

DIVERSIFIED METAL FABRICATORS, INC.



Parts & Service Manual RW-1212 & RW-1420



November 2017

SERIAL NUMBER (FRONT) _____

SERIAL NUMBER (REAR) _____

NOTE:

Please refer to the serial numbers when ordering parts or
inquiring about warranty items.

Message from DMF

No matter what your job function is, Operation, Installation, Maintenance, or Repair, it is your responsibility to familiarize yourself with the entire manual. Once you have read the entire manual, there are some specific sections that you will want to pay special attention to, depending on your role.

If you find anything missing, incorrect or unclear in this manual, please contact us. We are always trying to improve our manuals.

Manuals, service bulletins and general information are available on our website listed below.

We reserve the right to update our manuals without notice. You can download a current manual at our website (<http://www.dmfatlanta.com>).

Thank you for choosing DMF Railgear. We make every effort to provide quality, safe and rugged products for the railroad. We hope you'll find our gear to be satisfactory in every way. We take product support very seriously, so if you have any questions, please contact us.

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SECTION 1.0 GENERAL INFORMATION

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1.1 GENERAL DESCRIPTION

DMF's RW-1212 and RW-1420 Railgear are related products that share most component parts interchangeably, with the notable exception being the rail wheels. RW-1212 has solid 12" rolling diameter wheels and is designed for medium duty trucks in the 19,500 to 26,000 lb GVWR range. RW-1420 has 14" rolling diameter spoked wheels and serves on trucks in the 26,000 to 33,000 lb GVWR range. See Figure 1.1 for an illustration of each wheel.

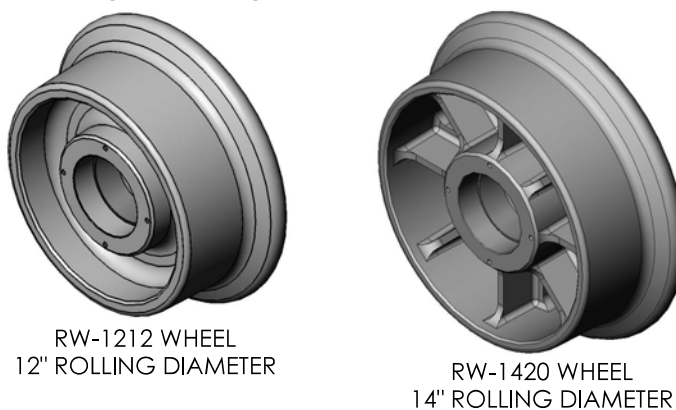


Figure 1.1 RW-1212 & RW-1420 Wheels

For both products, the front guide wheel assembly attaches to the frame and front axle and lifts the front truck tires off the track, thus utilizing the vehicle's front suspension. This design supports the vehicle as it was intended, helps to navigate curves smoothly and damps out the effects of track irregularities. The rear assembly attaches directly to the truck frame behind the rear axle spring hangers. It deploys with an articulating dual scissor action that allows the rear Railgear to be moved both vertically and horizontally. This mechanism provides the "side shift" action which has made DMF gear so well known in the industry. The side shifting capability offers the operator a greater margin for aligning the vehicle to the tracks, which helps to speed up and simplify the process.

Materials:

All structural members and brackets are constructed of carbon steel. The guide wheels for DMF RW-1212 and RW-1420 Railgear are machined from hardened steel castings and are fitted to high strength alloy steel axles with heavy-duty tapered roller bearings.

Installation:

Both DMF front and rear Railgear bolt to the truck frame using only common tools found in any shop. They are designed to minimize the amount of space required and in many cases fit within the existing boundaries of the vehicle. The front Railgear, however, sometimes requires a bolt-on frame extension to complete the installation. The rear Railgear mounts below the top of frame and directly behind the rear axle spring hangers.

Brakes:

NOTE:

The rail wheel brake system is intended to assist the existing vehicle brakes when on rail. As the vehicle's rear tires are in contact with the railhead, the primary braking effort is derived from the rubber tires. Rail wheel brakes alone are insufficient to stop the vehicle in a reasonable distance.

The optional rail brakes are the external Cobra shoe type and are either air or hydraulically actuated. Air powered rail wheel brakes use a truck style air chamber to supply the clamping force. Supply pressure comes from the vehicle's air system. A pressure protection valve separates the Railgear and the truck's air systems, preventing a failure in the rail brake system.

from adversely affecting truck braking. Hydraulic rail wheel brakes are powered by a 12 VDC hydraulic power unit that dedicated to support the Railgear. Both styles of rail brakes are applied simultaneously with the truck brakes when the operator presses the brake pedal. A dashboard-mounted switch permits the operator to enable or disable the rail braking system.

Options:

There are several options available for RW-1212 and RW-1420 Railgear. The most commonly ordered options include rail wheel brakes for improved stopping on rail, insulated wheels to prevent crossing signal actuation, rail sweeps to clear the rail of potentially damaging materials, and remote pin-offs for ease of operation. Other less common options are non-standard track gauges, and slotted links for improved hi-rail performance at crossings.

1.2 FRONT RAILGEAR

1.2.1 Front Railgear Components

Figure 1.2.1 shows the individual parts of the installed front Railgear. These item descriptions will be used throughout this installation manual. DMF Railgear assemblies are also referred to as guide wheels, rail wheels, or hi-rail gear.

RW-1212

GVWR Range: 19,500 to 26,000 lbs.

Approx. Installed Weight (Front): 1,095 lbs.

Capacity: 12,300 pounds per Railgear axle @ 20 MPH

RW-1420

GVWR Range: 26,000 to 33,000 lbs.

Approx. Installed Weight (Front): 1,105 lbs.

Capacity: 20,000 pounds per Railgear axle @ 20 MPH

For parts drawings, see Section 8.0, and for installation instructions, see Section 4.0.

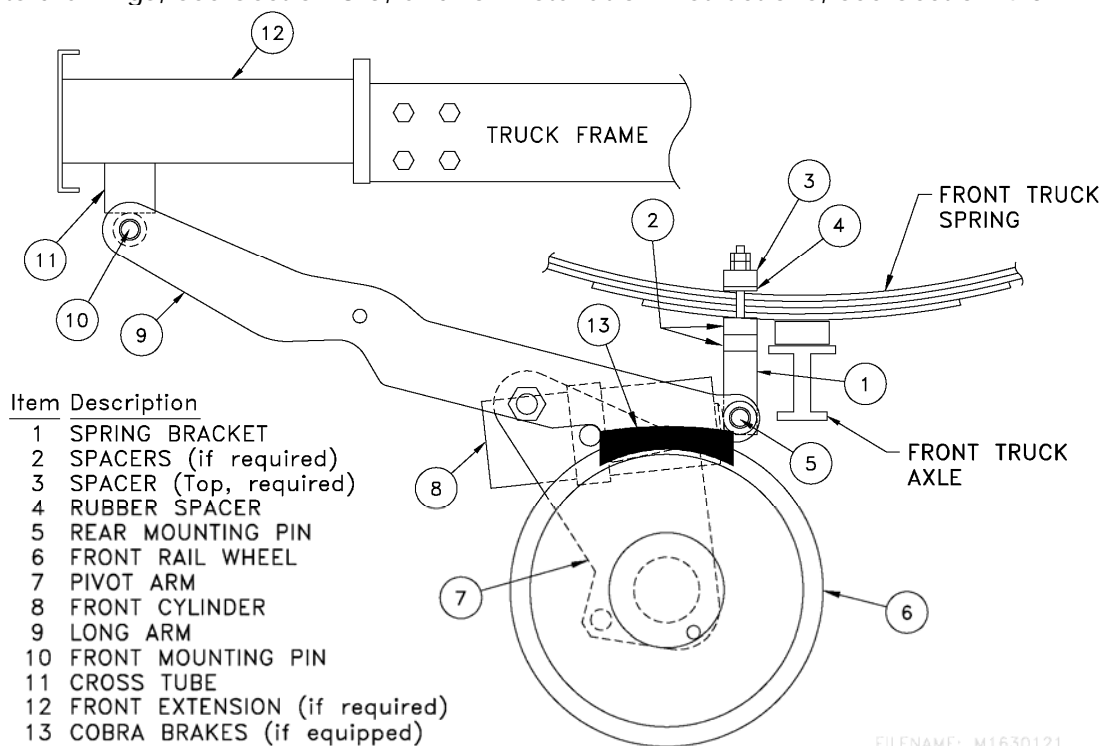


Figure 1.2.1 Front Railgear Components

1.3 REAR RAILGEAR

1.3.1 Rear Railgear Components

RW-1212

GVWR Range: 19,500 to 26,000 lbs.

Approx. Installed Weight (Rear): 760 lbs.

Capacity: 12,300 pounds per Railgear axle @ 20 MPH

RW-1420

GVWR Range: 26,000 to 33,000 lbs.

Approx. Installed Weight (Rear): 875 lbs.

Capacity: 20,000 pounds per Railgear axle @ 20 MPH

Figure 1.3.1 shows the individual parts of the installed rear Railgear with the rail wheels in the rail position. These item descriptions will be used throughout this installation manual.

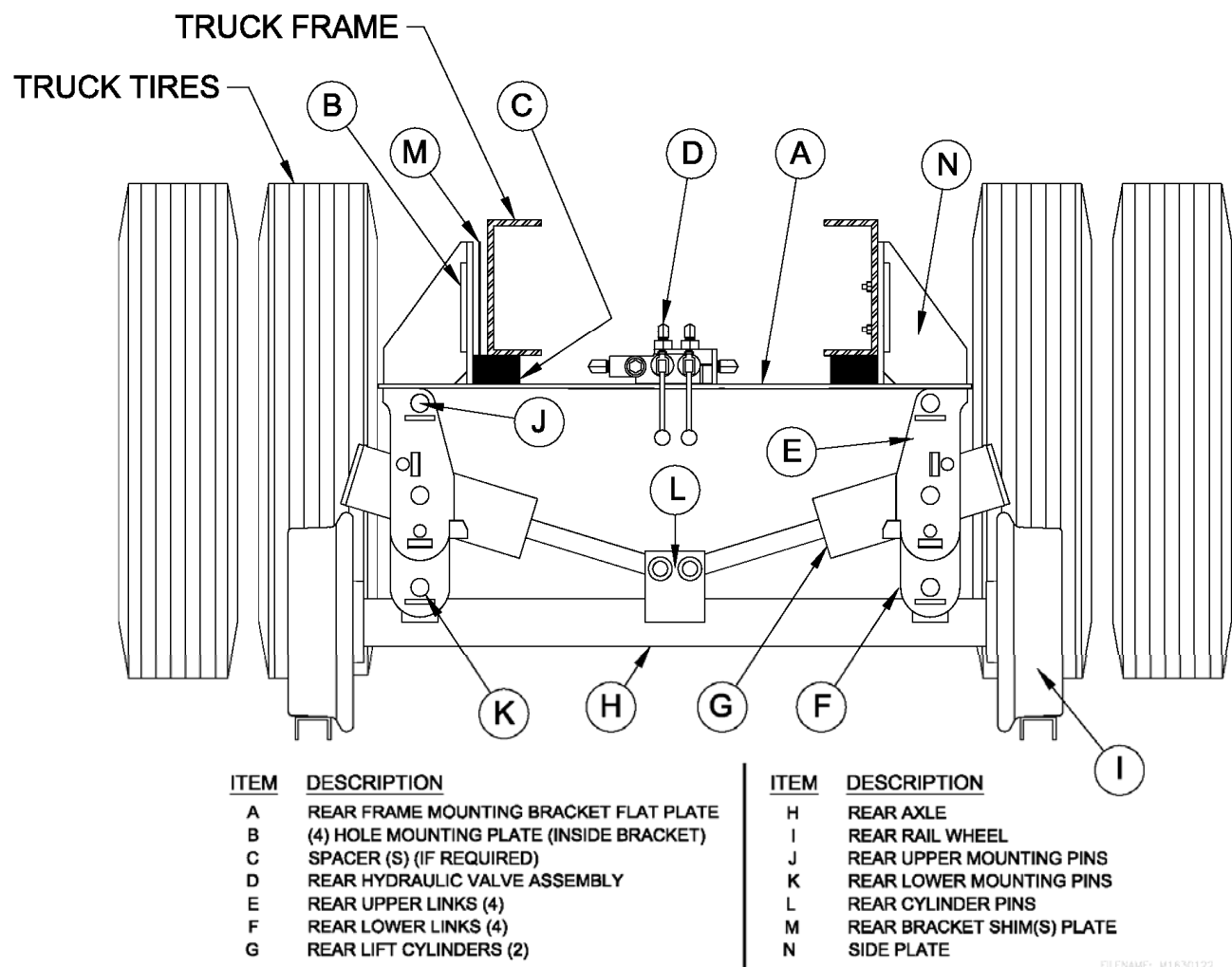


Figure 1.3.1 Rear Railgear Components

For parts drawings, see Section 7.0, and for installation instructions, see Section 4.0.

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2.1 BEFORE YOU OPERATE THE RAILGEAR

2.1.1 Familiarize Yourself with the Railgear

Clearances & Approach Angles

The installation of Railgear typically reduces the ground clearance and approach angle in the front and back. In some installations, the guide wheels extend slightly beyond the corners of the front bumper. Operators should familiarize themselves with the modified clearance and approach angles.

Pin-off Systems and Locations

Walk around vehicle and identify the location and type of pin-off system(s) that are installed on this particular vehicle. Please note that front and rear Railgear may have different types of pin-off systems (i.e. front may be manual, while rear may be cable pin-offs). See Section 5.0 for more information on pin-offs.

DMF offers the following Pin-off options:

- Manual Pin-Offs
- Cable Remote Pin-Offs
- Air Remote Pin-Offs

NOTE:

DMF's Rear Cylinders are equipped with integral locking valves, however, pin-offs are still required in both the rail and highway positions.

Operation Controls

- Locate and familiarize yourself with the front and rear Railgear operating controls
- Locate Power Take-Off (PTO) and/or 12 VDC hydraulic power unit control switch and indicator light, typically found on the dashboard
- If your truck is equipped with Railgear brakes, locate the brake switch on the dashboard of the truck
- Identify the type of steering lock used on your truck

2.1.2 Daily Inspection

Before operating your Railgear-equipped vehicle, whether for highway or rail use, it is imperative that you perform a daily inspection – see Section 3.1.1 for Daily Inspection List. If any items found during your inspection do not conform to requirements, it is your responsibility to take corrective action before any use of the vehicle.

2.2 ANTI-LOCK BRAKE SYSTEM (ABS)

2.2.1 Trucks Equipped with ABS

All medium and heavy duty trucks manufactured after March 1, 1998, and equipped with air brakes, are required by federal law to also include ABS. All trucks over 10,000 lb GVWR manufactured after March 1, 1999 and equipped with hydraulic brakes are required by federal law to also include ABS. The ABS system is designed to prevent wheel lock-up during braking.

The ABS consists of wheel speed sensors, an **“ECU”** (electronic control unit), all wiring and air/hydraulic lines that link the ABS component to the truck’s brakes electrical system.

During braking, the sensors will detect if one or more of the wheels are locking and automatically engage the ABS. The ECU then signals the system to apply and release brake pressure as much as 15 times per second, allowing the wheel(s) to turn just enough to maintain optimum traction.

Vehicles equipped with WABCO or Allied-Bendix ABS have an amber dash-mounted warning / diagnostic lamp. During normal road operation, the lamp will come ON when the truck engine is started and, depending on the type of system, will go OFF after about 3 seconds or when the truck reaches a speed of approximately 5-7 mph. A self-diagnostic check of the ABS is conducted during this time. If the lamp stays on, or comes on any other time during road operation, a possible malfunction is indicated, which will shut off only the part of the system at fault. The affected wheel(s) will revert back to conventional braking. For complete information and instructions relative to the ABS system, please refer to the truck’s operation manual.

2.2.2 Rail Operation of Trucks with ABS

When the Railgear is in the rail position, the front truck tires are lifted off the ground. This may produce an ABS fault and cause the ABS light to illuminate. In this condition, the brakes will still function but the ABS system will not. If the amber ABS dash light remains on during rail operation, the truck engine must be turned off and restarted after returning to highway operation. This will clear the ABS light after a few seconds. If the amber light remains on during road operation, the truck’s brake system may have an active fault and should be checked. Please refer to the truck’s operation manual.

2.3 HIGHWAY OPERATION

Before operating a Railgear-equipped vehicle on the highway:

1. Verify Railgear is in highway position.
2. Verify pins are properly and fully inserted in both front and rear Railgear (even if the Railgear on your truck is equipped with a locking valve system, you **MUST** verify that the pins are correctly inserted).
3. Steering wheel lock has been removed (if applicable).
4. Verify that Railgear brakes have been disengaged (if applicable).
5. Verify PTO and/or 12 VDC hydraulic power unit has been disengaged and that the indicator light is OFF.

2.4 GETTING ON THE RAIL

2.4.1 Getting onto the Rail

1. At the track crossing, drive past the track, then back the vehicle onto the rails. Engaging the rear Railgear first will allow your vehicle to side-shift and align itself to the rail, making it easier to engage the front Railgear.
2. Engage the truck's parking brake to prevent the truck from rolling.

2.4.2 Lower Rear Guide Wheels

3. If the Railgear has brakes, turn brake switch on.
4. Engage the PTO and/or 12 VDC hydraulic power unit, leave the truck running and the transmission in neutral gear.
5. Remove the safety pin-off pins (4 pins: 2 front and 2 rear, on both driver and passenger sides). If pins are too tight to be easily removed, verify that Railgear is fully raised by briefly pulling (bumping) the valve handle towards you.
6. Push valve handles to lower wheels and engage rail.
7. To assist with alignment of the wheels to the rail, you can also use the valve handles independently to lower one side at a time to engage the rail, at which point you can then lower the opposite side. This will cause your vehicle to side-shift and align itself with the rail.
8. When both wheels are in rail position and properly engaging rail, replace safety pin-off pins.

2.4.3 Lower Front Guide Wheels

9. If necessary, drive the truck into position to line up the front guide-wheels with the rail.
10. Ensure that the PTO and/or 12 VDC hydraulic power unit is engaged (this was engaged during the lowering of the rear Railgear).
11. Ensure front safety pin-off pins are removed.
12. Check and make sure that the front guide wheels line up with the rail.
13. Push valve handle to lower wheels and engage rail.
14. Engage the steering wheel lock (if applicable).
15. If you do not require the use of the PTO for additional equipment, it can now be disengaged. If the truck has hydraulic brakes, the 12 VDC hydraulic power unit needs to be left on to actuate the hydraulic Railgear brakes (if equipped).
16. Disengage the truck's parking brake when you are ready to proceed.

NOTE:

The front guide wheel assembly is an over-center design and does not require safety pin-off pins engaged in rail mode.

2.4.4 On the Tracks

- Do not exceed posted track speed limit, and at no time exceed 30 MPH while on track.
- Be aware that some Railgear is insulated, and will not operate the crossing gate circuits.
- You are responsible for knowing if your Railgear equipped vehicle has insulated or non-insulated wheels. To assist in identifying insulated rail wheels, a grooved ring is machined around the inside of the front and rear driver's side wheels.
- All railroad rules and safety guidelines should be observed.
- Reduce speed while in reverse and/or at all crossings, curves, branch lines, switches and frogs (no more than a slow walking pace is recommended).
- Traction is reduced on the track, especially in wet conditions.
- Braking distance is increased on the track, especially in wet conditions.
- Do not slide tires or guide wheels on the tracks as this will cause premature wear.
- Do not exceed the maximum rated capacity of the equipment.
- On newer trucks with Anti-Lock braking systems, the amber 'ABS' dash light may remain on with the front wheels elevated. This will not affect rear truck braking or rail wheel braking.

2.5 GETTING OFF THE RAIL

1. Safely pull onto the track crossing, paying attention to traffic and other obstacles.
2. Set the truck parking brakes and engage the PTO (if equipped).
3. Leave the truck running and the transmission in neutral gear.
4. Lift both sets of Railgear (there is no preference for removal order).
5. Engage all 4 safety pin-off pins in highway position (passenger and driver side, for both front and rear Railgear).
6. Disengage the switch that controls the Railgear brakes (if applicable).
7. Disengage the steering wheel lock (if applicable).
8. Disengage the PTO and/or 12 VDC hydraulic power unit and the parking brakes.
9. Make sure surrounding area is free and clear of any obstacles and vehicles before pulling off of the rail and onto the road.
10. If the amber ABS dash light remained on during rail operation, the truck engine must be turned off and restarted after returning to highway operation. This will clear and ABS light after a few seconds. If the amber light remains on during road operation, the truck's brake system may have an active fault and should be checked out. Please refer to the truck's operation manual.

SECTION 3.0 ROUTINE MAINTENANCE

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3.1 INSPECTION AND MAINTENANCE

If your Railgear vehicle is high-use or operated under extreme conditions, such as material handlers, weed-spraying vehicles, operating in mountainous regions, or extreme temperatures, the levels of inspections listed below may need to be performed more frequently than stated.

The following are instructions for routine inspections recommended by Diversified Metal Fabricators. In some circumstances, government or corporate regulations may require additional inspections be performed. Please ensure that you are aware of any inspection requirements that pertain to your Railgear and that you abide by all local and national laws regarding Railgear maintenance and safety.

3.1.1 Daily

- Visually inspect for hydraulic fluid leaks.
- Check and make sure that all threaded fasteners are secured. NOTE: All hex nuts are either nylon insert or slotted hex nuts with cotter pins.
- Check and make sure all tie straps that secure hoses from moving parts and exhaust systems are in place. Replace if cracked or worn.
- Inspect wheel flanges for excessive wear (see Section 3.3 for wear gauge), primarily noting differences in wear between wheels on the same axle or diagonally. If an abnormal pattern is noted, check Railgear alignment (see alignment procedure in Section 4.8).
- Inspect wheel "end-play": Placing one hand at the 9 o'clock position and your other hand at the 3 o'clock position, firmly grab the wheel and push and pull it a few times. There should be no discernable movement in and out, and the wheel should rotate freely. If you feel there is too much movement in and out, or if the wheel does not rotate freely, a detailed inspection should be performed. See Sections 7.0 and 8.0 for appropriate axle assembly drawings.
- Throughout the day, inspect wheel temperature. If extremely hot, this could indicate bearing adjustment is too tight. For adjustment information, see Section 7.0 and 8.0 for appropriate axle assembly drawings.

3.1.2 Weekly

Perform standard daily inspection points as listed above, and then check the following:

- Grease and lubricate all grease fittings on front and rear Railgear.

NOTE:

There are six (6) locations on front assembly and fourteen (14) locations on rear assembly. See Drawing in Section 3.2 for details.

- Check level of hydraulic oil and all other fluids.
- Check air pressure in tires and inflate to proper inflation pressure (if necessary).
- Inspect brakes and adjust if necessary. Refer to Section 5.3.4 or 5.4.4.
- Test brakes as outlined in Section 5.3.5 or 5.4.5.
- If brakes do not function properly, contact a Service Representative at DMF.

3.1.3 Bi-annually

Perform standard daily and weekly inspection points as listed above, and then check the following:

- Remove the hubcaps from the Rail wheels and inspect for deterioration or loss of wheel bearing grease. Unless there is a problem, the cavity may be topped off with the recommended grease without removing and/or re-packing the bearings.
- Clean the hubcap and mating surfaces and apply a bead of silicone gasket and re-attach securely.

- Clean the strainer / filter in the hydraulic power unit tank.
- Rail test for proper traction and adjust as appropriate (see Section 4.9).
- Rail test for proper braking and adjust as appropriate (see Section 5.3 or 5.4).
- Check Railgear alignment (see Section 4.8)

3.1.4 Annual Maintenance or as required

In addition to the items listed in 3.1.1 Daily Maintenance, 3.1.2 Weekly Maintenance and 3.1.3 Bi-annual Maintenance; perform the following:

- Disassemble, inspect, repack and reassemble Rail Wheel Bearings as shown in Sections 7.0 and 8.0.

