

INSTALLATION OF R-650/R-890 FRONT VEHICLE AXLE LOCK KIT

SAFETY PRECAUTIONS

If any installation problems are encountered, please call G&B Specialties, Inc. for technical assistance before continuing with the installation process.



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand this manual completely before attempting installation of the equipment.
- Installation instructions provided below only address the Rafna railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Beware of all pinch points on the railgear and keep all parts of the body clear.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system
- When routing hydraulic hoses, ensure that the hoses do not contact any sharp edges or hot surfaces

INSTALLATION OF FRONT AXLE LOCK KIT

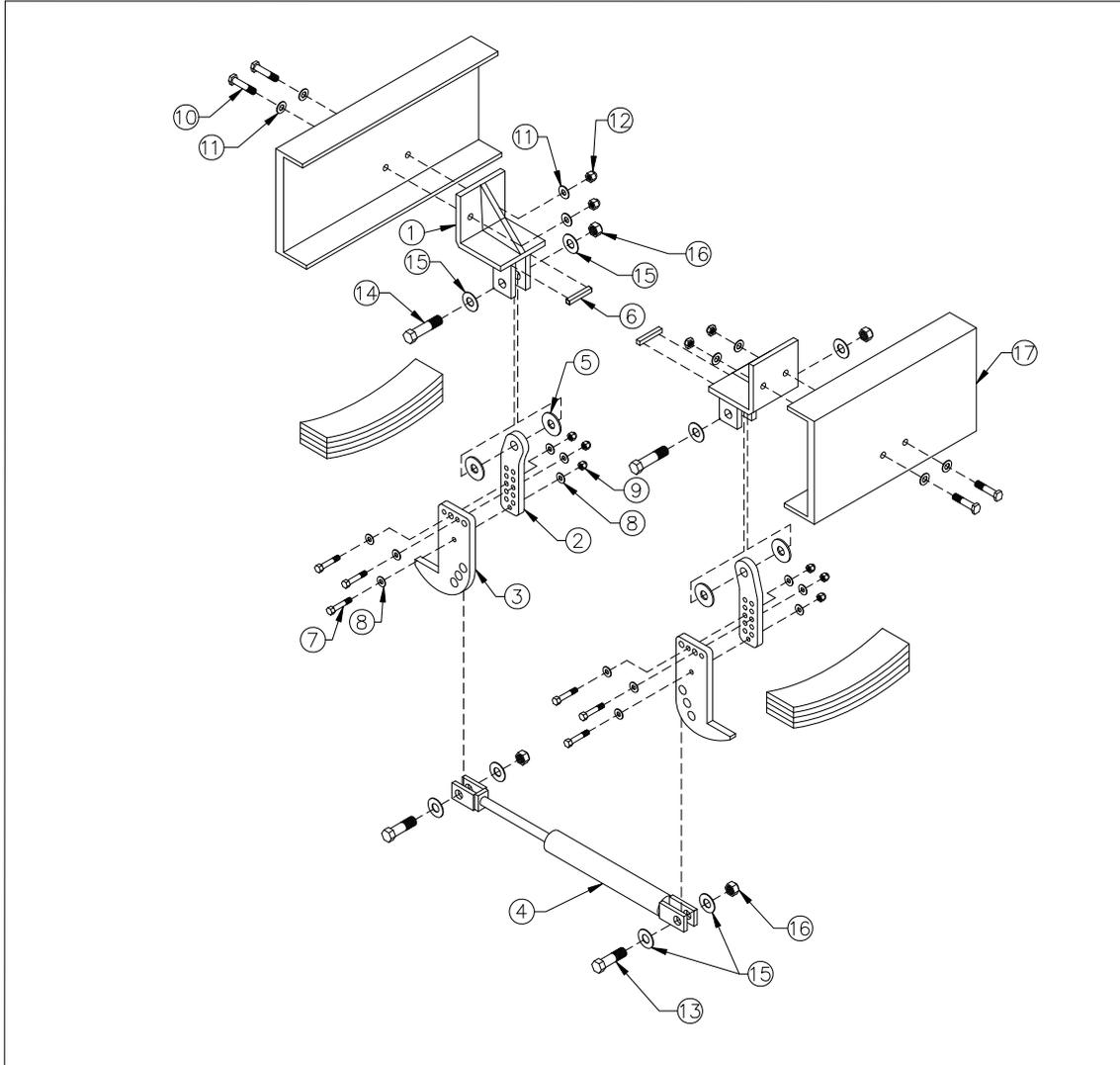
The following procedure details the installation of the front axle lock kit. The hardware required for this installation is listed in table 1.

