

**INSTALLATION OF R-290 HYDRAULIC KIT
FULL-IN-CAB CONTROLS (FICC) w/ UNDER HOOD PUMP
2007-2014 SUBURBAN/2017-PRESENT SUBURBAN HD/2011-2019 GM HD
PICKUPS**

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 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 KIT (FICC)

The following procedure details the installation of the hydraulic kit. The hardware required for this installation is listed in Table 1.

Table 1: Hydraulic Kit Installation Parts

Part Number	Description	Qty
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-002001	Double Pilot Operated Check Valve	2
S-001032	Railgear Operation Decal	2
HY-849FSO-04-04	1/4" Male O-Ring Boss to 1/4" Male JIC 90°	7
HY-849FSO-04-06	3/8" Male O-Ring Boss to 1/4" Male JIC 90°	3
HY-25UA-06	3/8" Male NPT to 3/8" Male NPT 90°	2
HY-848FSO-04-06	3/8" Male O-Ring Boss to 1/4" Male JIC Straight	4
HY-849FS-04-06	3/8" Male NPT to 1/4" Male JIC 90°	2
HY-720FSO-06-06	3/8" Male O-Ring Boss to 3/8" Female NPT Straight	2
HY-HFS2-04	Hose 16" Long	2
HY-HFS2-04	Hose 23" Long	2
HY-HFS2-04	Hose 33" Long	2
HY-HFS2-04	Hose 360" Long	2
HY-HU04-04NJ	1/4" Female JIC Straight Coupler (On Hoses)	14
HY-HU04-04NJ90T	1/4" Female JIC 90° Coupler (On Hoses)	4
HY-848FSO-04-04	1/4" Male O-Ring Boss to 1/4" Male JIC	4
R-990KIT-115	1/4" UNC Gr. 8 Bolt x 3/4" Long	4
	1/4" SAE Washer	4
	1/4" Lock Washer	4
	5/16" UNC Gr. 8 Bolt x 3/4" Long	4
	5/16" SAE Washer	4
	5/16" Lock Washer	4
Not Supplied	4 & 14 Gauge Wire, Terminals, Loom, Etc.	As Req'd
R-10536	Adapter Plate Assembly	1
R-990KIT-115	5/16"-18 Gr. 8 Hex Bolt x 1" long	4
	5/16" SAE Washer	4
	5/16"-18 Gr. 8 Nylock Nut	4
R-10537	Pump Mounting Bracket	1
R-10539	Support Bracket	2
R-990KIT-115	5/16"-18 Gr. 8 Bolt x 1" Long	2
	5/16"-18 Gr. 8 Nylock Nut	2
	5/16" SAE Washer	4
(2015 GM SUPPLEMENTAL HARDWARE KIT)		
R-990KIT-382 (FOR 2015 GM ONLY)	5/16" UNC Gr.5 Bolt x 1 1/4" Long, Hex Serrated Flange	4
	5/16" UNC Gr.5 Nylock Nut, Hex Flange	4
	5/16" Gr.8 Washer, Flat	4
	5/16" UNC Gr.8 Nylock Nut	4

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 front railgear cylinder check valve and the rod end port on the front railgear cylinder.
6. 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.
7. Connect one 80" long hydraulic hose (straight and 90° ends) between the C2 port on the manifold and the D1 port on the front railgear cylinder check valve. The 90° hose end should be at the check valve.
8. Connect one 80" long hydraulic hose (straight and 90° ends) between the C1 port on the manifold and the D2 port on the front 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 C4 port on the manifold and mark the other end of this hose as "D1".
12. Connect one 360" long hydraulic hose to the C3 port on the manifold and mark the other end of this hose as "D2".
13. Route the two 360" long hydraulic hoses to the rear of the vehicle through drivers' 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 rear railgear cylinder check valve.
15. Connect the end of the 360" long hydraulic hose marked "D2" to the D2 port on the 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 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.
20. 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 through the firewall to the "Aux" terminal on the circuit breaker.
 - d) Connect another black wire from the "Bat" terminal on the circuit breaker to the power terminal on the solenoid.
 - e) Connect another wire from the ground terminal on the railgear 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 and tar on the frame.
21. Using suitable 4 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 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.
22. 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.
23. 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.
24. 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.
25. 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.

26. Affix the supplied railgear operation decals in a suitable location adjacent to the front and rear control boxes.
27. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.
28. Ensure all holes in the firewall are sealed and protected with a grommet.
29. 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.
30. Follow the Hydraulic System Relief Valve Setting procedure detailed in the Hydraulic Kit Operating, Service and Parts Manual.
31. 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.
32. 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

PUMP/MANIFOLD INSTALL/MODIFICATION INSTRUCTIONS

1. Remove spare battery tray from vehicle. The spare battery tray is located at the front corner of the engine compartment on the driver's side.
 - a. Trim battery tray mounting flange as shown. Figure 1 (for 2015-2019 gm only)
2. Place the battery tray adapter plate into spare battery tray and mark hole locations from the adapter plate onto the battery tray. Figure 2 (figure 2a for 2015-2019)
3. Drill (4) 11/32" diameter holes, thru the spare battery tray, that were marked in the previous step. Figure 2 (figure 2a for 2015-2019)
4. From the back side of the battery tray, weld (4) 5/16"-18 x 1" long hex bolts to the battery tray as shown. Figure 3

2015-2019 MY

!!DO NOT WELD SPARE BATTERY TRAY - IT IS ALUMINUM!!

5. Install (4) serrated flange hex bolts and (4) flanged nylon insert lock nuts on to battery tray as shown. (figure 3a for 2015-2019 gm only)
6. Re-install battery tray into vehicle, then install the battery tray adapter plate onto spare battery and secure with (4) 5/16" flat washers and (4) 5/16"-18 Nylock nuts. Figure 4
7. Bench assemble hydraulic pump, manifold and pump bracket as shown. Figure 5
8. Assemble hydraulic pump/manifold/bracket assembly onto modified battery tray assembly as shown, locate and adjust as required using (2) 5/16"-18 x1" lg. Hex bolts, (4) 5/16" flat washers and (2) 5/16"-18 Nylock nuts. Figure 6
9. Be sure to check for any interference with surrounding vehicle components. Be sure to locate the pump as to allow for free movement of the emergency hand pump and handle when the handle is installed and actuated. Figure 7

