



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



MIO-R46AVXFX04A (REV A)

**INSTALLATION, OPERATIONS, SERVICE & PARTS MANUAL
CABLE ACTUATED FRONT AXLE LOCK KIT
2008 FORD F-450/550 4x4, 4x2**



G&B Specialties, Inc.
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MIO-R46AVXFX04A (REV A)

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 Industries 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 in order to protect the vehicle's electrical system.



1.0

AXLE LOCK-UP INSTALLATION

Front Railgear Kit Installation Parts

Part Number	Description	Qty
R-12016D	L-Bracket, Drivers Side	1
R-12016P	L-bracket, Passengers Side	1
R-20152D	Support Bracket, Drivers Side	1
R-20152P	Support Bracket, passengers Side	1
R-20146	Spacer	2
R-20145	Cap Plate	2
R-20150	Clevis	2
R-20143	Clevis Pin	2
R-20152-3	Front Plate	2
R-5635	Insulating Washer	4
R-20151	Hook	2
R-20148	Frame Washer	2
P-00058	Pull Cable	2
R-LABEL001	Pull-To-Unlock Placard	2
P-00018D	Mounting Bracket, Pull Cable, Drivers Side	1
P-00018P	Mounting Bracket, Pull Cable, Passengers Side	1
P-00014	Adapter Bolt	2
P-00017	Support Bracket, Pull Cable	2
R-4911	Bracket, Suspension Arm	2
R-4914	Hook Catch	2
R-990KIT-263	3/4" Flat Washer, GR.8	14
	3/4" UNC Gr.8 Nyloc Nut	4
	3/4" UNC Nyloc Jam Nut	2
	3/4" UNC Gr.8 Bolt x 2" Lg.	2
	3/4" UNC Gr.8 Bolt x 2.5" Lg.	2
	1/2" UNF GR.8 jam Nut	2
	1/2" Flat Washer, GR.8	20
	1/2" UNC Gr.8 Nyloc Nut	6
	1/2" UNC Gr.8 Nyloc Jam Nut	2
	1/2" UNC Gr.8 Bolt x 1.75" Lg.	6
	Cotter Pin, 1/8" X 1" Lg.	2
	3/8" UNC GR.8 Bolt x 1.5" lG.	4
	3/8" Flat Washer, GR.8	4
3/8" Lock Washer, GR.*	4	
R-990KIT-263A	3/8" UNC Gr.8 Bolt x 4.0" Lg.	2
	3/8" Flat Washer, GR.8	4
	3/8" UNC Gr.8 Nyloc Nut	2
	3/4" UNC Gr.8 Bolt x 4.5" Lg.	2
	3/4" Flat Washer, GR.8	4
	3/4" UNC Gr.8 Nyloc Nut	2



1. If necessary relocate the ABS sensor wire located along top of suspension arm.
2. Position the drivers side L-bracket weldment on to the inside and bottom of the frame with the hook mounting rod facing to the outside of the vehicle. Drill a 13/16" diameter hole into the existing small hole on the inside frame rail of the vehicle frame. The hole in the frame should line up with the hole in the L-bracket. The L-Bracket should be flush with the inside and bottom surfaces of the frame.
3. Align the slot on the L-Bracket with the slot on the bottom of the frame and bolt with 3/4" x 2-1/2" long bolt, flat washer, frame washer and nyloc nut. Use the supplied 3/4" x 2" bolt, flat washers and nyloc nut to finish mounting L-Bracket to the frame. Torque the 3/4" fasteners to 175 ft-lbs dry.
4. Assemble the support bracket to the L-bracket as show. Mark the frame using the support bracket as a template. Remove the support bracket and drill a (2) 17/32" diameter holes thru the outside frame rail at the previously marked position. Reassemble with 1/2" x 1-3/4" bolts, flat washers and nyloc nuts. Torque 1/2" fasteners to 100 ft-lbs dry.
5. Assemble hook assembly as shown. If lateral adjustment is required the hook spacer can be trimmed down, or washers can be added into assembly to maintain proper clearance with frame, suspension arm, and hook.
6. Repeat steps 1 thru 5 for the passengers side of the vehicle.
7. Position each bracket on each vehicle suspension arm as shown. The larger hole in the mounting brackets should align with the existing hole in each of the suspension arms. Mark and drill a 13/32" hole into each of the suspension arms for 3/8" bolts. Fasten each bracket to each suspension arm using one 3/4" x 4.5" long bolt, two 3/4" washers, and one 3/4" nut, and one 3/8" x 4.0" long bolt, two 3/8" washers and one 3/8" nut as shown. Do not torque these fasteners. Tighten them only sufficiently to hold the bracket on the suspension arm without deforming the suspension arm.
8. Install the actuating cables for the axle lockup as show. Route the cables to the front of the vehicle and mount as shown using the pull cable mounting brackets.

Do not install the hook catch or make any adjustment to the lockup hook engagement until all of the vehicles permanent load has been installed as the vehicle equipment will affect the vehicles ride height and therefore the axle lock hook engagement.

9. Position each hook so that it is hanging vertically with the hooking surface horizontal. Position each hook catch on each bracket as shown so that the vertical side of the hook just touches the forward-most part of the hook catch and there is a minimal gap between the



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bottom of the hook catch and the hooking surface. Tack weld each hook catch to each bracket.

