



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



Bulletin MIO-H46RXF001A (Rev D)

**INSTALLATION, OPERATION & SERVICE OF
HYDRAULIC KIT FOR PTO 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/ PTO

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-H45RXF002A - Hydraulic Kit Installation Parts, Cable Lockup		
Part Number	Description	Qty
S-802020	Operating Valve	2
R-559-11	Handle, Operating Valve	2
S-001030	Railgear Operation Decal	1
R-2407	Mounting Plate, Operating Valve	2
844FS-04-04	TEE, 1/4 Male JIC	4
HU04-04NJ	Coupler, Straight, 1/4 JIC Female	24
849FSO-04-06	Adapter, 90°, 1/4 JIC Male x 3/8 ORB Male	4
HFS2-04	Hydraulic Hose, 36" Long	2
HFS2-04	Hydraulic Hose, 24" Long	2
HFS2-04	Hydraulic Hose, 18" Long	1
HFS2-04	Hydraulic Hose, 13" Long	1
HFS2-04	Hydraulic Hose, 48" Long	2
HFS2-04	Hydraulic Hose, 60" Long	2
R-990KIT-027	1/4" UNC Gr.8 Bolt X 2.25"	4
	1/4" Type-A Flat Washer Gr.8	8
	1/4" UNC Gr.8 Nyloc Nut	4



Table 2		K-H45RXF002C - Hydraulic Kit Installation Parts, Hydraulic Lockup	
Part Number	Description		Qty
S-802020	Operating Valve		2
R-559-11	Handle, Operating Valve		2
S-001030	Railgear Operation Decal		1
R-2407	Mounting Plate, Operating Valve		2
R-20160	Run TEE, 1/4 Male JIC		2
844FS-04-04	TEE, 1/4 Male JIC	H-990KIT-035	4
HU04-04NJ	Coupler, Straight, 1/4 JIC Female		24
849FSO-04-06	Adapter, 90°, 1/4 JIC Male x 3/8 ORB Male		4
HFS2-04	Hydraulic Hose, 36" Long		2
HFS2-04	Hydraulic Hose, 24" Long		2
HFS2-04	Hydraulic Hose, 18" Long		1
HFS2-04	Hydraulic Hose, 13" Long		1
HFS2-04	Hydraulic Hose, 48" Long		2
HFS2-04	Hydraulic Hose, 60" Long		2
R-990KIT-027	1/4" UNC Gr.8 Bolt X 2.25"		
	1/4" Type-A Flat Washer Gr.8		8
	1/4" UNC Gr.8 Nyloc Nut		4
K-H45RXF002D	Hydraulic Axle Lock Kit		

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. The vehicle's PTO pump should be selected to supply 3-5 gallons per minutes (GPM) of oil at 2000 PSI at the front and rear railgear operating valves. A main relief valve should be installed just after the PTO pump to protect it. For vehicles operating more than just the railgear from the PTO pump, the railgear's hydraulic system should be on a separate circuit dedicated to the railgear. A relief valve should be installed on the railgear hydraulic circuit.
2. Choose a suitable location on the vehicle to mount the front and rear railgear operating valve using the supplied weld-on operating valve bracket or an installer fabricated bracket. Ensure that there will be sufficient room for the operator to stand safely out of the way of moving parts.
3. Fasten the operating valve to the operating valve bracket using two 1/4" x 2.25" long bolts, four 1/4" washers and two 1/4" nuts. Torque the 1/4" fasteners to 12 ft-lbs dry. Do not over torque.
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. Adjust the operating valve relief valve pressure as per the procedure in the Hydraulic Kit Operation, Service and Parts section of this manual.
7. Test the operation of the controls as per the procedure in the Hydraulic Kit Operation, Service and Parts section of this manual.

