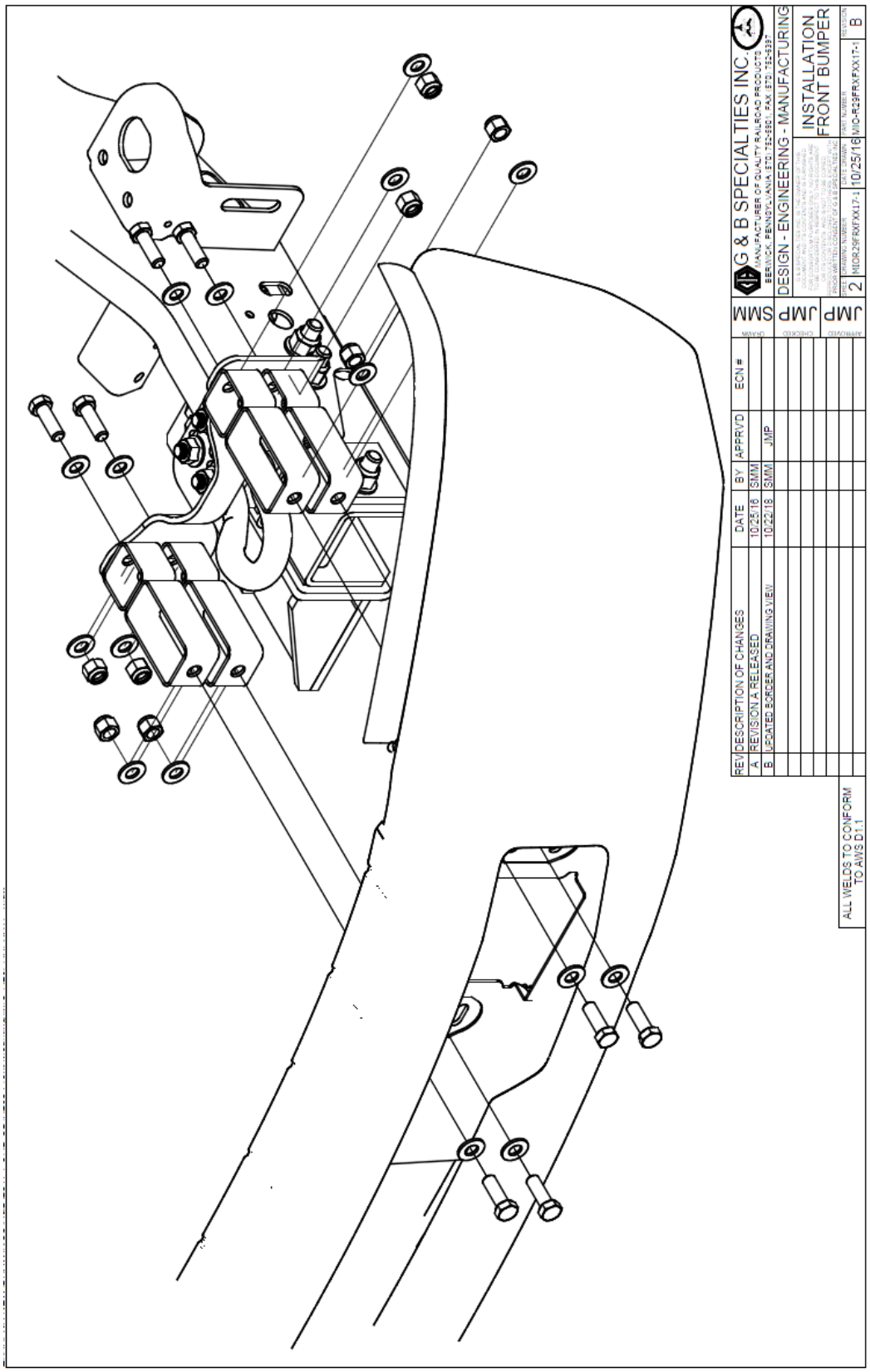
G & B SPECIALTIES INC.
INSTALLATION
FRONT BUMPER
DESIGN - ENGINEERING - MANUFACTURING
REV DESCRIPTION OF CHANGES DATE BY APPR'D ECN #
A REVISION A RELEASED 10/25/16 SMM
B UPDATED BORDER AND DRAWING VIEW 10/22/18 SMM JMP
DRAWN SMM
CHECKED JMP
APPROVED JMP
SIZE 2
DRAWING NUMBER MIOR-R29FRXFXX17-1
10/25/16
PART NUMBER MIO-R29FRXFXX17-1
REVISION B
ALL WELDS TO CONFORM TO AWS D1.1

Figure 5

INSTALLATION OF REAR MOUNTING KIT

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

Part Number	Description	# Req.	Remarks	Check
K-R29RRXFXX17 Rear Mounting Kit				
R-33275D	Rear Mounting Bracket, Drivers Side	1		
R-33275P	Rear Mounting Bracket, Passengers Side	1		
R-2960	Railgear Mounting Shim 1/2"	4		
R-2960A	Railgear Mounting Shim 1"	2		
R-2631	Railgear Mounting Shim 2"	2		
R-33260	Spacer Bumper	4		
R-33568	Machined Bolt	2		
R-990KIT-299C	7/8" UNC Gr. 8 Nylon Insert Lock Nut	2	Rear Mounting Bracket Install	
	7/8" Gr. 8 Washer	2		
	1/2" UNC Gr. 8 Bolt x 2.250" Long	8		
	1/2" UNC Gr. 8 Nylon Insert Lock Nut	8		
	1/2" Gr. 8 Washer	16		
	3/4" UNC Gr. 8 Bolt x 5.50" Long	4	Railgear Mounting	
	3/4" UNC Gr. 8 Bolt x 6.50" Long	4		
	3/4" UNC Gr. 8 Bolt x 7.50" Long	4		
	3/4" Gr. 8 Washer	8		
	3/4" UNC Gr. 8 Nylon Insert Lock Nut	4		

1. Remove the original spare tire and spare tire heat shield from under the vehicle's cargo box if so equipped. The original spare tire will not be re-installed.

2. Remove the tow hitch from the rear of the frame if so equipped.

3. Place each rear mounting bracket against the underside and outside of the frame rails as shown, just ahead of the rear spring hangers. The three slots in the side of each rear mounting plate should align with the three slots in the side of the frame. The four slots in the bottom of each rear mounting plate should align with the four slots in the lower flange of the frame for the OEM tow hitch.

4. Fasten each rear mounting bracket to the bottom of the frame as shown.

For Install with OEM Tow Hitch (Figure 1, 2 & 3)

1. Install the OEM tow hitch to the bottom of the rear mounting bracket.

2. Tighten but do not torque the fasteners.

3. Ensure the mounting brackets are tight to the underside and outside of the frame and are aligned with each other and that the support bracket is sitting flush against the rear mounting bracket.

4. Torque the 14 mm OEM fasteners to 150 ft-lb dry and the 19 mm OEM fasteners to 175 ft-lb dry. Do not over torque.

5. Remove both bumper mounting brackets and modify slots as per Figure 3.

6. Remount the modified bumper brackets and mount bumper spacer, P/N R-33260 to tow hitch.

7. The supplied railgear mounting shims are to be used as required when mounting the railgear to the rear mounting plates.

A minimum of 3" of shim is required when installing this unit in conjunction with the OEM tow hitch. If less than 3" of shim is used, the railgear may come in contact with the tow hitch when stowed in the road position. If the recommended unit installation height, as specified in the railgear installation manual, cannot be achieved with a minimum of 3" of shim, the tow hitch must be modified by the installer at their own discretion.

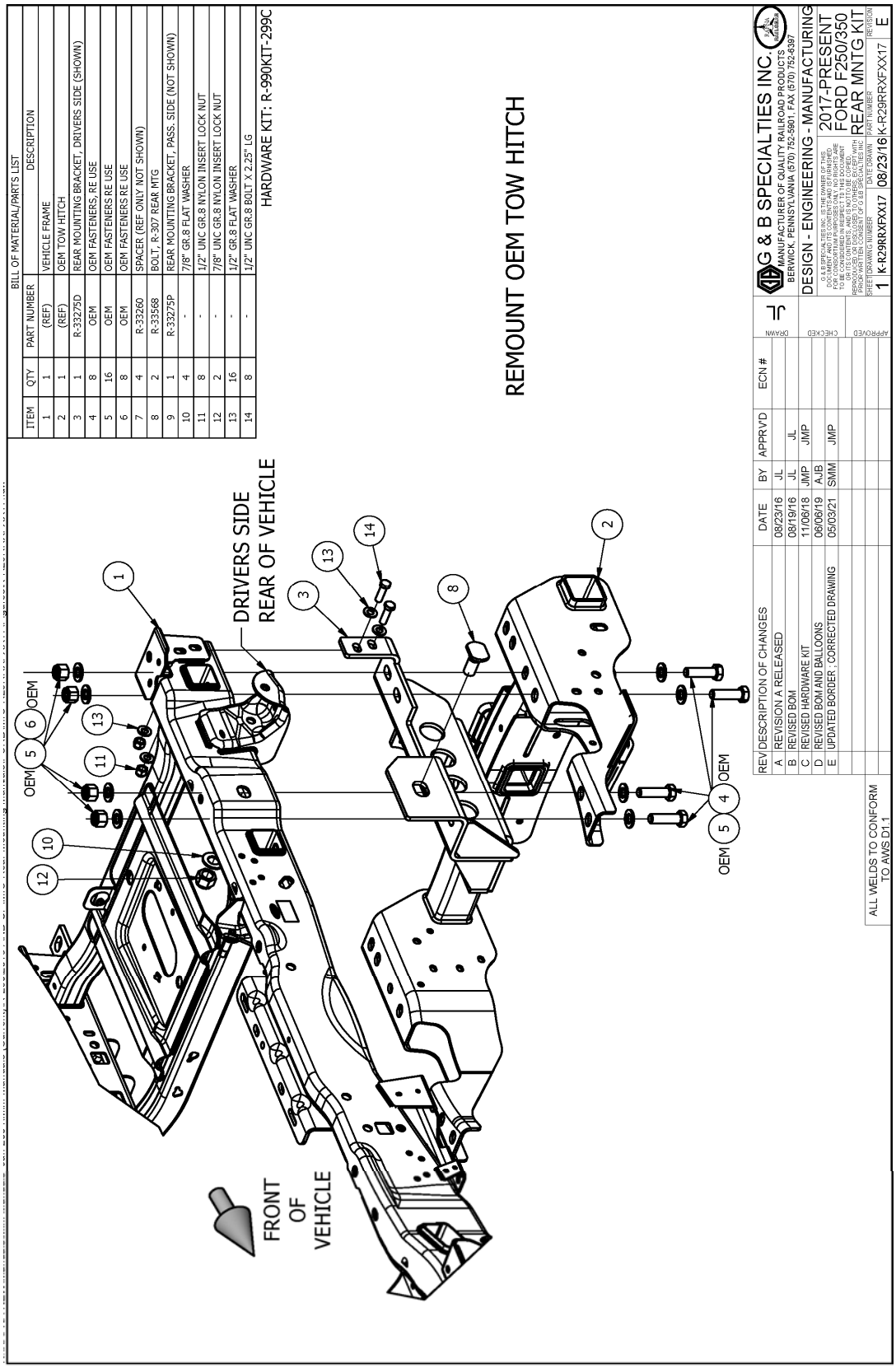
REMOUNT OEM TOW HITCH
DRIVERS SIDE
REAR OF VEHICLE
FRONT OF VEHICLE
OEM
OEM
OEM
OEM
BILL OF MATERIAL/PARTS LIST
ITEM QTY PART NUMBER DESCRIPTION
1 1 (REF) VEHICLE FRAME
2 1 (REF) OEM TOW HITCH
3 1 R-33275D REAR MOUNTING BRACKET, DRIVERS SIDE (SHOWN)
4 8 OEM OEM FASTENERS, RE USE
5 16 OEM OEM FASTENERS RE USE
6 8 OEM OEM FASTENERS RE USE
7 4 R-33260 SPACER (REF ONLY NOT SHOWN)
8 2 R-33568 BOLT, R-307 REAR MTG
9 1 R-33275P REAR MOUNTING BRACKET, PASS. SIDE (NOT SHOWN)
10 4 - 7/8" GR.8 FLAT WASHER
11 8 - 1/2" UNC GR.8 NYLON INSERT LOCK NUT
12 2 - 7/8" UNC GR.8 NYLON INSERT LOCK NUT
13 16 - 1/2" GR.8 FLAT WASHER
14 8 - 1/2" UNC GR.8 BOLT X 2.25" LG
HARDWARE KIT: R-990KIT-299C
REV DESCRIPTION OF CHANGES DATE BY APPR'D ECN #
A REVISION A RELEASED 08/23/16 JL JL
B REVISED BOM 08/19/16 JL JL
C REVISED HARDWARE KIT 11/06/18 JMP JMP
D REVISED BOM AND BALLOONS 06/06/19 AJB
E UPDATED BORDER , CORRECTED DRAWING 05/03/21 SMM JMP
ALL WELDS TO CONFORM TO AWS D1.1
DRAWN
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
2017-PRESENT
FORD F250/350
REAR MNTG KIT
SHEET DRAWING NUMBER DATE DRAWN PART NUMBERS REVISION
1 K-R29RRXFXX17 08/23/16 K-R29RRXFXX17 E

Figure 1

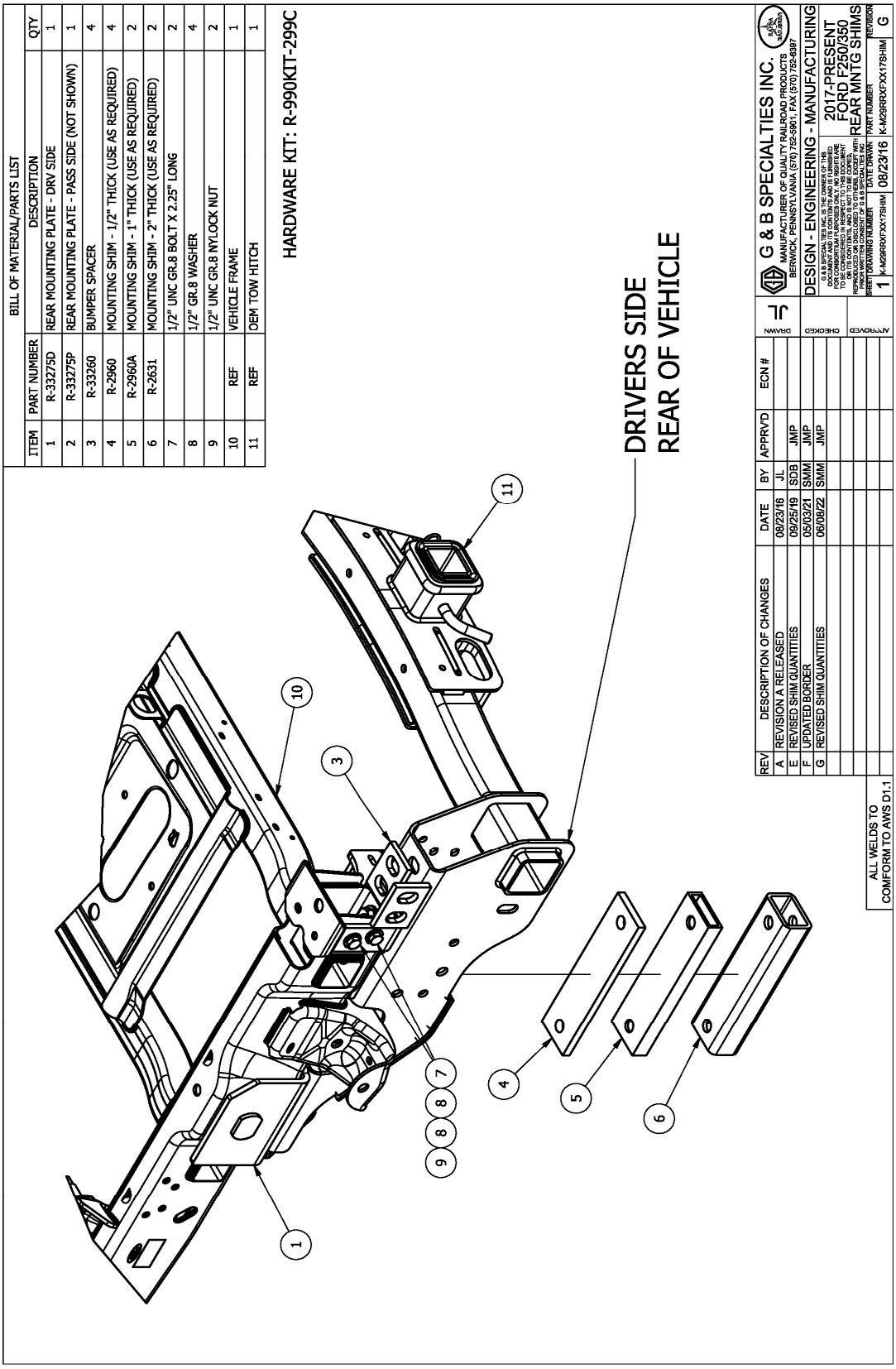
BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-33275D | REAR MOUNTING PLATE - DRV SIDE | 1
2 | R-33275P | REAR MOUNTING PLATE - PASS SIDE (NOT SHOWN) | 1
3 | R-33260 | BUMPER SPACER | 4
4 | R-2960 | MOUNTING SHIM - 1/2" THICK (USE AS REQUIRED) | 4
5 | R-2960A | MOUNTING SHIM - 1" THICK (USE AS REQUIRED) | 2
6 | R-2631 | MOUNTING SHIM - 2" THICK (USE AS REQUIRED) | 2
7 | | 1/2" UNC GR.8 BOLT X 2.25" LONG | 2
8 | | 1/2" GR.8 WASHER | 4
9 | | 1/2" UNC GR.8 NYLOCK NUT | 4
10 | REF | VEHICLE FRAME | 2
11 | REF | OEM TOW HITCH | 1
HARDWARE KIT: R-990KIT-299C
DRIVERS SIDE
REAR OF VEHICLE
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRV'D | ECN #
A | REVISION A RELEASED | 08/23/16 | JL
E | REVISED SHIM QUANTITIES | 09/25/19 | SDB | JMP
F | UPDATED BORDER | 05/03/21 | SMM | JMP
G | REVISED SHIM QUANTITIES | 06/08/22 | SMM | JMP
DRAWN
CHECKED
APPROVED
ALL WELDS TO COMFORM 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
2017-PRESENT FORD F250/350 REAR MNTG SHIMS
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | K-M29RRXFXX17SHIM | 08/23/16 | K-M29RRXFXX17SHIM | G

Figure 2

Figure 3

BUMPER BRACKET MODIFICATION

Remove both driver's side bumper brackets, and passenger side bumper bracket.
Extend slots as per above photo on both driver and passenger bumper brackets.
Reinstall bumper brackets to vehicle.


Use following fasteners for remounting of the bumper bracket
OEM FASTENERS
1/2" X 2.25" HHCS and 1/2" washers and nylock lock nuts
Add Bumper Bracket, R-33260 to both locations, both on drivers side and on passengers side.

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.
- 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.

OPERATION AND SERVICE OF FRONT/REAR MOUNTING KIT

With the front mounting kit installed on this vehicle, it may be operated as normal, however the front bumper is located further forward than standard. Side wands are located on the front bumper to aid in determining the length and width of the vehicle. Caution must be used when operating the vehicle. With the rear mounting kit installed on this vehicle, it may be operated as normal.

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.

The front/rear mounting kit must be serviced regularly to avoid damage to the equipment. Table 1 below provides the Recommended Service Schedule and Table 2 provides Standard Fastener Torque Values.

Table 1: Recommended Service Schedule

Service Required	Initial 100 km (62 Miles) of road and/or rail use	Daily	Weekly	Monthly
Inspect front/rear mounting kit fasteners (re-torque if required)		✓	✓	✓

Table 2: Standard Fastener Torque Values

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

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4.0 FRONT & REAR RAILGEAR KIT

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 of the equipment.
- Installation instructions provided below only address the RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Beware of all pinch points on the railgear and keep all parts of the body clear.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear to protect the vehicle's electrical system.
- Max vehicle speed on rail not to exceed 45 MPH.

RAILGEAR KITS

The following procedure details the installation of the railgear kit. The procedure is identical for both front and rear applications.

Table 1: Railgear Kit Installation Parts

Part Number	Description	Qty
R-2900A	Railgear Assembly (Standard/In-Cab)	1
R-2900B	Railgear Assembly (Full In-Cab)	
R-1600	Rail Wheel Assembly	2
R-21102D	Rail Sweep	1
R-21102P	Rail Sweep	1
R-990KIT-203 (2 per)	½" UNC Gr. 8 Bolt x 2" Long	8 (4)
	½" Gr. 8 Washer	16 (8)
	½" UNC Gr. 8 Nylon Insert Lock Nut	8 (4)

R-290 All Front/Rear Applications w/ Steel Wheels

Table 2: Railgear Kit Installation Parts

Part Number	Description	Qty
R-2900A	Railgear Assembly (Standard/In-Cab)	1
R-2900B	Railgear Assembly (Full In-Cab)	
R-25121	Rail Wheel Assembly - Rubber	2
R-21102D	Rail Sweep	1
R-21102P	Rail Sweep	1
R-990KIT-203 (2 per)	½" UNC Gr. 8 Bolt x 2" Long	8 (4)
	½" Gr. 8 Washer	16 (8)
	½" UNC Gr. 8 Nylon Insert Lock Nut	8 (4)

R-290 All Front/Rear Applications w/ Rubber Wheels

INSTALLATION OF RAILGEAR KIT

1. Ensure that the respective (front or rear) mounting kit has been installed on the vehicle prior to installing the railgear kit.

2. To install the railgear at the correct height, ensure that the road wheels and tires kit has been installed on the vehicle and that the vehicle is resting on its four properly inflated tires.

3. **Standard/In-Cab Controls Only:**

    a. Depending on the Hydraulic Kit ordered, lock cam converters may have been supplied to prevent the lock pins from engaging in the rail position. If this is the case, manually rotate the railgear until the rail position lock cam is accessible. Position the lock cam converter on the rail position lock cam and weld it in place. Grind the cam smooth so that the lock pin slides smoothly past the weld. The lock cam converter should prevent the lock pin from engaging in the rail position.

4. Measure from the railgear mounting surface, the bottom of the mounting brackets, to the ground. Determine what combination of railgear mounting shims are required to set the railgear mounting surface at approximately 17.5 - 18" from the ground. Railgear mounting shims are supplied with the vehicle mounting kit. If this height cannot be achieved with the supplied shims, the vehicle suspension will need to be modified. This modification is not included with the Rafna railgear.

5. Position the railgear beneath the mounting plates on the vehicle. When installed on the front of the vehicle, the hydraulic cylinder should be on the front side of the railgear. When installed on the rear of the vehicle, the hydraulic cylinder should be on the rear side of the railgear.

6. Raise the railgear to the mounting plates using the railgear mounting shims as required between the mounting plates and the railgear. Align the holes in the railgear and shims with the slots in the mounting plates. Center the railgear on the mounting plate slots. If there are multiple slot sets in the mounting plates, try to use the slots that will position the railgear closest to the vehicle wheels. Ensure that the railgear does not contact any vehicle components. Fasten the railgear and shims to the mounting plates using four suitably long ¾" bolts, eight ¾" washers, and four ¾" nuts.

7. Tighten but do not torque the ¾" fasteners as they will be torqued following the railgear alignment procedure.

8. Place the rail wheels below the mounting tables on the railgear axle. Place the rail sweeps in front of (for front railgear applications) or to the rear of (for rear railgear applications) the rail wheels and below the mounting tables. Fasten the rail wheels and rail sweeps to the mounting tables with eight ½" bolts, sixteen ½" washers, and eight ½" nuts.

9. Tighten but do not torque the ½" fasteners as they will be torqued following the railgear alignment procedure.

10. Re-install the vehicle bumper and other components as required.

11. Manually rotate the railgear up to the road position. Take note of if and where the railgear, rail wheels, and/or rail sweeps contact the vehicle bumper and or exhaust. Trim and reinforce the bumper as required. Ensure there is enough clearance to accommodate side-to-side adjustment and rail wheel load adjustment of the railgear. The exhaust system can be bent to fit around the railgear. Ensure any exhaust system modifications conform to applicable laws and regulations. Proceed to install the railgear hydraulic system as per the Hydraulic Kit Installation manual before continuing with the following steps.

12. **Standard/In-Cab Controls Only:**
    a. The locking cable is supplied with a bulkhead fitting to ease installation. Ensure that the "Pull to Unlock" placard is on the cable end.

13. Follow the Railgear Over-Center Adjustment procedure detailed in the Railgear Kit Operation, Service and Parts manual. Ensure the cylinder rod-end lock nut is re-tightened following this adjustment.

14. **Standard/In-Cab Controls Only:**

    a. With the railgear fully raised to the road position, ensure that the railgear lock pin properly engages the lock cam. It may be necessary to grind the lock cam slightly to ensure proper fit.

15. **Standard/In-Cab Controls Only:**
    a. Note that some hydraulic kit installations provide a lock cam converter to prevent the railgear lock pin from engaging in the rail position. If such a lock cam converter was installed, skip this step. Otherwise, with the railgear fully lowered to the rail position, ensure that the railgear lock pin properly engages the lock cam. It may be necessary to grind the lock cam slightly to ensure proper fit.

16. Follow the Rail Wheel Load Adjustment procedure detailed in the Railgear Kit Operation, Service and Parts manual.

17. Follow the Railgear Alignment procedure detailed in the Railgear Kit Operation, Service and Parts manual.

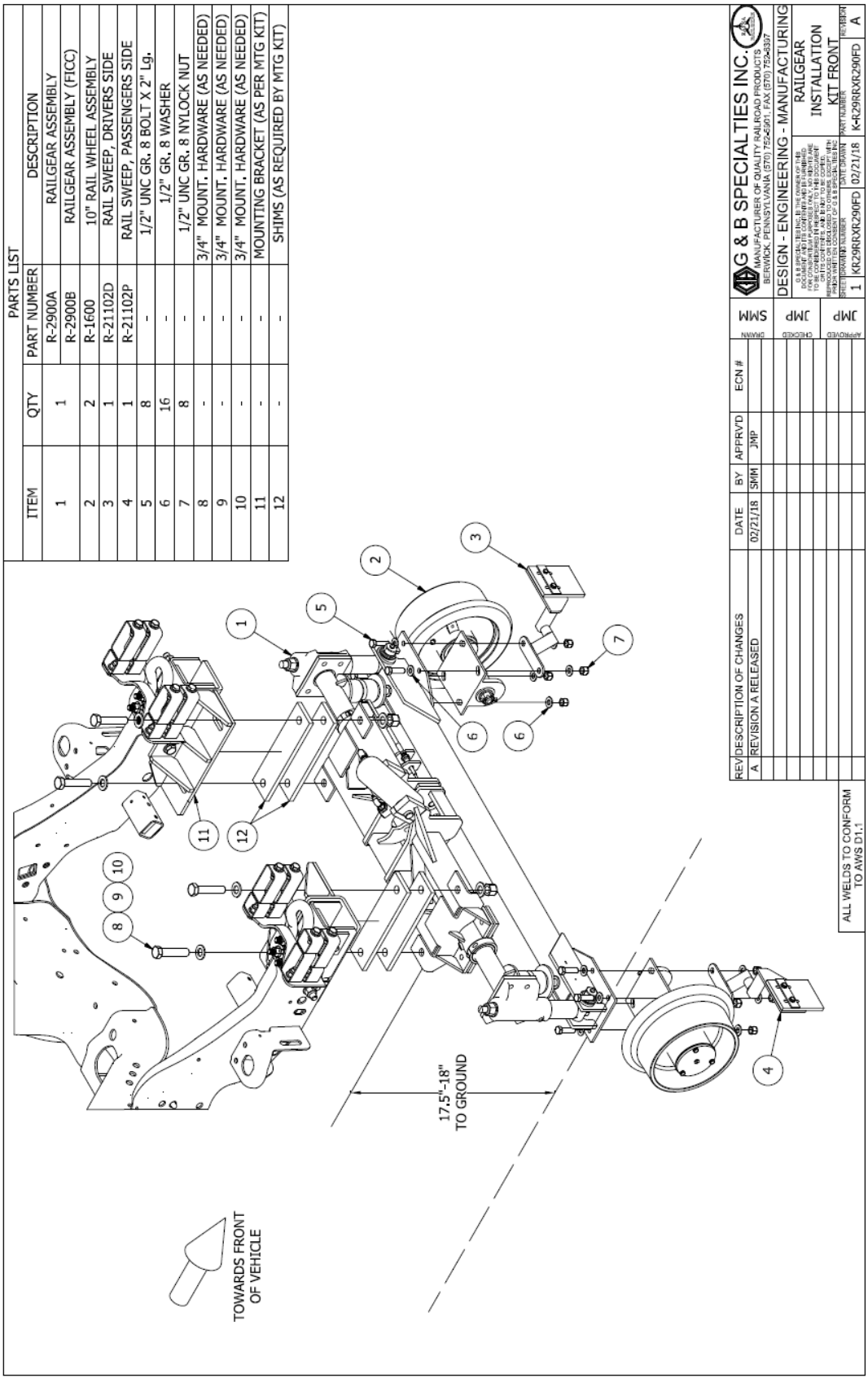
18. Follow the Rail Sweep Adjustment procedure detailed in the Railgear Kit Operation, Service and Parts manual.

19. Torque all fasteners as detailed in the Railgear Kit Operation, Service and Parts manual.

20. Grease the railgear at all lubrication points as detailed in the Railgear Kit Operation, Service and Parts manual.

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-2900A	RAILGEAR ASSEMBLY
		R-2900B	RAILGEAR ASSEMBLY (FICC)
2	2	R-1600	10" RAIL WHEEL ASSEMBLY
3	1	R-21102D	RAIL SWEEP, DRIVERS SIDE
4	1	R-21102P	RAIL SWEEP, PASSENGERS SIDE
5	8	-	1/2" UNC GR. 8 BOLT X 2" Lg.
6	16	-	1/2" GR. 8 WASHER
7	8	-	1/2" UNC GR. 8 NYLOCK NUT
8	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
9	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
10	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
11	-	-	MOUNTING BRACKET (AS PER MTG KIT)
12	-	-	SHIMS (AS REQUIRED BY MTG KIT)



REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'VD	ECN #
A	REVISION A RELEASED	02/21/18	SMM	JMP	

DRAWN SMM | 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

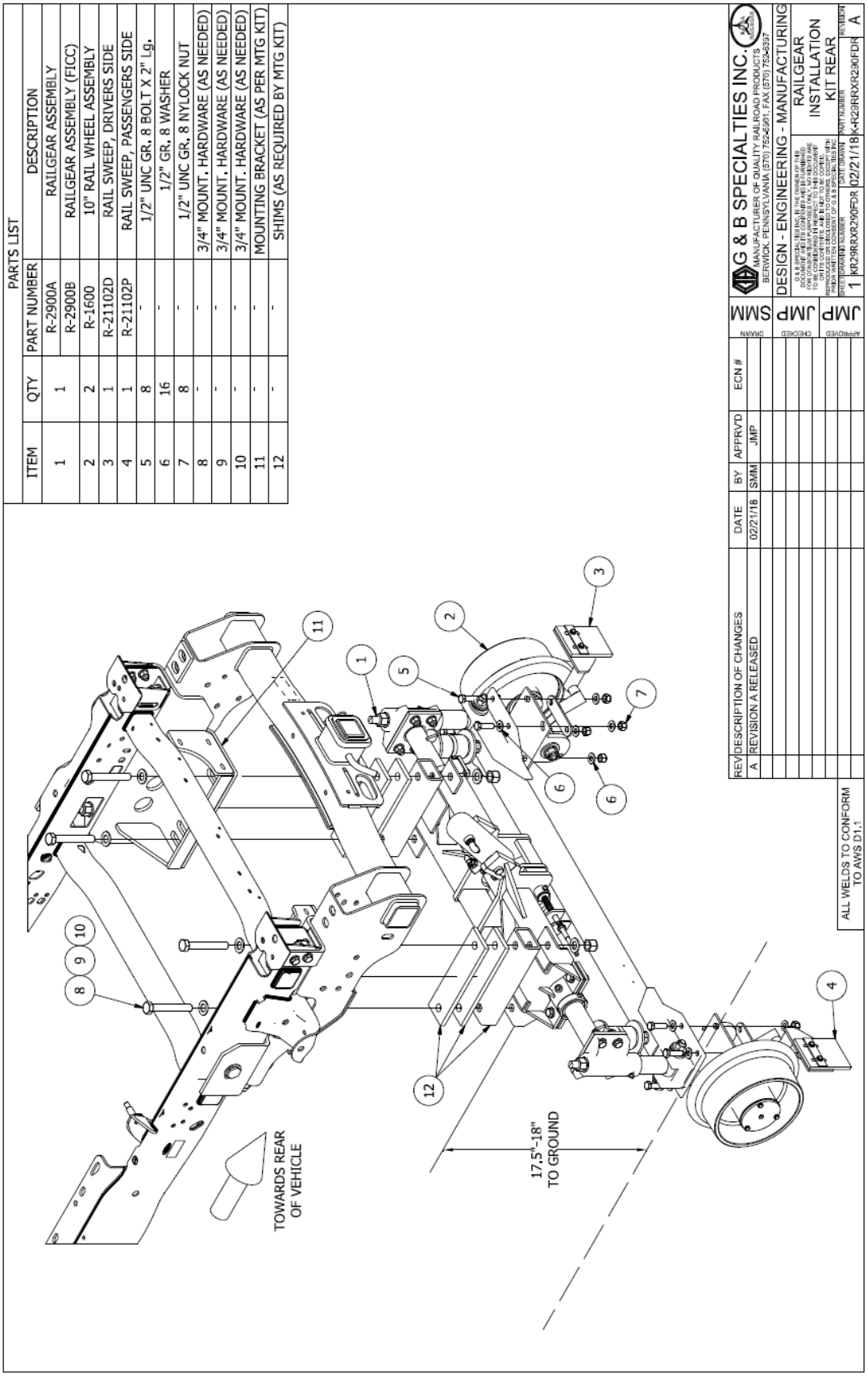
RAILGEAR INSTALLATION KIT FRONT

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	KR29RRXR290FD	02/21/18	K-R29RRXR290FD	A

ALL WELDS TO CONFORM TO AWS D1.1

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-2900A	RAILGEAR ASSEMBLY
		R-2900B	RAILGEAR ASSEMBLY (FICC)
2	2	R-1600	10" RAIL WHEEL ASSEMBLY
3	1	R-21102D	RAIL SWEEP, DRIVERS SIDE
4	1	R-21102P	RAIL SWEEP, PASSENGERS SIDE
5	8	-	1/2" UNC GR. 8 BOLT X 2" Lg.
6	16	-	1/2" GR. 8 WASHER
7	8	-	1/2" UNC GR. 8 NYLOCK NUT
8	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
9	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
10	-	-	3/4" MOUNT. HARDWARE (AS NEEDED)
11	-	-	MOUNTING BRACKET (AS PER MTG KIT)
12	-	-	SHIMS (AS REQUIRED BY MTG KIT)



INSTALLATION OF FRONT RAILGEAR LEVER LOCK KIT

The following procedure details the installation of the front railgear kit as it pertains to the Front Railgear Lever Actuated Lock. The hardware required for one front installation is listed in Table 1.

Table 1: Railgear Kit Installation Parts

Part Number	Description	Qty
R-2900LF-B	Front Railgear Assembly, Lever Lock	REF
R-1600	Rail Wheel Assembly	REF
R-21102D	Rail Sweep	REF
R-21102P	Rail Sweep	REF
K-R29ARRXR290F	Lever Lock Kit	1
R-11144	"FRONT UNIT" Decal	REF

The components of the Front Lever Lock Kit are listed in Table 2 below.

Table 2: K-R29ARRXR290F - Front Lever Lock Kit

Part Number	Description	Qty
P-00029	Actuating Lever, Front	1
P-00028	Push Rod, Front (pre-assembled)	1
P-00023	Lock Pin (pre-assembled)	1
P-00027	Clevis (pre-assembled)	1
P-00030	Thrust Washer	1
R-990KIT-278	Installation Hardware Kit	1
R-3561	Spring (pre-assembled)	1

1. Refer to the Railgear Kit installation manual that was shipped with this Railgear Unit for installation procedures.

2. The Front Railgear Unit is shipped with the lever lock partially assembled. The remaining components are shipped loose with the railgear unit and will need to be installed at railgear installation.

3. Assemble the actuating lever to the front push rod using the supplied clevis pin and cotter pin. Assemble the actuating lever to the railgear upper frame assembly using the supplied 1/2" hardware and thrust washer.

4. The actuating lever may need to be modified by the installer as required to work with the individual vehicle installation.

5. Adjust the Lever Lock as described in the Operations section of this manual.

OPERATION OF FRONT RAILGEAR LEVER LOCK KIT

The front railgear lever lock is designed to automatically lock when the railgear unit is raised to the road position. It is important to ensure the lever lock is adjusted properly and in good working condition. It is also important that the lever is free from any vehicle obstruction that would hinder movement and/or operation.

Lever Lock Adjustment

Lock pin travel should be adjusted as follows:

1. Remove the cotter pin holding the lever to clevis.
2. Swing the lever out from between the clevis arms.
3. Loosen the jam nut securing the clevis to the front pushrod.
4. Holding the push rod, turn the clevis either in or out to adjust lock pin travel.
5. Turning the clevis in will increase the lock pin travel.
6. Assemble the lever to the clevis with the clevis pin.
7. Test the lock pin travel to ensure the lock pin is fully retracted.
8. If necessary, repeat steps 1 thru 7.
9. Tighten the clevis jam nut and attach the clevis cotter pin.

Lever Lock Operation

Placing the Vehicle on Rail – To Lower the Railgear:

1. Disengage the lock pin by pulling on the lock lever. Do not force. If the lock pin cannot be disengaged, raise the railgear slightly.

2. Hold the lock lever in the disengaged position.

3. Lower the railgear and release the lever 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. (If this is not the case, **DO NOT use the railgear**. Inspect the railgear for lubrication and damage.)

5. Continue lowering the railgear until the hydraulic cylinder is fully extended and the lock pin re-engages in the rail position. Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position; they have a hydraulic lock instead.

6. Ensure that the railgear is fully deployed and 2-3° over-center before proceeding.

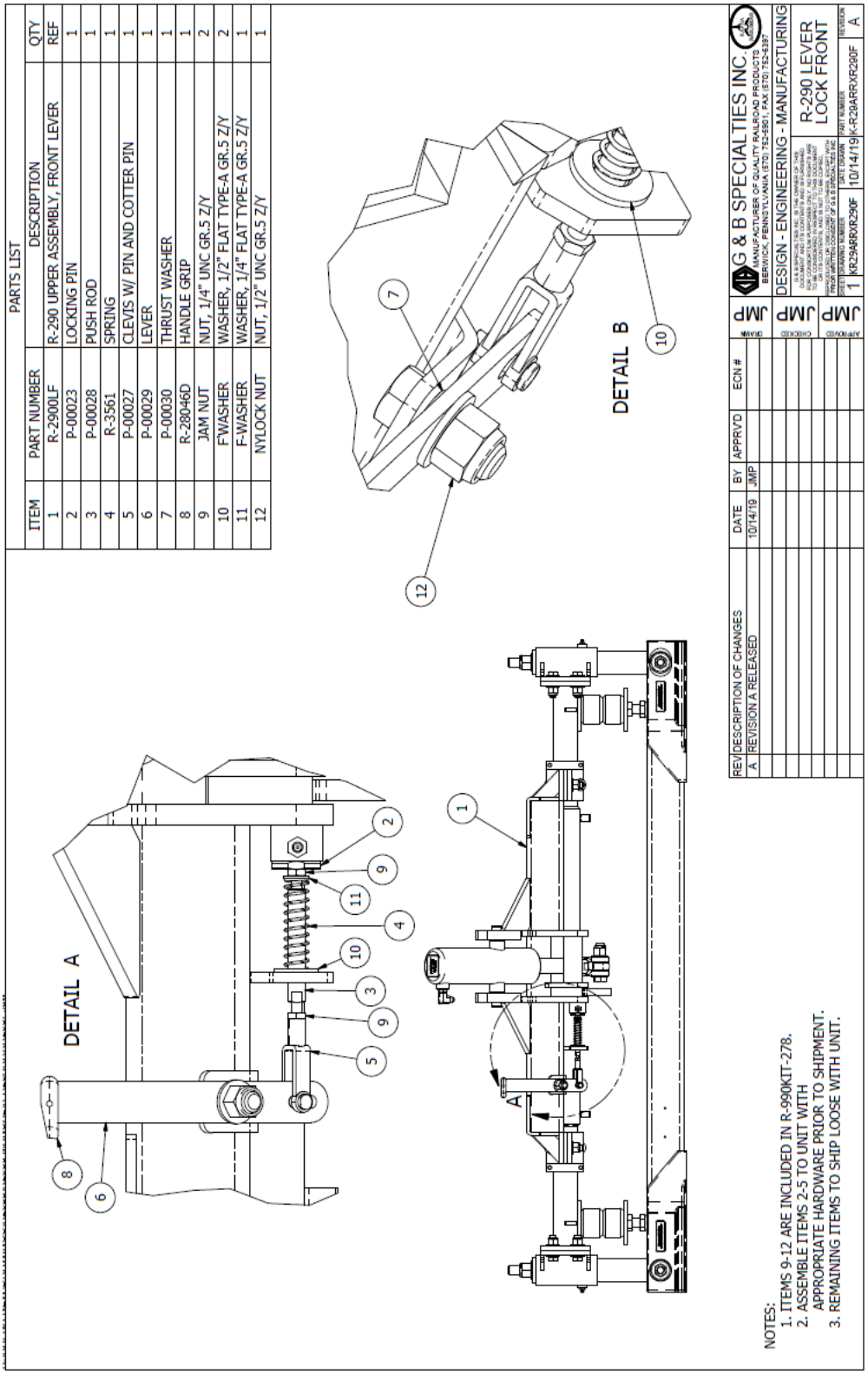
Removing the Vehicle from Rail – To Raise the Railgear:

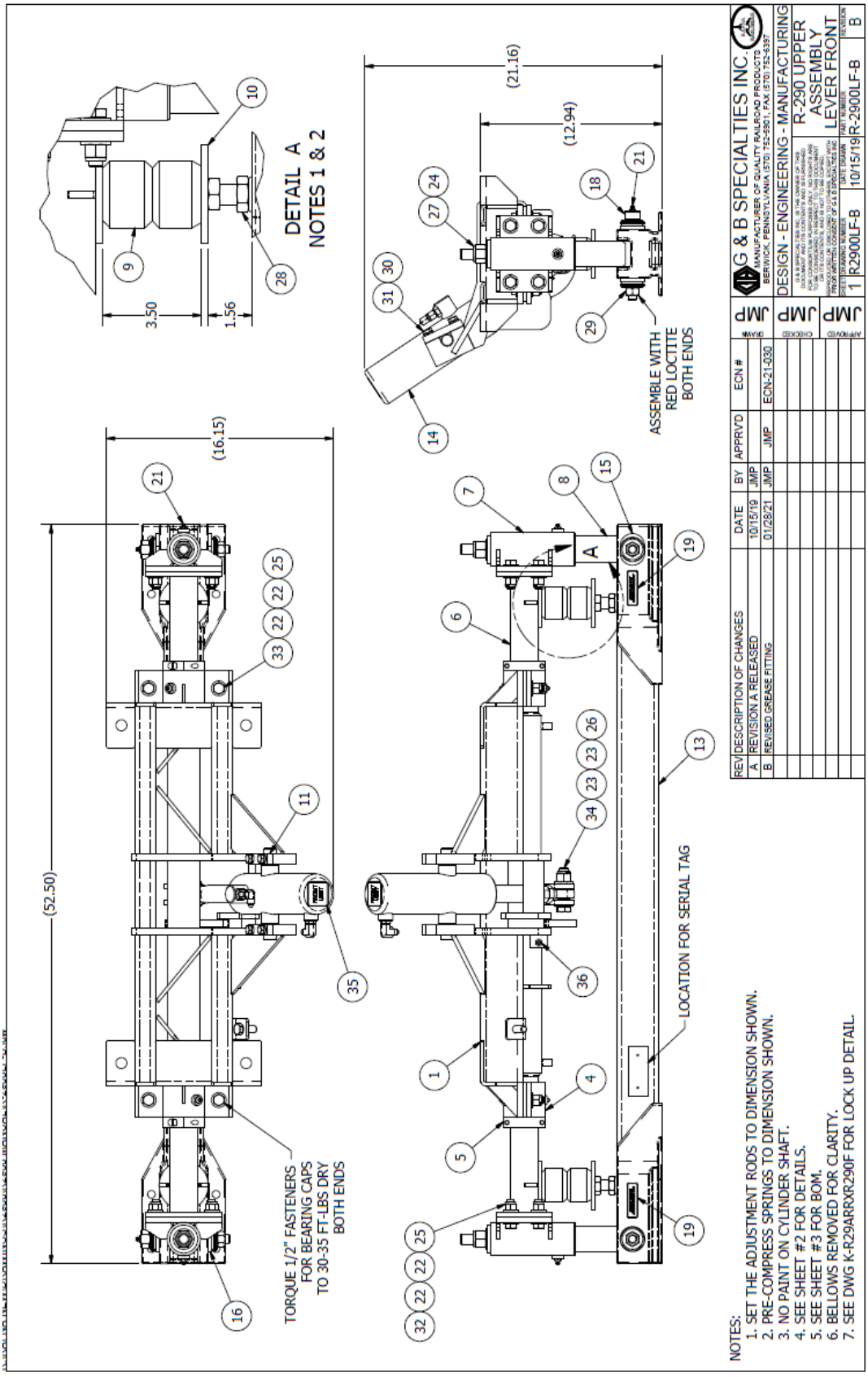
1. Disengage the lock pin by pulling on the lock lever. Do not force. If the lock pin cannot be disengaged, lower the railgear slightly. (Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position in which case the lock pin does not need to be disengaged.)

