



G&B Specialties, Inc.
A Global Railway Industries Company



Bulletin MIO-H46RXF001 (Rev G)

**INSTALLATION, OPERATION & SERVICE OF
HYDRAULIC KIT FOR PUMP APPLICATIONS**

**R-460 ROTARY RAILGEAR
HD R-460 ROTARY RAILGEAR
2008 FORD F-450/550 4x2/4x4**



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.
- 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.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.



INSTALLATION OF HYDRAULIC KIT W/ PUMP

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

Table 1 is to be used for Cable Actuated Rear Railgear Axle Lock (Figure 1)
Table 2 & 2A is to be used for Hydraulic Actuated Rear Railgear Axle Lock (Figure 2)

Table 1 K-H45RFX002 - Hydraulic Kit Installation Parts, Cable Lockup		
Part Number	Description	Qty
P-00060	Railgear Hydraulic Pump	1
R-060-2	Pump Bracket	1
R-20162	Pump Mounting Blocks	2
R-1567	Dash Switch	1
R-1577	5 Amp In-Line Fuse	1
S-001030	Railgear Operation Decal	1
CO-130G	"Railgear Pump" Decal	1
848FSO-04-06	Adapter, 1/4 Male JIC x 3/8 Male ORB	4
844FS-04-04	TEE, 1/4 Male JIC	4
HU04-04NJ	Coupler, Straight, 1/4 JIC Female (installed on hoses)	16
HFS2-04	Hydraulic Hose 13" Long	2
HFS2-04	Hydraulic Hose 18" Long	2
HFS2-04	Hydraulic Hose 36" Long	2
HFS2	Hydraulic Hose 24" Long	2
R-990KIT-268	1/4" UNC Gr. 5 Bolt x 7" Long	2
	1/4" SAE Washer	4
	1/4" Lock Washer	2
	3/8" TYPE-A Flat Washer	6
	3/8" UNC Gr. 8 Bolt x 1.25" Long	6
	3/8" Lock Washer	6



Table 2		K-H45RXF002B - Hydraulic Kit Installation Parts, Hydraulic Lockup	
Part Number	Description		Qty
P-00060	Railgear Hydraulic Pump		1
R-060-2	Pump Bracket		1
R-20162	Pump Mounting Blocks		2
R-1567	Dash Switch		1
R-1577	5 Amp In-Line Fuse		1
R-20160	Run TEE, 1/4 Male JIC		2
S-001030	Railgear Operation Decal		1
CO-130G	"Railgear Pump" Decal		1
848FSO-04-06	Adapter, 1/4 Male JIC x 3/8 Male ORB	H-990KIT-034	4
844FS-04-04	TEE, 1/4 Male JIC		4
HU04-04NJ	Coupler, Straight, 1/4 JIC Female (installed on hoses)		16
HFS2-04	Hydraulic Hose 13" Long		2
HFS2-04	Hydraulic Hose 18" Long		2
HFS2-04	Hydraulic Hose 36" Long		2
HFS2	Hydraulic Hose 24" Long		2
R-990KIT-268	1/4" UNC Gr. 5 Bolt x 7" Long		
	1/4" SAE Washer		4
	1/4" Lock Washer		2
	3/8" TYPE-A Flat Washer		6
	3/8" UNC Gr. 8 Bolt x 1.25" Long		6
	3/8" Lock Washer		6
K-H45RXF002D	Hydraulic Axle Lock Kit		1

Table 2A		K-H45RXF002D - Railgear Hydraulic Axle Lock Kit	
Part Number	Description		Qty
R-8594	Ball Valve		1
R-19078	Tie Plate		2
R-19077	Mounting Plate		1
R-19075	Adapter, 1/4 JIC Male x 3/8 MPT		2
R-20161	Adapter, 1/4 JIC Male x 1/4 ORB Male		2
HFS2-04	Hydraulic Hose, 26" Long	H-990KIT-038	1
HFS2-04	Hydraulic Hose, 48" Long		2
R-990KIT-268A	#10 UNC GR.5 Bolt X 2"		4
	#10 TYPE-A Flat Washer GR.5		8
	#10 UNC GR.5 Nylock Nut		4



1. Assemble the pump mounting blocks to the pump bracket as shown using the supplied 3/8" fasteners. Torque the 3/8" fasteners to 40 ft-lbs dry.
2. Assemble the pump to the pump bracket as shown using the 1/4" fasteners at the motor end of the pump and the 3/8" fasteners on the bottom of the pump. Torque the 3/8" fasteners to 30 ft-lbs dry. Do not over torque.
3. Choose a suitable location for the pump assembly, either forward mounted or rear mounted. The pump mounting blocks are designed for the purpose of welding the blocks to an installer supplied mounting plate. The mounting blocks can be removed or modified at the installers discretion.
4. Install all appropriate fittings and install/fabricate all appropriate hoses as show on the included hydraulic schematic.
5. Ensure that none of the hoses contact any sharp edges or hot surfaces. Secure these hoses in place with tie-wraps. Ensure that there is enough slack in the hoses for the railgear to function.
6. Install the dash switch and "Railgear Pump" decal in a convenient location on the dash.
7. The pump has two wire harnesses and two wires connected to it:
 - a) Two 35' wire harnesses with a control box on the end.
 - b) One white and one black wire each with ring terminals on the ends.
 - c) Depending on the location of the pump, it may be necessary to shorten and or lengthen the control box wiring harness.
8. 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 pump 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 pump to the load terminal on the dash switch.
 - c) Connect another 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 the power terminal on the solenoid.
 - e) Connect another wire from the ground terminal on the dash switch to a suitable ground location on the vehicle.