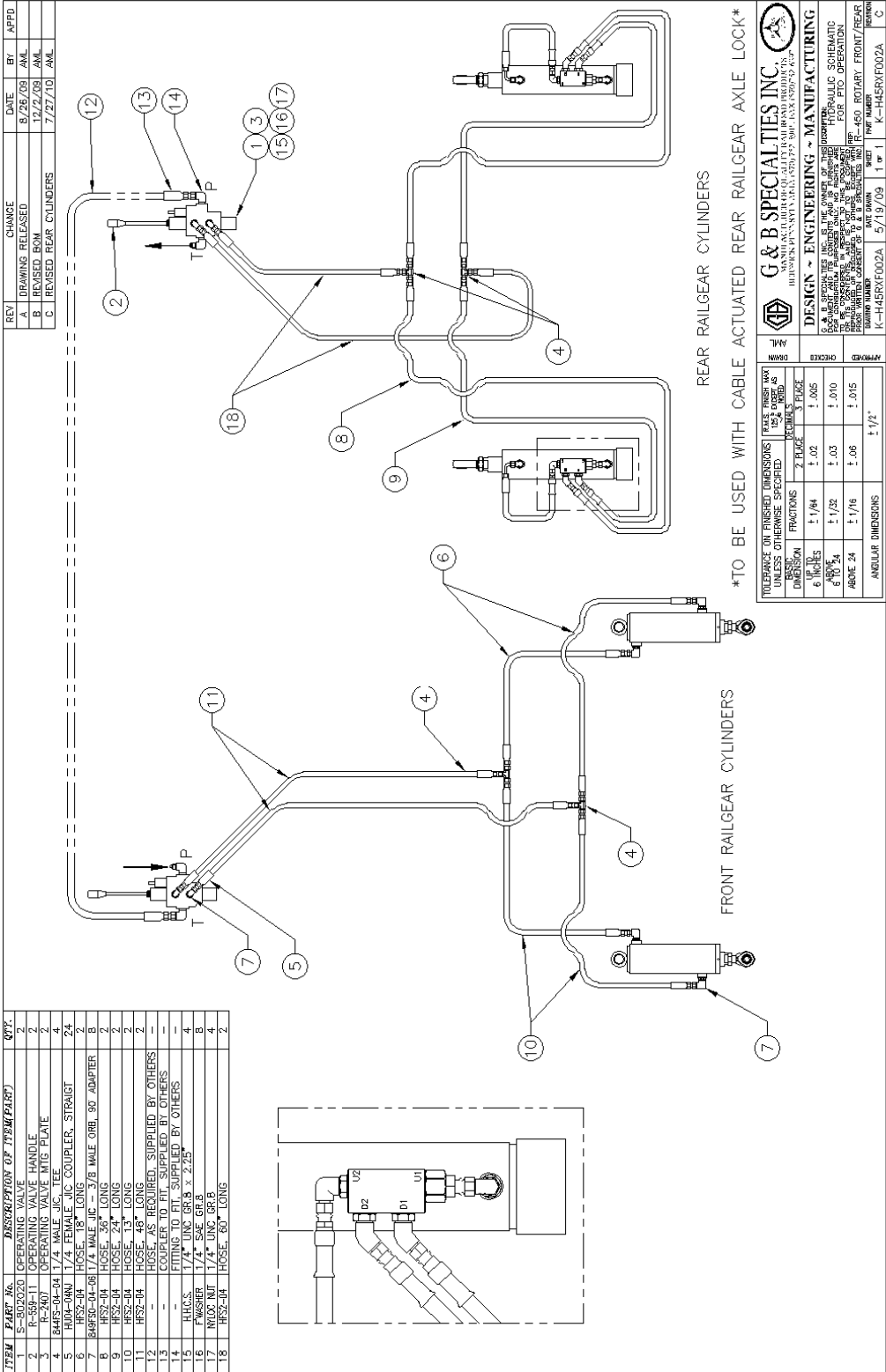


Figure 1: Rear Railgear Cable Axle Lockup (ref: Table 1)

G&B Specialties Inc. 535 West 3rd Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397