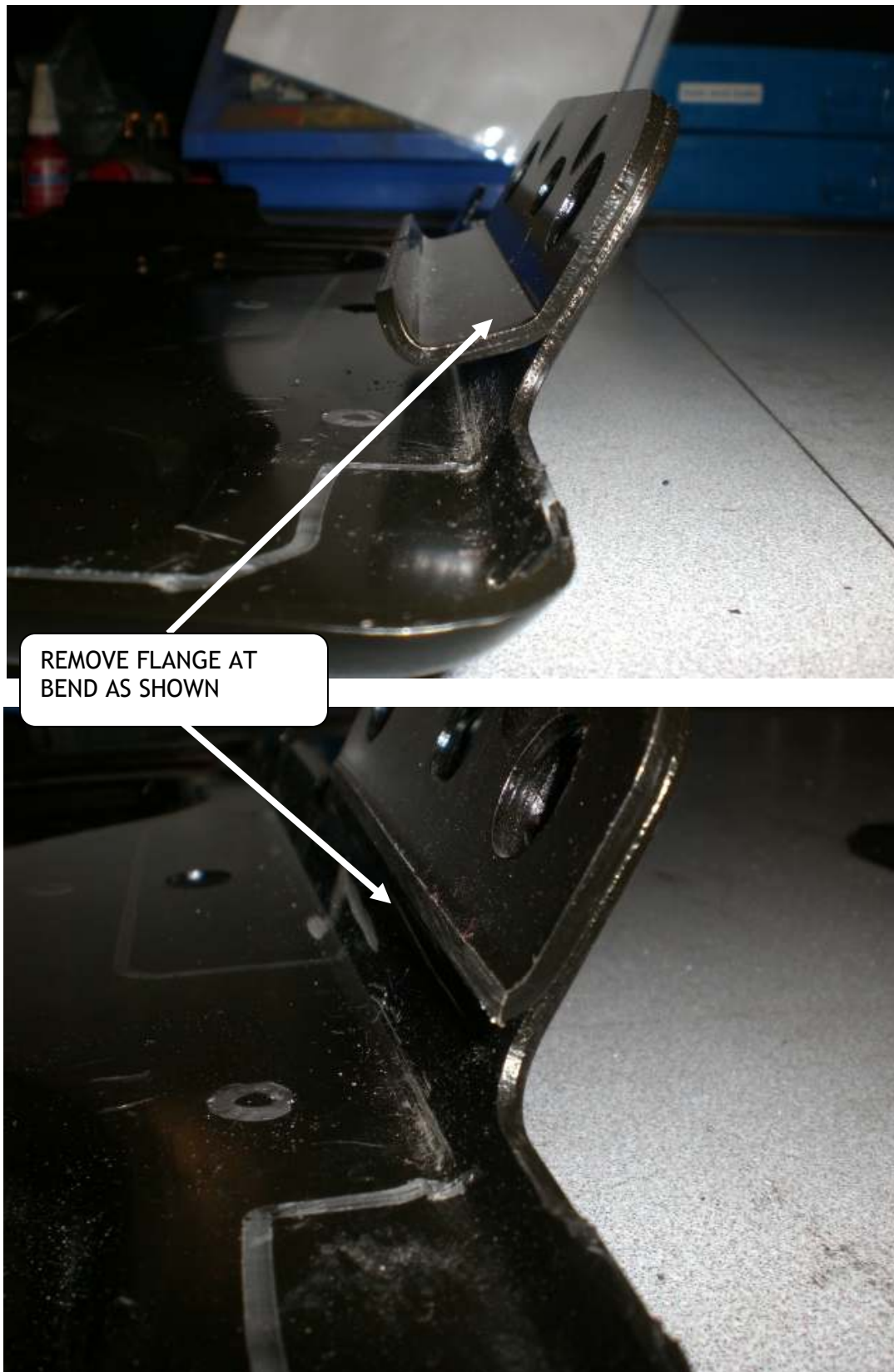


Figure 1 (2015-2019 MODEL YEAR)

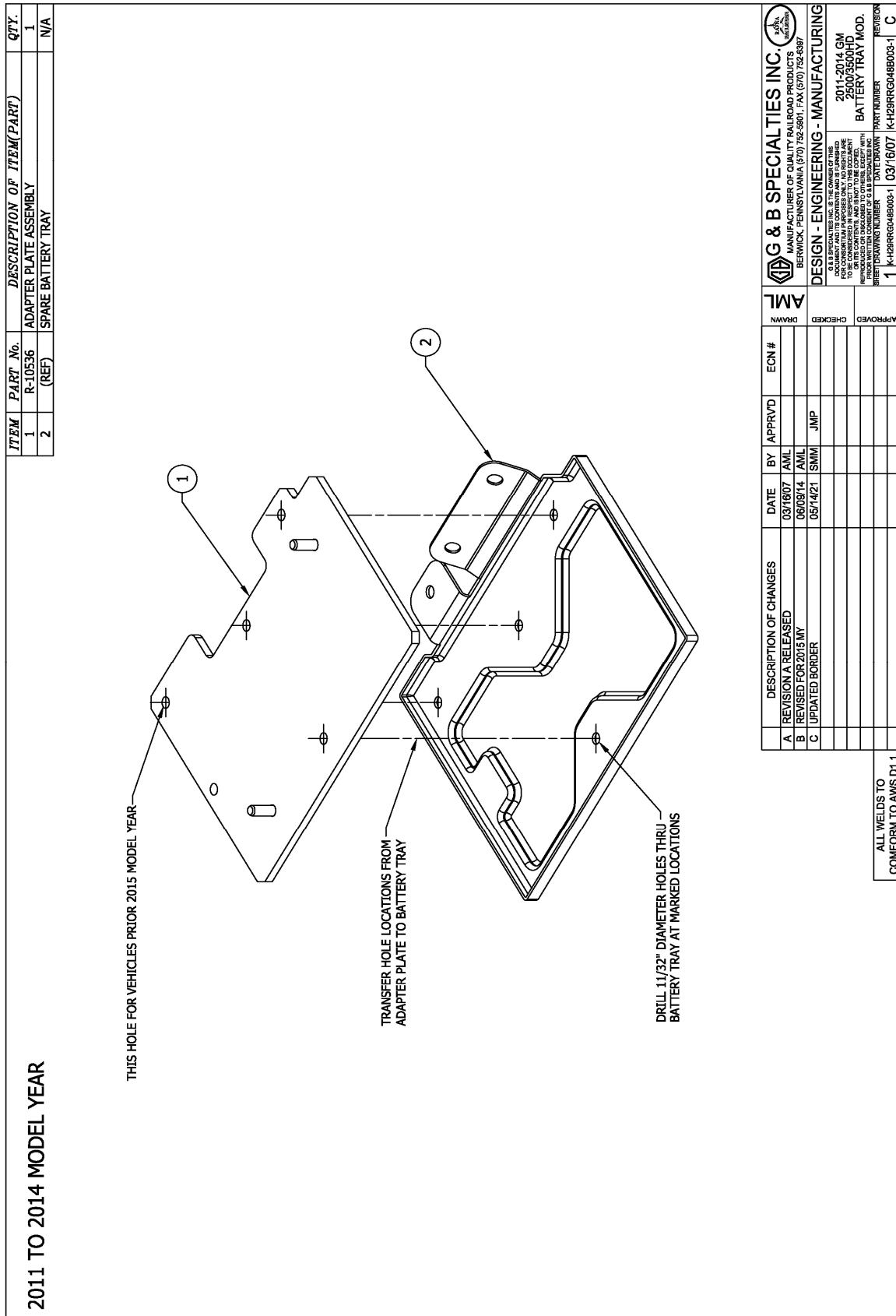


Figure 2 (2011 TO 2014 MODEL YEAR)

[illegible]

Figure 2A (2015-2019 MODEL YEAR)