9. Optional Upfitter Switch Installation:



- 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 pump to the switching terminal on the railgear pump solenoid.
 - b) Lengthen the black wire if required, and connect it from the pump to one end of the in-line fuse.
 - c) Connect another length of black wire from the other end of the in-line fuse to the brown wire for the AUX 4 upfitter switch.
10. 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 silicone 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.
11. Route the 35' wire harnesses from the pump along the frame to the railgear unit 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.
12. 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.
13. Ensure all wires and terminals are soldered, heat shrink sealed, enclosed in protective cable loom and secured with tie-wraps.
14. Ensure all holes in the firewall are sealed and protected with a grommet.
15. Fill the hydraulic system and bleed the air out:
- a) Fill the pump tank with **ESSO Univis Extra** (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 section of this manual 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 section of this manual 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.
16. Follow the Hydraulic System Relief Valve Setting procedure located in the Hydraulic Kit Operating, Service and Parts section of this manual.
17. Test the operation of the controls. Refer to the operation procedure in the Railgear Kit and Hydraulic Kit Operation, Service, and Parts section of this manual.

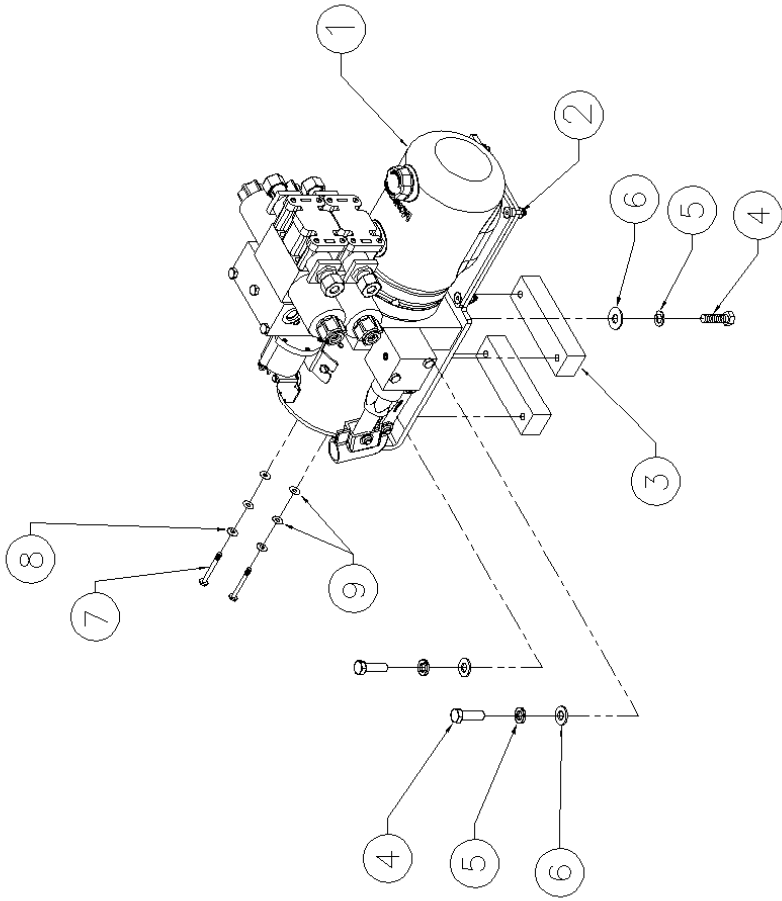


G&B Specialties, Inc.
A Global Railway Industries Company



Bulletin MIO-H46RXF001 (Rev G)

REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/21/09	AML	



G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA 17004-5590 TEL: (570) 752-5901 FAX: (570) 752-6397

DESIGN ~ ENGINEERING ~ MANUFACTURING

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SALES & SERVICE (EUROPE) +44 (0)1252 535300
SALES & SERVICE (ASIA) +65 6335 3333
SALES & SERVICE (AFRICA) +27 11 991 1111
SALES & SERVICE (AUSTRALIA) +61 8 9477 1111

HYDRAULIC KIT, PUMP

TRAINING NUMBER: K-H46RXF001-1 | SHEET: 1 of 1 | REF: K-H46RXF001-1 A

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	FRACTIONS	DECIMALS	ANGLES
2 PLACE	± .02	± .005	± .010
3 PLACE	± .002	± .001	± .005
4 PLACE	± .0002	± .0001	± .001
5 PLACE	± .00002	± .00001	± .0005
6 PLACE	± .000002	± .000001	± .00005
ANGULAR DIMENSIONS			± 1/2°

ITEM	PART NO.	DESCRIPTION	QTY
1	R-000	RAILGEAR HYDRAULIC PUMP	1
2	R-000-2	PUMP BRACKET	1
3	R-20162	OUNTING BLOCKS; PUMP BRACKET	1
4	H.H.C.S.	3/8" UNC GR. 8 BOLT X 1.25" LONG	6
5	F.WASHER	3/8" TYPE-A GR 8	6
6	L.WASHER	3/8" GR 8	6
7	H.H.C.S.	1/4" UNC GR. 8 BOLT X 7" LONG	2
8	L.WASHER	1/4" GR 8	2
9	F.WASHER	1/4" TYPE-A GR 8	4



G&B Specialties, Inc.