3.2 LUBRICATION SPECIFICATION

Hydraulic Oil for trucks with a PTO:

- ASTM D6158 HM (Unax RX-46 Hydraulic Oil, Shell Tellus EE 46 or equal)
OR
- Some customers operate on Dexron III ATF

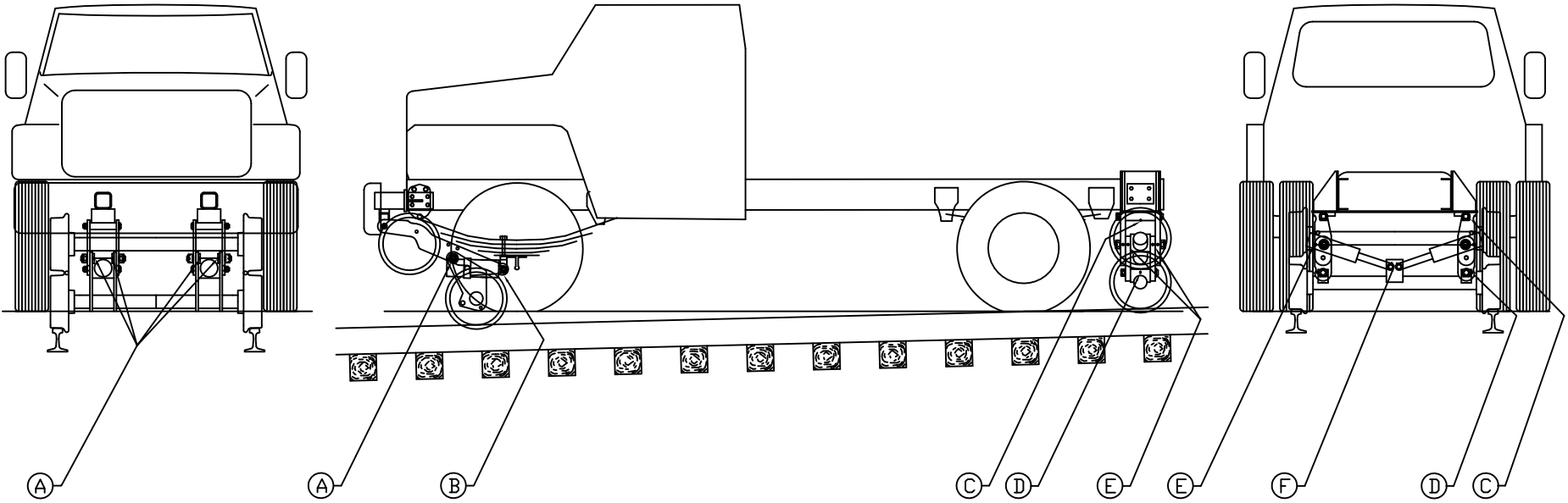
Hydraulic Oil for DMF supplied 12 VDC hydraulic power unit:

- Dexron III ATF

Wheel Bearing Grease / Grease Fittings:

- **Factory Standard:** Citgo Syndurance Premium Synthetic 460 #2
- **Warm Climates:** Mystik JT-6 Hi-Temp Multi-Purpose Grease #2 (or equivalent)

ITEM	GREASE PT	PLCS.	DESCRIPTION
1	A	4	FRONT PIVOT ARM PIVOT PINS, CENTER OF THE PIN HEAD
2	B	2	FRONT CYLINDER ROD CROSS TUBES
3	C	2	REAR BRACKET UPPER PIN CROSS TUBES
4	D	2	REAR AXLE LOWER PIN SADDLE BLOCK
5	E	8	REAR SCISSORS LINK MECHANISM
6	F	2	REAR CYLINDER ROD CROSS TUBES
7			



	-	-	-	-	-		
	-	-	-	-	-		
REV	DATE	DESCRIPTION			BY APP		
TOLERANCES (UNLESS SPECIFIED):		TITLE:					
FRAC, MACH:	±1/32"	RW-1212 & 1420		GREASE POINT LOCATIONS			
FRAC, OTHER:	±1/16"						
.X	±.063						
.XX	±.030						
.XXX	±.005						
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SURF FINISH:	125 MICRO					DRAWING NUMBER:	REV:
THREADS:	2A & 2B						
BREAK SHARP EDGES .03 X 45° MAX							
DMF (404)875-1512		BJF	-	10/31/16	M1214001	#	

3.3 WHEEL WEAR GAUGE

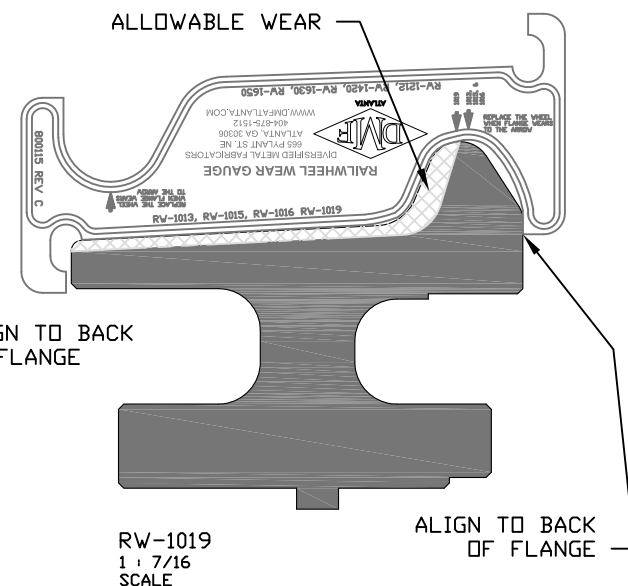
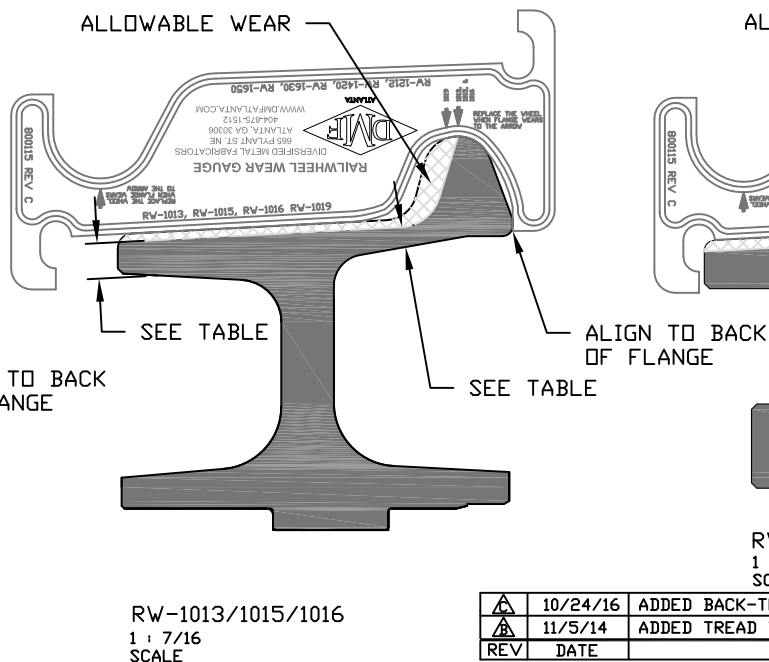
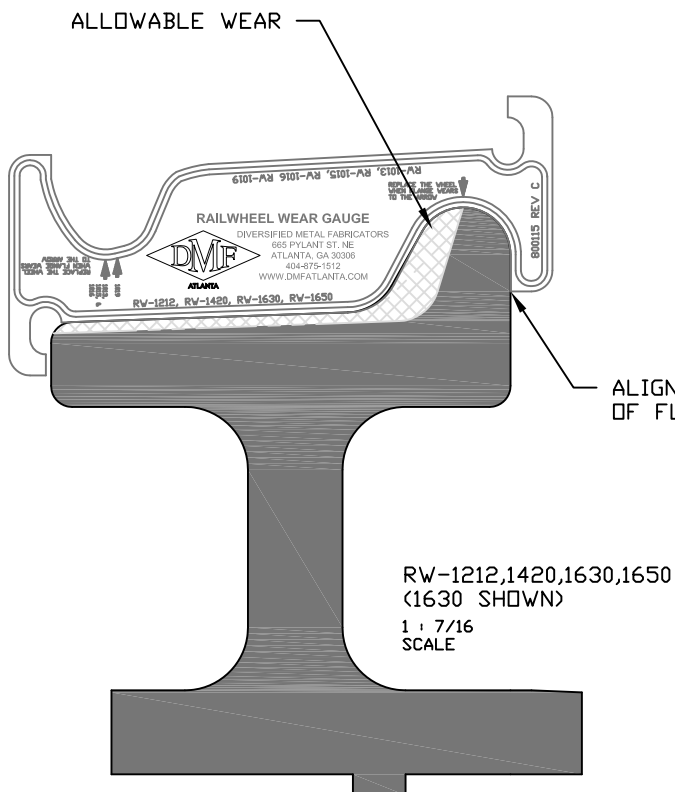
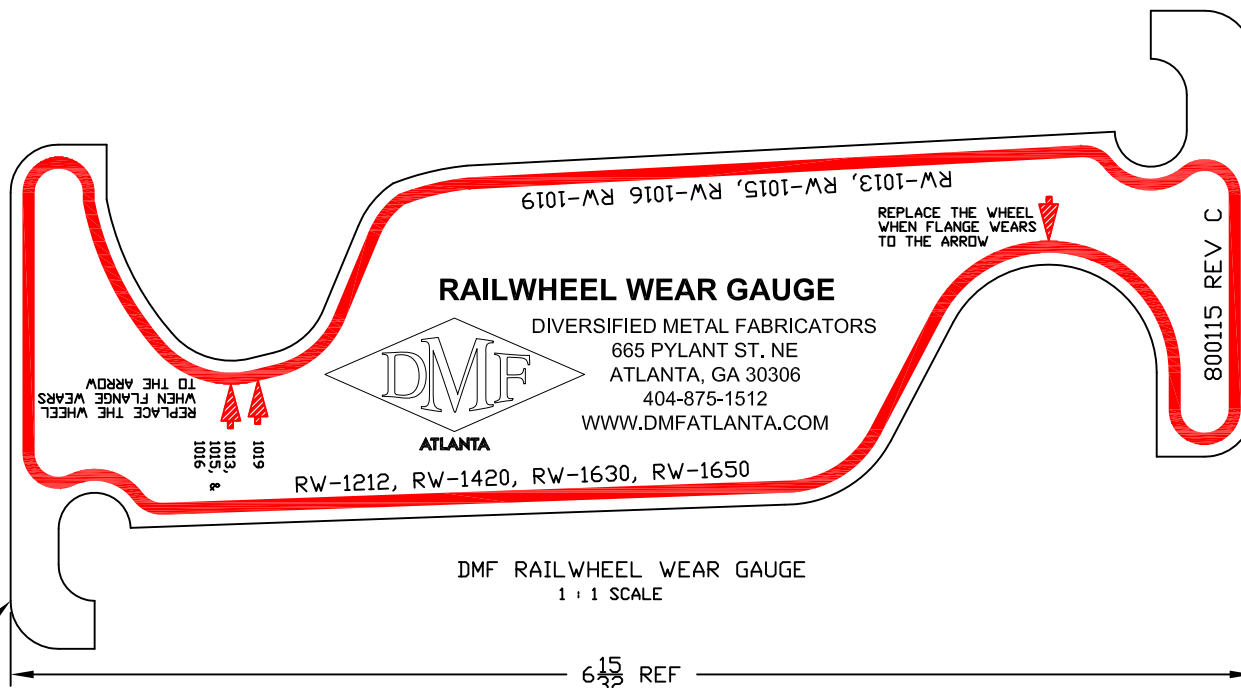
A metal wheel wear gauge (DMF part number 800115) is available to aid in inspecting worn wheels. The drawing on the next page illustrates how to use the gauge. It also lists specifications for minimum wall thickness on the wheel tread and tolerance on wheel back-to-back spacing.

NOTE:
THIS GAGE IS USED TO DETERMINE FLANGE WEAR.
FLANGE IS TYPICALLY THE MOST SIGNIFICANT
WHEEL WEAR AND THE CAUSE OF MOST WHEEL
REPLACEMENT. WHEELS MAY ALSO BE CONDEMED
FOR TREAD CONDITIONS SUCH AS HOLLOW GROUND
TREADS OR CORRUGATION IF IT AFFECTS TRACKING
ON RAIL, OR INSUFFICIENT TREAD WALL
THICKNESS.

△ TREAD WALL THICKNESS & WHEEL BACK-TO-BACK:

WHEEL SIZE	MINIMUM WALL (IN)	WHEEL FLANGE BACK-TO-BACK (IN) +/- 1/8
RW-1630/50	3/4	52 7/8
RW-1212/1420	1/2	52 15/16
RW-1019	3/8	53 1/4
RW-1013/1015/1016	1/4	

0.063 ALUMINUM



△	10/24/16	ADDED BACK-TO-BACK DATA & 1016 WHEELS	BJF	
△	11/5/14	ADDED TREAD WEAR LIMITS, REVISED PROFILE FOR 500066	BJF	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES:				
UNLESS SPECIFIED, COMMON SENSE PREVAILS				
FRACTIONAL: 1/32"				
FRACTIONAL: 1/16"				
X				
XX				
XXX OR XXXXX				
DRILL SIZES				
ANGULAR				
SURF FINISH: 125 MICRO				
THREADS: RA AND 2B				
SMALL SHOTS: 1/8" & 1/16" & 1/32"				
DMF		TITLE:		
DRAWN BY: WAK		DET, GAUGE, WHEEL WEAR		
APPD BY:		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		
DATE: 2/2/10		DRAWING NUMBER: 800115		
		REV: C		

3.4 TROUBLESHOOTING

3.4.1 Troubleshooting On-Track Problems

Symptom	Possible Cause	Diagnostic Step	Corrective Action
Rail wheel vibration/ noise	Damaged tread / flange	Inspect treads / flange	Replace wheel
	Patterned wear on tread / flange	Inspect treads / flange	Replace wheel
	Loose wheel	Check wheel end play (detailed instructions at Section 7.0 & 8.0 for appropriate wheel & axle assy. drawings)	Follow detailed instructions at Section 7.0 & 8.0
Vehicle tracking to one side, wandering	Misalignment	Check alignment (see Section 4.10)	Adjust alignment
	Overload or load imbalance	Visually inspect, scale vehicle	Unload and/or redistribute load
	Un-even rail wheel load / vehicle load	Weigh vehicle and check rail wheel load	Adjust load distribution and re- set rail wheel load
	Excessive wheel wear	Check alignment and wheel wear	Adjust alignment, replace worn wheels
Insufficient traction or braking	Rail wheel load set too low	See Section 4.10	Set rail wheel load
	Tires worn	Inspect tires	Replace tires

Table 3.4.1 Troubleshooting On-Track Problems

3.5 DERAILMENT

In the case of a minor derailment, the cause should be determined and corrective steps taken. The vehicle should be inspected to determine if repairs or adjustments are required. This inspection should include, but should not be limited to, the following:

- Visually inspect Railgear for hydraulic leaks
- Ensure all lines and hoses are still secured and out of the way of any moving parts
- Ensure all hydraulic hose connections and fittings are securely in place and not broken
- Verify that all threaded fasteners are secure, and that cotter pins are not broken
- Visually inspect wheels to ensure that tread and flange are not severely damaged
- Spin all 4 Rail wheels, noting any bearing noise, resistance, and end play

Any items noted should be repaired using specifications in the manual, to ensure they are repaired to initial install standards.

In case of a major derailment, a complete inspection should be performed, including but not limited to the following:

- Perform all inspection items as listed above in the Minor Derailment section
- Inspect all long arms, pivot arms, and links, to ensure they are not bent, cracked, or broken
- Inspect and test rail brake system (see Section 5.3 or 5.4).
- Ensure spring brackets are securely fastened, and are not bent, cracked or broken
- Ensure all welds are intact and show no signs of cracking or breaking
- Ensure all mounting hardware and brackets are securely fastened, and are not bent, cracked, or damaged in any way
- A full alignment should be performed. See Section 4.8.
- Wheels should be removed and the bore, bearings, races, and insulation (if applicable) should be inspected for any damage. For further wheel details, see Section 7.0 and 8.0 for appropriate wheel and axle assembly drawings.
- Ensure axle threads are not stripped or damaged

Any items noted should be repaired using specifications in the manual, to ensure they are repaired to initial install standards.

Please contact DMF for any assistance you may require.

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4.1 PRE-INSTALL

NOTE:

The proper installation of this equipment is solely the responsibility of you, the installer. When in doubt, contact DMF for assistance.

NOTE:

During Railgear installation, there are 3 different alignments - front Railgear to truck frame, rear Railgear to truck frame, and a final procedure that aligns both sets of Railgear to each other.

4.1.1 Safety Statements

- Always block up gear before getting underneath
- Always use jack stands when jacking up vehicle
- Use personal protective equipment and clothing

4.1.2 Installation Order

This manual presents the installation information in the order that we find to work best. Your shop, tools, personnel or other factors may dictate a different order. This is acceptable as long as the Rail Test, Road Test, and Final Inspection are performed at the end.

4.1.3 Required Tools & Materials

Aside from general shop tools and safety equipment the following tools will be required:

- Arc or MIG welder
- Surge protector (protects ECM from damage during welding)
- Cutting torch
- Hand grinder
- Frame drill
- Air saw
- Angle finder
- Test rail – see Section 4.2.4
- Hydraulic oil for PTO (if equipped): ASTM D6158 HM (Unax RX-46 hydraulic oil, Shell Tellus EE 46 or equal), or some customers operate on Dexron III ATF fluid
- Hydraulic oil for 12 VDC hydraulic power unit: Dexron III ATF fluid
- Wheel bearing grease / grease fittings:
 - **Factory standard:** Citgo Syndurance Premium Synthetic 460 #2
 - **Warm climates:** Mystik JT-6 Hi-Temp Multi-Purpose Grease #2 (or equivalent)

Additionally the following tools are recommended:

- Transmission jack, motorcycle lift, pallet jack or forklift
- Overhead crane
- Work lights
- Wheel dolly

4.1.4 Bolt Torque Specifications

See following page for recommended torque specifications.

TITLE: Purchased Fastener Torque Specifications

PURPOSE: To establish production methods for the installation of commonly purchased threaded fasteners.

COMMON USAGE: Most areas of multiple part assembly and retention.

PARTS GENERALLY ENCOMPASSED BY THIS PROCEDURE: Most common sizes of SAE J429 Grade 5 and 8 and of ASTM A574 socket head cap screws.

PROCEDURE:

A) Identify the fastener as either fine or coarse thread, select the appropriate chart below.

B) Identify the fastener size (diameter and threads per inch), select the appropriate row in the chart selected.

C) Identify grade of the bolt.

D) Read across the size row and down the grade column. The intersection of row and column gives torque.

FINE THREAD BOLTS

SIZE (DIA-TPI)	SAE J429 GRADE 5 (3 MARKS) PLATED (FTLB)	SAE J429 GRADE 8 (6 MARKS) PLATED (FTLB)	ASTM A574 SOCKET HEAD CAP SCREW (FTLB)
1/4-28	6	8	12
5/16-24	12	15	24
3/8-24	21	27	43
7/16-20	33	43	68
1/2-20	51	66	105
9/16-18	72	96	-
5/8-18	100	135	202
3/4-16	180	223	354
7/8-14	260	350	564
1-12	390	530	860
1 1/8-12	540	750	-
1 1/4-12	745	1050	1697
1 3/8-12	-	-	2288
1 1/2-12	1320	1850	3001

COARSE THREAD BOLTS (MATCHING HEX NUTS)

SIZE (DIA-TPI)	SAE J429 GRADE 5 (3 MARKS) PLATED (FTLB)	SAE J429 GRADE 8 (6 MARKS) PLATED (FTLB)	ASTM A574 SOCKET HEAD CAP SCREW (FTLB)
1/4-20	5	7	10
5/16-18	19	14	22
3/8-16	19	24	38
7/16-14	30	38	61
1/2-13	45	59	93
9/16-12	66	84	-
5/8-11	90	120	179
3/4-10	160	200	317
7/8-9	240	320	511
1-8	360	480	767
1 1/8-7	480	670	1087
1 1/4-7	670	930	1533
1 3/8-6	-	-	2010
1 1/2-6	1170	1650	2668

COMMENTS:

A) Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress capacity (such as Never-Seez, graphite and oil, molybdenum disulphide, colloidal copper or white lead) are applied, multiply the torque values in charts by 0.90. The use of Loctite does not affect the torque values in charts.




B) All values are in Foot-Pounds (FTLB). Multiply by 12 for Inch-Pounds.

C) Flat washers of equal strength must be used.

D) Bolt manufacturer's specs should be used when available.

E) Values shown are for Nylock nuts or Grade C prevailing torque nuts.

F) Never re-use a highly stressed, torque fastener: IT MAY FAIL!

	07/15/15	UPDATED ALL TORQUE VALUES, REMOVED PLAIN TORQUE SPECS		DJJ	
	12/29/99	ADDED RECOMMENDED TORQUE CHART		LOR	
REV	DATE	DESCRIPTION			BY APP
TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS FRACTIONAL: ± 1/32" FRACTIONAL, OTHER: ± 1/16" X: ± .063 .XX: ± .030 .XXX OR .XXXX: ± .005 DRILL SIZES: ± .005 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES		DRAWN BY: TSH APPD BY:		TITLE: PRODUCTION PROCEDURE 006 FASTENER TORQUE SPECIFICATION DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512	
		DATE: 06/02/94		DRAWING NUMBER: PP006	REV: B

4.1.5 Welding Information

- Dual Shield Wire spec. → AWS E71T-1
- Low Hydrogen spec. → AWS E-7018

Low Hydrogen Electrodes (AWS E-7018)

Manufacturer	Equivalent Rod
Air Products	AP-7018, 7018IP
Airco	7018C, 7018-A1
Arcos	Ductilend 70
Air Products	170-LA, SW-47,616
Chemtron	170-LA, SW-47,616
Hobart	718, 718-SR
Marquette	7018
McKay Co	7018
Reid-Avery	7018
Uniblaze	7018
Westinghouse	Wiz-18
Lincoln	Jetweld LH-70

Table 4.1.5 Manufacturer Equivalent Welding Rod

4.2 INITIAL INSTRUCTIONS

4.2.1 Work Area

The area in which the Railgear installation is to occur should meet minimum requirements in order to facilitate the process and provide adequate conditions in which the work can be completed safely, accurately and in a timely manner.

- Floor - The floor should be level in order to provide good measurements required to check the alignment of the Railgear.
- Lighting - The work area should be adequately lighted.
- Space - There should be enough space to maneuver the Railgear components into position and to safely work around other equipment.

4.2.2 Truck Condition

Before installation, the truck should be checked in some important areas:

- Tires - The tire pressure should be checked for the manufacturer's recommended inflation and for consistent pressure readings from all the tires. This will ensure correct traction of the tires on the rail. The condition of the rear tires needs to be evaluated. If the rear tires are worn, they should be replaced.
- Alignment - Rear truck axle must be square with truck frame. DMF recommends that a reputable alignment shop check this. 0-degree thrust angle (which may be different than the factory specification) is required for proper Railgear operation.
- Frame & Suspension - On a new truck, these should be in good condition. On a used truck, the frame should be inspected to ensure that it has not been damaged or bent. The suspension bushings should also be examined for excessive wear and replaced if necessary. If any problems in these areas are not corrected, it will cause difficulties aligning and operating the Railgear.
- Transverse Torque Rods - On vehicles that will regularly experience high center of gravity loads on rail (e.g. spray trucks, material loaders), it is advisable to install rear tandem

control rods to limit transverse axle displacement. This is also necessary on long wheelbase vehicles to prevent front tandem walking off in curves.

4.2.3 Hydraulic System

The truck should have a hydraulic system installed before installing the railgear. Hydraulic pressure will be needed to assist during the installation process. Please see Section 6.0 for information on installing or modifying an existing hydraulic system for Railgear.

4.2.4 Front and Rear Installation Rails

For proper tire traction on rail, it is necessary to have access to rail during installation. If not available, a set of installation rails can be fabricated as detailed below in Figure 4.2.4. Drive the truck up onto the rear installation rails making sure the rail aligns with the vehicle rear axles. The rails should align with the rear inside tires and suspend the outside tires off the floor. The Front Installation Rails are not needed at this point.

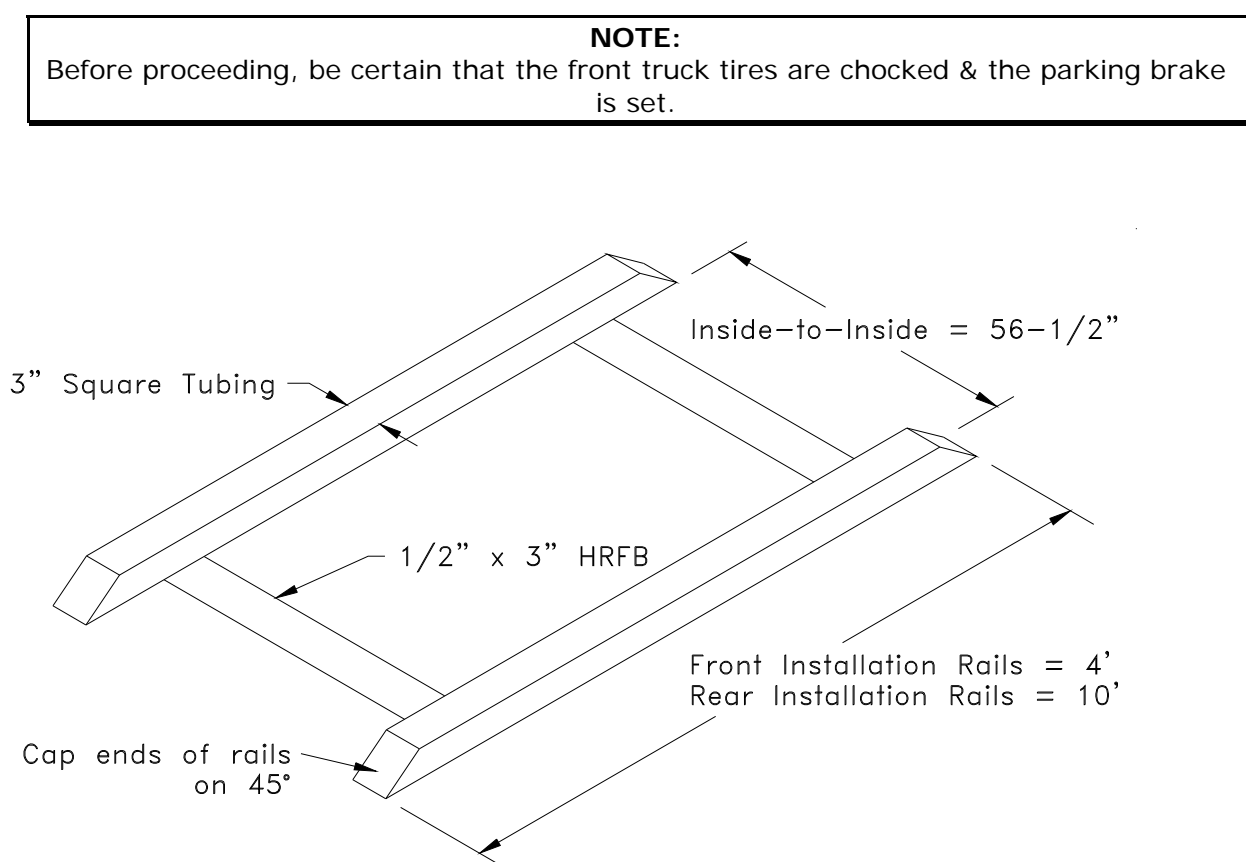


Figure 4.2.4 Installation Rails

NOTE:
Inside-to-Inside measurement of 56-1/2" is the standard gauge for the United States. If your equipment is to be operated on any other gauge, adjust measurements according.

4.3 INSTALLATION OF REAR RAILGEAR

NOTE:

Only use GRADE 5 bolts when attaching rear bracket on the truck frame. The rear bracket should break away from the truck frame in an accident otherwise it will damage your truck frame.

4.3.1 General Information

There are several items to note before you begin the installation of the rear Railgear:

- Before you begin Railgear installation, please read installation instructions for the options you have ordered. Some options may affect the Railgear installation process.
- It is important to note that there is a difference between “shims” and “spacers”. Shims are vertical fillers, used to fill in the gaps between the truck frame and rear mounting bracket side plates. Spacers are solid steel pieces varying in thickness, used between the rear mounting bracket and the bottom of the truck frame to achieve proper weight settings between the truck tires and rail wheels while on rail.
- Spacers used in adjusting the height of the rear bracket must be solid steel pieces because they will experience the full structural load seen by the rear frame.
- When setting the height of the rear bracket using spacers you must be within the range of ½” minimum to 3” of spacers maximum. If you are outside of this range it may be necessary to change out your links. See Section 7.0 for different link measurements and contact DMF for final consultation before ordering a different set of links. DMF will not be responsible if the links are changed from the initial order without consulting with DMF.
- Before permanently affixing your rear bracket to the truck frame (including welding or drilling holes), be aware that during the locating, shimming (if necessary), spacing, squaring, and weight setting procedures, your rear bracket will be making slight movements during each of these steps. So you will want to only TEMPORARILY secure Railgear using clamps, chains, fork lift, etc. after each procedure.
- The rear Railgear is usually installed with the safety pin-offs (manual, cable or air operated) facing towards the rear of the truck. However, truck work body may dictate locating the safety pin-offs on the front side. If the rear pin-offs must be located toward the front and the Railgear is supplied with insulated rail wheels, make sure to swap the left and right rail wheels. See Section 7.3. The insulated rail wheels should always be on the driver’s side of the Railgear.
- It is important that the truck tire pressure (especially the rear tires) be checked and brought to the tire manufacturer’s intended pressure for a given load. Reference your tire manufacturer’s load rating and inflation chart. Inflating tires to their max side wall pressure may result in drastically reduced contact with the rail if under-loaded.
- If the rear truck frame does not extend the minimum of 19-1/4” for single axle trucks, it should be properly lengthened to provide the necessary mounting clearance for the Railgear.