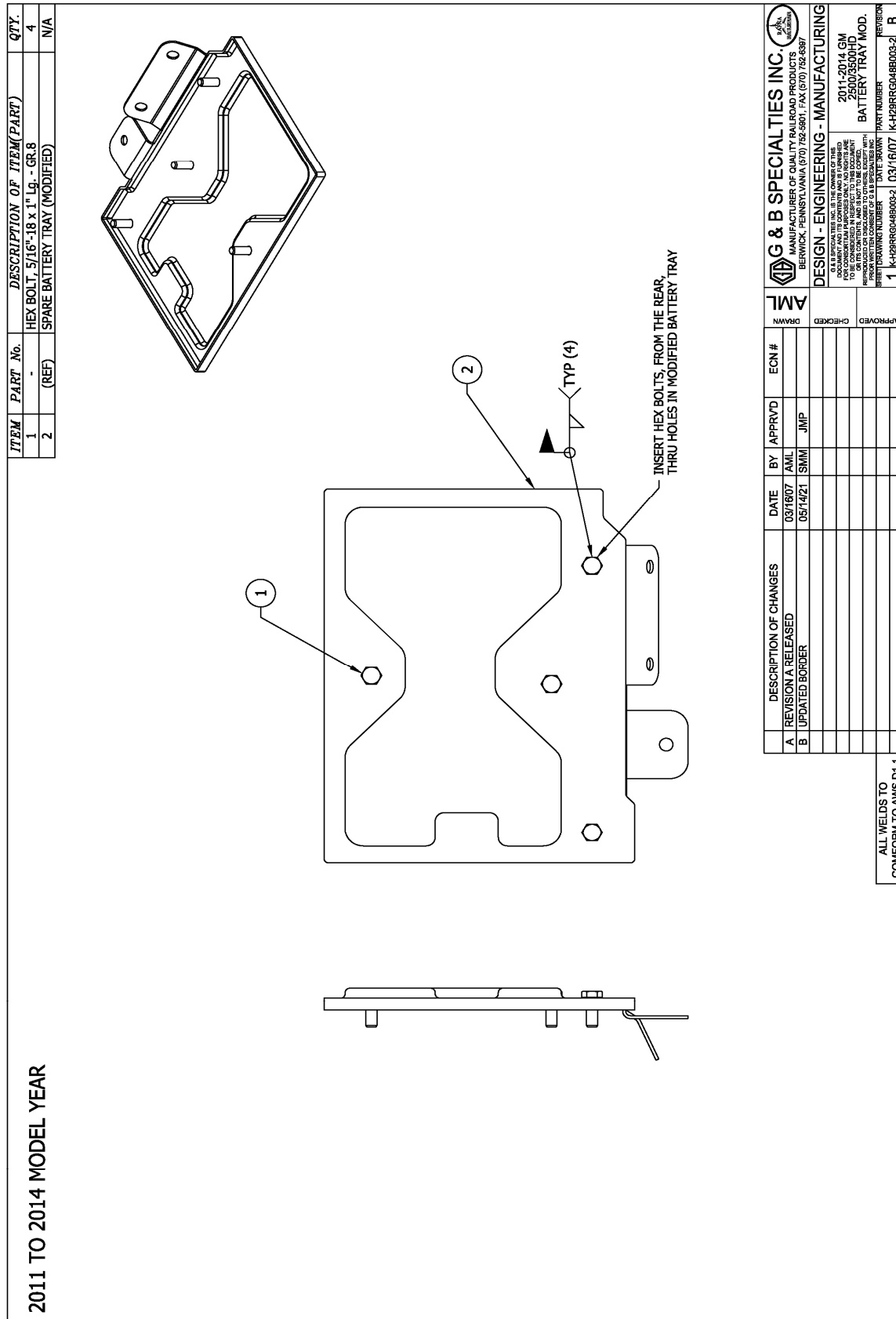


Figure 3 (2011 TO 2014 MODEL YEAR)

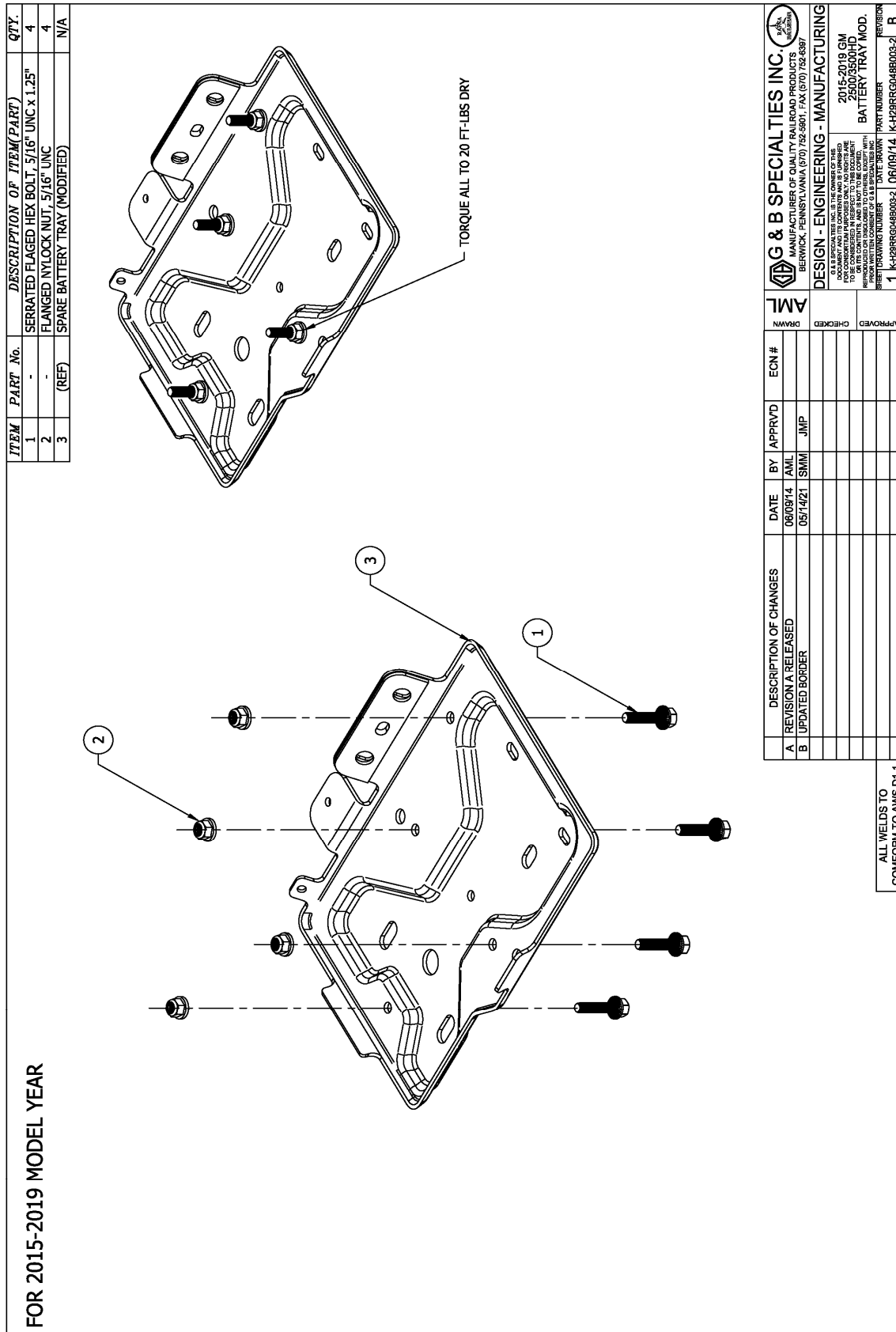


Figure 3A (2015-2019 MODEL YEAR)