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Bulletin MIO-H46RXF001 (Rev G)

REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/21/09	AML	

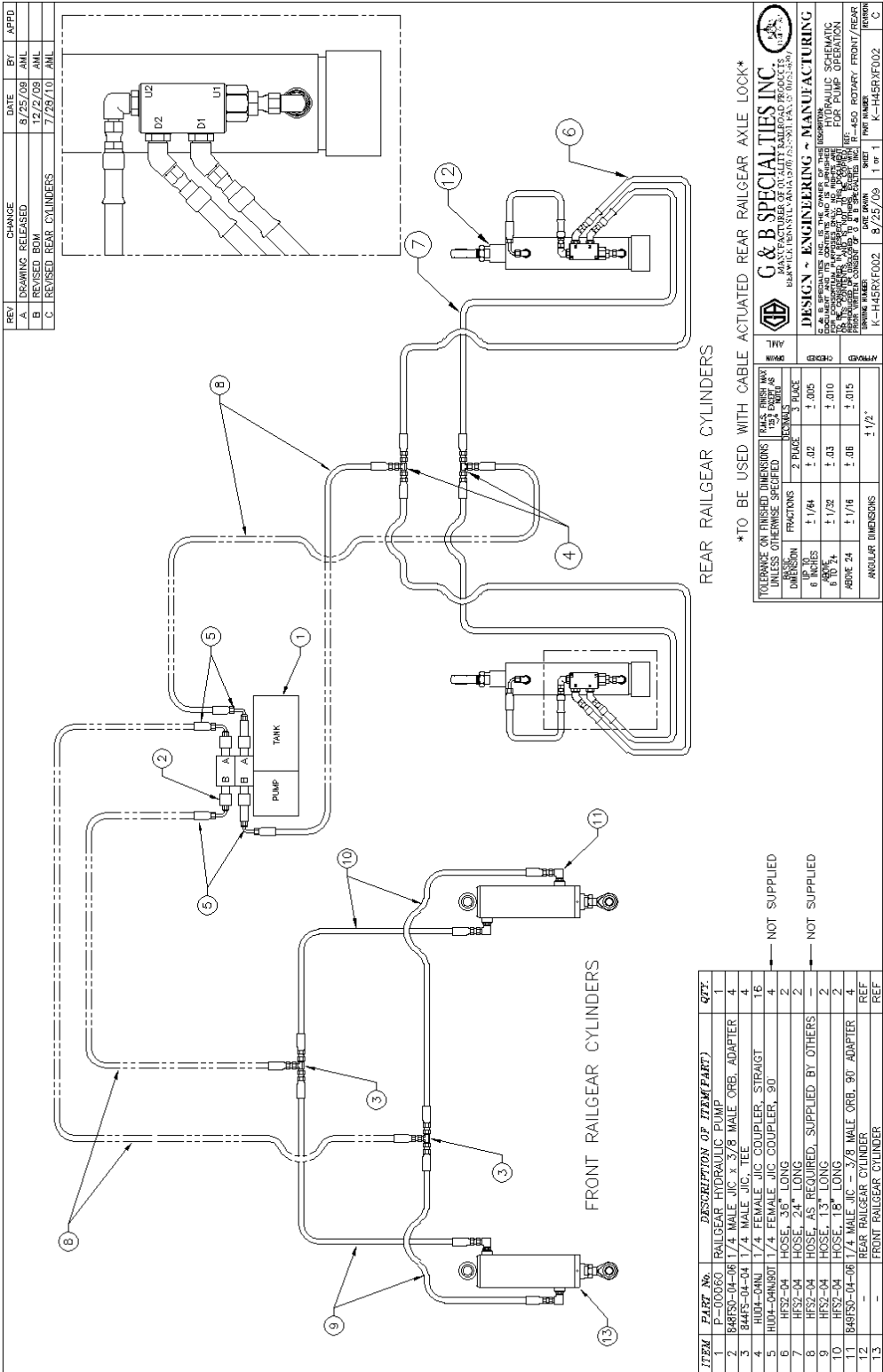
REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/21/09	AML	

NOTE:
IDENTICAL FASTENERS NOT SHOWN FOR CLARITY

ITEM	PART NO.	PART DESCRIPTION	QTY
1	R-061-1	ELECTRIC MOTOR ASSEMBLY	1
2	R-061-2	BEARING	1
3	R-061-3	SOLENOID SWITCH (MOUNTED UNDER HOOD)	1
4	R-061-4	SCREW	2
5	R-061-5	3/16" GR. 3 UNF NUT (SUPPLIED WITH MOTOR)	1
6	R-061-6	PUMP ASSEMBLY	1
7	R-061-7	O-RING	1
8	R-061-8	POCKET CHECK VALVE KIT	1
9	R-061-9	O-RING	2
10	R-061-10	SEAL	1
11	R-061-11	RELIEF VALVE KIT	1
12	R-061-12	RETURN TUBE	1
13	R-061-13	FILTER SCREEN	1
14	R-061-14	SUCTION TUBE	1
15	R-061-15	RESERVOIR	1
16	R-061-16	VENT PLUG	1
17	R-061-17	CLAMP	1
18	R-061-18	VALVE ASSEMBLY	1
19	R-061-19	SOLENOID VALVE	2
20	R-061-20	SCREW	8
21	R-061-21	SCREW	3
22	R-060-1	DUAL PUSH BUTTON CONTROL (NOT SHOWN)	2
23	R-060-2	MOUNTING BRACKET	1
24	-	1/4" UNC GR. 5 BOLT x 7" LONG	2
25	-	1/4" WASHER	4
26	-	1/4" EXTERNAL TOOTH LOCK WASHER (W/ PUMP)	2
27	-	5/16" LOCK WASHER (SUPPLIED WITH MOTOR)	2
28	-	3/8" UNC GR. 8 BOLT x 1" LONG	2
29	-	3/8" LOCK WASHER	2
30	-	3/8" TYPE-A FLAT WASHER	6

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		PLAYS FINISH MAX	
FRACCTIONS	DECIMALS	2 PLACE	3 PLACE
± 1/64	± .02	± .005	± .010
± 1/32	± .03	± .010	± .015
± 1/16	± .06	± .015	± .020
ANGULAR DIMENSIONS	± 1/2°		