Table 1: Front Axle Lock Kit Installation Parts

Part Number	Description	Qty
R-6712	Hook Bracket	2
R-6711	Hook Extension	2
R-6710	Hook	2
R-5682	Hydraulic Cylinder	1
R-5635	Nylon Washer	4
R-6610C	Stopper	2
R-8594	Ball Valve	1
HY-848FS-06-06	$\frac{3}{8}$ " Male NPT to $\frac{3}{8}$ " Male JIC Straight	2
HY-849FS-06-06	$\frac{3}{8}$ " Male NPT to $\frac{3}{8}$ " Male JIC 90°	2
	$\frac{3}{8}$ " UNC Gr. 8 Bolt x 2" Long	6
	$\frac{3}{8}$ " SAE Washer	12
	$\frac{3}{8}$ " UNC Gr. 5 Nylon Insert Lock Nut	6
	$\frac{1}{2}$ " UNC Gr. 8 Bolt x 2.25" Long	4
	$\frac{1}{2}$ " Gr. 8 Washer	8
	$\frac{1}{2}$ " UNC Gr. 8 Nylon Insert Lock Nut	4
	$\frac{3}{4}$ " UNC Gr. 8 Bolt x 2.5" Long	2
	$\frac{3}{4}$ " UNC Gr. 8 Bolt x 3.5" Long	2
	$\frac{3}{4}$ " Gr. 8 Washer	8
	$\frac{3}{4}$ " UNC Gr. 8 Nylon Insert Lock Nut	4

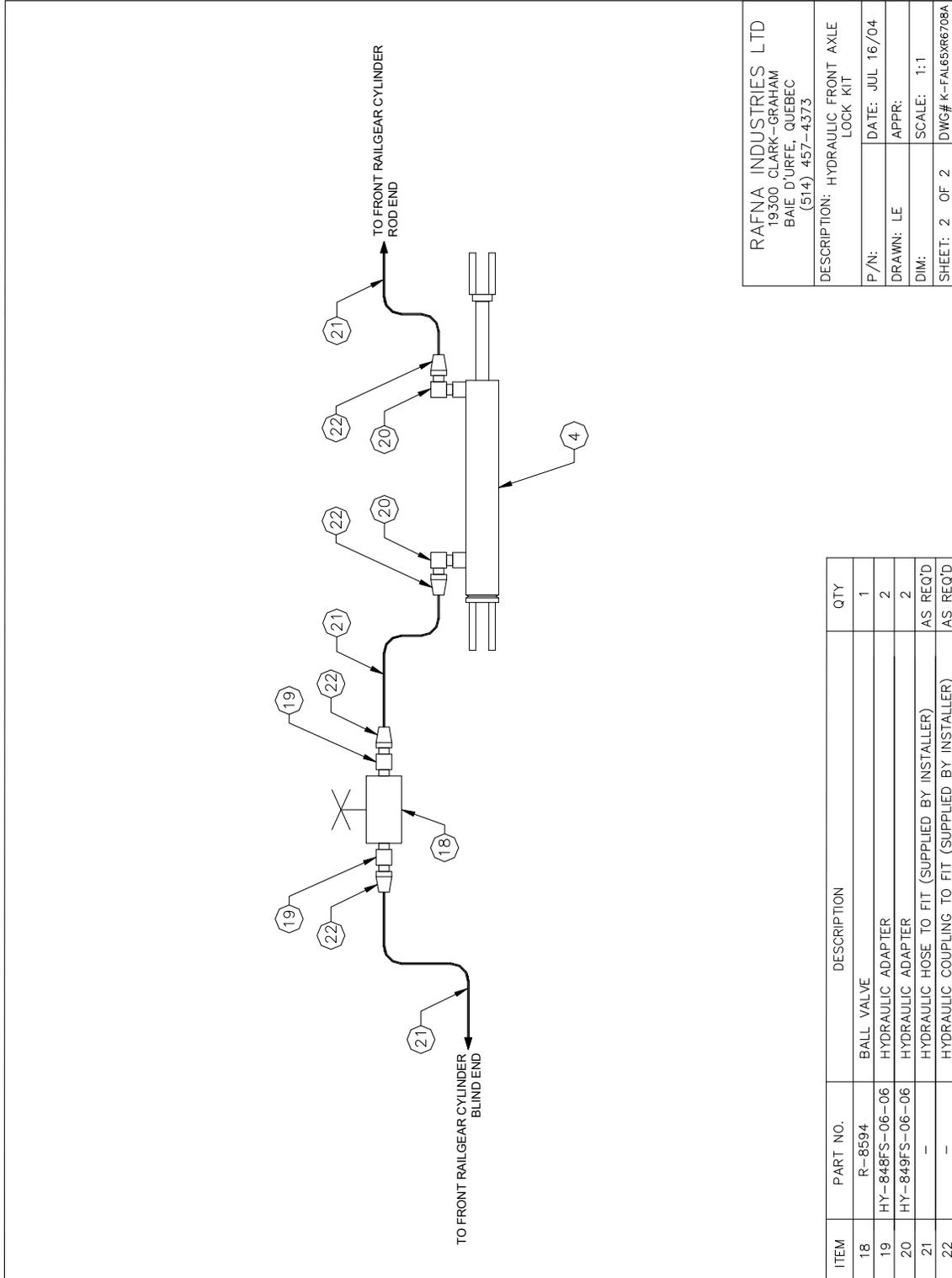
1. The front axle lock may be shipped fully or partially assembled. If not, assemble the hook extensions with the hook brackets and the hooks as shown. The cylinder can also be assembled to the hooks as shown.
2. Position the assembled front axle lock on the vehicle frame within 6" ahead or behind of the vehicle front axle center line. The hook brackets should be inside the frame. The hooks should hang to the inside of the vehicle front leaf springs. Ensure that the front axle lock components will not contact any vehicle components throughout their full range of motion. It may be necessary to grind off a portion of the hook brackets to fit them within the frame. Clamp the hook brackets to the frame.
3. Follow the Front Axle Lock Hook Clearance Adjustment procedure in the Front Axle Lock Kit Operation, Service and Parts manual. Use manual force or air to extend and retract the hydraulic cylinder at this point.