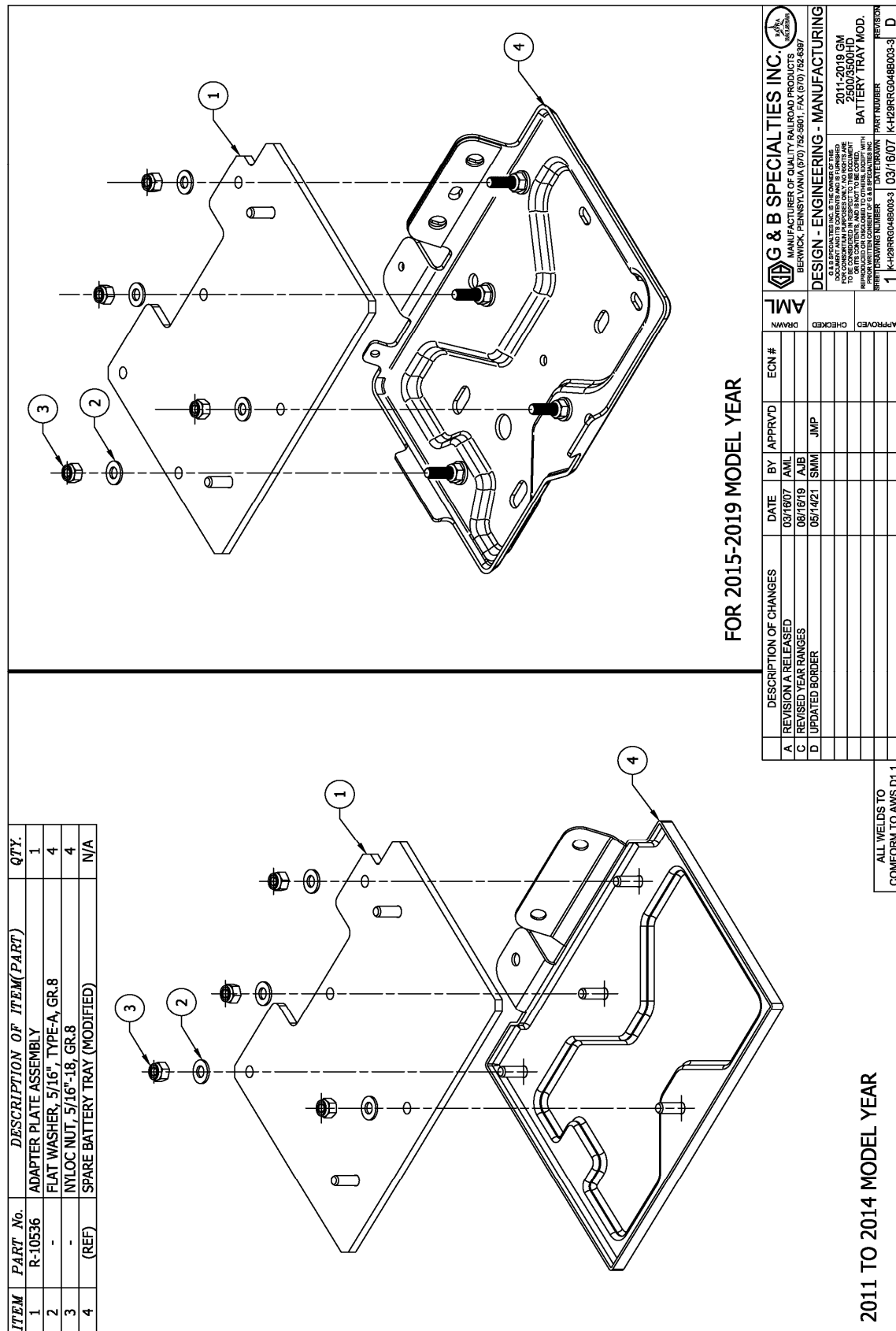


Figure 4

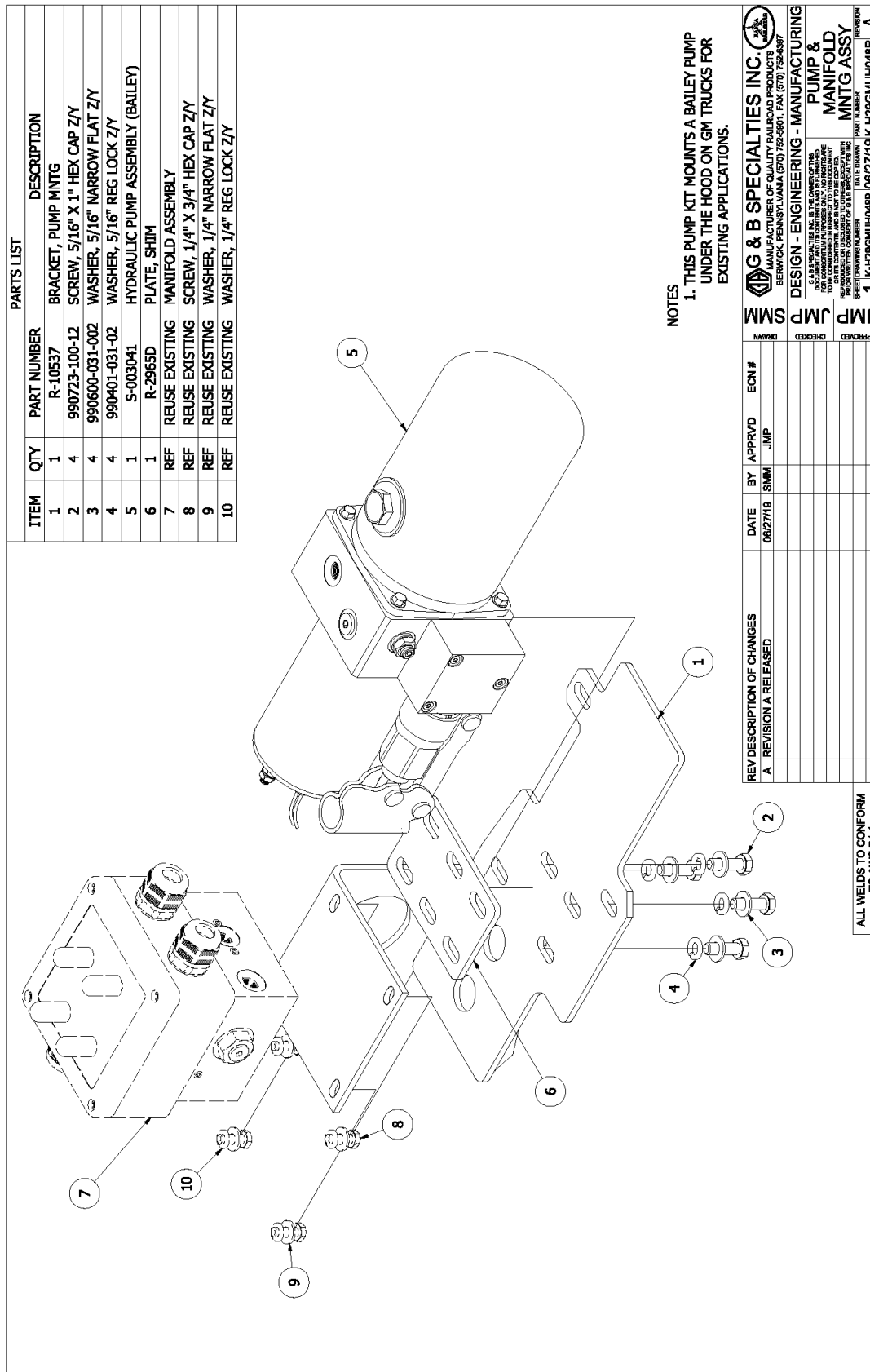


Figure 5

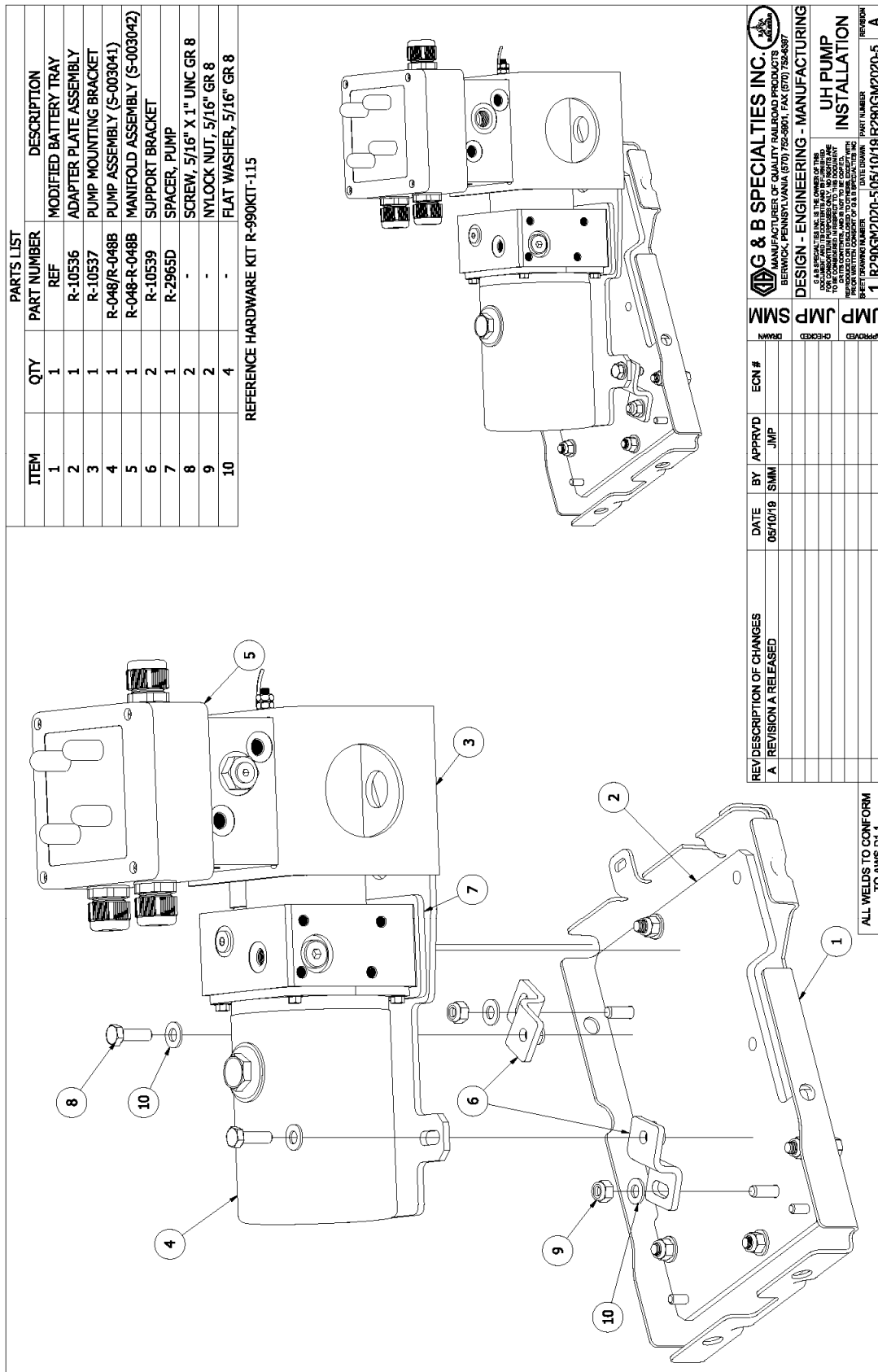