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DESIGN ~ ENGINEERING ~ MANUFACTURING	HYDRAULIC KIT, PUMP
DRAWING NUMBER: MIO-H46RXF001-2	REV: 000
DATE: 5/21/09	BY: AML
DRAWN BY: AML	CHECKED BY: AML
APPROVED BY: AML	DATE: 5/21/09
SHEET: 1	TOTAL SHEETS: 1
PART NUMBER: R-060 PUMP PARTS	PROJECT NUMBER: R-H46RXF001-2



REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	8/25/09	JML	
B	REVISED REAR CYLINDERS	7/27/08	JML	
C	REVISED REAR CYLINDERS	7/28/10	JML	

TO BE USED WITH CABLE ACTUATED REAR RAILGEAR AXLE LOCK

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	FRONTS	2 PLACE	3 PLACE	DECIMALS	FRONT	REAR
DIMENSION	± 1/64	± .02	± .005			
INCHES	± 1/32	± .03	± .010			
MILLIMETERS	± 0.125	± .05	± .015			
ANGULAR DIMENSIONS	± 1/2°					

G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
MANUFACTURING DIVISION 755-901 PA. 17022-8600

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SCALE AND THE SCHEMATIC ARE FOR PUMP OPERATION ONLY. THE SCHEMATIC IS NOT TO BE USED FOR PUMP OPERATION. FOR PUMP OPERATION, SEE THE HYDRAULIC SCHEMATIC FOR PUMP OPERATION.

DRAWING NUMBER: MIO-H46RXF002 | SHEET NUMBER: 1 of 1 | PART NUMBER: K-H46RXF002 | REV: G

ITEM	PART No.	DESCRIPTION OR ITEM PART	QTY.
1	B46FS0-04-08	RAILGEAR HYDRAULIC PUMP	1
2	B46FS0-04-08	1/4" MALE ORB. ADAPTER	4
3	B46FS0-04-04	1/4" MALE JIC. TEE	4
4	H104-04N1	1/4" FEMALE JIC. COUPLER, STRAIGHT	16
5	H104-04N01	1/4" FEMALE JIC. COUPLER, 90°	4
6	HFS2-04	HOSE, 3/8" LONG	2
7	HFS2-04	HOSE, 24" LONG	2
8	HFS2-04	HOSE, AS REQUIRED, SUPPLIED BY OTHERS	—
9	HFS2-04	HOSE, 13" LONG	2
10	HFS2-04	HOSE, 18" LONG	2
11	B46FS0-04-08	1/4" MALE JIC. - 3/8" MALE ORB. 90° ADAPTER	4
12	—	REAR RAILGEAR CYLINDER	REF
13	—	FRONT RAILGEAR CYLINDER	REF

Figure 1: Cable Axle Lockup (ref: Table 1)