4. Once the front axle lock is completely adjusted, check for sufficient clearance between the front axle lock and all vehicle components throughout their full range of motion.
5. Drill two $17/32$ " diameter holes through each hook bracket and the frame. Fasten each hook bracket to the frame using two $1/2$ " x 2.25" long bolts, four $1/2$ " washers and two $1/2$ " nuts.
6. Torque all the front axle lock $1/2$ " fasteners to 100 ft-lbs and all $3/8$ " fasteners to 40 ft-lbs. Do not over torque. Do not torque the $3/4$ " fasteners that connect the hook extensions to the hook brackets or the $3/4$ " fasteners that connect the hooks to the hydraulic cylinder. These fasteners must remain slightly loose to allow the hooks to swing freely.
7. Position and weld the stoppers to the backside of the hook brackets as shown to prevent the front axle lock from swinging side-to-side when it is fully disengaged.
8. Fabricate a bracket to hold the ball valve near to the front railgear operating valve. Install one $3/8$ " male NPT to $3/8$ " male JIC straight fitting into each end of the ball valve.
9. Install one $3/8$ " male NPT to $3/8$ " male JIC 90° fitting into each port of the hydraulic cylinder.
10. Refer to the hydraulic schematic provided with the front railgear to determine the connection points for the front axle lock hydraulics. Depending on the railgear model, there may be 'T' fittings with caps installed on the front railgear in order to accommodate the hydraulics for the front axle lock.
11. Fabricate, terminate and connect a hose to reach between the rod end port of the front axle lock cylinder and the rod end of the front railgear cylinders.
12. Fabricate, terminate and connect a hose to reach between the blind end of the front axle lock cylinder and the ball valve.
13. Fabricate, terminate and connect a hose to reach between the ball valve and the blind end of the front railgear cylinders.
14. 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 and front axle lock to function. Where necessary, fasten the hoses to the frame with installer-supplied 'P' hose clips and hardware.
15. Test the operation of the front axle lock. Refer to the operation procedure in the Front Axle Lock Kit Operation, Service and Parts manual.