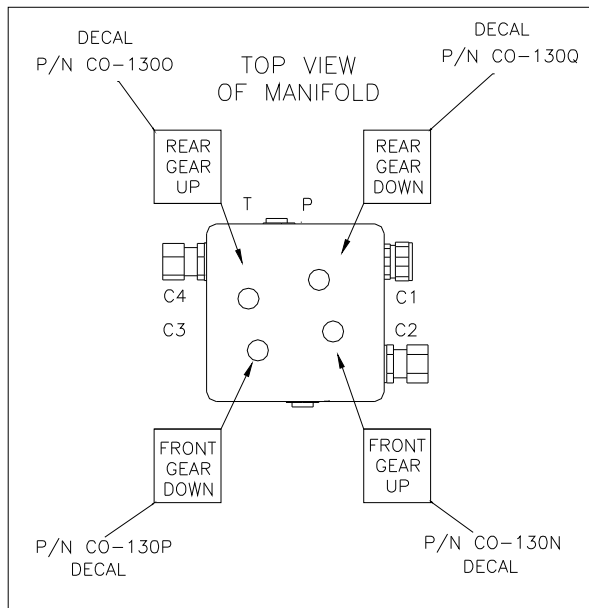
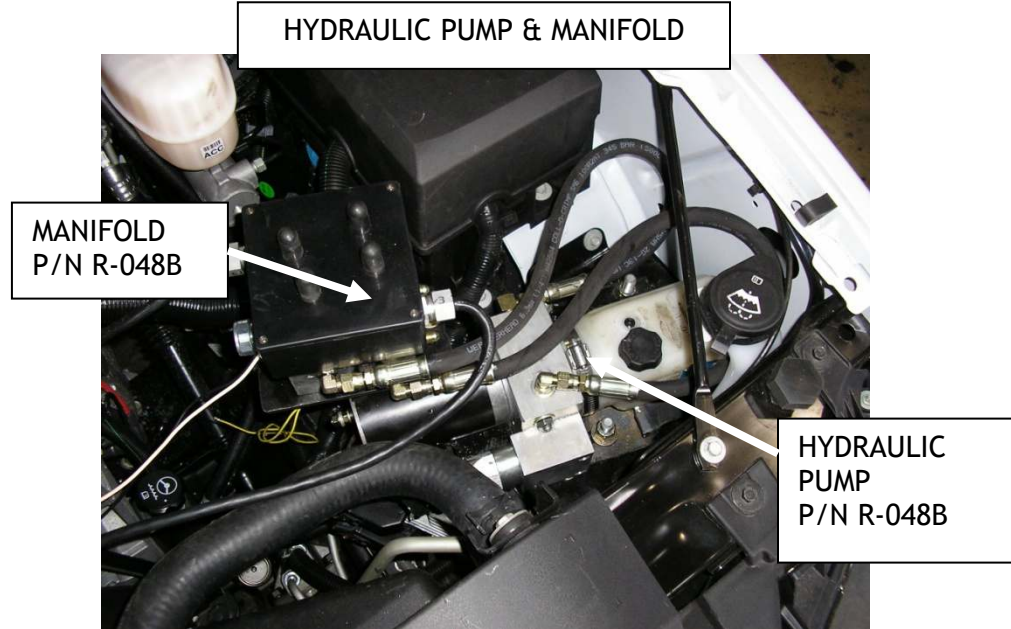
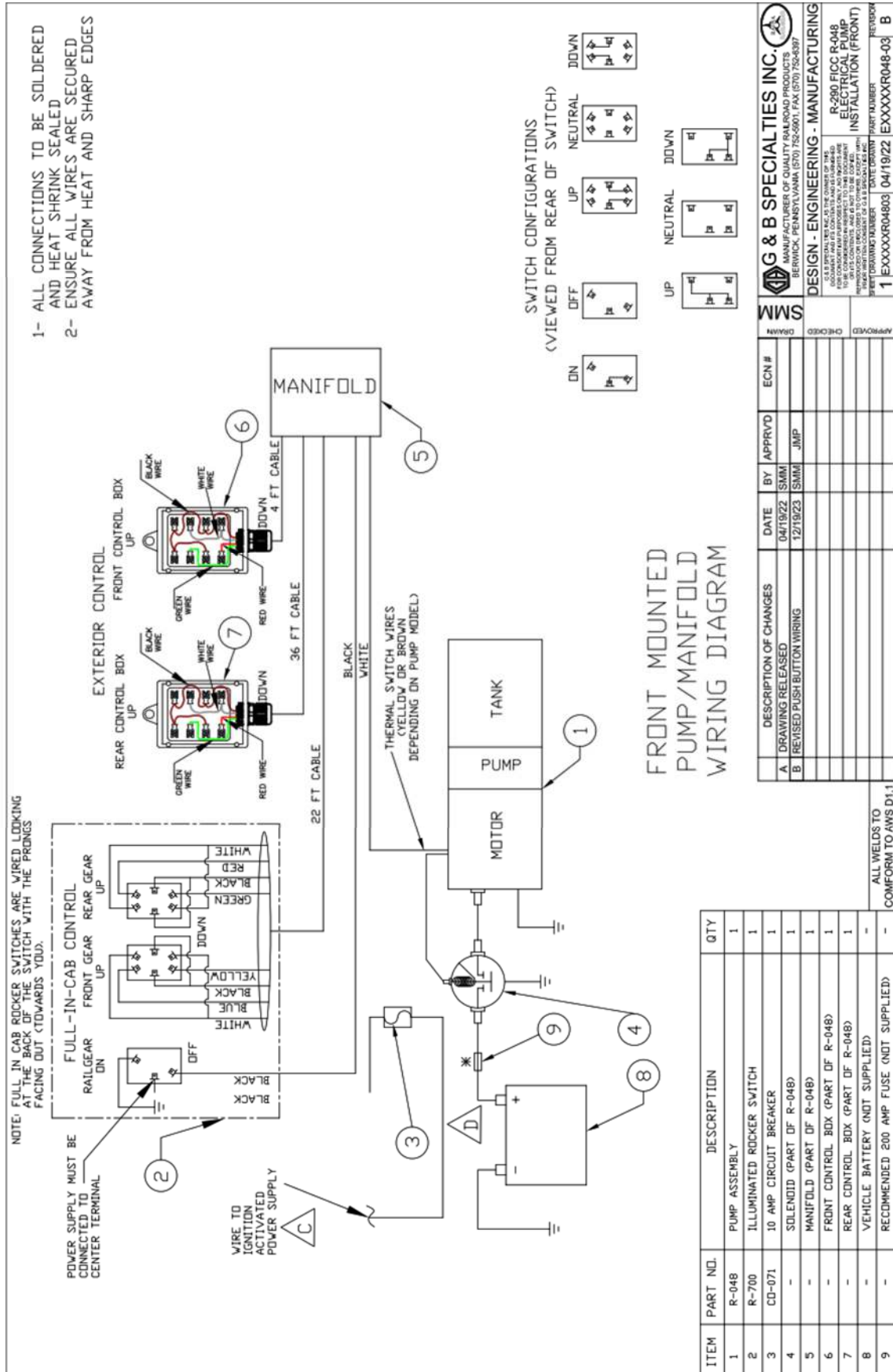