10. With the axle lock-up cables installed, engage the lock-up so that both cables are fully extended. Ensure that the hook will fully engage the hook catch. If the hook/hook catch engagement needs to be adjusted; the hook catch can be removed and tack welded in a different location. The engagement can also be adjusted by loosening the 1/2" jam nut on the adapter bolt and adjusting the adapter bolt in or out to increase or decrease the engagement. Tighten jam nut.
11. Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.
12. Full weld the hook catch to the suspension arm bracket as shown.
13. Paint all areas that were welded or heated.
14. Test the operation of the front axle lock.



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REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/28/09	AML	

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	H.H.C.S.	3/4" UNC GR.8 x 2" Lg	2
2	F'WASHER	3/4" TYPE-A GR.8	4
3	NYLOC NUT	3/4" UNC GR.8	2
4	R-12016D	L-BRACKET, DRIVERS SIDE	1
5	R-12016P	L-BRACKET, PASSENGERS SIDE (NOT SHOWN)	1
6	—	VEHICLE FRAME	REF

TOWARDS FRONT OF VEHICLE

INSIDE FRAME RAIL
DRIVERS SIDE

INSIDE FRAME

DRILL 13/16" DIAMETER HOLE

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		FRACCTIONS		DIMENSION	
2	PLATE	± 1/64	± .02	UP TO 6 INCHES	± .005
6	TO 24	± 1/32	± .03	± .010	
ABOVE 24		± 1/16	± .06	± .015	
ANGULAR DIMENSIONS				± 1/2°	

NOTES:
DRIVERS SIDE SHOWN
PASSENGERS SIDE TYPICAL

APPROVED	CHECKED	DATE	BY	APPD
		5/28/09	1 of 1	A

	G & B SPECIALTIES INC. MANUFACTURER OF QUALITY RAILROAD PRODUCTS BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397	
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DRAWING NUMBER	SHEET	REVISION
K-R45AVVFX04-2	5/28/09	1 of 1
K-R45AVVFX04-2	K-R45AVVFX04-2	A