ITEM	PART NO.	DESCRIPTION	QTY
1	R-6712	HOOK BRACKET	2
2	R-6711	HOOK EXTENSION	2
3	R-6710	HOOK	2
4	R-5682	HYDRAULIC CYLINDER	1
5	R-5635	NYLON WASHER	4
6	R-6610C	STOPPER	2
7	-	3/8" UNC GR. 8 BOLT X 2" LONG	6
8	-	3/8" SAE WASHER	12
9	-	3/8" UNC GR. 5 NYLON INSERT LOCK NUT	6
10	-	1/2" UNC GR. 8 BOLT X 2.25" LONG	4
11	-	1/2" GR. 8 WASHER	8
12	-	1/2" UNC GR. 8 NYLON INSERT LOCK NUT	4
13	-	3/4" UNC GR. 8 BOLT X 2.5" LONG	2
14	-	3/4" UNC GR. 8 BOLT X 3.5" LONG	2
15	-	3/4" GR. 8 WASHER	8
16	-	3/4" UNC GR. 8 NYLON INSERT LOCK NUT	4
17	-	VEHICLE FRAME	N/A

RAFNA INDUSTRIES LTD 19300 CLARK-GRAHAM BAIE D'URFE, QUEBEC (514) 457-4373	
DESCRIPTION: HYDRAULIC FRONT AXLE LOCK KIT	
P/N:	DATE: JUL 16/04
DRAWN: LE	APPR:
DIM:	SCALE: 1:1
SHEET: 1 OF 2	DWG# K-FAL65XR6708A



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DWG# K-FAL65XR6708A	

ITEM	PART NO.	DESCRIPTION	QTY
18	R-8594	BALL VALVE	1
19	HY-848FS-06-06	HYDRAULIC ADAPTER	2
20	HY-849FS-06-06	HYDRAULIC ADAPTER	2
21	-	HYDRAULIC HOSE TO FIT (SUPPLIED BY INSTALLER)	AS REQ'D
22	-	HYDRAULIC COUPLING TO FIT (SUPPLIED BY INSTALLER)	AS REQ'D

OPERATION, SERVICE AND PARTS OF R-650/R-890 FRONT VEHICLE AXLE LOCK KIT

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.
- Always disconnect the vehicle's battery when welding on the vehicle or railgear in order to protect the vehicle's electrical system.
- Never operate the vehicle on road with the front axle lock engaged.

OPERATION OF FRONT AXLE LOCK KIT

With the front axle lock kit installed on this vehicle, it may be operated as normal.

The front axle lock should only be engaged for rail travel and should always be disengaged for road travel. Never operate the vehicle on road with the front axle lock engaged.

Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.

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

To Engage the Front Axle Lock:

1. The front axle lock should be engaged **before** deploying the front railgear to rail position.
2. Open the ball valve on the hydraulic line leading to the front axle lock cylinder. This will allow the front axle lock to function at the same time as the railgear.
3. Proceed to lower the front railgear as per the Railgear Operation, Service and Parts Manual. Once the rail wheels lower sufficiently to touch the rails, the front axle lock cylinder should extend and the front axle lock hooks should rotate into the engaged position under the vehicle leaf springs.
4. At this point, close the ball valve on the hydraulic line leading to the front axle lock cylinder.
5. Ensure that the front axle lock is fully engaged.
6. Continue to lower the railgear as per the Railgear Operation, Service and Parts Manual.

To Disengage the Front Axle Lock:

1. The front axle lock should only be disengaged once the front railgear is fully returned to the road position. Ensure that the railgear's vertical lock hooks are engaged and that the railgear is locked in the road position.
2. Carefully open the ball valve on the hydraulic line leading to the front axle lock cylinder. The railgear may move down onto its vertical lock hooks at this point.
3. Even though the railgear is already fully raised, proceed to activate the railgear controls to raise the front railgear. The railgear may move up slightly and the front axle lock should disengage from the vehicle leaf springs.

4. With the front axle lock fully disengaged, release the railgear controls and close the ball valve on the hydraulic line leading to the front axle lock cylinder.
5. Ensure the front axle lock is fully disengaged before proceeding with road travel.

SERVICE OF FRONT AXLE LOCK KIT

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 $\frac{3}{4}$ " fasteners that connect the hook extensions to the hook brackets or the $\frac{3}{4}$ " fasteners that connect the hooks to the hydraulic cylinder. These fasteners must remain slightly loose to allow the hooks to swing freely. 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 front axle lock for oil leaks (repair 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
$\frac{3}{4}$ " UNC Gr. 8 Fasteners	175
$\frac{5}{8}$ " UNC Gr. 8 Fasteners	150
$\frac{1}{2}$ " UNC Gr. 8 Fasteners	100
$\frac{3}{8}$ " UNC Gr. 8 Fasteners	40
$\frac{1}{4}$ " UNC Gr. 8 Fasteners	12

FRONT AXLE LOCK HOOK CLEARANCE ADJUSTMENT

Both the engaged and disengaged clearance between the front axle lock hooks and the vehicle suspension must be correctly adjusted to ensure proper function and to avoid interference.