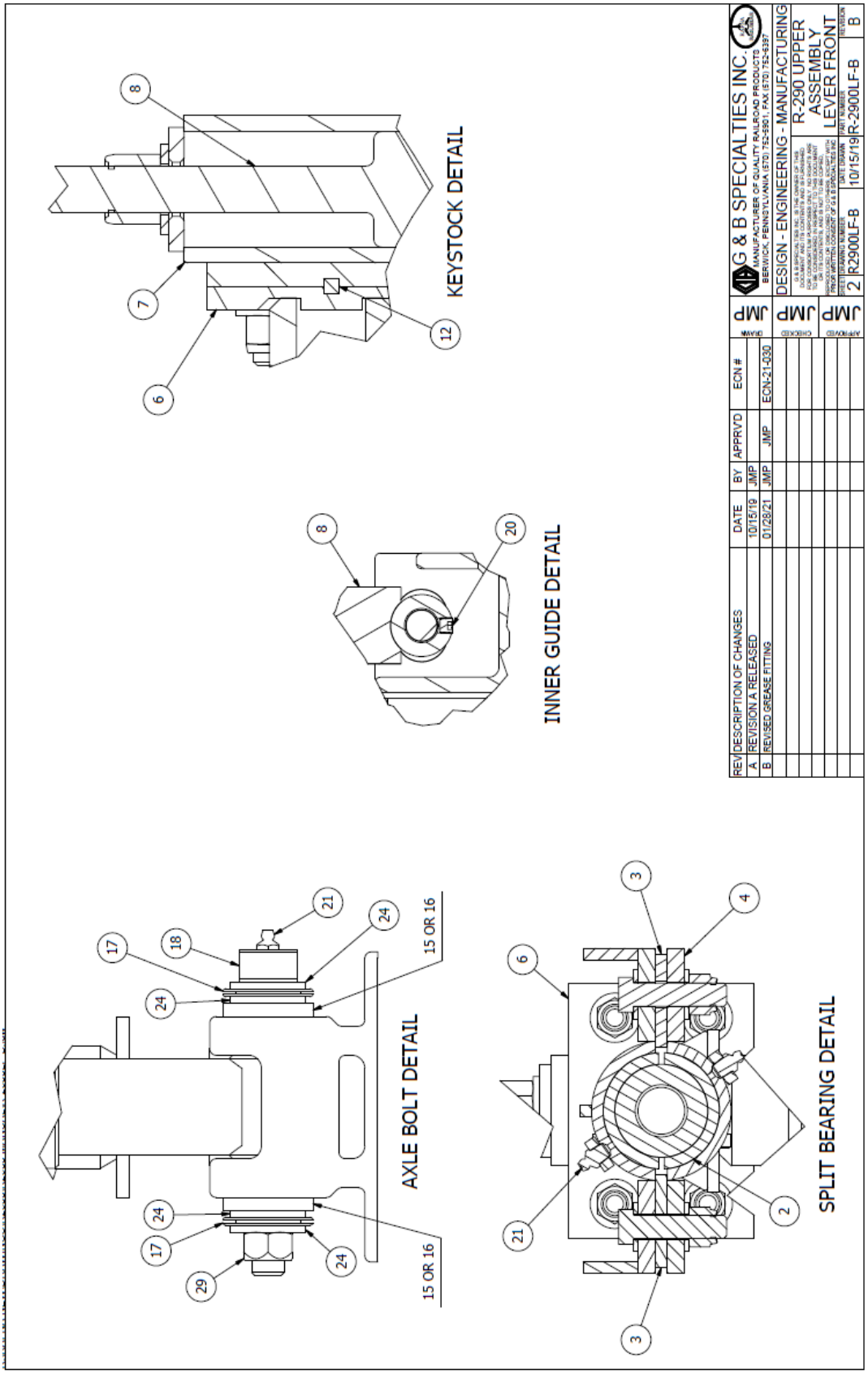
2. Raise the railgear and release the lever once the railgear has rotated past the rail locked position.

3. Continue raising the railgear until the lock pin clicks into the road locked position. The hydraulic cylinder should be completely retracted.

PARTS OF FRONT RAILGEAR LEVER LOCK KIT




DETAIL A
NOTES 1 & 2
(21.16)
(12.94)
(16.15)
(52.50)
3.50
1.56
ASSEMBLE WITH RED LOCTITE BOTH ENDS
TORQUE 1/2" FASTENERS FOR BEARING CAPS TO 30-35 FT-LBS DRY BOTH ENDS
LOCATION FOR SERIAL TAG
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER ASSEMBLY LEVER FRONT
DRAWING NUMBER R2900LF-B
DATE DRAWN 10/15/19
PART NUMBER R-2900LF-B
REVISION B
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 10/15/19 JMP
B REVISED GREASE FITTING 01/28/21 JMP JMP ECN-21-030
NOTES:
1. SET THE ADJUSTMENT RODS TO DIMENSION SHOWN.
2. PRE-COMPRESS SPRINGS TO DIMENSION SHOWN.
3. NO PAINT ON CYLINDER SHAFT.
4. SEE SHEET #2 FOR DETAILS.
5. SEE SHEET #3 FOR BOM.
6. BELLOWS REMOVED FOR CLARITY.
7. SEE DWG K-R29ARRXR290F FOR LOCK UP DETAIL.


KEYSTOCK DETAIL
INNER GUIDE DETAIL
AXLE BOLT DETAIL
SPLIT BEARING DETAIL
15 OR 16
15 OR 16
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER ASSEMBLY LEVER FRONT
PART NUMBER R-2900LF-B
DATE 10/15/19
REVISION B
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 10/15/19 JMP JMP ECN-21-030
B REVISED GREASE FITTING 01/28/21 JMP

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2910B	FRAME, UPPER CROSS	1
2	R-3618BRZ	SPLIT BEARING SET, BRONZE	2
3	R-3602A	SHIM	4
4	R-3602B	BEARING END CAP	2
5	R-2589	SPLIT COLLAR	2
6	R-2920	FRAME, LOWER CROSS	1
7	R-2941	OUTER GUIDE TUBE ASSEMBLY	2
8	R-2944	INNER GUIDE TUBE ASSEMBLY	2
9	R-130	SPRING, TIMBREN	2
10	R-2948	ADJUSTMENT ROD	2
11	R-2950	TRUNNION CAP	2
12	SB025-025	KEYSTOCK, 1/4" SQUARE X 4"	2
13	R-2930-1	AXLE	1
14	R-9115	HYDRAULIC CYLINDER ASSEMBLY	1
15	R-29041	SLOTTED BUSHING	2
16	R-29041A	BUSHING	2
17	R-1505	BELLOWS	2
18	R-29042	PIN	2
19	Z-LABEL025	LABEL, AXLE WARNING	2
20	R-125	PLUG, 1/8 NPT PIPE	2
21	990900-009	FITTING, 1/8 NPT STRAIGHT	9
22	990600-050-002	WASHER, 1/2" FLAT TYPE-A NARROW	24
23	990600-062-002	WASHER, 5/8" FLAT TYPE-A NARROW	2
24	990600-075-002	WASHER, 3/4" FLAT TYPE-A NARROW	10
25	990316-050-22	NUT, 1/2" NYLOCK GR.8 Z/Y	12
26	990316-062-22	NUT, 5/8" NYLOCK GR.8 Z/Y	1
27	990316-075-22	NUT, 3/4" NYLOCK GR.8 Z/Y	2
28	990330-075-02	NUT, 3/4" HVY HEX JAM Z/Y	2
29	038066-062-22	NUT, 5/8" TOPLOCK GR.9 Z/Y	2
30	990402-037-02	WASHER, 3/8" HVY LOCK Z/Y	4
31	990725-125-22	SCREW, 3/8" X 1-1/4" HHCS GR.8 Z/Y	4
32	990727-175-22	SCREW, 1/2" X 1-3/4" HHCS GR.8 Z/Y	8
33	990727-200-22	SCREW, 1/2" X 2" HHCS GR.8 Z/Y	4
34	990729-275-22	SCREW, 5/8" X 2-3/4" HHCS GR.8 Z/Y	1
35	R-11144	LABEL, FRONT UNIT	1
36	990900-023	FITTING, 1/8 NPT STRAIGHT - SHORT	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	10/15/19	JMP		
B	REVISED GREASE FITTING	01/28/21	JMP	JMP	ECN-21-030

DRAWN JMP
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-290 UPPER ASSEMBLY LEVER FRONT

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
3	R2900LF-B	10/15/19	R-2900LF-B	B

INSTALLATION OF REAR RAILGEAR ROD LOCK KIT

The following procedure details the installation of the rear railgear kit as it pertains to the Rear Railgear Rod Actuated Lock. The hardware required for one front installation is listed in Table 1.

Table 1: Railgear Kit Installation Parts

Part Number	Description	Qty
R-2900LR-B	Rear Railgear Assembly, Lever Lock	REF
R-1600	Rail Wheel Assembly	REF
R-21102D	Rail Sweep	REF
R-21102P	Rail Sweep	REF
K-R29ARRXR290R	Lever Lock Kit	1

The components of the Rear Rod Lock Kit are listed in Table 2 below.

Table 2: K-R29ARRXR290R - Rear Rod Lock Kit

Part Number	Description	Qty
P-00031	Push Rod, Lower	1
P-00032	Push Rod, Upper	1
P-00023	Lock Pin	1
R-3561	Spring (pre-assembled)	1
P-00024	Tie Plate	1
R-5652A	Knob	1
P-00034	Support Plate, Upper Rod	1
R-990KIT-279	Installation Hardware Kit	1

1. Refer to the Railgear Kit installation manual that was shipped with this Railgear Unit for installation procedures.

2. The Rear Railgear Unit is shipped with the rod lock partially assembled. The remaining components are shipped loose with the railgear unit and will need to be installed at railgear installation.

3. Once the railgear is installed at the correct mounting height, assemble the lower push rod to the upper push rod with the supplied tie plate. Locate and adjust the upper push rod as necessary.

4. The upper push rod may cut to length or otherwise modified by the installer as required to work with the individual vehicle installation.

5. Locate and install the upper rod support plate as necessary. Due to the length of the upper rod it is necessary to support the end of the rod to ensure proper operation. If the supplied support plate is not suitable, a proper support plate will need to be supplied by the installer.

OPERATION OF REAR RAILGEAR ROD LOCK KIT

The rear railgear rod lock is designed to automatically lock when the railgear unit is raised to the road position. It is important to ensure the rod lock is adjusted properly and in good working condition. It is also important that the rod is free from any vehicle obstruction that would hinder movement and/or operation.

Rod Lock Operation

Placing the Vehicle on Rail – To Lower the Railgear:

1. Disengage the lock pin by pulling on the upper push rod knob. Do not force. If the lock pin cannot be disengaged, raise the railgear slightly.

2. Hold the push rod in the disengaged position.

3. Lower the railgear and release the rod 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. (If this is not the case, **DO NOT use the railgear**. Inspect the railgear for lubrication and damage.)

5. Continue lowering the railgear until the hydraulic cylinder is fully extended and the lock pin re-engages in the rail position. Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position; they have a hydraulic lock instead.

6. Ensure that the railgear is fully deployed and 2-3° over-center before proceeding.

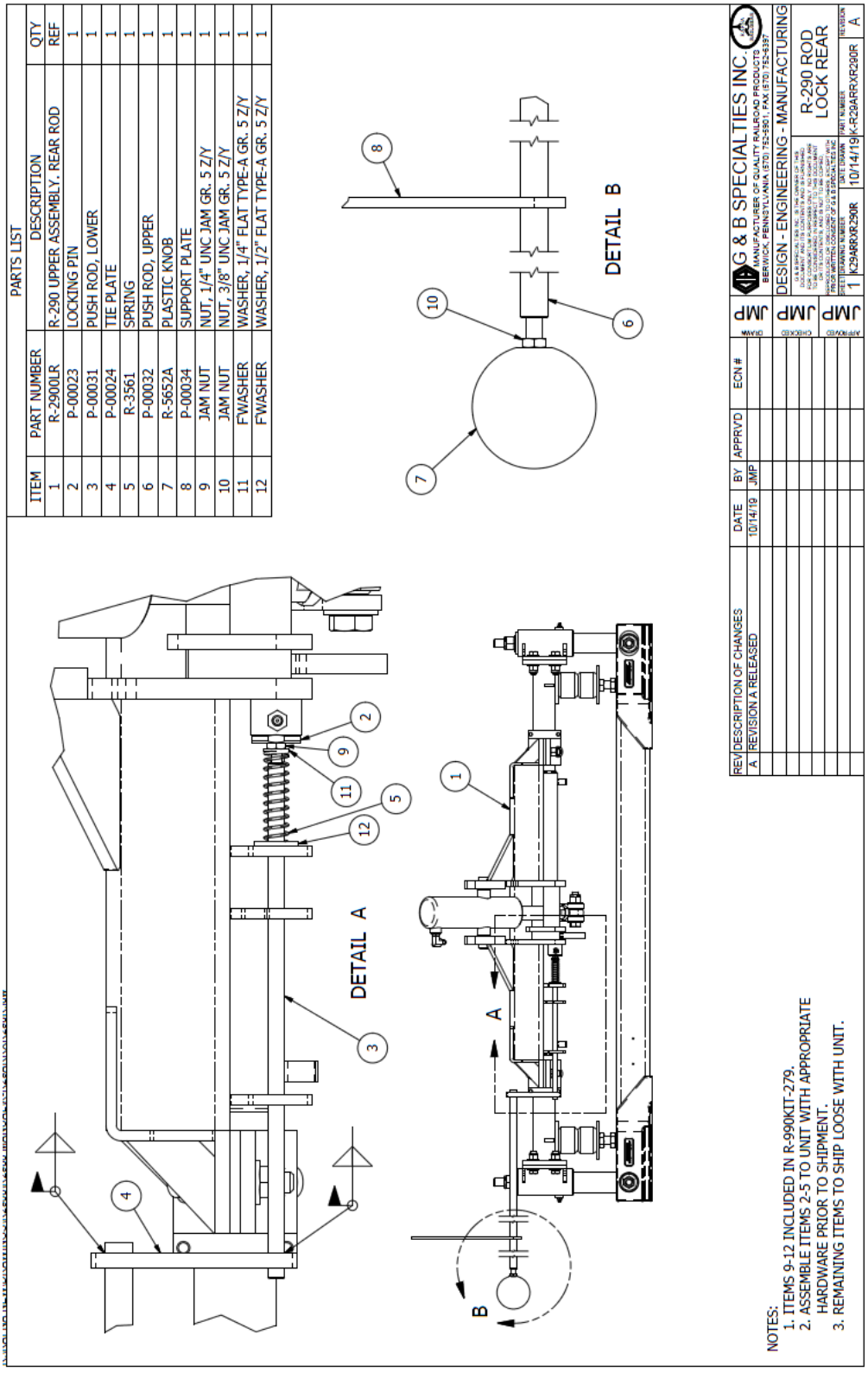
Removing the Vehicle from Rail – To Raise the Railgear:

1. Disengage the lock pin by pulling on upper push rod knob. Do not force. If the lock pin cannot be disengaged, lower the railgear slightly. (Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position in which case the lock pin does not need to be disengaged.)

2. Raise the railgear and release the rod once the railgear has rotated past the rail locked position.

3. Continue raising the railgear until the lock pin clicks into the road locked position. The hydraulic cylinder should be completely retracted.

PARTS OF REAR RAILGEAR ROD KIT



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2900LR	R-290 UPPER ASSEMBLY, REAR ROD	REF
2	P-00023	LOCKING PIN	1
3	P-00031	PUSH ROD, LOWER	1
4	P-00024	TIE PLATE	1
5	R-3561	SPRING	1
6	P-00032	PUSH ROD, UPPER	1
7	R-5652A	PLASTIC KNOB	1
8	P-00034	SUPPORT PLATE	1
9	JAM NUT	NUT, 1/4" UNC JAM GR. 5 Z/Y	1
10	JAM NUT	NUT, 3/8" UNC JAM GR. 5 Z/Y	1
11	FWASHER	WASHER, 1/4" FLAT TYPE-A GR. 5 Z/Y	1
12	FWASHER	WASHER, 1/2" FLAT TYPE-A GR. 5 Z/Y	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	10/14/19	JMP		

JMP DRAWN | JMP CHECKED | JMP APPROVED

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

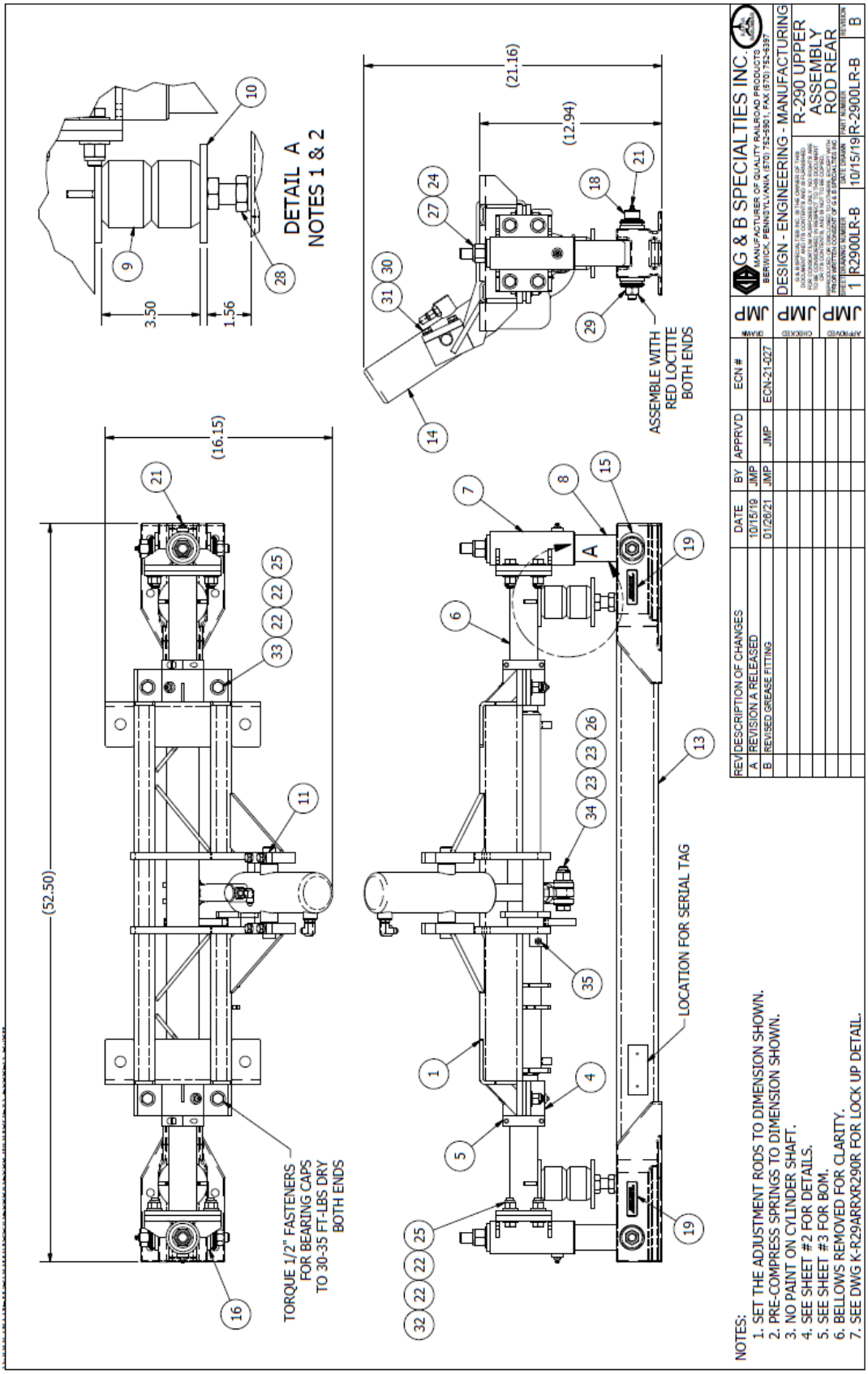
DESIGN - ENGINEERING - MANUFACTURING

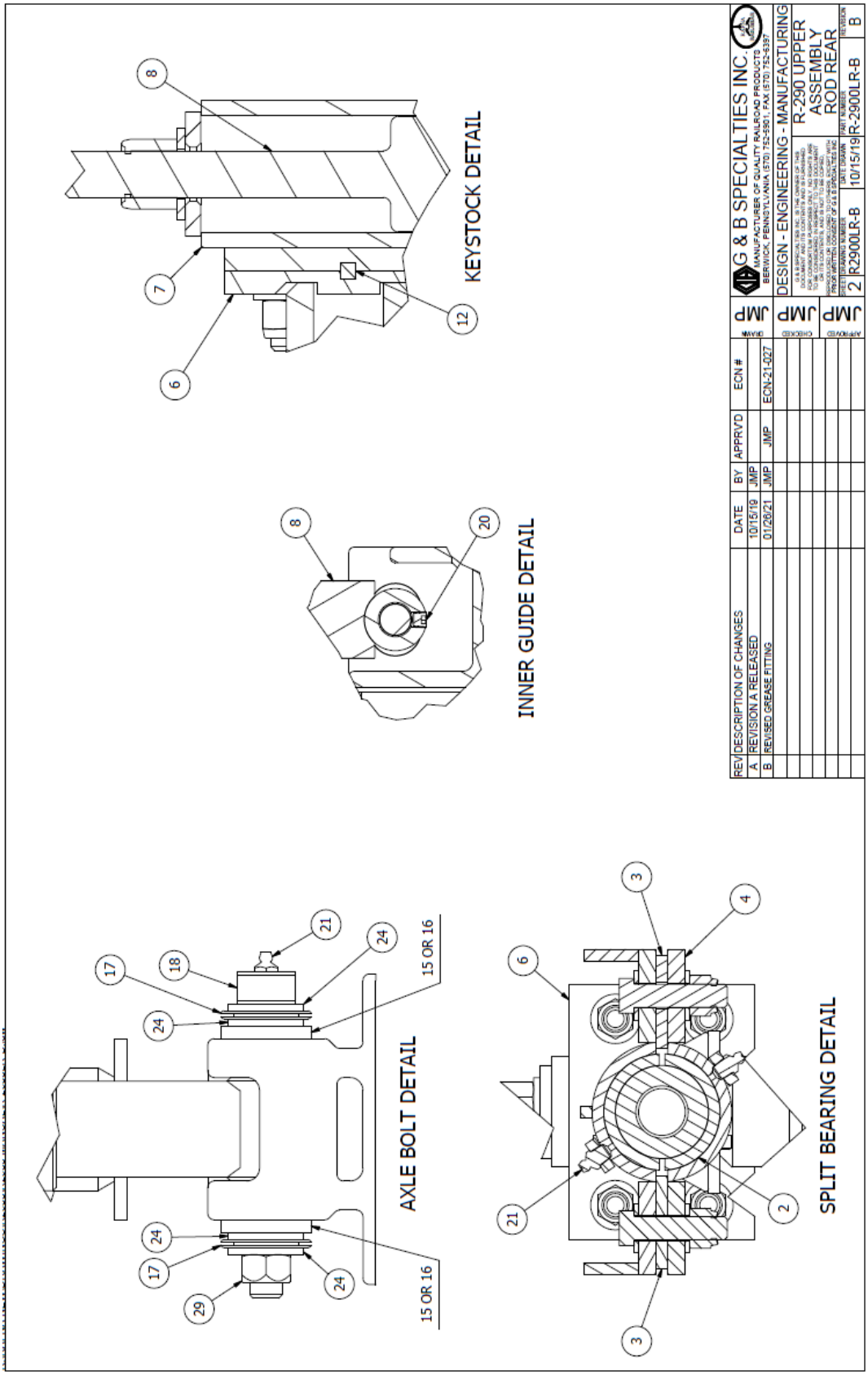
R-290 ROD LOCK REAR

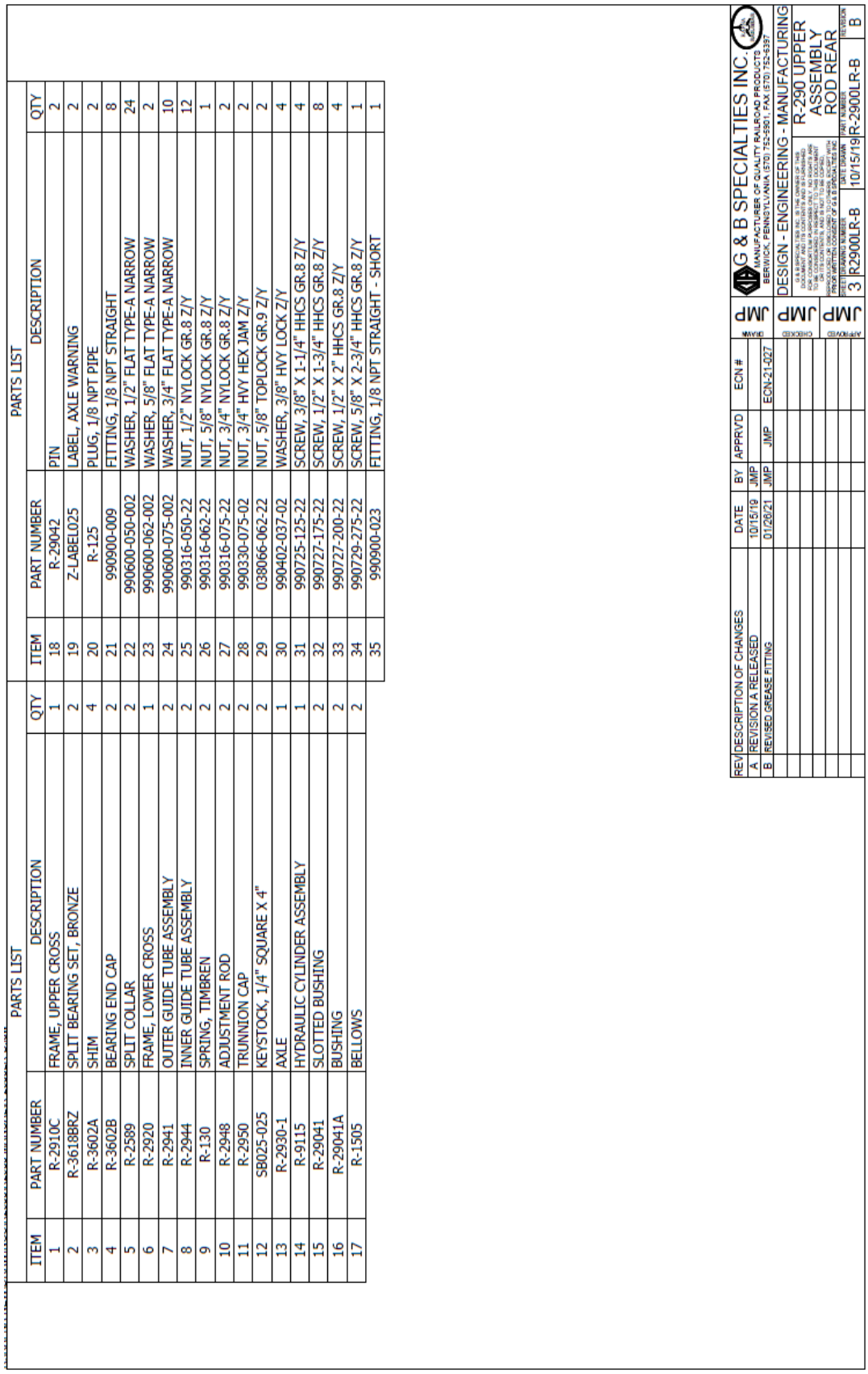
PART NUMBER	DATE
K29ARRXR290R	10/14/19

SIZE	DRAWING NO.	REVISION
A	K-R29ARRXR290R	A

NOTES:
1. ITEMS 9-12 INCLUDED IN R-990KIT-279.
2. ASSEMBLE ITEMS 2-5 TO UNIT WITH APPROPRIATE HARDWARE PRIOR TO SHIPMENT.
3. REMAINING ITEMS TO SHIP LOOSE WITH UNIT.


DETAIL A
NOTES 1 & 2
(21.16)
(12.94)
(16.15)
(52.50)
3.50
1.56
ASSEMBLE WITH RED LOCTITE BOTH ENDS
TORQUE 1/2" FASTENERS FOR BEARING CAPS TO 30-35 FT-LBS DRY BOTH ENDS
LOCATION FOR SERIAL TAG
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5861, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER ASSEMBLY ROD REAR
SIZE B
DRAWING NUMBER R2900LR-B
DATE 10/15/19
PART NUMBER R-2900LR-B
REVISION B
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 10/15/19 JMP
B REVISED GREASE FITTING 01/26/21 JMP JMP ECN-21-027
NOTES:
1. SET THE ADJUSTMENT RODS TO DIMENSION SHOWN.
2. PRE-COMPRESS SPRINGS TO DIMENSION SHOWN.
3. NO PAINT ON CYLINDER SHAFT.
4. SEE SHEET #2 FOR DETAILS.
5. SEE SHEET #3 FOR BOM.
6. BELLOWS REMOVED FOR CLARITY.
7. SEE DWG K-R29ARRXR290R FOR LOCK UP DETAIL.


KEYSTOCK DETAIL
INNER GUIDE DETAIL
AXLE BOLT DETAIL
SPLIT BEARING DETAIL
15 OR 16
15 OR 16
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER ASSEMBLY ROD REAR
R2900LR-B
10/15/19
R-2900LR-B
B
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 10/15/19 JMP
B REVISED GREASE FITTING 01/26/21 JMP ECN-21-027



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2910C	FRAME, UPPER CROSS	1
2	R-3618BRZ	SPLIT BEARING SET, BRONZE	2
3	R-3602A	SHIM	4
4	R-3602B	BEARING END CAP	2
5	R-2589	SPLIT COLLAR	2
6	R-2920	FRAME, LOWER CROSS	1
7	R-2941	OUTER GUIDE TUBE ASSEMBLY	2
8	R-2944	INNER GUIDE TUBE ASSEMBLY	2
9	R-130	SPRING, TIMBREN	2
10	R-2948	ADJUSTMENT ROD	2
11	R-2950	TRUNNION CAP	2
12	SB025-025	KEYSTOCK, 1/4" SQUARE X 4"	2
13	R-2930-1	AXLE	1
14	R-9115	HYDRAULIC CYLINDER ASSEMBLY	1
15	R-29041	SLOTTED BUSHING	2
16	R-29041A	BUSHING	2
17	R-1505	BELLOWS	2

PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
18	R-29042	PIN	2
19	Z-LABEL025	LABEL, AXLE WARNING	2
20	R-125	PLUG, 1/8 NPT PIPE	2
21	990900-009	FITTING, 1/8 NPT STRAIGHT	8
22	990600-050-002	WASHER, 1/2" FLAT TYPE-A NARROW	24
23	990600-062-002	WASHER, 5/8" FLAT TYPE-A NARROW	2
24	990600-075-002	WASHER, 3/4" FLAT TYPE-A NARROW	10
25	990316-050-22	NUT, 1/2" NYLOCK GR.8 Z/Y	12
26	990316-062-22	NUT, 5/8" NYLOCK GR.8 Z/Y	1
27	990316-075-22	NUT, 3/4" NYLOCK GR.8 Z/Y	2
28	990330-075-02	NUT, 3/4" HVY HEX JAM Z/Y	2
29	038066-062-22	NUT, 5/8" TOPLOCK GR.9 Z/Y	2
30	990402-037-02	WASHER, 3/8" HVY LOCK Z/Y	4
31	990725-125-22	SCREW, 3/8" X 1-1/4" HHCS GR.8 Z/Y	4
32	990727-175-22	SCREW, 1/2" X 1-3/4" HHCS GR.8 Z/Y	8
33	990727-200-22	SCREW, 1/2" X 2" HHCS GR.8 Z/Y	4
34	990729-275-22	SCREW, 5/8" X 2-3/4" HHCS GR.8 Z/Y	1
35	990900-023	FITTING, 1/8 NPT STRAIGHT - SHORT	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
A	REVISION A RELEASED	10/15/19	JMP		
B	REVISED GREASE FITTING	01/28/21	JMP	JMP	ECN-21-027

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

DESIGN - ENGINEERING - MANUFACTURING

R-290 UPPER ASSEMBLY ROD REAR

SIZE	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
3	R2900LR-B	10/15/19	R-2900LR-B	B

DIESEL EXHAUST MODIFICATION (2017 FORD SD F-250 THRU F-450 & CHASSIS CAB)

Applicable Installations:

R-290 Railgear installed on 2017 ~ CURRENT Ford F250/F350/F450/CHASSIS CAB, 6.7l *diesel* engines.

Recommendations:

Any alterations to the exhaust system of 2017 ~ Present, Ford Super Duty F-Series, must follow the guidelines of the Ford Document below.

Any alterations to the exhaust system of 2017 ~ Present, Ford Super Duty F-Series, must follow the guidelines of Ford Document Q-253.

Q-253

SVE BULLETIN

SPECIAL VEHICLE ENGINEERING – BODY BUILDERS ADVISORY SERVICE

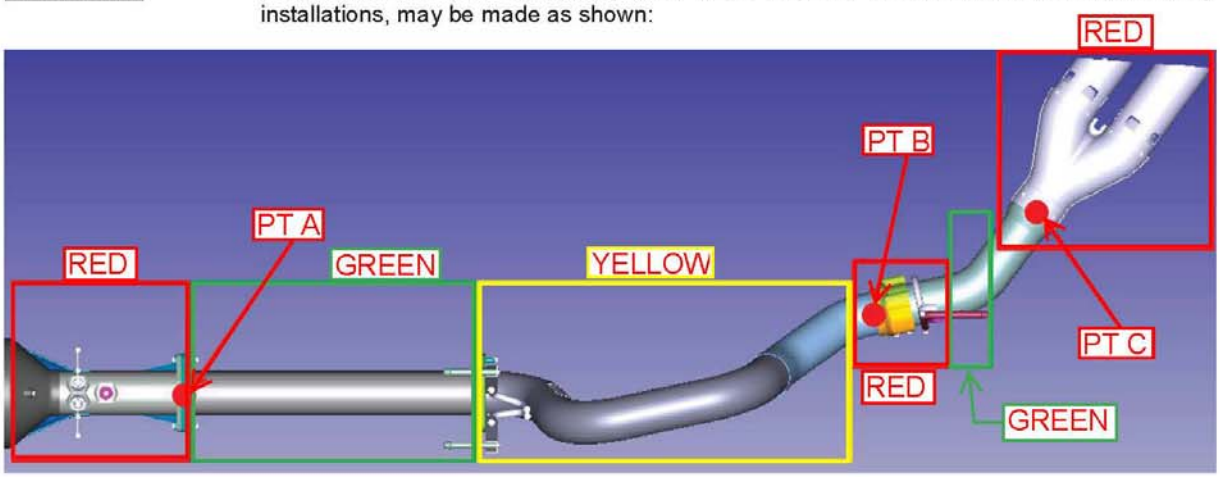
E-Mail via Website: www.fleet.ford.com/truckbbas (click "Contact Us")
Toll-free: (877) 840-4338

QVM Bulletin: Q-253 Date: 09 August, 2016

2017 MY F-Series Super Duty 6.7L Exhaust System Modifications

Models Affected: 2017 MY to present F-Series Super Duty Pickup (F-250/350/450) and Chassis Cab with 6.7L diesel engine.

Description: Modifications to the exhaust system, when required to accommodate service body installations, may be made as shown:



RED: Areas that CANNOT be modified due to durability or functional requirements.

YELLOW: Areas that are NOT RECOMMENDED for modification due to critical clearances to rear axle motion envelope.

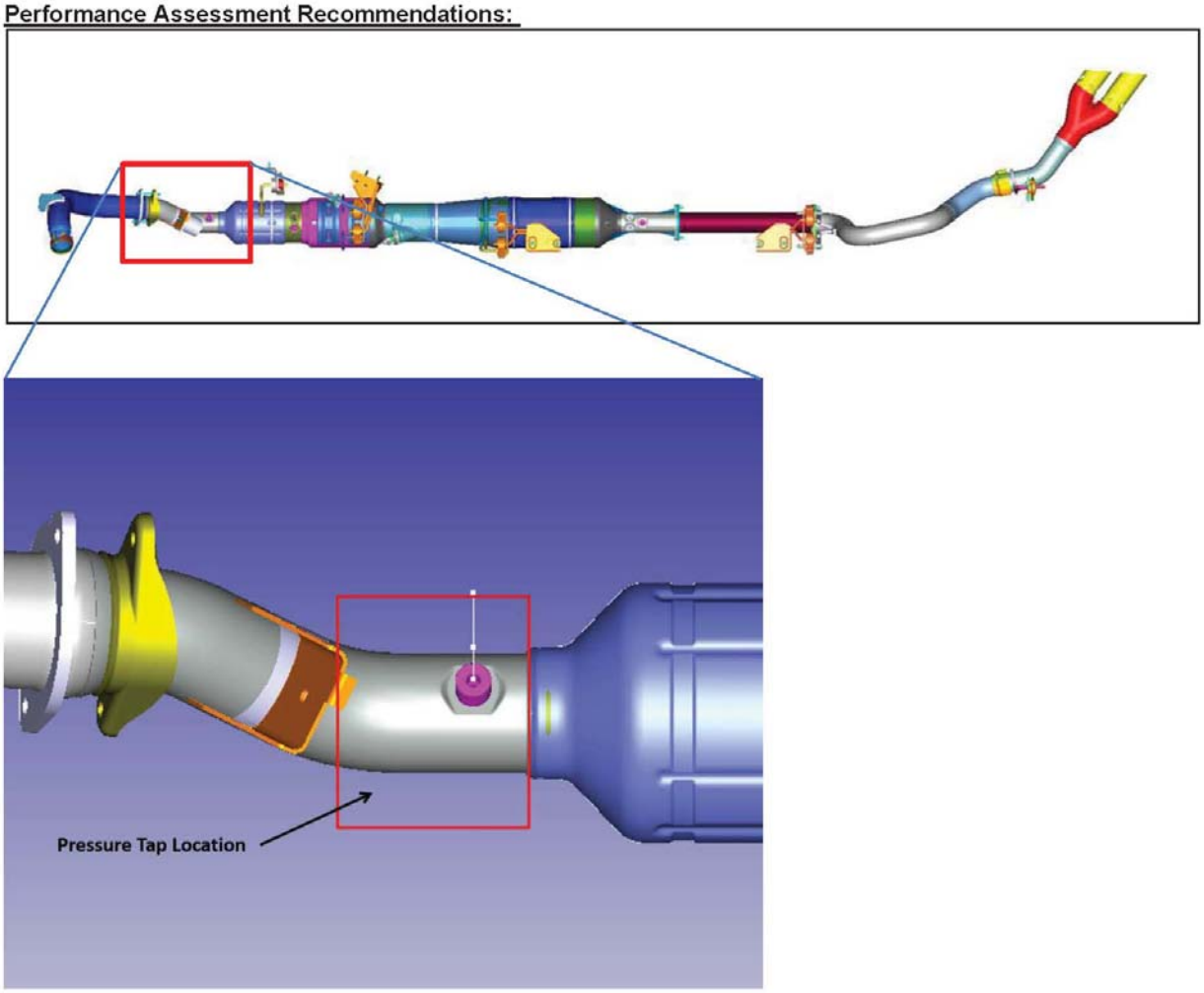
GREEN: Areas that are allowed to be modified.

PT A - PT B: Any modifications between Pts A – B must not shorten the centerline length between the two points to a length less than that of the shortest wheelbase. MIN Centerline Length = 1160 mm for reference.
PT B – PT C: Any modifications between Pts B – C must not shorten the centerline length between the two points and should be made using pipe diameter equivalent to the OEM assembly. MIN Centerline Length = 400 mm for reference.

Additional information:

- Dual tip diffuser cannot be removed or altered.
- Modifications must not change system restriction or alter the performance of the dual tip diffuser (see following performance assessment recommendations).
- Appropriate heat shielding must be utilized if required.

Performance Assessment Recommendations:



- Install a temporary pressure tap and suitable pressure measuring device upstream of the diesel oxidation catalyst
- Load vehicle and trailer to GVWR and operate the unit at WOT on a suitable grade.
- Record peak pressure reading.
- Repeat test following installation of aftermarket hardware to confirm equivalent pressure reading.
- Modify aftermarket hardware as required to achieve equivalent pressure readings.
- Modifications must not change backpressure (increase or decrease).

G&B Specialties Inc. 535 West 3rd Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397
US Field Service: 570-441-6988; CAN Field Service 570-854-0482**; www.rafna.com**

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 or rail position before starting road or rail travel respectively.
- 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.

OPERATION OF RAILGEAR KIT (STANDARD/IN-CAB CONTROLS)

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.

Refer to the Hydraulic Kit Operation, Service, and Parts manual for information on the location and operation of the railgear hydraulic system controls.

Placing the Vehicle on Rail – To Lower the Railgear:

1. Disengage the lock pin by pulling on the locking cable handle. If the lock pin 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. (If this is not the case, **DO NOT use the railgear**. Inspect the railgear for lubrication and damage.)

5. Continue lowering the railgear until the hydraulic cylinder is fully extended and the lock pin re-engages in the rail position. Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position; they have a hydraulic lock instead.

6. Ensure that the railgear is fully deployed and 2-3° over-center before proceeding.

Removing the Vehicle from Rail – To Raise the Railgear:

1. Disengage the lock pin by pulling on the locking cable handle. If the lock pin cannot be disengaged, lower the railgear slightly. Some railgear models have a lock cam converter installed to prevent the lock pin from engaging in the rail position in which case the lock pin does not need to be disengaged.

2. Raise the railgear and release the locking cable handle once the railgear has rotated past the rail locked position.

3. Continue raising the railgear until the lock pin clicks into the road locked position. The hydraulic cylinder should be completely retracted.

OPERATION OF RAILGEAR KIT (FULL IN-CAB CONTROLS)

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.

Refer to the Hydraulic Kit Operation, Service, and Parts manual for information on the location and operation of the railgear hydraulic system controls.

Placing the Vehicle on Rail – To Lower the Railgear:

1. Prior to approaching the rail crossing, remove the manual safety lock pins from the front and rear railgear. It may be necessary to raise the railgear off the lock pins. Store the lock pins in secure place in the vehicle.

2. Lower the railgear.

3. As the railgear is being deployed, it will start taking some of the vehicle's load. (If this is not the case, **DO NOT use the railgear**. Inspect the railgear for lubrication and damage.)

4. Continue lowering the railgear until the hydraulic cylinder is fully extended.

5. Ensure that the railgear is fully deployed and 2-3° over-center before proceeding.

Removing the Vehicle from Rail – To Raise the Railgear:

1. Raise the railgear.

2. Continue raising the railgear until the hydraulic cylinder is completely retracted.

3. Once the vehicle is clear of the rails, insert the manual safety lock pin through the lock guides.

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.

Non-standard fastener torque values relative to this railgear are shown in Figure 1. Table 2 provides all other Standard Fastener Torque Values.