4.3.2 Diagram of Key Components

Figure 4.3.2 shows the individual parts of the installed rear Railgear. Please familiarize yourself with these item descriptions as they will be used throughout this installation manual.

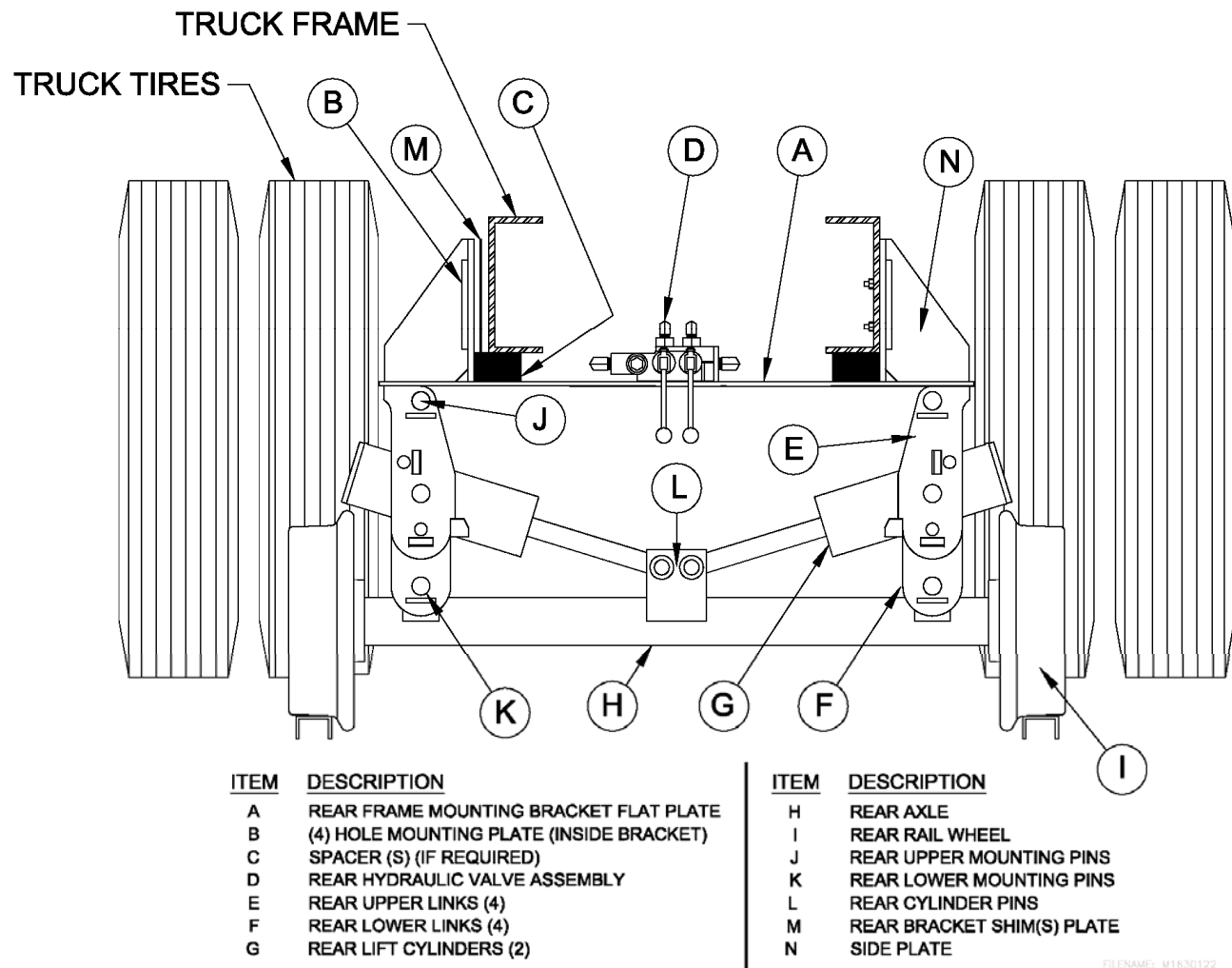


Figure 4.3.2 Diagram of Key Components

4.3.3 Location of Rear Railgear

Position the rear Railgear as close to the rear tires as practical (allowing clearance for mud flaps). Table 4.3.3 gives standard location and clearance guidelines for the rear Railgear and these dimensions are shown in Figure 4.3.4. Generally, leave a minimum of 2" clearance to any tire, spring, or suspension components.

Minimum Distance from:	Single Axle:
Rear Tire to Rail Wheel Center	13-1/4"
Min. Truck Frame Extension (from rear edge of tire)	19-1/4"
Minimum Clearance Area (from rear edge of tire)	20-1/4" x 19"

Table 4.3.3 Location of Rear Railgear

4.3.4 Location and Clearance of Rear Railgear

The Railgear typically drops straight down, but it can also articulate from side-to-side to allow alignment of the vehicle with the rail. A clear space of 19 inches must extend outward from each side of the frame in this area to allow for proper articulation (see Figure 4.3.4). It is important that nothing encroach upon this space (e.g., outriggers, lift-gates, and body tie-down bolts).

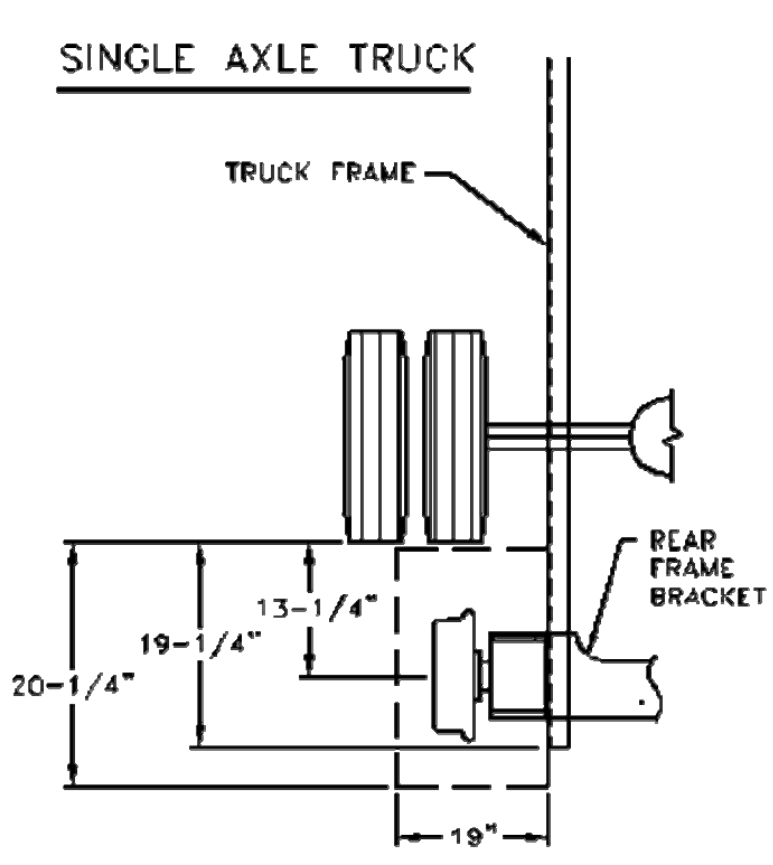


Figure 4.3.4 Location and Clearance of Railgear

4.3.5 Shimming and Temporarily Spacing Rear Bracket

Once Railgear is correctly located on rear frame, as above, if more than a 1/16" gap exists between the rear Railgear bracket side plate and the side of the truck frame, install equal amount of shims on each side to fill the gap, thus keeping the Railgear bracket centered. Note that DMF provides shims of different thicknesses, and it is important that the same amount of shim measurement is achieved on both sides.

With the rear bracket correctly located against bottom of frame rail and centered, there are two differing methods of setting a preliminary weight setting:

1. The first method is to measure from top of rear bracket plate to floor, and adjust bracket with temporary spacers, as shown in Table 4.3.5.A for RW-1212 Railgear and 4.3.5.B for RW-1420. This should provide a good starting point for final weight setting.

	24"	25"	26"	27"	28"	29"	30"	31"
Xtra Short Links	0"	1"	2"	3"				
Short Links			0"	1"	2"	3"		
Long Links					0"	1"	2"	3"

Table 4.3.5.A RW-1212 Shimming Chart

	25"	26"	27"	28"	29"	30"	31"	32"
Xtra Short Links	0"	1"	2"	3"				
Short Links			0"	1"	2"	3"		
Long Links					0"	1"	2"	3"

Table 4.3.5.B RW-1420 Shimming Chart

2. The second method is to insert the minimum (1/2") or maximum (3") of spacers, and then during the final weight setting, add or remove spacers as appropriate until optimal weight setting is achieved.

Once spacers are positioned, temporarily clamp, chain, or otherwise secure rear Railgear to truck frame. Keep in mind that the spacers and the rear bracket may have to be adjusted for final weight setting and squaring/aligning with the truck axle.

4.3.6 Square Rear Railgear with Truck Axle

The Rear Railgear needs to be made absolutely square with the rear truck axle. Four measurements (shown in Figure 4.3.7) need to be taken to ensure this requirement:

1. The distance from the truck axle to the rear Railgear axle at each end. In Figure 4.3.6, distance "A" must be equal to "B" (within 1/8"). This is an important alignment check.
2. The diagonal from the truck axle to the opposite rear rail wheel. In Figure 4.3.6 distance "C" must be equal to "D" (within 1/4").

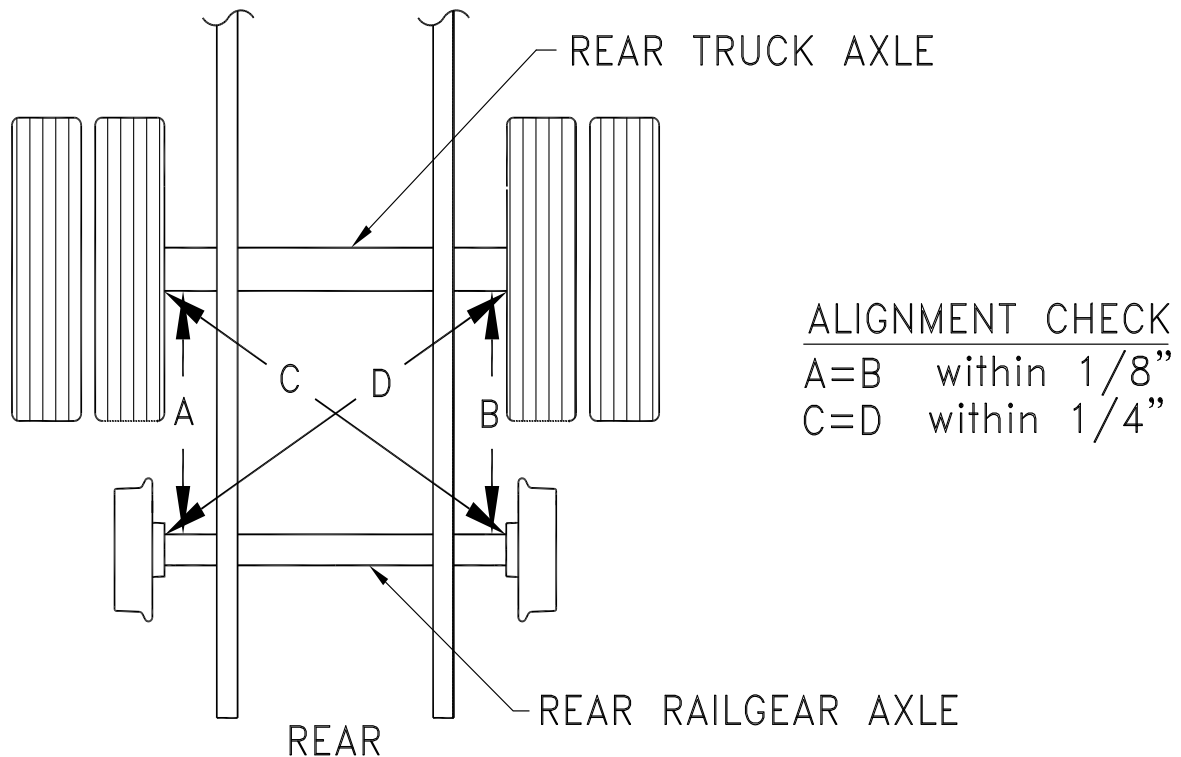


Figure 4.3.6 Squaring Rear Railgear

NOTE:

Although the previous mounting conditions and alignment may be met, be certain that enough room exists between the Rear Railgear and other equipment. In general, this should include a 2" clearance around the Railgear (more clearance will be needed if Remote Pin-offs are installed). Also ensure that there is clearance to remove the Pin-Offs from their holes.

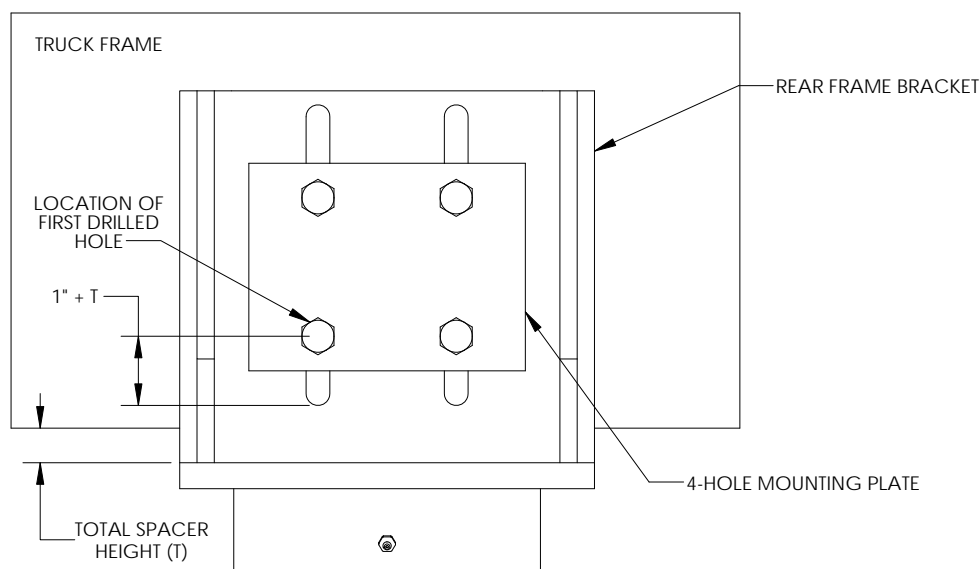
4.3.7 Temporarily Securing Rear Bracket

Now that the rear bracket is correctly centered, vertically positioned, and aligned, measure 1" up from the bottom of the slot in the rear bracket slide plate, and drill your first 5/8" hole through the shims (if applicable) and truck frame. If any spacers are installed, add the total spacer height to 1" dimension, see Figure 4.3.8. Align this first hole with the 4-hole mounting plate, ensure that the mounting plate is level, and then drill the additional 3 holes. Once all 4 holes are drilled, install four 5/8-11 Grade-5 bolts and secure them with the appropriate washers and nylock nuts. Repeat this mounting bracket procedure for the other side of the Railgear. Temporarily tack weld the mounting plate to the rear frame bracket. If re-adjustment is later needed, the welds may be ground off, and the rear frame bracket may be slid up or down by loosening the bolts in the slots. Also, temporarily tack the spacers into place, so that if further adjustment is necessary, the welds can easily be ground off and spacers added/removed as necessary.

NOTE:

Only use Grade 5 bolts on rear Railgear.

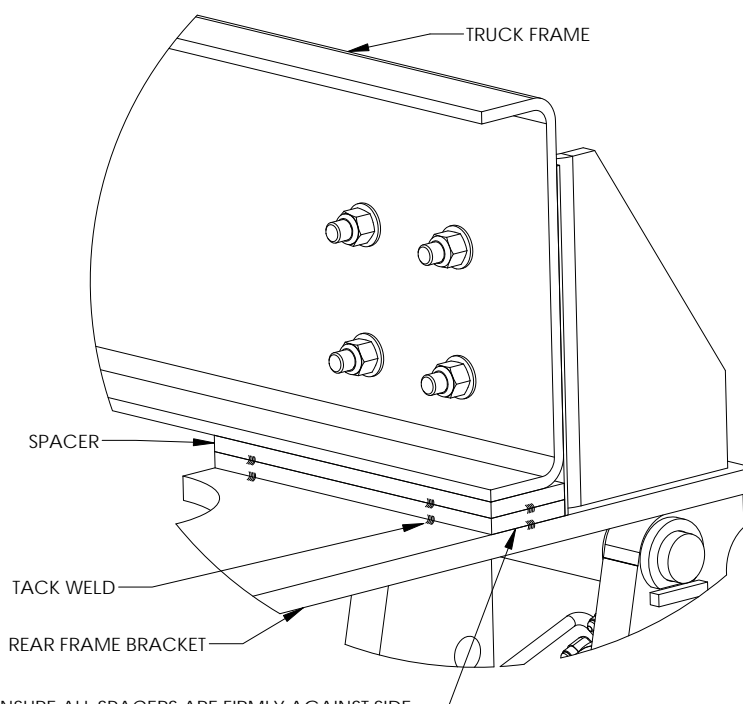
4.3.8 Mounting Plate Installation



ONCE THE REAR BRACKET IS CORRECTLY CENTERED, VERTICALLY POSITIONED, AND ALIGNED MEASURE 1" UP FROM THE BOTTOM OF THE SLOT IN THE REAR BRACKET SIDE PLATE, AND DRILL FIRST 5/8" HOLE THROUGH THE SHIMS (IF APPLICABLE) AND TRUCK FRAME. IF ANY SPACERS ARE INSTALLED, ADD THE TOTAL SPACER HEIGHT TO 1" DIMENSION.

Figure 4.3.8 Mounting Plate Installation

4.3.9 Tack Welding of Spacer



ENSURE ALL SPACERS ARE FIRMLY AGAINST SIDE BRACKET OR SHIMS & ALIGNED WITH THE REAR MOUNTING BRACKET. TACK WELD SPACER TO MOUNTING BRACKET AS SHOWN. IF MULTIPLE SPACERS ARE USED, SPACERS NEED TO BE TACK WELDED TO ONE ANOTHER AT THE REAR & TACKED ON THE SIDES IF POSSIBLE.

Figure 4.3.9 Tack Welding of Spacer

4.3.10 Final Rear Railgear Alignment and Weight Settings

Rear Railgear alignment and weight settings can only be performed after front Railgear is installed. The procedures for these final steps can be found in Section 4.8.

4.4 VARYING FRONT RAILGEAR CONFIGURATIONS

Due to the numerous variations between chassis, DMF has designed several different mounting configurations to supply our customers with the perfect fit for their application. These configurations fall into two main categories as listed below. Each of these categories, though similar, requires varying installation procedures. Please identify which category pertains to your application and familiarize yourself with the installation procedure prior to beginning.

4.4.1 Traditional Long Arm Assembly

This style of assembly is the most common and attaches to the front axle leaf springs and to the chassis frame with a stationary pin. This design allows the front rail wheels to ride on the chassis suspension alleviating vibration from track irregularities.

4.4.2 Cargo Arm Assembly

This style of assembly is normally used when chassis components (such as a low-hanging radiator or steering components) prohibit the use of the traditional long arm configuration. It is attached to the chassis by way of brackets on the front leaf springs.

4.5 TRADITIONAL LONG ARM ASSEMBLY INSTALLATION

4.5.1 General Information

There are several items to note before you begin the installation of the front Railgear:

- The Railgear unit that we have shipped to you has been designed for your specific truck. Before starting the front Railgear installation, check the vehicle's front tire spacing. The front Railgear operates between the front steering tires; therefore, you must have a minimum of 65" between the tires. If this is not the case, contact DMF.
- Check to see if frame extensions are needed. As seen in Section 8.3, measure your long arm from front to rear mounting pin hole to determine dimension between holes. Starting from approximate installed location of rear mounting pin on Figure 4.5.5, extend a tape measure to the length found in dimension between holes. Raise end of tape measure up toward truck frame – if you contact suitable mounting location, no frame extensions should be needed. If the end of the tape measure is beyond the front of the truck frame, then front frame extensions are likely required. Please contact DMF if you have any questions or for ordering information. Also, see Section 4.5.3 for frame extension installation instructions.
- Check for sufficient clearances to prevent interference with Railgear and other parts of the truck (ie. frame, radiator, steering boxes, shocks, oil filters, etc.). See Section 4.5.7 for complete Clearance Note. If notable clearance issues are found, please contact DMF prior to continuing installation.

4.5.2 Diagram of Key Components

Figure 4.5.2 shows the individual parts of the installed front Railgear. Please familiarize yourself with these item descriptions as they will be used throughout this installation manual.

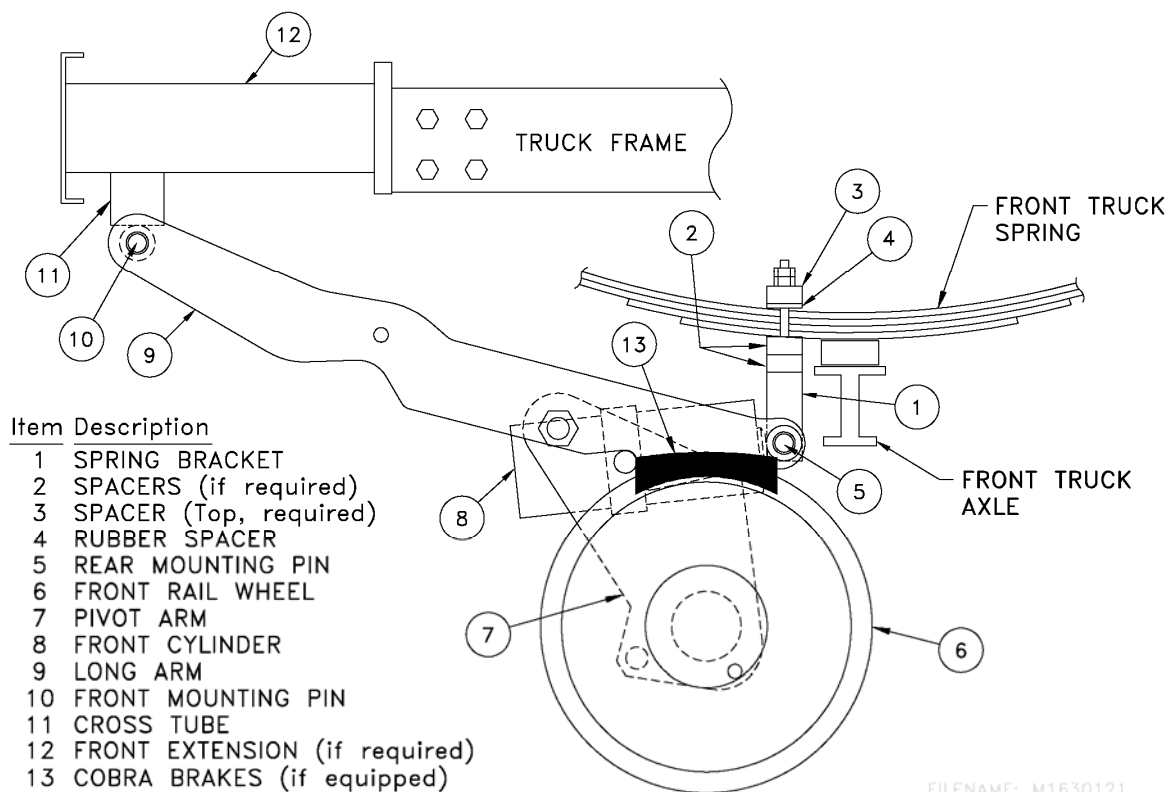


Figure 4.5.2 Diagram of Key Components

4.5.3 Frame Extension Installation

Remove the truck's front bumper. If frame extensions are not required, please skip forward to Section 4.5.4.

Bolt the frame extension to the truck frame (refer to Figure 4.5.5). Make sure that the tilt of the cab's hood will clear the frame extensions. Trim the brackets and re-gusset them if necessary. All truck frame extensions that are bolt-on brackets must use 5/8"-18 Gr. 8 or stronger bolts, hardened steel washers and Gr. 8 prevailing torque locknuts. All of the fasteners should be tightened to torque specs in Section 4.1.4. When choosing bolts, make sure to use a bolt which has threads that begin past the joint seam. See Figure 4.5.3 for an illustration. Check that the frame extension tubes are level front to rear and side to side with the frame.

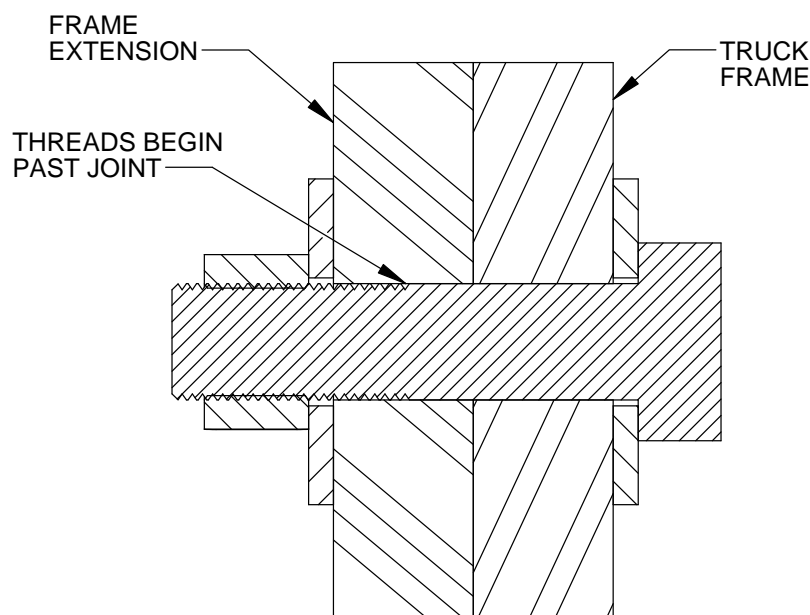


Figure 4.5.3 Bolted Joint Cross Section

NOTE:

DMF front frame extensions are designed to support the Railgear only. It is the installer's responsibility to properly engineer brackets for rail racks, boom rests and etc.