When the front axle lock is engaged just before the front railgear starts to lift the vehicle, the vertical side of the hooks should be vertical and pushing against the vertical side of the vehicle leaf springs. Also, the top horizontal side of the hooks should be $\frac{3}{8}$ " - $\frac{5}{8}$ " below the bottom horizontal side of the vehicle leaf springs.

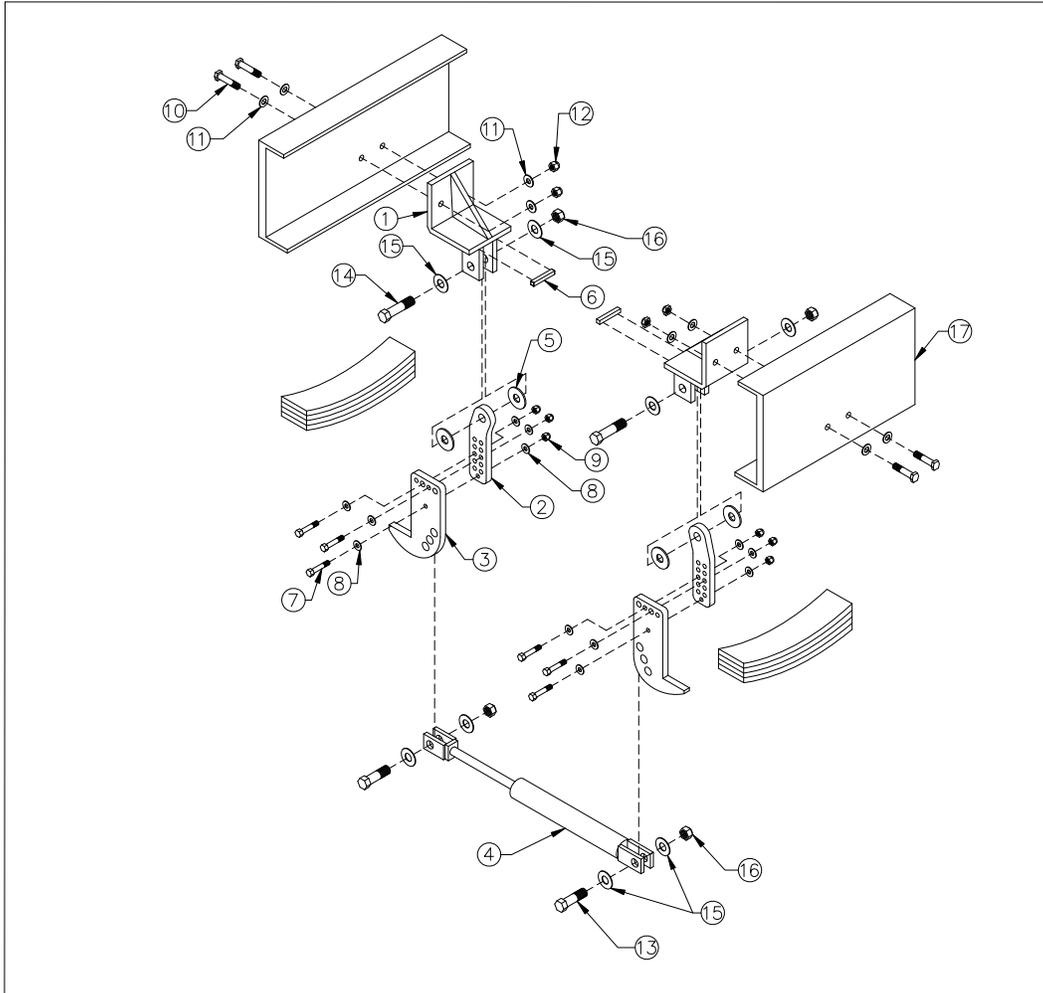
When the front axle lock is disengaged with the railgear in the road position, the hooks and all front axle lock components should be at least $\frac{3}{4}$ " - 1" away from any vehicle components including moving parts of the vehicle suspension.

There are multiple ways in which to adjust the engaged and disengaged clearance. There are multiple holes in both the hooks and the hook extensions, the hook extensions can be bolted to the hook brackets in two different orientations, the hydraulic cylinder can be bolted to the hooks in multiple locations, shim stock can be welded to the hook horizontal and vertical sides in order to fine tune the clearances, and the hook brackets can be located differently on the vehicle frame.