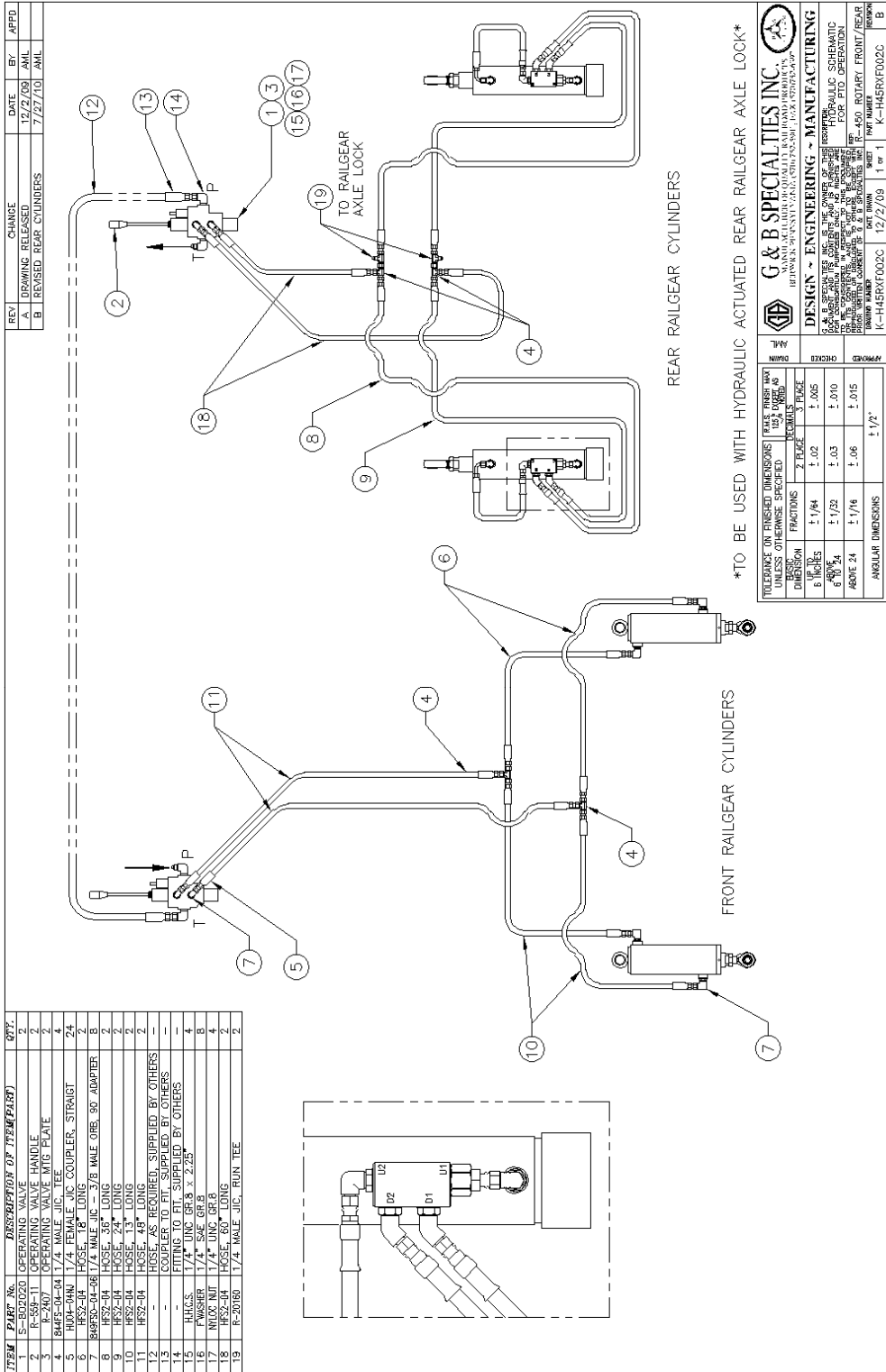