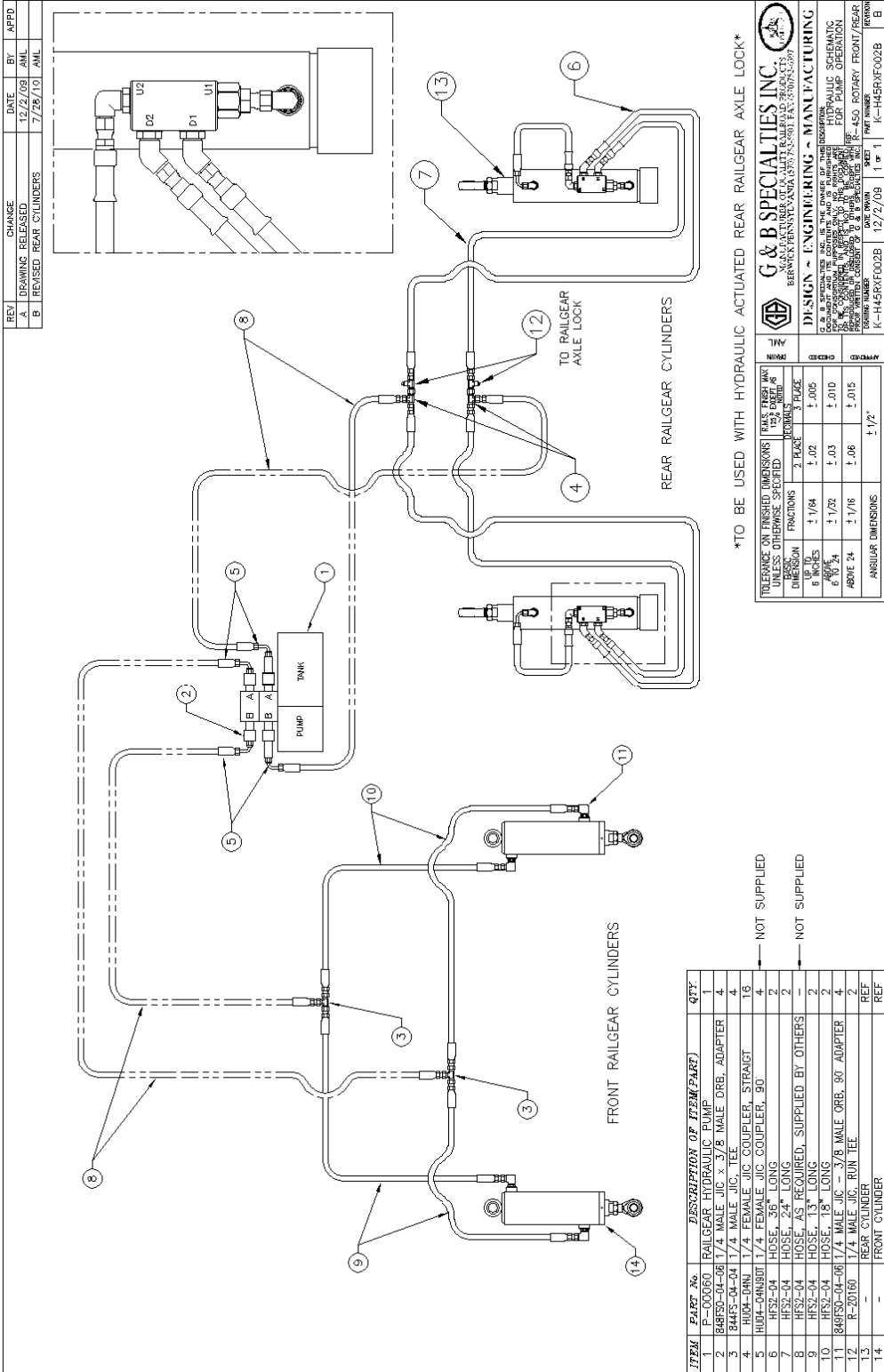
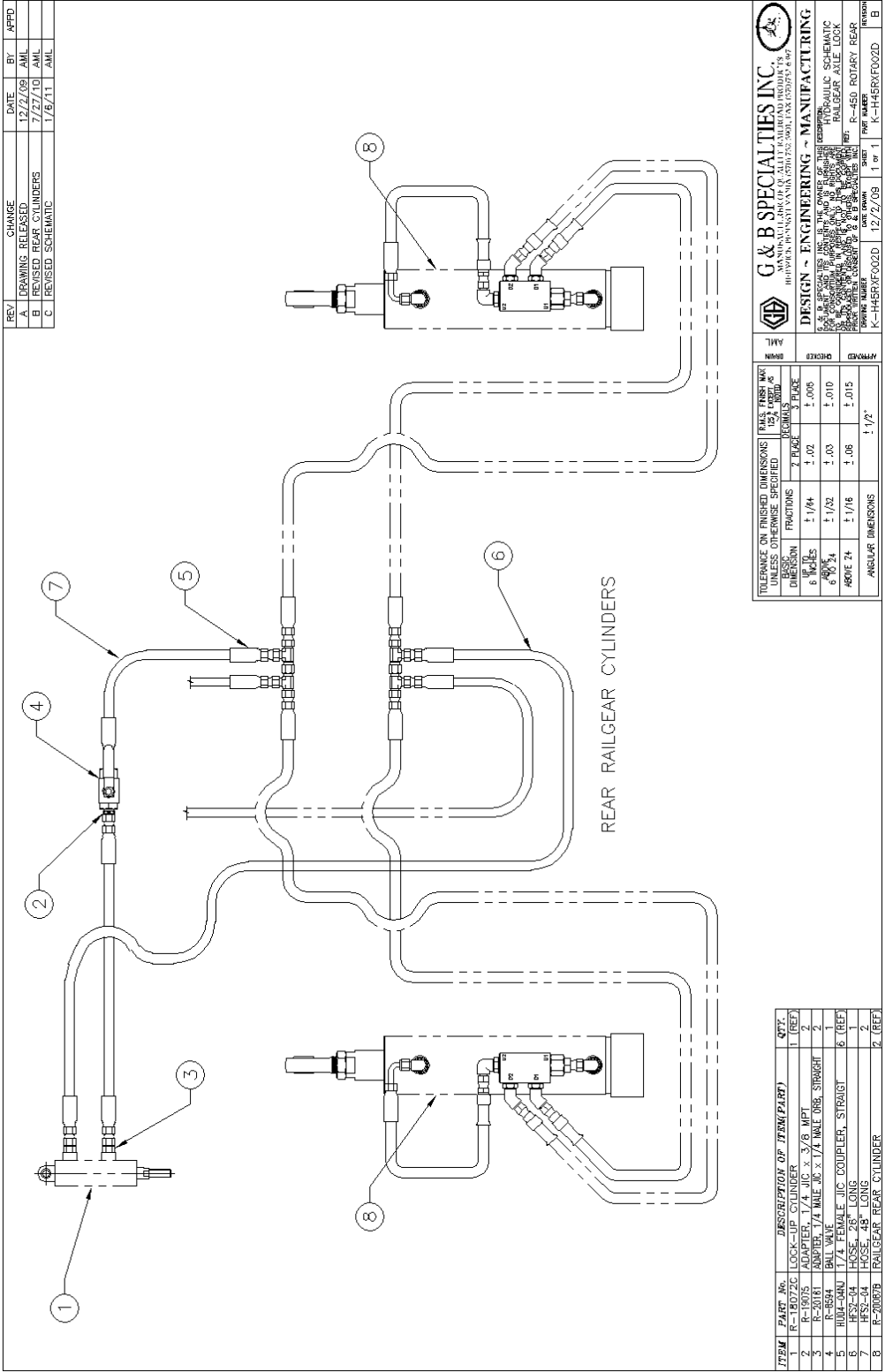


Figure 2: Hydraulic Axle Lockup (ref: Table 2)

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REV.	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	12/2/09	AML	
B	REVISED REAR CYLINDERS	7/27/10	AML	
C	REVISED SCHEMATIC	1/6/11	AML	

G & B SPECIALTIES INC.
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TEL: (717) 752-5901 FAX: (717) 752-6397
WWW.GANDBSPECIALTIES.COM

G & B SPECIALTIES INC. IS THE OWNER OF THE PATENT FOR THE ROTARY LOCK RAILGEAR ASSEMBLY AND THE ROTARY LOCK RAILGEAR ASSEMBLY. THE ROTARY LOCK RAILGEAR ASSEMBLY IS A REGISTERED TRADEMARK OF G & B SPECIALTIES INC.