In normal applications, mount the front valve plate assembly between the frame extensions (with the front valve on the underside and the handle facing forward) and weld in place. If this is not possible, mount the valve assembly in the most appropriate and easily accessible location.

4.5.4 Bridge Kit Information

For some trucks, the frame rails are wider than normal to clear vehicle components, such as the radiator. When this occurs, the frame rail is too wide and the cross tubes fall in between the frame rails and a bridge kit is needed to support the cross tubes. There are two different types of bridge kits: below frame rails (Figure 4.5.4.A) and between frame rails (Figure 4.5.4.B). If the correct front mounting pin height can be achieved with a heavy walled square tube below the frame rail as shown in Figure 4.5.4.A, that is preferred. However, if the correct front mounting pin height cannot be achieved because the below frame rail bridge will cause the

front mounting pin to be too low, it is possible to use a between the frame rail bridge with gussets (Figure 4.5.4.B).

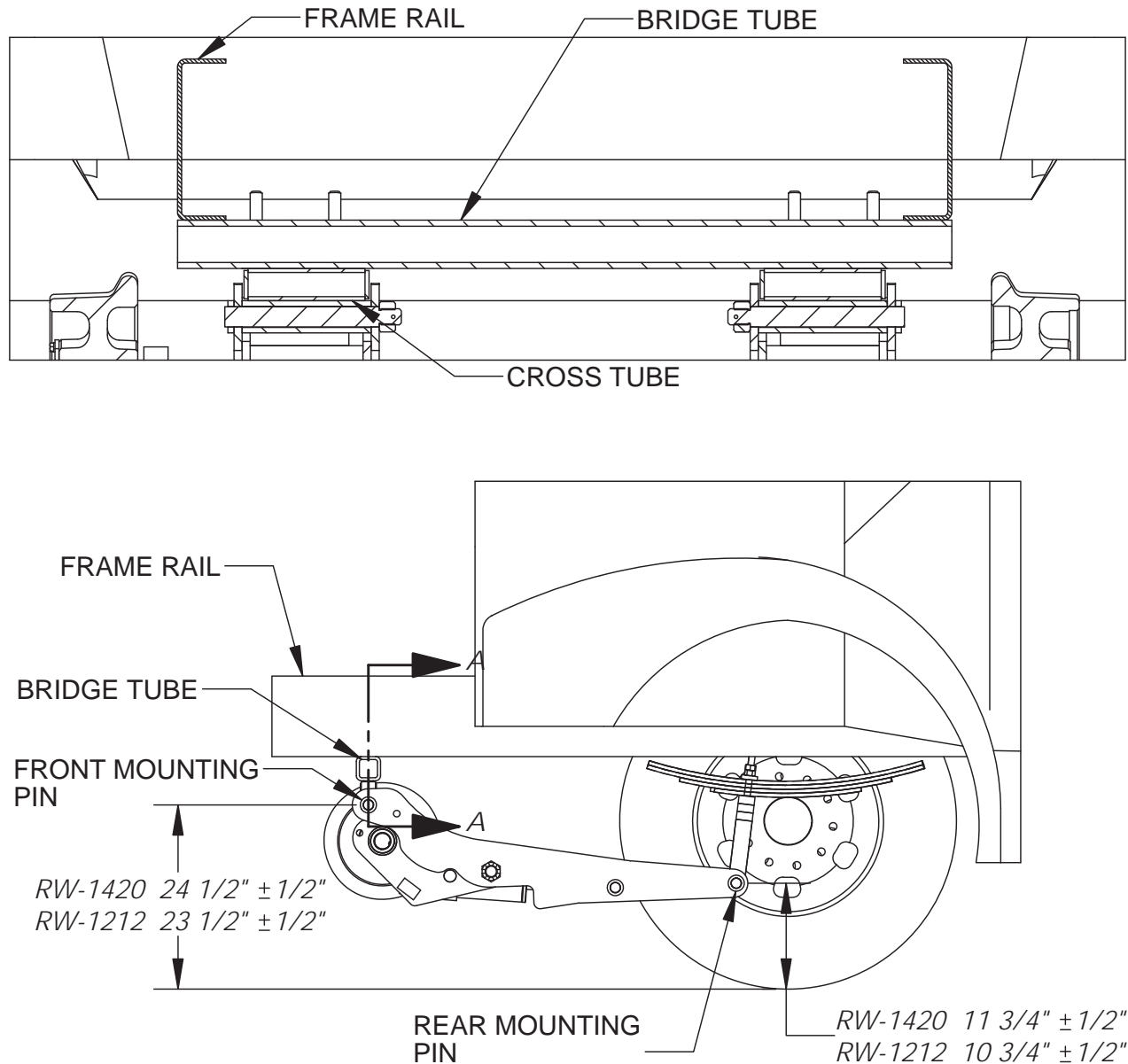


Figure 4.5.4.A Below Frame Rail Bridge Kit

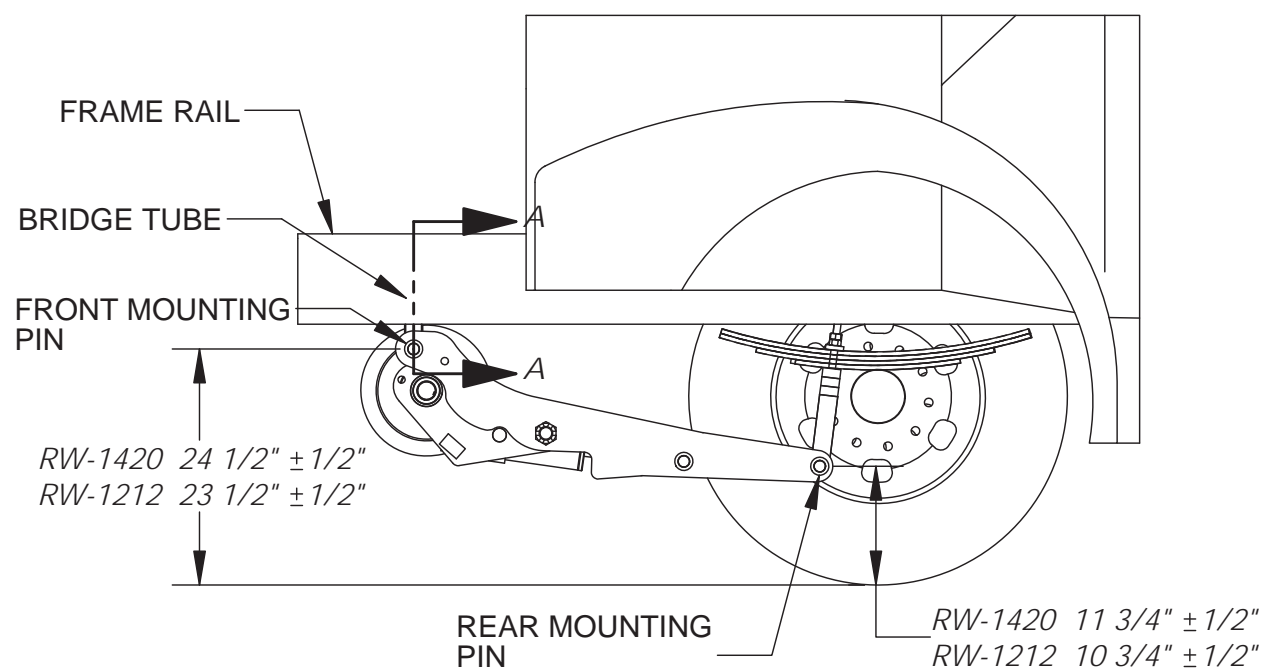
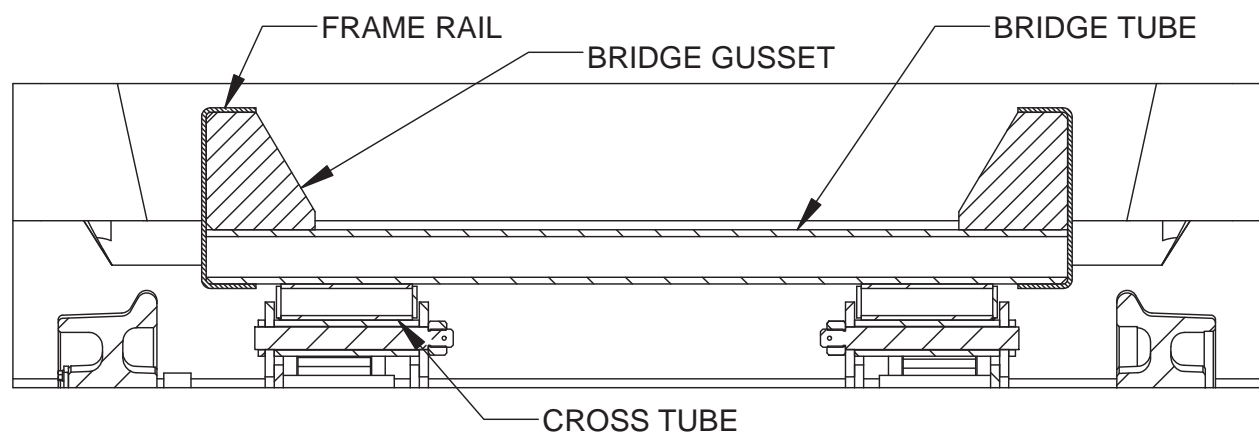


Figure 4.5.4.B Between Frame Rail Bridge Kit

4.5.5 Front Mounting Dimensions

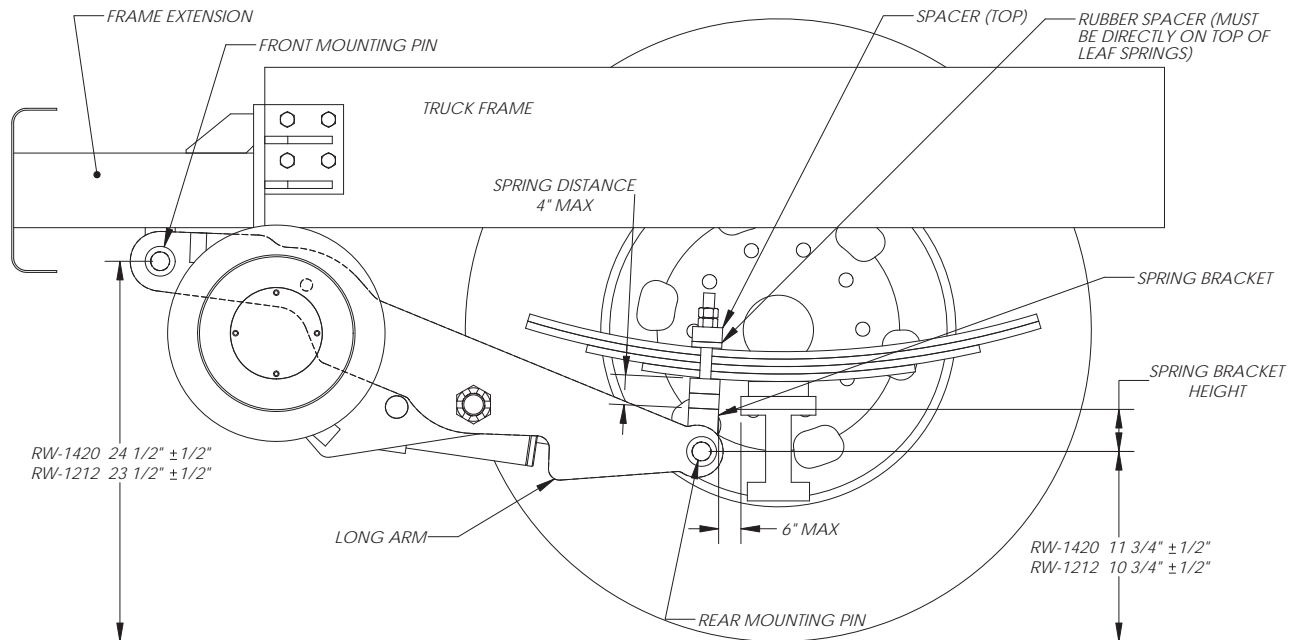


Figure 4.5.5 Front Mounting Dimensions

NOTE:

If the vehicle has been supplied with an integral extended front frame, the frame extension will not be required. The cross tubes can be brought up to the extended frame as shown in Figure 4.5.5. Follow all instructions for finding the front mounting pin height with the frame extensions. Solid or load bearing spacers may be required between the cross tubes & the bottom of the frame to obtain the desired height from ground to front mounting pin.

4.5.6 Mount Front Railgear

Mounting spring bracket hangers:

1. Remove the truck's front bumper.
2. Slide the front Railgear under the truck frame, positioning the spring bracket hangers as close as possible to the front truck axle. Make sure at least half of the spacer is seated on the leaf spring closest to the front truck axle. If not, move spring bracket hanger forward to next leaf spring. The spring hanger can be moved 6" max from front truck axle.
3. Once positioned, place a floor jack under the outboard and inboard long arm, close to the spring hanger on the driver's side. Using the jack, raise the spring hanger up toward the truck's leaf springs. You will raise and lower the long arms until the "rear mounting pin" is at the correct height from the floor. See Figure 4.5.5 for dimensions.
4. Once you achieve the desired height, insert 1" x 2" flat bar spacers between spring hanger and leaf spring, up to a maximum of 4". If you need more than 4" of spacers, a change of spring brackets may be required (see Section 8.0 for spring bracket information). Contact DMF for assistance.
5. Once spacers are in place with spring bracket at the appropriate height, attach the spring bracket to the truck spring using a rubber spacer (already supplied) directly on top of the leaf springs, and then a 1" x 2" flat bar spacer (already supplied) on top of the rubber spacer and two 3/4"-10 hex nuts per stud. The top spacer has no effect on the height of the Railgear and is only used for clamping purposes.

6. The nuts should be tightened down until the rubber spacer begins to deform from the downward pressure (**Caution: Do not over tighten**).
7. Repeat process on passenger side.

Route Hydraulic Lines:

1. Route all hydraulic lines as shown in Section 6.0.
2. Engage the PTO and allow hydraulic circuit to self-bleed.
3. Inspect all connections for leaks and tighten as necessary.

Mounting Front Cross Tubes:

1. Ensure that both spring bracket hangers are properly installed before attempting to install front cross tubes.
2. Remove the front pin-offs and set the steering tires straight ahead. The front Railgear can now be actuated with the hydraulic system, which will cause the long arms to be raised up to the frame (see Figure 4.5.5). The cross tubes only need to be brought up to where they touch the frame extension or truck frame (not raised all the way to lift the truck frame and raise the truck tires).
3. To install the front of the front Railgear at the correct height, the center of the front mounting pins must be located at the correct height from the ground (with the truck tires on the ground) as shown in Figure 4.5.5. If required, shim the cross tubes to obtain this height. Any shims used should be load bearing members (no thin wall tubing). If necessary, a different cross tube can be used to obtain the desired height of the front mounting pin, up to a maximum of 3" of shims. If you need more than 3" of shims, a change of cross tubes / mounting block may be required (see Section 8.0 for information). Contact DMF for assistance.
4. Once properly shimmed, the hydraulic system should already be properly positioned to hold the shims in place until alignment can be completed.
5. Check for truck frame, spring, steering gear or other truck component interference with the Railgear (particularly the long arms – see CLEARANCE NOTE in Section 4.5.7). The front and rear mounting pins may be lowered evenly (front to rear and also left to right) to correct a clearance problem. The minimum heights (with railgear stowed for highway travel) are 22" for the front mounting pin and 10" for rear mounting pin. These heights will allow the Railgear to have 8" of ground clearance when stowed. These minimum pin heights are the same for RW-1212 and RW-1420.

4.5.7 Front Railgear Clearance

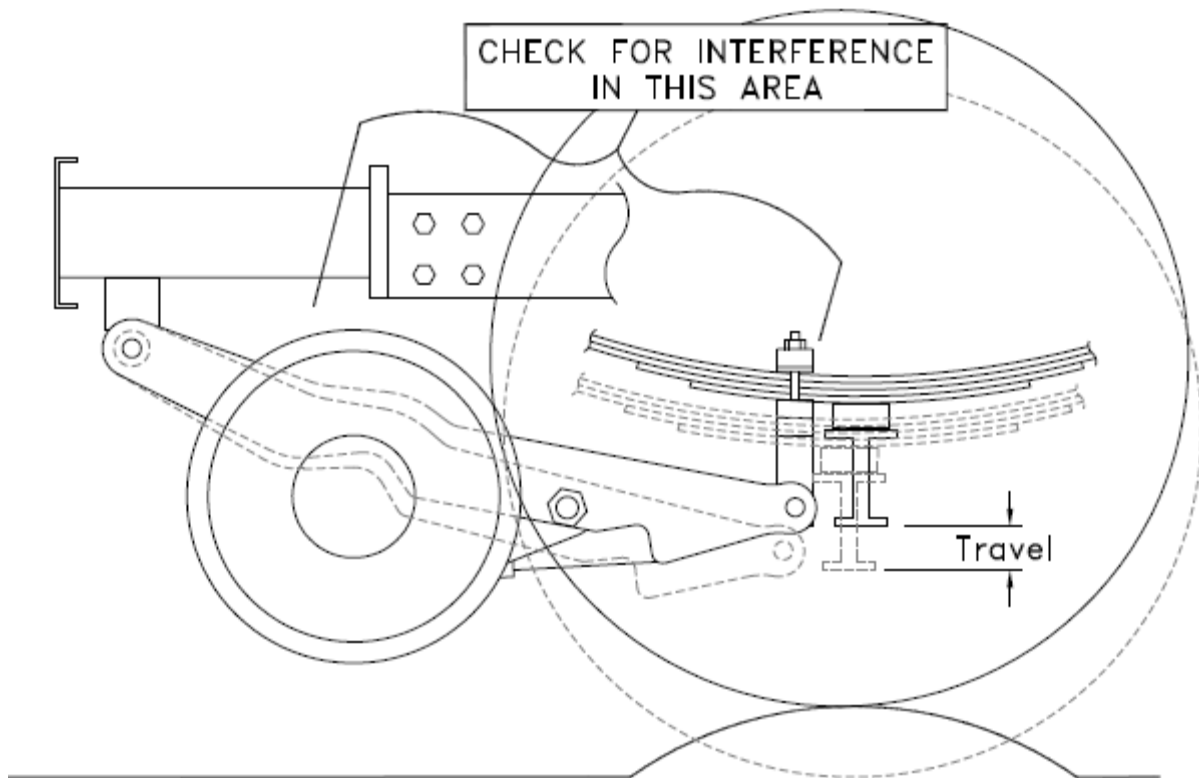


Figure 4.5.7 Front Railgear Clearance

CLEARANCE NOTE:

Proper clearances will allow the Railgear to move up and down with the truck front suspension. As the truck tire hits bumps in the road, the truck spring allows the front axle to move upward (see Figure 4.5.7). Since the Railgear is attached to the spring just in front of the axle, sufficient clearance must be allowed to prevent interference with other parts on the truck (i.e. frame, radiator, steering boxes, shocks, oil filters, spring hangers, hydraulic lines, etc.). The front mounting pin does not move in relation to the vehicle frame because it is fastened through the frame extension or directly to the truck frame. As the front mounting pin does not move and the rear mounting pin (at the axle) does, the Railgear effectively rotates about the front mounting pin. Therefore, the part of the Railgear near the rear mounting pin moves more than the part near the front mounting pin. Attention needs to be paid to the possible clearance problems that can be caused by this movement.

4.6 CARGO ARM FRONT ASSEMBLY INSTALLATION

4.6.1 Front Cargo Arms

In some applications, the front Railgear long arms, which extend to the front frame extensions, interfere with truck components and cannot be used. Cargo arms are a version of the long arms designed to address this issue. The rear of the arms mount to the truck springs in the same manner as a standard set of long arms. The front of the arms mount further forward on the leaf springs to utilize the suspension of the chassis.

4.6.2 Diagram of Key Components / Front Mounting Dimensions

Figure 4.6.2 shows the individual parts of the installed front Railgear. Please familiarize yourself with these item descriptions as they will be used throughout this installation manual.

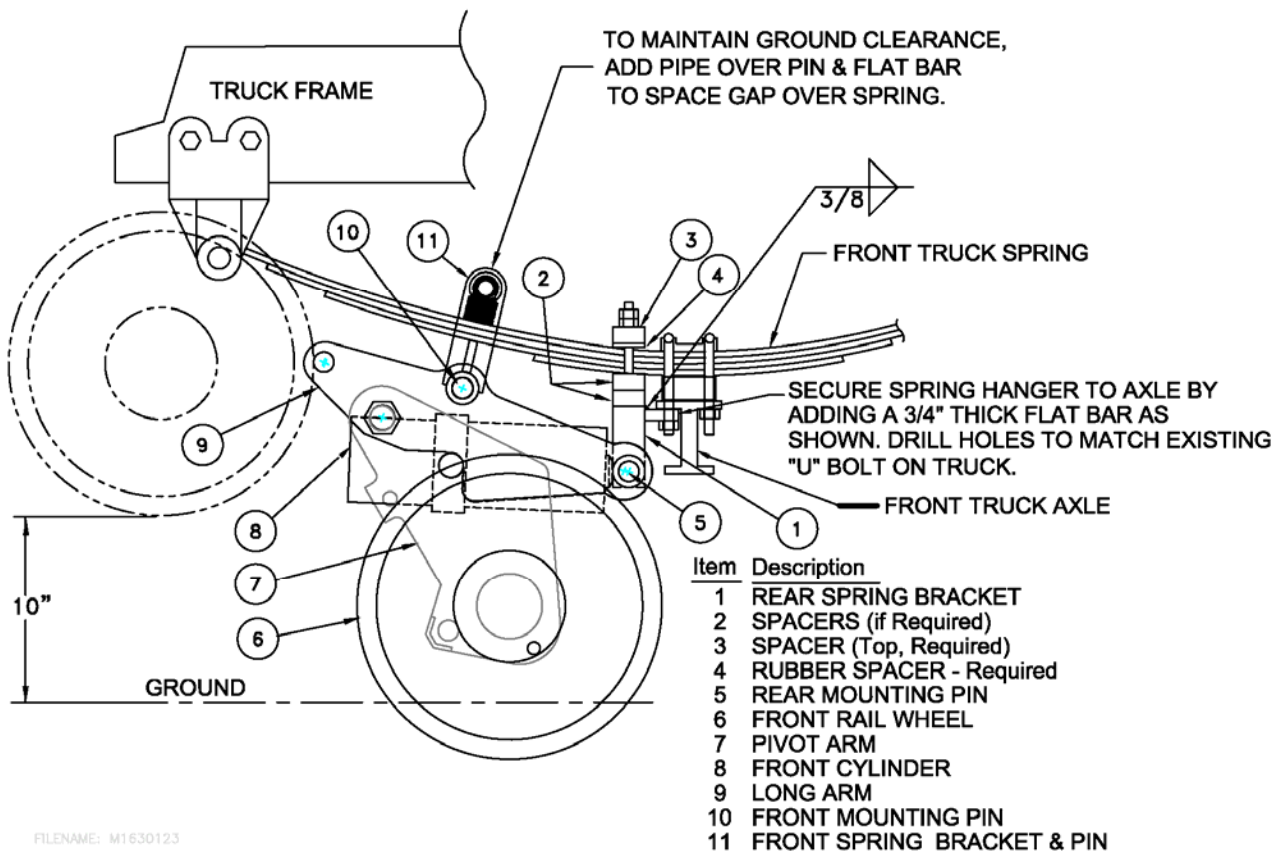


Figure 4.6.2 Diagram of Key Components/Front Mounting Dimensions

4.6.3 Mount Front Railgear

Mounting Rear Spring Bracket:

1. Remove the truck's front bumper.
2. Slide the front Railgear under the truck frame, positioning the spring bracket hangers as close as possible to the front truck axle. Make sure at least half of the spacer is seated on the leaf spring closest to the front truck axle. If the spacer is not at least half-seated, move spring bracket hanger forward to next leaf spring. The spring hanger can be moved 6" max from front truck axle.
3. Once positioned, place a floor jack under the outboard and inboard long arm, close to the spring hanger on the driver's side. Using the jack, raise the spring hanger up

- toward the truck's leaf springs. You will raise and lower the long arms until the rear mounting pin is at the correct height from the floor. See Figure 4.5.5 for dimensions.
4. Once you achieve the desired height, insert 1" x 2" flat bar spacers between spring hanger and leaf spring, up to a maximum of 4". If you need more than 4" of spacers, a change of spring brackets may be required (see Section 8.0 for spring bracket information). Contact DMF for assistance.
 5. Once spacers are in place with spring bracket at the appropriate height, attach the spring bracket to the truck spring using a rubber spacer (already supplied) directly on top of the leaf springs, and then a 1" x 2" flat bar spacer (already supplied) on top of the rubber spacer and two 3/4"-10 hex nuts per stud. The top spacer has no effect on the height of the Railgear and is only used for clamping purposes.
 6. The nuts should be tightened down until the rubber spacer begins to deform from the downward pressure (**Caution: Do not over tighten**).
 7. Repeat process on passenger side ensuring that the back of spring hanger to front of axle web dimensions are equal on both sides.

Route and Attach Hydraulics:

1. Route all hydraulic lines as shown in Section 6.0.
2. Turn on the PTO or 12V DC hydraulic pump and allow hydraulic circuit to self-bleed.
3. Inspect all connections for leaks and tighten as necessary.

Mounting Front Spring Bracket:

1. Ensure that both spring bracket hangers are properly installed before attempting to install front spring bracket.
2. Ensure that the safety pin-off pins are in the highway position. Then place a floor jack under the center of the Railgear axle. Using the jack, raise the Railgear up toward the truck's leaf springs paying close attention to clearances to prevent damaging chassis components. Raise the axle until a 10" (minimum 8") ground clearance is achieved at the rail wheel flange. The rear mounting pin height can also be reduced (minimum 10") as needed to help with rail wheel ground clearance or chassis component clearance issues.

NOTE:

If the required ground clearance cannot be achieved, the front truck axle may have to be blocked down to provide additional clearance. Have this work performed by a professional axle shop that can ensure these changes will not produce unsafe steering geometry or other problems for the vehicle.