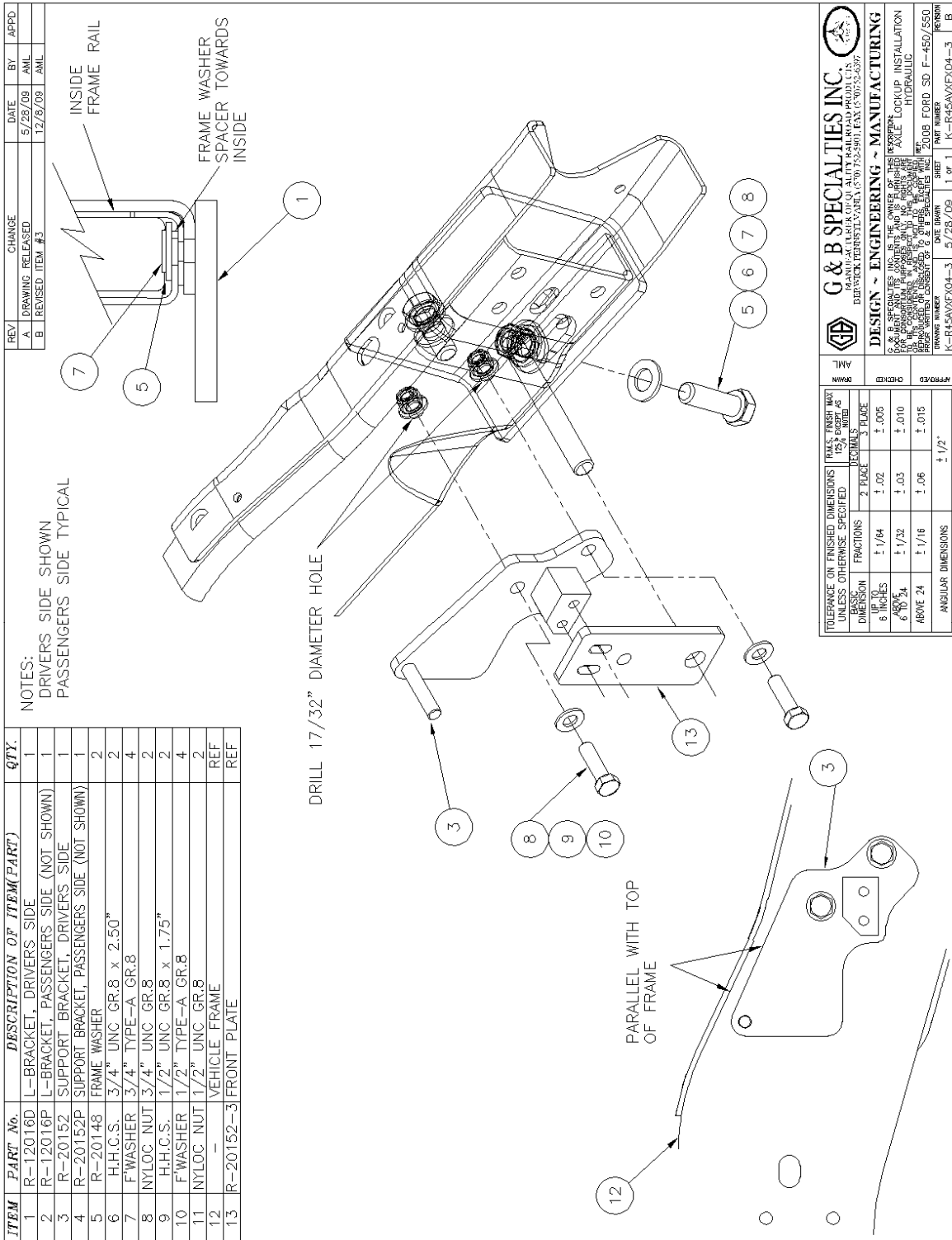


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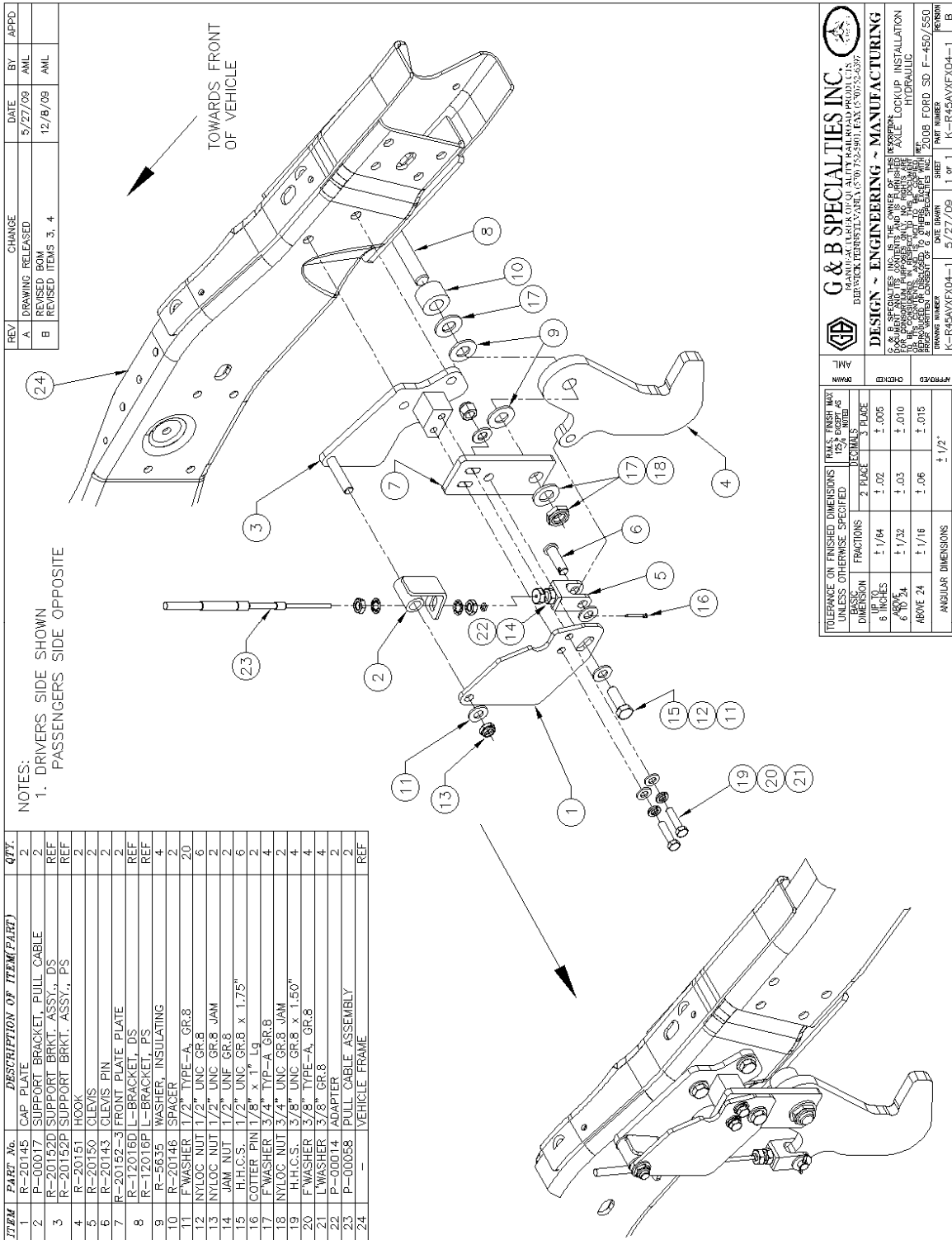