HYDRAULIC SCHEMATIC
R-460 ROTARY REAR
K-H46RXF002 12/2/09 1 of 1 K-H46RXF002 B

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		RAILS FRESH MAX 12 1/2 MONTHS	
DISSON DIMENSION	FRACTIONS	Z TOLERANCE	REGULARS
1/4 INCHES	± 1/64	± .02	± .006
3/8 INCHES	± 1/32	± .03	± .010
1/2 INCHES	± 1/16	± .06	± .015
ANGULAR DIMENSIONS	± 1/2°		

ITEM	PART No.	DESCRIPTION OR PART NAME (PART)	QTY.
1	R-18075	LOCK-UP CYLINDER	1 (REF)
2	R-20181	ADAPTER, 1/4 JIC x 3/8 MPT	2
3	R-20181	ADAPTER, 1/4 MALE JIC x 1/4 NALL ORB, STRAIGHT	2
4	R-864	BALL VALVE	1
5	H104-040	1/4 FEMALE JIC COUPLER, STRAIGHT	6 (REF)
6	H32-04	HOSE, 1/2" LONG	2
7	H32-04	HOSE, 1/2" LONG	2
8	R-20078	RAILGEAR REAR CYLINDER	2 (REF)

Figure 3: Hydraulic Axle Lockup (ref: Table 2A)



G&B Specialties, Inc.

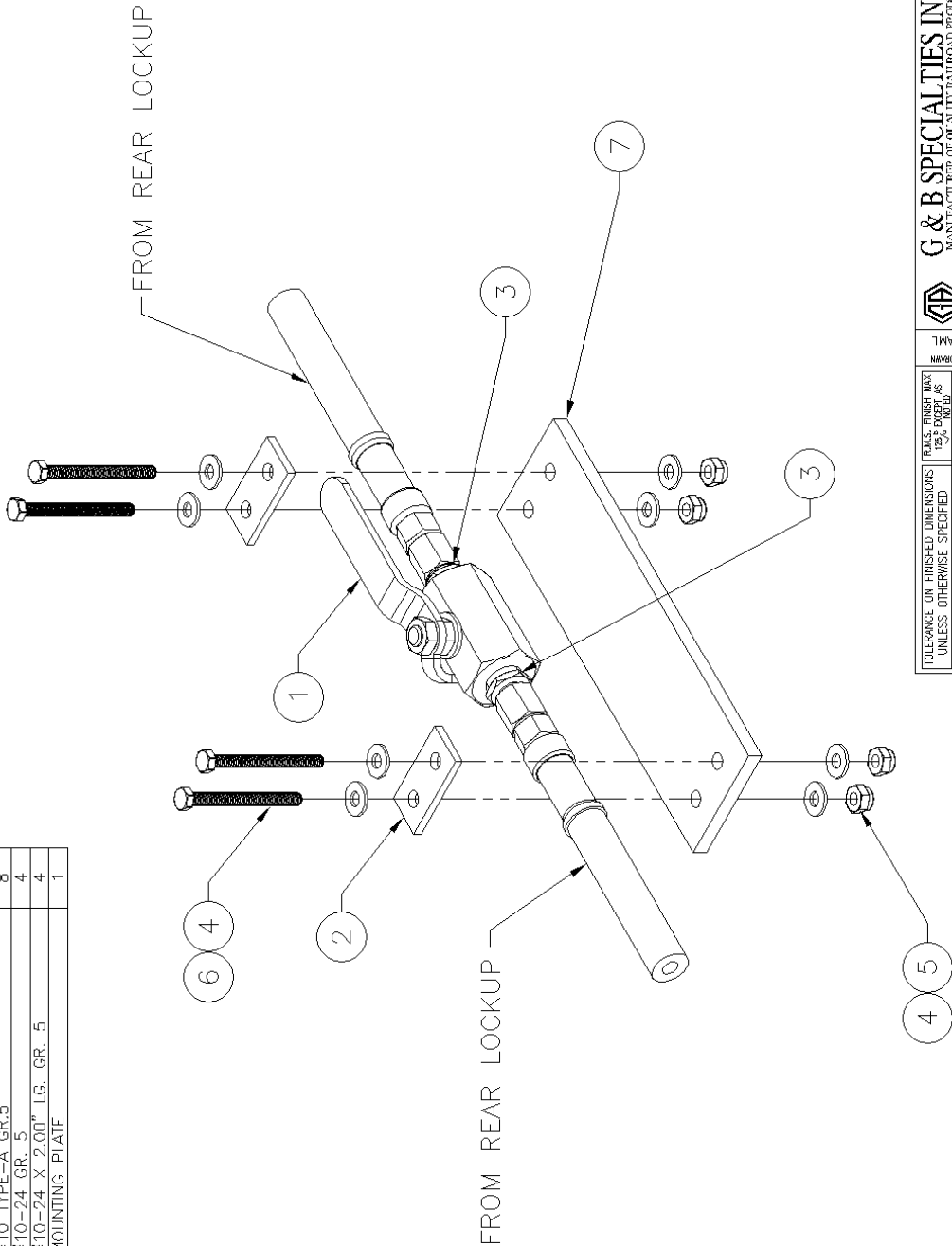
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Bulletin MIO-H46RXF001 (Rev G)

REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/21/09	AML	

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-8594	BALL VALVE	1
2	R-19078	TIE PLATE	2
3	R-19075	3/8" MPT x 1/4" JIC, MALE CONNECTOR	2
4	F WASHER #10 TYPE-A GR.5		8
5	NYLOCK NUT #10-24 GR. 5		4
6	H.H.C.S. #10-24 X 2.00" LG. GR. 5		4
7	R-19077	MOUNTING PLATE	1