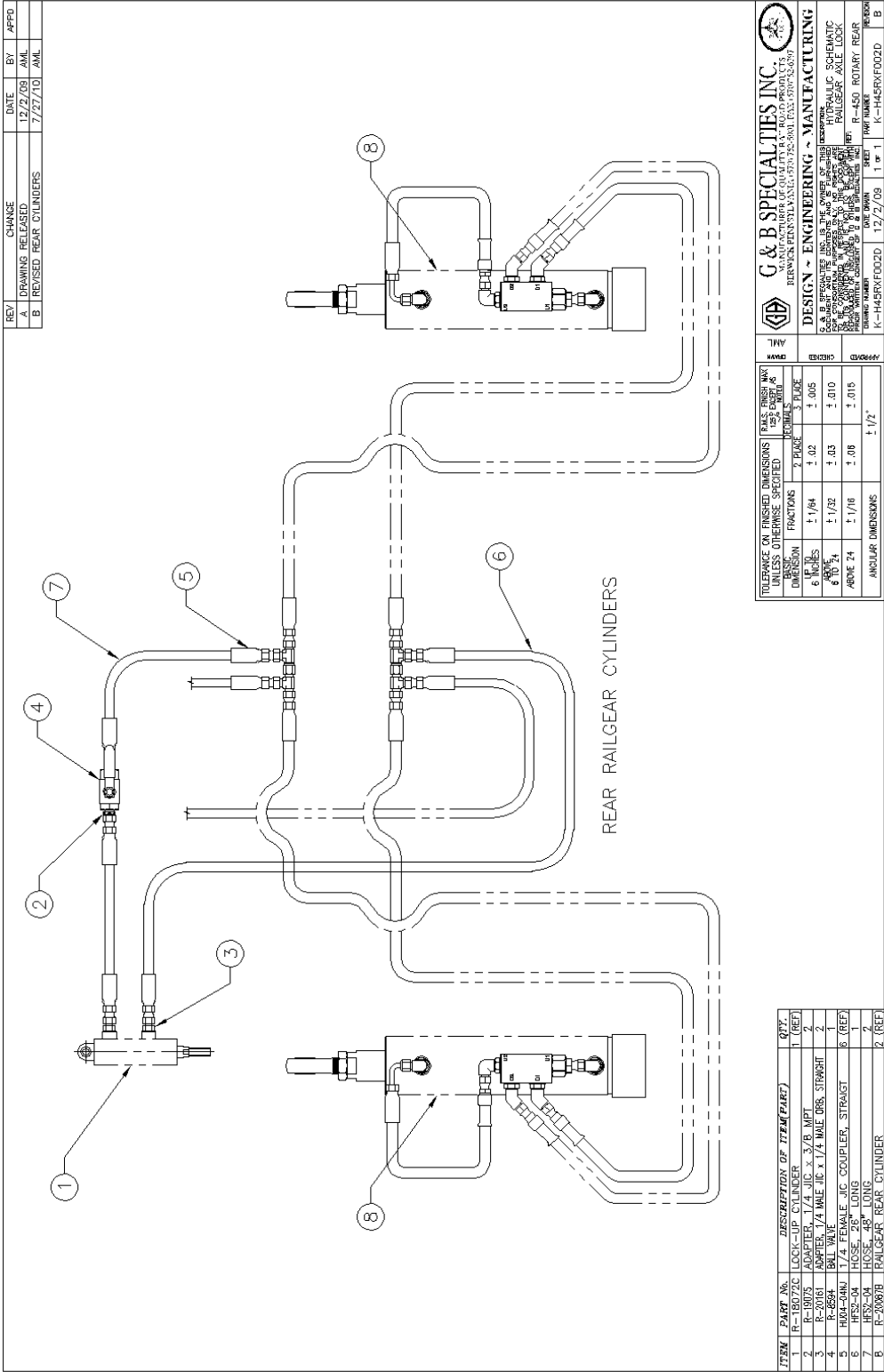