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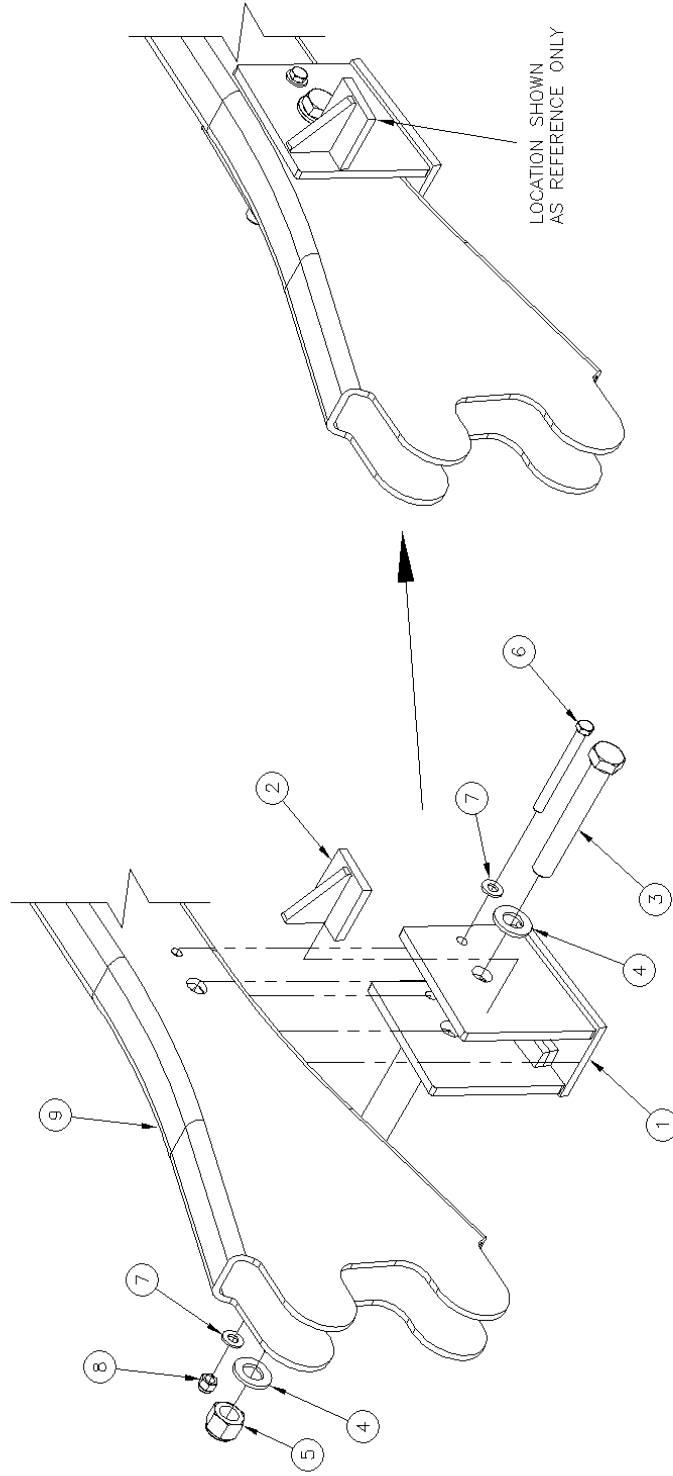
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REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/28/09	AML	
B	REVISED BOX & LOCATION OF ITEM #2	12/09/09	AML	

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-4911	BRACKET	2
2	R-4914	HOOK CATCH	2
3	H.H.C.S.	3/4" UNC GR.8 x 4.50"	2
4	F WASHER	3/4" TYPE-A GR.8	4
5	NYLOC NUT	3/4" UNC GR.8	2
6	H.H.C.S.	1/2" UNC GR.8 x 4.0"	2
7	F WASHER	1/2" TYPE-A GR.8	4
8	NYLOC NUT	1/2" UNC GR.8	2
9	-	SUSPENSION ARM	REF



TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	FRACTIONS	DECIMALS	PLACES
6 TO 24	± 1/64	± .02	± .005
ABOVE 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS	± 1/2°		

NOTES:
 DRIVERS SIDE SHOWN
 PASSENGERS SIDE TYPICAL

APPROVED: _____
 CHECKED: _____
 DRAWN: _____

G & B SPECIALTIES INC.
 REPAIR PARTS DIVISION, 535 WEST 3RD STREET, BERWICK, PA 17604
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K-R46AVXFX04-4 | 5/28/09 | 1 of 1 | K-R46AVXFX04-4



MIO-R46AVVFX04A (REV A)

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY	REV	CHANGE	DATE	BY	APPRO
1	—	VEHICLE FRAME	REF	A	DRAWING RELEASED	12/15/09	AML	
2	—	VEHICLE FRONT BUMPER	4					
3	R-20235	BUMPER SPACER	4					
4	P-00018D	MTG BRKT., PULL CABLE, DRIVERS SIDE	1					
5	P-00018P	MTG BRKT., PULL CABLE, PASSENGERS SIDE	1					
6	—	PULL CABLE, RAILGEAR AXLE LOCK	REF					
7	—	PULL CABLE, VEHICLE AXLE LOCK	REF					
8	—	"PULL TO UNLOCK" PLACARD	REF					
9	H.H.C.S.	1/2" UNC GR 8 X 3.50"	2					
10	H.H.C.S.	1/2" UNC CR 8 X 3.25"	2					
11	F.WASHER	1/2" TYPE-A GR:8	8					
12	INTLOCK INUT	1/2" UNC GR:8	4					

NOTES:

- ITEMS 4, 5, 7 & 8 INCLUDED IN KIT K-R45AVVFX04A
- ITEM 6 INCLUDED WITH FRONT RAILGEAR UNIT

R-980KIT-277

*DRIVERS SIDE SHOWN
PASSENGERS SIDE TYPICAL*

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	FRACTIONS	DECIMALS	PLACES
6 INCHES AND ABOVE	± 1/64	± .02	3 PLACES
6 TO 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS	± 1/2°		

APPROVED	CHECKED	DATE	BY
AML	AML		

G & B SPECIALTIES, INC. A MEMBER OF THE GLOBAL RAILWAY INDUSTRIES COMPANY BERWICK, PENNSYLVANIA (570) 752-5901 FAX (570) 752-6397	RAFNA RAILGEAR
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DRAWING NUMBER: MIO-R46AVVFX04A-9 | DATE DRAWN: 12/15/09 | SHEET: 1 of 1 | PART NUMBER: MIO-R45RFX20070-9 | REV: A



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.
- 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.
- Railway company rules governing rail travel must be observed at all times.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system



2.0

AXLE LOCK-UP OPERATION

When on rail, the front tires should be approximately 2” to 3” above the rail head. This dimension may vary depending on the load that the vehicle is carrying.