3. After achieving proper ground clearance, swing the front spring bracket into position normal to the front leaf springs and insert the upper pin.
4. Weld spacers onto the front spring bracket above or below the leaf springs as shown in Figure 4.6.2. This will restrict the amount of vertical travel while still allowing fore and aft travel as the suspension flexes.
5. Ensure that the safety pin-off pins are removed and actuate the Railgear through its full range of motion to check that there is proper clearance.
6. Since the front mounting bracket is no longer pinned to a fixed point on the truck frame, a permanent attachment is to be made at the truck axle (see Figure 4.6.2). The width of the flat bar depends on the distance between the rear spring hanger and the web of the truck axle "I" beam. The flat bar is to be welded securely to the spring hanger and attached to the axle "U" bolt as shown.

4.7 COMPLETING FRONT INSTALLATION

4.7.1 Align Front Railgear

The front Railgear now is ready to be squared up and aligned. Three measurements need to be taken to ensure that everything is aligned properly.

Long Arms:

1. Check that they are parallel with each other and the truck frame. The outside long arms should be the same distance apart at the Rear Mounting Pin as they are at the Front mounting pin. This prevents the mechanism from binding during up/down operation of the Railgear. Also the distance from the long arms to the truck frame should be the same on each side.
2. Check that they are the same distance forward. Measure the distance from the front mounting pin to a common point in the truck frame. If the measurements are off, square the Railgear by loosening the nuts on one spring hanger and moving forward on the truck spring and re-tighten.
3. Check that the spring bracket to truck axle distance is same on both sides. Measure the distance from each spring bracket back to the truck axle. Since the forward position of the long arms has been verified (check #2 above), an off measurement here probably means the front truck axle is misaligned and needs to be corrected.

After these alignment checks and after ensuring there are sufficient clearances, the frame mounting brackets can be tack welded to the frame extensions.

NOTE:

Do not attach the welding machine ground clamp onto the rail wheels. This will cause arcing across the bearings inside the wheels and lead to premature bearing failure.

Raise the front rail wheels just above the floor, enough to slide the front installation rails into place under the rail wheels. Because the Railgear axle assembly is not fixed to the pivot arms (outside pivot arms will be completely welded at final weld-out), the rail wheels need to be centered. To center, measure the distance from the inside of the rail wheel to the truck frame. If the measurements are off, slide the rail wheels and axle assembly to one side (the axle tube will slide through the holes in the pivot arms).

Depending on the brake configuration used, the axle tube will need to be rotated in order to locate front Railgear components in the right position. The possible configurations are:

Without Brakes:

If the Railgear is not supplied with any brakes, the steering wheel Locks must be aligned. When the front Railgear is in the rail position, these steering wheel locks prevent the front truck wheels from interfering with the Railgear operation.

With Cobra Brakes:

If the Railgear is supplied with hydraulic or air brakes (factory-installed), then they need to be rotated around so that they are oriented in the correct position (see Section 5.3.1 or 5.4.1). For the rest of the brake installation, see Section 5.3 or 5.4.

With the axle tubes now centered and brake configuration determined, the axle tubes should be temporarily tacked. At final adjustment, the tacks can be ground off and the axle re-adjusted if necessary. See Figures 4.7.1.A for diagram of recommended tack locations. The front Railgear is ready to be lowered on the installation rails. As the Railgear is lowered, check the clearance from the truck tire to the rail wheels. If there is any interference, stop lowering the wheels, and retrace the installation steps to fix the problem.

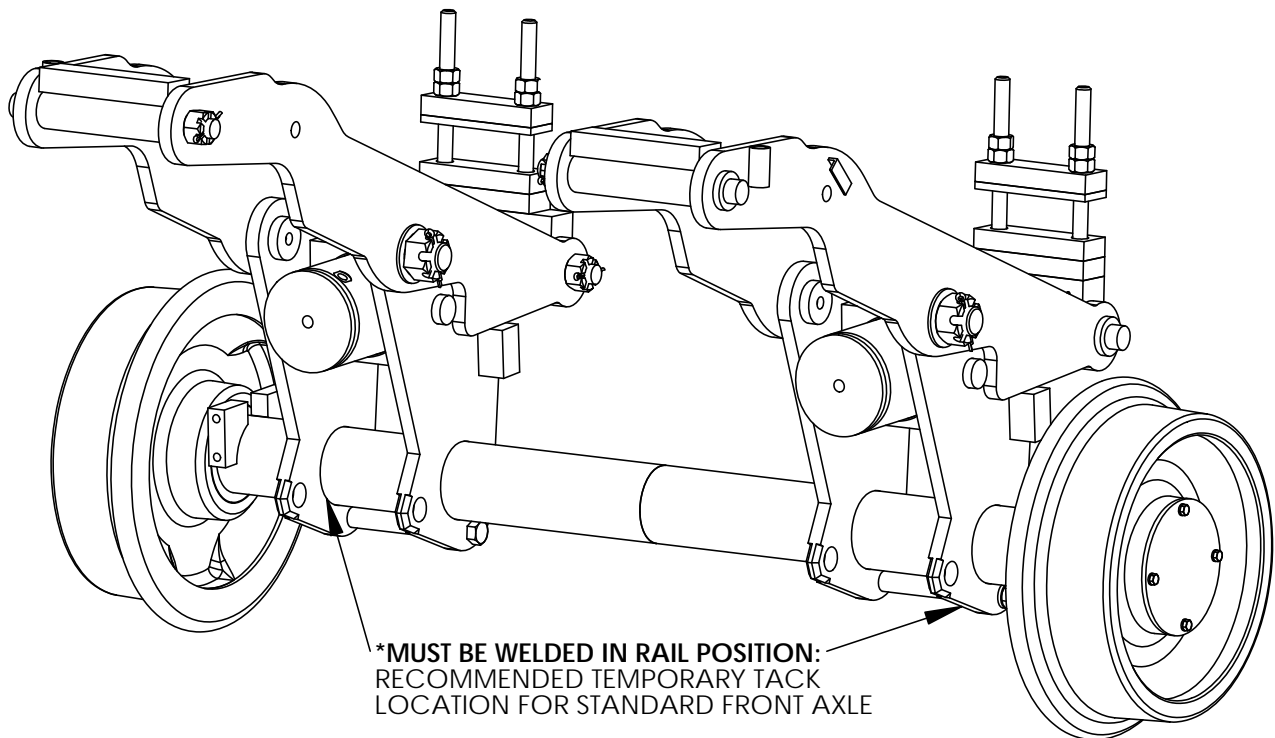


Figure 4.7.1.A Recommended Tack Location for Front Axle

When the Railgear is completely lowered, the front truck tires should be approximately 2 inches above the Installation Rails as shown in Figure 4.7.1.B. If this check is being performed off the rail (such as a concrete shop floor), note that the rail wheel flange is roughly 1.25" tall. The front and rear mounting pins may be lowered evenly (front to rear and also left to right) to provide more tire clearance above the rail. The minimum heights, with railgear stowed for highway travel, are 22" for the front mounting pin and 10" for rear mounting pin. These minimum heights apply to both RW-1212 and RW-1420. These heights will allow the Railgear to have 8" of ground clearance when stowed.

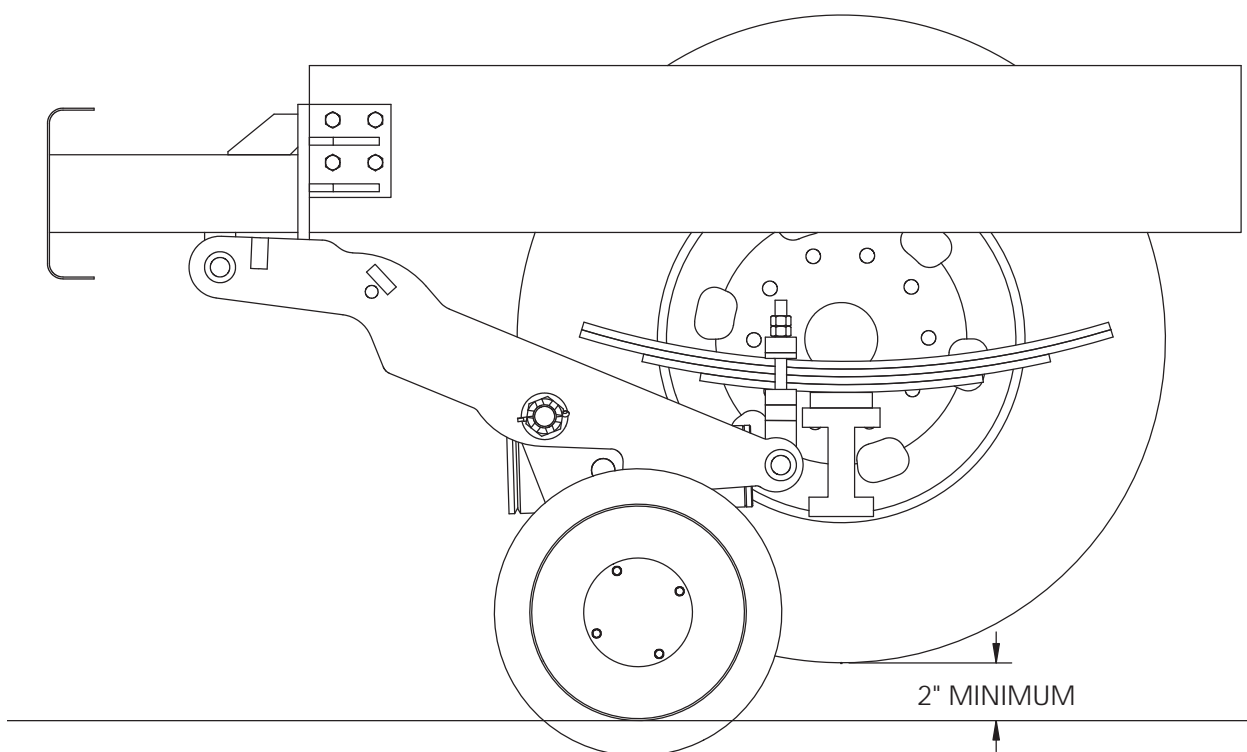


Figure 4.7.1.B Front Tire Clearance Above Rail

If Railgear will not lift the truck, do the following. Check that the cylinders are not cross plumbed, that the system pressure relief valve (if present) is set high enough and that the pressure relief on the front railgear valve is set high enough. As a final review, recheck the center alignment of the rail wheels to the truck frame. If it is off, break the tacks holding the axle tube and slide the axle tube to the correct position and re-tack in place.

4.7.2 Final Steps

If the Spring Bracket location had to be adjusted, make sure that the hex nuts (two per stud) on both Spring Brackets have been tightened. Then with a torch, cut the excess stud length on the Spring Brackets. If these studs are not trimmed down, they may pose a clearance problem with other parts on the truck. See CLEARANCE NOTE and Figure 4.5.7.

NOTE:

Remount the truck front bumper or use 8" standard channel welded onto the ends of the Frame Extensions.

4.8 OVERALL ALIGNMENT PROCEDURE

4.8.1 Overall Alignment Procedure and Final Weight Adjustment

See next page for alignment and weight drawing. Once you have completed the alignment procedure, continue to Section 4.9 for further installation instructions.

With the front and rear Railgear both installed and each squared individually to the truck frame, you must perform a final overall alignment of front to rear Railgear, and also adjust the weight setting.

ALIGNMENT PROCEDURE

A) STEPS 1) and 2) must be completed in listed order and are assumed to be within specifications and should only be addressed, if after alignment of the railgear, excessive flanging occurs.

- 1) Frame should be square, to within 1/8" maximum, on the diagonal.
- 2) Rear drive axle should be square to frame within 1-1/6" maximum on the diagonal to achieve 0° thrust angle. this should be checked by a qualified alignment shop.

B) The following procedure applies to shop or field inspection.

- 1) Check air pressure in all tires. tires should be inflated to the minimum rating of the wheel or tire.
- 2) Place vehicle on straight and level track, or 3" channel to simulate rail. Lower the railgear to the rail so that front to rear and diagonal measurements can be made. (Note: these measurements can be made from any convenient locations, as long as it stays consistent from side to side.
- 3) If diagonal measurement is out of tolerance, adjustment of the front railgear must be made. The procedure for this is as follows (for D-1 & D-2 only): Place shim material between the stop block on the pivot arm (see dwg below) & where it comes into contact with the long arm. The location for the shim is most accessible from behind the front Railgear axle (example: shim on left side, it will push left axle forward). Once proper shimming has been obtained, weld the shim into place on the pivot arm. Max. allowable 1/4" - Contact DMF if outside the maximum range.

RAIL WHEEL LOAD ADJUSTMENT PROCEDURE

Tire traction varies w/ every truck based on several factors such as weight & tire design. It can also vary on the same truck as equipment is added or deleted. Thus, we recommend performing the traction adjustments after all equipment is installed or removed. Since every truck differs, there is no exact procedure. However, we have found the following two methods to be a good guide. The true test is how the vehicle performs on rail.

METHOD #1

Note: Method #1 is a visual procedure of the tire capping on rail.

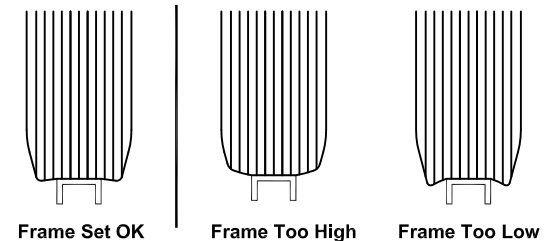
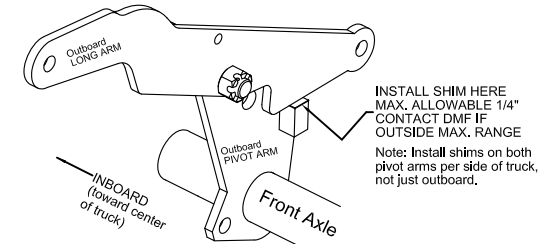
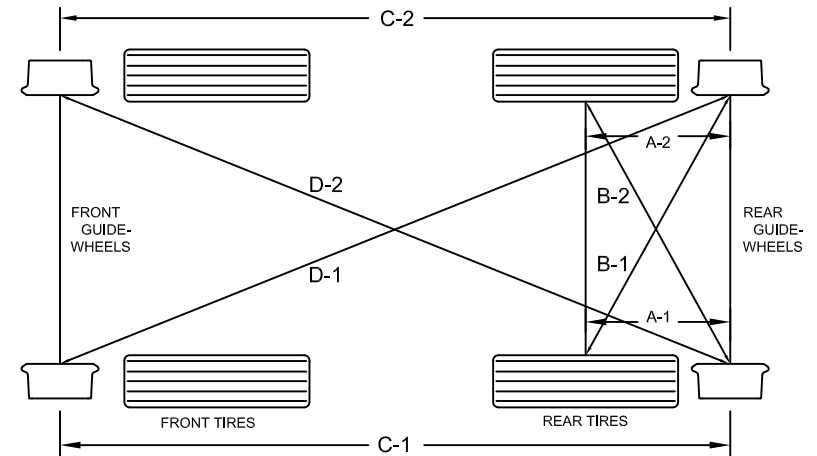
- 1) Grind off the welds on the (2) four hole mounting plates at the rear mounting bracket.
- 2) Loosen the (8) rear bracket mounting bolts.
- 3) Lower the railgear supporting the railgear with a floor jack or with the unit itself.
- 4) Remove or add spacer shim material located between the bottom of the truck frame and the shelf on the rear mounting bracket. Add shim to decrease traction and remove shim to increase traction (ref. side dwg. for illustration of proper tire capping).
- 5) Raise Railgear once again to contact the bottom of the truck frame.
- 6) Re-tighten the rear mounting bracket bolts to 154 ft/lb. torque and re-weld the mounting plates, and shims to the bracket (per rear install detail in section 5.1). If multiple spacers are used, remember to weld spacers to one another.

METHOD #2

Note: Method #2 distributes the vehicles rear axle(s) weight(s) equally over all rear axles, including the Railgear.

- 1) If truck scales are available, weigh the vehicle's rear axle (if tandem, weigh both)
- 2) With front and rear Railgear in the rail position, add or remove shims until rear Railgear axle weight is distributed equally between rear truck axle & Railgear. If truck has tandem axle, the weight should be equally distributed over all 3 axles (tandem & railgear axle - 1/3, 1/3, 1/3).
- 3) Once weight is equally distributed, then raise Railgear to the highway position.
- 4) Re-tighten the rear mounting bracket bolts to 154 ft/lb. torque and re-weld the mounting plates, and shims to the bracket (per rear install detail in section 5.1). If have multiple spacers, remember to weld spacers to one another.

INSPECTOR:			DATE:
SPECIFICATION	S/B = to	SPECIFICATION	TOLERANCES
A-1 _____	=	A-2 _____	± 1/8"
B-1 _____	=	B-2 _____	± 1/4"
C-1 _____	=	C-2 _____	± 1/8"
D-1 _____	=	D-2 _____	± 1/4"



4/17/12	UPDATED AS PER 1630 MANUAL CHANGES	JDI	
9/14/09	UPDATED AS PER 1630 MANUAL CHANGES	JBG	
REV	DATE	DESCRIPTION	BY APP
TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X .063 .XX .030 .XXX OR .XXXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: PA AND 2B BREAK SHARP EDGES (.005 DIA .002 R MAX.)			
DRAWN BY: TSH		APPD BY: APP	
DATE: 12/20/91		DRAWING NUMBER: M1630115	
TITLE: ALIGNMENT PROCEDURE & TEAR SHEET & TRACTION ADJUSTMENT PROCEDURES DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		REV: B	

4.9 RAIL TEST

- Run vehicle forwards and backwards on rail.
- If available, run the vehicle through curves and switches.
- Verify alignment by observing the wear pattern on the wheel and the behavior of the vehicle. If adjustment is required, refer to Section 4.8, for alignment.

4.10 FINAL WELD-OUT

Front Railgear:

- Weld inboard side of outside pivot arm to axle tube all the way around as shown in Figure 4.10.A. The inside pivot arms should not be welded to the axle tube to facilitate ease of disassembly for repair or future maintenance.

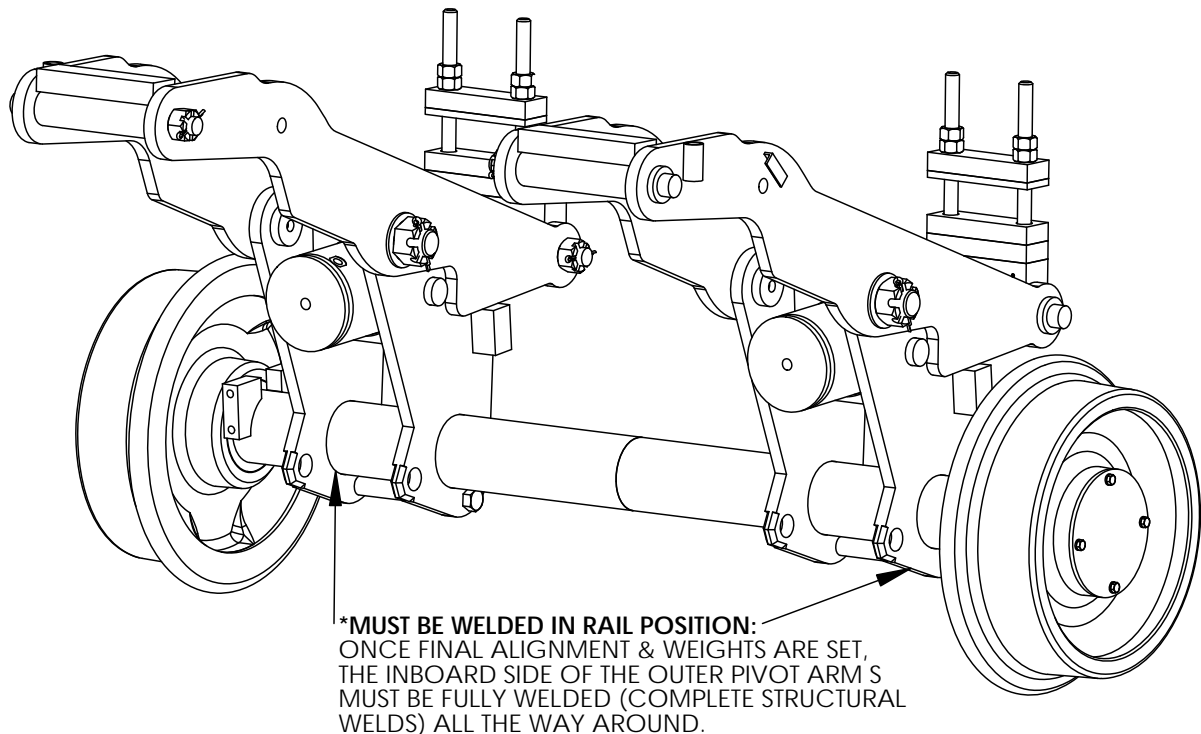


Figure 4.10.A Final Weld-out

- Fully weld, on all sides, front mounting blocks / cross tubes to truck frame.
- If shims were required, fully weld shims into place on all sides for each shim location.

Rear Railgear:

- Weld 4-hole mounting plate to rear frame bracket as shown in Figure 4.10.B.

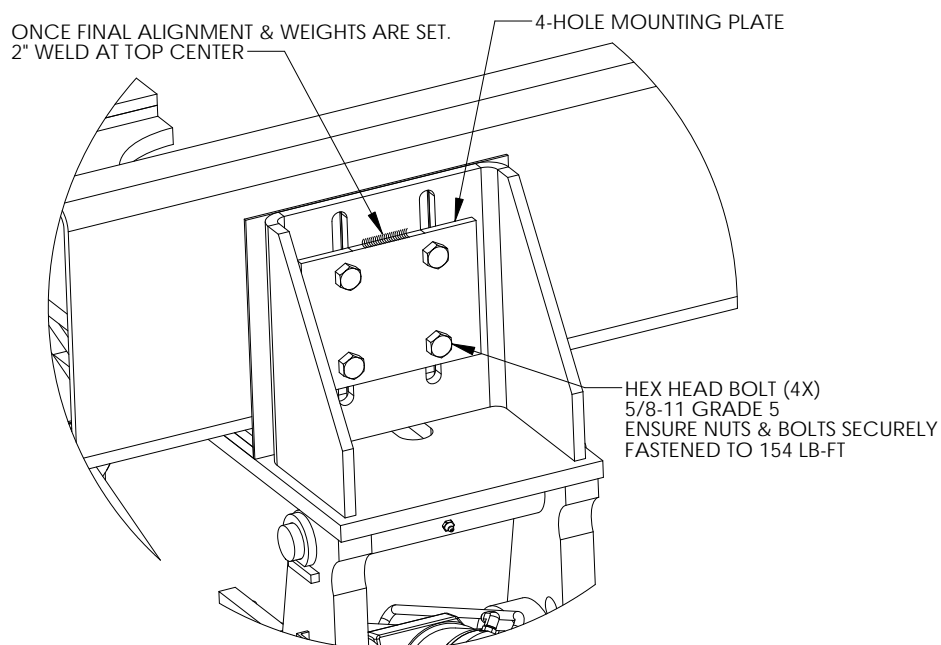


Figure 4.10.B Mounting Plate Weld-Off

- Ensure all spacers are firmly against side bracket and aligned with the rear mounting bracket, then fully weld spacer to mounting bracket as shown in Figure 4.10.C.
- If multiple spacers are used, spacers must be fully welded to one another on the rear, and tack welded on the sides, as shown in Figure 4.10.C.

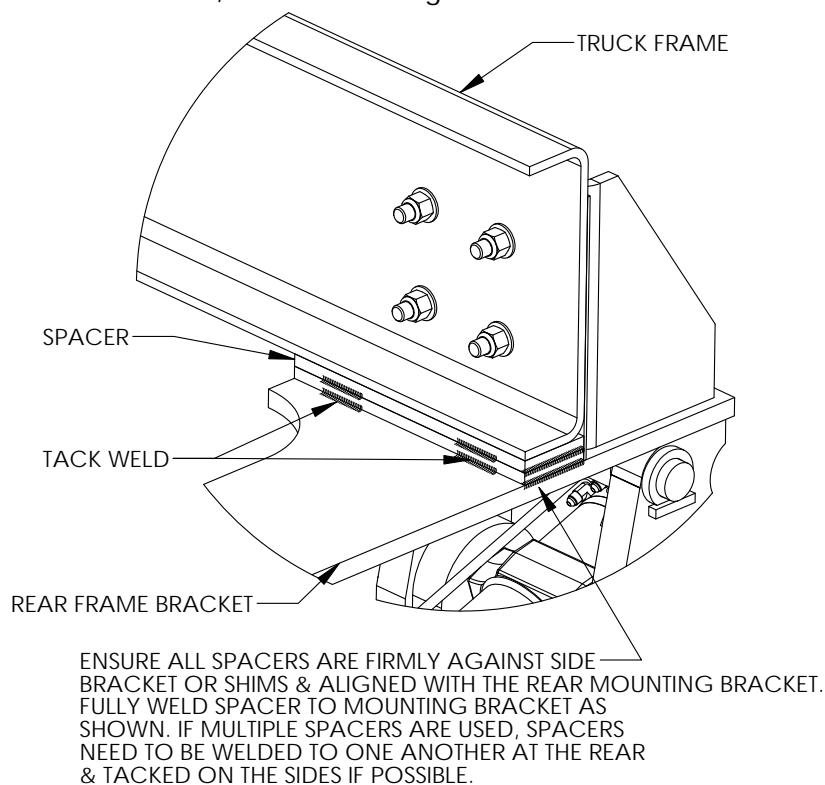


Figure 4.10.C Welding of Spacer

4.11 INSTALL DECALS

Install decal kit 800190 provided with the railgear. This kit includes 2 pages of decals. There is a drawing on the backside of each page to show where the decals belong on the vehicle.

4.12 VELCRO STEERING WHEEL LOCK

Installation Instructions for The DMF Velcro® Steering Wheel Lock

The DMF Velcro® steering wheel lock consists of two 2" wide adhesive backed "hook" strips and a 4" wide piece of "loop" fabric. A piece of adhesive backed hook is placed on the steering wheel column and a second piece placed on the top flat of the steering wheel hub. The 4" wide piece of loop fabric can then be applied to bridge the gap between column and wheel preventing the front tires from accidentally being turned while on the rail. However, in the event of an emergency, the steering wheel can be forcibly turned and the Velcro fasteners will separate allowing the driver to steer the vehicle.