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 miles)				✓	✓	✓
Check and adjust rail wheel load						✓
Check and adjust rail wheel alignment						✓
Check and repack rail wheel bearings						✓

Table 2: Standard Fastener Torque Values

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

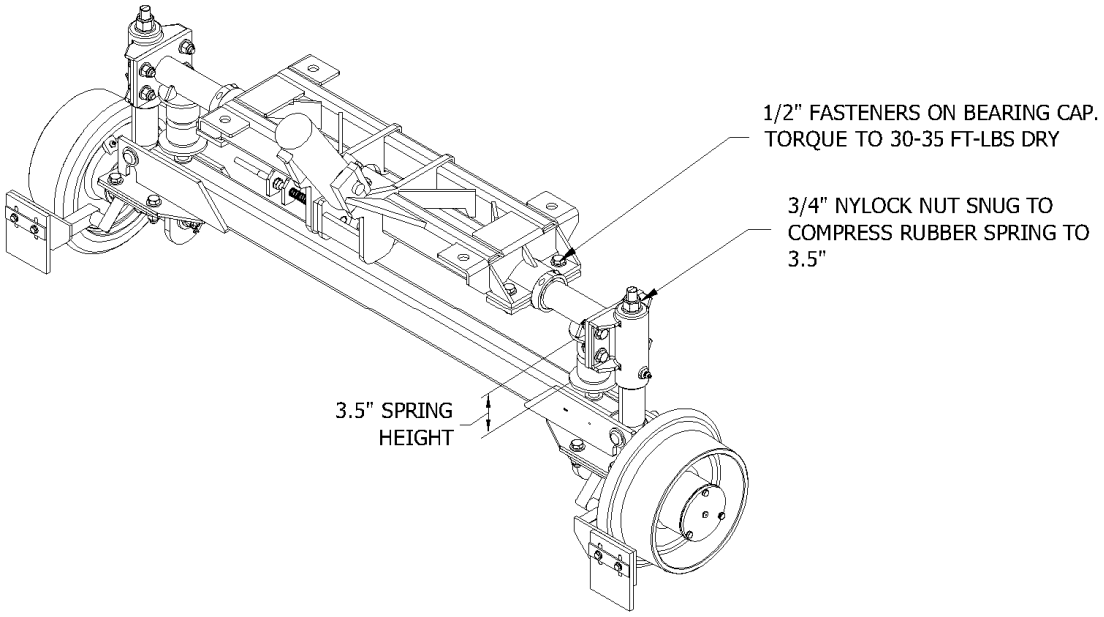


Figure 1: Non-Standard Fastener Torque Values

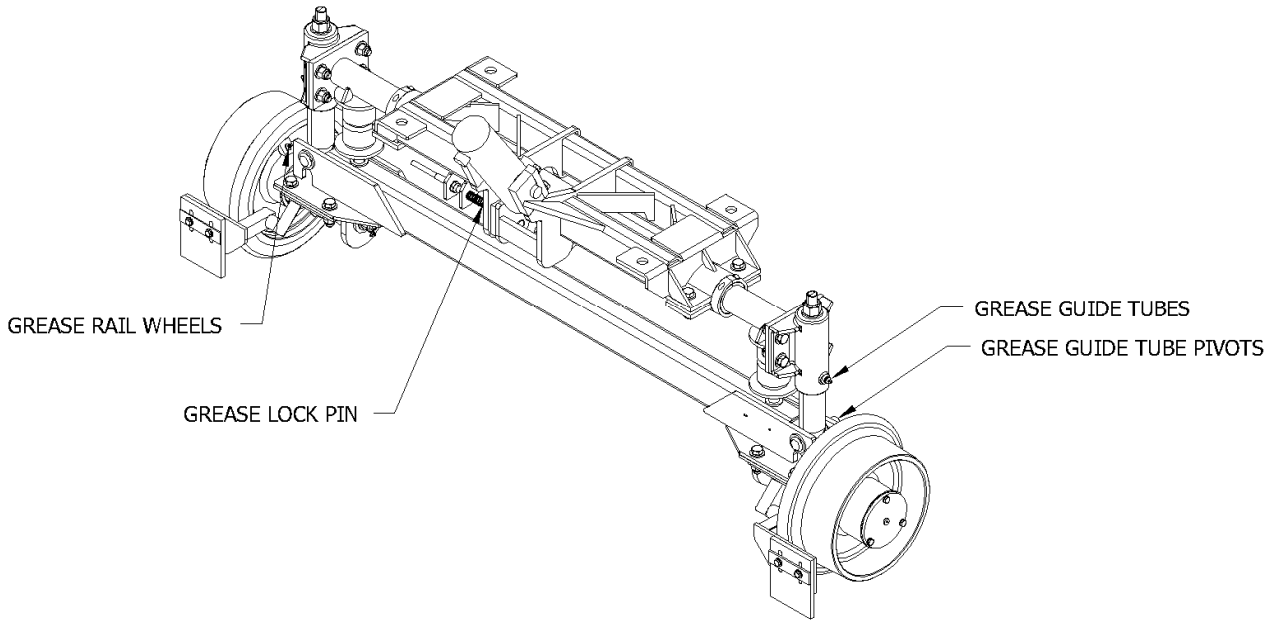


Figure 2: Lubrication Points

RAILGEAR OVER-CENTER ADJUSTMENT

The railgear is designed to rotate slightly past vertical into the rail position to provide a secondary safety feature in the event of a hydraulic and / or lock pin failure. With this additional rotation, the railgear would have to lift the vehicle before it could rotate out of the rail position. 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 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 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 ¾" 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. 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. 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.

6. With the railgear fully raised to the road position, ensure that the railgear lock pin properly engages the lock cam. It may be necessary to grind the lock cam slightly to ensure proper fit.

7. Note that some hydraulic kit installations provide a lock cam converter to prevent the railgear lock pin from engaging in the rail position. If such a lock cam converter was installed, skip this step. Otherwise, with the railgear fully lowered to the rail position, ensure that the railgear lock pin properly engages the lock cam. It may be necessary to grind the lock cam slightly to ensure proper fit.

RAIL WHEEL BEARING ADJUSTMENT

The rail wheel bearings require periodic adjustment to keep the end-play 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 end-play with the railgear in the road position and with the rail wheels free to turn.

Use a magnetic base dial gauge to measure the end-play of each rail wheel bearing. The bearing end-play 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 ¼" bolts and ¼" lock washers. Remove and discard the cotter pin from the ¾" 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 end-play 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 end-play 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 ¼" bolts and new ¼" split lock washers. Blue Loctite can be used on the bolts as an added safety measure. Tighten and torque the ¼" 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 ¼" fasteners which 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 ¼" 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 to avoid derailment. Likewise, a minimum amount of load must be maintained on the vehicle wheels to provide traction for acceleration and braking, this load at installation must be a minimum of 450 lbs and a maximum of 750 lbs and is checked as described below using a bottle jack equipped with a gauge.

The rail wheel load should be adjusted following the installation of the railgear and once the vehicle has had all 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 permanent vehicle equipment is changed, or the vehicle suspension settles or is changed. The rail wheel load should be checked at regular intervals that coincide with regular maintenance schedule for the vehicle or minimally once a year during vehicle annual FRA inspection. As non-permanent load is added to and/or removed from the vehicle, the rail wheel load will change also. This is acceptable if the weight ratings of the vehicle, axles, wheels, tires and railgear are not exceeded and if the minimum rail wheel load is maintained and the maximum wheel load of 750 lbs per wheel is not exceeded.

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 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, if necessary convert the pressure reading to a load reading using the supplied table

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 the railgear lower cross frame and each adjustment rod. The adjustment rods are threaded into the railgear axle. The rubber springs support the load between the lower cross frame and the axle while a ¾" Nylock nut on top of each guide tube prevents the axle from separating from the lower cross frame. The load on the rail wheels is adjusted by threading the adjustment rod into or out of the axle and moving the ¾" Nylock nut to keep the rubber springs compressed at 3.5" while in the road position. There must be at least two threads passing through the ¾" Nylock nut on top of the guide tubes. Both adjustment rods on the same railgear should be set at the same distance from the railgear axle.

1. Raise the railgear until the rail wheels are off the rails.

2. Loosen the ¾" jam nuts that secure the adjustment rods to the railgear axle and loosen the ¾" Nylock nuts on top of the outer guide tubes.

3. Screw the adjustment rods into the axle to decrease the rail wheel loads or out of the axle to increase the rail wheel loads.

4. Lower the railgear to the rail position and re-check the rail wheel loads. Re-adjust the rail wheel loads if necessary.

5. The distance between the top of the axle and the bottom of the adjustment rod plates once adjusted should not exceed 2.5". If the correct rail wheel load cannot be achieved within this maximum distance, then railgear mounting shims will have to be added between the railgear and the railgear mounting brackets. Likewise, if the adjustment rods are threaded completely into the axle and the rail wheel load is still too high, then railgear mounting shims will have be removed from between the railgear and the railgear mounting brackets. The railgear alignment will have to be checked if shims are added or removed.

6. Raise the railgear until the rail wheels are off the rails. Tighten the ¾" jam nuts on the adjustment rods against the axle. Tighten the ¾" Nylock nuts on top of the guide tubes so that the rubber springs are compressed to 3.5".

7. 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 bumper or exhaust, it can be trimmed and reinforced as required. Ensuring any exhaust system modifications conform to applicable laws and regulations.

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. G&B Specialties can also supply a special alignment tool kit (order part number R-066U) with which separate instructions are supplied.

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 ½" fasteners which secure it to the railgear axle. The rail wheel is then turned into alignment. The four ½" fasteners should then be tightened and torqued to 100 ft.-lbs dry. Do not over torque.

The railgear is aligned laterally by loosening the four ¾" fasteners which secure it to the mounting plates. The railgear is then moved sideways into alignment. It may be necessary to raise the railgear off the rails to move the railgear side to side. Do not use any force against the railgear guide tubes as this may damage them and restrict suspension movement. The four ¾" fasteners should then be tightened and torqued to 175 ft.-lbs dry. Do not over torque.

Refer to Figure 3 for alignment measurement and specifications. Use an 18" magnetic straight edge on the back of each rail wheel to measure from.

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.

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.

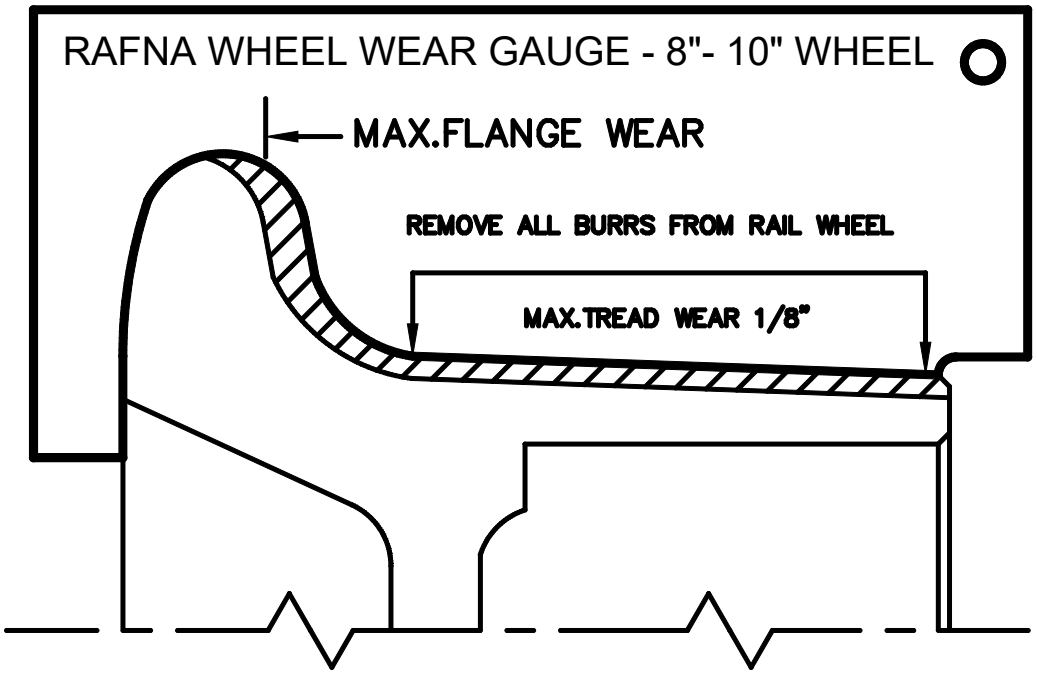
The gauge for the R-290 model railgear can be ordered using the following part number; S-001200

- **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



R-290 RAILGEAR – 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. **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. _____ Front & rear railgear over-center adjusted (see manuals for procedure)
3. _____ Rail sweeps adjusted (see manuals for procedure)
4. _____ Rail wheel load adjusted (see manuals & fill out values on alignment sheet)
5. _____ Rail wheel alignment performed (attach copy of alignment sheet)
6. _____ Front & rear railgear lock systems engage/disengage smoothly
7. _____ Lock cam converters installed on In-Cab Controls models only
8. _____ Safety lock pins installed on Full-In-Cab Controls models only
9. _____ Railgear components clear all vehicle component thru full range of motion
10. _____ Railgear operating decals installed next to controls
11. _____ Railgear pump decal installed next to dash switch (standard control models)
12. _____ Railgear manifold decals installed on manual over-rides
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. _____ Vehicle turning stop blocks installed
17. _____ Wheel and spacer lug nuts tightened (see manuals for specifications)
18. _____ Wheel lug nut torque value decals installed on wheels
19. _____ Wheels & tires clear all vehicle components thru full range of motion

Hydraulic Checks

20. _____ Hydraulic lock valves installed with correct orientation (ICC & FCC only)
21. _____ Air bled from railgear hydraulic system
22. _____ Pump tank filled as required with hydraulic fluid
23. _____ Railgear pump relief valve adjusted (see manuals for procedure)
24. _____ All hydraulic hoses clear of hot / sharp edges and tied back
25. _____ No hydraulic oil leaks – at pump, manifold, hoses, fittings, and cylinders

Electrical Checks

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

Miscellaneous Checks

30. _____ All welded / heated / bare metal painted
31. _____ Exterior railgear controls operate railgear correctly
32. _____ In-Cab controls operate railgear correctly (ICC and FCC only)
33. _____ Emergency hand pump and manifold over-rides 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
38. _____ Alter exhaust pipe to clear rail gear
39. _____ Install new tire pressure stickers.
40. _____ Reprogram TPS sensors.

Installed By: _____ Inspected By: _____

Company: _____ Company: _____

Comments:

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"

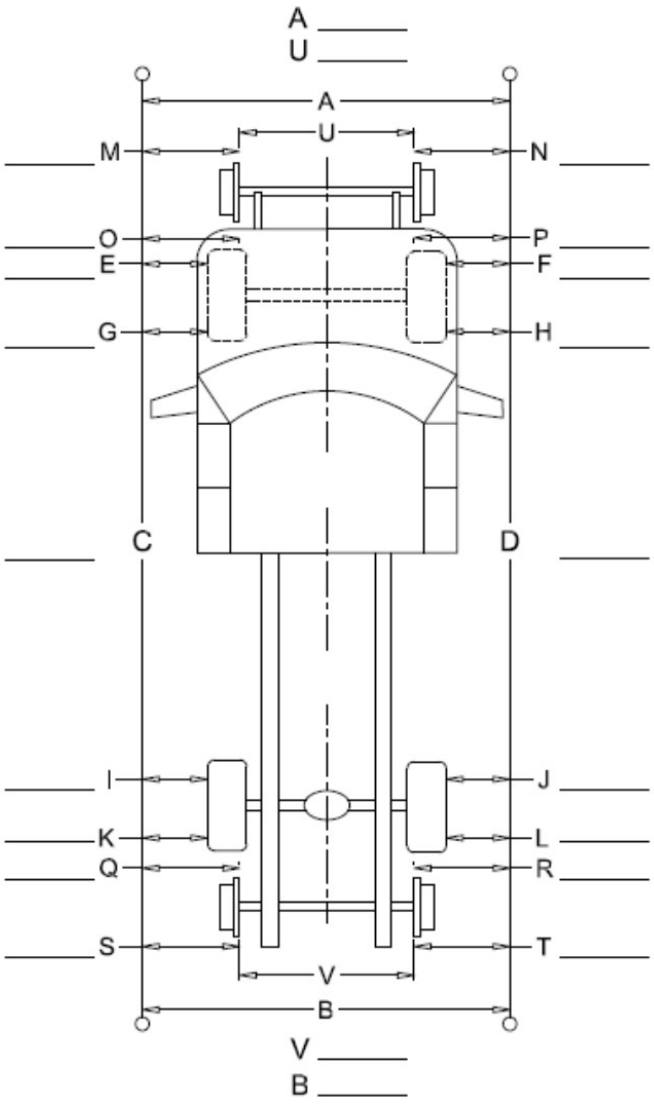
ADJUST RAILGEAR LATERAL ALIGNMENT
M & O MUST EQUAL N & P WITHIN 1/8"
Q & S MUST EQUAL R & T WITHIN 1/8"

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: _____

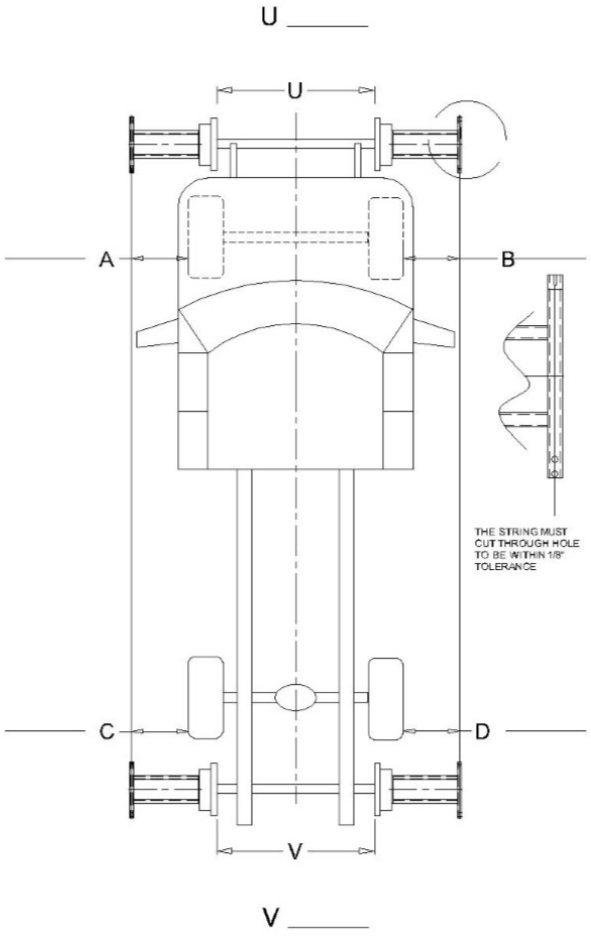
ADJUST RAILGEAR LATERAL ALIGNMENT
A MUST EQUAL B WITHIN 1/8"
C MUST EQUAL D WITHIN 1/8"

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: _____

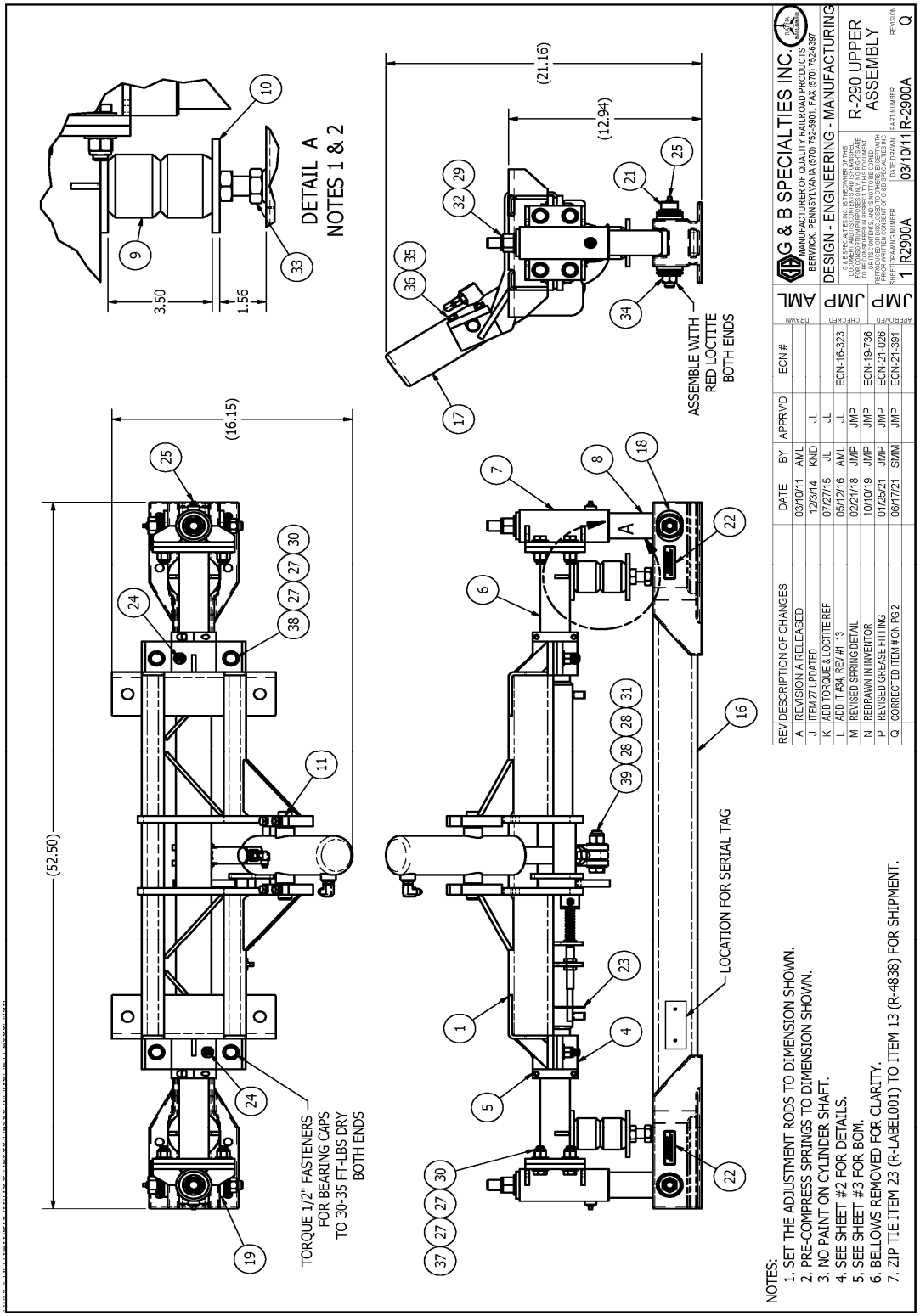
OEM: VEHICLE WEIGHT: _____ FRONT GAWR: _____ REAR GAWR: _____

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

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

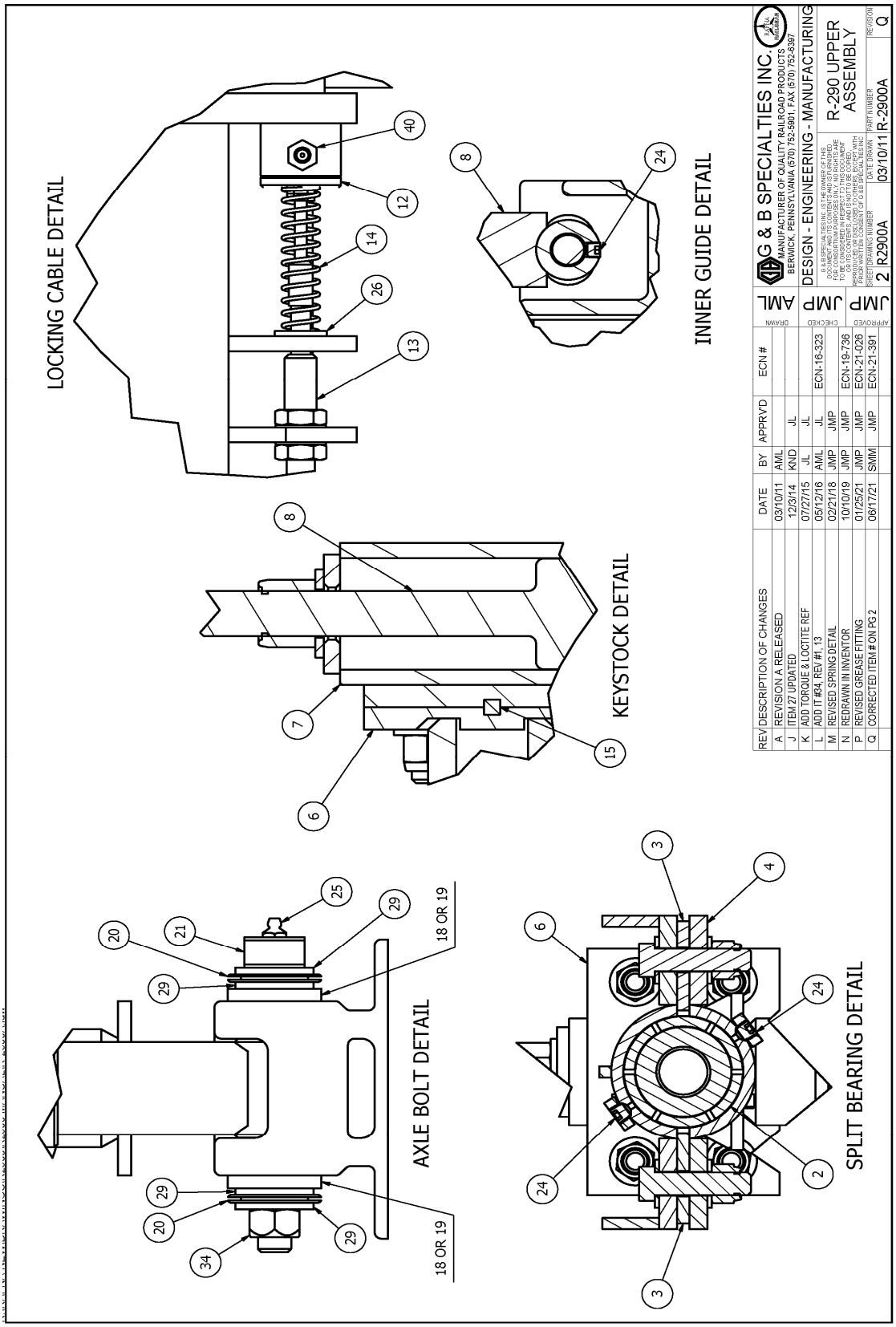
MAY 31, 2018 REV B

PARTS OF RAILGEAR KIT



REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	03/10/11	AML		
J	ITEM 27 UPDATED	12/3/14	KND	JL	
K	ADD TORQUE & LOCTITE REF	07/27/15	JL	JL	ECN-16-323
L	ADD IT #34, REV #1, 13	05/12/16	AML	JL	
M	REVISED SPRING DETAIL	02/21/18	JMP	JMP	
N	REDRAWN IN INVENTOR	10/10/19	JMP	JMP	ECN-19-736
P	REVISED GREASE FITTING	01/25/21	JMP	JMP	ECN-21-026
Q	CORRECTED ITEM # ON PG 2	06/17/21	SMM	JMP	ECN-21-391

R-2900A (STD/ICC)



R-2900A (STD/ICC)

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2910	FRAME, UPPER CROSS	1
2	R-3618	SPLIT BEARING SET, NYLON	2
3	R-3602A	SHIM	4
4	R-3602B	BEARING END CAP	2
5	R-2589	SPLIT COLLAR	2
6	R-2920	FRAME, LOWER CROSS	1
7	R-2941	OUTER GUIDE TUBE ASSEMBLY	2
8	R-2944	INNER GUIDE TUBE ASSEMBLY	2
9	R-130	SPRING, TIMBREN	2
10	R-2948	ADJUSTMENT ROD	2
11	R-2950	TRUNNION CAP	2
12	R-2940	LOCKING PIN	1
13	R-4838	LOCKING CABLE ASSEMBLY	1
14	R-3561	SPRING	1
15	SB025-025	KEYSTOCK, 1/4" SQUARE X 4"	2
16	R-2930-1	AXLE	1
17	R-9115	HYDRAULIC CYLINDER ASSEMBLY	1
18	R-29041	SLOTTED BUSHING	2
19	R-29041A	BUSHING	2
20	R-1505	BELLOWS	2

ITEM	PART NUMBER	DESCRIPTION	QTY
21	R-29042	PIN	2
22	Z-LABEL025	LABEL, AXLE WARNING	2
23	R-LABEL001	LABEL, PULL TO UNLOCK	1
24	R-125	PLUG, 1/8 NPT PIPE	6
25	990900-009	FITTING, 1/8 NPT STRAIGHT	4
26	990600-037-002	WASHER, 3/8" FLAT TYPE-A NARROW	1
27	990600-050-002	WASHER, 1/2" FLAT TYPE-A NARROW	24
28	990600-062-002	WASHER, 5/8" FLAT TYPE-A NARROW	2
29	990600-075-002	WASHER, 3/4" FLAT TYPE-A NARROW	10
30	990316-050-22	NUT, 1/2" NYLOCK GR.8 Z/Y	12
31	990316-062-22	NUT, 5/8" NYLOCK GR.8 Z/Y	1
32	990316-075-22	NUT, 3/4" NYLOCK GR.8 Z/Y	2
33	990330-075-02	NUT, 3/4" HVY HEX JAM Z/Y	2
34	038066-062-22	NUT, 5/8" TOPLOCK GR.9 Z/Y	2
35	990402-037-02	WASHER, 3/8" HVY LOCK Z/Y	4
36	990725-125-22	SCREW, 3/8" X 1-1/4" HHCS GR.8 Z/Y	4
37	990727-175-22	SCREW, 1/2" X 1-3/4" HHCS GR.8 Z/Y	8
38	990727-200-22	SCREW, 1/2" X 2" HHCS GR.8 Z/Y	4
39	990729-275-22	SCREW, 5/8" X 2-3/4" HHCS GR.8 Z/Y	1
40	990900-023	FITTING, 1/8 NPT STRAIGHT - SHORT	1

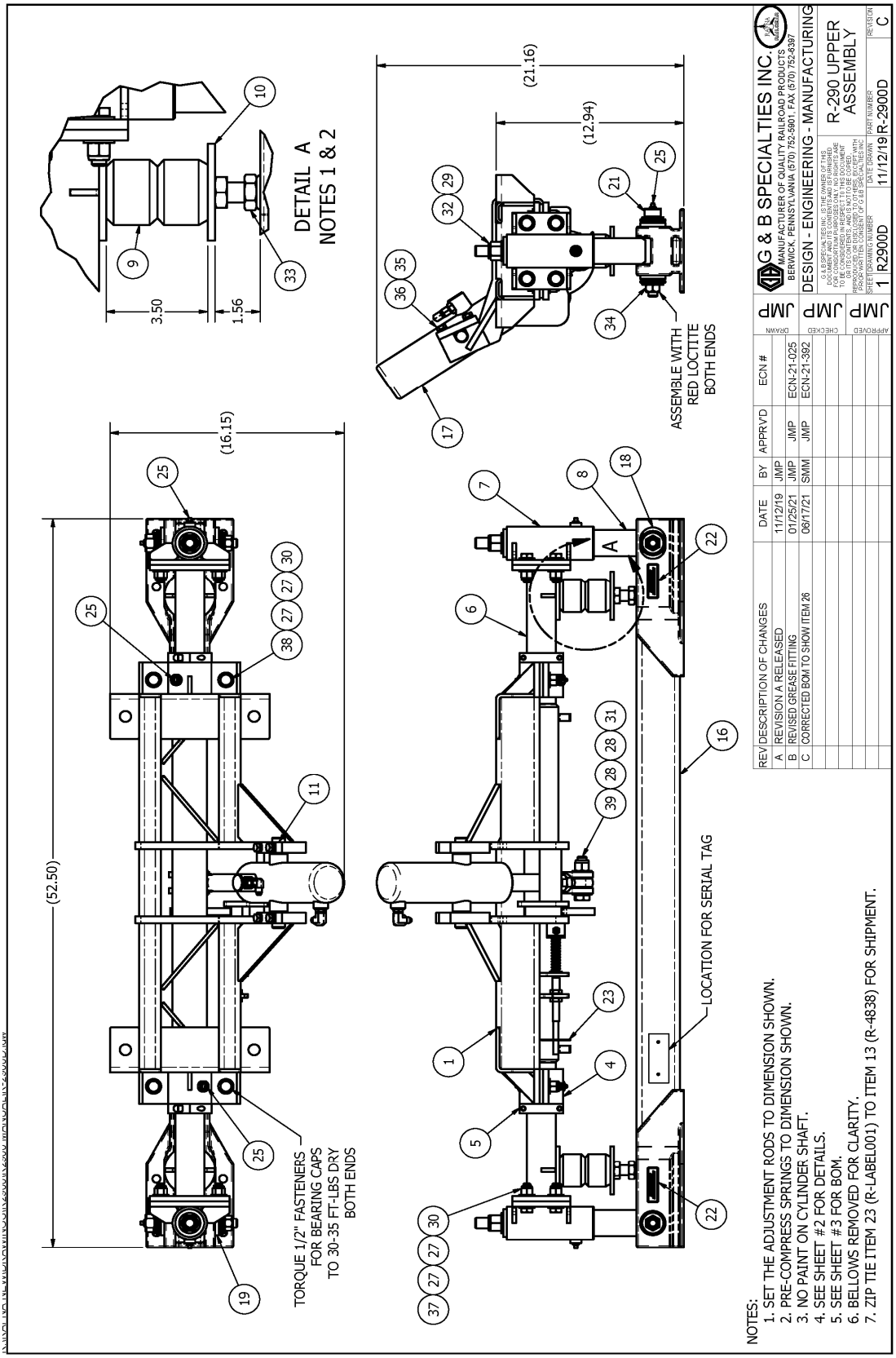
REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
A	REVISION A RELEASED	03/10/11	AML		
J	ITEM 27 UPDATED	12/03/14	KND	JL	
K	ADD TORQUE & LOCTITE REF	07/27/15	JL	JL	ECN-16-323
L	ADD IT #34, REV #1, 13	05/12/16	AML	JL	
M	REVISED SPRING DETAIL	02/21/18	JMP	JMP	
N	REDRAWN IN INVENTOR	10/10/19	JMP	JMP	ECN-19-736
P	REVISED GREASE FITTING	01/25/21	JMP	JMP	ECN-21-026
Q	CORRECTED ITEM # ON PG 2	08/17/21	SMM	JMP	ECN-21-391

DRAWN: AML
CHECKED: JMP
APPROVED: JMP

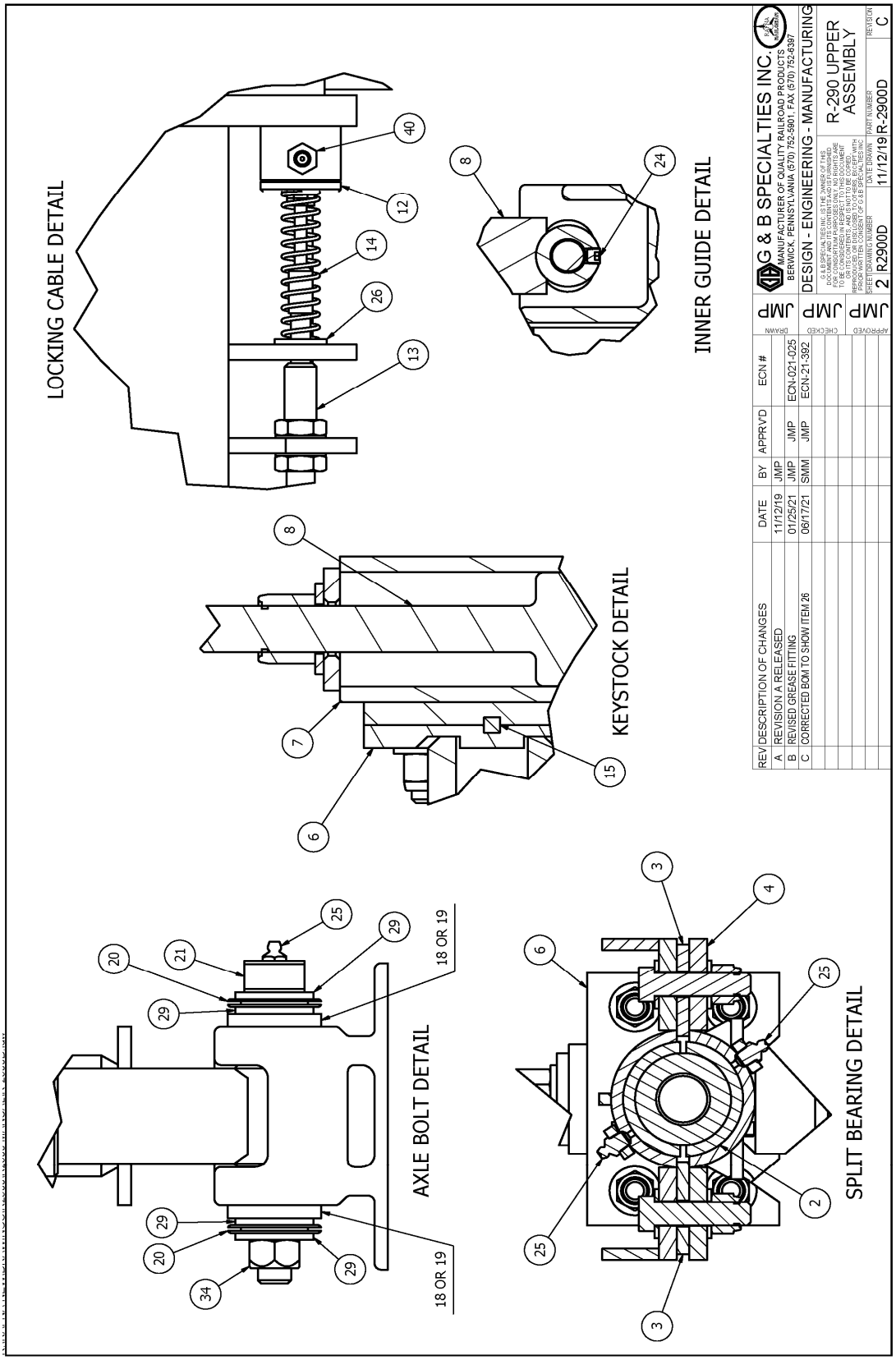
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

R-2900A (STD/ICC)



R-2900D (STD/ICC WITH BRONZE BUSHINGS)



R-2900D (STD/ICC WITH BRONZE BUSHINGS)

PARTS LIST				PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2910	FRAME, UPPER CROSS	1	21	R-29042	PIN	2
2	R-3618	SPLIT BEARING SET, BRONZE	2	22	Z-LABEL025	LABEL, AXLE WARNING	2
3	R-3602A	SHIM	4	23	R-LABEL001	LABEL, PULL TO UNLOCK	1
4	R-3602B	BEARING END CAP	2	24	R-125	PLUG, 1/8 NPT PIPE	2
5	R-2589	SPLIT COLLAR	2	25	990900-009	FITTING, 1/8 NPT STRAIGHT	8
6	R-2920	FRAME, LOWER CROSS	1	26	990600-037-002	WASHER, 3/8"" FLAT TYPE-A NARROW	1
7	R-2941	OUTER GUIDE TUBE ASSEMBLY	2	27	990600-050-002	WASHER, 1/2" FLAT TYPE-A NARROW	24
8	R-2944	INNER GUIDE TUBE ASSEMBLY	2	28	990600-062-002	WASHER, 5/8" FLAT TYPE-A NARROW	2
9	R-130	SPRING, TIMBREN	2	29	990600-075-002	WASHER, 3/4" FLAT TYPE-A NARROW	10
10	R-2948	ADJUSTMENT ROD	2	30	990316-050-22	NUT, 1/2" NYLOCK GR.8 Z/Y	12
11	R-2950	TRUNNION CAP	2	31	990316-062-22	NUT, 5/8" NYLOCK GR.8 Z/Y	1
12	R-2940	LOCKING PIN	1	32	990316-075-22	NUT, 3/4" NYLOCK GR.8 Z/Y	2
13	R-4838	LOCKING CABLE ASSEMBLY	1	33	990330-075-02	NUT, 3/4" HVY HEX JAM Z/Y	2
14	R-3561	SPRING	1	34	038066-062-22	NUT, 5/8" TOPLOCK GR.9 Z/Y	2
15	SB025-025	KEYSTOCK, 1/4" SQUARE X 4"	2	35	990402-037-02	WASHER, 3/8" HVY LOCK Z/Y	4
16	R-2930-1	AXLE	1	36	990725-125-22	SCREW, 3/8" X 1-1/4" HHCS GR.8 Z/Y	4
17	R-9115	HYDRAULIC CYLINDER ASSEMBLY	1	37	990727-175-22	SCREW, 1/2" X 1-3/4" HHCS GR.8 Z/Y	8
18	R-29041	SLOTTED BUSHING	2	38	990727-200-22	SCREW, 1/2" X 2" HHCS GR.8 Z/Y	4
19	R-29041A	BUSHING	2	39	990729-275-22	SCREW, 5/8" X 2-3/4" HHCS GR.8 Z/Y	1
20	R-1505	BELLOWS	2	40	990900-023	FITTING, 1/8 NPT STRAIGHT - SHORT	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	11/12/19	JMP		
B	REVISED GREASE FITTING	01/25/21	JMP	JMP	ECN-21-025
C	CORRECTED BOM TO SHOW ITEM 26	06/17/21	SMM	JMP	ECN-21-392

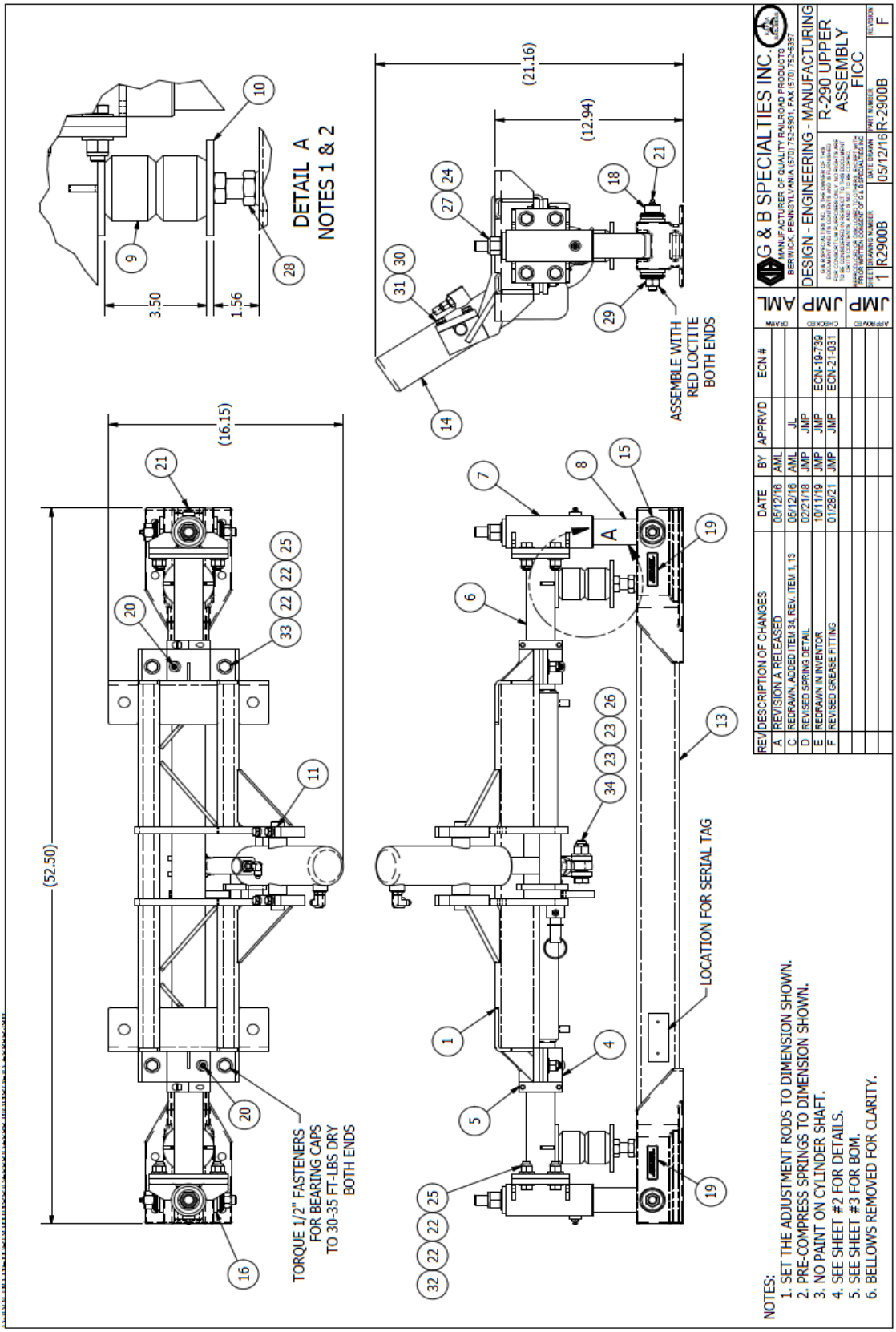
DRAWN JMP
CHECKED JMP
APPROVED JMP

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

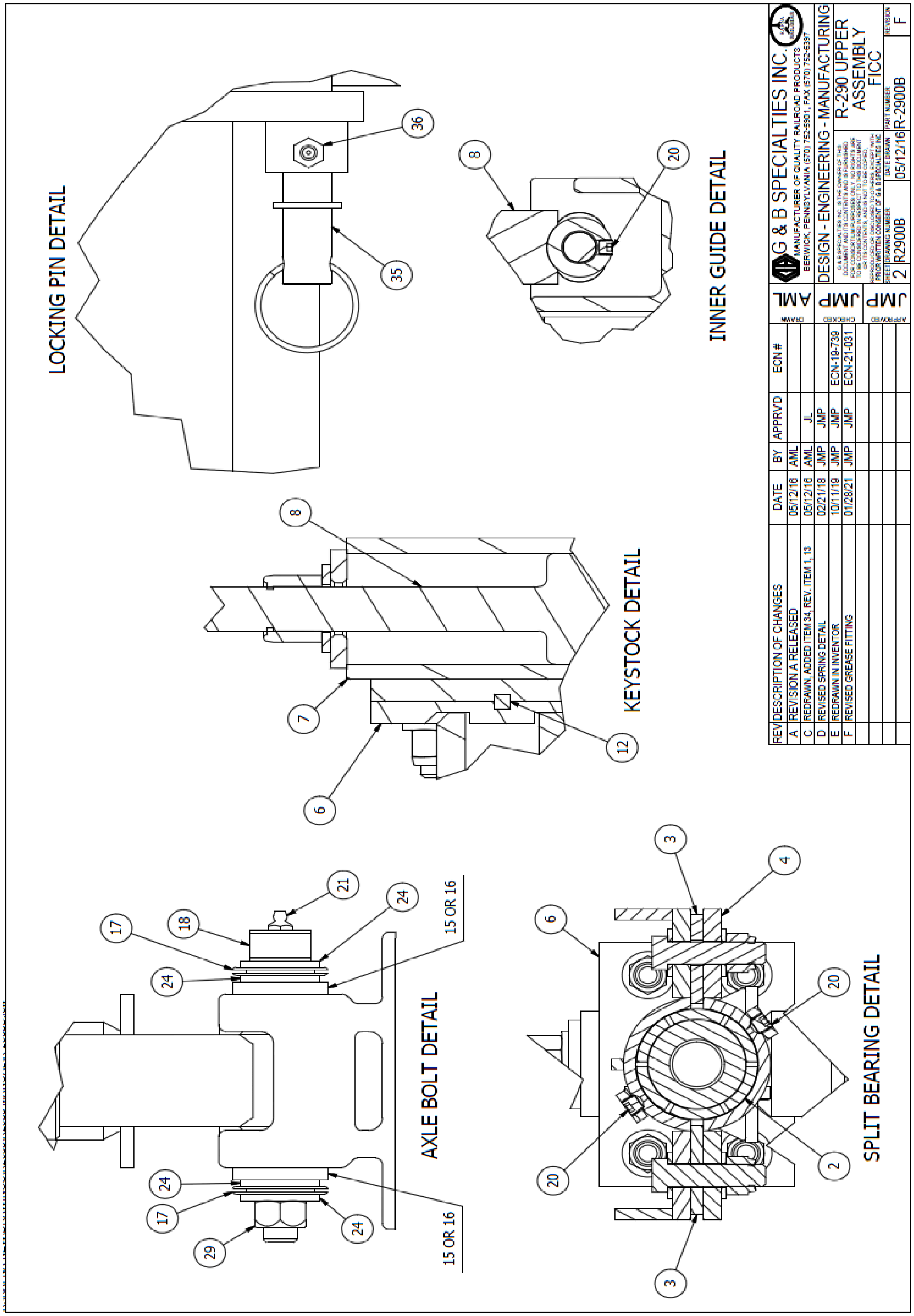
R-290 UPPER ASSEMBLY

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
3	R2900D	11/12/19	R-2900D	C

R-2900D (STD/ICC WITH BRONZE BUSHINGS)


DETAIL A
NOTES 1 & 2
3.50
1.56
(16.15)
(52.50)
(21.16)
(12.94)
ASSEMBLE WITH
RED LOCTITE
BOTH ENDS
TORQUE 1/2" FASTENERS
FOR BEARING CAPS
TO 30-35 FT-LBS DRY
BOTH ENDS
LOCATION FOR SERIAL TAG
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER
ASSEMBLY
FICC
DRAWING NUMBER
R2900B
DATE DRAWN
05/12/16
PART NUMBER
R-2900B
REVISION
F
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 05/12/16 AML
C REDRAWN, ADDED ITEM 34, REV. ITEM 1, 13 05/12/16 AML JL
D REVISED SPRING DETAIL 02/21/18 JMP JMP ECN-18-739
E REDRAWN IN INVENTOR 10/11/19 JMP JMP ECN-21-031
F REVISED GREASE FITTING 01/28/21 JMP JMP
NOTES:
1. SET THE ADJUSTMENT RODS TO DIMENSION SHOWN.
2. PRE-COMPRESS SPRINGS TO DIMENSION SHOWN.
3. NO PAINT ON CYLINDER SHAFT.
4. SEE SHEET #2 FOR DETAILS.
5. SEE SHEET #3 FOR BOM.
6. BELLOWS REMOVED FOR CLARITY.