Pump Operated Railgear Units

Placing Vehicle on Rail

1. Ensure that the in-cab pump power switch is on.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and push the cable in toward the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully engaged the hook catches welded to the front suspension arms.
4. Proceed to lower the front railgear unit.
5. As the front rail wheels engage the rail. The front of the vehicle will begin to rise.
6. Continue to lower the front railgear unit until the cylinders are fully extended and the railgear lock pin has engaged.
7. With the front railgear unit in the fully locked rail position the front tires should be approximately 2” to 3” above the rail head, depending on vehicle load.

Removing Vehicle From Rail

1. Disengage the railgear lock pin and raise the railgear to the full locked road position.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and pull the cable out away the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully retracted from the hook catches welded to the front suspension arms.

PTO Operated Railgear Units

Placing Vehicle on Rail

1. Ensure that the PTO is engaged and diverted for railgear operation.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and push the cable in toward the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully engaged the hook catches welded to the front suspension arms.
4. Proceed to lower the front railgear unit.
5. As the front rail wheels engage the rail. The front of the vehicle will begin to rise.
6. Continue to lower the front railgear unit until the cylinders are fully extended and the railgear lock pin has engaged.



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7. With the front railgear unit in the fully locked rail position the front tires should be approximately 2” to 3” above the rail head, depending on vehicle load.

Removing Vehicle From Rail

1. Disengage the railgear lock pin and raise the railgear to the full locked road position.
2. Grasp the handle for the axle lock cable (one for each side), twist handle to unlock and pull the cable out away the front bumper. Twist the handle again to lock in place.
3. Visually inspect that both axle lock-up hooks have fully retracted from the hook catches welded to the front suspension arms.



3.0 AXLE LOCK-UP SERVICE

The front axle lock 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.

Do not torque the 3/8" or 3/4" fasteners that connect the bracket to the suspension arm; these fasteners should only be tightened sufficiently to hold the bracket on the suspension arm without deforming the suspension arm. Table 2 provides all other Standard Fastener Torque Values.

Table 1: Recommended Service Schedule

Service Required	Daily	Weekly	Monthly	3 Months	6 Months
Inspect front axle lock fasteners (re-torque if required)					✓
Check / adjust front axle lock hook clearance (see procedure)					✓

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



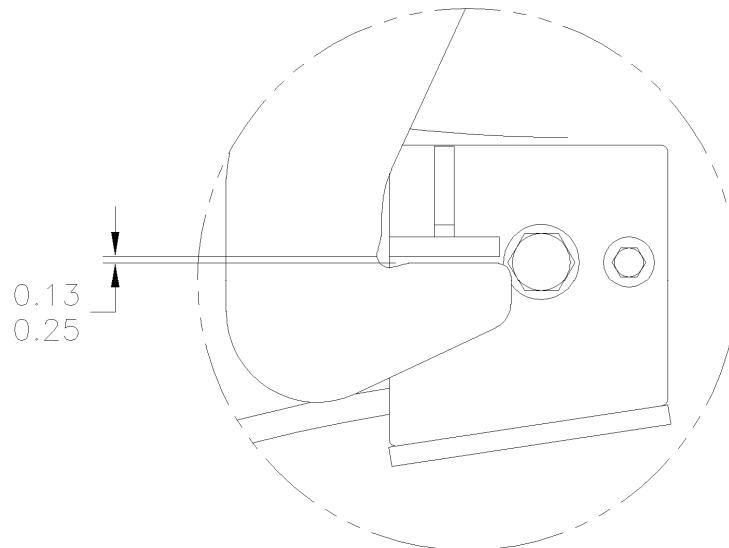
Front Axle Lock Adjustment

The front axle lock is adjusted when the vehicle is resting on its tires in its minimum loaded condition with the railgear in the **road** position and the axle lock engaged. In order for the axle lock to function properly there are three adjustments to be made:

1. There should be a clearance of 1/8" to 1/4" between the hooking surface of each hook and hook catch. If the clearance is larger than 1/4", steel shims can be welded to the bottom of the hook catch. If the clearance is less than 1/2", any previously installed shims can be removed. If there are no shims to remove, the hook catch can be cut off the bracket and re-welded higher up on the bracket using a 3/8" all around fillet weld.
2. The rear vertical edge of each hook should rest flat against the forward edge of the hook catch when the axle lock is fully engaged. This can be adjusted by cutting the hook catch off the bracket and re-welding it in place using a 3/8" all around fillet weld.
3. Each hook must clear the suspension arm by at least 3/8"-1/2" through its full range of motion.

Paint all welded areas after the axle lock is properly adjusted.

Ensure that there is sufficient clearance between the front axle lock components and all vehicle components through their full range of motion.