Once the correct hook to hook extension assembly is obtained, ensure that a third $\frac{3}{8}$ " fastener is installed through the hook and hook extension in the bottom most hole on the hook extension. The hook will have to be drilled to match the hook extension.

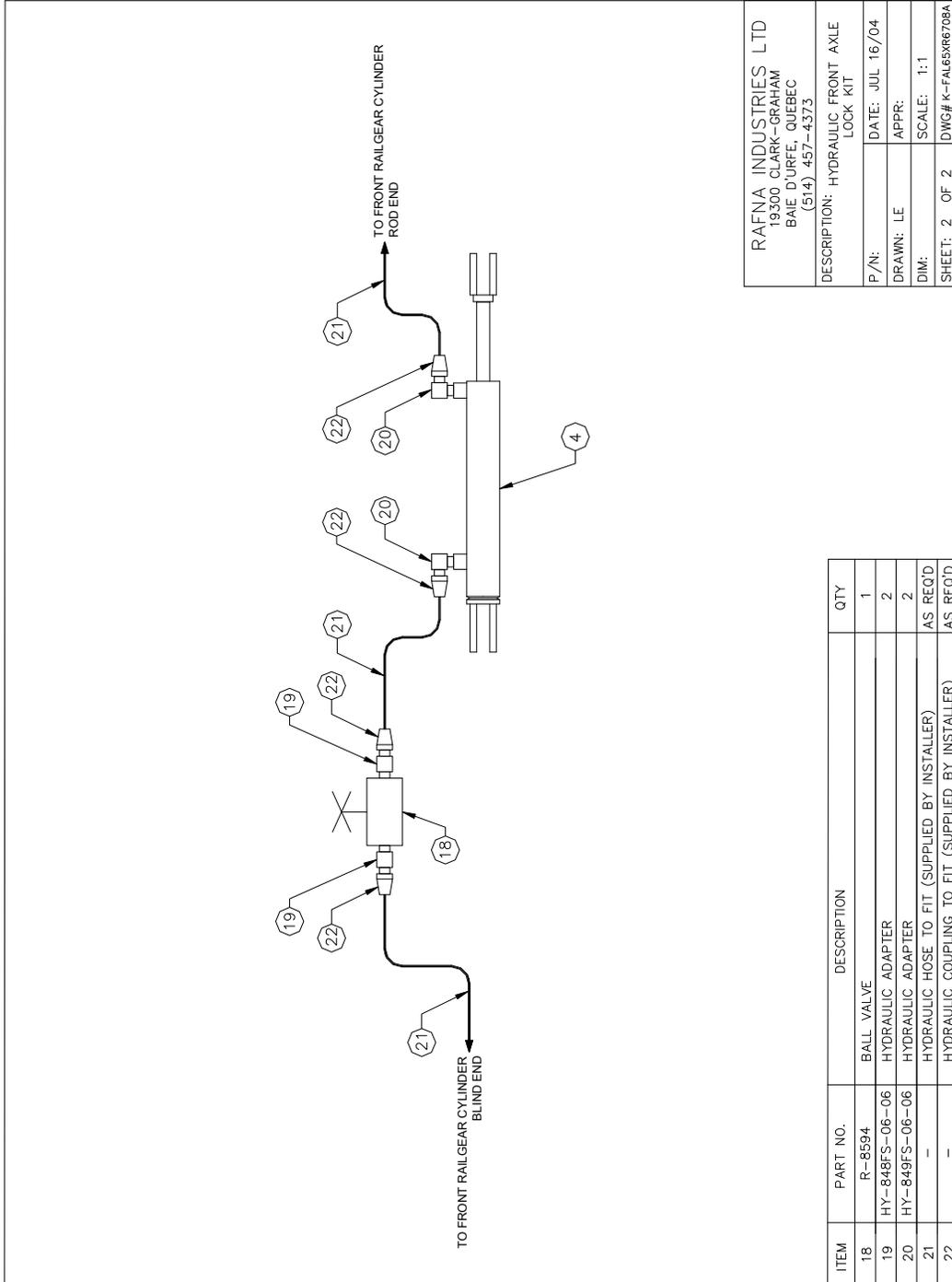
Once the front axle lock is completely adjusted, check for sufficient clearance between the front axle lock and all vehicle components throughout their full range of motion. Torque all the front axle lock fasteners to specifications. Ensure that the stoppers are installed on the hook brackets to prevent the front axle lock from swinging side-to-side when it is disengaged.

PARTS OF FRONT AXLE LOCK KIT



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