R-2900B (FICC)


LOCKING PIN DETAIL
INNER GUIDE DETAIL
KEYSTOCK DETAIL
AXLE BOLT DETAIL
SPLIT BEARING DETAIL
15 OR 16
G & B SPECIALTIES INC.
DESIGN - ENGINEERING - MANUFACTURING
R-290 UPPER ASSEMBLY FICC
R2900B
05/12/16
R-2900B
F
AML
JMP
JMP
REV DESCRIPTION OF CHANGES
A REVISION A RELEASED
C REDRAWN, ADDED ITEM 34, REV. ITEM 1, 13
D REVISED SPRING DETAIL
E REDRAWN IN INVENTOR
F REVISED GREASE FITTING
DATE
BY
APPRVD
ECN #
ECN-19-739
ECN-21-031

R-2900B (FICC)

PARTS LIST				PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-2910A	FRAME, UPPER CROSS	1	19	Z-LABEL025	LABEL, AXLE WARNING	2
2	R-3618	SPLIT BEARING SET, NYLON	2	20	R-125	PLUG, 1/8 NPT PIPE	6
3	R-3602A	SHIM	4	21	990900-009	FITTING, 1/8 NPT STRAIGHT	5
4	R-3602B	BEARING END CAP	2	22	990600-050-002	WASHER, 1/2" FLAT TYPE-A NARROW	24
5	R-2589	SPLIT COLLAR	2	23	990600-062-002	WASHER, 5/8" FLAT TYPE-A NARROW	2
6	R-2920	FRAME, LOWER CROSS	1	24	990600-075-002	WASHER, 3/4" FLAT TYPE-A NARROW	10
7	R-2941	OUTER GUIDE TUBE ASSEMBLY	2	25	990316-050-22	NUT, 1/2" NYLOCK GR.8 Z/Y	12
8	R-2944	INNER GUIDE TUBE ASSEMBLY	2	26	990316-062-22	NUT, 5/8" NYLOCK GR.8 Z/Y	1
9	R-130	SPRING, TIMBREN	2	27	990316-075-22	NUT, NYLOCK 3/4" GR.8 Z/Y	2
10	R-2948	ADJUSTMENT ROD	2	28	990330-075-02	NUT, 3/4" HVY HEX JAM Z/Y	2
11	R-2950	TRUNNION CAP	2	29	038066-062-22	NUT, 5/8" TOPLOCK GR.9 Z/Y	2
12	SB025-025	KEYSTOCK, 1/4" SQUARE X 4"	2	30	990402-037-02	WASHER, 3/8" HVY LOCK Z/Y	4
13	R-2930-1	AXLE	1	31	990725-125-22	SCREW, 3/8" X 1-1/4" HHCS GR.8 Z/Y	4
14	R-9115	HYDRAULIC CYLINDER ASSEMBLY	1	32	990727-175-22	SCREW, 1/2" X 1-3/4" HHCS GR.8 Z/Y	8
15	R-29041	SLOTTED BUSHING	2	33	990727-200-22	SCREW, 1/2" X 2" HHCS GR.8 Z/Y	4
16	R-29041A	BUSHING	2	34	990729-275-22	SCREW, 5/8" X 2-3/4" HHCS GR.8 Z/Y	1
17	R-1505	BELLOWS	2	35	S-001011	PIN, QUICK RELEASE	1
18	R-29042	PIN	2	36	990900-023	FITTING, 1/8 NPT STRAIGHT - SHORT	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'VD	ECN #
A	REVISION A RELEASED	05/12/16	AML		
C	REDRAWN, ADDED ITEM 34, REV. ITEM 1, 13	05/12/16	AML	JL	ECN-16-323
D	REVISED SPRING DETAIL	02/21/18	JMP	JMP	
E	REDRAWN IN INVENTOR	10/11/19	JMP	JMP	ECN-19-739
F	REVISED GREASE FITTING	01/28/21	JMP	JMP	ECN-21-031

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

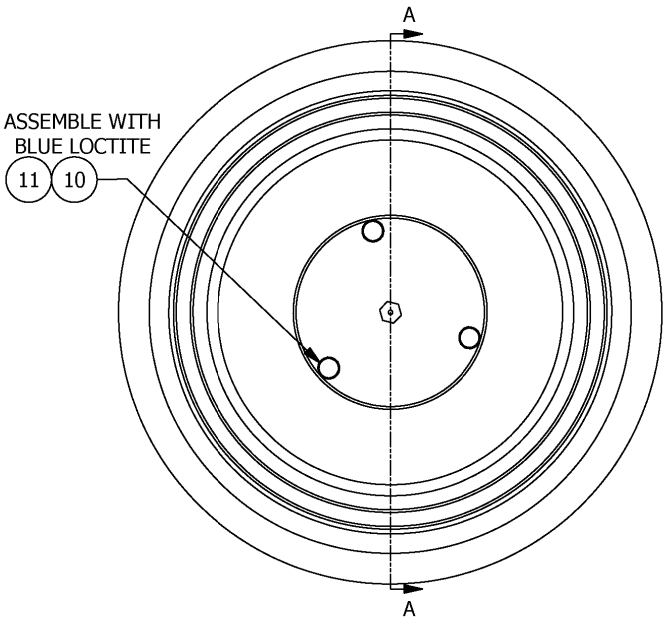
R-290 UPPER ASSEMBLY FICC

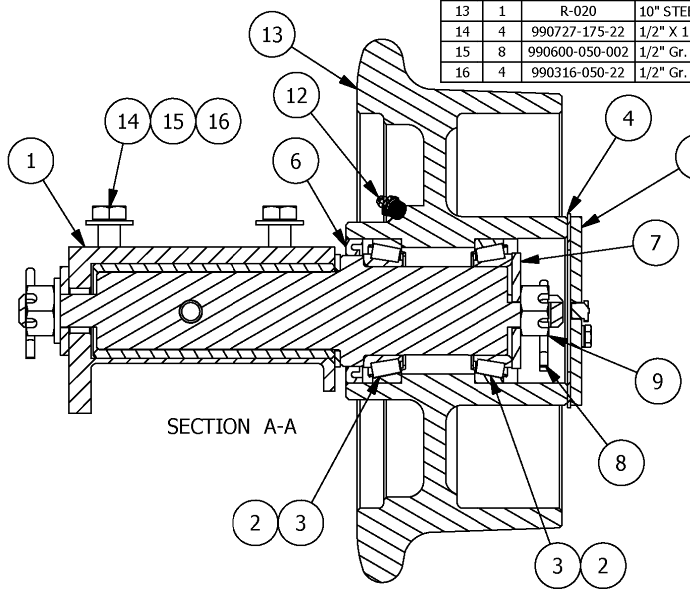
SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
3	R2900B	05/12/16	R-2900B	F

R-2900B (FICC)

ESTIMATED ASSEMBLY WEIGHT: 70LBS

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.





BILL OF MATERIAL/PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-1600D	10" WHEEL SUB-ASSEMBLY
2	2	R-011	TAPERED ROLLER BEARING CUP (#LM104911)
3	2	R-010	TAPERED ROLLER BEARING CONE (#LM104949)
4	1	R-017A	GASKET
5	1	R-017	HUB CAP ASSEMBLY (10" WHEEL)
6	1	R-009	OIL SEAL (#471271)
7	1	R-014	SLOTTED WASHER
8	1	990507-125-02	3/16" x 2" LG. Z/Y COTTER PIN
9	1	R-016	3/4" SLOTTED HEX NUT
10	3	990722-075-22F	1/4" x 3/4" LG. GR.8 H.H.C.S.
11	3	990402-025-02	1/4" GR.8 LOCK WASHER
12	1	990900-009	1/8" NPT - STRAIGHT GREASE ZERK
13	1	R-020	10" STEEL WHEEL
14	4	990727-175-22	1/2" X 1 3/4" Lg. GR. 8 H.H.C.S.
15	8	990600-050-002	1/2" Gr. 8 FLAT WASHER
16	4	990316-050-22	1/2" Gr. 8 NYLOCK NUT

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REMOVED GR. RELIEF FIT. FROM BOM	01/22/03	VZ		
B	ADDED ITEM #1	10/04/06	AML		
C	UPDATED BOM AND BORDER	09/21/17	SMM	JMP	ECN-17-511
D	REVISED NOTES, BALLOONS	02/20/18	JMP	JMP	ECN-18-154
E	ADDED NOTE ON WHEEL HUB	05/22/18	JEV	JMP	ECN-18-421
F	REVISED ITEM 1 DEPICTION	06/01/18	JMP	JMP	ECN-18-443
G	REVISED DRAWING, ADDED GREASE NOTE	04/07/21	SMM	JMP	ECN-21-203

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

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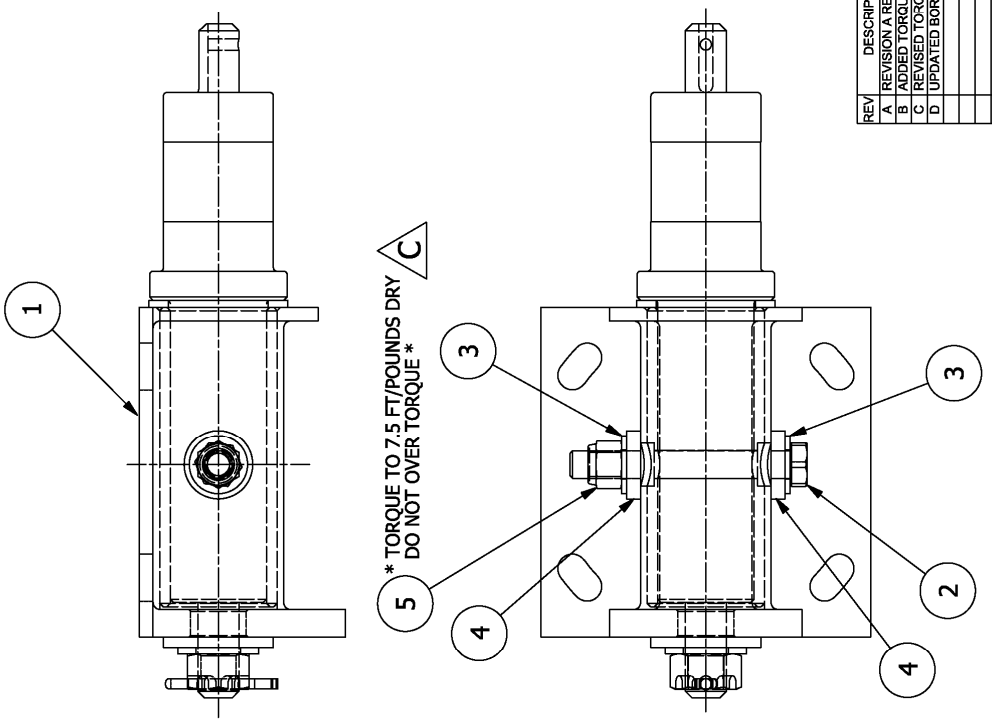
10" WHEEL ASSEMBLY

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	R1600	05/23/06	R-1600	G

BILL OF MATERIAL/PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-1600C	10" WHEEL SUB-ASSEMBLY MODIFICATION
2	1	H.H.C.S.	1/2" UNC x 4.00" Lg. - GR.8
3	2	F'WASHER	1/2" GR.8, TYPE-A
4	2	R-6505	SPINDLE BUSHING
5	1	Nylock Nut	1/2 Std NC Nylock Nut



REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'VD	ECN #
A	REVISION A RELEASED	08/25/06	AML		
B	ADDED TORQUE NOTES	12/10/14	KMD		
C	REVISED TORQUE VALUE	04/14/15	JL		
D	UPDATED BORDER	06/02/21	SMM	JMP	ECN-21-353

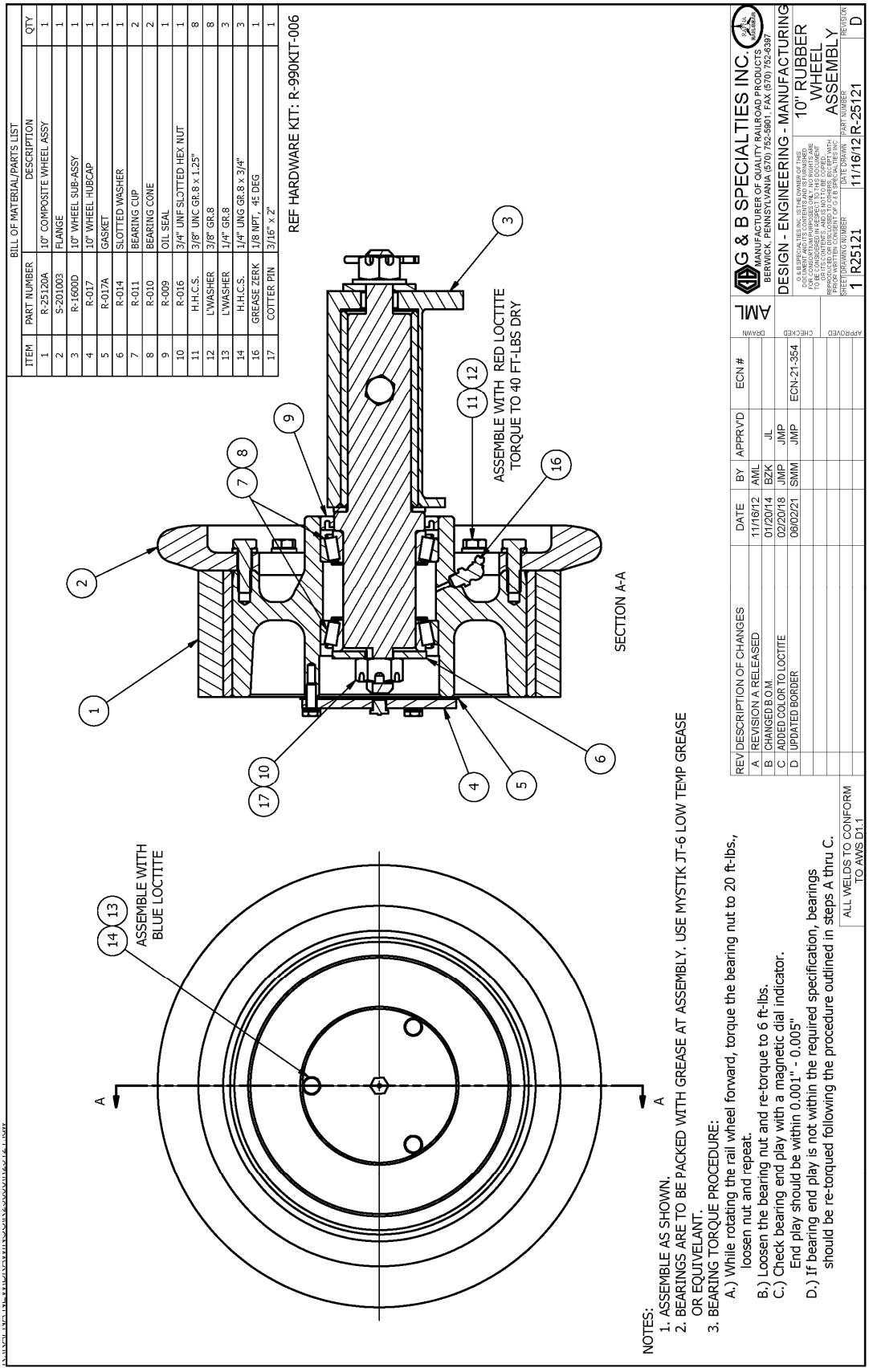
DRAWN AML
CHECKED
APPROVED

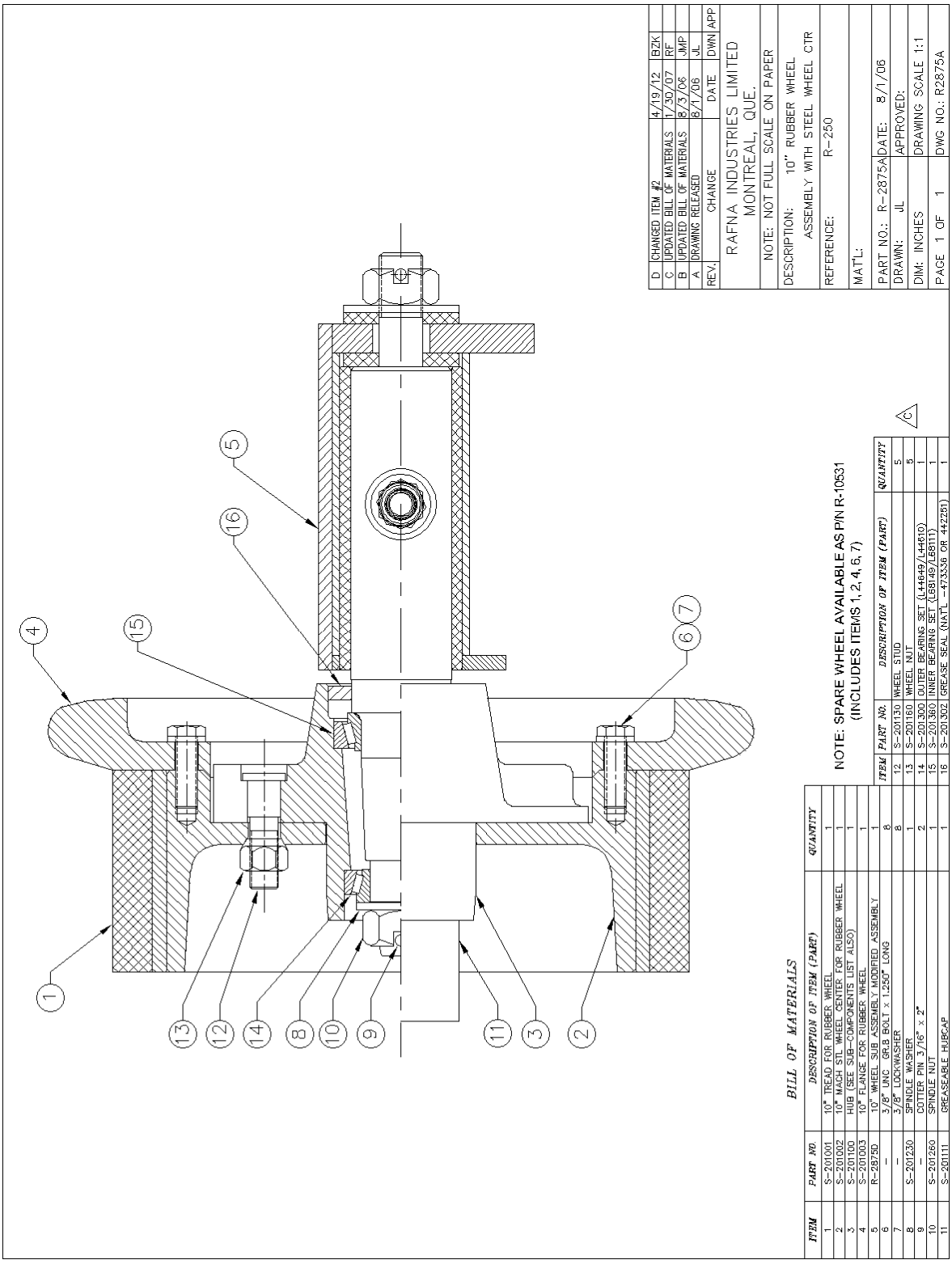
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

10" WHEEL SUB-ASSEMBLY MODIFIED ASSY

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	R1600D	08/25/06	R-1600D	D


BILL OF MATERIAL/PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | R-25120A | 10" COMPOSITE WHEEL ASSY | 1
2 | S-201003 | FLANGE | 1
3 | R-1600D | 10" WHEEL SUB-ASSY | 1
4 | R-017 | 10" WHEEL HUBCAP | 1
5 | R-017A | GASKET | 1
6 | R-014 | SLOTTED WASHER | 1
7 | R-011 | BEARING CUP | 2
8 | R-010 | BEARING CONE | 2
9 | R-009 | OIL SEAL | 1
10 | R-016 | 3/4" UNF SLOTTED HEX NUT | 1
11 | H.H.C.S. | 3/8" UNC GR.8 x 1.25" | 8
12 | L'WASHER | 3/8" GR.8 | 8
13 | L'WASHER | 1/4" GR.8 | 3
14 | H.H.C.S. | 1/4" UNC GR.8 x 3/4" | 3
16 | GREASE ZERK | 1/8 NPT, 45 DEG | 1
17 | COTTER PIN | 3/16" x 2" | 1
REF HARDWARE KIT: R-990KIT-006
ASSEMBLE WITH RED LOCTITE
TORQUE TO 40 FT-LBS DRY
SECTION A-A
ASSEMBLE WITH
BLUE LOCTITE
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.
ALL WELDS TO CONFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'VD | ECN #
A | REVISION A RELEASED | 11/16/12 | AML
B | CHANGED B.O.M. | 01/20/14 | BZK | JL
C | ADDED COLOR TO LOCTITE | 02/20/18 | JMP | JMP
D | UPDATED BORDER | 06/02/21 | SMM | JMP | ECN-21-354
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" RUBBER WHEEL ASSEMBLY
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R25121 | 11/16/12 | R-25121 | D



REV.	CHANGE	DATE	DWN	APP
D	CHANGED ITEM #2	4/19/12	BZK	
C	UPDATED BILL OF MATERIALS	1/30/07	RF	
B	UPDATED BILL OF MATERIALS	8/3/06	JMP	
A	DRAWING RELEASED	8/1/06	JL	

RAFNA INDUSTRIES LIMITED
MONTREAL, QUE.

NOTE: NOT FULL SCALE ON PAPER

DESCRIPTION: 10" RUBBER WHEEL ASSEMBLY WITH STEEL WHEEL CTR

REFERENCE: R-250

MATL:

PART NO.: R-28754 DATE: 8/1/06

DRAWN: JL APPROVED:

DIM: INCHES DRAWING SCALE 1:1

PAGE 1 OF 1 DWG NO.: R28754

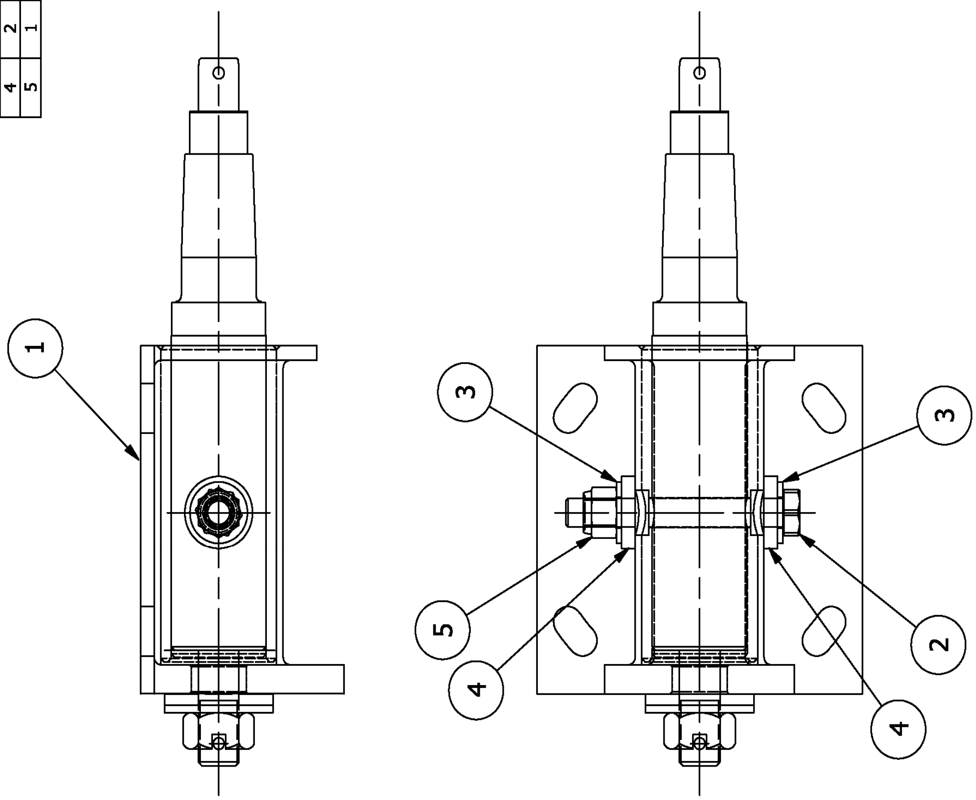
NOTE: SPARE WHEEL AVAILABLE AS P/N R-10531
(INCLUDES ITEMS 1, 2, 4, 6, 7)

BILL OF MATERIALS

ITEM	PART NO.	DESCRIPTION OF ITEM (PART)	QUANTITY
1	S-201001	10" TREAD FOR RUBBER WHEEL	1
2	S-201002	10" MACH STL WHEEL CENTER FOR RUBBER WHEEL	1
3	S-201100	HUB (SEE SUB-COMPONENTS LIST ALSO)	1
4	S-201003	10" FLANGE FOR RUBBER WHEEL	1
5	R-28750	10" WHEEL SUB ASSEMBLY MODIFIED ASSEMBLY	1
6	–	5/8" UNC GR.8 BOLT x 1.250" LONG	8
7	–	5/8" LOCKWASHER	8
8	S-201230	SPINDLE WASHER	1
9	–	COTTER PIN 3/16" x 2"	2
10	S-201260	SPINDLE NUT	1
11	S-201111	GREASEABLE HUBCAP	1
12	S-201130	WHEEL STUD	5
13	S-201160	WHEEL NUT	5
14	S-201300	OUTER BEARING SET (L44649/L44610)	1
15	S-201360	INNER BEARING SET (L68149/L68111)	1
16	S-201302	GREASE SEAL (NATL -473336 OR 442281)	1

BILL OF MATERIAL/PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	R-2875C	10" WHEEL SUB-ASSEMBLY MODIFICATION
2	1	H.H.C.S.	1/2" UNC x 4.00" Lg. - GR.8
3	2	F'WASHER	1/2" GR.8, TYPE-A
4	2	R-6505	SPINDLE BUSHING
5	1	Nylock Nut	1/2 Std NC Nylock Nut



REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	01/24/07	RF	

REVISION

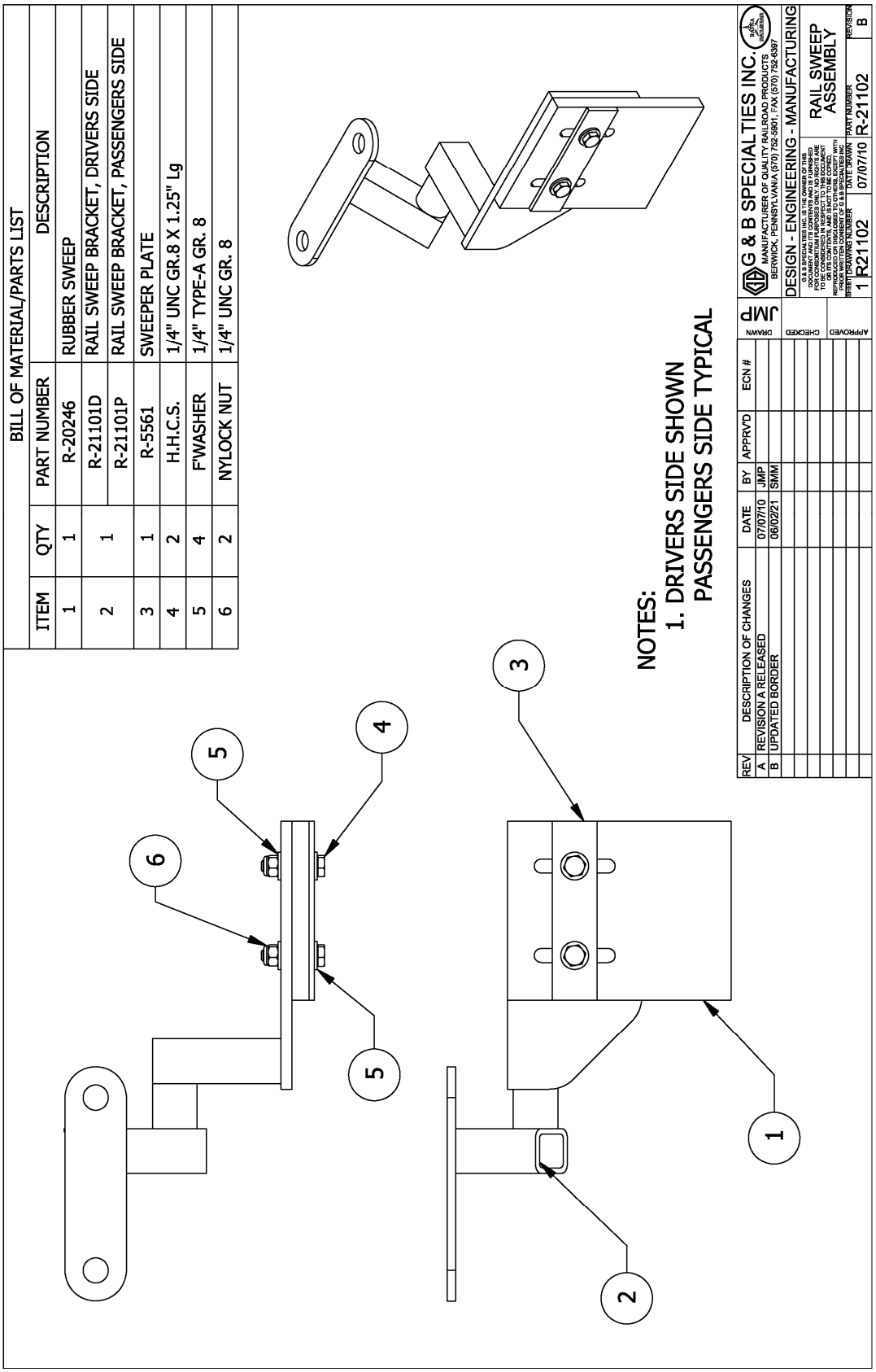
DRAWN RF
CHECKED
APPROVED

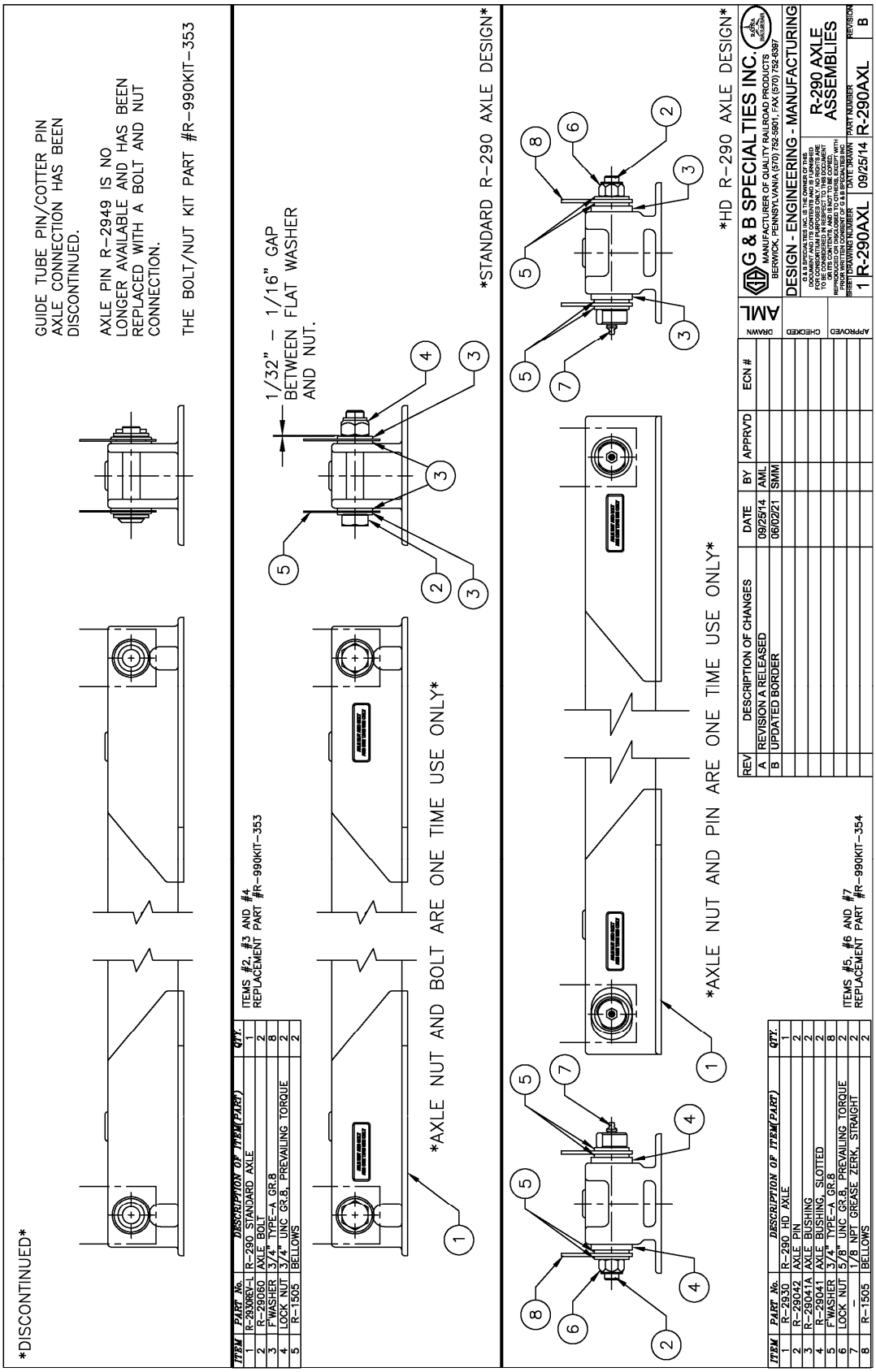
G&B SPECIALTIES INC.
MANUFACTRURER OF QUALITY RAILROAD PRODUCTS
BERWICK PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

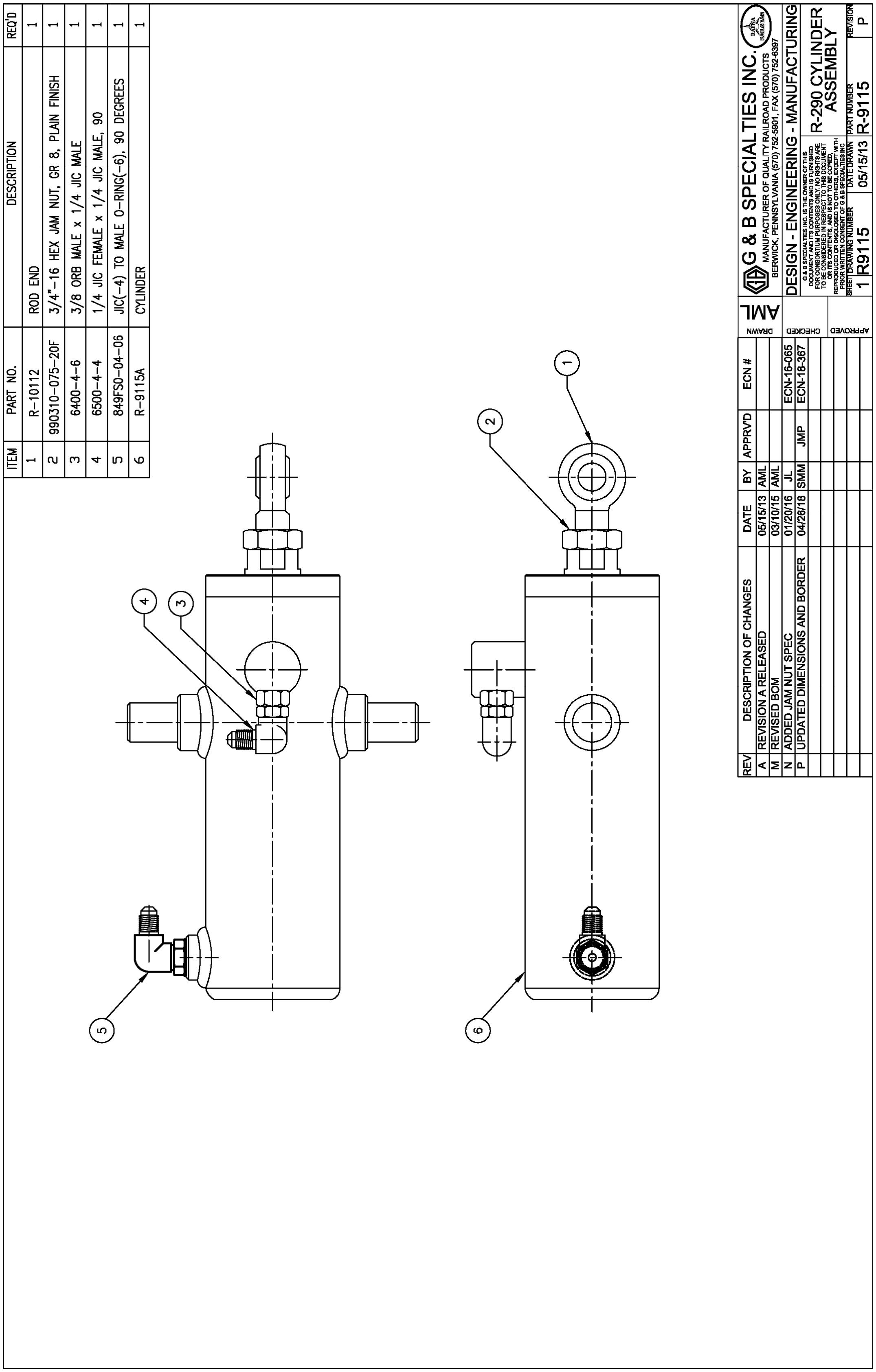
DESIGN ~ ENGINEERING ~ MANUFACTURING

DESCRIPTION: 10" WHEEL SUB-ASSEMBLY MODIFIED ASSEMBLY
REF: R-250 HD, R-290

DRAWING NUMBER	DATE DRAWN	SHEET	PART NUMBER	REVISION
R2875D	01/24/07	1 OF 1	R-2875D	A


BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | R-20246 | RUBBER SWEEP
2 | 1 | R-21101D | RAIL SWEEP BRACKET, DRIVERS SIDE
2 | 1 | R-21101P | RAIL SWEEP BRACKET, PASSENGERS SIDE
3 | 1 | R-5561 | SWEEPER PLATE
4 | 2 | H.H.C.S. | 1/4" UNC GR.8 X 1.25" Lg
5 | 4 | F'WASHER | 1/4" TYPE-A GR. 8
6 | 2 | NYLOCK NUT | 1/4" UNC GR. 8
NOTES:
1. DRIVERS SIDE SHOWN
PASSENGERS SIDE TYPICAL
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRV'D | ECN #
A | REVISION A RELEASED | 07/07/10 | JMP
B | UPDATED BORDER | 06/02/21 | SMM
DRAWN
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
RAIL SWEEP ASSEMBLY
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | R21102 | 07/07/10 | R-21102 | B


DISCONTINUED
GUIDE TUBE PIN/COTTER PIN AXLE CONNECTION HAS BEEN DISCONTINUED.
AXLE PIN R-2949 IS NO LONGER AVAILABLE AND HAS BEEN REPLACED WITH A BOLT AND NUT CONNECTION.
THE BOLT/NUT KIT PART #R-990KIT-353
1/32" - 1/16" GAP BETWEEN FLAT WASHER AND NUT.
STANDARD R-290 AXLE DESIGN
AXLE NUT AND BOLT ARE ONE TIME USE ONLY
HD R-290 AXLE DESIGN
AXLE NUT AND PIN ARE ONE TIME USE ONLY
ITEM PART No. DESCRIPTION OF ITEM (PART) QTY.
1 R-2930REV-L R-290 STANDARD AXLE 1
2 R-29060 AXLE BOLT 2
3 F'WASHER 3/4" TYPE-A GR.8 8
4 LOCK NUT 3/4" UNC GR.8, PREVAILING TORQUE 2
5 R-1505 BELLOWS 2
ITEMS #2, #3 AND #4 REPLACEMENT PART #R-990KIT-353
ITEM PART No. DESCRIPTION OF ITEM (PART) QTY.
1 R-2930 R-290 HD AXLE 1
2 R-29042 AXLE PIN 2
3 R-29041A AXLE BUSHING 2
4 R-29041 AXLE BUSHING, SLOTTED 2
5 F'WASHER 3/4" TYPE-A, GR.8 8
6 LOCK NUT 5/8" UNC GR.8, PREVAILING TORQUE 2
7 - 1/8 NPT GREASE ZERK, STRAIGHT 2
8 R-1505 BELLOWS 2
ITEMS #5, #6 AND #7 REPLACEMENT PART #R-990KIT-354
REV DESCRIPTION OF CHANGES DATE BY APPRVD ECN #
A REVISION A RELEASED 09/25/14 AML
B UPDATED BORDER 06/02/21 SMM
DRAWN AML
CHECKED
APPROVED
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5861 FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-290 AXLE ASSEMBLIES
SHEET DRAWING NUMBER DATE DRAWN PART NUMBER REVISION
1 R-290AXL 09/25/14 R-290AXL B



ITEM	PART NO.	DESCRIPTION	REQ'D
1	R-10112	ROD END	1
2	990310-075-20F	3/4"-16 HEX JAM NUT, GR 8, PLAIN FINISH	1
3	6400-4-6	3/8 ORB MALE x 1/4 JIC MALE	1
4	6500-4-4	1/4 JIC FEMALE x 1/4 JIC MALE, 90	1
5	849FS0-04-06	JIC(-4) TO MALE O-RING(-6), 90 DEGREES	1
6	R-9115A	CYLINDER	1

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	05/15/13	AML		
M	REVISED BOM	03/10/15	AML		
N	ADDED JAM NUT SPEC	01/20/16	JL		ECN-16-065
P	UPDATED DIMENSIONS AND BORDER	04/26/18	SMM	JMP	ECN-18-367

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5.0 HYDRAULIC KIT (STD, ICC, FICC, & MANUAL VALVE CONTROLS)

INSTALLATION SAFETY PRECAUTION

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 or operation of the equipment.
- Installation/Operation 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.
- When routing hydraulic hoses, ensure that the hoses do not contact any sharp edges or hot surfaces.
- When routing electrical wires, ensure that the wires do not contact any sharp edges or hot surfaces.
- All wire connections are to be soldered and heat shrink sealed to prevent future corrosion related problems.
- All wires must be covered with protective cable loom.
- Railway company rules governing rail travel must always be observed.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- Note that if the railgear is part way retracted or extended, opening the manifold directional valve manual over-rides may cause the railgear to drop suddenly causing personal injury. Ensure all body parts are clear of the railgear if it should suddenly drop.
- When 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).