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4.0

AXLE LOCK-UP PARTS

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	H.H.C.S.	3/4" UNC GR.8 x 2" Lg	2
2	F WASHER	3/4" TYPE-A GR.8	4
3	NYLOC NUT	3/4" UNC GR.8	2
4	R-12016D	L-BRACKET, DRIVERS SIDE	1
5	R-12016P	L-BRACKET, PASSENGERS SIDE (NOT SHOWN)	1
6	-	VEHICLE FRAME	REF

REV	CHANGE	DATE	BY
A	DRAWING RELEASED	5/28/09	ANL

REV	CHANGE	DATE	BY
A	DRAWING RELEASED	5/28/09	ANL

TOLERANCE ON FINISHED DIMENSIONS		PARTS FINISH (SEE FINISH SPEC.)	
UNLESS OTHERWISE SPECIFIED		UNLESS OTHERWISE SPECIFIED	
DIMENSION	FRACTIONS	DIMENSION	DECIMALS
UP TO 1/8"	± 1/64	2 PLACE	± .005
1/8" TO 1/4"	± 1/32	3 PLACE	± .010
1/4" TO 1"	± 1/16		± .015
ABOVE 1"		ANGULAR DIMENSIONS	± 1/2°

NOTES:
 DRIVERS SIDE SHOWN
 PASSENGERS SIDE TYPICAL

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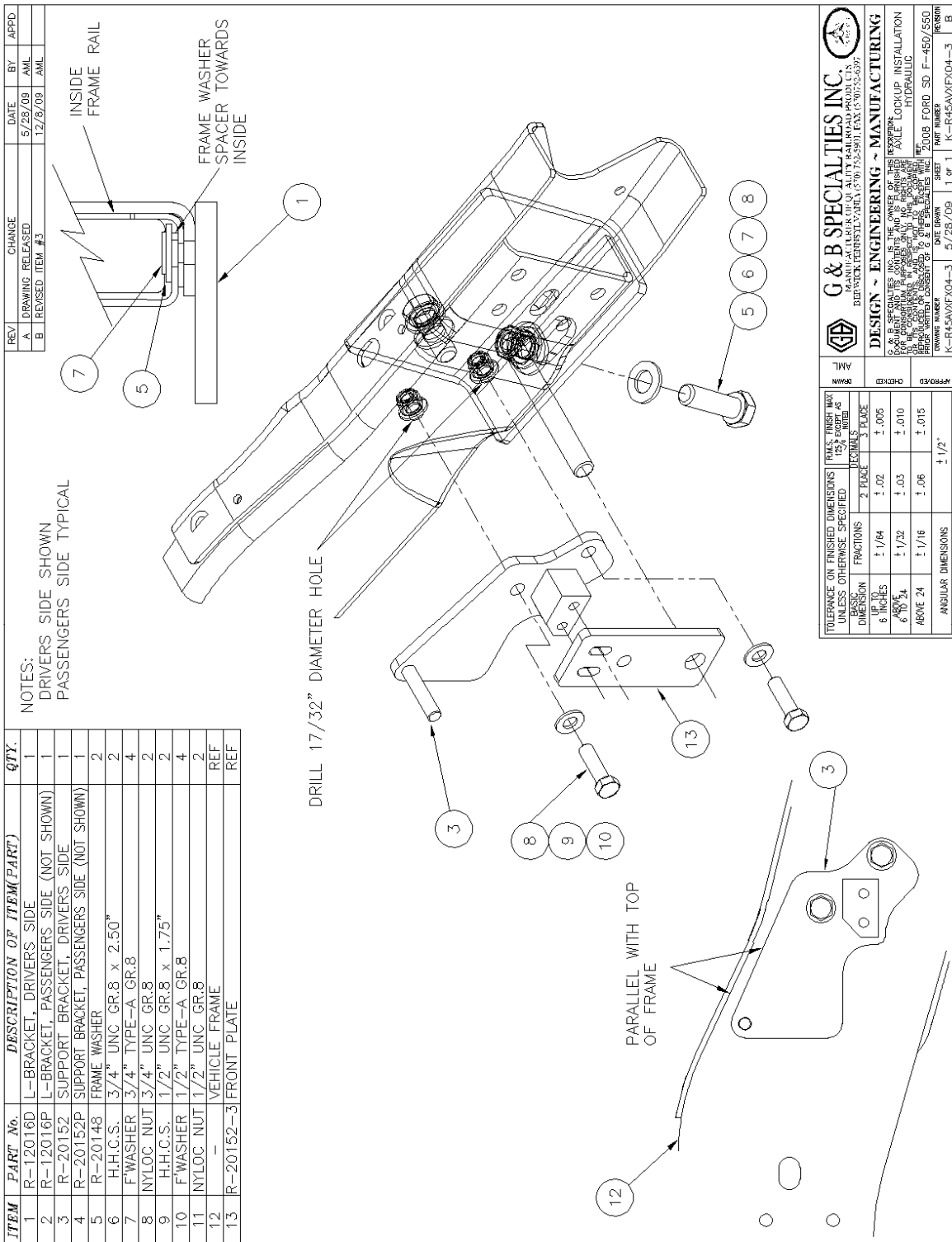