Figure 1: Rear Railgear Hydraulic Axle Lockup (ref: Table 2)

G&B Specialties Inc. 535 West 3rd Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397



REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	12/27/09	JMIL	
B	REVISED REAR CYLINDERS	7/27/10	JMIL	

G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA 17011-2639	
DESIGN ~ ENGINEERING ~ MANUFACTURING	
SCALE: 1/2" = 1'-0" (AS SHOWN) FOR DIMENSIONS NOT SPECIFIED IN THIS DRAWING, REFER TO THE DRAWING OF THE PART OR THE DRAWING OF THE ASSEMBLY TO WHICH THIS DRAWING APPLIES. FOR DIMENSIONS NOT SPECIFIED IN THIS DRAWING, REFER TO THE DRAWING OF THE PART OR THE DRAWING OF THE ASSEMBLY TO WHICH THIS DRAWING APPLIES. FOR DIMENSIONS NOT SPECIFIED IN THIS DRAWING, REFER TO THE DRAWING OF THE PART OR THE DRAWING OF THE ASSEMBLY TO WHICH THIS DRAWING APPLIES.	
ITEM NUMBER	REV
K-H46RXF002D	1 of 1
DATE OWN	DATE
12/27/09	12/27/09
TRF NUMBER	TRF NUMBER
K-H46RXF002D	K-H46RXF002D
REV	REV
B	B

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	1	2	3	4	5	6	7	8
FRACCTIONS								
DECIMALS								
ANGLES								
ANGULAR DIMENSIONS								

ITEM	PART NO.	DESCRIPTION OF ITEM/PART	QTY.
1	R-18072C	LOCK-UP CYLINDER	1 (REF)
2	R-19075	ADAPTER, 1/4" JIC x 3/8" NPT	2
3	R-20071	1/4" MALE IR x 1/4" MALE OHS, STRAIGHT	2
4	R-20071	1/4" MALE IR x 1/4" MALE OHS, STRAIGHT	2
5	HVA-CRM	1/4" FEMALE JIC COUPLER, STRAIGHT	6 (REF)
6	HES-04	HOSE, 26" LONG	1
7	HES-04	HOSE, 48" LONG	2
8	R-2007B	RAILGEAR REAR CYLINDER	2 (REF)