Figure 6

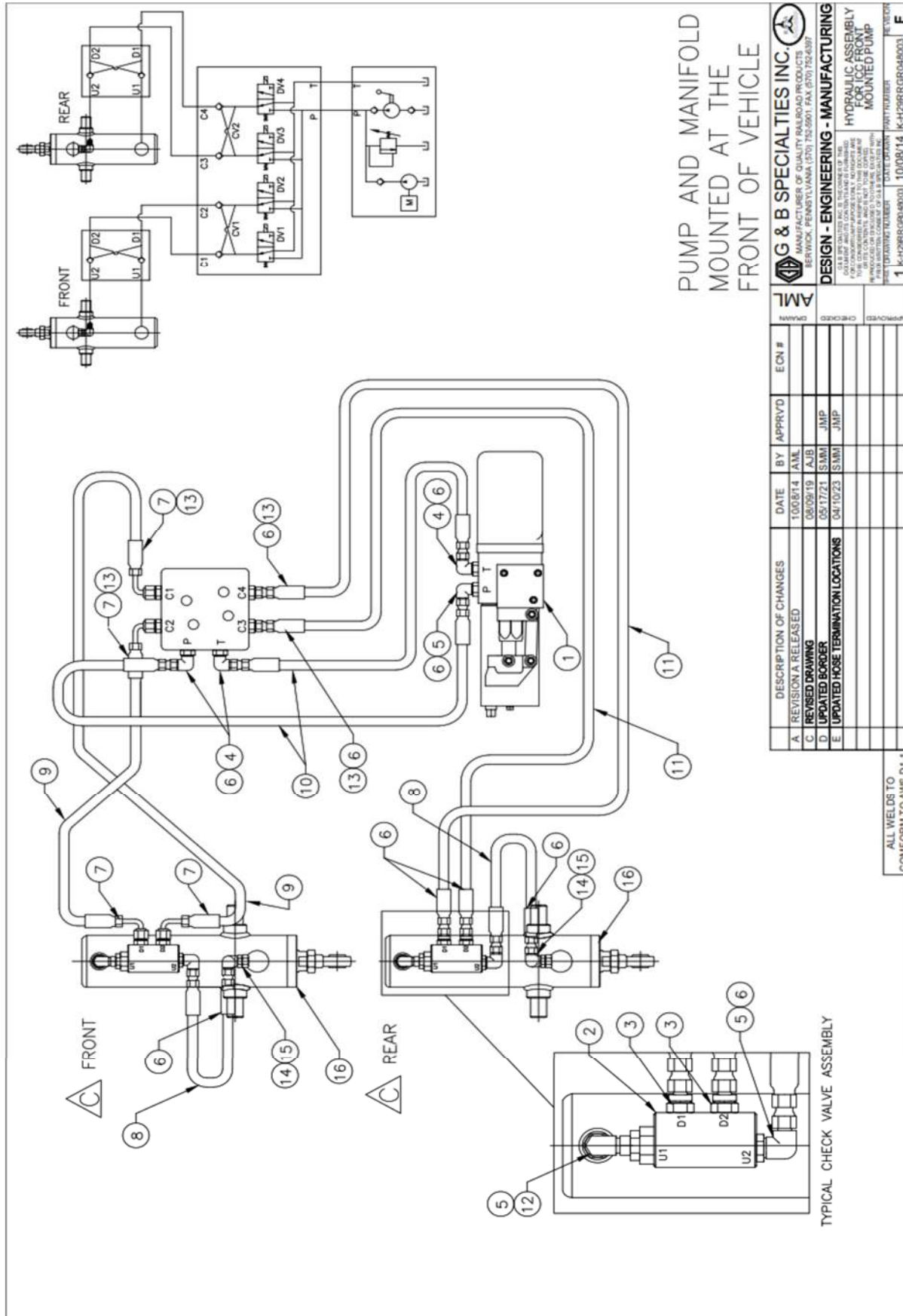


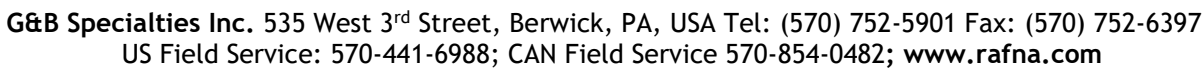
HYDRAULIC PUMP & MANIFOLD ARE
MOUNTED UNDER THE HOOD IN TO
THE SPARE BATTERY BOX USING
SUPPLIED BRACKETS.