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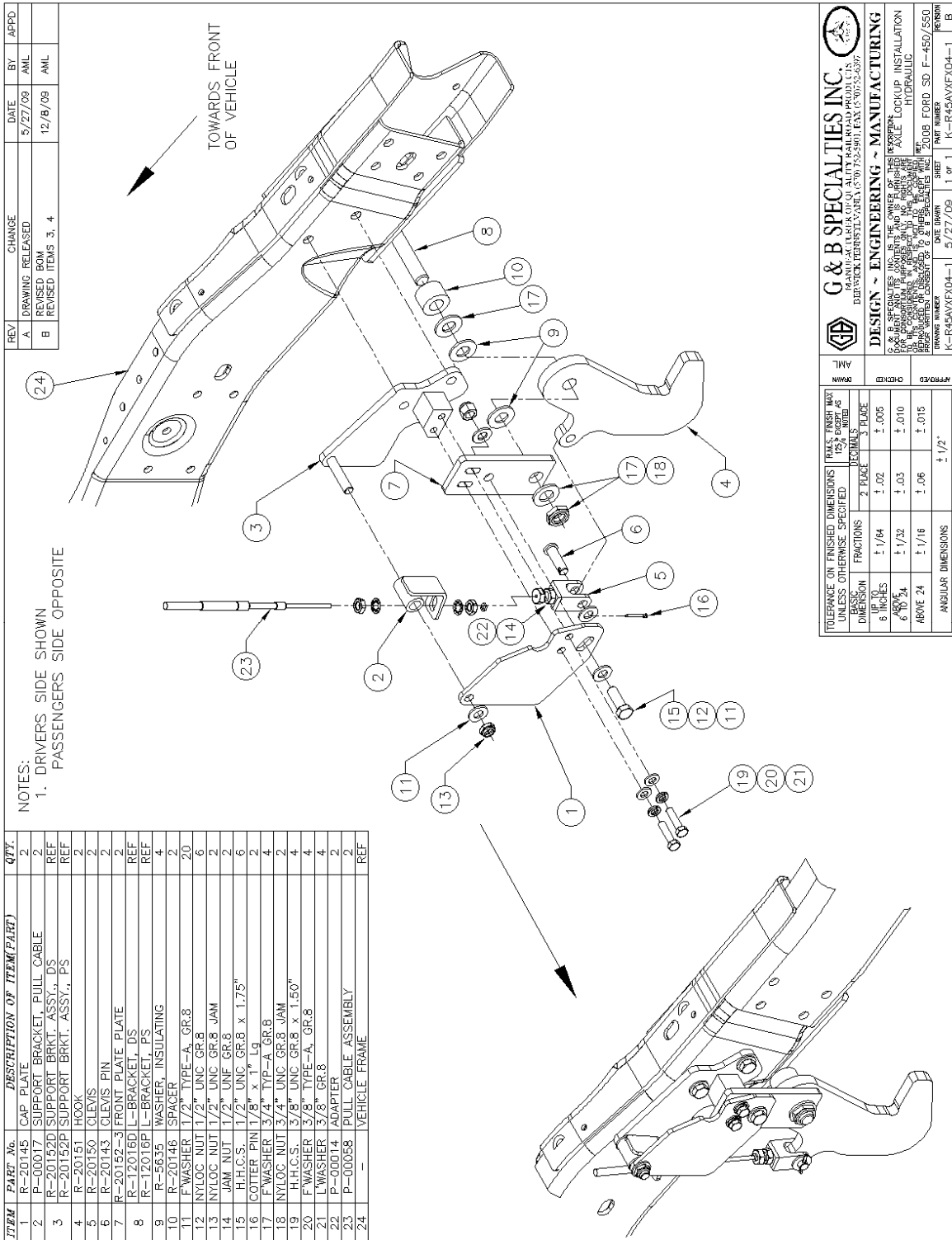


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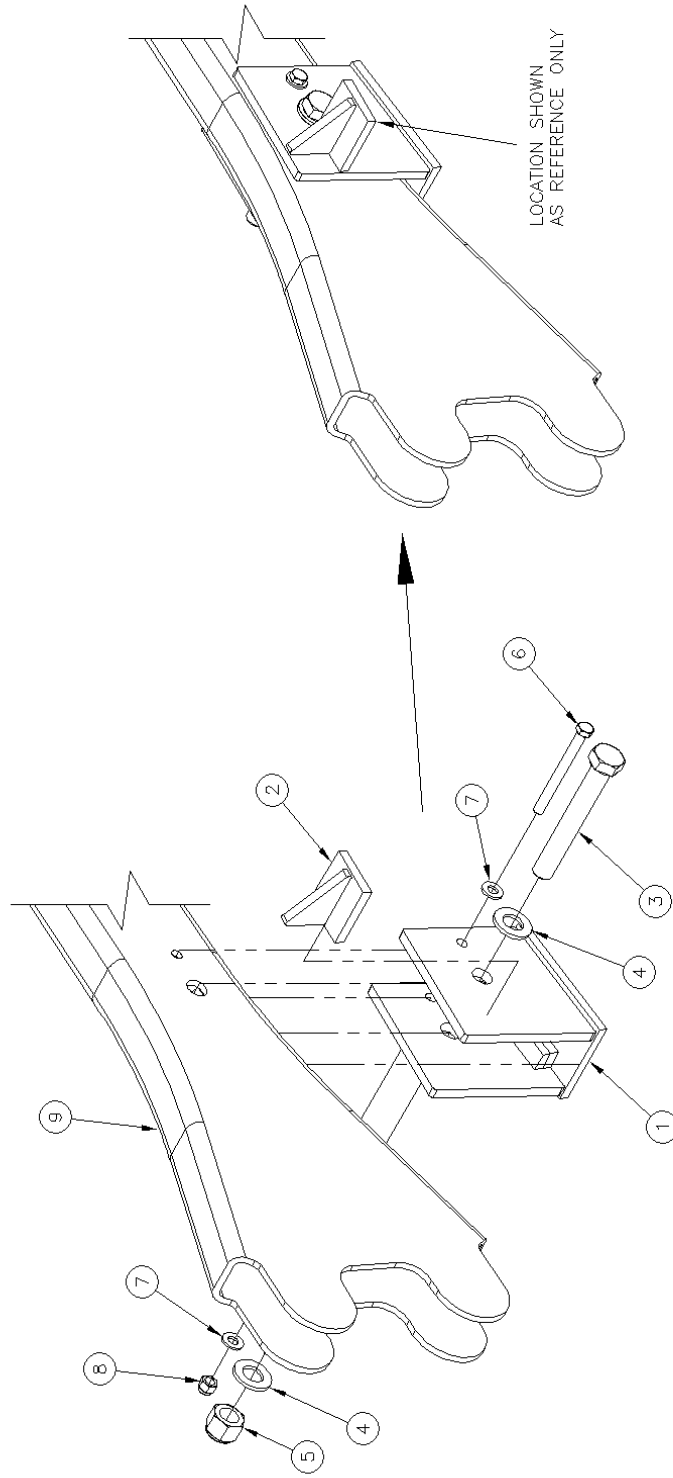
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MIO-R46AVXFX04A (REV A)