1. Clean the areas where the self adhesive 2" wide "hook" strips will be applied on the steering column and wheel with rubbing alcohol and a clean cloth.
2. Allow the column and wheel to dry.
3. Remove the adhesive backing from the "hook" strips and apply them to the top of the steering wheel hub and the column as close to the wheel-column gap as possible.
NOTE: Trim the strips to fit around obstructions such as hazard light switches.



4. Allow the adhesive to cure for 24 hours prior to attaching the 4" loop fabric.
5. When putting the truck on the rail, position the 4" loop fabric to bridge the gap between the hooks on both the column and wheel as shown below and press firmly.



6. To remove the lock simply pull on the 'D' ring and store the piece of Velcro fabric.

4.13 INSTALLATION REVIEW CHECKLIST

The following checklist is intended to assist the installer in re-checking and verifying aspects of the installation that are often overlooked or forgotten.

- ☐ Check tire pressures.
- ☐ Rail test the truck to check for good traction and braking. A good industrial siding or some authorized track time will be required. Check that Rail wheels with brakes do not lock-up or slide.
- ☐ Adjust the Railgear height as required.
- ☐ Re-check alignment of the Rear Railgear to the rear axle.
- ☐ Weld the Mounting Plate to the Rear Frame Bracket with two 2" welds (at the top center and bottom center). Welding the plates must be done; DO NOT forget to do it.
- ☐ Double check all welds and fasteners, and mounting cotter pins. Tie strap all hydraulic hoses, air hoses, and electrical wires away from exhausts and moving parts. Ensure that all hydraulic and air hoses have sufficient radius at bends.
- ☐ Top off the hydraulic oil in the tank.
- ☐ Verify grease installed at all grease fittings (see section 3.2)
- ☐ Touch-up the black acrylic enamel paint on the Front and Rear Railgear.
- ☐ Raise the Railgear (highway position) and install all of the pin-offs.
- ☐ Apply the Decal Kit.
- ☐ Check Front Alignment:
 - o Front Mounting Pin height: 23-1/2" for RW-1212 or 24-1/2" for RW-1420
 - o Rear Mounting Pin height: 10-3/4" for RW-1212 or 11-3/4" for RW-1420
- ☐ Check Rear Alignment
 - o Tire to Rail Wheel center: Single Axle: 13-1/4" Tandem Axle: 9-1/4"
 - o Minimum Truck Frame extension: Single Axle: 19-1/4" Tandem Axle: 15-1/4"
- ☐ Check overall measurements:
 - o Rear Truck Axle to Rear Railgear Axle (straight): A1 = A2 (within 1/8")
 - o Rear Truck Axle to Rear Railgear Axle (diagonal): B1 = B2 (within 1/4")
 - o Front Railgear to Rear Railgear (straight): C1 = C2 (within 1/8")
 - o Front Railgear to Rear Railgear (diagonal): D1 = D2 (within 1/4")
- ☐ Raise and lower Railgear and verify pin-off at highway and rail positions
- ☐ Verify that all bodywork is replaced and secure.
- ☐ In a parking lot or open area, verify that the truck tires and rims do not contact the Railgear in any bump, droop, or steering position.
- ☐ Check for any rattles and vibration.

SECTION 5.0 RAILGEAR OPTIONS

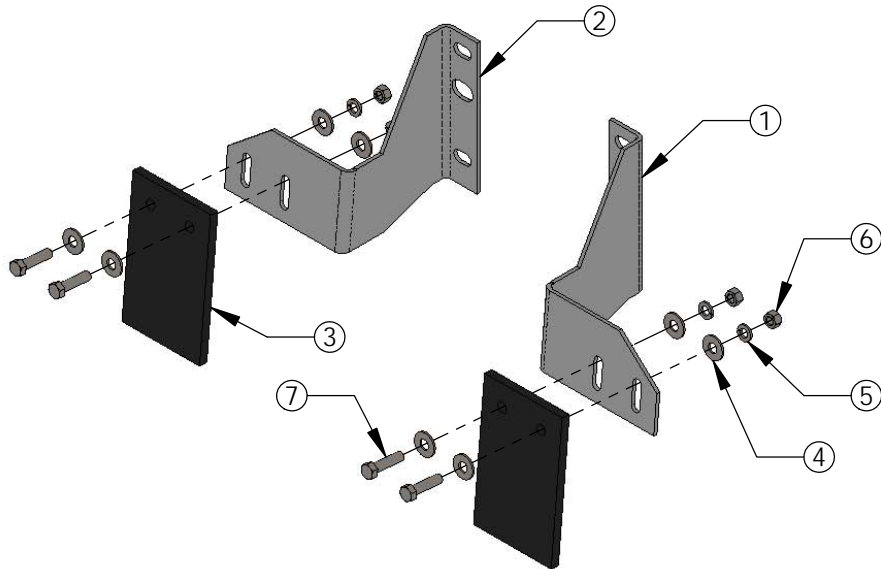
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5.1 RAIL SWEEPS

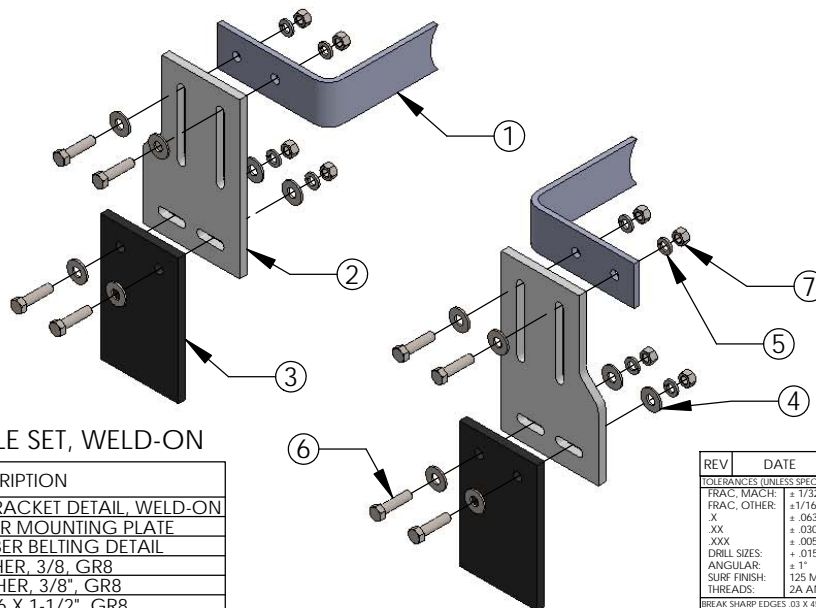
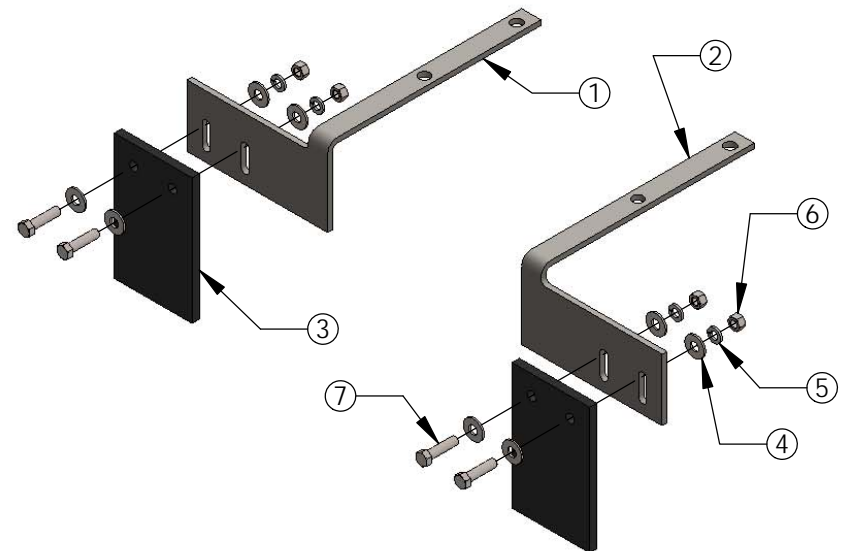
The components that make up the standard front and rear rail sweeps for Railgear without any brakes are different than rail sweeps for Railgear with hydraulic brakes or air brakes. The parts needed for RW-1212 and RW-1420 Railgear also differ slightly. See the drawings on the following pages for details.

Installation of rail sweeps is done while the Railgear is in the rail position. For standard rail sweeps without brakes, weld the mounting bracket directly to the Railgear axle tube oriented so that the rubber is flush with the rail. For rail sweeps with hydraulic or air brakes, bolt the mounting bracket directly to the brake structure. On the front, bolt on the side facing forward; on the rear, bolt to the top of the brake, which faces backward.

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	12472	1	RW-1212 RAILSWEET BRACKET, LH, BOLT-ON
2	12473	1	RW-1212 RAILSWEET BRACKET, RH, BOLT-ON
3	818503	2	RAILSWEET RUBBER BELTING DETAIL
4	818508	8	FLAT WASHER, 3/8", GR8
5	12566	4	LOCK WASHER, 3/8", GR8
6	605103	4	HEX NUT, 3/8-16, GR5
7	102408	4	HHCS, 3/8-16 X 1-1/2", GR8



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	818626	1	RAILSWEEP REAR BRACKET, LH, FOR HYD. BRAKES
2	818627	1	RAILSWEEP REAR BRACKET, LH, FOR HYD. BRAKES
3	818503	2	RAILSWEEP RUBBER BELTING DETAIL
4	818508	8	FLAT WASHER, 3/8, GR8
5	12566	4	LOCK WASHER, 3/8", GR8
6	605103	4	HEX NUT, 3/8-16, GR5
7	102408	4	HHCS, 3/8-16 X 1-1/2", GR8

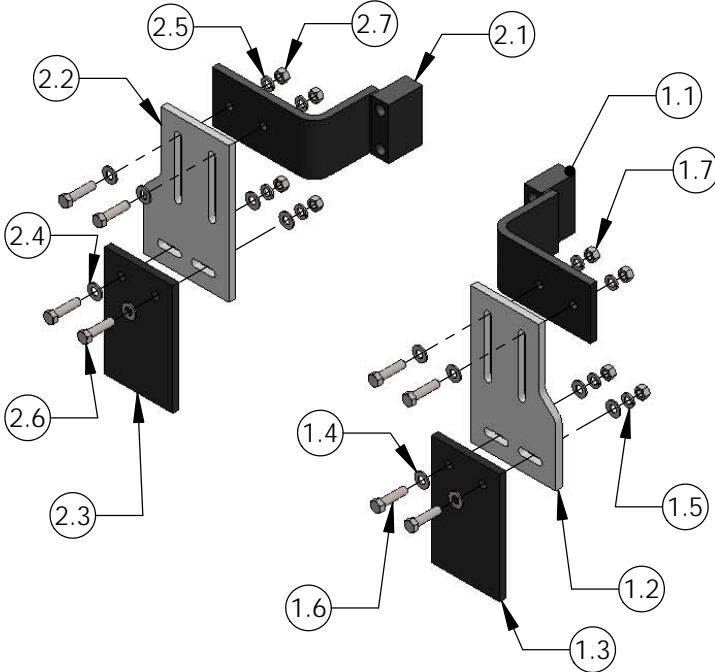


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	12484	2	RW-1212 RAILSWEET BRACKET DETAIL, WELD-ON
2	818501	2	RAILSWEET RUBBER MOUNTING PLATE
3	818503	2	RAILSWEET RUBBER BELTING DETAIL
4	818508	12	FLAT WASHER, 3/8", GR8
5	12566	8	LOCK WASHER, 3/8", GR8
6	102408	8	HHCS, 3/8-16 X 1-1/2", GR8
7	605103	8	HEX NUT, 3/8-16, GR5

REV	DATE	DESCRIPTION				BY	APP
(TOLERANCES UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .XX = .063 .XX = .030 .XX = .005 .XX = .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREEDGES: 2A AND 2B BREAK SHARP EDGES .03 X 45° MAX		TITLE: RW-1212 RAILSWEPT OPTIONS THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
RW-1212		DRAWN BY:	APPD BY:	DATE:	DMF	DRAWING NUMBER:	REV:
DMF (404)875-1512		BJF	-	5/22/17		M1214003	#

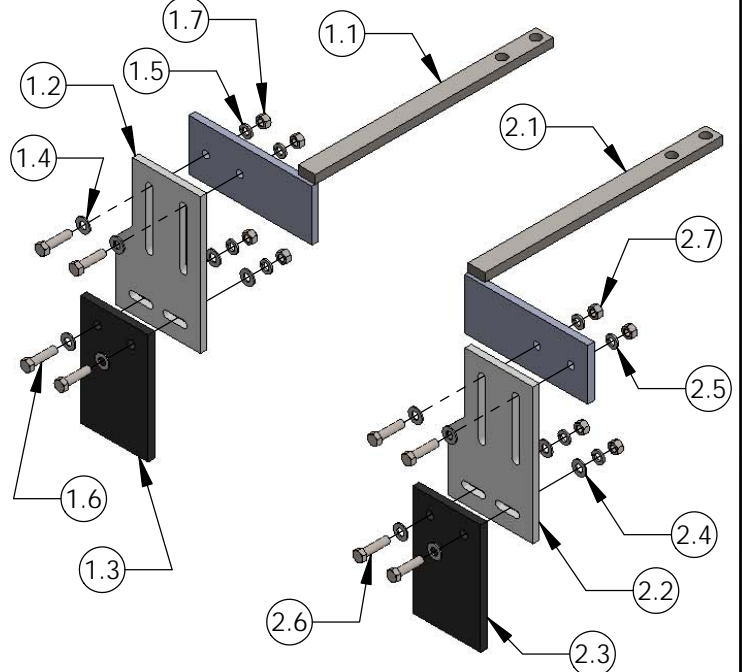
14486: RW-1420 RAILSWEPT FRONT AXLE SET, BOLT-ON, FOR AIR BRAKES

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	14482	1	RW-1420 RAILSWEPT ASSEMBLY, FRONT LH, BOLT-ON, FOR AIR BRAKES
1.1	14475	1	RW-1420 RAIL SWEEP FRONT MOUNTING BRACKET (BOLT-ON)
1.2	818501	1	RAILSWEEP RUBBER MOUNTING PLATE
1.3	818503	1	RAILSWEEP RUBBER BELTING DETAIL
1.4	818508	6	FLAT WASHER, 3/8", GR8
1.5	12566	4	LOCK WASHER, 3/8", GR8
1.6	102408	4	HHCS, 3/8-16 X 1-1/2", GR8
1.7	605103	4	HEX NUT, 3/8-16, GR5
2	14483	1	RW-1420 RAILSWEPT ASSEMBLY, FRONT RH, BOLT-ON, FOR AIR BRAKES
2.1	14475	1	RW-1420 RAIL SWEEP FRONT MOUNTING BRACKET (BOLT-ON)
2.2	818501	1	RAILSWEEP RUBBER MOUNTING PLATE
2.3	818503	1	RAILSWEEP RUBBER BELTING DETAIL
2.4	818508	6	FLAT WASHER, 3/8", GR8
2.5	12566	4	LOCK WASHER, 3/8", GR8
2.6	102408	4	HHCS, 3/8-16 X 1-1/2", GR8
2.7	605103	4	HEX NUT, 3/8-16, GR5



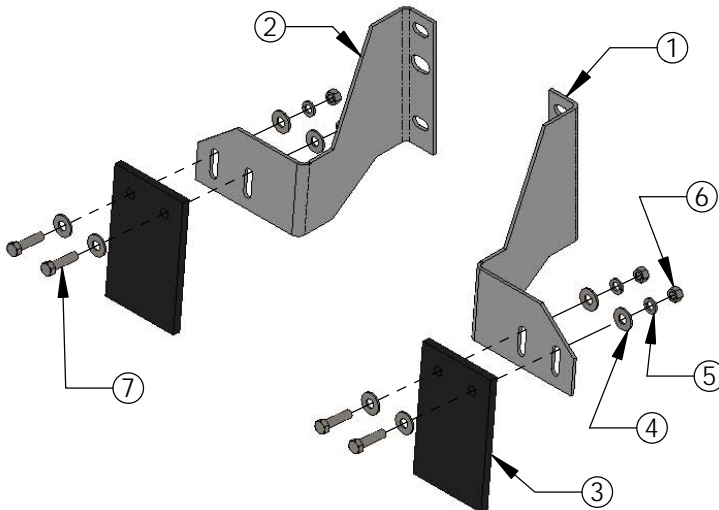
14487: RW-1420 RAILSWEPT REAR AXLE SET, BOLT-ON, FOR AIR BRAKES

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	14484	1	RW-1420 RAILSWEPT ASSY, REAR LH, BOLT-ON, FOR AIR BRAKES
1.1	818630	1	RAILSWEEP REAR WELDMENT, LH, BOLT-ON
1.2	818501	1	RAILSWEEP RUBBER MOUNTING PLATE
1.3	818503	1	RAILSWEEP RUBBER BELTING DETAIL
1.4	818508	6	FLAT WASHER, 3/8", GR8
1.5	12566	4	LOCK WASHER, 3/8", GR8
1.6	102408	4	HHCS, 3/8-16 X 1-1/2", GR8
1.7	605103	4	HEX NUT, 3/8-16, GR5
2	14485	1	RW-1420 RAILSWEPT ASSY, REAR RH, BOLT-ON, FOR AIR BRAKES
2.1	818631	1	RAILSWEEP REAR WELDMENT, RH, BOLT-ON
2.2	818501	1	RAILSWEEP RUBBER MOUNTING PLATE
2.3	818503	1	RAILSWEEP RUBBER BELTING DETAIL
2.4	818508	6	FLAT WASHER, 3/8", GR8
2.5	12566	4	LOCK WASHER, 3/8", GR8
2.6	102408	4	HHCS, 3/8-16 X 1-1/2", GR8
2.7	605103	4	HEX NUT, 3/8-16, GR5



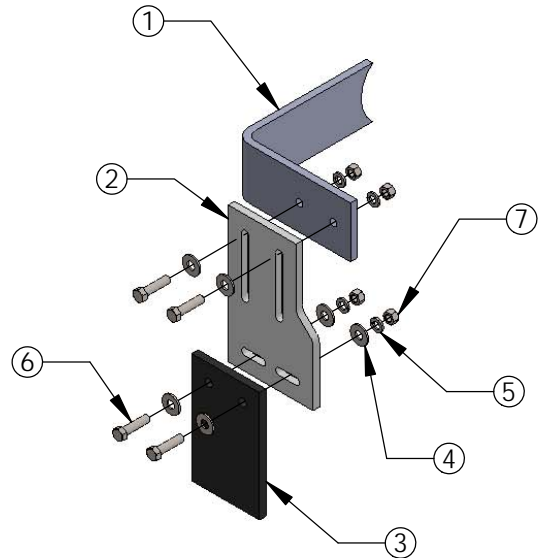
14477: RW-1420 RAILSWEPT FRONT AXLE SET, FOR HYDRAULIC BRAKES

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	14472	1	RW-1420 FRONT RAILSWEPT BRKT, LH, BOLT-ON, FOR HYD. BRAKES
2	14473	1	RW-1420 FRONT RAILSWEPT BRKT, RH, BOLT-ON, FOR HYD. BRAKES
3	818503	2	RAILSWEEP RUBBER BELTING DETAIL
4	818508	8	FLAT WASHER, 3/8", GR8
5	12566	4	LOCK WASHER, 3/8", GR8
6	605103	4	HEX NUT, 3/8-16, GR5
7	102408	4	HHCS, 3/8-16 X 1-1/2", GR8



14481: RW-1420 RAILSWEPT ASSEMBLY, WELD-ON, ONE SIDE

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	14474	1	RAILSWEEP MOUNTING BRACKET, WELD-ON, RW-1420
2	818501	1	RAILSWEEP RUBBER MOUNTING PLATE
3	818503	1	RAILSWEEP RUBBER BELTING DETAIL
4	818508	6	FLAT WASHER, 3/8", GR8
5	12566	4	LOCK WASHER, 3/8", GR8
6	102408	4	HHCS, 3/8-16 X 1-1/2", GR8
7	605103	4	HEX NUT, 3/8-16, GR5



REV	DATE	DESCRIPTION	BY	APP
1		RW-1420	BJF	-
TOLERANCES (UNLESS SPECIFIED): FRAC, MACH: ± 1/32" FRAC, OTHER: ± 1/16" X: ± .063 XX: ± .030 XXX: ± .005 DRILL SIZES: + .015 SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES .03 X 45° MAX DMF (404)875-1512				
		TITLE: RW-1420 RAILSWEPT OPTIONS		
		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
		DRAWING NUMBER: M1214004		
		REV: #		

5.2 PIN-OFF OPTIONS

DMF offers manual, cable, and air operated pinoffs. Figure 5.2 shows the manual pin-offs that come standard. The same pins can be used on the front or rear Railgear.

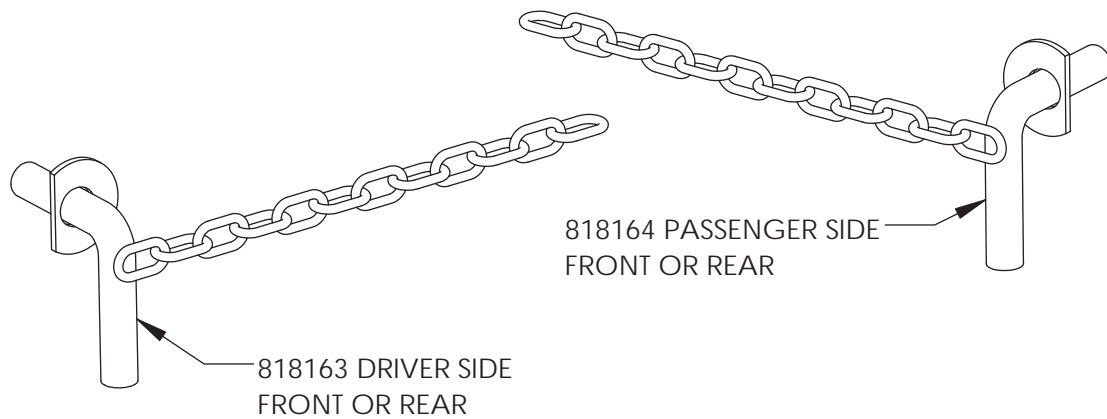


Figure 5.2 Manual Pinoffs

The installation of cable or air controlled pin-offs differs slightly between the front and rear Railgear. See drawings M1214005 (rear) and M1630112 (front) on the following pages for details.

NOTE #1:
SPECIFY THE CABLE THAT
BEST FITS YOUR APPLICATION.

REPLACEMENT CABLES	
P/N	LENGTH
818577	41"
818576	50"
818575	64"
818578	78"
818579	97"
818580	120"

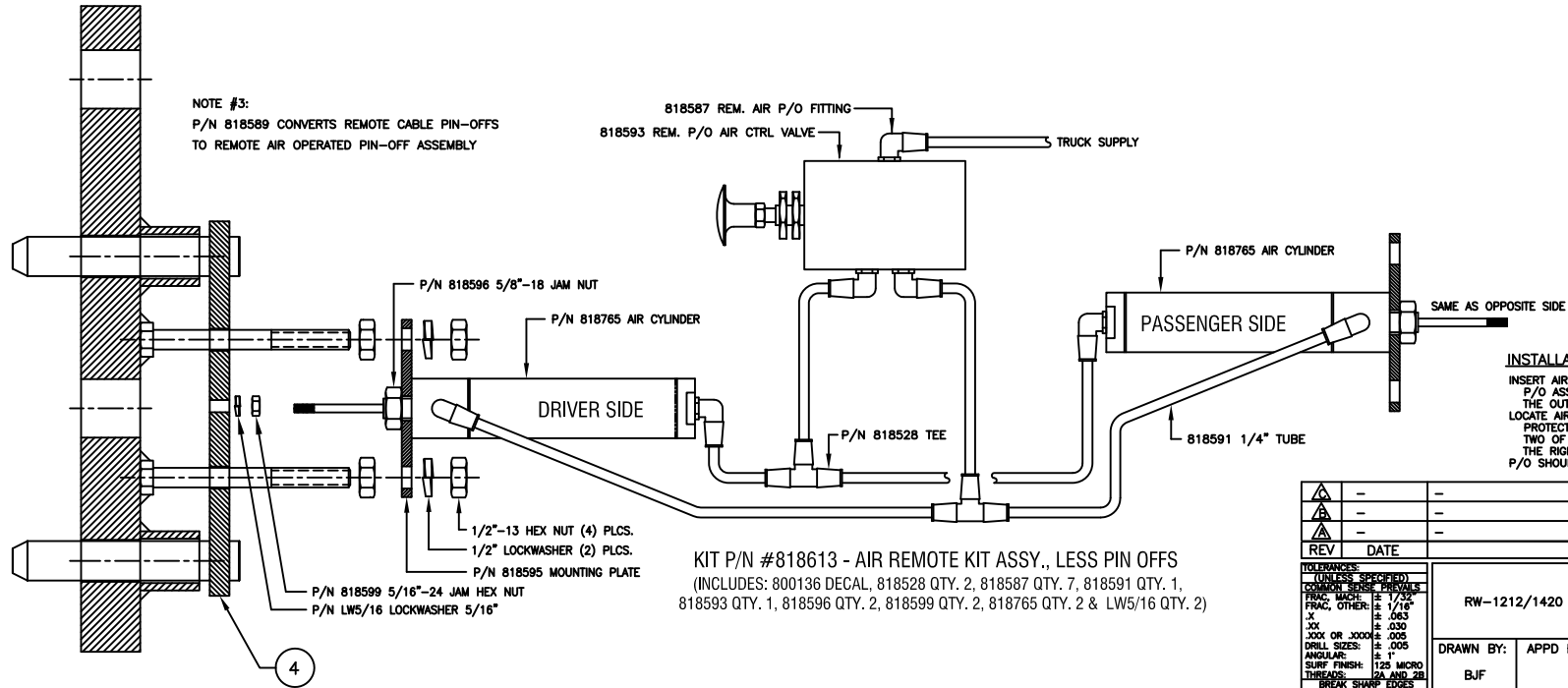
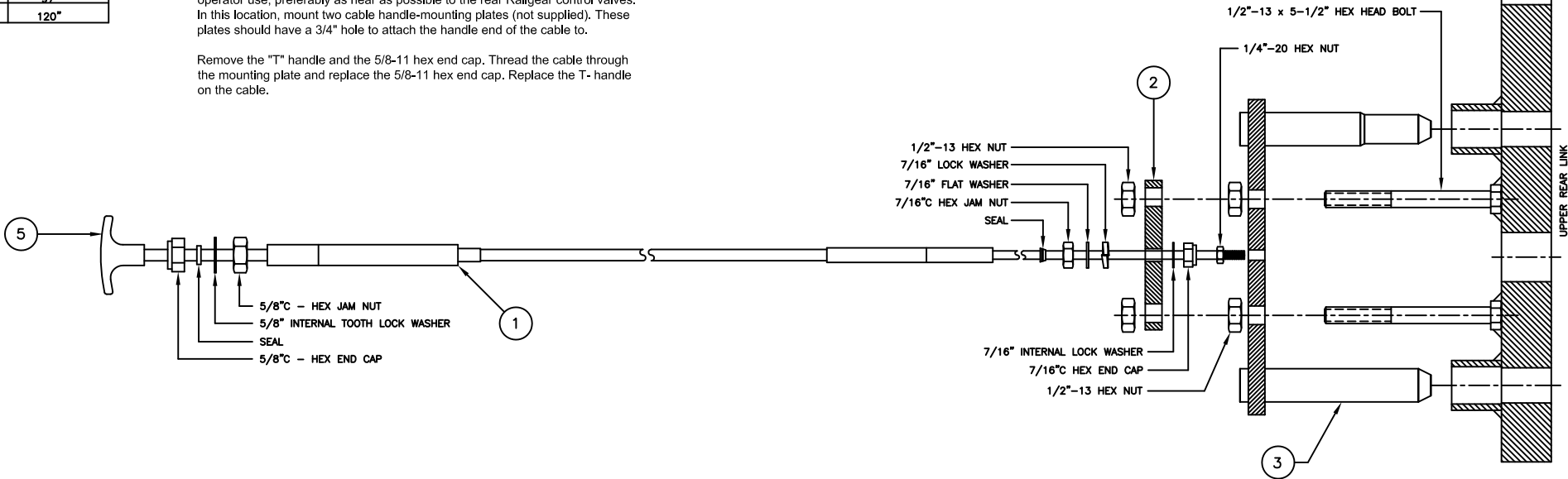
Note: Remote Rear Pin-Offs
There are two different types of remote pin-offs available for both front and rear Railgear, and they can be used in any combination. The two different types are:
· Cable operated
· Air operated

Remote pin-offs are not installed at the factory to prevent damage during shipment.