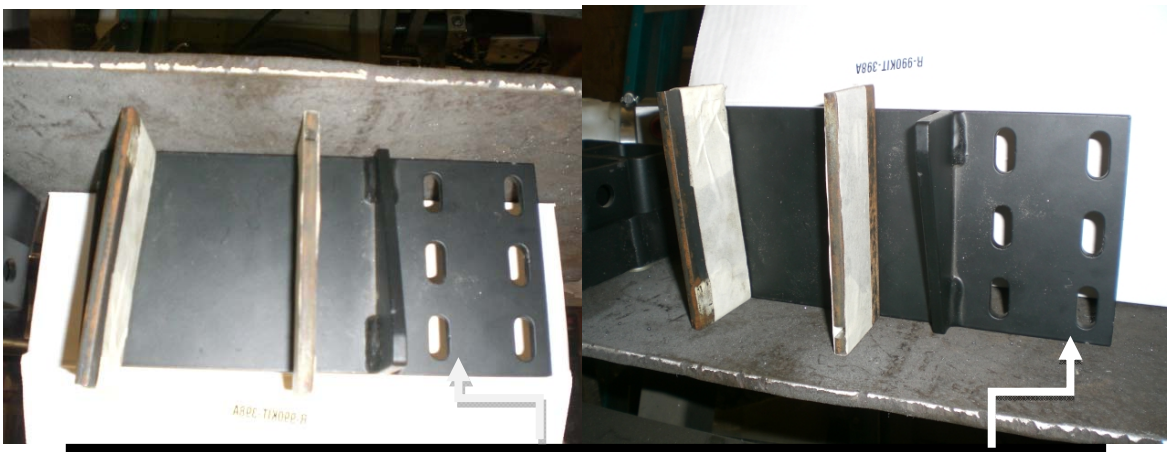
- Do not use the emergency hand pump to raise and lower the railgear on a routine basis. If the hydraulic pump or manifold should fail, have it repaired as soon as possible.

- If the emergency hand pump has been used to raise or lower the railgear, ensure the manifold directional valve manual over-rides are in the closed and locked position before starting road or rail travel.

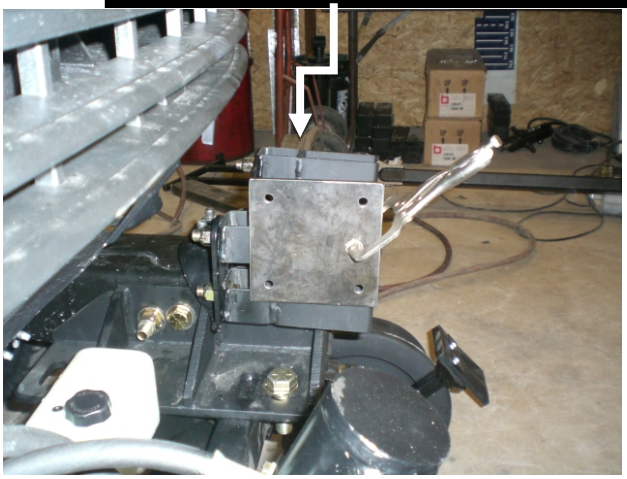
- Ensure the hydraulic pump has been de-energized before starting road or rail travel.

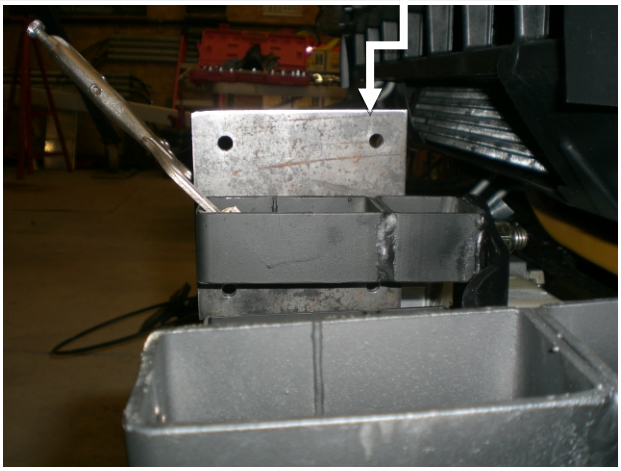
INSTALLATION OF HYDRAULIC PUMP AT THE FRONT OF THE VEHICLE

MOUNT PUMP AND MANIFOLD USING SUPPLIED BRACKETS OR FABRICATE YOUR OWN. BRACKETS WILL NEED TO BE WELDED TO RAILGEAR AT LOCATIONS CHOSEN BY INSTALLER. CHOOSE A LOCATION ON FRONT OF VEHICLE WHICH WILL ACCOMMODATE YOUR END USERS REQUIREMENTS. PHOTOS ARE ATTACHED FOR REFERENCE USE ONLY.

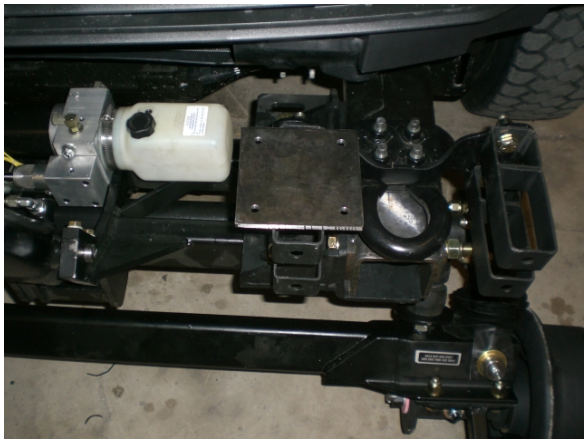


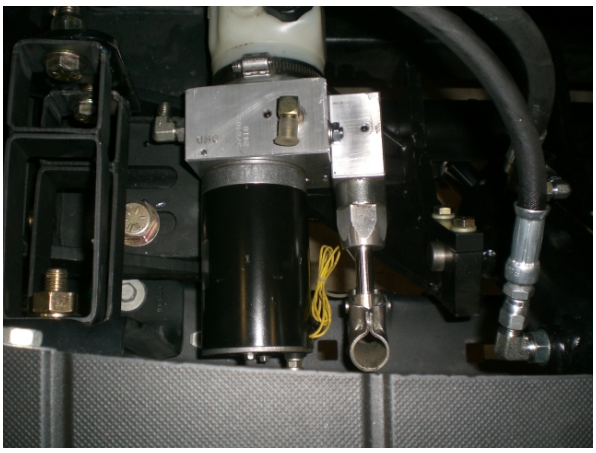
SUPPLIED PARTS, R-2965, R-2965B, AND R-2965C

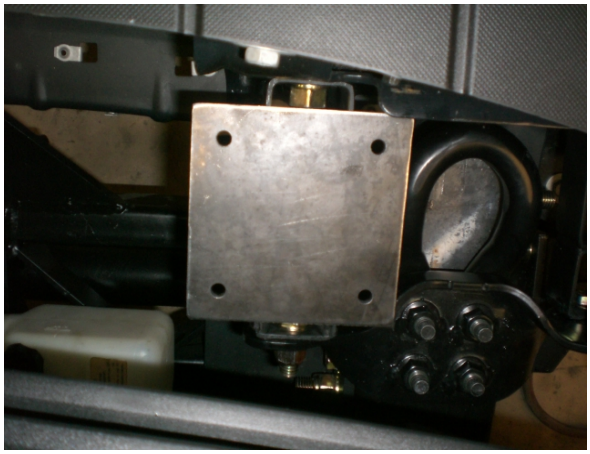




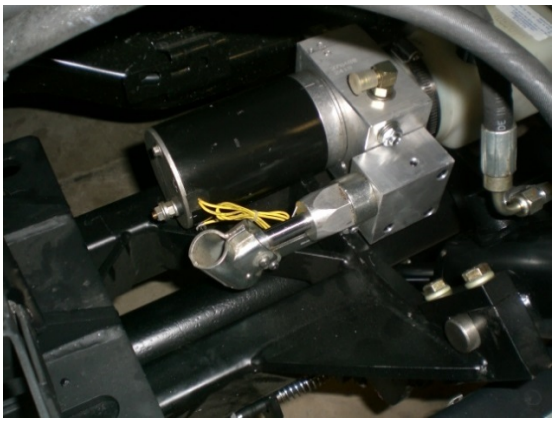
Front Mounting

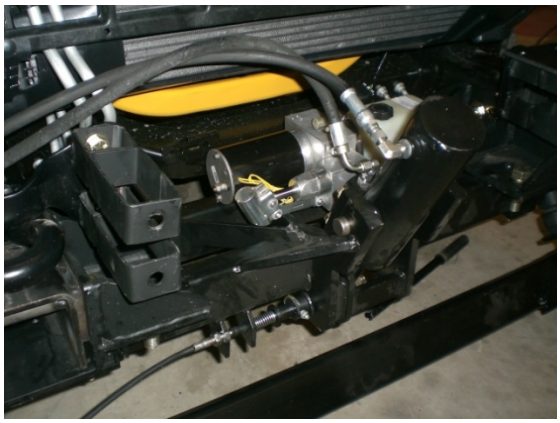






FRONT MOUNTING





INSTALLATION OF HYDRAULIC PUMP AT THE REAR OF THE VEHICLE

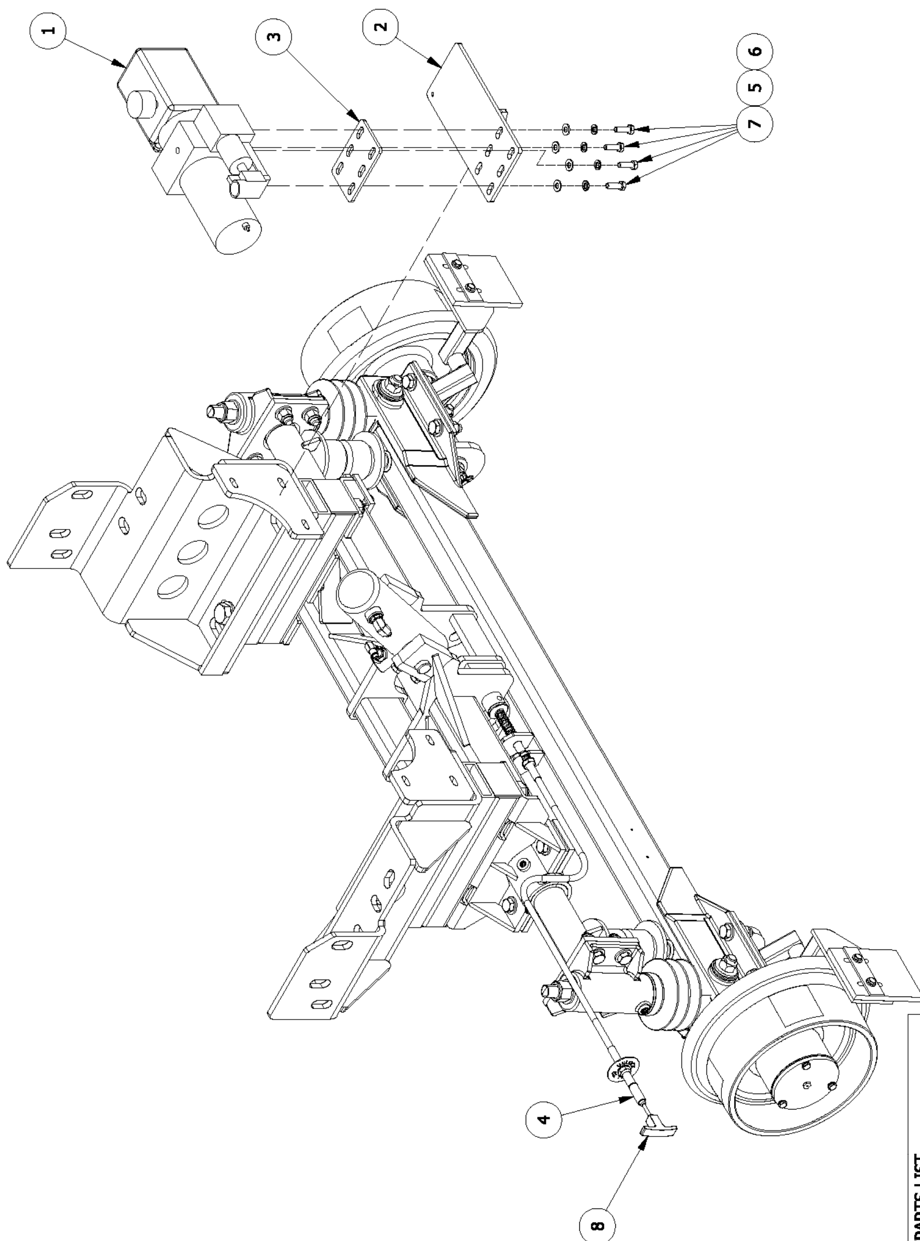
REAR MOUNTING

1. Position the rear pump mounting bracket against the right side rear mounting plate as shown. Clamp it in place. Position the pump on top of the rear pump mounting bracket as shown with the tank towards the right side of the vehicle. Ensure the pump will not interfere with any part of the vehicle or railgear components. The hand pump handle receiver can be turned to point downwards to ease hand pump handle use.

2. Once the rear pump mounting bracket position is verified, remove the pump and weld the rear pump mounting bracket to the right side rear mounting plate all around.

3. Reposition and fasten the pump on top of the rear pump mounting bracket with four $^{5}/_{16}$" x 0.75" long bolts, four $^{5}/_{16}$" lock washers and four $^{5}/_{16}$" washers.

4. Position the manifold on the left rear mounting plate as shown with the P and T ports facing upwards. Fasten the manifold to the left rear mounting plate with three ¼" x 1" long bolts, three ¼" lock washers and three ¼" washers.



BILL OF MATERIALS/PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	S-003041	HYDRAULIC PUMP	1
2	R-2965	PUMP MOUNTING BRACKET	1
3	R-2965D	PUMP SHIM PLATE	1
4	R-2868	LOCK CABLE HOLDING COLLAR	1
5	R-990KIT-402	5/16" GR.8 LOCK WASHER	4
6		5/16" GR.8 WASHER	4
7		5/16" UNC GR.8 BOLT X 1" LONG	4
8	-	RAILGEAR LOCK CABLE	N/A

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	DRAWING RELEASED	01/15/14	AML		
B	DRAWING AND BOM REVISED	08/12/19	AJB		

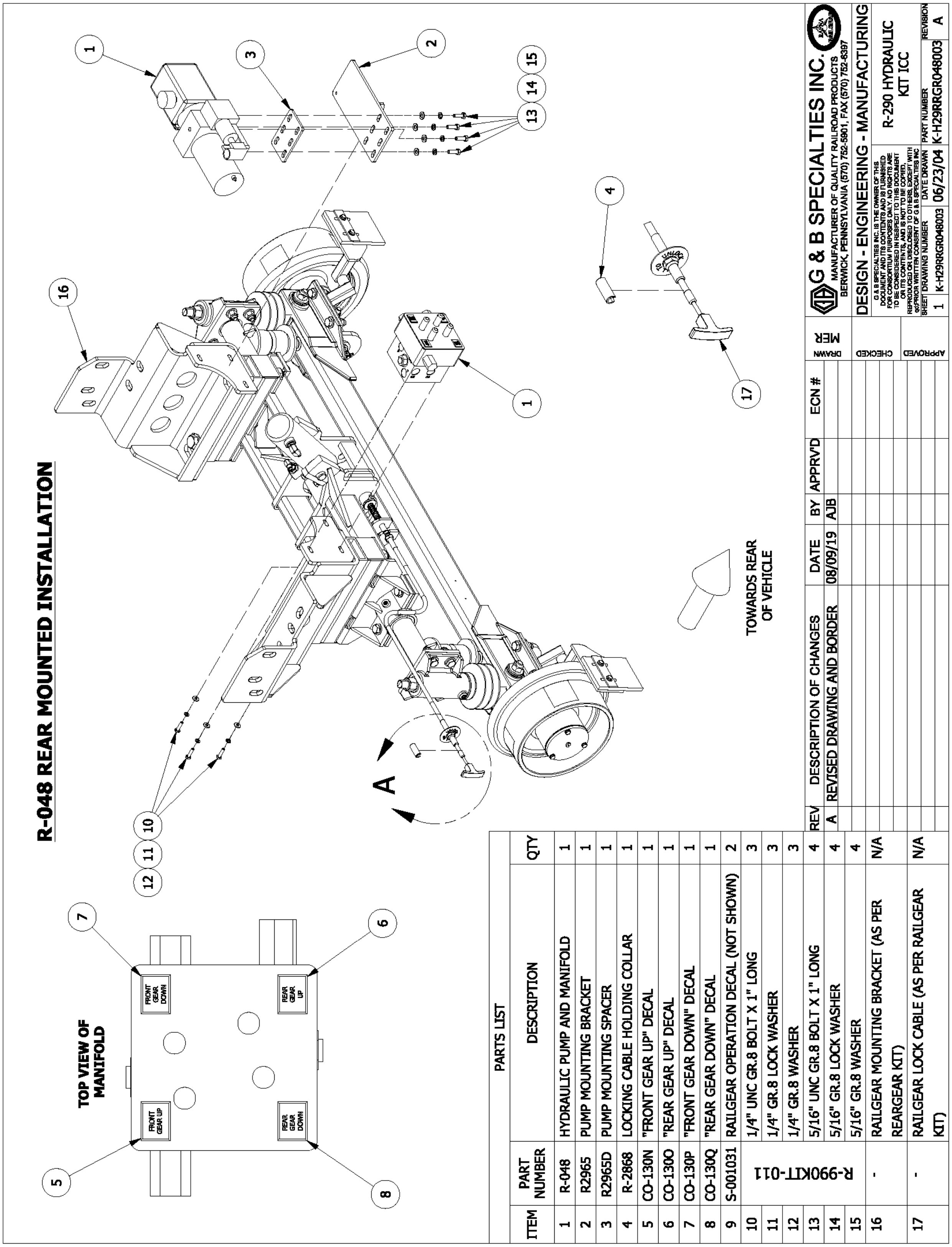
DRAWN: AML
CHECKED:
APPROVED:

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

PUMP MOUNTING

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	K-H29RRXS003041-3	01/15/14	K-H29RRXS003041-3	B

For ICC Only: (Decals may be located in different locations other than shown)



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-048	HYDRAULIC PUMP AND MANIFOLD	1
2	R2965	PUMP MOUNTING BRACKET	1
3	R2965D	PUMP MOUNTING SPACER	1
4	R-2868	LOCKING CABLE HOLDING COLLAR	1
5	CO-130N	"FRONT GEAR UP" DECAL	1
6	CO-130O	"REAR GEAR UP" DECAL	1
7	CO-130P	"FRONT GEAR DOWN" DECAL	1
8	CO-130Q	"REAR GEAR DOWN" DECAL	1
9	S-001031	RAILGEAR OPERATION DECAL (NOT SHOWN)	2
10	R-990KIT-011	1/4" UNC GR.8 BOLT X 1" LONG	3
11		1/4" GR.8 LOCK WASHER	3
12		1/4" GR.8 WASHER	3
13		5/16" UNC GR.8 BOLT X 1" LONG	4
14		5/16" GR.8 LOCK WASHER	4
15		5/16" GR.8 WASHER	4
16	-	RAILGEAR MOUNTING BRACKET (AS PER REARGEAR KIT)	N/A
17	-	RAILGEAR LOCK CABLE (AS PER RAILGEAR KIT)	N/A

INSTALLATION OF HYDRAULIC KIT (STANDARD)

Part Number	Description	Qty
R-2965	Rear Pump Mounting Bracket	1
R-2965B	Front Pump Mounting Bracket	2
R-2965C	Front Manifold Mounting Bracket	1
R-2965D	Shim Plate for Hydraulic Pump	1
R-048B	Hydraulic Pump and Manifold	1
R-1567	Dash Switch	1
R-1577	In-Line Fuse 5 Amp	1
CO-130G	"Railgear Pump" Decal	1
CO-130N	"Front Gear Up" Decal	1
CO-130O	"Rear Gear Up" Decal	1
CO-130P	"Front Gear Down" Decal	1
CO-130Q	"Rear Gear Down" Decal	1
R-2868	Locking Cable Holding Collar	1
S-001030	Railgear Operation Decal	2
849FSO-04-04	¼" Male O-Ring Boss to ¼" Male JIC 90°	7
849FSO-04-06	3/8" Male O-Ring Boss to ¼" Male JIC 90°	1
849FS-04-06	Elbow, 90M 1/4T 3/8MW	4
HFS2-04	Hose 23" Long	2
HFS2-04	Hose 33" Long	2
HFS2-04	Hose 360" Long	2
HU04-04NJ	¼" Female JIC Straight Coupler (On Hoses)	12
R-990KIT-011	1/4" UNC Gr. 8 Bolt x 1" Long	3
	1/4" SAE Washer	3
	1/4" Lock Washer	3
	5/16" UNC Gr. 8 Bolt x 0.75" Long	4
	5/16" SAE Washer	4
	5/16" Lock Washer	4
Not Supplied	2 & 14 Gauge Wire, Terminals, Loom, Etc.	As Req'd

1. The pump is shipped with a manifold, a hand pump handle, a solenoid, and a rubber terminal boot.

2. Locate and install the solenoid in a convenient location under the hood near the vehicle's battery using installer supplied hardware. Ensure that the solenoid's body is electrically grounded.

3. Install all hydraulic fittings and adapters as shown on hydraulic schematic.

4. There are four directional valve manual over-rides on the face of the manifold. The decal plates can be installed on the face of the manifold as shown. Stick the decal plates next to the respective over-rides such that they are properly oriented.

5. Connect one 23" long hydraulic hose between the C1 port on the manifold and the blind end port on the railgear cylinder nearest to the manifold.

6. Connect one 23" long hydraulic hose between the C2 port on the manifold and the rod end port on the railgear cylinder nearest to the manifold.

7. Connect one 33" long hydraulic hose between the P port on the manifold and the P port on the pump.

8. Connect one 33" long hydraulic hose between the T port on the manifold and the T port on the pump.

9. Connect one 360" long hydraulic hose to the C3 port on the manifold and mark the other end of this hose as "Blind".

10. Connect one 360" long hydraulic hose to the C4 port on the manifold and mark the other end of this hose as "Rod".

11. Route the two 360" long hydraulic hoses to the other end of the vehicle along the side of the frame and secure in place with tie-wraps. Where necessary, fasten the hose to the frame with installer supplied hose clips and hardware.

12. Connect the end of the 360" long hydraulic hose marked "Blind" to the blind end port on the railgear cylinder on the railgear furthest away from the pump/manifold.

13. Connect the end of the 360" long hydraulic hose marked "Rod" to the rod end port on the railgear cylinder on the railgear furthest away from the pump/manifold.

14. Ensure that none of the hoses contact any sharp edges or hot surfaces. Tie-wrap all hoses securely leaving enough slack for the railgear to function.

15. Install the dash switch and "Railgear Pump" decal in a convenient location on the dash.

16. The pump manifold has two wire harnesses and two wires connected to it:
    a) One 4' wire harness for the railgear mounted nearest to the pump/manifold with a control box on the end.
    b) One 36' wire harness for the railgear mounted furthest from the pump/manifold with a control box on the end.
    c) One white and one black wire each with ring terminals on the ends.

17. Using suitable 14-gauge wire, cable loom, connectors, solder and heat shrink tubing:
    a) Lengthen the white wire if required, and connect it from the manifold to the switching terminal on the railgear pump solenoid previously mounted under the hood.
    b) Lengthen the black wire if required, and connect it from the manifold through the firewall to the load terminal on the dash switch.
    c) Connect a length of black wire from the power terminal on the dash switch to the in-line fuse.
    d) Connect another length of black wire from the in-line fuse to an ignition activated power supply.
    e) Connect another wire from the ground terminal on the dash switch to a suitable ground location on the vehicle.
    f) Ensure the manifold is properly grounded to the vehicle chassis by connecting a wire from the manifold to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates or tar on the frame.

18. Using suitable 2-gauge wire, cable loom, connectors, solder and heat shrink tubing:
    a) Connect one wire from the vehicle's battery to the power terminal on the circuit breaker or fuse.
    b) Connect another wire from the load terminal on the circuit breaker to the power terminal on the solenoid.
    c) Connect another wire from the load terminal on the solenoid to the power terminal on the pump motor. Use the supplied rubber boot to protect the pump power terminal from shorting out.
    d) Ensure the pump motor base is properly grounded to the vehicle chassis by connecting a wire from the pump motor base to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates or tar on the frame.

19. Route the 36' wire harness from the pump along the frame to the railgear at the other end of the vehicle and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the railgear control box with installer-supplied hardware in a protected vertical position in a suitable location. Ensure the control box is within reach of the railgear locking cable handle.

20. Route the 4' wire harness from the pump to the vehicle near the railgear and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the railgear control box with installer-supplied hardware in a protected vertical position in a suitable location. Ensure the control box is within reach of the railgear locking cable handle.

21. Ensure that the control boxes are mounted vertically so that the controls do not fill with water and freeze. They should also be mounted in a location protected from road spray etc.

22. Affix the supplied railgear operation decals in a suitable location adjacent to the front and rear control boxes.

23. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.

24. Ensure all holes in the firewall are sealed and protected with a grommet.

25. Fill the hydraulic system and bleed the air out:
    a) Fill the pump tank with **DEXRON III** (or equivalent) hydraulic fluid.
    b) Operate the front railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    c) Refill the pump tank and repeat the above step until all air is removed from the front hydraulic system.
    d) Operate the rear railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    e) Refill the pump tank and repeat the above step until all air is removed from the rear hydraulic system.
    f) With both front and rear railgear locked in the road position, fill the pump tank to the full line.

26. Follow the Hydraulic System Relief Valve Setting procedure detailed in the Hydraulic Kit Service section of this manual.

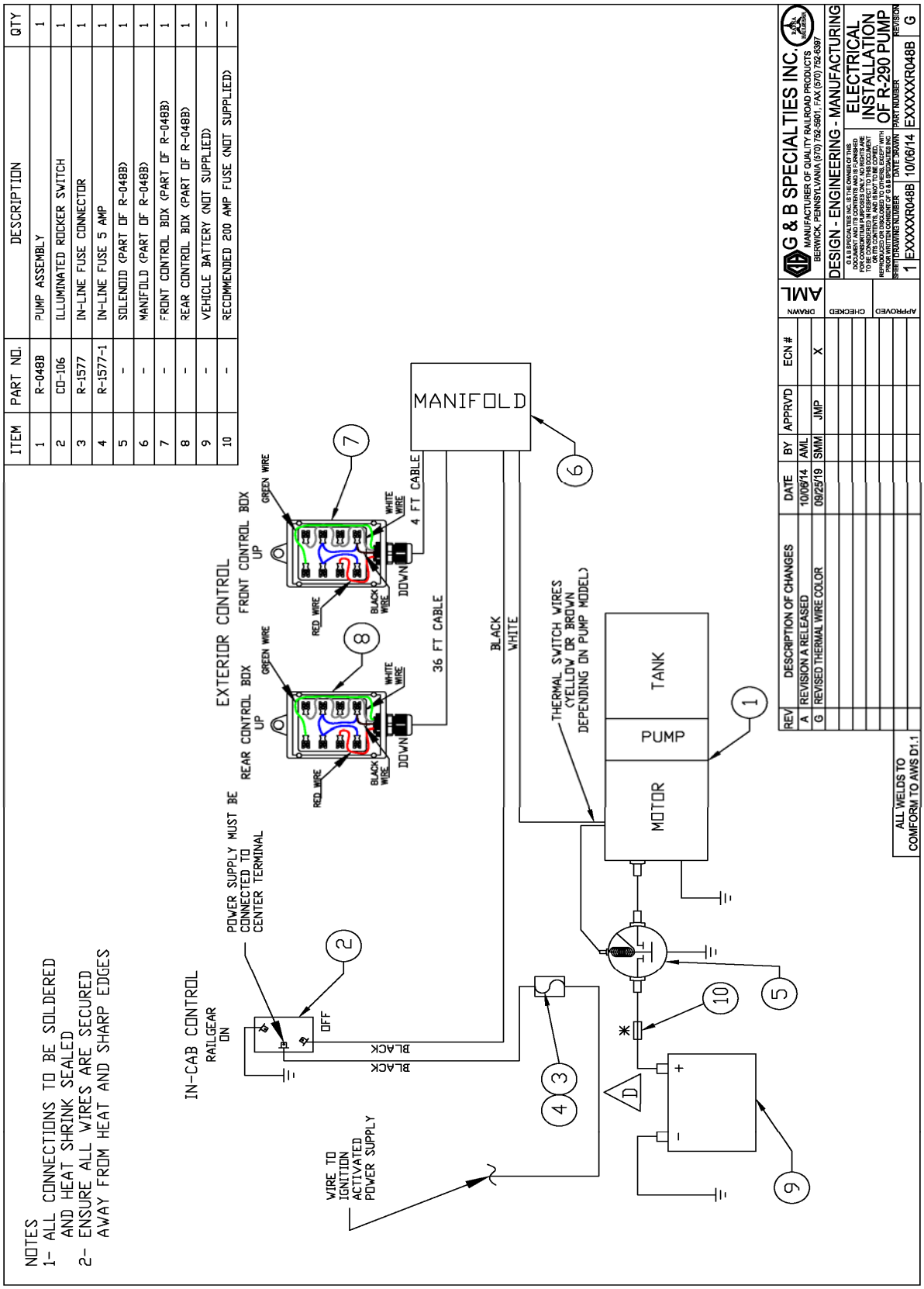
27. Test the fit of the locking cable holding collar on both the front and rear locking cables. Ensure that the locking cable holding collar keeps the railgear locking pin fully disengaged. Grind the locking cable holding collar or adjust the locking cable handle on the cable to fit if necessary.

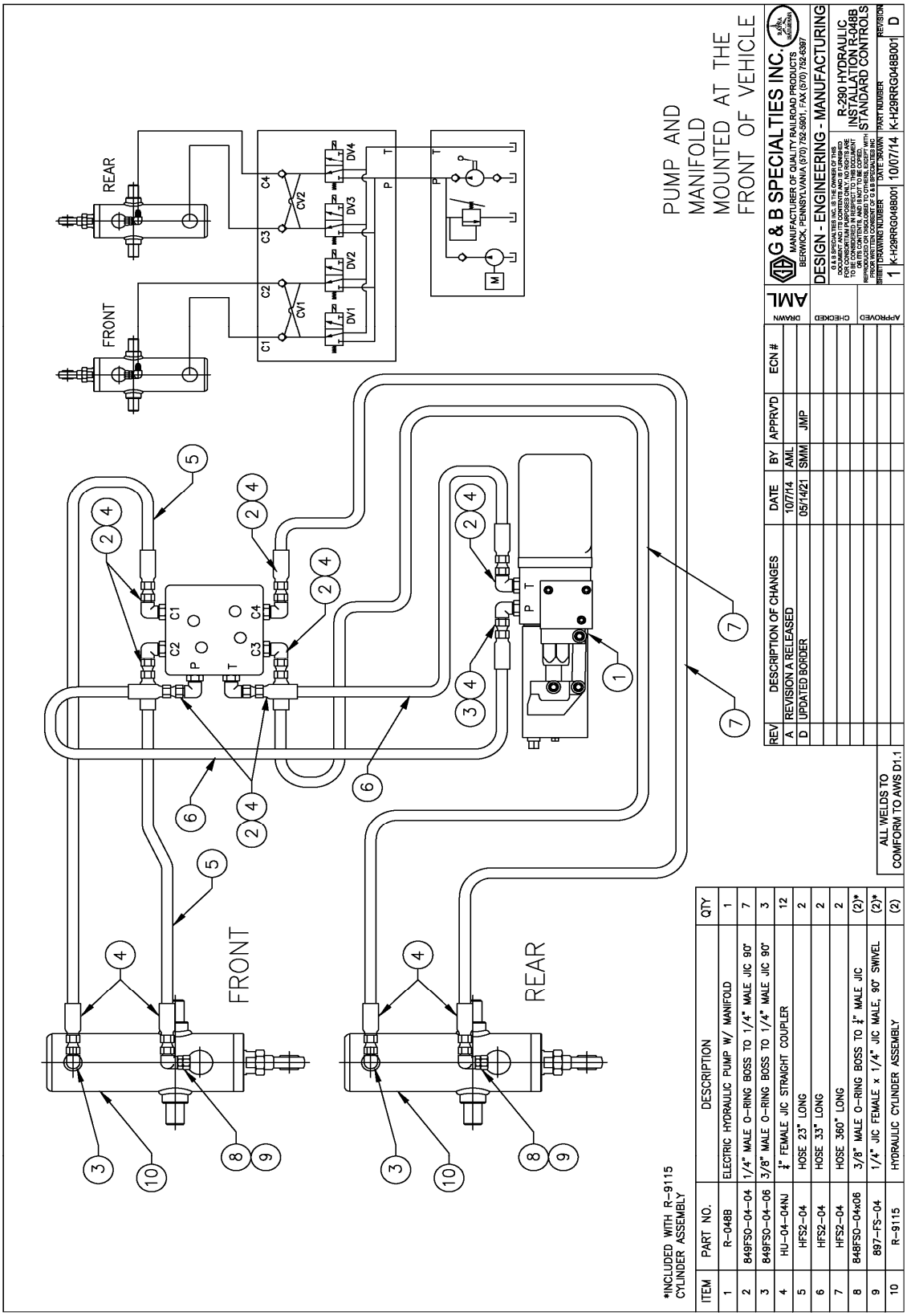
28. Test the operation of the controls and directional valve manual over-rides. Refer to the operation procedure in the Railgear Kit manual and Hydraulic Kit Operation section of this manual.

29. Locate and store the hand pump handle and the locking cable holding collar in a secure location in the vehicle cab.

Ensure that the thermal overload wires are properly spliced/connected as shown

It is recommended that a 200-amp fuse or 200-amp circuit breaker be installed to isolate the hydraulic pump from the vehicle electrical system as shown

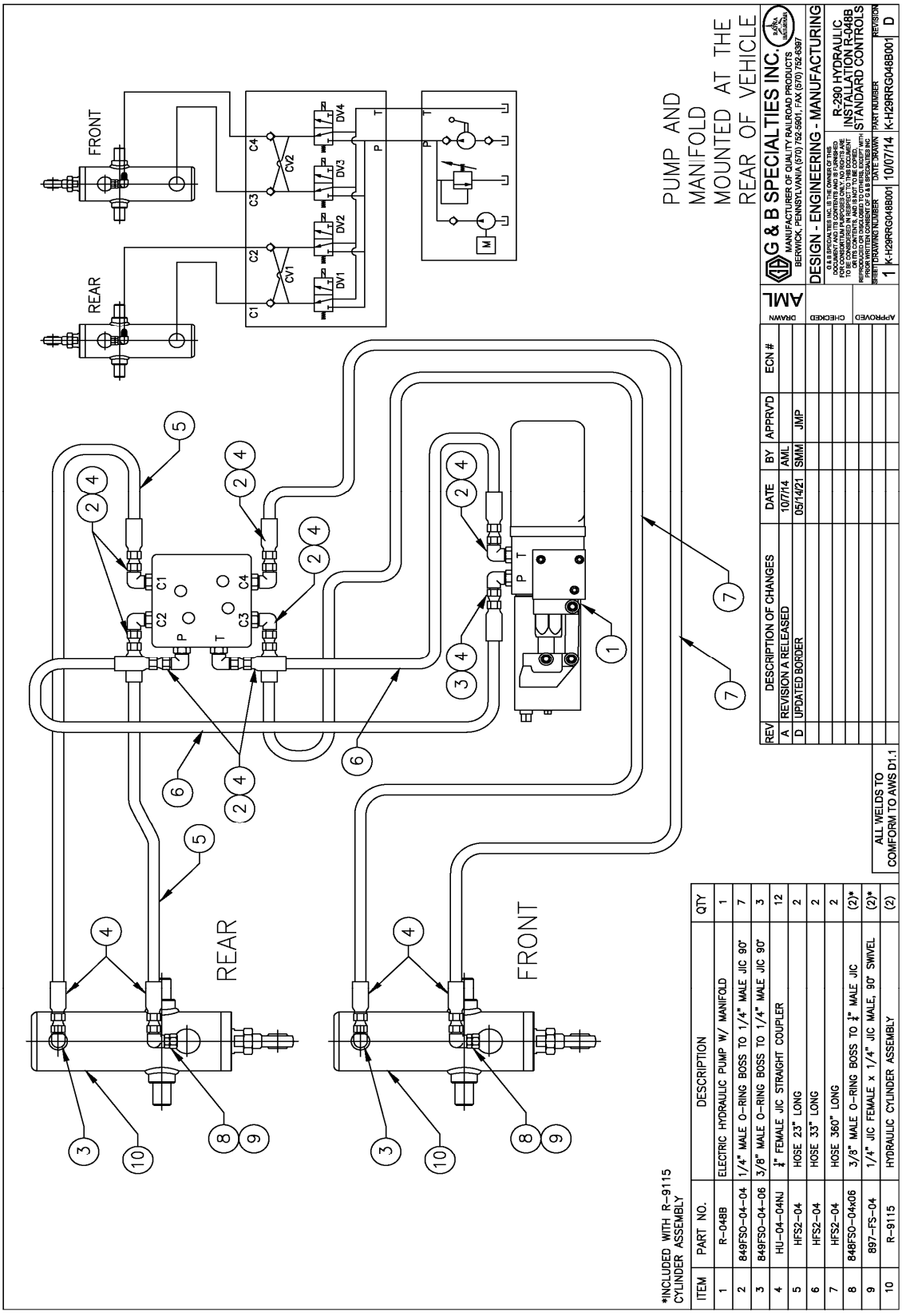

NOTES
1- ALL CONNECTIONS TO BE SOLDERED AND HEAT SHRINK SEALED
2- ENSURE ALL WIRES ARE SECURED AWAY FROM HEAT AND SHARP EDGES
ITEM | PART NO. | DESCRIPTION | QTY
1 | R-048B | PUMP ASSEMBLY | 1
2 | CD-106 | ILLUMINATED ROCKER SWITCH | 1
3 | R-1577 | IN-LINE FUSE CONNECTOR | 1
4 | R-1577-1 | IN-LINE FUSE 5 AMP | 1
5 | - | SOLENOID (PART OF R-048B) | 1
6 | - | MANIFOLD (PART OF R-048B) | 1
7 | - | FRONT CONTROL BOX (PART OF R-048B) | 1
8 | - | REAR CONTROL BOX (PART OF R-048B) | 1
9 | - | VEHICLE BATTERY (NOT SUPPLIED) | -
10 | - | RECOMMENDED 200 AMP FUSE (NOT SUPPLIED) | -
MANIFOLD
EXTERIOR CONTROL
FRONT CONTROL BOX
REAR CONTROL BOX
UP
DOWN
GREEN WIRE
WHITE WIRE
RED WIRE
BLACK WIRE
4 FT CABLE
36 FT CABLE
BLACK
WHITE
THERMAL SWITCH WIRES (YELLOW OR BROWN DEPENDING ON PUMP MODEL)
TANK
PUMP
MOTOR
IN-CAB CONTROL
RAILGEAR
ON
OFF
POWER SUPPLY MUST BE CONNECTED TO CENTER TERMINAL
WIRE TO IGNITION ACTIVATED POWER SUPPLY
ALL WELDS TO COMFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 10/06/14 | AML | | |
G | REVISED THERMAL WIRE COLOR | 09/25/19 | SMM | JMP | X
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
ELECTRICAL INSTALLATION OF R-290 PUMP
SHEET 1 | DRAWING NUMBER EXXXXXR048B | DATE DRAWN 10/06/14 | PART NUMBER EXXXXXR048B | REVISION G



REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
A	REVISION A RELEASED	10/7/14	AML		
D	UPDATED BORDER	05/14/21	SMM	JMP	

ITEM	PART NO.	DESCRIPTION	QTY
1	R-048B	ELECTRIC HYDRAULIC PUMP W/ MANIFOLD	1
2	849FSO-04-04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	7
3	849FSO-04-06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
4	HU-04-04NJ	¼" FEMALE JIC STRAIGHT COUPLER	12
5	HFS2-04	HOSE 23" LONG	2
6	HFS2-04	HOSE 33" LONG	2
7	HFS2-04	HOSE 360" LONG	2
8	848FSO-04x06	3/8" MALE O-RING BOSS TO ¼" MALE JIC	(2)*
9	897-FS-04	1/4" JIC FEMALE x 1/4" JIC MALE, 90° SWIVEL	(2)*
10	R-9115	HYDRAULIC CYLINDER ASSEMBLY	(2)

Standard Controls



Standard Controls

INSTALLATION OF HYDRAULIC KIT (ICC CONTROLS)

Part Number	Description	Qty
R-2965	Rear Pump Mounting Bracket	1
R-2965B	Front Pump Mounting Bracket	2
R-2965C	Front Manifold Mounting Bracket	1
R-2965D	Hydraulic Pump Shim Plate	1
R-048	Hydraulic Pump and Manifold	1
R-700	In-Cab Control Panel	1
CO-071	10 Amp Circuit Breaker	1
CO-130N	"Front Gear Up" Decal	1
CO-130O	"Rear Gear Up" Decal	1
CO-130P	"Front Gear Down" Decal	1
CO-130Q	"Rear Gear Down" Decal	1
S-002002	Single Pilot Operated Check Valve	2
R-2868	Locking Cable Holding Collar	1
R-2961	In-Cab Control Lock Cam Converter	2
S-001031	Railgear Operation Decal	2
849FSO-04-04	¼" Male O-Ring Boss to ¼" Male JIC 90°	7
849FSO-04-06	3/8" Male O-Ring Boss to ¼" Male JIC 90°	3
848FSO-04-06	3/8" Male O-Ring Boss to ¼" Male JIC Straight	4
HFS2-04	Hose 16" Long	2
HFS2-04	Hose 23" Long	2
HFS2-04	Hose 33" Long	2
HFS2-04	Hose 360" Long	2
HU04-04NJ	¼" Female JIC Straight Coupler (On Hoses)	12
HU04-04NJ90T	¼" Female JIC 90° Coupler (On Hoses)	3
R-990KIT-011	1/4" UNC Gr. 8 Bolt x 1" Long	3
	1/4" SAE Washer	3
	1/4" Lock Washer	3
	5/16" UNC Gr. 8 Bolt x 0.75" Long	4
	5/16" SAE Washer	4
	5/16" Lock Washer	4
Not Supplied	2 & 14 Gauge Wire, Terminals, Loom, Etc.	-

1. If not already done, install the lock cam converters. Manually rotate both the front and rear railgear until the rail position lock cams are accessible. Position the lock cam converters on the rail position lock cams and weld them in place. Grind the cams smooth. The lock cam converters should prevent the front and rear lock pins from engaging in the rail position.

2. The pump is shipped with a manifold, a hand pump handle, a solenoid, and a rubber terminal boot.

3. Locate and install the solenoid in a convenient location under the hood near the vehicle's battery using installer supplied hardware. Ensure that the solenoid's body is electrically grounded.

4. Install the hydraulic fittings, adapters and hoses as shown on the hydraulic schematic.
5. There are four directional valve manual over-rides on the top face of the manifold. The decal plates can be installed on the top face of the manifold. Apply the decal plates next to the respective over-rides such that they are properly oriented while standing in front of the vehicle.

6. Ensure that none of the hoses contact any sharp edges or hot surfaces. Tie-wrap all hoses securely leaving enough slack for the railgear to function.

7. Install the In-Cab Control panel in the cab in a convenient location under the dash.

8. Install the circuit breaker under the hood near the previously installed railgear pump solenoid.

9. The pump manifold has three wire harnesses and two wires connected to it:
   a) One 4' wire harness for the front railgear with a control box on the end.
   b) One 36' wire harness for the rear railgear with a control box on the end.
   c) One 22' wire harness for the in-cab controls with terminated wires on the end.
   d) One white and one black wire each with ring terminals on the ends.

10. Using suitable 14-gauge wire, cable loom, connectors, solder and heat shrink tubing:
    a) Lengthen the white wire if required, and connect it from the manifold to the switching terminal on the railgear pump solenoid previously mounted under the hood.
    b) Lengthen the black wire if required, and connect from the manifold through the firewall to the load terminal on the railgear switch on the In-Cab Control panel.
    c) Connect another length of black wire from the power terminal on the railgear switch to ignition activated power supply.
    d) Connect another wire from the ground terminal on the railgear switch to a suitable ground location on the vehicle.
    e) Ensure the manifold is properly grounded to the vehicle chassis by connecting a wire from the manifold to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates and tar on the frame.

11. Using suitable 2-gauge wire, cable loom, connectors, solder and heat shrink tubing:
    a) Connect one wire from the vehicle's battery to the circuit breaker. Then from the circuit breaker to the power terminal on the railgear pump solenoid.
    b) Connect another wire from the load terminal on the solenoid to the power terminal on the pump motor. Use the supplied rubber boot to protect the pump power terminal from shorting out.

    c) Ensure the pump motor base is properly grounded to the vehicle chassis by connecting a wire from the pump motor base to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates or tar on the frame.

12. Route the 22' wire harness from the manifold through the firewall to the In-Cab Control panel. Connect the wires to the In-Cab Control switches as shown on pages 138.

13. Route the 36' wire harness from the pump along the frame to the rear of the vehicle and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the rear railgear control box with installer-supplied hardware in a protected vertical position in a suitable location. Ensure the control box is within reach of the railgear locking cable handle.

14. Route the 4' wire harness from the pump to the front of the vehicle and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the front railgear control box with installer-supplied hardware in a protected vertical position in a suitable location. Ensure the control box is within reach of the railgear locking cable handle.

15. Ensure that the control boxes are mounted vertically so that the controls do not fill with water and freeze. They should also be mounted in a location protected from road spray etc.

16. Affix the supplied railgear operation decals in a suitable location adjacent to the front and rear control boxes.

17. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.

18. Ensure all holes in the firewall are sealed and protected with a grommet.

19. Fill the hydraulic system and bleed the air out:
    a) Fill the pump tank with **DEXRON** III (or equivalent) hydraulic fluid.
    b) Operate the front railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    c) Refill the pump tank and repeat the above step until all air is removed from the front hydraulic system.
    d) Operate the rear railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    e) Refill the pump tank and repeat the above step until all air is removed from the rear hydraulic system.
    f) With both front and rear railgear locked in the road position, fill the pump tank to the full line.

20. Follow the Hydraulic System Relief Valve Setting procedure detailed in the Hydraulic Kit Service section of this manual

21. Test the fit of the locking cable holding collar on both the front and rear locking cables. Ensure that the locking cable holding collar keeps the railgear locking pin fully disengaged. Grind the locking cable holding collar or adjust the locking cable handle on the cable to fit if necessary.