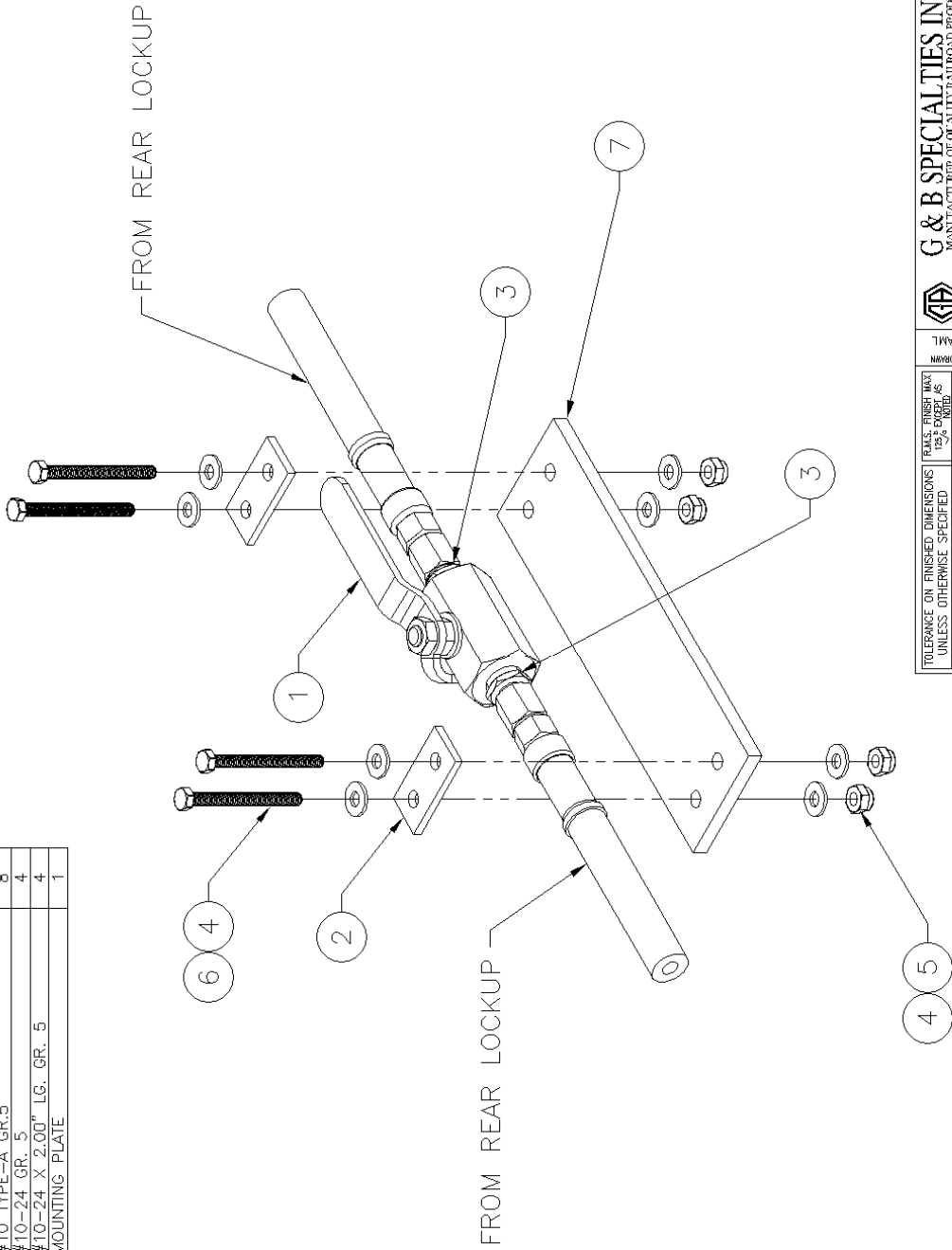
Figure 1: Rear Railgear Hydraulic Axle Lockup (ref: Table 2A)

G&B Specialties Inc. 535 West 3rd Street, Berwick, PA, USA Tel: (570) 752-5901 Fax: (570) 752-6397



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 17604 TEL: (570) 752-5901 FAX: (570) 752-6397			
DESIGN - ENGINEERING - MANUFACTURING		HYDRAULIC KIT, PUMP	
TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		DECIMALS	
BASIC DIMENSION	FRACTIONS	2 PLACE	3 PLACE
6 INCHES	+ 1/64	+ .02	+ .005
ABOVE 6 TO 24	+ 1/32	+ .03	+ .010
BELOW 24	+ 1/16	+ .06	+ .015
ANGULAR DIMENSIONS		+ 1/2°	
DRAWING NUMBER		DATE DRAWN	SHEET
K-H46RXF001-3		5/21/09	1 of 1
PART NUMBER		REVISION	
K-H46RXF001-3		K-H46RXF001-3	



ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	S-002002	HYDRAULIC LOCKING VALVE	2
2	—	HYDRAULIC CYLINDER	REF
3	849F50-04-06	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	854F50-04-08	3/8 MALE ORB x 1/4 MALE JIC 45°	4
6	HFS2-04	HOSE, 10' LONG	2
7	HU04-04NJ	1/4 FEMALE JIC STRAIGHT COUPLER	2
8	HU04-04NJ90	1/4 FEMALE JIC 90° COUPLER	2
9	849F50-04-06	3/8 MALE ORB x 1/4 MALE JIC 90°	2

* ITEM#3 SUPPLIED WITH CYLINDER*

TO OPERATING VALVE,
PUMP, PTO
OR
REAR HYDRAULIC LOCKUP

TO OPERATING VALVE,
PUMP, PTO
OR
REAR HYDRAULIC LOCKUP

TO OPERATING VALVE,
PUMP, PTO
OR
REAR HYDRAULIC LOCKUP

REAR CYLINDERS

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		PLAYS FINISH MAY EXCEED AS NOTED	
BASIC DIMENSION	FRACTIONS	2 PLACE	3 PLACE
UP TO 6 INCHES	± 1/64	± .02	± .005
6 TO 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS			± 1/2°