G & B SPECIALTIES INC. 535 WEST 3 RD STREET, BERWICK, PA, USA 17505-5901 TEL: (570) 752-5901 FAX: (570) 752-6397			
DESIGN - ENGINEERING - MANUFACTURING		HYDRAULIC KIT, PUMP	
TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		DECIMALS	
BASIC DIMENSION		3 PLACE	
FRACTIONS		2 PLACE	
6 DECIMALS		± 1/64 ± .005	
ABOVE		± 1/32 ± .010	
BELOW		± 1/16 ± .015	
ANGULAR DIMENSIONS		± 1/2°	
DRAWING NUMBER: K-H46RXF001-3		DATE DRAWN: 5/21/09	
SHEET: 1 of 1		PART NUMBER: K-H46RXF001-3	
REVISION: A			



ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.	REV	CHANGE	DATE	BY	APPD
1	S-002002	HYDRAULIC LOCKING VALVE	2	A	DRAWING RELEASED	7/27/10	AML	
2	—	HYDRAULIC CYLINDER	2*	B	REVISED PO CHECK PORTS	1/8/11	AML	
3	849FS0-04-06	3/8 ORB MALE x 1/4 JIC MALE 90°	2*					
4	C5216X4X6	1/4 JIC FEMALE x 3/8 ORB MALE SWIVEL	2					
5	854FS0-04-06	3/8 MALE ORB x 1/4 MALE JIC 45°	4					
6	HFS2-04	HOSE 10" LONG	2					
7	HJ04-04NJ	1/4 FEMALE JIC STRAIGHT COUPLER	2					
8	HJ04-04NJ90	1/4 FEMALE JIC 90° COUPLER	2					
9	849FS0-04-06	3/8 MALE ORB x 1/4 MALE JIC 90°	2					

* ITEM#3 SUPPLIED WITH CYLINDER*

REAR CYLINDERS

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	FRACCTIONS		DECIMALS	
	2 PLACE	3 PLACE	2 PLACE	3 PLACE
BASIC DIMENSION	± 1/64	± .005	± .02	± .005
6 INCHES	± 1/32	± .010	± .03	± .010
ABOVE 6 INCHES	± 1/16	± .015	± .05	± .015
ANGULAR DIMENSIONS	± 1/2°			

G & B SPECIALTIES INC.
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PART NUMBER: K-H46RXF001-PO DATE: 7/27/10 1 of 1 K-H46RXF001-PO B