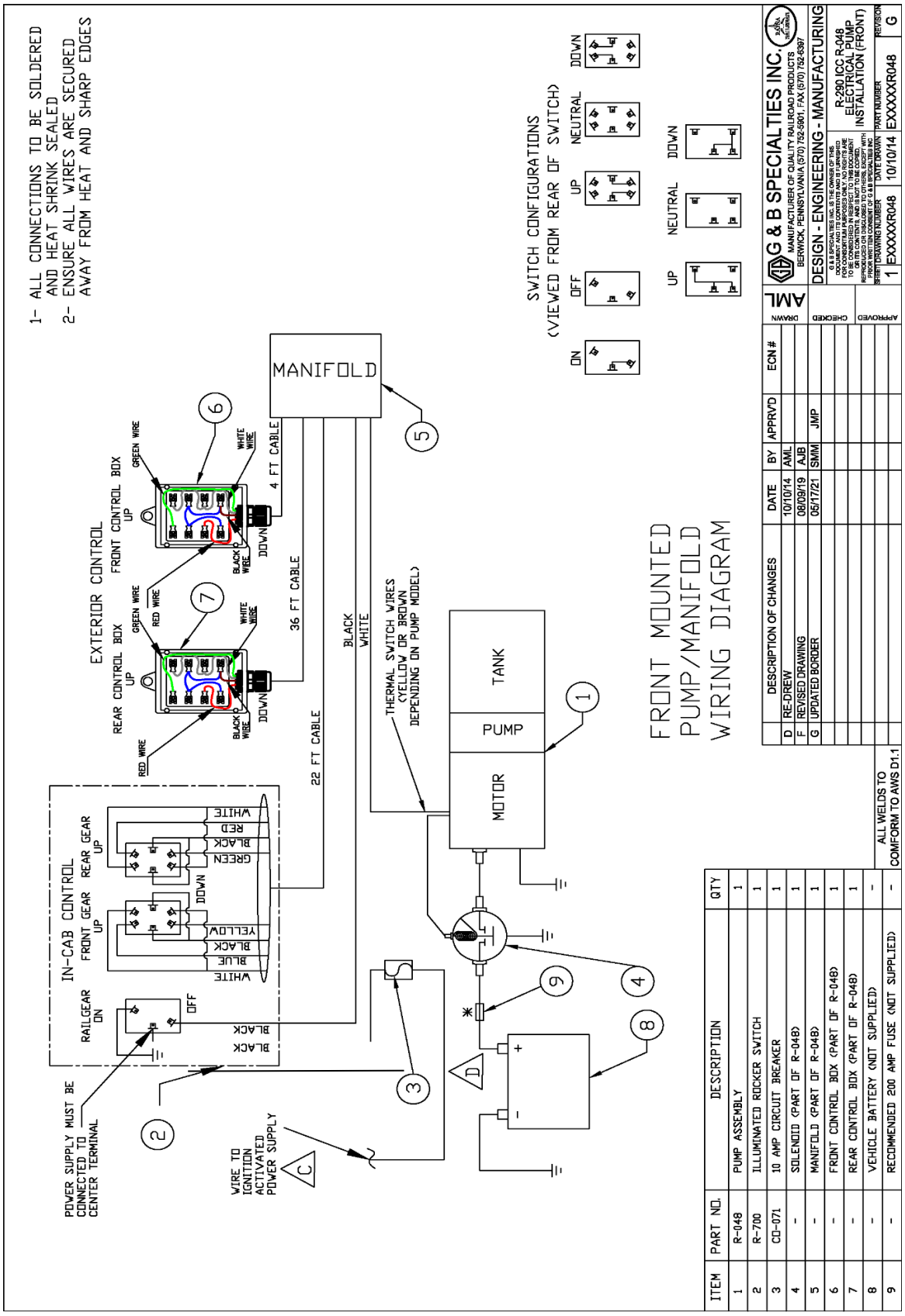
22. Test the operation of the controls and directional valve manual over-rides. Refer to the operation procedure in the Railgear Kit Manual and Hydraulic Kit Operation section of this manual.

23. Lower both front and rear railgear to rail position and ensure the lock cam converters previously installed prevent the lock pins from engaging the lock cams.

24. Locate and store the hand pump handle and the locking cable holding collar in a secure location in the vehicle cab.

Ensure that the thermal overload wires are properly spliced/connected as shown

It is recommended that a 200-amp fuse or 200-amp Circuit Breaker be installed to isolate the hydraulic pump from the vehicle electrical system as shown



ITEM	PART NO.	DESCRIPTION	QTY
1	R-048	PUMP ASSEMBLY	1
2	R-700	ILLUMINATED ROCKER SWITCH	1
3	CD-071	10 AMP CIRCUIT BREAKER	1
4	-	SOLENOID (PART OF R-048)	1
5	-	MANIFOLD (PART OF R-048)	1
6	-	FRONT CONTROL BOX (PART OF R-048)	1
7	-	REAR CONTROL BOX (PART OF R-048)	1
8	-	VEHICLE BATTERY (NOT SUPPLIED)	-
9	-	RECOMMENDED 200 AMP FUSE (NOT SUPPLIED)	-

	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
D	RE-DREW	10/10/14	AML		
F	REVISED DRAWING	08/09/19	AJB		
G	UPDATED BORDER	06/17/21	SMM	JMP	

DRAWN: AML
CHECKED:
APPROVED:

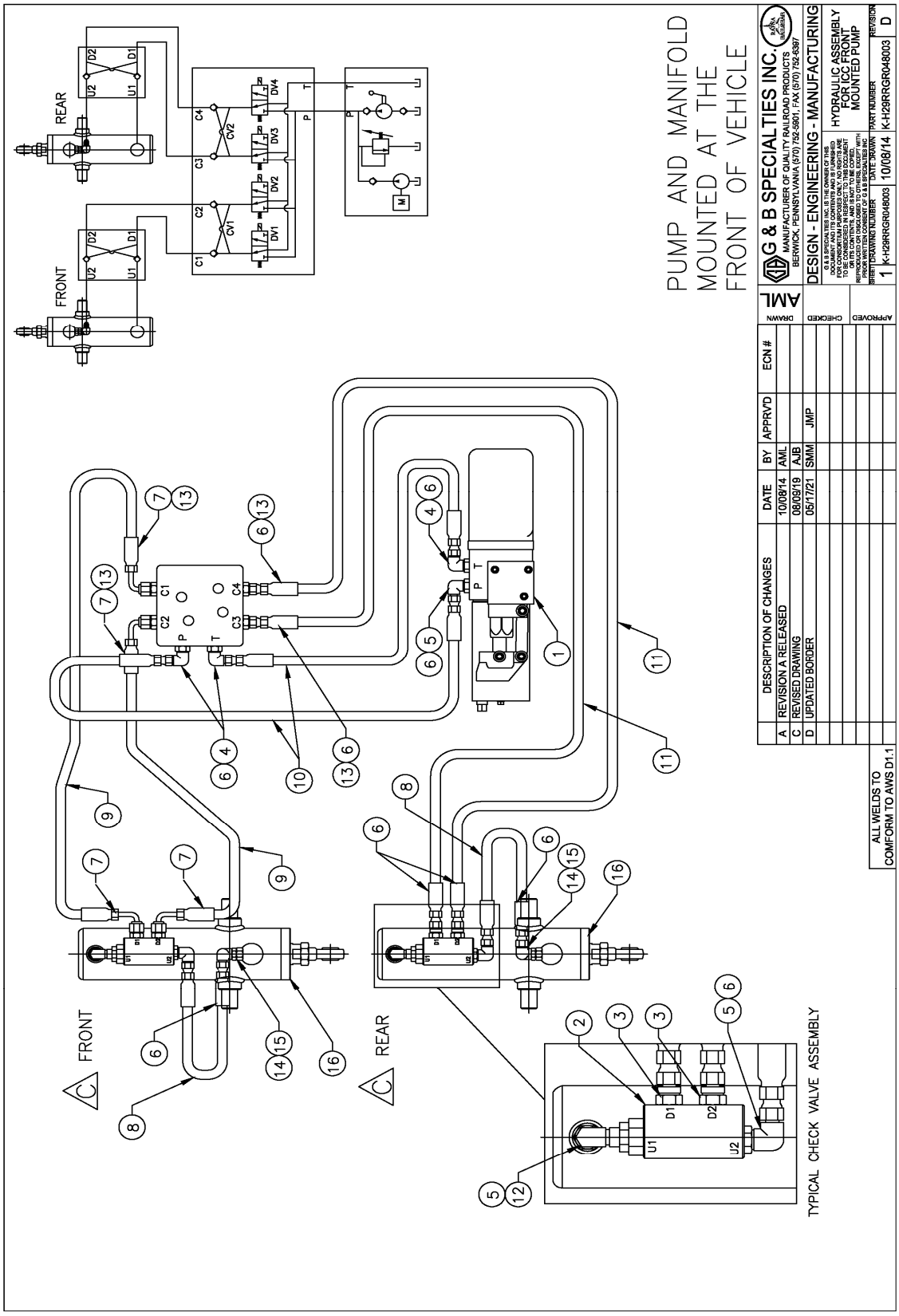
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901, FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

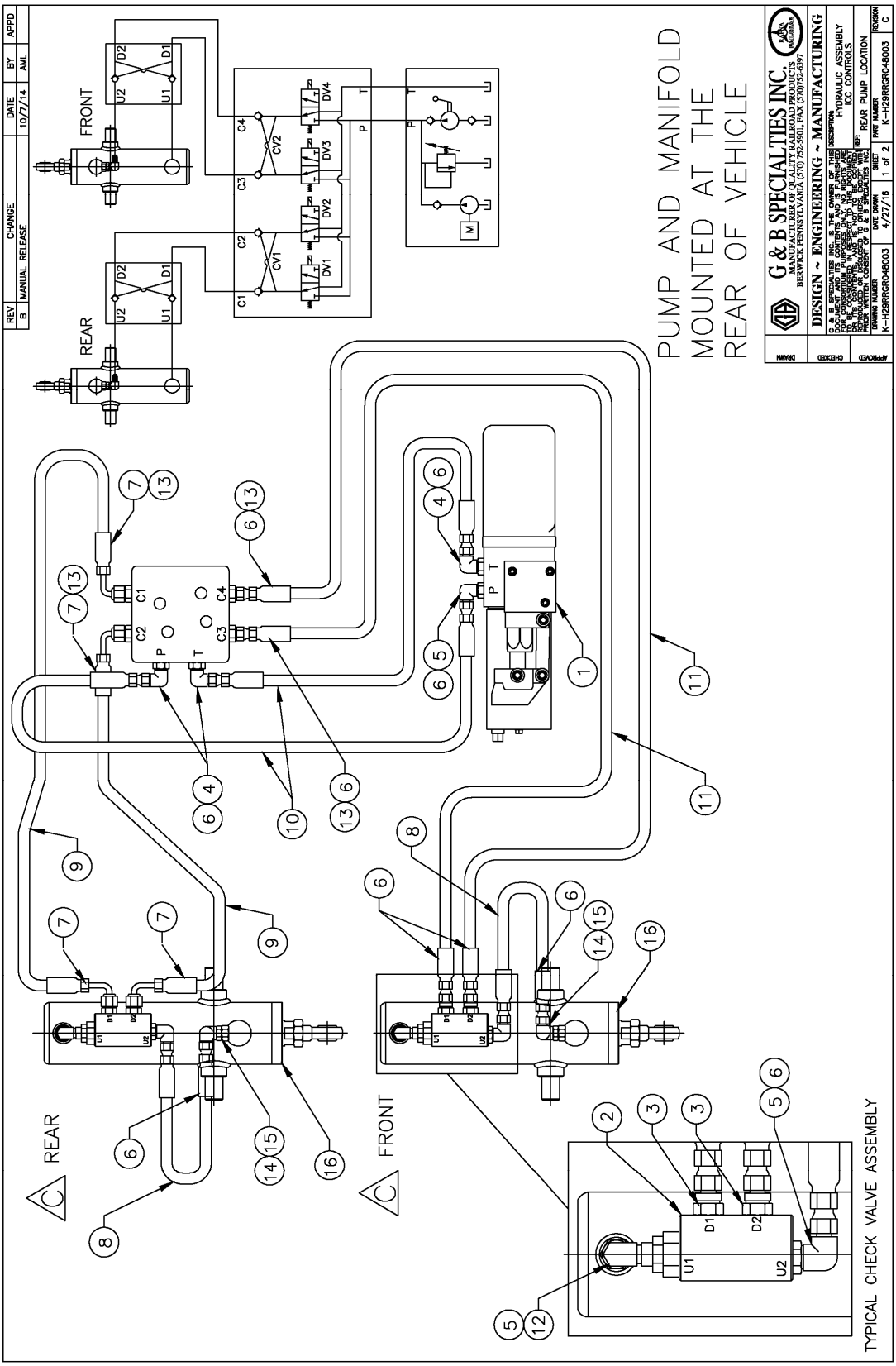
R-290 ICC R-048 ELECTRICAL PUMP INSTALLATION (FRONT)

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	EXXXXXR048	10/10/14	EXXXXXR048	G

ALL WELDS TO COMFORM TO AWS D1.1



In-Cab Controls



In-Cab Controls

ITEM	PART NO.	DESCRIPTION	QTY
1	R–048	ELECTRIC HYDRAULIC PUMP W/ MANIFOLD	1
2	S–002002	SINGLE P.O. CHECK VALVE	2
3	848FSO–04x06	3/8" MALE O–RING BOSS TO $\frac{1}{4}$" MALE JIC	4
4	849FSO–04–04	1/4" MALE O–RING BOSS TO 1/4" MALE JIC 90°	3
5	849FSO–04–06	3/8" MALE O–RING BOSS TO 1/4" MALE JIC 90°	3
6	HU–04–04NJ	1/4" FEMALE JIC STRAIGHT COUPLER	12
7	HU–04–04NJ90T	1/4" FEMALE JIC 90° COUPLER	4
8	HFS2–04	HOSE 16" LONG	2
9	HFS2–04	HOSE 23" LONG	2
10	HFS2–04	HOSE 33" LONG	2
11	HFS2–04	HOSE 360" LONG	2
12	C5216x4x6	1/4 JIC FEMALE X 3/8 MALE O–RING	2
13	848FSO–04x04	1/4" MALE O–RING BOSS TO 1/4" MALE JIC	4
14	848FSO–04x06	3/8" MALE O–RING BOSS TO $\frac{1}{4}$" MALE JIC	(2)*
15	897–FS–04	1/4" JIC FEMALE x 1/4" JIC MALE, 90° SWIVEL	(2)*
16	R–9115	HYDRAULIC CYLINDER ASSEMBLY	(2)
17	R–2965B	PLATE PUMP MOUNTING	2
18	R–2965C	MANIFOLD MOUNTING PLATE	1

	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	10/10/14	AML		
C	UPDATED BORDER	05/17/21	SMM	JMP	

DRAWN AML
CHECKED
APPROVED

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DESIGN - ENGINEERING - MANUFACTURING

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R-290 ICC R-048
ELECTRICAL PUMP
INSTALLATION BOM

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	EXXXXXR048	10/10/14	EXXXXXR048	C

INSTALLATION OF HYDRAULIC KIT (FICC CONTROLS)

Part Number	Description	Qty
R-048	Hydraulic Pump	1
R-2965	Rear Pump Mounting Bracket	1
R-2965B	Front Pump Mounting Plate	2
R-2965C	Front Manifold Mounting Bracket	1
R-2965D	Shim Plate for Hydraulic Pump	1
R-700	In-Cab Control Panel	1
CO-071	10 Amp Circuit Breaker	1
CO-130N	"Front Gear Up" Decal	1
CO-130O	"Rear Gear Up" Decal	1
CO-130P	"Front Gear Down" Decal	1
CO-130Q	"Rear Gear Down" Decal	1
S-002001	Double P.O. Hydraulic Locking Valve	2
R-1565	Flow Reducer	2
S-001032	Railgear Operation Decal	2
H-990KIT-000	Adapter	7
	Adapter	3
	Adapter	2
	Adapter	4
	Adapter	2
	Adapter	2
	Hose 16" Long	2
	Coupler	4
	Hose 23" Long	2
	Coupler	2
	Coupler	2
	Hose 33" Long	2
	Coupler	4
	Hose 360" Long	2
	Coupler	4
H-990KIT-052	Adapter, Hydraulic	2
R-990KIT-011	1/4" UNC Gr. 8 Bolt x 1" Long	3
	1/4" SAE Washer	3
	1/4" Lock Washer	3
	5/16" UNC Gr. 8 Bolt x 1" Long	4
	5/16" SAE Washer	4
	5/16" Lock Washer	4
Not Supplied	2 & 14 Gauge Wire, Terminals, Loom, Etc.	-

1. The pump is shipped with a manifold, a hand pump handle, a solenoid, and a rubber terminal boot.

2. Locate and install the solenoid in a convenient location under the hood near the vehicle's battery using installer supplied hardware. Ensure that the solenoid's body is electrically grounded.

3. Install the hydraulic fittings and adapters as shown on the hydraulic schematic.

4. There are four directional valve manual over-rides on the top face of the manifold. The decal plates can be installed on the top face of the manifold as shown. Stick the decal plates next to the respective over-rides such that they are properly oriented while standing in front of the vehicle.

5. Connect one 16" long hydraulic hose between the U2 port on the rear railgear cylinder check valve and the rod end port on the rear railgear cylinder.

6. Connect one 16" long hydraulic hose between the U2 port on the front railgear cylinder check valve and the rod end port on the front railgear cylinder.

7. Connect one 23" long hydraulic hose (straight and 90° ends) between the C1 port on the manifold and the D1 port on the front or rear railgear cylinder check valve. The 90° hose end should be at the check valve.

8. Connect one 23" long hydraulic hose (straight and 90° ends) between the C2 port on the manifold and the D2 port on the front or rear railgear cylinder check valve. The 90° hose end should be at the check valve.

9. Connect one 33" long hydraulic hose between the P port on the manifold and the P port on the pump.

10. Connect one 33" long hydraulic hose between the T port on the manifold and the T port on the pump.

11. Connect one 360" long hydraulic hose to the C3 port on the manifold and mark the other end of this hose as "D1".

12. Connect one 360" long hydraulic hose to the C4 port on the manifold and mark the other end of this hose as "D2".

13. Route the two 360" long hydraulic hoses to the front or rear of the vehicle along the left side of the frame and secure in place with tie-wraps. Where necessary, fasten the hose to the frame with installer supplied hose clips and hardware.

14. Connect the end of the 360" long hydraulic hose marked "D1" to the D1 port on the front or rear railgear cylinder check valve.

15. Connect the end of the 360" long hydraulic hose marked "D2" to the D2 port on the front or rear railgear cylinder check valve.

16. Ensure that none of the hoses contact any sharp edges or hot surfaces. Tie-wrap all hoses securely leaving enough slack for the railgear to function.

17. Install the In-Cab Control panel in the cab in a convenient location under the dash.

18. Install the circuit breaker under the hood near the previously installed railgear pump solenoid.

19. The pump manifold has three wire harnesses and two wires connected to it:
    a) One 4' wire harness for the front or rear railgear with a control box on the end.
    b) One 36' wire harness for the front or rear railgear with a control box on the end.
    c) One 22' wire harness for the in-cab controls with terminated wires on the end.
    d) One white and one black wire each with ring terminals on the ends.

20. Using suitable 14 gauge wire, cable loom, connectors, solder and heat shrink tubing:
    f) Lengthen the white wire if required and connect it from the manifold to the switching terminal on the railgear pump solenoid previously mounted under the hood.
    g) Lengthen the black wire if required and connect from the manifold through the firewall to the load terminal on the railgear switch on the In-Cab Control panel.
    h) Connect another length of black wire from the power terminal on the railgear switch through the firewall to the "Aux" terminal on the circuit breaker.
    i) Connect another black wire from the "Bat" terminal on the circuit breaker to the power terminal on the solenoid.
    j) Connect another wire from the ground terminal on the railgear switch to a suitable ground location on the vehicle.
    k) Ensure the manifold is properly grounded to the vehicle chassis by connecting a wire from the manifold to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates and tar on the frame.
    l) Lengthen the 22' wire harness if required and route it from the manifold through the firewall to the In-Cab Control panel. Connect the wires to the In-Cab Control switches as shown.

21. Using suitable 2 gauge wire, cable loom, connectors, solder and heat shrink tubing:
    e) Connect one wire from the vehicle's battery to the power terminal on the railgear pump solenoid.
    f) Connect another wire from the load terminal on the solenoid to the power terminal on the pump motor. Use the supplied rubber boot to protect the pump power terminal from shorting out.
    g) Ensure the pump motor base is properly grounded to the vehicle chassis by connecting a wire from the pump motor base to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates or tar on the frame.

22. Route the 36' wire harness from the pump along the frame to the front or rear of the vehicle and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the front or rear railgear control box with installer-supplied hardware in a protected vertical position in a suitable location.

23. Route the 4' wire harness from the pump to the front or rear of the vehicle and secure in place with tie-wraps. If necessary, the control box can be removed from and reinstalled on the wire harness to facilitate routing. Fabricate a bracket and mount the front or rear railgear control box with installer-supplied hardware in a protected vertical position in a suitable location.

24. Ensure that the control boxes are mounted vertically so that the controls do not fill with water and freeze. They should also be mounted in a location protected from road spray etc.

25. Affix the supplied railgear operation decals in a suitable location adjacent to the front and rear control boxes.

26. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.

27. Ensure all holes in the firewall are sealed and protected with a grommet.

28. Fill the hydraulic system and bleed the air out:
    h) Fill the pump tank with **DEXRON III** (or equivalent) hydraulic fluid.
    i) Operate the front railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    j) Refill the pump tank and repeat the above step until all air is removed from the front hydraulic system.
    k) Operate the rear railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    l) Refill the pump tank and repeat the above step until all air is removed from the rear hydraulic system.
    m) With both front and rear railgear locked in the road position, fill the pump tank to the full line.

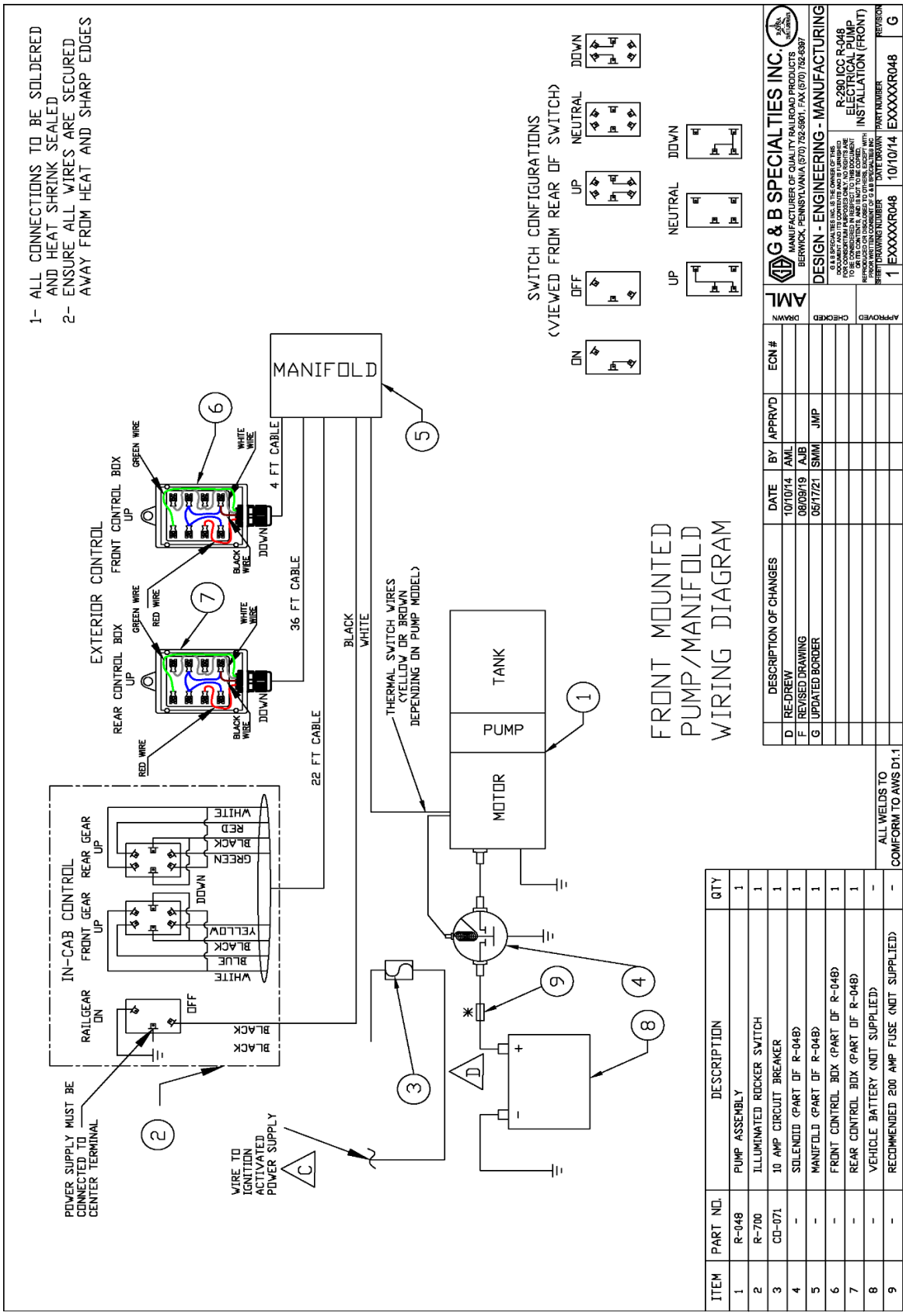
29. Follow the Hydraulic System Relief Valve Setting procedure detailed in the Hydraulic Kit Operation section of this manual.

30. Test the operation of the controls and directional valve manual over-rides. Refer to the operation procedure in the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals.

31. Locate and store the hand pump handle in a secure location in the vehicle cab.

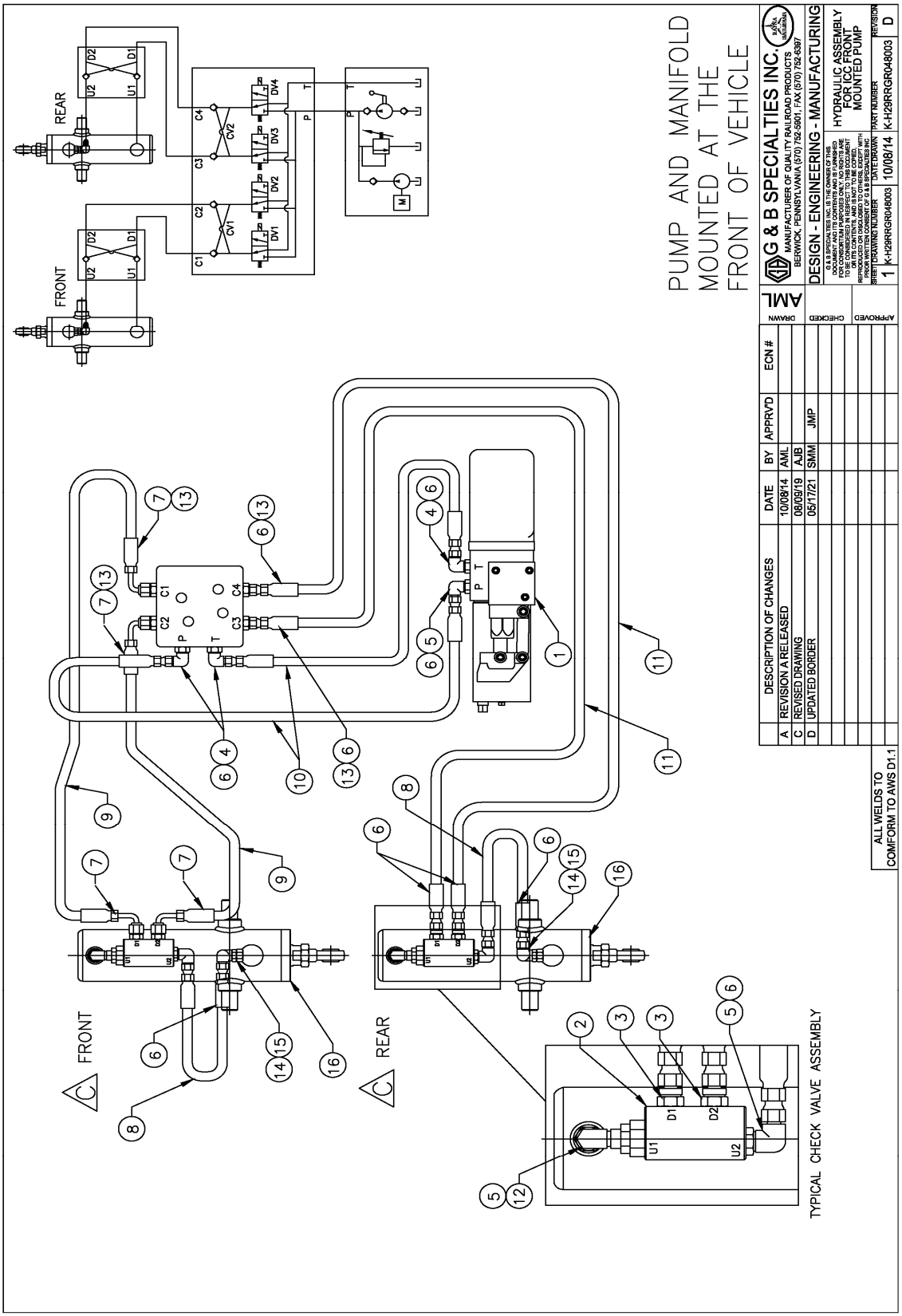
Ensure that the thermal overload wires are properly spliced/connected as shown

It is recommended that a 200 amp fuse be installed to isolate the hydraulic pump from the vehicle electrical system as shown



ITEM	PART NO.	DESCRIPTION	QTY
1	R-048	PUMP ASSEMBLY	1
2	R-700	ILLUMINATED ROCKER SWITCH	1
3	CB-071	10 AMP CIRCUIT BREAKER	1
4	-	SOLENOID (PART OF R-048)	1
5	-	MANIFOLD (PART OF R-048)	1
6	-	FRONT CONTROL BOX (PART OF R-048)	1
7	-	REAR CONTROL BOX (PART OF R-048)	1
8	-	VEHICLE BATTERY (NOT SUPPLIED)	-
9	-	RECOMMENDED 200 AMP FUSE (NOT SUPPLIED)	-

	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
D	RE-DREW	10/10/14	AML		
F	REVISED DRAWING	08/09/19	AJB		
G	UPDATED BORDER	06/17/21	SMM	JMP	



Full In-Cab Control

ITEM	PART NO.	DESCRIPTION	QTY
1	R-048	ELECTRIC HYDRAULIC PUMP W/ MANIFOLD	1
2	S-002002	SINGLE P.O. CHECK VALVE	2
3	848FSO-04x06	3/8" MALE O-RING BOSS TO ¾" MALE JIC	4
4	849FSO-04-04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
5	849FSO-04-06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
6	HU-04-04NJ	1/4" FEMALE JIC STRAIGHT COUPLER	12
7	HU-04-04NJ90T	1/4" FEMALE JIC 90° COUPLER	4
8	HFS2-04	HOSE 16" LONG	2
9	HFS2-04	HOSE 23" LONG	2
10	HFS2-04	HOSE 33" LONG	2
11	HFS2-04	HOSE 360" LONG	2
12	C5216x4x6	1/4 JIC FEMALE X 3/8 MALE O-RING	2
13	848FSO-04x04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC	4
14	848FSO-04x06	3/8" MALE O-RING BOSS TO ¾" MALE JIC	(2)*
15	897-FS-04	1/4" JIC FEMALE x 1/4" JIC MALE, 90° SWIVEL	(2)*
16	R-9115	HYDRAULIC CYLINDER ASSEMBLY	(2)
17	R-2965B	PLATE PUMP MOUNTING	2
18	R-2965C	MANIFOLD MOUNTING PLATE	1

DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A REVISION A RELEASED	10/10/14	AML		
C UPDATED BORDER	05/17/21	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

R-290 ICC R-048
ELECTRICAL PUMP
INSTALLATION BOM

SIZE	PART NUMBER	REVISION
1	EXXXXXR048	C

DRAWN 10/10/14 EXXXXXR048

INSTALLATION OF HYDRAULIC KIT WITH MANUAL VALVES

K-H29RRXS004270 Hydraulic Kit
See Pages 156-158 for Parts

Part Number	Description	Qty
R-2965B	Plate Pump Mounting	2
S-003041	Hydraulic Pump	1
R-31595	Manual Control Valve	2
R-31596	#8 JIC Hydraulic Plug	4
R-31597	Plug, Male Adaptor	2
R-2965	Rear Pump Mounting Bracket	1
CO-106	Dash Switch	1
R-1577	In-Line Fuse 5 Amp	1
R-1577-1	5 Amp Fuse	1
CO-130G	"Railgear Pump" Decal	3
CO-130N	"Front Gear Up" Decal	1
CO-130O	"Rear Gear Up" Decal	1
CO-130P	"Front Gear Down" Decal	1
CO-130Q	"Rear Gear Down" Decal	1
R-2868	Locking Cable Holding Collar	1
R-32145	Single P.O. Check Valve Assembly	2
R-32180	Railgear Operation Decal	2
849-FSO-04-04	Hydraulic Adapter	1
849-FSO-04-06	Hydraulic Adapter	3
849-FS-04-06	Hydraulic Adapter	4
848-FSO-04-08	Hydraulic Adapter	8
879-FS-04	Hydraulic Adapter	8
HFS2-04	Hose 23" Long	4
HFS2-04	Hose 33" Long (for standard pump location)	1
HFS2-04	Hose 80" Long (for under hood pump install)	1
HFS2-04	Hose 360" Long	2
R-990KIT-402	1/4" UNC Gr. 8 Bolt x 2.25" Long	4
	1/4" SAE Washer	8
	1/4" Nylock Nut	4
	5/16" UNC Gr. 8 Bolt x 0.75" Long	4
	5/16" SAE Washer	4
	5/16" Lock Washer	4
Not Supplied	2 & 14 Gauge Wire, Terminals, Loom, Etc.	As Req'd

K-H29RRXS003041 Hydraulic Kit
See Pages 153-155 for Parts

Part Number	Description	Qty
R-2965B	Plate Pump Mounting	2
S-003041	Hydraulic Pump	1
R-2965	Rear Pump Mounting Bracket	1
R-2965D	Shim Plate for Hydraulic Pump	1
R-31592	Manual Control Valve	2
R-31590	Toggle Switch	2
R-31591	Boot, Toggle Switch	2
CO-106	Dash Switch	1
R-1577	In-Line Fuse 5 Amp	1
R-1577-1	5 Amp Fuse	1
CO-130G	“Railgear Pump” Decal	3
CO-130N	“Front Gear Up” Decal	1
CO-130O	“Rear Gear Up” Decal	1
CO-130P	“Front Gear Down” Decal	1
CO-130Q	“Rear Gear Down” Decal	1
R-2868	Locking Cable Holding Collar	1
S-001030	Railgear Operation Decal	2
R-32180	Operation Decal	2
R-32145	Single P.O. Check Valve Assembly	2
849-FSO-04-04	Hydraulic Adapter	1
849-FSO-04-06	Hydraulic Adapter	3
849-FS-04-06	Hydraulic Adapter	4
848-FSO-04-08	Hydraulic Adapter	4
848-FSO-04-10	Hydraulic Adapter	4
879-FS-04	Hydraulic Adapter	8
HFS2-04	Hose 23” Long	4
HFS2-04	Hose 33” Long (for standard pump location)	1
HFS2-04	Hose 80” Long (for under hood pump install)	1
HFS2-04	Hose 360” Long	2
R-990KIT-402	1/4” UNC Gr. 8 Bolt x 2.25” Long	4
	1/4” SAE Washer	8
	1/4” Nylock Nut	4
	5/16” UNC Gr. 8 Bolt x 0.75” Long	4
	5/16” SAE Washer	4
	5/16” Lock Washer	4
Not Supplied	2 & 14 Gauge Wire, Terminals, Loom, Etc.	As Req’d

1. The pump is shipped with a hand pump handle, a solenoid, and a rubber terminal boot.

2. Locate and install the solenoid in a convenient location under the hood near the vehicle's battery. Ensure that the solenoid's body is electrically grounded.

3. Install all hydraulic fittings and adapters as shown on hydraulic schematic.

4. Route all required hose as shown on the hydraulic schematic.

5. Ensure that none of the hoses contact any sharp edges or hot surfaces. Tie-wrap all hoses securely leaving enough slack for the railgear to function.

6. Install the dash switch and "Railgear Pump" decal in a convenient location on the dash.

7. Using suitable 14-gauge wire, cable loom, connectors, solder and heat shrink tubing:

    a. Route and install all electrical components as shown on the electrical schematic.

8. Using suitable 2-gauge wire, cable loom, connectors, solder and heat shrink tubing:
    a. Connect one wire from the vehicle's battery to the power terminal on the circuit breaker or fuse.
    b. Connect another wire from the load terminal on the circuit breaker to the power terminal on the solenoid.
    c. Connect another wire from the load terminal on the solenoid to the power terminal on the pump motor. Use the supplied rubber boot to protect the pump power terminal from shorting out.
    d. Ensure the pump motor base is properly grounded to the vehicle chassis by connecting a wire from the pump motor base to a suitable ground location on the vehicle. The railgear may not be properly grounded due to paint on the mounting plates or tar on the frame.

9. Mount the front and rear control valves as required. It may be necessary to fabricate a bracket to mount the valve in a suitable location. Ensure the control valve is within reach of the railgear locking cable handle and the toggle switch for activating the railgear pump.

10. Ensure that the control valves in a location protected from road spray etc.

11. Affix the supplied railgear operation decals in a suitable location adjacent to the front and rear control valves.

12. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.

13. Ensure all holes in the firewall are sealed and protected with a grommet.

14. Fill the hydraulic system and bleed the air out:
    a. Fill the pump tank with **DEXRON** III (or equivalent) hydraulic fluid.
    b. Operate the front railgear up and down briefly to circulate the fluid and bleed the system of air (refer to the Railgear Kit and Hydraulic Kit Operation, Service, and Parts manuals for operation instructions).
    c. Refill the pump tank and repeat the above step until all air is removed from the front hydraulic system.
    d. Operate the rear railgear up and down briefly to circulate the fluid and bleed the system of air.
    e. Refill the pump tank and repeat the above step until all air is removed from the rear hydraulic system.
    f. With both front and rear railgear locked in the road position, fill the pump tank to the full line.

15. Follow the Hydraulic System Relief Valve Setting procedure detailed in the Hydraulic Kit Service section of this manual.

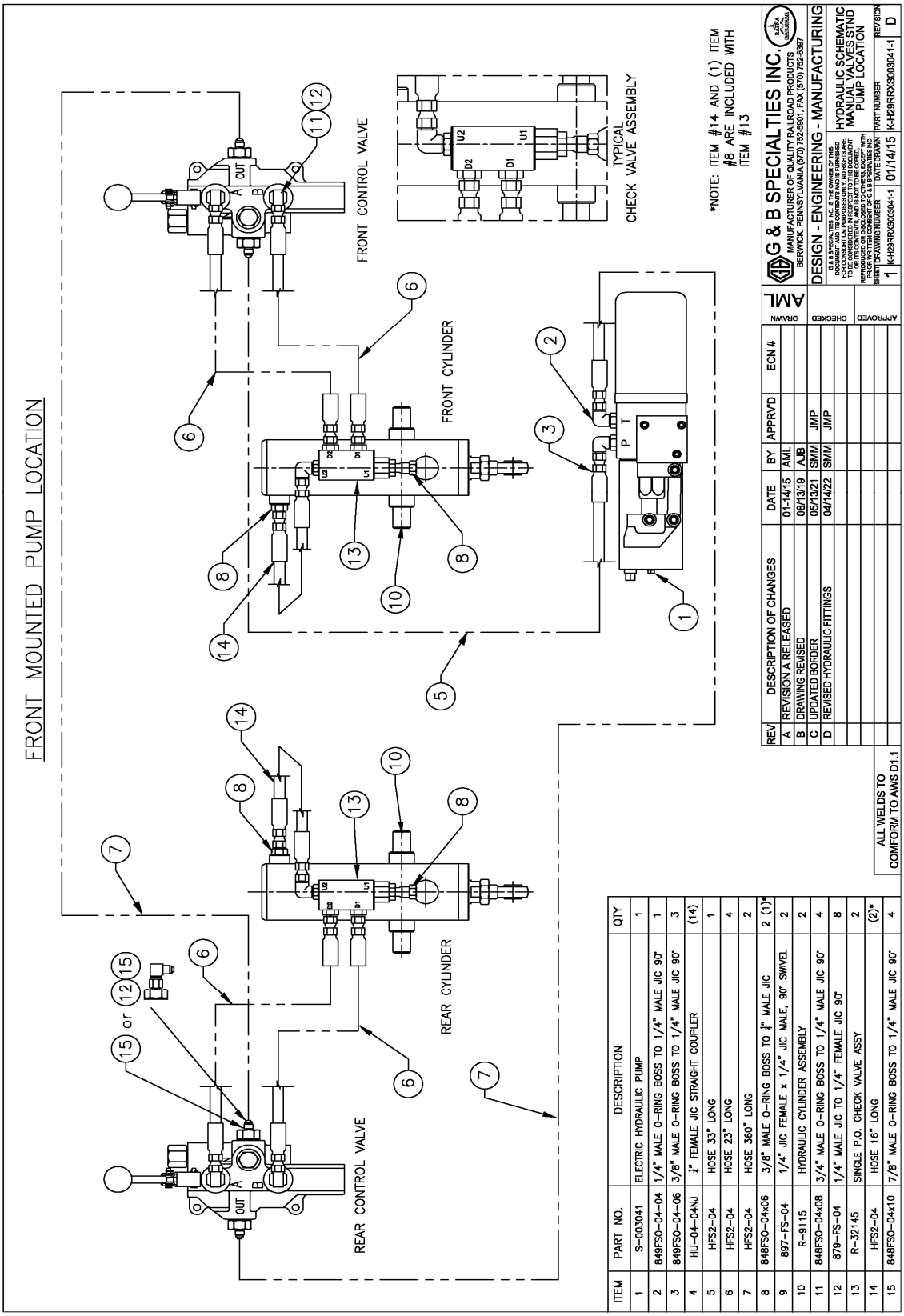
16. Test the fit of the locking cable holding collar on both the front and rear locking cables. Ensure that the locking cable holding collar keeps the railgear locking pin fully disengaged. Grind the locking cable holding collar or adjust the locking cable handle on the cable to fit if necessary.

17. Test the operation of the controls and emergency pump operation. Refer to the operation procedure in the Railgear Kit manual and Hydraulic Kit Operation section of this manual.