Note: Cable Rear Pin-Offs
Once cables are installed to pins, route cables to easily-accessible location for operator use, preferably as near as possible to the rear Railgear control valves. In this location, mount two cable handle-mounting plates (not supplied). These plates should have a 3/4" hole to attach the handle end of the cable to.

Remove the "T" handle and the 5/8-11 hex end cap. Thread the cable through the mounting plate and replace the 5/8-11 hex end cap. Replace the T- handle on the cable.

ITEM	PART NO.	QTY	DESCRIPTION
1	NOTE 1	(REF.)	REMOTE PIN-OFF CABLE (MORSE)
2	818563	(REF.)	REMOTE PIN-OFF MOUNTING PLATE
3	818582	(REF.)	REMOTE PIN-OFF ASSY FOR CABLE CONTROL
4	818583	(REF.)	REMOTE PIN-OFF ASSY FOR AIR CONTROL
5	818685	(REF.)	REMOTE PIN-OFF "T-HANDLE" (ALUMINUM)



INSTALLATION NOTES:
INSERT AIR CYLINDER THROUGH PLATE AND SCREW INTO P/O SLIDE WELDMENT.
P/O ASSEMBLY MUST BE PARALLEL TO LINK AND STUDS SHOULD BE FLUSH WITH THE OUTER HEX NUTS.
LOCATE AIR CTRL VALVE (P/N 818593) FOR CONVENIENCE AND CONNECT TO A PROTECTED AIR SUPPLY. CONNECT LEFT VALVE TO THE LEFT P/O CYLINDER WITH TWO OF THE HOSES AND FITTINGS SUPPLIED. REPEAT THE SAME PROCEDURE FOR THE RIGHT P/O ASSEMBLY.
P/O SHOULD DISENGAGE WHEN VALVE IS PULLED.

KIT P/N #818613 - AIR REMOTE KIT ASSY., LESS PIN OFFS
(INCLUDES: 800136 DECAL, 818528 QTY. 2, 818587 QTY. 7, 818591 QTY. 1, 818593 QTY. 1, 818596 QTY. 2, 818599 QTY. 2, 818765 QTY. 2 & LWS/16 QTY. 2)

△	-	-	-	-	
△	-	-	-	-	
△	-	-	-	-	
REV	DATE	DESCRIPTION		BY	APP
TOLERANCES: (UNLESS SPECIFIED) COMMON SIZES: FRACTIONS FRACTION: 1/16" FRACTION: 1/8" FRACTION: 1/4" FRACTION: 3/8" FRACTION: 1/2" FRACTION: 3/4" FRACTION: 1" FRACTION: 1 1/2" FRACTION: 2" FRACTION: 3" FRACTION: 4" FRACTION: 6" FRACTION: 8" FRACTION: 12" FRACTION: 18" FRACTION: 24" FRACTION: 36" FRACTION: 48" FRACTION: 72" FRACTION: 96" FRACTION: 120" FRACTION: 144" FRACTION: 180" FRACTION: 216" FRACTION: 240" FRACTION: 288" FRACTION: 360" FRACTION: 432" FRACTION: 480" FRACTION: 540" FRACTION: 600" FRACTION: 720" FRACTION: 864" FRACTION: 960" FRACTION: 1080" FRACTION: 1200" FRACTION: 1440" FRACTION: 1800" FRACTION: 2160" FRACTION: 2400" FRACTION: 2880" FRACTION: 3600" FRACTION: 4320" FRACTION: 4800" FRACTION: 5400" FRACTION: 6000" FRACTION: 7200" FRACTION: 8640" FRACTION: 9600" FRACTION: 10800" FRACTION: 12000" FRACTION: 14400" FRACTION: 18000" FRACTION: 21600" FRACTION: 24000" FRACTION: 28800" FRACTION: 36000" FRACTION: 43200" FRACTION: 48000" FRACTION: 54000" FRACTION: 60000" FRACTION: 72000" FRACTION: 86400" FRACTION: 96000" FRACTION: 108000" FRACTION: 120000" FRACTION: 144000" FRACTION: 180000" FRACTION: 216000" FRACTION: 240000" FRACTION: 288000" FRACTION: 360000" FRACTION: 432000" FRACTION: 480000" FRACTION: 540000" FRACTION: 600000" FRACTION: 720000" FRACTION: 864000" FRACTION: 960000" FRACTION: 1080000" FRACTION: 1200000" FRACTION: 1440000" FRACTION: 1800000" FRACTION: 2160000" FRACTION: 2400000" FRACTION: 2880000" FRACTION: 3600000" FRACTION: 4320000" FRACTION: 4800000" FRACTION: 5400000" FRACTION: 6000000" FRACTION: 7200000" FRACTION: 8640000" FRACTION: 9600000" FRACTION: 10800000" FRACTION: 12000000" FRACTION: 14400000" FRACTION: 18000000" FRACTION: 21600000" FRACTION: 24000000" FRACTION: 28800000" FRACTION: 36000000" FRACTION: 43200000" FRACTION: 48000000" FRACTION: 54000000" FRACTION: 60000000" FRACTION: 72000000" FRACTION: 86400000" FRACTION: 96000000" FRACTION: 108000000" FRACTION: 120000000" FRACTION: 144000000" FRACTION: 180000000" FRACTION: 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SPECIFY THE CABLE THAT
BEST FITS YOUR APPLICATION.

REPLACEMENT CABLES	
P/N	LENGTH
818577	41"
818576	50"
818575	64"
818578	78"
818579	97"
818580	120"

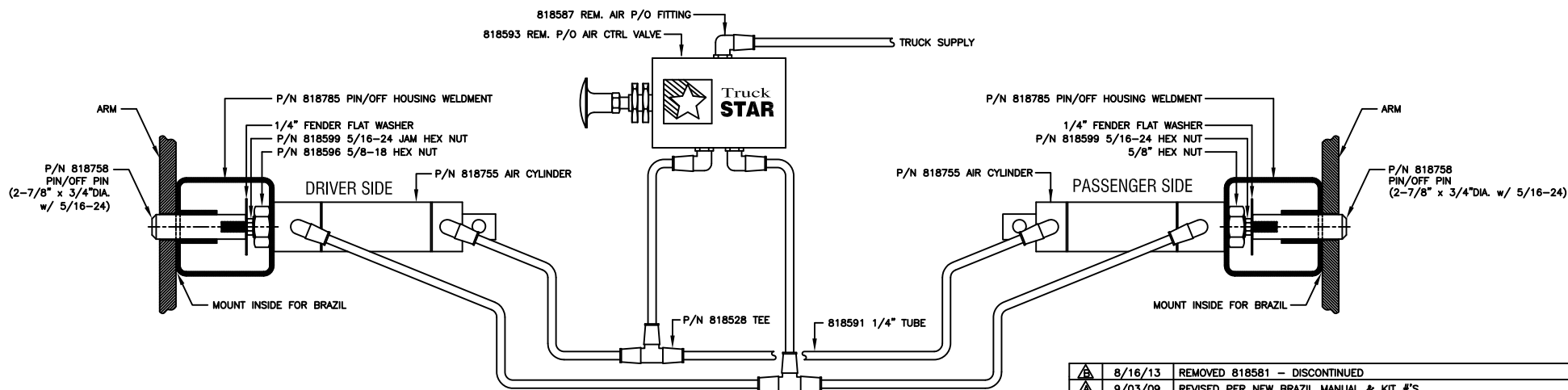
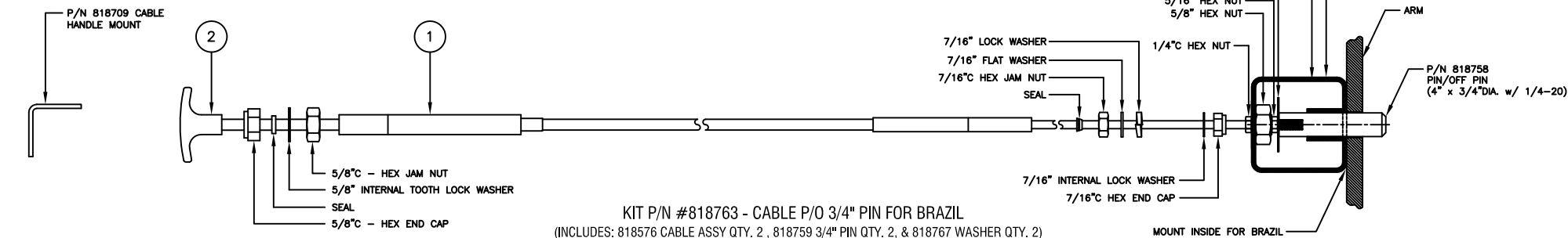
There are two different types of remote pin-offs available for both front and rear Railgear, and they can be used in any combination. The two different types are:

- Cable operated
- Air operated

Note: Remote Front Pin-Offs (Shown w/ & w/o Air Cylinder)

Once cables are installed to pins, route cables to easily-accessible location for operator use, preferably as near as possible to the front Railgear control valve. In this location, mount two cable handle-mounting plates (not supplied). These plates should have a 3/4" hole to attach the handle end of the cable to.

Remove the "T" handle and the 5/8-11 hex end cap. Thread the cable through the mounting plate and replace the 5/8-11 hex end cap. Replace the T- handle on the cable.



KIT P/N #818774 - FRONT REMOTE AIR KIT ASSY., LESS PIN OFFS
(INCLUDES: 800136 DECAL, 818528 QTY. 2, 818587 QTY. 7, 818591 QTY. 1, 818593 QTY. 1, 818596 QTY. 2, 818599 QTY. 2, 818755 QTY. 2, 818758 QTY. 2, & FW1/4 QTY. 2)

ITEM	PART NO.	QTY	DESCRIPTION
1	NOTE 1	(REF.)	REMOTE PIN-OFF CABLE (MORSE)
2	818571	(REF.)	REMOTE PIN-OFF "T-HANDI" (MORSE)

8/16/13	REV	DATE	REVISED PER NEW BRAZIL MANUAL & KIT #S	JDI	BY	APP
TOLERANCES:			TITLE:			
(UNLESS OTHERWISE SPECIFIED)			RW-1630 REMOTE CABLE PIN-OFF ASSY FRONT			
FRACTIONAL DECIMALS			(NOTE #2 RETO-FIT KIT GENERIC DRAWING)			
FRACTIONAL DECIMALS			DIVERSIFIED METAL FABRICATORS, INC.(404)875-1512			
FRACTIONAL DECIMALS			DRAWN BY: APPD BY: DATE: 10/06/98			
FRACTIONAL DECIMALS			DRAWING NUMBER: M1630112			
FRACTIONAL DECIMALS			REV: B			

5.3 HYDRAULIC BRAKES

NOTE:

The rail wheel brake system is intended to assist the existing vehicle brakes when in the rail mode. As the vehicle rear tires are in contact with the railhead, the primary braking effort is derived from the rubber tires. Rail wheel brakes alone are insufficient to stop the vehicle in a reasonable distance.

DMF's RW-1212 and RW-1420 Railgear can use an optional hydraulic braking system. The same hydraulic braking system is used for both the front and rear Railgear. A drawing of the hydraulic brake assembly is shown in Section 5.3.6 and details regarding plumbing and wiring are found in Section 6.

While the Railgear is in the rail position, the front hydraulic brake assembly should be located as shown below in Figure 5.3. The rear hydraulic brake assembly is oriented at the factory and will not need to be changed.

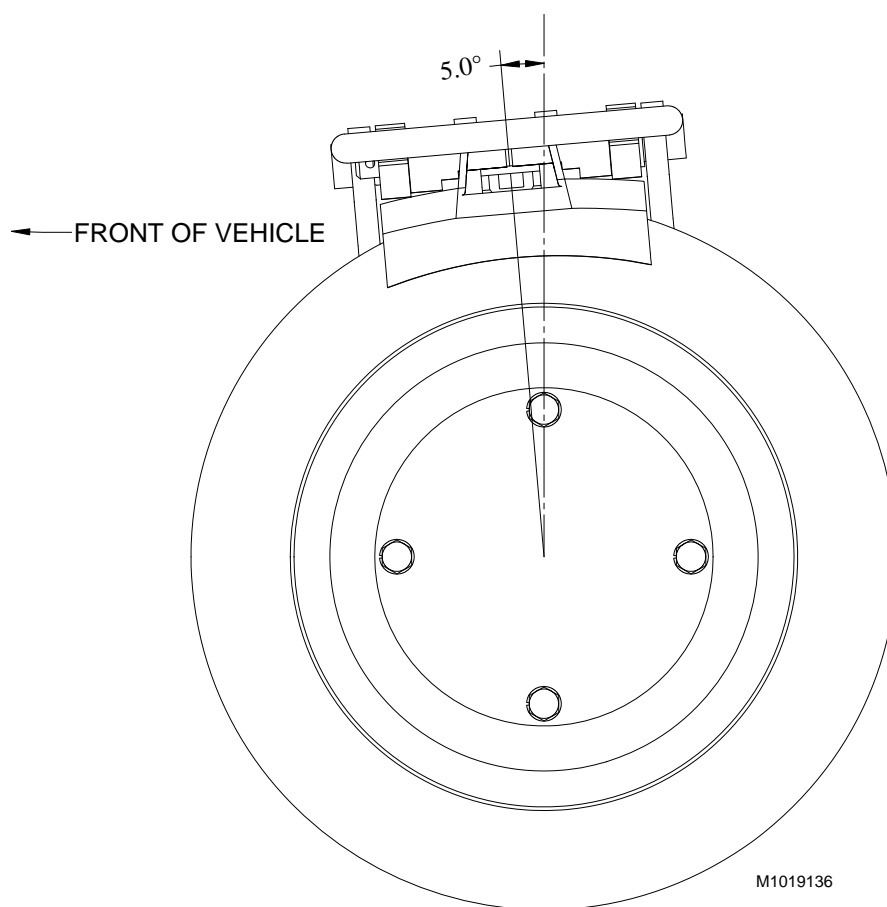


Figure 5.3 Front Hydraulic Brake Location

5.3.1 Front Hydraulic Brake Line Routing

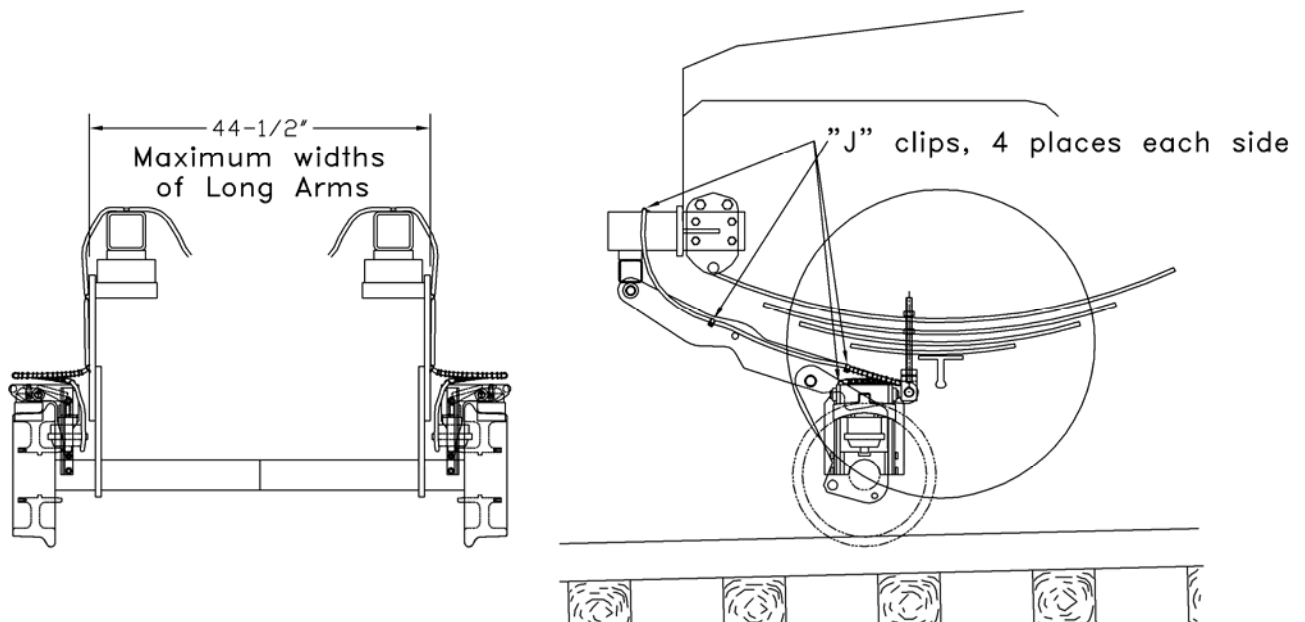


Figure 5.3.1 Front Hydraulic Brake Line Routing

5.3.2 Rear Hydraulic Brake Line Routing

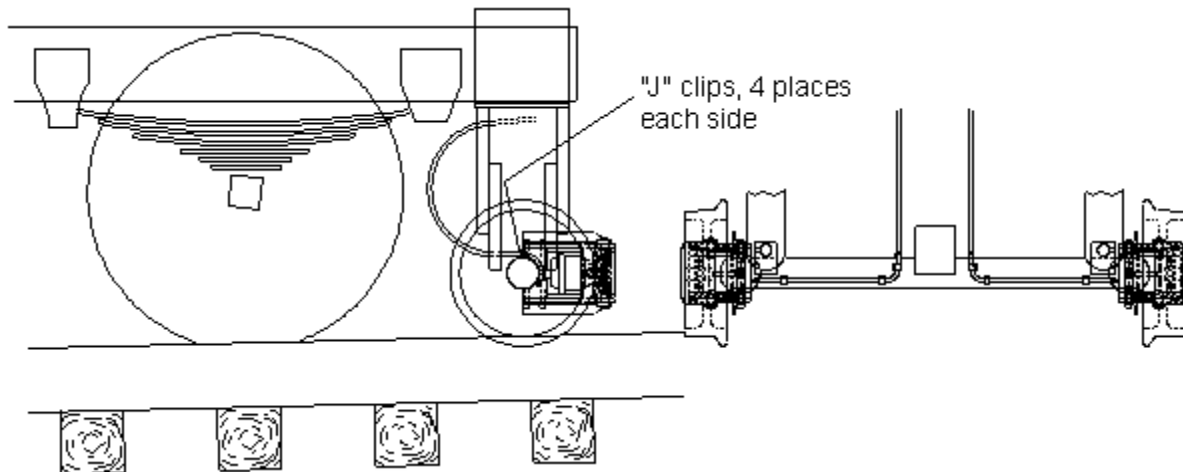


Figure 5.3.2 Rear Hydraulic Brake Line Routing

5.3.3 Hydraulic Brake Plumbing Installation

See Section 6 for details on how to plumb hydraulic brakes and wire up the controls.

5.3.4 Inspection and Adjustment

Inspect and adjust brake shoes per Figure 5.3.4.

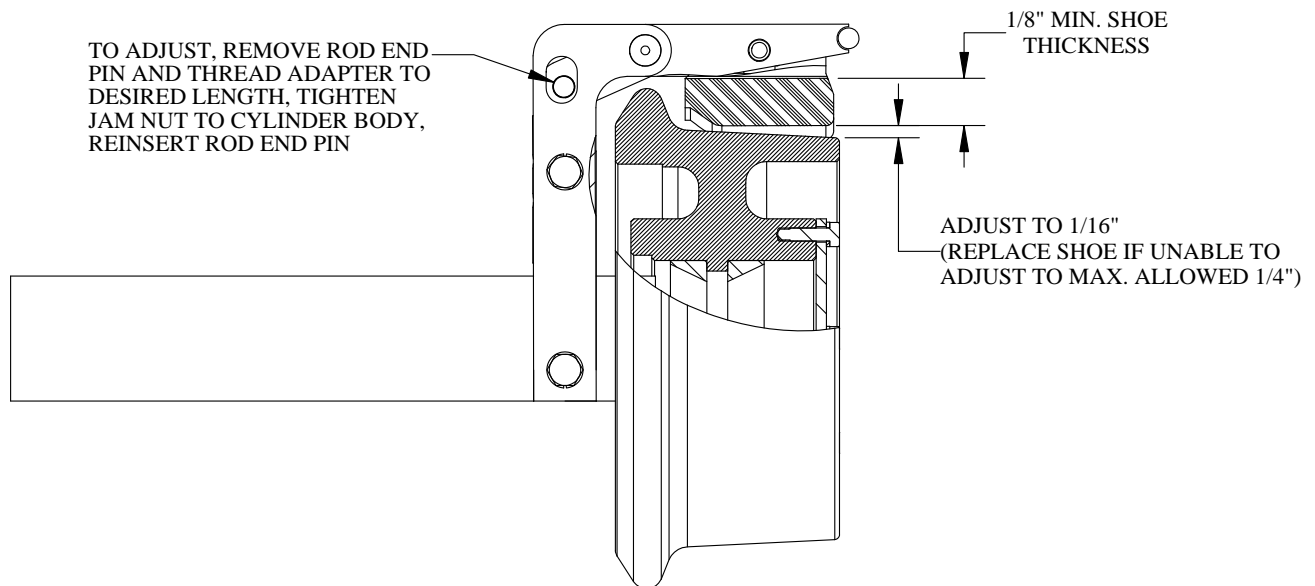


Figure 5.3.4 Hydraulic Brake Inspection and Adjustment

5.3.5 Testing

Operate the vehicle on a test track. With the Railgear brake switch on and 12 VDC hydraulic power unit on, check that:

1. When the vehicle brake pedal is depressed, the guide wheel brakes clamp the rail wheel enough to begin slowing its rotation, but not enough to totally lock the rail wheel. The rail wheels should not be allowed to lock up since that will cause a flat spot on the wheel due to the sliding action on the rail.
2. The brakes properly release when the brake pedal is released or after 30 seconds of continuous brake engagement, whichever comes first.

If brakes do not function properly, contact a service representative at DMF.

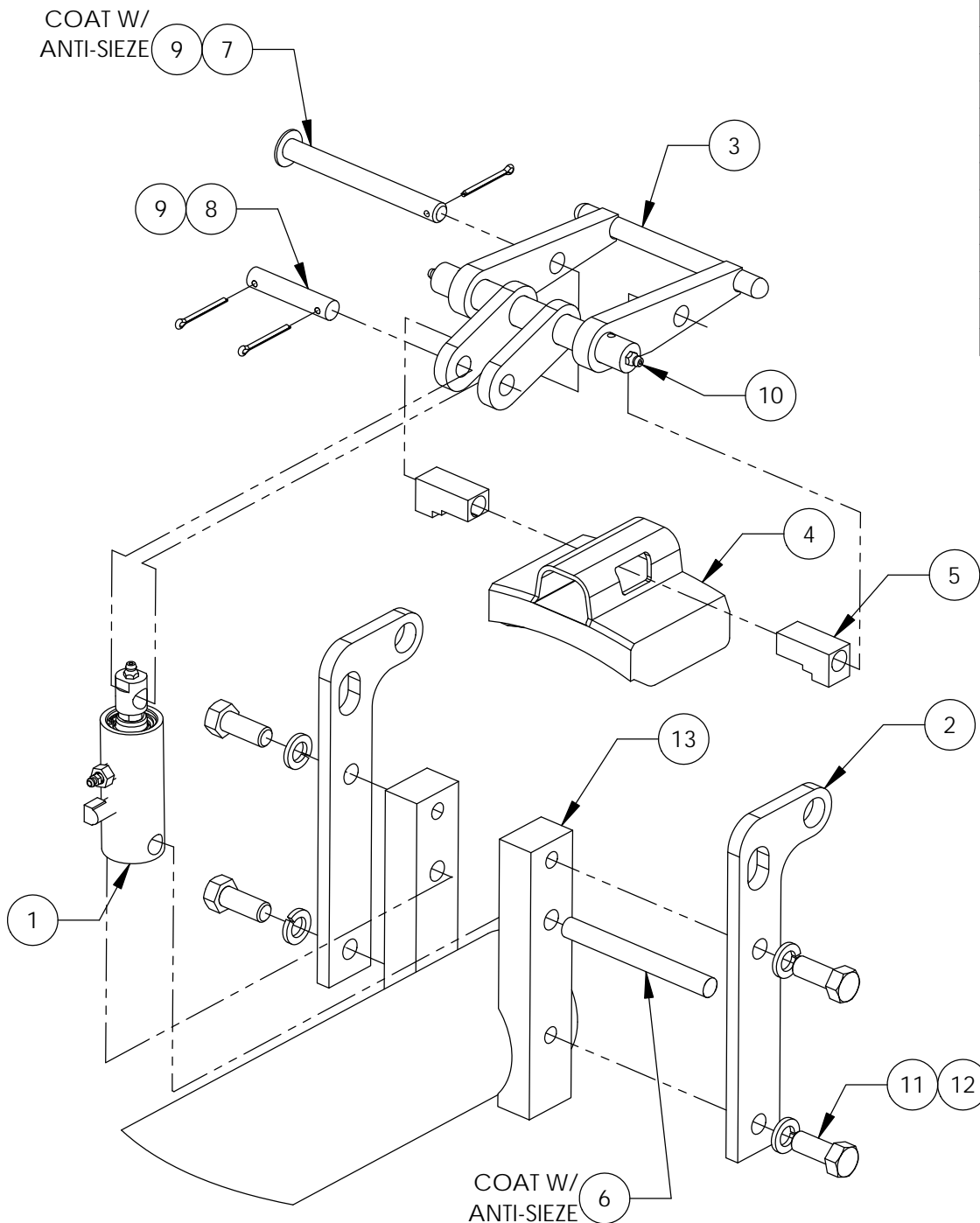
NOTE:

The rail wheel brake system is intended to assist the existing vehicle brakes when in the rail mode. As the vehicle rear tires are in contact with the railhead, the primary braking effort is derived from the rubber tires. Rail wheel brakes alone are insufficient to stop the vehicle in a reasonable distance.