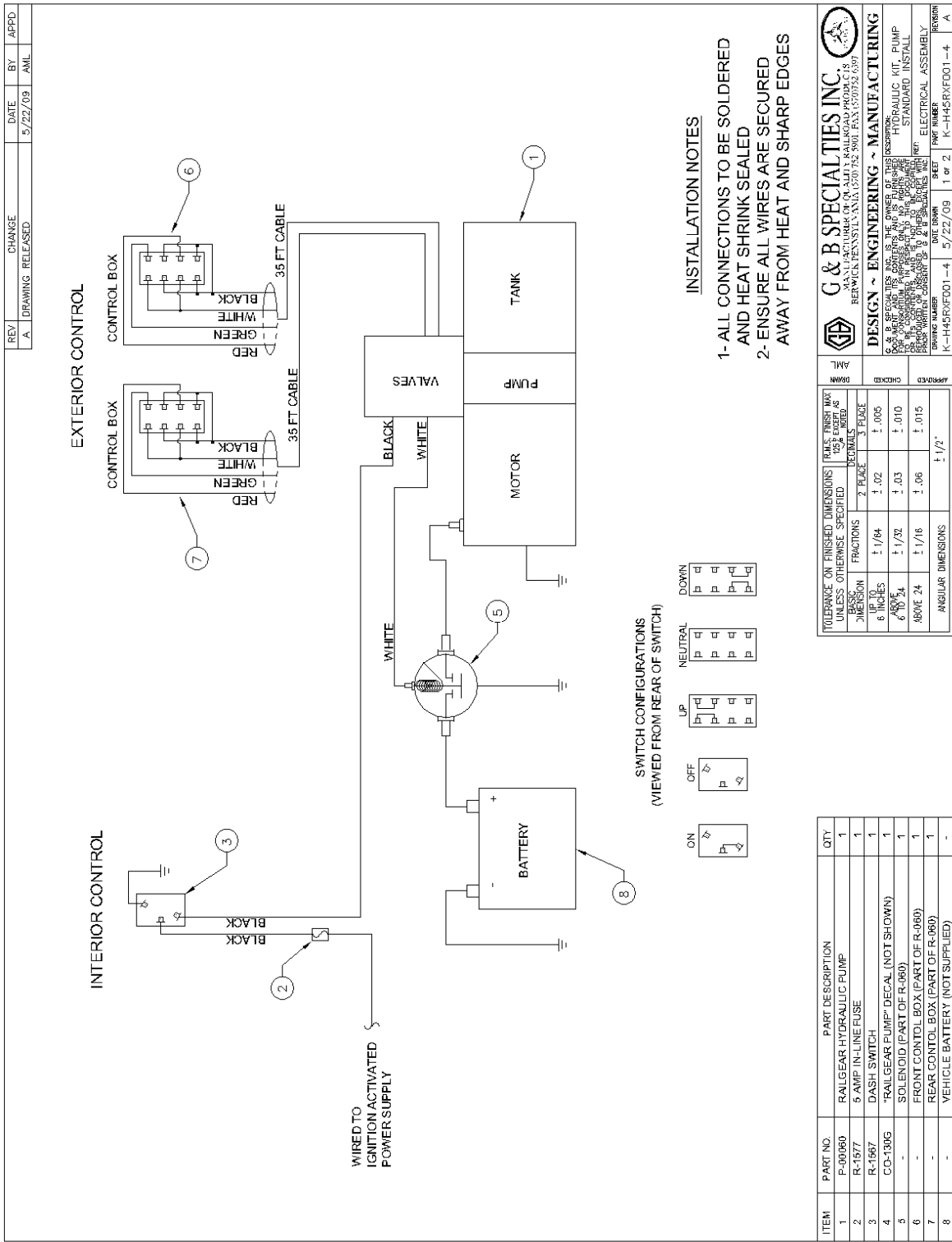


Figure 4: Electrical Schematic

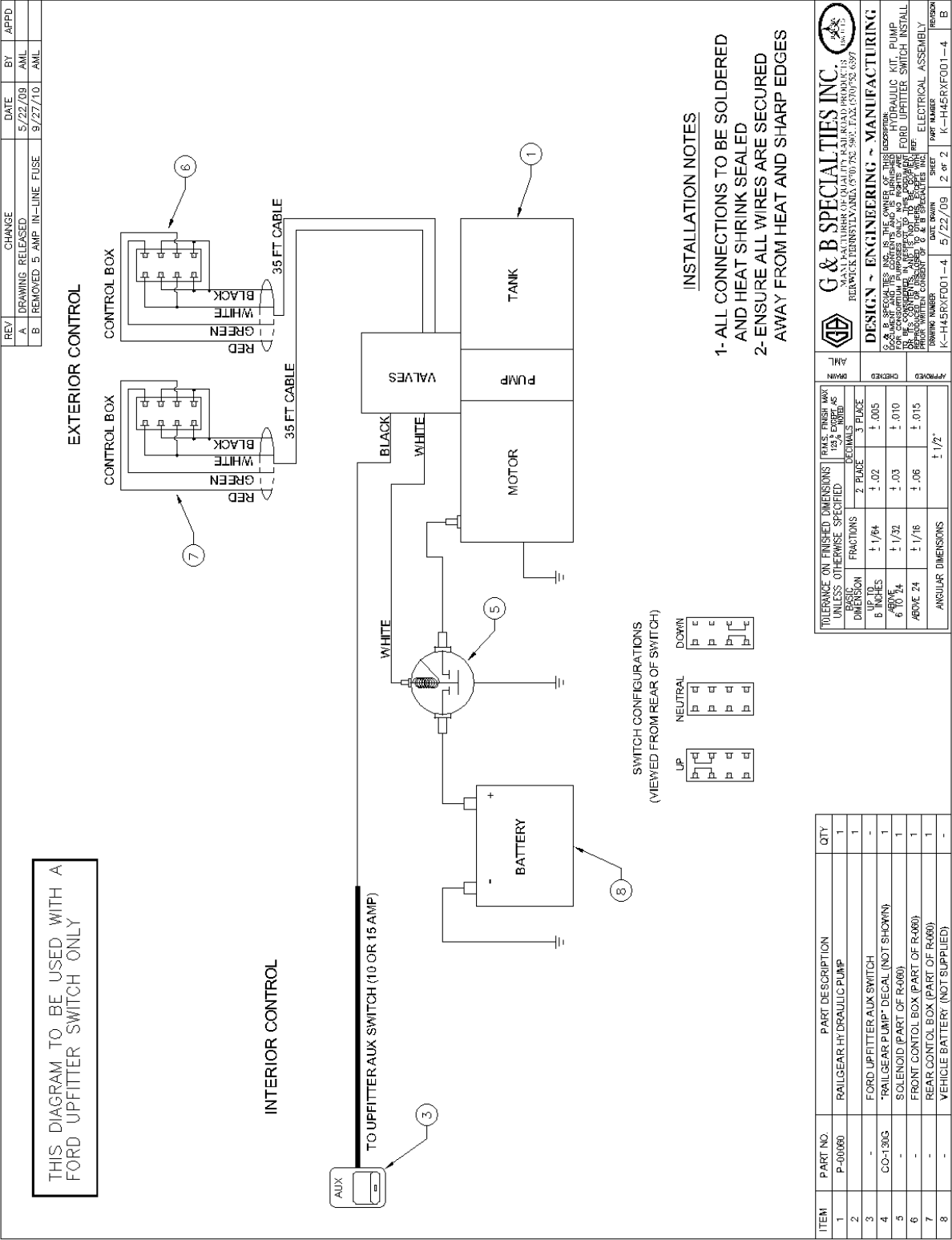


Figure 5: Electrical Schematic

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OPERATION & SERVICE SAFETY PRECAUTIONS

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- 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 is clear of any moving parts of the railgear. Be aware of all pinch points.
- Ensure the hydraulic pump has been de-energized before starting road or rail travel.
- 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 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 Railgear Hydraulic System Controls:

The railgear hydraulic system consists of a hydraulic pump, 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 inactive.



SERVICE OF HYDRAULIC KIT

The hydraulic 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.

The recommended oil for the railgear hydraulic system is **ESSO Univis Extra** or equivalent. In extremely cold weather areas/seasons, **ESSO Univis J13** 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)				✓

Table 2: Standard Fastener Torque Values

Fastener Size	Fastener Torque Value (ft-lbs) Dry
1" UNC Gr. 8 Fasteners	250
3/4" UNC Gr. 8 Fasteners	175
5/8" UNC Gr. 8 Fasteners	150
1/2" UNC Gr. 8 Fasteners	100
3/8" UNC Gr. 8 Fasteners	40
1/4" UNC Gr. 8 Fasteners	12



HYDRAULIC SYSTEM RELIEF VALVE SETTING

This system is equipped with one relief valve located on the railgear pump body. 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 upper “B” port on 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 14-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.