18. Locate and store the hand pump handle and the locking cable holding collar in a secure location in the vehicle cab.

Ensure that the thermal overload wires are properly spliced/connected as shown

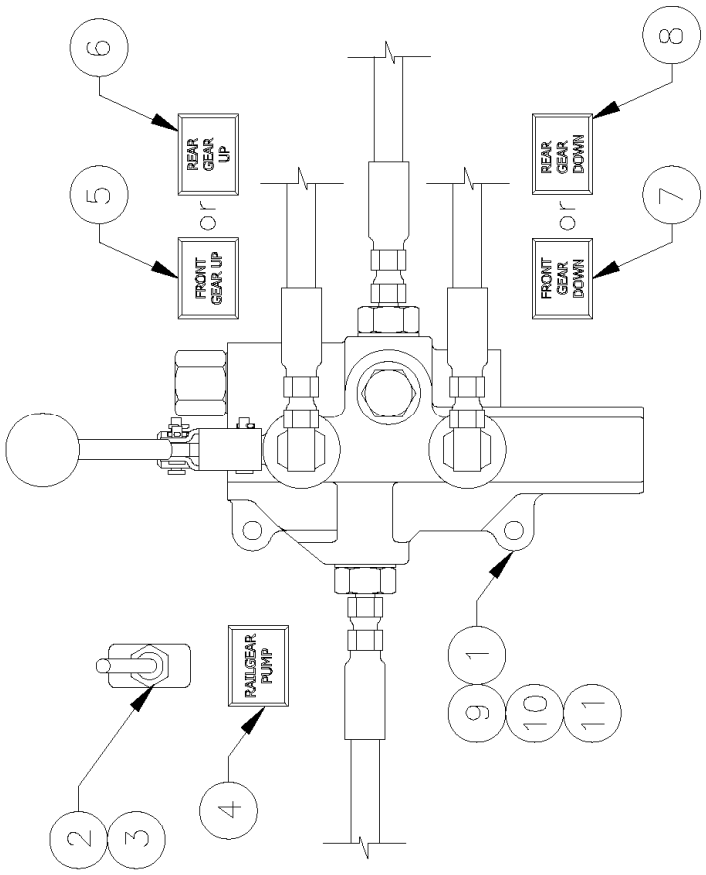
It is recommended that a 200-amp fuse or a 200-amp circuit breaker be installed to isolate the hydraulic pump from the vehicle electrical system as shown



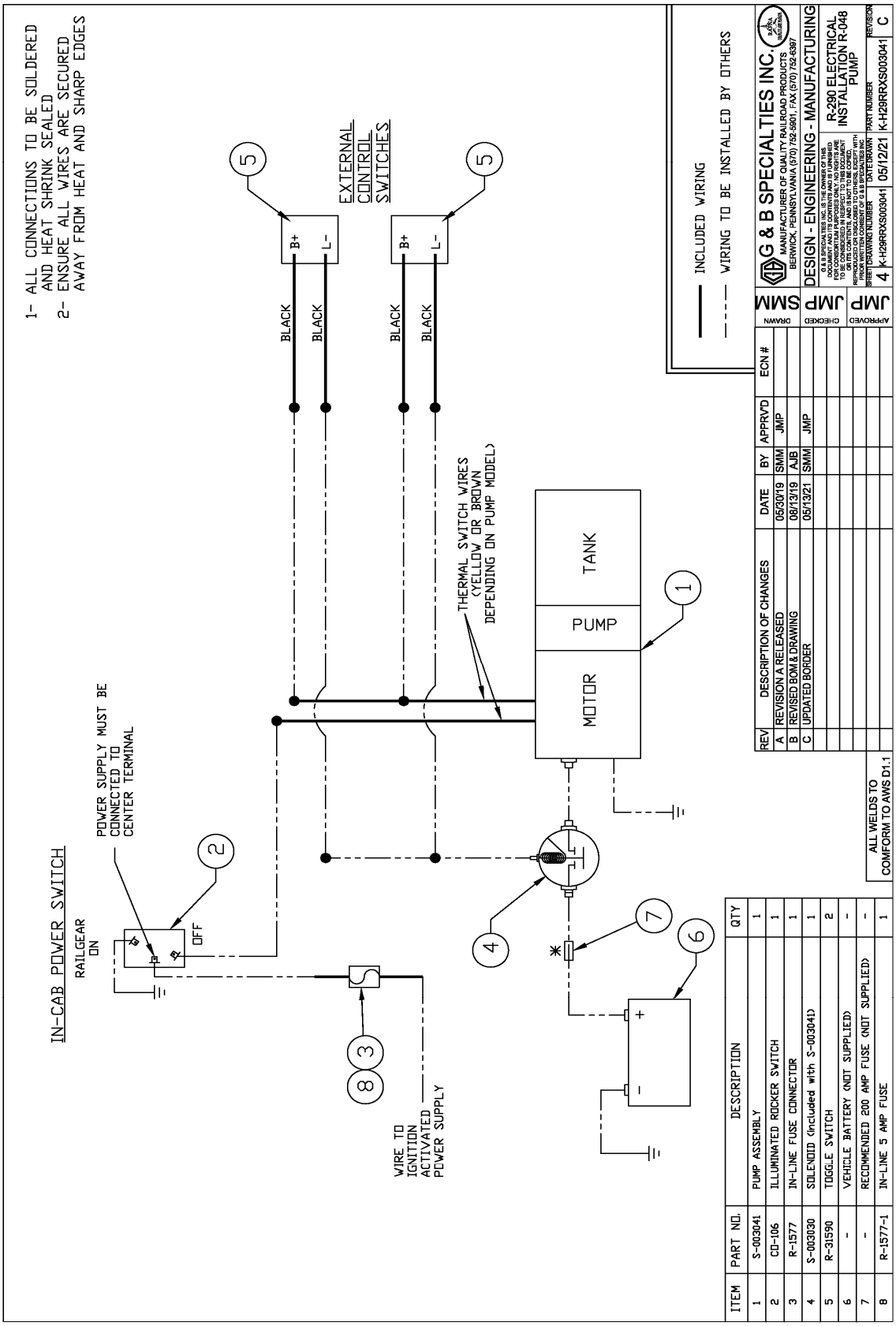
REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
A	REVISION A RELEASED	01-14/15	AML		
B	DRAWING REVISED	08/13/19	AJB		
C	UPDATED BORDER	05/13/21	SMM	JMP	
D	REVISED HYDRAULIC FITTINGS	04/14/22	SMM	JMP	

ITEM	PART NO.	DESCRIPTION	QTY
1	S-003041	ELECTRIC HYDRAULIC PUMP	1
2	849FSO-04-04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	1
3	849FSO-04-06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
4	HU-04-04NJ	¼" FEMALE JIC STRAIGHT COUPLER	(14)
5	HFS2-04	HOSE 33" LONG	1
6	HFS2-04	HOSE 23" LONG	4
7	HFS2-04	HOSE 360" LONG	2
8	848FSO-04x06	3/8" MALE O-RING BOSS TO ¾" MALE JIC	2 (1)*
9	897-FS-04	1/4" JIC FEMALE x 1/4" JIC MALE, 90° SWIVEL	2
10	R-9115	HYDRAULIC CYLINDER ASSEMBLY	2
11	848FSO-04x08	3/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	4
12	879-FS-04	1/4" MALE JIC TO 1/4" FEMALE JIC 90°	8
13	R-32145	SINGLE P.O. CHECK VALVE ASSY	2
14	HFS2-04	HOSE 16" LONG	(2)*
15	848FSO-04x10	7/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	4

Rear Mounted Pump Install – Swap Front Labels with Rear for Front Mounted Pump Install.

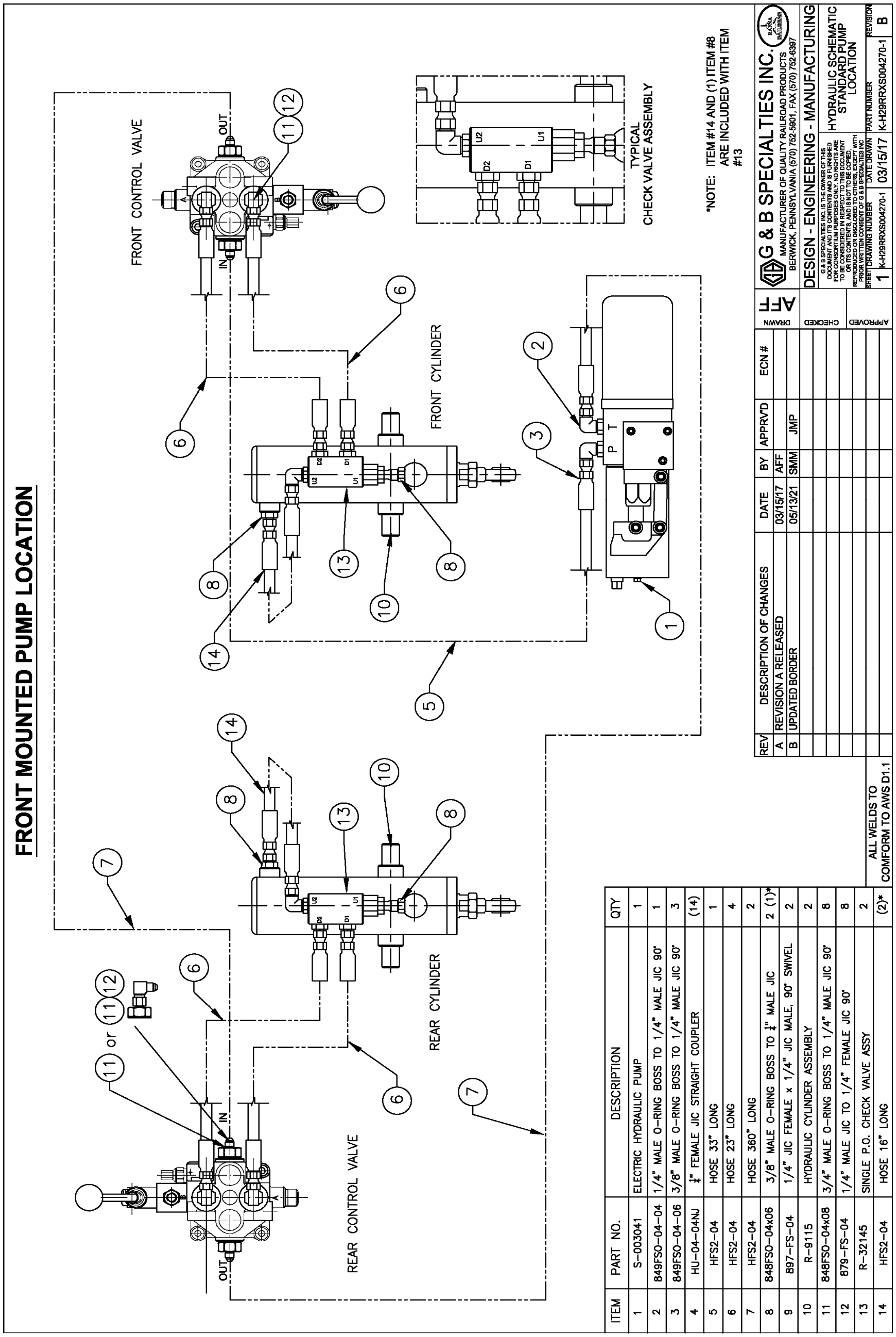


ITEM	PART NO.	DESCRIPTION	QTY
1	R-31592	MANUAL CONTROL VALVE	2
2	R-31590	TOGGLE SWITCH	2
3	R-31591	TOGGLE SWITCH BOOT	2
4	CO-130G	"RAILGEAR PUMP" DECAL	2
5	CO-130N	"FRONT GEAR UP" DECAL	1
6	CO-130O	"REAR GEAR UP" DECAL	1
7	CO-130P	"FRONT GEAR DOWN" DECAL	1
8	CO-130Q	"REAR GEAR DOWN" DECAL	1
9	H.H.C.S.	1/4" UNC x 2.25"	4
10	F'WASHER	1/4" SAE	8
11	NYLOCK NUT	1/4" UNC	4



REV	DESCRIPTION OF CHANGES	DATE	BY	APPR'D	ECN #
A	REVISION A RELEASED	05/30/19	SMM	JMP	
B	REVISED BOM & DRAWING	08/13/19	AJB	JMP	
C	UPDATED BORDER	05/13/21	SMM	JMP	

ITEM	PART NO.	DESCRIPTION	QTY
1	S-003041	PUMP ASSEMBLY	1
2	CD-106	ILLUMINATED ROCKER SWITCH	1
3	R-1577	IN-LINE FUSE CONNECTOR	1
4	S-003030	SOLENOID (included with S-003041)	1
5	R-31590	TOGGLE SWITCH	2
6	-	VEHICLE BATTERY (NOT SUPPLIED)	-
7	-	RECOMMENDED 200 AMP FUSE (NOT SUPPLIED)	-
8	R-1577-1	IN-LINE 5 AMP FUSE	1

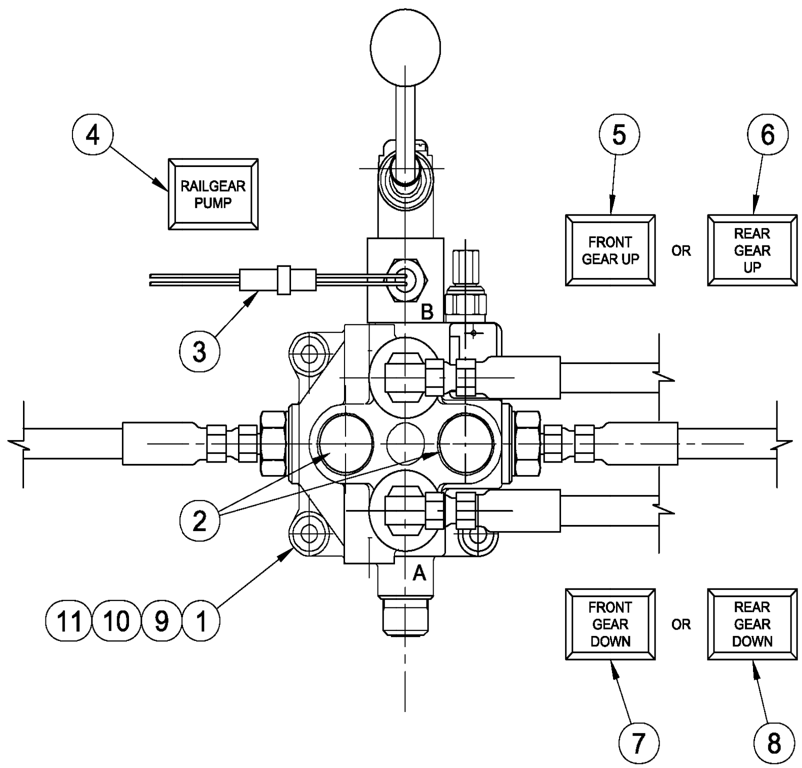


ITEM	PART NO.	DESCRIPTION	QTY
1	S-003041	ELECTRIC HYDRAULIC PUMP	1
2	849FSO-04-04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	1
3	849FSO-04-06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
4	HU-04-04NJ	1/4" FEMALE JIC STRAIGHT COUPLER	(14)
5	HFS2-04	HOSE 33" LONG	1
6	HFS2-04	HOSE 23" LONG	4
7	HFS2-04	HOSE 360" LONG	2
8	848FSO-04x06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC	2 (1)*
9	897-FS-04	1/4" JIC FEMALE x 1/4" JIC MALE, 90° SWIVEL	2
10	R-9115	HYDRAULIC CYLINDER ASSEMBLY	2
11	848FSO-04x08	3/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	8
12	879-FS-04	1/4" MALE JIC TO 1/4" FEMALE JIC 90°	8
13	R-32145	SINGLE P.O. CHECK VALVE ASSY	2
14	HFS2-04	HOSE 16" LONG	(2)*

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	03/15/17	AFF		
B	UPDATED BORDER	05/13/21	SMM	JMP	

Front Mounted Pump Install – Swap Rear Labels with Front for Rear Mounted Pump Install.

ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-31595	MANUAL CONTROL VALVE W/ SOLENOID	2
2	R-31596	#8 JIC HYDRAULIC PLUG	4
3	R-31597	PLUG, MALE ADAPTOR	2
4	CO-130G	"RAILGEAR PUMP" DECAL	2
5	CO-130N	"FRONT GEAR UP" DECAL	1
6	CO-130O	"REAR GEAR UP" DECAL	1
7	CO-130P	"FRONT GEAR DOWN" DECAL	1
8	CO-130Q	"REAR GEAR DOWN" DECAL	1
9	H.H.C.S.	1/4" UNC X 1.25"	4
10	F' WASHER	1/4" SAE	8
11	NYLOCK NUT	1/4" UNC	4



REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	03/15/17	AFF		
B	REVISED BOM	08/13/19	AJB		

DRAWN AFF
CHECKED -
APPROVED -

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

DESIGN - ENGINEERING - MANUFACTURING

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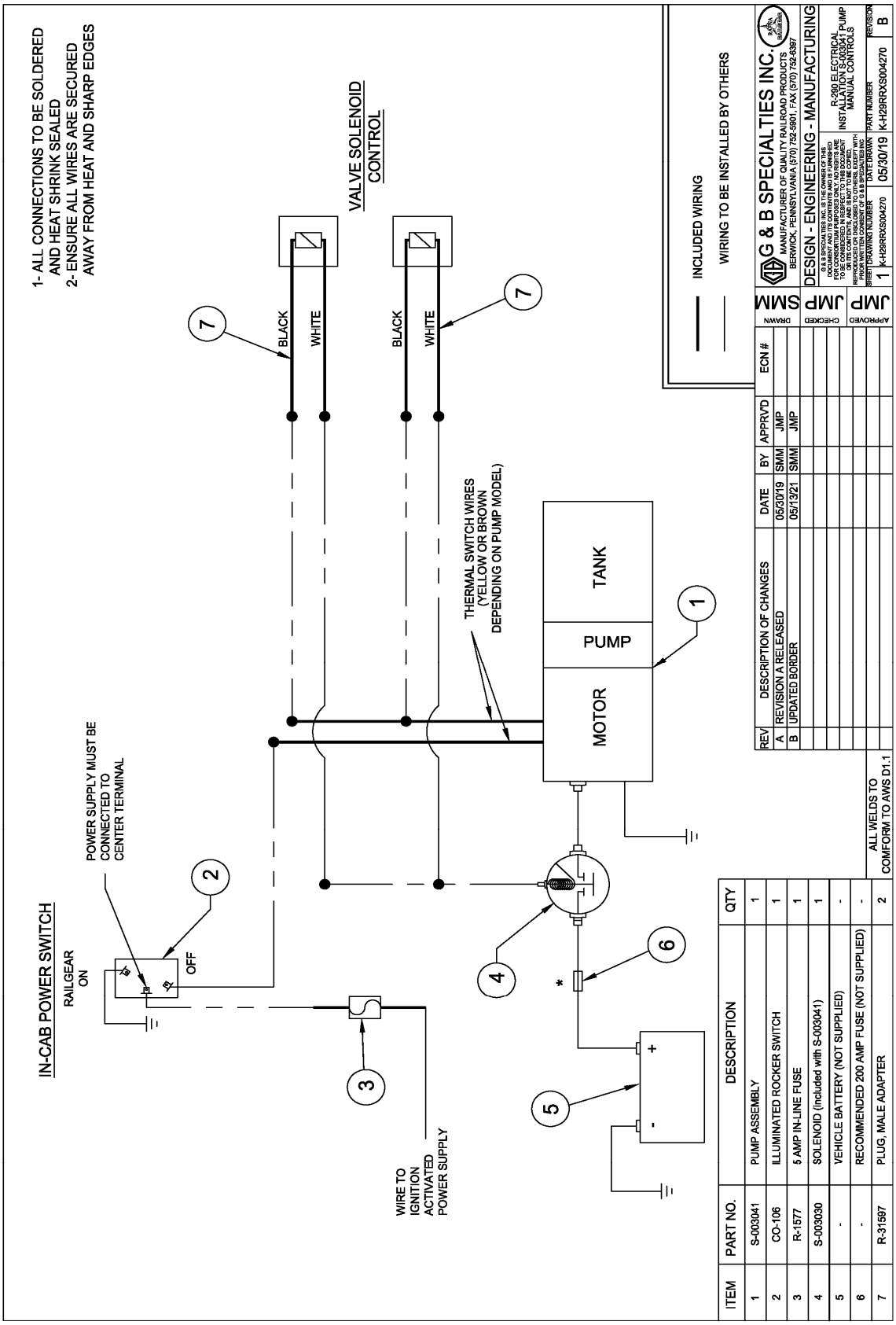
MANUAL VALUE W/ SOLENOID DETAIL

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	K-H29RRXS004270-2	03/15/17	K-H29RRXS004270-2	B


1- ALL CONNECTIONS TO BE SOLDERED AND HEAT SHRINK SEALED
2- ENSURE ALL WIRES ARE SECURED AWAY FROM HEAT AND SHARP EDGES
INCLUDED WIRING
WIRING TO BE INSTALLED BY OTHERS
VALVE SOLENOID CONTROL
BLACK
WHITE
BLACK
WHITE
THERMAL SWITCH WIRES (YELLOW OR BROWN DEPENDING ON PUMP MODEL)
TANK
PUMP
MOTOR
IN-CAB POWER SWITCH
RAILGEAR ON
OFF
POWER SUPPLY MUST BE CONNECTED TO CENTER TERMINAL
WIRE TO IGNITION ACTIVATED POWER SUPPLY
ALL WELDS TO COMFORM 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
R-290 ELECTRICAL INSTALLATION S-003041 PUMP MANUAL CONTROLS
DRAWING NUMBER K-H29RRXS004270
DATE DRAWN 05/30/19
PART NUMBER K-H29RRXS004270
REVISION B
SHEET 1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 05/30/19 | SMM | JMP
B | UPDATED BORDER | 05/13/21 | SMM | JMP
DRAWN SMM
CHECKED JMP
APPROVED JMP
ITEM | PART NO. | DESCRIPTION | QTY
1 | S-003041 | PUMP ASSEMBLY | 1
2 | CO-106 | ILLUMINATED ROCKER SWITCH | 1
3 | R-1577 | 5 AMP IN-LINE FUSE | 1
4 | S-003030 | SOLENOID (included with S-003041) | 1
5 | - | VEHICLE BATTERY (NOT SUPPLIED) | -
6 | - | RECOMMENDED 200 AMP FUSE (NOT SUPPLIED) | -
7 | R-31597 | PLUG, MALE ADAPTER | 2

OPERATION 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 be observed at all times.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- Note that if the railgear is part way retracted or extended, opening the manifold directional valve manual over-rides may cause the railgear to drop suddenly causing personal injury. Ensure all body parts are clear of the railgear if it should suddenly drop.
- When 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.
- If the emergency hand pump has been used to raise or lower the railgear, ensure the manifold directional valve manual over-rides are in the closed and locked position before starting road or rail travel.
- Ensure the hydraulic pump has been de-energized before starting road or rail travel.

OPERATION OF HYDRAULIC KIT

With the hydraulic kit installed on this vehicle, it may be operated as normal.

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.

Refer to the Railgear Kit Operation, Service and Parts manual for information on the mechanical operation, service and parts of the railgear.

Location and Operation of the Standard Railgear Hydraulic System Controls:

The railgear hydraulic system consists of a hydraulic pump and manifold, a front control box and a rear control box.

1. The railgear hydraulic system must be energized prior to use by turning on the respective dash switch. At this point the dash switch light should come on but the pump should not run and the railgear should not move until a control button is depressed.

2. The direction of the front or rear railgear movement is selected by pushing the “Up” or “Down” button on the respective control box located near the railgear. At this point the pump should start and the railgear should move in the selected direction.

3. To stop the movement of the railgear, release the depressed button or return the handle to the middle position.

4. The pump must be de-energized after use by turning off the respective dash switch. At this point the pump should not be able to run and the control buttons should be in-active.

Location And Operation Of The Hydraulic Pump Emergency Hand Pump:

If the railgear hydraulic system should fail such that the railgear does not respond to depressing the buttons on the front and / or rear control boxes, then the emergency hand pump system may be used to place the vehicle on rail or remove the vehicle from rail. Follow the standard operation procedure (as detailed in the Railgear Kit Operation, Service and Parts Manual) except substitute the following steps when the procedure requires raising or lowering of the railgear.

1. Remove the hand pump handle from storage and insert the handle into the hand pump located on the body of the hydraulic pump.

2. There are four manifold directional valves, one for each railgear function: “Front Gear Up”, “Front Gear Down”, “Rear Gear Up”, and “Rear Gear Down”. The manual over-rides for these valves are located on the manifold under rubber boots. Only open one manifold directional valve over-ride at a time. To manually open a manifold directional valve over-ride, remove the rubber boot, push in and twist the knob allowing the knob to extend. To manually close a manifold directional valve over-ride, push the knob in, twist the knob to lock it in place and replace the rubber boot.

3. Select and open the manual over-ride for the respective railgear and desired direction of movement.

4. Remove the locking cable holding collar from storage. It can be slipped in between the locking cable handle and the locking cable bulkhead fitting to hold the locking cable in the disengaged position.

5. Pump the emergency hand pump handle to move the railgear. It will require approximately 100 full strokes to fully raise or lower each railgear.

6. Close the manual over-ride. Ensure all manifold directional valve manual over-rides are closed and locked in position. Replace all the rubber boots.

7. Remove and store the locking cable holding collar and the hand pump handle.

8. Ensure the railgear lock pins are fully engaged as required by the procedure.

Location And Operation Of The Hydraulic Pump Emergency Hand Pump (Locking Manual Valve only):

1. Remove the hand pump handle from storage and insert the handle into the hand pump located on the body of the hydraulic pump.

2. The railgear control valves have an integrated detent. This will allow the valve to be lock in the position for up or down motion of the railgear. Select the direction you want the railgear to move by pressing the handle on the valve in that direction. The handle should stay in that position.

3. Remove the locking cable holding collar from storage. It can be slipped in between the locking cable handle and the locking cable bulkhead fitting to hold the locking cable in the disengaged position.

4. Pump the emergency hand pump handle to move the railgear. It will require approximately 100 full strokes to fully raise or lower each railgear.

5. Return the control valve handle to the middle position.

6. Remove and store the locking cable holding collar and the hand pump handle.

7. Ensure the railgear lock pins are fully engaged as required by the procedure.

SERVICE OF HYDRAULIC KIT

The hydraulic kit must be serviced regularly to avoid damage to the equipment.

The recommended oil for the railgear hydraulic system is **DEXRON III** or equivalent. In extremely cold weather areas/seasons, Tellus S4 VX32 or equivalent may be used.

Table 1: Recommended Service Schedule

Service Required	Initial 100 km (62 Miles) of road and/or rail use	Daily	Weekly	Monthly
Inspect hydraulic kit fasteners (re-torque if required)		✓	✓	✓
Inspect all hydraulic fittings and hoses for leaks and wear.		✓	✓	✓
Check oil in hydraulic reservoir. (fill with railgear raised if req'd)				✓
Check emergency hand pump and manifold over-ride operation				✓

HYDRAULIC SYSTEM RELIEF VALVE SETTING

This system is equipped with one relief valve located on the railgear pump body next to the emergency hand pump. This relief valve protects the entire hydraulic system from over pressurization. The relief valve will require adjustment if ever there appears to be inadequate hydraulic pressure to operate the railgear.

1. Disconnect the hydraulic hose from the "P" port of the pump.

2. Install a hydraulic pressure gauge (up to 3000 PSI) between the disconnected hydraulic hose and the pump port. The pressure gauge will indicate the relief valve setting when the pump is loaded.

3. The pressure reading on the pressure gauge should climb to 1800 PSI.

4. If the pressure is not correct, release the railgear controls and adjust the relief valve on the pump accordingly. Loosen the lock nut and turn the setscrew in to increase the pressure or out to decrease the pressure. Re-check the pressure.

5. Once the correct pressure on the pump relief valve is obtained, ensure the lock nut on the relief valve is tightened. Release the pressure in the system and remove the pressure gauge. Re-connect all hydraulic hoses.

6. Ensure the railgear is properly raised as per the Railgear Kit Operation, Service and Parts manual.

ELECTRICAL SYSTEM TROUBLESHOOTING

The following basic test can be performed to check the integrity of the railgear electrical system.

Should the railgear pump fail to operate, first check the fuse or the circuit breaker and all wiring for shorts. Then the following test can be performed to verify the integrity of the pump motor and pump solenoid.

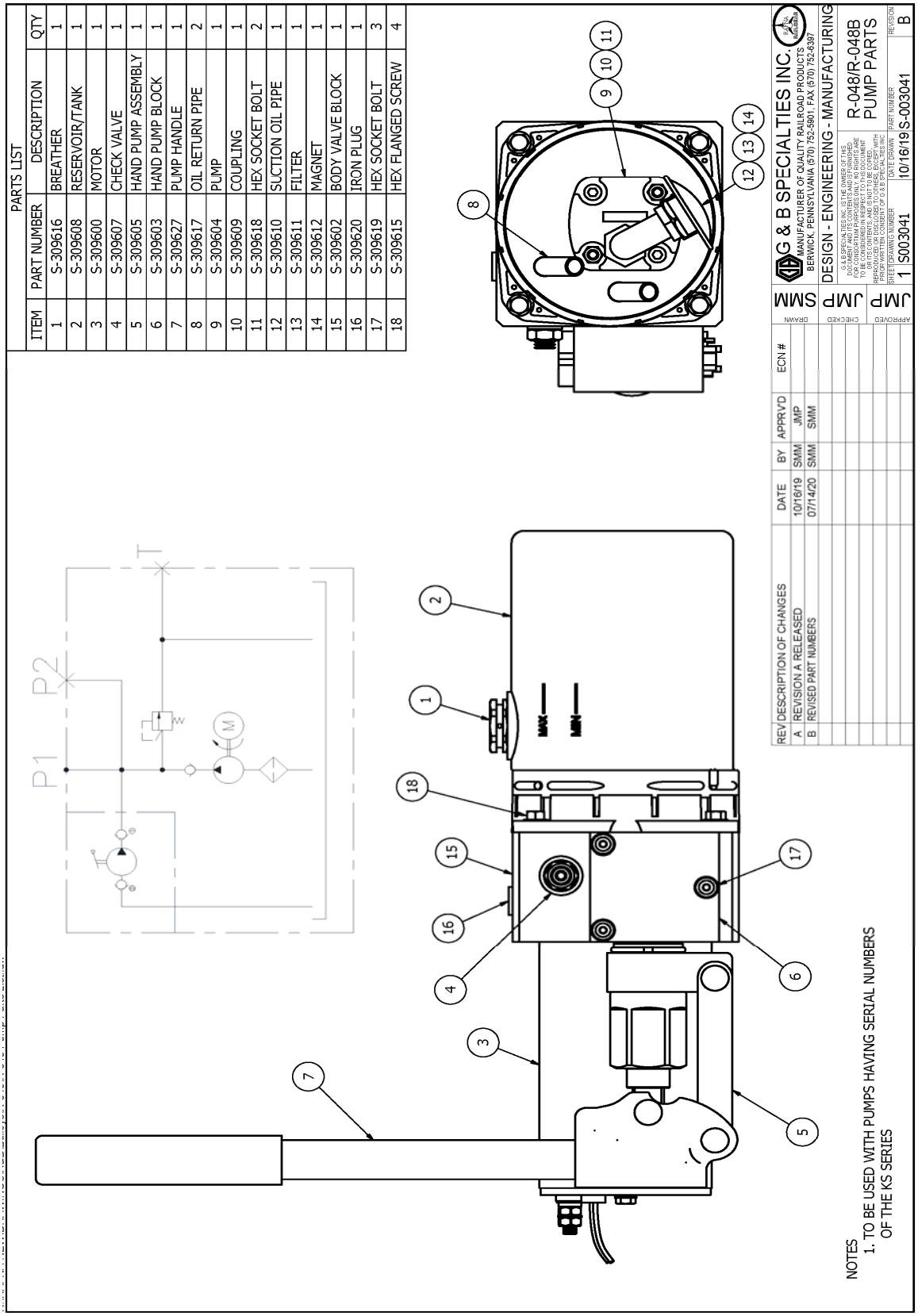
1. Pump motor test:
   a) Connect one end of a 2-gauge shunt wire to the pump motor power terminal and touch the other end to the battery positive terminal.
   b) The pump motor should run upon touching the shunt wire.
   c) If the pump does not run, the pump is not properly grounded or the pump motor is defective.
   d) If the pump motor runs, test for a defective solenoid.

2. Solenoid test:
   a) Connect one end of a 14-gauge shunt wire to the switching terminal on the solenoid and touch the other end to the battery positive terminal. If the pump does not operate the solenoid is not properly grounded or it is defective. If the pump operates, the problem lies with the fuse/circuit breaker, wiring and/or switches.

Should the pump start running immediately following turning on the respective dash switch, the following tests can be performed to help locate the problem.

1. Disconnect the wire from the switching terminal on the solenoid. If the pump continues to run, then the solenoid is defective.

2. Check all wiring and switches for shorts and / or loose terminals.



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	S-309616	BREATHER	1
2	S-309608	RESERVOIR/TANK	1
3	S-309600	MOTOR	1
4	S-309607	CHECK VALVE	1
5	S-309605	HAND PUMP ASSEMBLY	1
6	S-309603	HAND PUMP BLOCK	1
7	S-309627	PUMP HANDLE	1
8	S-309617	OIL RETURN PIPE	2
9	S-309604	PUMP	1
10	S-309609	COUPLING	1
11	S-309618	HEX SOCKET BOLT	2
12	S-309610	SUCTION OIL PIPE	1
13	S-309611	FILTER	1
14	S-309612	MAGNET	1
15	S-309602	BODY VALVE BLOCK	1
16	S-309620	IRON PLUG	1
17	S-309619	HEX SOCKET BOLT	3
18	S-309615	HEX FLANGED SCREW	4

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #
A	REVISION A RELEASED	10/16/19	SMM	JMP	
B	REVISED PART NUMBERS	07/14/20	SMM	SMM	

DRAWN SMM | CHECKED JMP | APPROVED JMP

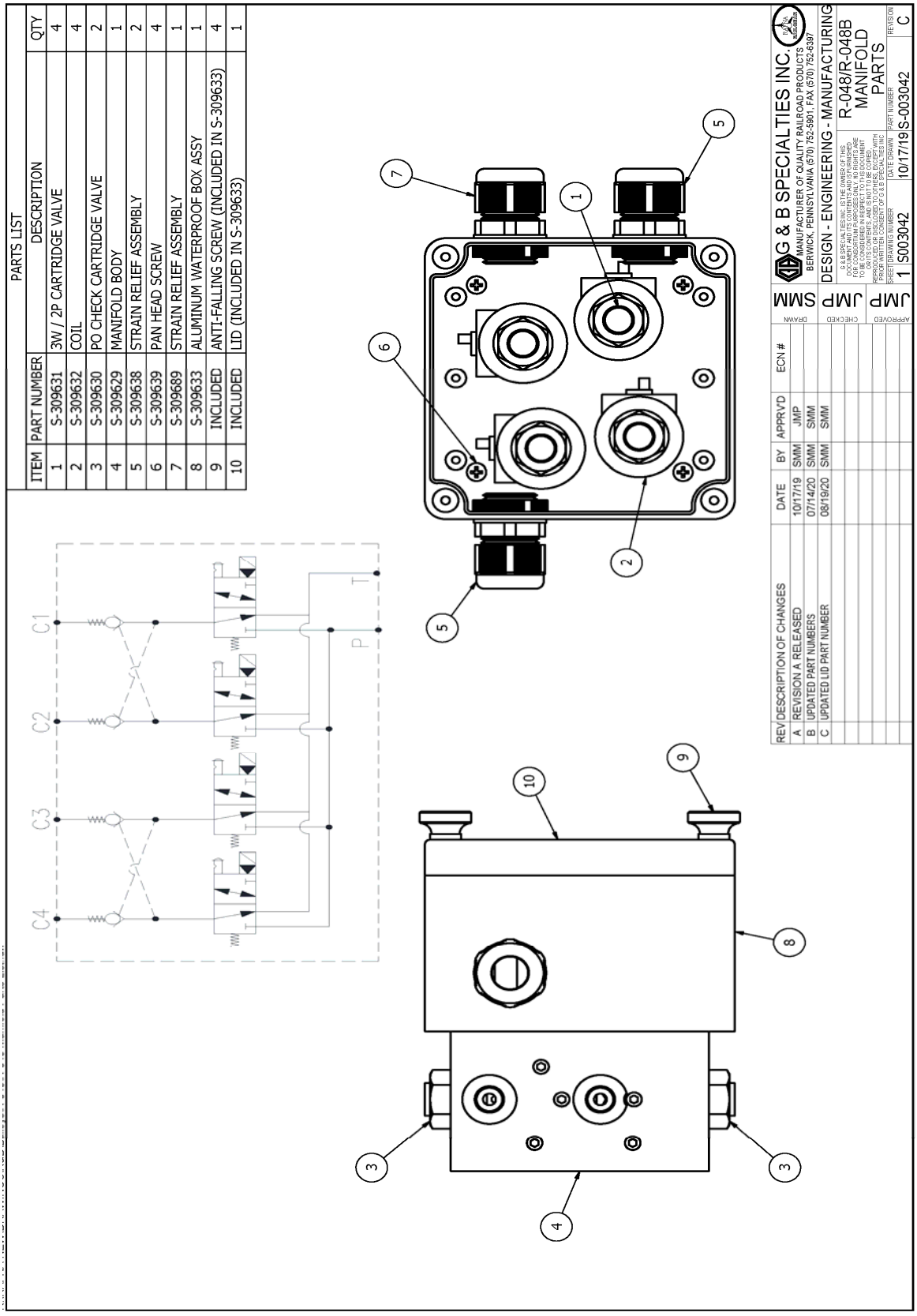
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901 - FAX (570) 752-6397

DESIGN - ENGINEERING - MANUFACTURING

R-048/R-048B
PUMP PARTS

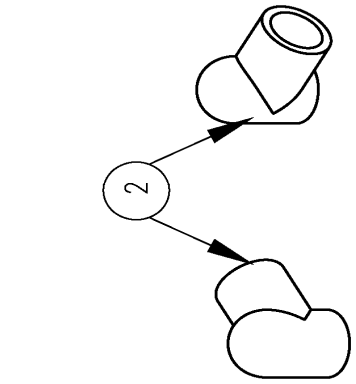
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | S003041 | 10/16/19 | S-003041 | B

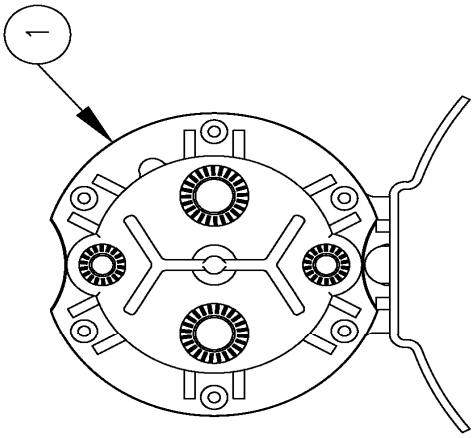
NOTES
1. TO BE USED WITH PUMPS HAVING SERIAL NUMBERS OF THE KS SERIES


PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | S-309631 | 3W / 2P CARTRIDGE VALVE | 4
2 | S-309632 | COIL | 4
3 | S-309630 | PO CHECK CARTRIDGE VALVE | 2
4 | S-309629 | MANIFOLD BODY | 1
5 | S-309638 | STRAIN RELIEF ASSEMBLY | 2
6 | S-309639 | PAN HEAD SCREW | 4
7 | S-309689 | STRAIN RELIEF ASSEMBLY | 1
8 | S-309633 | ALUMINUM WATERPROOF BOX ASSY | 1
9 | INCLUDED | ANTI-FALLING SCREW (INCLUDED IN S-309633) | 4
10 | INCLUDED | LID (INCLUDED IN S-309633) | 1
C1
C2
C3
C4
P
T
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 10/17/19 | SMM | JMP
B | UPDATED PART NUMBERS | 07/14/20 | SMM | SMM
C | UPDATED LID PART NUMBER | 08/19/20 | SMM | SMM
DRAWN SMM
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-048/R-048B
MANIFOLD
PARTS
SHEET 1
DRAWING NUMBER S003042
DATE DRAWN 10/17/19
PART NUMBER S-003042
REVISION C

PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QTY
1	S-309601	SOLENOID	1
2	S-309624	TERMINAL BOOT	1





REV	DESCRIPTION OF CHANGES	DATE	BY	APPRV'D	ECN #
A	REVISION A RELEASED	10/18/19	SMM	JMP	

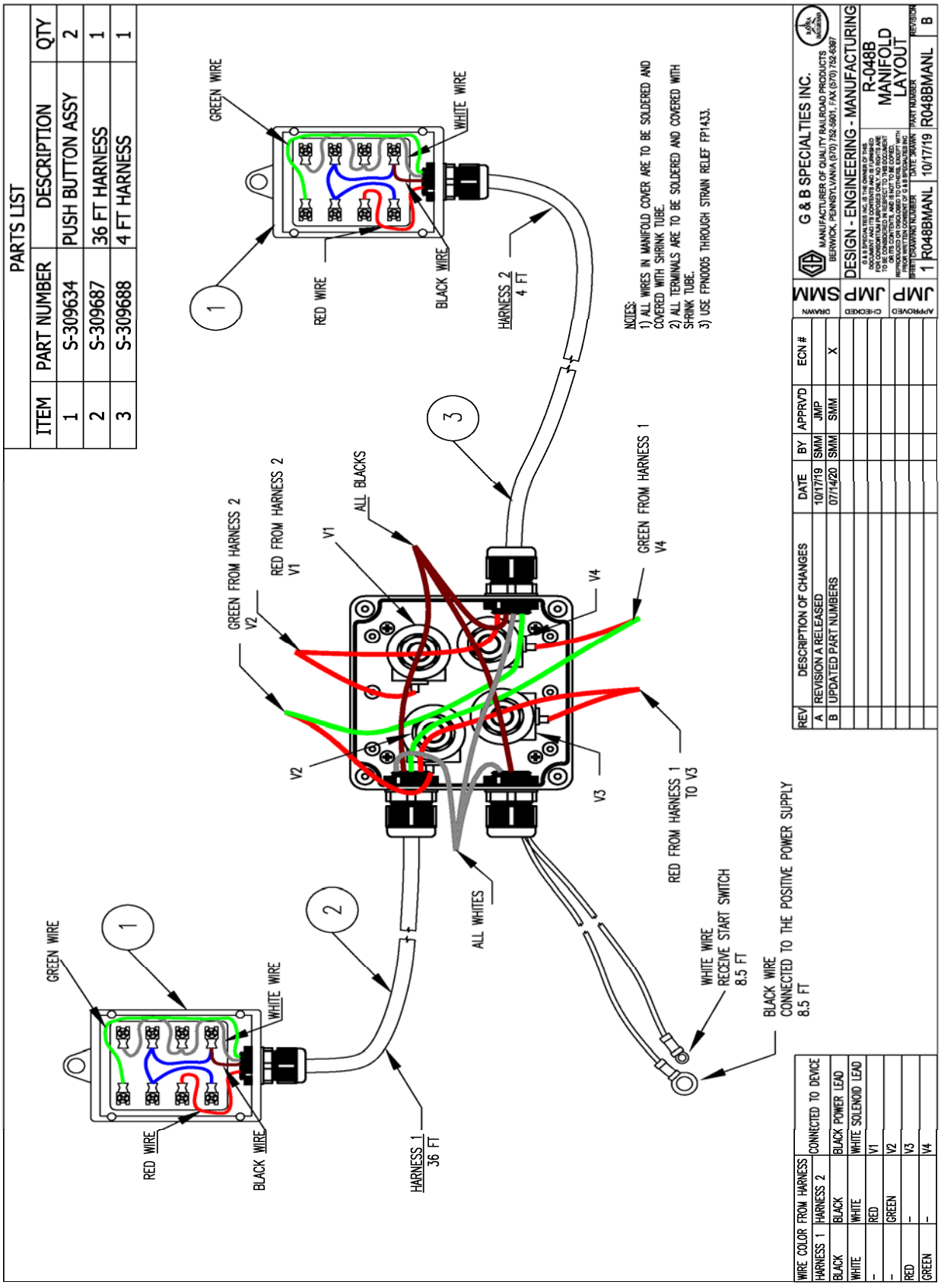
DRAWN SMM
CHECKED JMP
APPROVED JMP

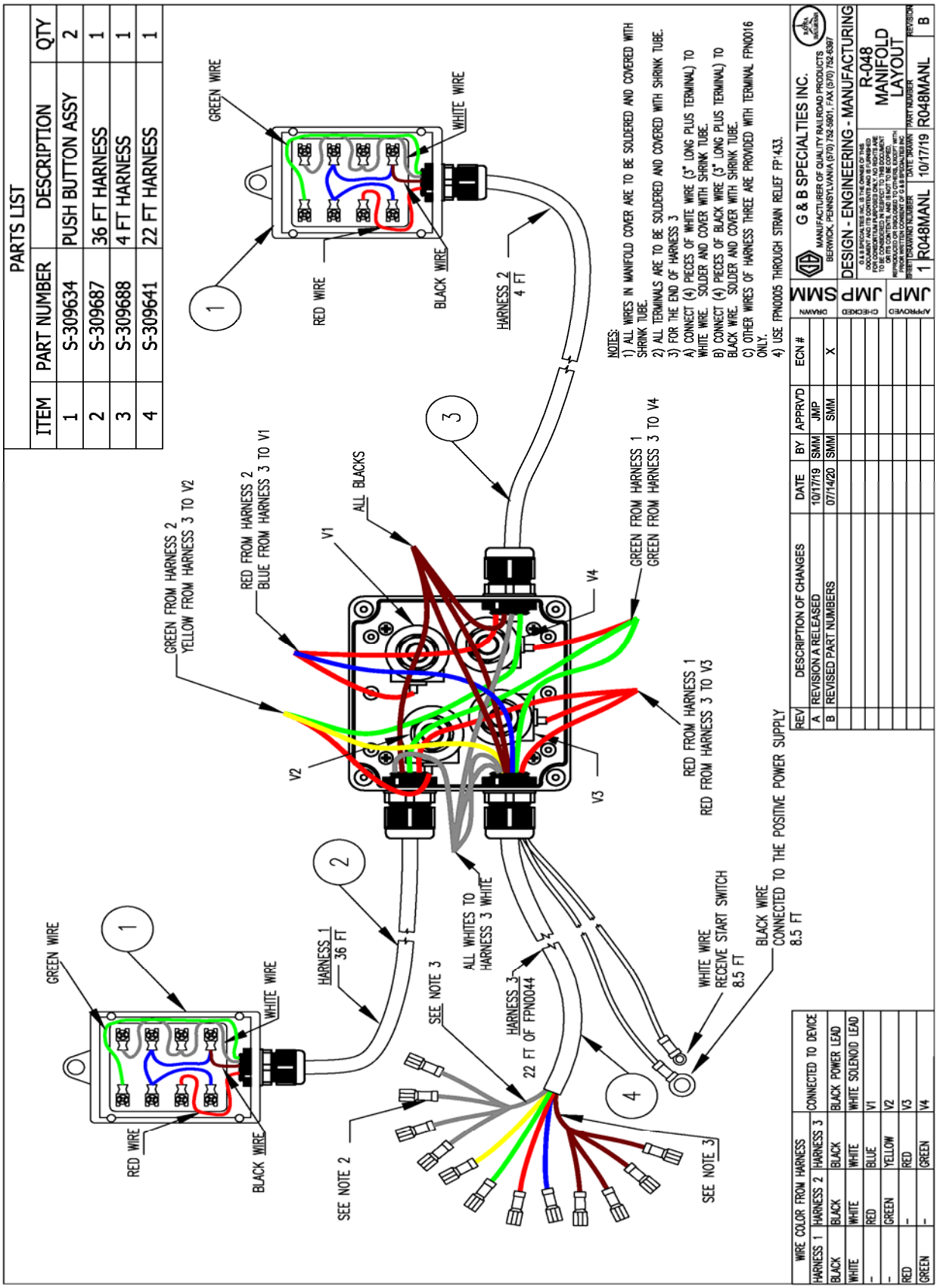
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5901; FAX (570) 752-6397