REV	CHANGE	DATE	BY	APPD
A	DRAWING RELEASED	5/28/09	AML	
B	REVISED BOX & LOCATION OF ITEM #2	12/09/09	AML	

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.
1	R-4911	BRACKET	2
2	R-4914	HOOK CATCH	2
3	H.H.C.S.	3/4" UNC GR.8 x 4.50"	2
4	F WASHER	3/4" TYPE-A GR.8	4
5	NYLOC NUT	3/4" UNC GR.8	2
6	H.H.C.S.	1/2" UNC GR.8 x 4.0"	2
7	F WASHER	1/2" TYPE-A GR.8	4
8	NYLOC NUT	1/2" UNC GR.8	2
9	-	SUSPENSION ARM	REF



TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED		RAILS FINISH MARK 125 EXHIBIT AS SHOWN	
BASIC DIMENSION	FRACTIONS	Z PLACE	3 PLACE
6 IN & LES	± 1/64	± .02	± .005
ABOVE 6 TO 24	± 1/32	± .03	± .010
ABOVE 24	± 1/16	± .06	± .015
ANGULAR DIMENSIONS		± 1/2°	

NOTES:
 DRIVERS SIDE SHOWN
 PASSENGERS SIDE TYPICAL

APPROVED: [Signature] FROM: [Signature]
 CHECKED: [Signature]
 AML

G & B SPECIALTIES INC.
 REPAIR PARTS DIVISION, 535 WEST 3RD STREET, BERWICK, PA 17004

DESIGN ~ ENGINEERING ~ MANUFACTURING

G&B SPECIALTIES ASSUMES THE POWER OF THE DESCRIPTION FOR THE LOCKUP INSTALLATION. THE PASSENGER SIDE OF THIS DRAWING IS FOR REFERENCE ONLY. NO PARTS ARE TO BE ORDERED FROM THIS DRAWING WITHOUT THE WRITTEN CONSENT OF G & B SPECIALTIES INC.
 2008B FORM SD F-650/550
 K-R46AVXFX04-4 5/28/09 1 of 1 K-R46AVXFX04-4



MIO-R46AVXFX04A (REV A)

ITEM	PART No.	DESCRIPTION OF ITEM(PART)	QTY.	REV	CHANGE	DATE	BY	APFD
1	—	VEHICLE FRAME	REF	A	DRAWING RELEASED	12/15/09	AML	
2	—	VEHICLE FRONT BUMPER	REF					
3	R-200235	BUMPER SPACER	4					
4	P-00018D	MTC BRKT., PULL CABLE, DRIVERS SIDE	1					
5	P-00018P	MTC BRKT., PULL CABLE, PASSENGERS SIDE	1					
6	—	PULL CABLE, RAILGEAR AXLE LOCK	REF					
7	—	PULL CABLE, VEHICLE AXLE LOCK	REF					
8	—	PULL TO UNLOCK PLACARD	REF					
9	H.H.C.S.	1/2" UNC GR.8 X 3.50"	2					
10	H.H.C.S.	1/2" UNC GR.8 X 3.25"	2					
11	F WASHER	1/2" TYPE-A GR.8	8					
12	NYLOCK NUT	1/2" UNC GR.8	4					

NOTES:

- ITEMS 4, 5, 7 & 8 INCLUDED IN KIT K-R45AVXFX04A
- ITEM 6 INCLUDED WITH FRONT RAILGEAR UNIT

R-980KIT-277

*DRIVERS SIDE SHOWN
PASSENGERS SIDE TYPICAL*

TOLERANCE ON FINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED	12% EXCEPT AS OTHERWISE SPECIFIED	2 PLACE	3 PLACE
BASIC DIMENSION	FRACTIONS	DECIMALS	DECIMALS
0 TO .125	± 1/64	± .02	± .005
.125 TO .25	± 1/32	± .03	± .010
ABOVE .25	± 1/16	± .06	± .015
ANGULAR DIMENSIONS			± 1/2°

AML	DRW	CHKD	APP'D
DRAWING NUMBER: MID-R46RFX20070-9		DATE DRAWN: 12/15/09	SHEET: 1 of 1
REVISION: A		PART NUMBER: MIO-R45RFX20070-9	

G & B SPECIALTIES INC.
A MANUFACTURER OF QUALITY RAILROAD PRODUCTS
BERWICK, PENNSYLVANIA 17004, PA. (717) 368-6977

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