Figure 7





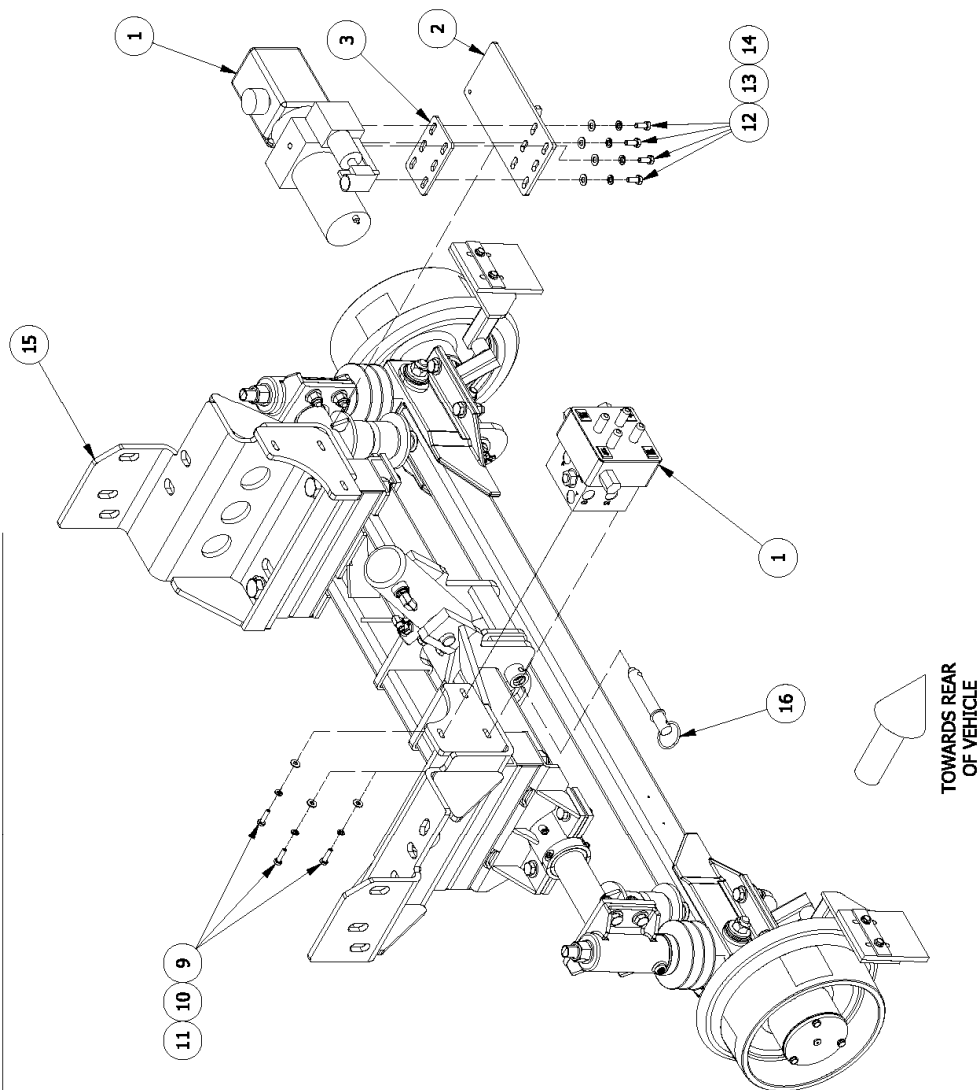





ITEM	PART NO.	DESCRIPTION	QTY
1	R-048	ELECTRIC HYDRAULIC PUMP W/ MANIFOLD	1
2	S-002001	DOUBLE P.O. CHECK VALVE	2
3	848FSO-04x06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC	4
4	849FSO-04-04	1/4" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
5	849FSO-04-06	3/8" MALE O-RING BOSS TO 1/4" MALE JIC 90°	3
6	HU-04-04NJ	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 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

 G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397		DESIGN - ENGINEERING - MANUFACTURING R-2965 FICG R-048 HYDRAULIC PUMP INSTALLATION BOM
DESCRIPTION OF CHANGES A REVISION A RELEASED	DATE 04/19/22	BY SMM
APPROVED DRAWN	ECN #	PART NUMBER K-H29RRGX048-03
CHECKED	DATE DRAWN 04/19/22	PART NUMBER K-H29RRGX048-03
REVISION 1	DATE 04/19/22	PART NUMBER K-H29RRGX048-03

R-048 REAR MOUNTED PUMP INSTALLATION



ITEM	PART NUMBER	DESCRIPTION	QTY
1	R-048	HYDRAULIC PUMP AND MANIFOLD	1
2	R2965	REAR PUMP MOUNTING BRACKET	1
3	R2965D	PUMP MOUNTING SPACER	1
4	CO-130N	"FRONT GEAR UP" DECAL	1
5	CO-1300	"REAR GEAR UP" DECAL	1
6	CO-130P	"FRONT GEAR DOWN" DECAL	1
7	CO-130Q	"REAR GEAR DOWN" DECAL	1
8	S-001032	RAILGEAR OPERATION DECAL (NOT SHOWN)	1
9	R-990KIT-011	1/4" UNC GR.8 BOLT X 1"	3
10		1/4" LOCK WASHER	3
11		1/4" SAE WASHER	3
12		5/16" UNC GR.8 BOLT X 1" LONG	4
13		5/16" LOCK WASHER	4
14		5/16" SAE WASHER	4
15	-	RAILGEAR MOUNTING BRACKET (AS PER MOUNTING KIT)	N/A
16	S-001011	RAIL GEAR LOCK PIN (AS PER RAIL GEAR KIT)	N/A

REV	DESCRIPTION OF CHANGES	DATE	BY	APPRVD	ECN #	DRAWN	MR
A	UPDATED BOM AND BORDER	08/12/19	AJB				
<p>G & B SPECIALTIES INC.  MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (870) 762-5801, (870) 762-3387</p>							
<p>DESIGN - ENGINEERING - MANUFACTURING</p>							
<p>G & B SPECIALTIES INC. IS THE OWNER OF THIS DRAWING. IT IS TO BE USED ONLY FOR THE PROJECT AND FOR CONSTRUCTION PURPOSES ONLY. NO RIGHTS ARE TO BE ASSIGNED OR TRANSFERRED TO ANY OTHER PARTY. NO PARTS OR MATERIALS ARE TO BE COPIED OR REPRODUCED OR REPRODUCED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF G & B SPECIALTIES INC. ON ITS CONTRACTS AND IS NOT TO BE COPIED.</p>							
<p>R-290 HYDRAULIC KIT</p>							
<p>APPROVED</p>							
<p>SHEET DRAWING NUMBER DATE DRAWN PART NUMBER REVISION</p>							
<p>1 K-H29R9RGX048-03 06/23/04 K-H29R9RGX048-03 A</p>							

**OPERATION AND SERVICE OF R-290 HYDRAULIC KIT
FULL-IN-CAB CONTROLS (FICC) w/ UNDER HOOD PUMP
2007-2014 SUBURBAN/2017-PRESENT SUBURBAN HD/2011-2019 GM HD
PICKUPS**

OPERATION AND SERVICE SAFETY PRECAUTIONS

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



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting operation of the railgear equipped vehicle.
- Operating instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Railway company rules governing rail travel must always be observed.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the railgear. Be aware of all pinch points.
- 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 (FICC)

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 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 pump 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.
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.