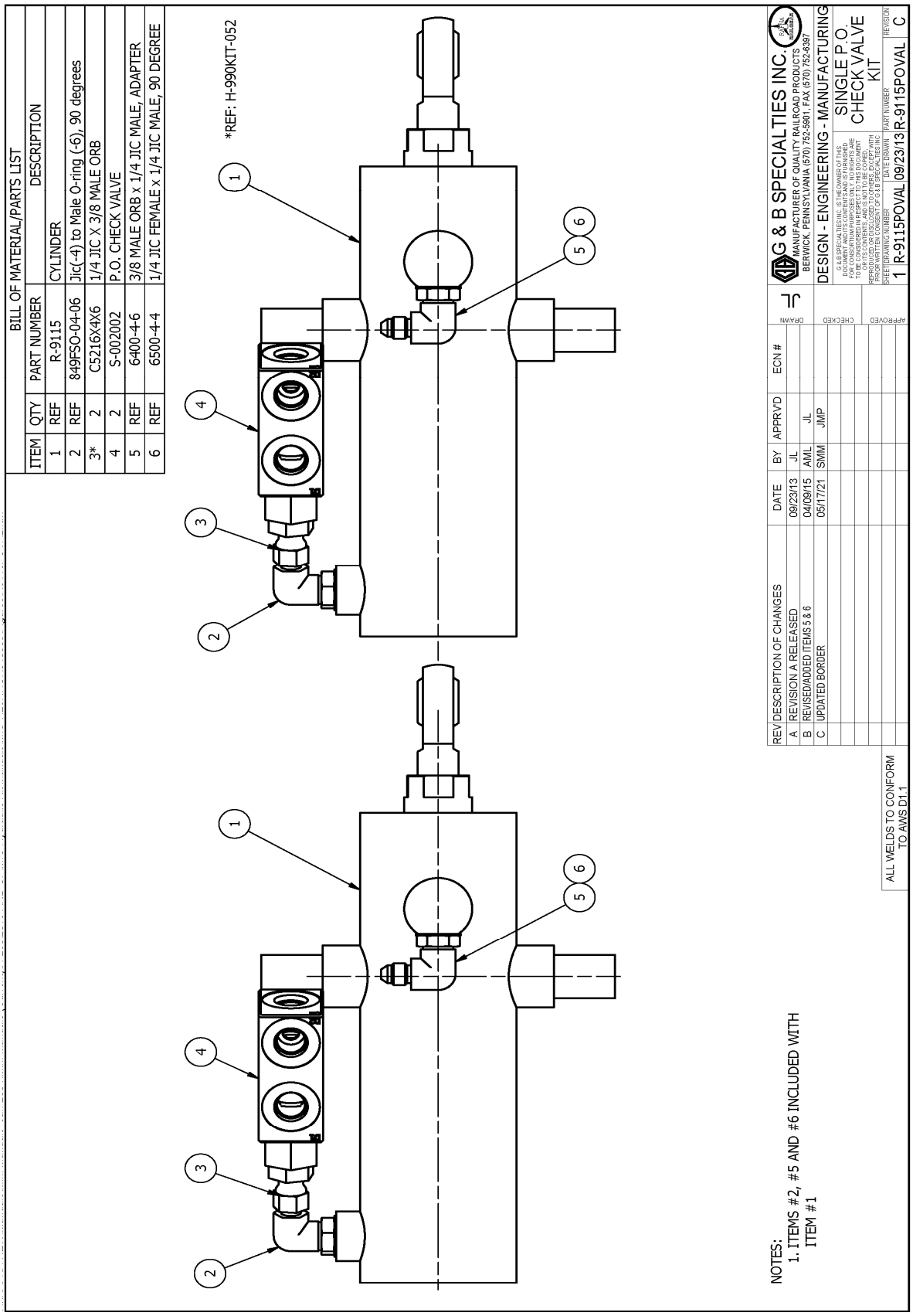
DESIGN - ENGINEERING - MANUFACTURING

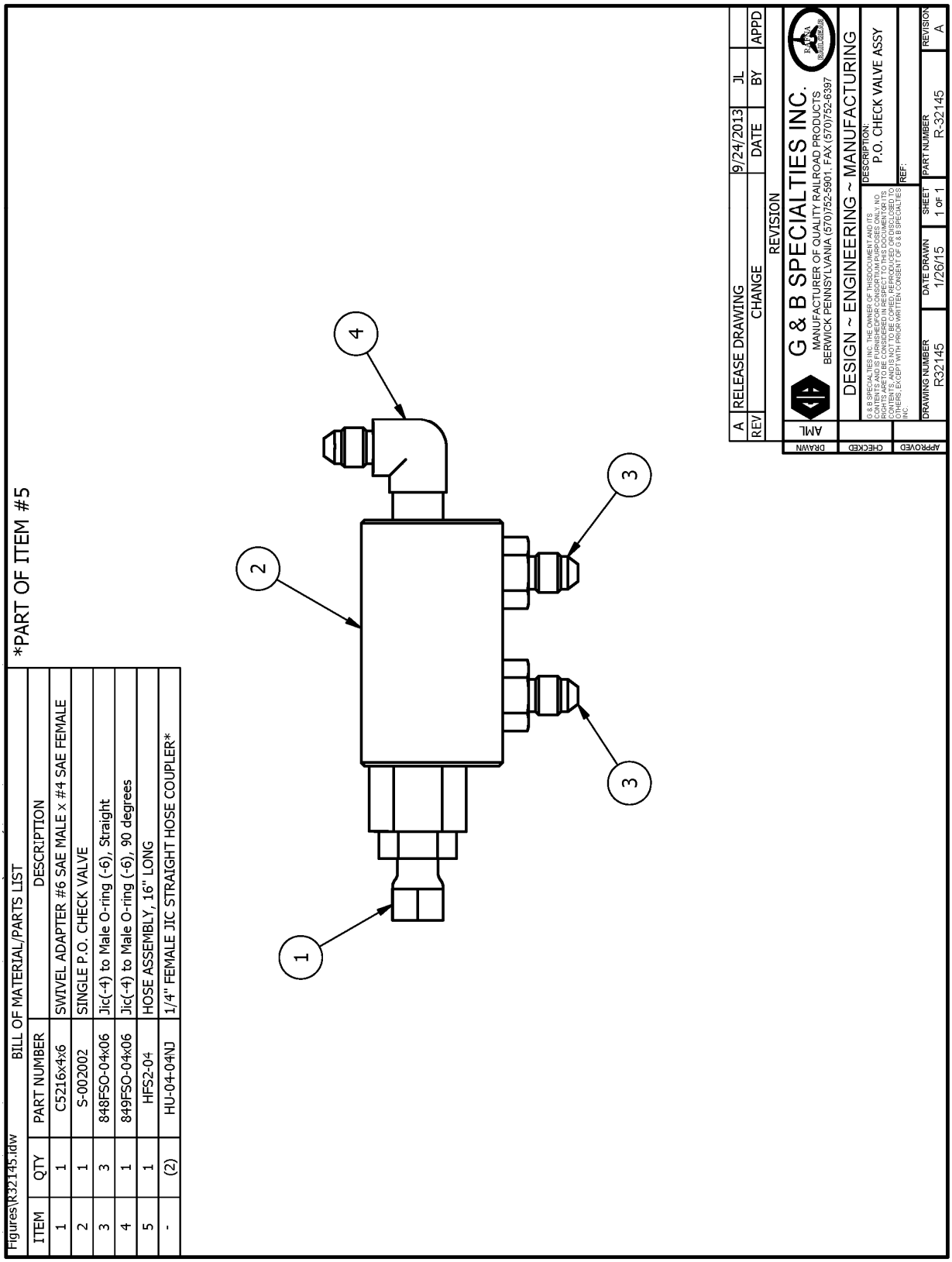
R-048/R-048B
MISC. PARTS

SHEET	DRAWING NUMBER	DATE DRAWN	PART NUMBER	REVISION
1	MISCR048/B	10/17/19	MISCR048/B	A


PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | S-309634 | PUSH BUTTON ASSY | 2
2 | S-309687 | 36 FT HARNESS | 1
3 | S-309688 | 4 FT HARNESS | 1
G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5601, FAX (570) 752-6397
DESIGN - ENGINEERING - MANUFACTURING
R-048B
MANIFOLD
LAYOUT
PART NUMBER
R048BMANL
REVISION
B
DRAWN SMM
CHECKED JMP
APPROVED JMP
DATE 10/17/19
SHEET 1
DESCRIPTION OF CHANGES
REV | DESCRIPTION | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 10/17/19 | SMM | JMP |
B | UPDATED PART NUMBERS | 07/14/20 | SMM | SMM | X
NOTES:
1) ALL WIRES IN MANIFOLD COVER ARE TO BE SOLDERED AND COVERED WITH SHRINK TUBE.
2) ALL TERMINALS ARE TO BE SOLDERED AND COVERED WITH SHRINK TUBE.
3) USE FPN0005 THROUGH STRAIN RELIEF FP1433.
GREEN WIRE
WHITE WIRE
RED WIRE
BLACK WIRE
HARNESS 2
4 FT
GREEN FROM HARNESS 2
V2
RED FROM HARNESS 2
V1
ALL BLACKS
V1
V4
GREEN FROM HARNESS 1
V4
V2
V3
RED FROM HARNESS 1
TO V3
ALL WHITES
WHITE WIRE
RECEIVE START SWITCH
8.5 FT
BLACK WIRE
CONNECTED TO THE POSITIVE POWER SUPPLY
8.5 FT
HARNESS 1
36 FT
WIRE COLOR FROM HARNESS | CONNECTED TO DEVICE
HARNESS 1 | HARNESS 2
BLACK | BLACK | BLACK POWER LEAD
WHITE | WHITE | WHITE SOLENOID LEAD
– | RED | V1
– | GREEN | V2
RED | – | V3
GREEN | – | V4


PARTS LIST
ITEM | PART NUMBER | DESCRIPTION | QTY
1 | S-309634 | PUSH BUTTON ASSY | 2
2 | S-309687 | 36 FT HARNESS | 1
3 | S-309688 | 4 FT HARNESS | 1
4 | S-309641 | 22 FT HARNESS | 1
GREEN WIRE
WHITE WIRE
RED WIRE
BLACK WIRE
HARNESS 2 4 FT
HARNESS 1 36 FT
HARNESS 3 22 FT OF FPN0044
GREEN FROM HARNESS 2 YELLOW FROM HARNESS 3 TO V2
RED FROM HARNESS 2 BLUE FROM HARNESS 3 TO V1
ALL BLACKS
GREEN FROM HARNESS 1 GREEN FROM HARNESS 3 TO V4
RED FROM HARNESS 1 RED FROM HARNESS 3 TO V3
ALL WHITES TO HARNESS 3 WHITE
WHITE WIRE RECEIVE START SWITCH 8.5 FT
BLACK WIRE CONNECTED TO THE POSITIVE POWER SUPPLY 8.5 FT
SEE NOTE 2
SEE NOTE 3
NOTES:
1) ALL WIRES IN MANIFOLD COVER ARE TO BE SOLDERED AND COVERED WITH SHRINK TUBE.
2) ALL TERMINALS ARE TO BE SOLDERED AND COVERED WITH SHRINK TUBE.
3) FOR THE END OF HARNESS 3
A) CONNECT (4) PIECES OF WHITE WIRE (3" LONG PLUS TERMINAL) TO WHITE WIRE. SOLDER AND COVER WITH SHRINK TUBE.
B) CONNECT (4) PIECES OF BLACK WIRE (3" LONG PLUS TERMINAL) TO BLACK WIRE. SOLDER AND COVER WITH SHRINK TUBE.
C) OTHER WIRES OF HARNESS THREE ARE PROVIDED WITH TERMINAL FPN0016 ONLY.
4) USE FPN0005 THROUGH STRAIN RELIEF FP1433.
REV | DESCRIPTION OF CHANGES | DATE | BY | APPRVD | ECN #
A | REVISION A RELEASED | 10/17/19 | SMM | JMP |
B | REVISED PART NUMBERS | 07/14/20 | SMM | SMM | X
DRAWN SMM | 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-048 MANIFOLD LAYOUT
SHEET 1 OF 1 | DRAWING NUMBER R048MANL | DATE 10/17/19 | PART NUMBER R048MANL | REVISION B
WIRE COLOR FROM HARNESS | CONNECTED TO DEVICE
HARNESS 1 | HARNESS 2 | HARNESS 3
BLACK | BLACK | BLACK | BLACK POWER LEAD
WHITE | WHITE | WHITE | WHITE SOLENOID LEAD
- | RED | BLUE | V1
- | GREEN | YELLOW | V2
RED | - | RED | V3
GREEN | - | GREEN | V4


BILL OF MATERIAL/PARTS LIST
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | REF | R-9115 | CYLINDER
2 | REF | 849FSO-04-06 | Jic(-4) to Male O-ring (-6), 90 degrees
3* | 2 | C5216X4X6 | 1/4 JIC X 3/8 MALE ORB
4 | 2 | S-002002 | P.O. CHECK VALVE
5 | REF | 6400-4-6 | 3/8 MALE ORB x 1/4 JIC MALE, ADAPTER
6 | REF | 6500-4-4 | 1/4 JIC FEMALE x 1/4 JIC MALE, 90 DEGREE
*REF: H-990KIT-052
1
2
3
4
5
6
NOTES:
1. ITEMS #2, #5 AND #6 INCLUDED WITH ITEM #1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'D | ECN #
A | REVISION A RELEASED | 09/23/13 | JL
B | REVISED/ADDED ITEMS 5 & 6 | 04/09/15 | AML | JL
C | UPDATED BORDER | 05/17/21 | SMM | JMP
DRAWN
CHECKED
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
SINGLE P.O. CHECK VALVE KIT
PART NUMBER
1 R-9115POVAL 09/23/13 R-9115POVAL
REVISION
C


Figures\R32145.idw
BILL OF MATERIAL/PARTS LIST
*PART OF ITEM #5
ITEM | QTY | PART NUMBER | DESCRIPTION
1 | 1 | C5216x4x6 | SWIVEL ADAPTER #6 SAE MALE x #4 SAE FEMALE
2 | 1 | S-002002 | SINGLE P.O. CHECK VALVE
3 | 3 | 848FSO-04x06 | Jic(-4) to Male O-ring (-6), Straight
4 | 1 | 849FSO-04x06 | Jic(-4) to Male O-ring (-6), 90 degrees
5 | 1 | HFS2-04 | HOSE ASSEMBLY, 16" LONG
- | (2) | HU-04-04NJ | 1/4" FEMALE JIC STRAIGHT HOSE COUPLER*
1
2
3
3
4
A | RELEASE DRAWING | 9/24/2013 | JL
REV | CHANGE | DATE | BY | APPD
REVISION
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
DESCRIPTION:
P.O. CHECK VALVE ASSY
REF:
DRAWING NUMBER R32145
DATE DRAWN 1/26/15
SHEET 1 OF 1
PART NUMBER R-32145
REVISION A

6.0 STEERING WHEEL LOCK KIT

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 of the equipment.
- Installation instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Ensure the areas where the adhesive back strips will be affixed are clean, and free of dirt and grease. Do not touch these areas or the adhesive on the back of the strips.
- Wait a minimum of 24 hours for the adhesive strips to fully cure before using the steering wheel lock.
- Ensure that the steering wheel lock does not interfere with any vehicle devices including the air bags

INSTALLATION OF STEERING WHEEL LOCK

Steering Wheel Lock Kit Components

Part Number	Description	Qty
S-001050	Steering Wheel Lock	1
S-001040	Steering Wheel Lock Decal	1
R-21163	Speed Decal	1

1. Ensure the front wheels are pointing straight ahead and the steering wheel is centered before installation.

2. The steering wheel lock consists of one steering wheel lock patch with Rafna logo and three adhesive back strips.

3. Without removing the protective backing, position one adhesive back strip on top of the steering column cover and another on the steering wheel. The strips should be close enough together so that the patch will cover both when the steering wheel lock is engaged. Ensure that the adhesive back strips do not interfere with any devices, such as the hazard light button on the steering column cover or the air bag cover on the steering wheel. Modify the adhesive back strips as required to clear any obstructions. Mark their locations on the steering column cover and the steering wheel.

4. Without removing the protective backing, position the third adhesive back strip in a convenient location on the dash (so that it does not interfere with the view and/or operation of the vehicle). This adhesive back strip will serve as a holder when the steering wheel lock is disengaged. Mark the location.

5. Scuff the three areas previously marked with medium / fine sand paper. The areas should be free of dust, dirt, and any oily residue. Thoroughly clean the areas with denatured alcohol or a similar non-oil based degreaser that will not react with the plastic. Let dry.

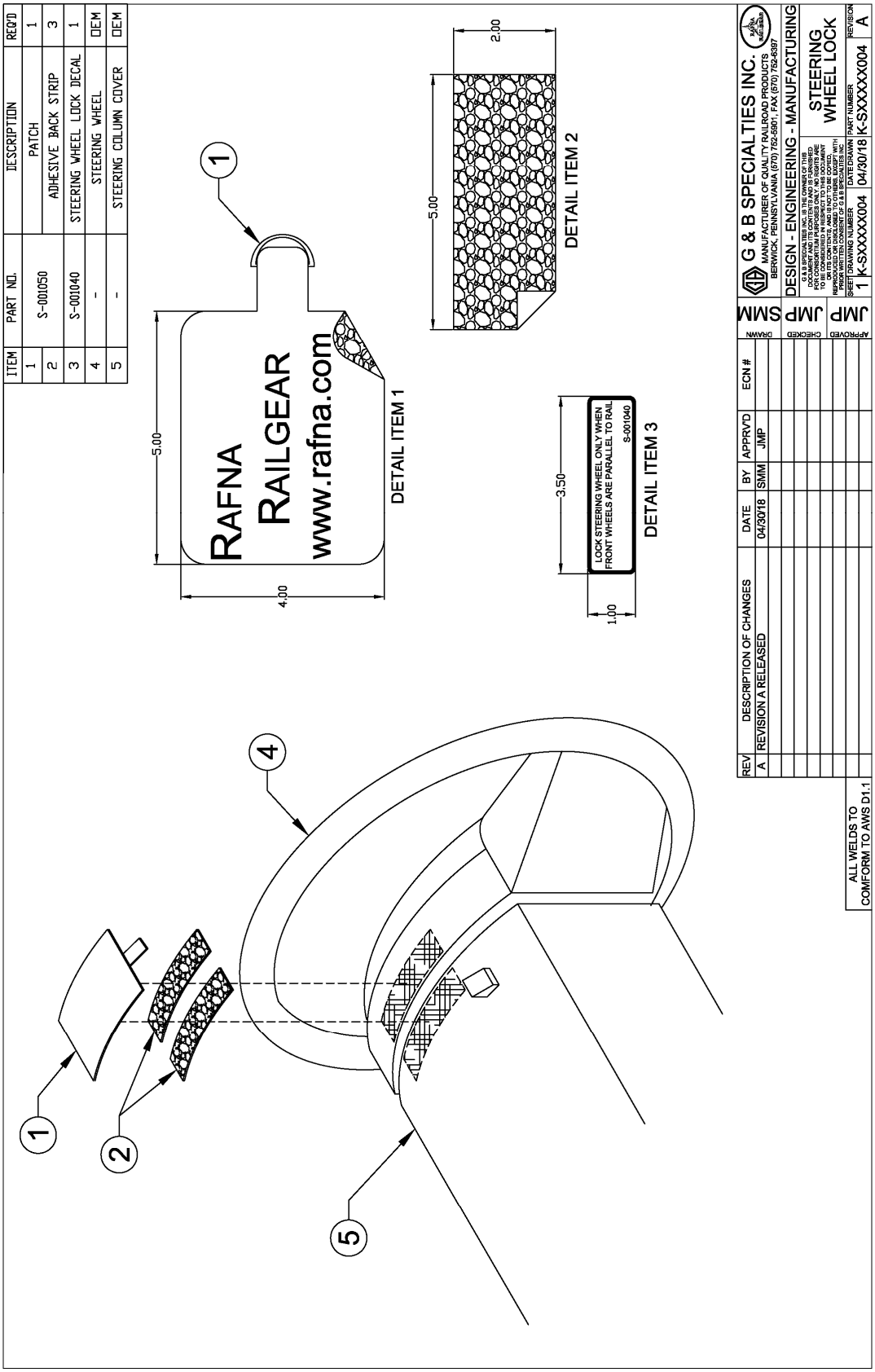
6. Take care when placing the adhesive back strips; once they are applied, they should not be removed. Do not touch the adhesive with your fingers. Removing the adhesive back strips once installed, or touching the adhesive may cause poor adhesion.

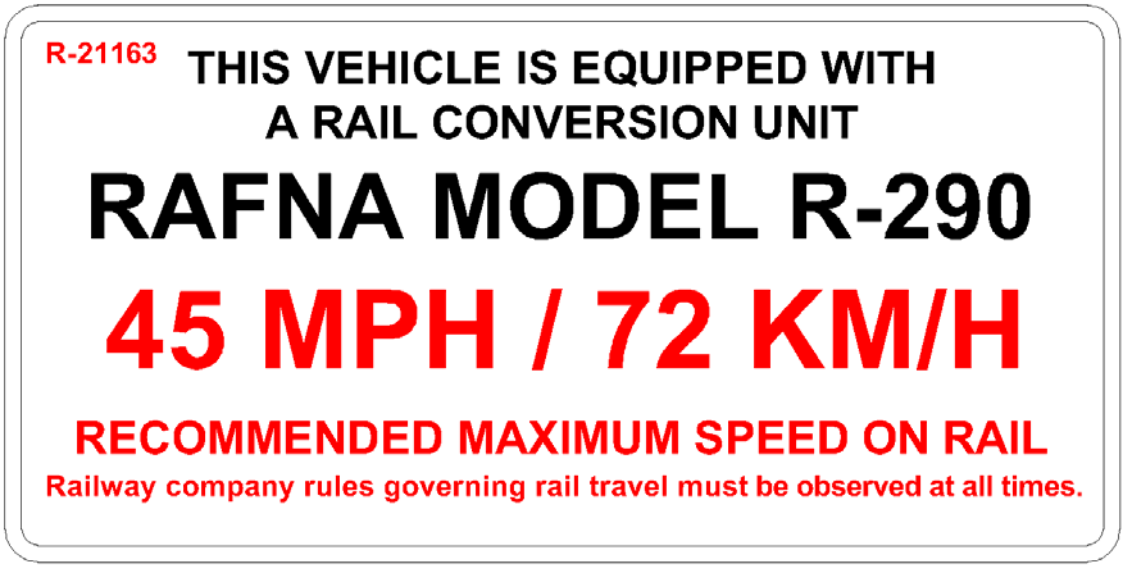
7. Peel off the protective backing from the adhesive back strips. Firmly press them into place as previously located. Do not disturb the adhesive back strips for 24 to 30 hours to allow the adhesive to fully cure.

8. Store the steering wheel lock patch on the adhesive back strip located on the dash.

9. Stick the steering wheel lock decal in a highly visible spot on the dashboard.

10. Stick the maximum speed decal in a highly visible spot, within clear sight of the operator, on the dashboard.


ITEM | PART NO. | DESCRIPTION | REQ'D
1 | S-001050 | PATCH | 1
2 | | ADHESIVE BACK STRIP | 3
3 | S-001040 | STEERING WHEEL LOCK DECAL | 1
4 | - | STEERING WHEEL | OEM
5 | - | STEERING COLUMN COVER | OEM
RAFNA RAILGEAR www.rafna.com
5.00
4.00
DETAIL ITEM 1
2.00
5.00
DETAIL ITEM 2
3.50
LOCK STEERING WHEEL ONLY WHEN FRONT WHEELS ARE PARALLEL TO RAIL
S-001040
1.00
DETAIL ITEM 3
ALL WELDS TO COMFORM TO AWS D1.1
REV | DESCRIPTION OF CHANGES | DATE | BY | APPR'VD | ECN #
A | REVISION A RELEASED | 04/30/18 | SMM | JMP
DRAWN SMM | 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
STEERING WHEEL LOCK
SHEET | DRAWING NUMBER | DATE DRAWN | PART NUMBER | REVISION
1 | K-SXXXXX004 | 04/30/18 | K-SXXXXX004 | A


R-21163
THIS VEHICLE IS EQUIPPED WITH
A RAIL CONVERSION UNIT
RAFNA MODEL R-290
45 MPH / 72 KM/H
RECOMMENDED MAXIMUM SPEED ON RAIL
Railway company rules governing rail travel must be observed at all times.

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.
- At level rail crossings, ensure that no other vehicles are approaching and flag the crossing to ensure safety. This vehicle will not operate crossing signals. Use caution when approaching and traversing level crossings.
- The steering wheel lock must be engaged at all times while on rail.

OPERATING OF STEERING WHEEL LOCK

The following procedure details the steering wheel lock operation.

Placing the Vehicle on The Track:

1. Engage the steering wheel lock after both the front and rear railgear are fully deployed and prior to rail travel.
2. Turn the steering wheel until the front tires point straight ahead.
3. Position the patch portion of the steering wheel lock onto the adhesive back strips affixed to the steering wheel and steering column cover. Press firmly into place. When installed on the adhesive back strips the patch should restrict the steering wheel from turning.

Traveling on Rail:

1. The steering wheel lock must be engaged at all times while on rail.

Removing the Vehicle from The Track:

2. Disengage the steering wheel lock after both the front and rear Railgear are fully retracted in the road position and prior to road travel.
3. Firmly grasp the steering wheel lock patch's d-ring and peel it off the adhesive back strips.
4. Store the patch on the adhesive back strip which serves as the holder located on the dash.

SERVICE OF STEERING WHEEL LOCK

Take care when removing the Patch. Due to certain plasticizers in the steering wheel steering column cover and dash, along with the vehicle's operating environment, the adhesive back strips may peel off and be removed. If the adhesive back strips do peel off, replace the strips with new ones at the earliest convenience.

7.0 RAILGEAR KITS/PARTS LISTS

RAILGEAR KITS

Rafna Industries Ltd.	1-Oct-14
Generic-290 Railgear Kit	
	rev. C

Vehicle Application Chart

Year	Make	Model #	Model

Part Number	Description	# Req.	Remarks	Check
Generic-290 Railgear Kit				
R-2900A	R-290 Upper Assy	2		
R-1600	Rail Wheel Assembly	4		
R-990KIT-203	Wheel Mounting Hardware	4	(SUPPLIED WITH R-1600, 1 PER)	
K-SXXXXX004290	Steering Wheel Lock Kit	1		
K-R29RS21102	Rail Sweep Kit	1		
S-002002	Single Pilot Operated Check Valve	2		
MIO-290	INSTALLATION/OPERATIONS MANUAL	1		

Packed By : _____

Legend:
1, 2, 3 = revision #
C = Item Changed
D = Item Deleted
A = Item Added

Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

Rafna Industries Ltd.	3-Oct-14
HR K-R29RRXR2900LF Railgear Kit	
	rev. B

Vehicle Application Chart

Year	Make	Model #	Model

Part Number	Description	# Req.	Remarks	Check
HR K-R29RRXR2900LF Railgear Kit				
R-2900LF	R-290 For Shipment, Lever Lockup	1		
R-1600	Rail Wheel Assembly	2		
R-21102D	Rail Sweep	1	5/12/2011 JL	
R-21102P	Rail Sweep	1	5/12/2-11 JL	
R-990KIT-203	Wheel Mounting Hardware	2	(SUPPLIED WITH R-1600, 1 PER)	
K-R29ARRXR290F	Lever Lock Kit	1		
R-11144	"FRONT UNIT" Decal	1		
MIO-290	Railgear Kit Manual	1		
AIO-R29RRXR2900LF	Addendum	1		

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Quantity : _____

Rafna Industries Ltd. HR K-R29RRXR2900LR Railgear Kit	3-Oct-14 rev. B

Vehicle Application Chart

Year	Make	Model #	Model

Part Number	Description	# Req.	Remarks	Check
HR K-R29RRXR2900LR Railgear Kit				
R-2900LR	R-290 For Shipment, Lever Lockup	1		
R-1600	Rail Wheel Assembly	2		
R-21102D	Rail Sweep	1	5/12/2011	
R-21102P	Rail Sweep	1	5/12/"2011	
R-990KIT-203	Wheel Mounting Hardware	2	(SUPPLIED WITH R-1600, 1 PER)	
K-R29ARRXR290R	Lever Lock Kit	1		
MIO-290	Railgear Kit Manual	1		
AIO-R29RRXR2900LR	Addendum	1		

Legend:
1, 2, 3 = revision #
C = Item Changed
D = Item Deleted
A = Item Added

Packed By : _____

Tags : _____

Customer : _____

Date : _____

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Quantity : _____

RAILGEAR MOUNTING KITS

Rafna Industries Ltd.	10-Oct-18
HR K-R29FRXFXX17 Front Mounting Kit (4 x 4)	rev. D

Vehicle Application Chart

Year	Make	Model #	Model
2017	Ford		F-250/350 All 4X4 Models

Part Number	Description	# Req.	Remarks	Check
R-33279D	Mounting Bracket, Drivers Side	1		
R-33277P	Mounting Bracket, Passengers Side	1		
R-33283	Frame Extension	2		
R-33285	Bumper Spacer	8		
R-33281	Tow Hook Spacer, 1"	2		
R-2960A	Railgear Mounting Shim, 1"	2		
R-2631	Railgear Mounting Shim, 2"	2		
R-33284	Frame Extension Spacer	4		
R-2960	Railgear Mounting Shim, 1/2"	4		
R-051	Side Wand Set	1		
R-990KIT-209A	3/4" UNC GR.8 Bolt x 2.50" Lg.	4	Railgear Mounting	
	3/4" UNC GR.8 Bolt x 3.50" Lg.	4		
	3/4" UNC GR.8 Bolt x 4.50" Lg.	4		
	3/4" Flat Washer, GR.8 - Type-A	8		
	3/4" UNC GR.8 Nylon Insert Lock Nut	4		
	5/8" UNC GR.8 Bolt x 6.50" Lg.	6	Front Frame Extension	
	5/8" Flat Washer, GR.8 - Type-A	12		
	5/8" UNC GR.8 Nylon Insert Lock Nut	6		
	M14 GR.10.9 Bolt 90mm Lg.	8	Tow Hook	
	M14 Flat Washer, Part 6	8		
	1/2" UNC GR.8 Bolt x 1.50" Lg.	16	Bumper/Bumper Brkt Mounting	
	1/2" Flat Washer, GR.8 - Type-A	32		
	1/2" UNC GR.8 Nylon Insert Lock Nut	16		
MIO-R29FRXFXX17	Installation/Operation Manual	1		

Legend:
1, 2, 3 = revision #
C = Item Changed
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A = Item Added

Packed By : _____

Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

Rafna Industries Ltd.

7-Nov-18

HR K-R29RRXFXX17 Rear Mounting Kit

rev. C

Vehicle Application Chart

Year	Make	Model #	Model	
2017	Ford		F-250/350 All Pick-Up Models	
			for Tow Hitch Applications	
Part Number	**Description**	**# Req.**	**Remarks**	**Check**
Rear Mounting Kit				
R-33275D	Rear Mounting Bracket, Drivers Side	1		
R-33275P	Rear Mounting Bracket, Passengers Side	1		
R-33260	Spacer, Bumper	4		
R-33568	Machine Bolt	2		
R-2960	Railgear Mounting Shim, 1/2"	4		
R-2960A	Railgear Mounting Shim, 1"	2		
R-2631	Railgear Mounting Shim, 2"	2		
R-990KIT-299C	7/8" UNC Gr. 8 Nylon Insert Lock Nut	2	Rear Mounting Bracket Install	
	7/8" Gr. 8 Washer	2		
	1/2" UNC Gr. 8 Bolt x 2 1/4" Long	8		
	1/2" UNC Gr. 8 Nylon Insert Lock Nut	8		
	1/2" Gr. 8 Washer	16		
	3/4" UNC Gr. 8 Bolt x 5 1/2" Long	4	Railgear Mounting	
	3/4" UNC Gr. 8 Bolt x 6 1/2" Long	4		
	3/4" UNC Gr. 8 Bolt x 7 1/2" Long	4		
	3/4" Gr. 8 Washer	8		
	3/4" UNC Gr. 8 Nylon Insert Lock Nut	4		
MIO-R29RRXFXX17	Rear Mounting Kit Manual	1		

Legend:
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Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

RAILGEAR WHEEL KITS

Rafna Industries Ltd.	31-Oct-16
HR K-W25XXF012 Wheel Kit	rev. C

Vehicle Application Chart

Year	Make	Model #	Model
2008-Current	Ford		F-250 4x4 Models
2008-Current	Ford		F-350 4x4 SRW Pick-Up Models

Part Number	Description	# Req.	Remarks	Check
R-2986	Wheel Adapter Assembly	4		
S-201502	19.5" x 6.75" Wheel x 5.60" Offset	5		
S-001015I	300 ft-lbs Wheel & 165 ft-lbs Spacer Decal	5	Apply to Rims	
S-201602	M20 x 1.5 Two-Piece Flanged Nut	32		
R-2699	Turning Stop Block	2	2016 and older	
R-2699C	Turning Stop Block	2	2017	
MIO-W25XXF012	Installation/Operations Manual	1	Use on 4x4 Only	
TSB-170	Technical Service Bulletin	1	Tire Substitution	
TSB-181	Technical Service Bulletin	1	Rim Replacement	

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Date : _____

Work order : _____

Quantity : _____

Rafna Industries Ltd.	19-Mar-15
HR K-W29ALF001 Aluminum Wheel Kit	rev. A

Vehicle Application Chart

Year	Make	Model #	Model
2008-Current	Ford		F-250/350 4X4

Part Number	Description	# Req.	Remarks	Check
R-32250	20" Aluminum Forged Wheel	4		
R-32196	165 ft-lbs Spacer Decal	4	Apply to Rims	
R-2699	Turning Stop Block 2016 Vehicles and older	2		
R-2699C	Turning Stop Block 2017 Vehicles	2		
MIO-W29ALF001	Road Wheels and Tires Installation Manual	1	Use on 4x4 Only	

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Quantity : _____

Rafna Industries Ltd.

HR K-W29ALF002 Aluminum Wheel Kit

19-Mar-15
rev. 0

Vehicle Application Chart

Year	Make	Model #	Model
2008-Current	Ford		F-250/350 4X4

Part Number	Description	# Req.	Remarks	Check
R-32250	20" Aluminum Forged Wheel	5		
R-32196	165 ft-lbs Spacer Decal	5	Apply to Rims	
R-2699	Turning Stop Block 2016 Vehicles and older	2		
R-2699C	Turning Stop Block 2017 Vehicles	2		
MIO-W29ALF001	Road Wheels and Tires Installation Manual	1	Use on 4x4 Only	

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Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

RAILGEAR TPMS KITS

Rafna Industries Ltd.	7-Nov-16
K-R29FDTPSAL17A TPMS Kit (OEM Sensor for Aluminum Wheel)	rev. A

Vehicle Application Chart

Year	Make	Model #	Model
2017	Ford		F-250/350 All Pick-Up Models

Part Number	Description	# Req.	Remarks	Check
R-10110A	TPMS (OEM FORD)	5	for aluminum wheel	
-	TPMS OEM Manual Insert			

Legend:
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Packed By : _____
Tags : _____
Customer : _____
Date : _____
Work order : _____
Quantity : _____

Rafna Industries Ltd.	7-Nov-16
HR K-R29FDTPS17A Tire Pressure Monitoring System Kit	rev. 0

Vehicle Application Chart

Year	Make	Model #	Model
2017	Ford		F-250/350 All Pick-Up Models

Part Number	Description	# Req.	Remarks	Check
K-R29FDTPS05	TIRE PRESSURE MONITORING SYSTEM KIT	5		
R-10110A	TIRE PRESSURE SENSOR	1		
MIO-R29FDTPS17	INSTALLATION MANUAL	1		

Legend:
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Packed By : _____
Tags : _____
Customer : _____
Date : _____
Work order : _____
Quantity : _____

RAILGEAR STEERING WHEEL LOCK KIT

Rafna Industries Ltd.	24-Oct-11
HR K- SXXXXX004290 Steering Wheel Lock Kit (Hook & Loop)	rev. 0

Vehicle Application Chart

Year	Make	Model #	Model

Part Number	Description	# Req.	Remarks	Check
HR K-SXXXXX004290 Steering Wheel Lock Kit				
S-001050	Velcro Steering Wheel Lock	1	K-SXXXXX004	
S-001040	Steering Wheel Lock Decal	1		
R-21163	Sticker, Max. Recommended Speed	1		
MIO-SXXXXX004290	Manual, Steering Wheel Lock	1		

Legend:
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Quantity : _____

RAILGEAR HYDRAULIC KITS

Rafna Industries Ltd.	18-Apr-07
HR K-H29RRG048B001 Hydraulic Kit - STD CTRL - STD MOUNT	rev. 8

Vehicle Application Chart

Year	Make	Model #	Model
2001-2005	GMC/Chevy	*25***HD	All 2500HD Models
2004-2005	GMC/Chevy	K359*3	3500 SRW 4x4
2005-Current	Ford	*21	F-250 All 4X4 Models
2005-Current	Ford	*31	F-350 All SRW 4X4 Pick-Up Models

Part Number	Description	# Req.	Remarks	Check
R-048B	Hydraulic Pump	1		
R-2965	Rear Pump Mounting Bracket	1		
R-1567	Dash Switch	1		
R-1577	In-Line Fuse 5 Amp	1		
CO-130G	"Railgear Pump" Decal	1		
CO-130N	"Front Gear Up" Decal	1		
CO-130O	"Rear Gear Up" Decal	1		
CO-130P	"Front Gear Down" Decal	1		
CO-130Q	"Rear Gear Down" Decal	1		
R-2868	Locking Cable Holding Collar	1		
R-1565	Flow Reducer	2		
S-001030	Railgear Operation Decal	2		
HY-849FSO-04-04	Adapter	7		
HY-849FSO-04-06	Adapter	1		
HY-849FS-04-06	Adapter	4		
HY-HFS2-04	Hose 23" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
HY-HFS2-04	Hose 33" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
HY-HFS2-04	Hose 360" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
R-990KGT-001	1/4" UNC Gr. 8 Bolt x 1" Long	3	Pump Manifold	
	1/4" SAE Washer	3		
	1/4" Lock Washer	3		
	5/16" UNC Gr. 8 Bolt x 3/4" Long	4	Pump	
	5/16" SAE Washer	4		
	5/16" Lock Washer	4		
MIO-H29RRG048B001	Hydraulic Kit Installation Manual	1		
TSB-169 Rev A	Technical Service Bulletin	1	Thermal Overload	

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Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

Pump S/N: _____

Rafna Industries Ltd.

26-Oct-16

HR K-H29RRGR048003 Hydraulic Kit, ICC (ORB Valve)

REV. 8

Vehicle Application Chart

Year	Make	Model #	Model
2001-2005	GMC/Chevy	*25***HD	All 2500HD Models
2004-2005	GMC/Chevy	K359*3	3500 SRW 4x4
2005-Current	Ford	*21	F-250 All 4X4 Models
2005-Current	Ford	*31	F-350 All SRW 4X4 Pick-Up Models

Part Number	Description	# Req.	Remarks	Check
R-2965B	Plate Pump Mounting	2	**rev8**	
R-2965C	Plate Manifold Mounting	1	**rev8**	
R-048	Hydraulic Pump	1		
R-2965	Rear Pump Mounting Bracket	1		
R-700	In-Cab Control Panel	1		
CO-071	10 Amp Circuit Breaker	1		
CO-130N	"Front Gear Up" Decal	1		
CO-130O	"Rear Gear Up" Decal	1		
CO-130P	"Front Gear Down" Decal	1		
CO-130Q	"Rear Gear Down" Decal	1		
R-2868	Locking Cable Holding Collar	1		
R-2961	In-Cab Control Lock Cam Converter	2		
R-1565	Flow Reducer	2		
S-001031	Railgear Operation Decal	2		
HY-849-FSO-04-04	Adapter	7		
HY-849-FSO-04-06	Adapter	3		
HY-25UA-06	Adapter	2		
HY-848FSO-04-06	Adapter	4		
HY-849FS-04-06	Adapter	2		
HY-720FSO-06-06	Adapter	2		
HY-HFS2-04	Hose 16" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
HY-HFS2-04	Hose 23" Long	2	Assemble Each Hose w/ One Straight Coupler & One 90° Coupler	
HY-HU04-04NJ	Coupler	2		
HY-HU04-04NJ90	Coupler	2		
HY-HFS2-04	Hose 33" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
HY-HFS2-04	Hose 360" Long	2	Assemble Each Hose w/ Two Straight Couplers	
HY-HU04-04NJ	Coupler	4		
R-990KIT-011	1/4" UNC Gr. 8 Bolt x 1" Long	3	Pump Manifold	
	1/4" SAE Washer	3		
	1/4" Lock Washer	3		
	5/16" UNC Gr. 8 Bolt x 3/4" Long	4	Pump	
	5/16" SAE Washer	4		
	5/16" Lock Washer	4		
MI-H29RRGR048003	Hydraulic Kit Intallation Manual	1		
MO-H29RRGR048003	Hydraulic Kit Operation Manual	1		
TSB-169 Rev A.	Technical Service Bulletin	1	Thermal Overload	

Rev. 7 5/3/11	Removed (2) s-002002 and added to Generic-290 and Generic-290CA

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Date : _____

Work order : _____

Quantity : _____

Pump S/N: _____

Rafna Industries Ltd.

20-Dec-17

HR K-H29RRXS003041 Hydraulic Kit

rev. C

Vehicle Application Chart

Year	Make	Model #	Model

STANDARD CONTROL w/ MANUAL EXTERNAL CONTROL VALVES

Part Number	Description	# Req.	Remarks	Check
R-2965B	Plate Pump Mounting	2		
S-003041	Hydraulic Pump	1		
R-31592	Manual Control Valve	2		
R-31590	Toggle Switch	2		
R-31591	Boot	2		
R-2965	Rear Pump Mounting Bracket	1		
CO-106	Dash Switch	1		
R-1577	In-Line Fuse 5 Amp	1		
R-1577-1	Fuse, 5 AMP	1		
CO-130G	"Railgear Pump" Decal	3		
CO-130N	"Front Gear Up" Decal	1		
CO-130O	"Rear Gear Up" Decal	1		
CO-130P	"Front Gear Down" Decal	1		
CO-130Q	"Rear Gear Down" Decal	1		
R-2868	Locking Cable Holding Collar	1		
R-32145	Single P.O. Check Valve Assy	2		
R-32180	Railgear Operation Decal	2		REV A
849FSO-04-04	Adapter	1	H-990KIT-057	
849FSO-04-06	Adapter	3		
849FS-04-06	Adapter	4		
848-FSO-04-08	Adapter	8		
879-FS-04	Adapter	8		
HY-HFS2-04	Hose Assy, 23" Long	4		
HY-HFS2-04	Hose Assy, 80" Long	1		
HY-HFS2-04	Hose Assy, 33" Long	1		
HY-HFS2-04	Hose Assy, 360" Long	2		
R-990KIT-402	1/4" UNC Gr. 8 Bolt x 2.25" Long	4	Control Valve	
	1/4" Flat Washer	8		
	1/4" UNC Nylock Nut	4		
	5/16" UNC Gr. 8 Bolt x 3/4" Long	4	Pump	
	5/16" Flat Washer	4		
	5/16" Lock Washer	4		
MIO-H29RRXS003041	Hydraulic Kit Installation Manual	1		
TSB-169 Rev A.	Technical Service Bulletin	1	Thermal Overload	

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Packed By : _____

Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

Pump S/N: _____

Rafna Industries Ltd.

20-Dec-17

HR K-H29RRXS004270 Hydraulic Kit

rev. B

Vehicle Application Chart

Year	Make	Model #	Model

STANDARD CONTROL w/ MANUAL EXTERNAL CONTROL VALVES AND SOLENOID

Part Number	Description	# Req.	Remarks	Check
R-2965B	Plate Pump Mounting	2		
S-003041	Hydraulic Pump	1		
R-31595	Manual Control Valve	2		
R-31596	#8 JIC Hydraulic Plug	4		
R-31597	Plug, Male Adaptor	2		
R-2965	Rear Pump Mounting Bracket	1		
CO-106	Dash Switch	1		
R-1577	In-Line Fuse 5 Amp	1		
R-1577-1	Fuse, 5 AMP	1		
CO-130G	"Railgear Pump" Decal	3		
CO-130N	"Front Gear Up" Decal	1		
CO-130O	"Rear Gear Up" Decal	1		
CO-130P	"Front Gear Down" Decal	1		
CO-130Q	"Rear Gear Down" Decal	1		
R-2868	Locking Cable Holding Collar	1		
R-32145	Single P.O. Check Valve Assy	2		
R-32180	Railgear Operation Decal	2		REV A
849FSO-04-04	Adapter	1	H-990KIT-057	
849FSO-04-06	Adapter	3		
849FS-04-06	Adapter	4		
848-FSO-04-08	Adapter	8		
879-FS-04	Adapter	8		
HY-HFS2-04	Hose Assy, 23" Long	4		
HY-HFS2-04	Hose Assy, 80" Long	1		
HY-HFS2-04	Hose Assy, 33" Long	1		
HY-HFS2-04	Hose Assy, 360" Long	2		
R-990KIT-402	1/4" UNC Gr. 8 Bolt x 2.25" Long	4	Control Valve	
	1/4" Flat Washer	8		
	1/4" UNC Nylock Nut	4		
	5/16" UNC Gr. 8 Bolt x 3/4" Long	4	Pump	
	5/16" Flat Washer	4		
	5/16" Lock Washer	4		
MIO-H29RRXS004270	Hydraulic Kit Installation Manual	1		
TSB-169 Rev A.	Technical Service Bulletin	1	Thermal Overload	

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Packed By : _____

Tags : _____

Customer : _____

Date : _____

Work order : _____

Quantity : _____

Pump S/N: _____

8.0 NOTES