G & B SPECIALTIES INC.
MANUFACTURER OF QUALITY RAILROAD PRODUCTS
PHANIK, PENNSYLVANIA 15067-5000, PA. (570) 752-6397

DESIGN ~ ENGINEERING ~ MANUFACTURING
G & B SPECIALTIES INC. IS THE OWNER OF THIS DRAWING. NO PARTS OR MATERIALS ARE TO BE USED IN THIS DRAWING UNLESS SPECIFICALLY IDENTIFIED BY THIS COMPANY. ALL RIGHTS ARE RESERVED. THIS DRAWING IS THE PROPERTY OF G & B SPECIALTIES INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. WITHOUT THE WRITTEN CONSENT OF G & B SPECIALTIES INC.

REV. NUMBER: K-H46RXF001-PO
DATE: 7/27/10
SHEET: 1 OF 1
PART NUMBER: K-H46RXF001-PO
REVISION: A



OPERATION & 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 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:

1. The PTO must be engaged following the manufacturer's instructions. The railgear should not move until the operating valve is actuated.
2. Each railgear is equipped with an operating valve. The direction of motion (up or down) of the railgear is selected by actuating the operating valve handle. The railgear should move only in the selected direction.
3. To stop the movement of the railgear, bring the handle on the respective railgear operating valve to the center position.
4. Disengage the PTO following the manufacturer's instructions.



SERVICE OF HYDRAULIC KIT

The hydraulic kit must be serviced regularly to avoid damage to the equipment. Table 1 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	6 Months
Inspect hydraulic kit fasteners (re-torque if required)				✓
Inspect all hydraulic fittings and hoses for leaks and wear.			✓	

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
⅝" UNC Gr. 8 Fasteners	150
½" UNC Gr. 8 Fasteners	100
⅜" UNC Gr. 8 Fasteners	40
¼" UNC Gr. 8 Fasteners	12



HYDRAULIC SYSTEM RELIEF VALVE SETTING

The following procedure details how to adjust the railgear pressure relief valve settings. One relief valve is located on each operating valve and there may be one or more additional relief valves in the railgear hydraulic system. An adjustment of the relief valve settings should be carried out at installation and/or if ever there appears to be inadequate hydraulic pressure to operate the railgear.

1. Locate the hydraulic hose that connects the front railgear operating valve to the railgear hydraulic system pressure line. Release the pressure in the railgear hydraulic system and disconnect this hose from the front railgear operating valve.
2. Install a combination test gauge (up to 3000 PSI) and shutoff valve between the disconnected hydraulic hose and the front operating valve. The pressure gauge will indicate the relief valve setting, while the shutoff valve will enable a false load to be put on the hydraulic pump. Ensure that the shutoff valve is installed between the test gauge and front operating valve.
3. Engage the hydraulic pump.
4. Close the shutoff valve to enable the railgear hydraulic system relief valve to start releasing pressure. The pressure reading on the test gauge should indicate 2000 PSI. If this reading is incorrect, adjust the railgear hydraulic system relief valve accordingly.
5. Once the correct pressure on the railgear hydraulic system relief valve is obtained, open the shutoff valve.
6. Proceed to adjust each operating valve relief valve setting as follows:
 - a) Have an assistant watch the test gauge pressure reading while adjusting the relief valve settings.
 - b) Ensure the shutoff valve has been completely opened.
 - c) With the railgear fully raised in road position, select “UP” on the operating valve. Hold in this position until the hydraulic oil passes over the relief valve and a reading is taken on the test gauge.
 - d) The pressure should be 1800 PSI on the front and rear operating valves. Adjust the relief valve setting accordingly.
 - e) Proceed to adjust the second operating valve relief valve setting.
7. Release the pressure in the railgear hydraulic system and remove the test gauge and shutoff valve.
8. Reconnect and tighten all hydraulic hoses