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 at installation and 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. Following the procedure in the Railgear Kit Operation, Service and Parts manual, raise the front railgear completely and continue to raise the railgear so that the hydraulic cylinder creates a load on the pump by trying to “dead-head”. 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 OF HYDRAULIC KIT

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	

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

DESIGN - ENGINEERING - MANUFACTURING

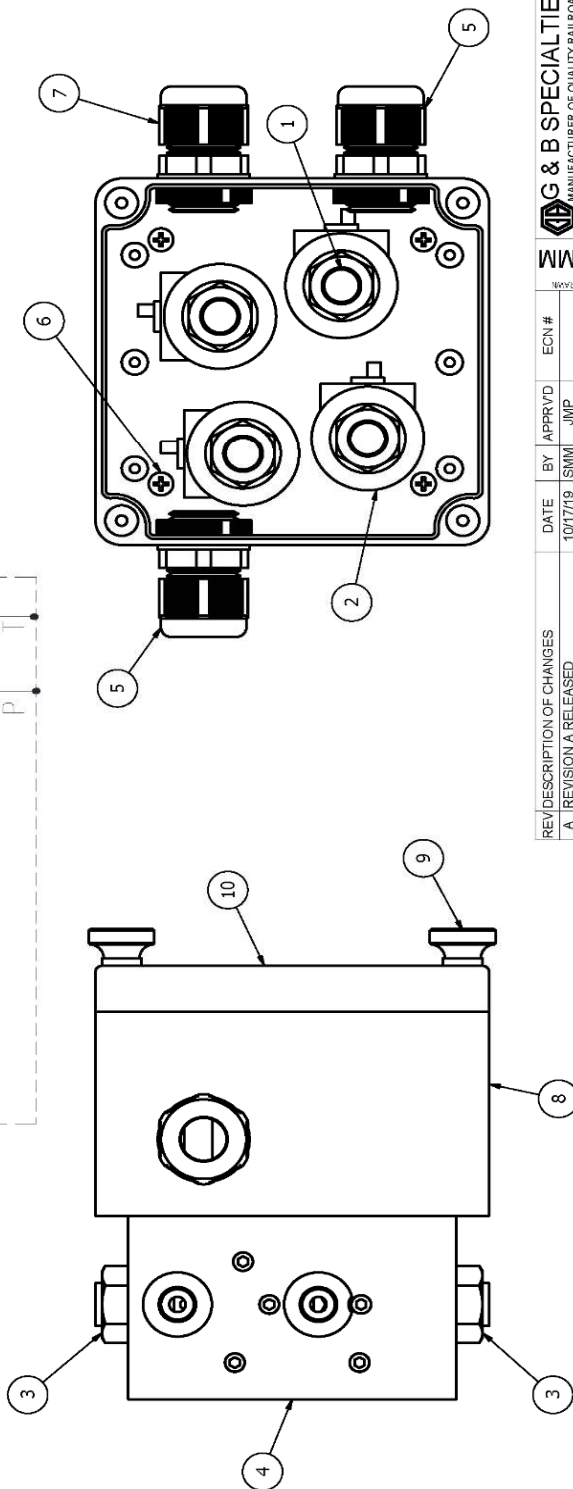
JMP SMM

R-048R-048B
PUMP PARTS

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

1 5003041 **10/16/19/S-003041** **B**

The diagram shows a four-channel system enclosed in a dashed box. On the left, four input lines are labeled C1, C2, C3, and C4. Each input line passes through a resistor and a buffer (represented by a circle with a triangle) before entering a crossbar interconnect. The crossbar consists of two horizontal lines and two vertical lines, with dashed lines indicating the possible connections between the inputs and the vertical lines. The outputs of the crossbar are connected to four output buffers, each represented by a triangle with a circle. The outputs of these buffers are connected to a common output line labeled P. The output line P is also connected to a terminal labeled T.



REV	DESCRIPTION OF CHANGES	DATE	BY	APPROVD	ECN #
A	REVISION A RELEASED	10/17/19	SMM	JMP	
B	UPDATED PART NUMBERS	07/14/20	SMM	SMM	
C	UPDATED LID PART NUMBER	09/19/20	SMM	SMM	



G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA (570) 752-5961 FAX (570) 752-6397

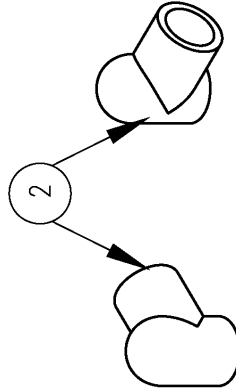
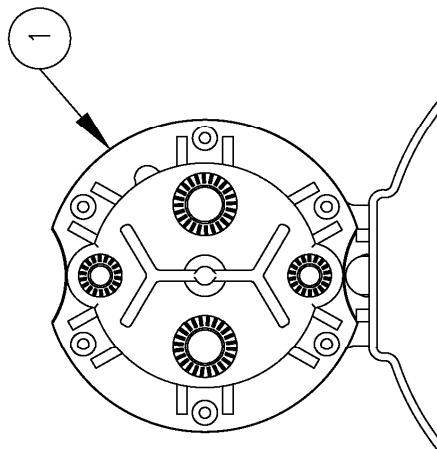
DESIGN - ENGINEERING - MANUFACTURING


R-048/R-048B
MANIFOLD
PARTS

G & B SPECIALTIES IS THE OWNER OF THIS DRAWING. IT IS TO BE USED ONLY FOR THE PROJECT AND FOR THE PARTS LISTED HEREON. IT IS NOT TO BE REPRODUCED OR COPIED FOR ANY OTHER PROJECT OR PARTS LIST. IT IS NOT TO BE USED FOR ANY OTHER PROJECT OR PARTS LIST. IT IS NOT TO BE USED FOR ANY OTHER PROJECT OR PARTS LIST.

SHEET/DRAWING NUMBER		DATE DRAWN	PART NUMBER	REVISION
1	50033042	10/17/19	S-0033042	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	APPR'D	ECN #	DRAWN	 G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA, USA (717) 752-4387	
A	REVISION A RELEASED	10/18/19	SMM	JMP		CHECKED	DESIGN - ENGINEERING - MANUFACTURING G & B SPECIALTIES INC. IS THE OWNER OF THIS DRAWING. IT IS TO BE USED ONLY FOR THE PROJECT FOR WHICH IT WAS PREPARED. NO PORTION ARE TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY INFORMATION STORAGE AND RETRIEVAL SYSTEMS, WITHOUT PERMISSION IN WRITING FROM G & B SPECIALTIES INC.	
							JMP	R-048/R-048B MISC. PARTS
							JMP	REVISION NUMBER: 0185000000
							JMP	PART NUMBER
							JMP	DATE DRAWN
							JMP	DATE APPROVED
							JMP	DATE RELEASED
							JMP	DATE INQUIRY
							JMP	DATE MODIFIED
							JMP	DATE CANCELLED
							JMP	DATE REWORKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED
							JMP	DATE REAPPROVED
							JMP	DATE REISSUED
							JMP	DATE RECALCULATED
							JMP	DATE RECHECKED
							JMP	DATE REDESIGNED
							JMP	DATE REEVALUATED