5.3.6 Brake Parts

See drawing 12702, 14710 and 12710 on the next pages for brake parts schematics and see Section 6 for brake control system parts.

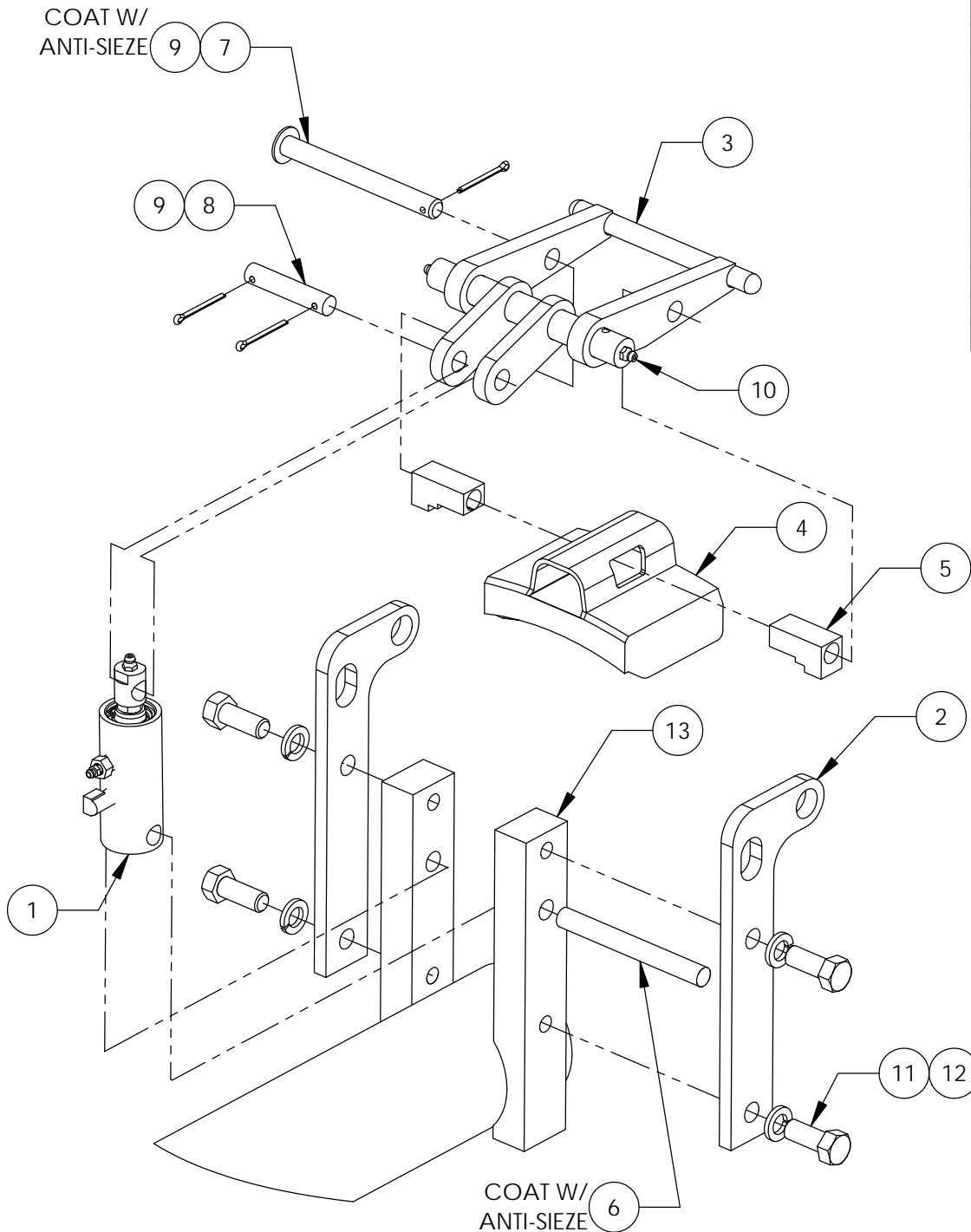
COAT W/
ANTI-SIEZE



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	12710	1	HYDRAULIC BRAKE CYLINDER; RW-1019/1212
2	12745	2	HYDRAULIC BRAKE SIDE BRACKET, RW-1019/1212
3	12735	1	HYD. BRAKE LEVER ARM ASSEMBLY W/ STOP, RW-1212
4	12434	1	HYDRAULIC BRAKE SHOE, COBRA CUTOFF, RW-1019/1212
5	12436	2	HYDRAULIC BRAKE SHOE MOUNTING BLOCK, RW-1019/1212
6	818452	1	AIR BRAKE SHOE PIN
7	12424	1	PIN WELDMENT, 1019/1212/1420 HYDRAULIC BRAKE SHOE
8	12760	1	HYDRAULIC BRAKES CYLINDER ROD PIN, RW-1019/1212
9	818456	3	COTTER PIN, 1/8" X 1-1/2"
10	818105	2	GREASE FITTING, 1/4"-28 (ALEMITE 1641-B)
11	12479	4	HHCS, 1/2-13 X 1-1/4", GR8
12	12481	4	LOCK WASHER, 1/2", GR8
13	12755	REF	RW-1212 HYDRAULIC BRAKE AXLE SADDLE

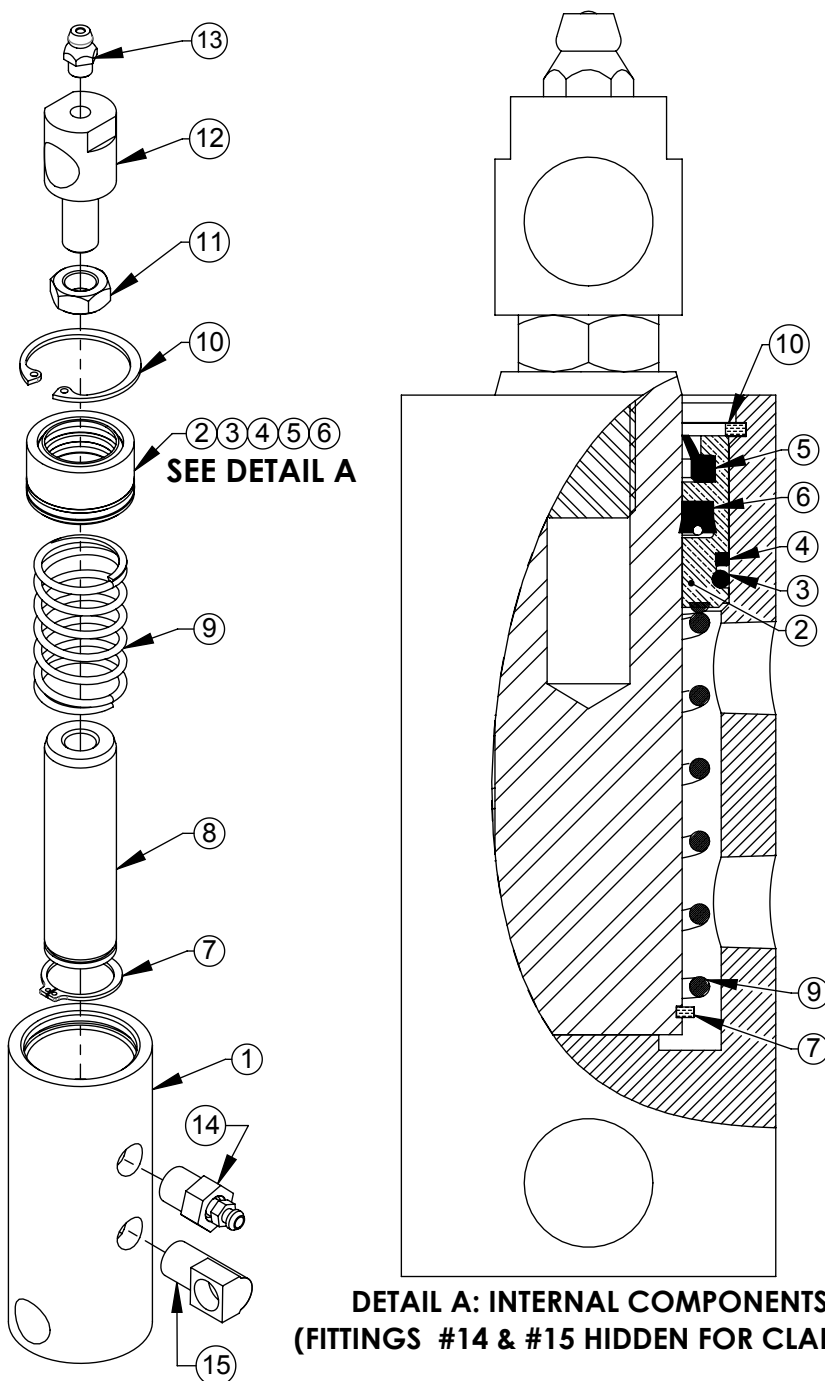
J	5/25/17	MIGRATED TO SOLIDWORKS				BJF	
REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE:					
FRAC. MACH: = 1/32"		RW-1212 HYDRAULIC BRAKE ASSEMBLY					
FRAC. OTHER: = 1/16"							
X = .063							
XX = .030							
XXX = .005							
DRILL SIZES: = .015		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
ANGULAR: = 1°		<div><div>DRAWN BY:</div><div>MRV</div><div>APPD BY:</div><div>TSH</div><div>DATE:</div><div>11/28/95</div><div></div><div>DRAWING NUMBER:</div><div>12702</div><div>REV:</div><div>J</div></div>					
SURF FINISH: 125 MICRO							
THREADS: 2B AND 2B							
BREAK SHARP EDGES .03 X 45° MAX							
DMF (404)875-1512							

COAT W/
ANTI-SIEZE



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	12710	1	HYDRAULIC BRAKE CYLINDER; RW-1019/1212
2	12745	2	HYDRAULIC BRAKE SIDE BRACKET, RW-1019/1212
3	12735	1	HYD. BRAKE LEVER ARM ASSEMBLY W/ STOP, RW-1212
4	12434	1	HYDRAULIC BRAKE SHOE, COBRA CUTOFF, RW-1019/1212
5	12436	2	HYDRAULIC BRAKE SHOE MOUNTING BLOCK, RW-1019/1212
6	818452	1	AIR BRAKE SHOE PIN
7	12424	1	PIN WELDMENT, 1019/1212/1420 HYDRAULIC BRAKE SHOE
8	12760	1	HYDRAULIC BRAKES CYLINDER ROD PIN, RW-1019/1212
9	818456	3	COTTER PIN, 1/8" X 1-1/2"
10	818105	2	GREASE FITTING, 1/4"-28 (ALEMITE 1641-B)
11	12479	4	HHCS, 1/2-13 X 1-1/4", GR8
12	12481	4	LOCK WASHER, 1/2", GR8
13	14755	REF	RW-1420 HYDRAULIC BRAKE AXLE SADDLE

D	5/25/17	MIGRATED TO SOLIDWORKS				BJF	
REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE:					
FRACTIONAL: ± 1/32"		RW-1420 HYDRAULIC BRAKE ASSEMBLY					
FRACTIONAL, OTHER: ± 1/16"		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
.X ± .063		DRAWN BY:		APPD BY:		DATE:	
.XX ± .030		MRV		TSH		5/5/97	
.XXX ± .005						DRAWING NUMBER:	
DRILL SIZES: ANGULAR: ± .015						14710	
SURF FINISH: 125 MICRO						REV:	
THREADS: 2A AND 2B						D	
BREAK SHARP EDGES .03 X 45° MAX							
DMF (404)875-1512							



**DETAIL A: INTERNAL COMPONENTS
(FITTINGS #14 & #15 HIDDEN FOR CLARITY)**


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	12712	1	CYL BODY DETAIL 1019/1212
2	12763	1	GLAND DETAIL; GEN2 HYD. BRAKE CYLINDER; RW-1019/1212
3	12720	1	O-RING; #022; 90A DURO
4	12719	1	BACK UP RING; #022
5	605165	1	ROD WIPER, AN 959/940, .75" ID, 1/8" W
6	605545	1	ROD SEAL, STD POLYPAK, .75" ID, 1/8"W
7	12717	1	EXTERNAL SNAP RING; 3/4" DIA SHAFT
8	12715	1	CYLINDER ROD 1019/1212
9	12722	1	COMPRESSION SPRING; HYDRAULIC BRAKE CYLINDER
10	12718	1	INTERNAL SNAP RING; 1-3/16" BORE; #118
11	605071	1	JAMB NUT, 3/8-24 UNF
12	12716	1	RW-1019/1212 HYD. BRAKE CYL. ROD EXTENSION
13	818105	1	GREASE FITTING, 1/4"-28 (ALEMITE 1641-B)
14	12726	1	RW-1019/1212 HYD. BRAKE CYL. BLEEDER SCREW (40160)
15	10432	1	FITTING 402X3 90 DEG BRAKE LINE 1/8 MPT X 1/8 INVERTED FLARE

ASSEMBLY PROCEDURE:

1. Ensure all parts are clean and free of burrs and sharp edges.
2. Lubricate rod, gland, and all seals lightly with blue assembly goo.
3. Install wiper (#5), rod seal (#6), backup ring (#4), and o-ring (#3) in gland (#2) in orientations shown in Detail A.
4. Install external snap ring (#7) and spring (#9) onto rod (#8).
5. Place rod into body (#1) with threaded end facing upwards.
6. Slide gland assembly over rod, compress spring, and secure with internal snap ring (#10).
7. Install jamb nut (#11) onto rod extension (#12). Coat exposed threads with antizeize. Thread extension completely into rod, and tighten jamb nut.
8. Install grease fitting (#13), bleed valve (#14), and hydraulic fitting (#15). Observe orientation shown.

TEST PROCEDURE:

1. DURING TEST PROCEDURE, DO NOT ALLOW ROD TO REACH FULL EXTENSION. MAX ROD EXTENSION SHOULD BE PHYSICALLY RESTRAINED TO 3/4" OR LESS.
2. Connect hydraulic power unit; set pressure relief to 2,000 psi.
3. Open bleed valve, cycle cylinder to purge air, and close bleed valve.
4. With rod extension limited to 3/4", pressure test for 15 sec. while inspecting for leaks.
5. Disconnect power unit and cap hydraulic fitting.

K	02/01/16	MIGRATED TO SOLIDWORKS. 12763 WAS 12714, 605545 WAS 12725, ADDED 605165			TAM								
REV	DATE	DESCRIPTION			BY	APP							
TOLERANCES: (UNLESS SPECIFIED)		RW-1019		TITLE: HYDRAULIC BRAKE CYLINDER; RW-1019/1212									
FRAC, MACH: ± 1/32"				DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512									
FRAC, OTHER: ± 1/16"													
.XX ± .063													
.XXX ± .030													
XXXX ± .005		DRAWN BY: MRV		APPD BY: TSH		DATE: 11/28/95				DRAWING NUMBER: 12710		REV: K	
DRILL SIZES: + .015													
ANGULAR: ± 1°													
SURF FINISH: 125 MICRO													
THREADS: 2A AND 2B													
SHEET 0049 OF 0050 (1/28/16 4:40 PM)													

5.4 AIR BRAKES

NOTE:

The rail wheel brake system is intended to assist the existing vehicle brakes when in the rail mode. As the vehicle rear tires are in contact with the railhead, the primary braking effort is derived from the rubber tires. Rail wheel brakes alone are insufficient to stop the vehicle in a reasonable distance.

DMF's RW-1420 Railgear can use an optional air braking system (not available on RW-1212 Railgear). The same air braking system is used for both the front and rear Railgear. For a detailed drawing of the air brake assembly, Section 5.4.6.

While the Railgear is in the rail position, the front air brake assembly should be located as shown below in Figure 5.4. The rear air brake assembly is oriented at the factory and will not need to be changed.

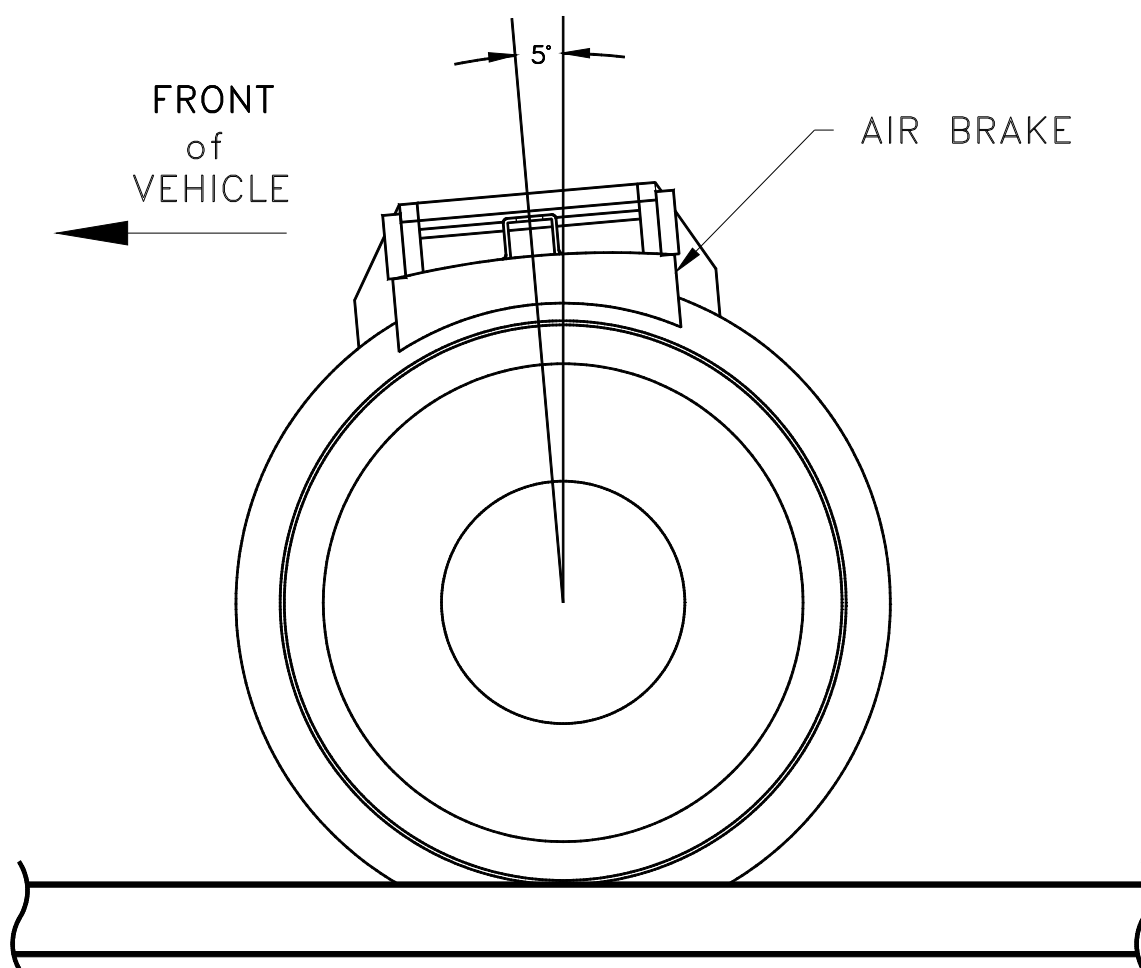
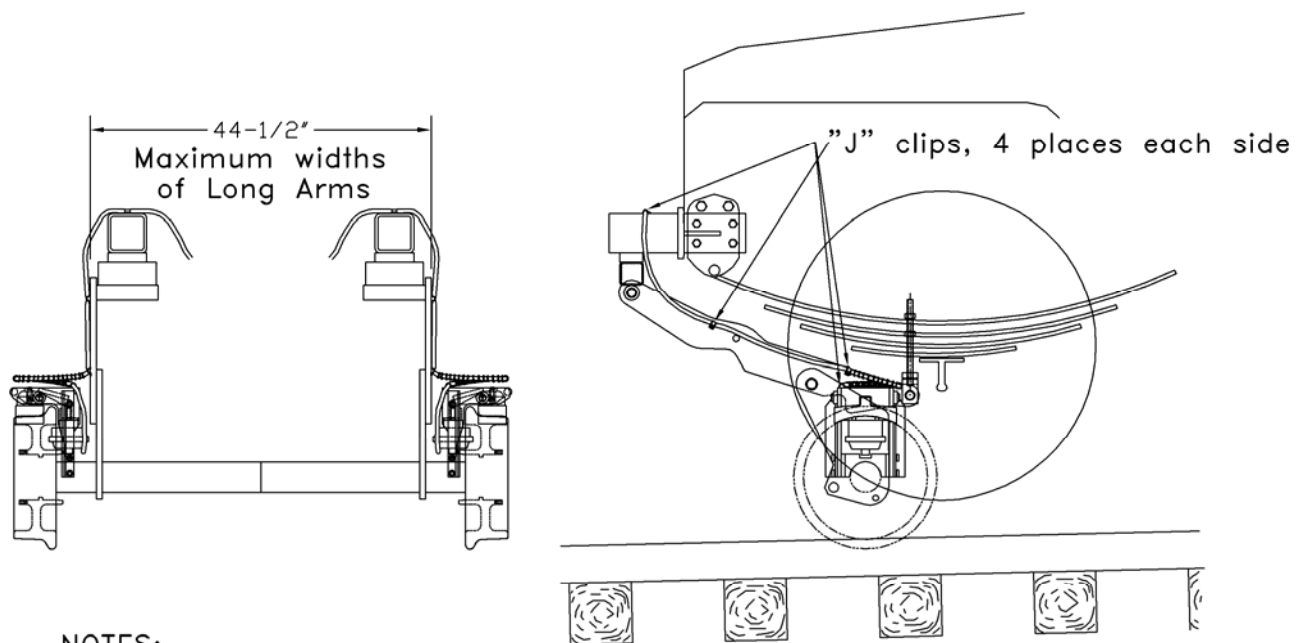


Figure 5.4 Front Air Brake Location

5.4.1 Front Air Brake Line Routing

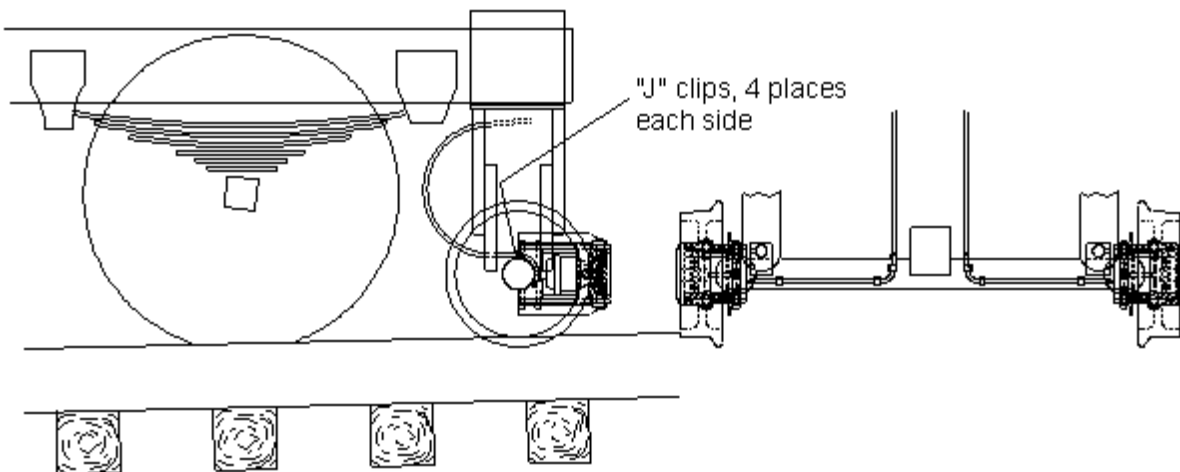


NOTES:

- * Run the supplied hoses through the "J" clips with the spring guards located in the loops left at the Brake Assemblies. The 75" Hose is for the passenger side & the 62" Hose is for the driver side.
- * Mount Air Brake Valve Assembly to an appropriate place near the Front Railgear (usually on the Front Valve Assembly Plate) with supplied Relay
- * Brake Hoses attach to the Front Valve Assembly.

Figure 5.4.1 Front Air Brake Line Routing

5.4.2 Rear Air Brake Line Routing



- * Run the supplied hoses through the "J" clips. Rear Hoses are 59" long.
- * Mount Air Brake Valve Assembly to an appropriate place near the Rear Railgear (usually on the Rear Frame Bracket) with supplied Relay Mount.
- * Attach Brake Hoses to the Air Brake Valve Assembly.

Figure 5.4.2 Rear Air Brake Line Routing

5.4.3 Air Brake Plumbing Installation

An air toggle valve, on a plate labeled brakes "on/off", is to be located on the vehicle instrument panel. This valve disconnects the guide wheel braking system from the vehicle airbrake system by interrupting the CONTROL line air pressure to the guide wheel system only.

The air brake relay valve is located on the front valve plate assembly and rear frame bracket. The CONTROL line comes from the toggle valve described above. The SUPPLY line comes from the pressure protection valve, which is plumbed onto the air reservoir. There is a ball valve and an adjustable pressure regulator in the SUPPLY line before the relay valve. The ball valve will disconnect the guide wheel braking system from the vehicle airbrake system, regardless of the position of the toggle valve, by interrupting the SUPPLY line air pressure to the guide wheel system only. The adjustable pressure regulator allows the braking effort on each axle to be set so that the Rail wheels do not lock up and slide.

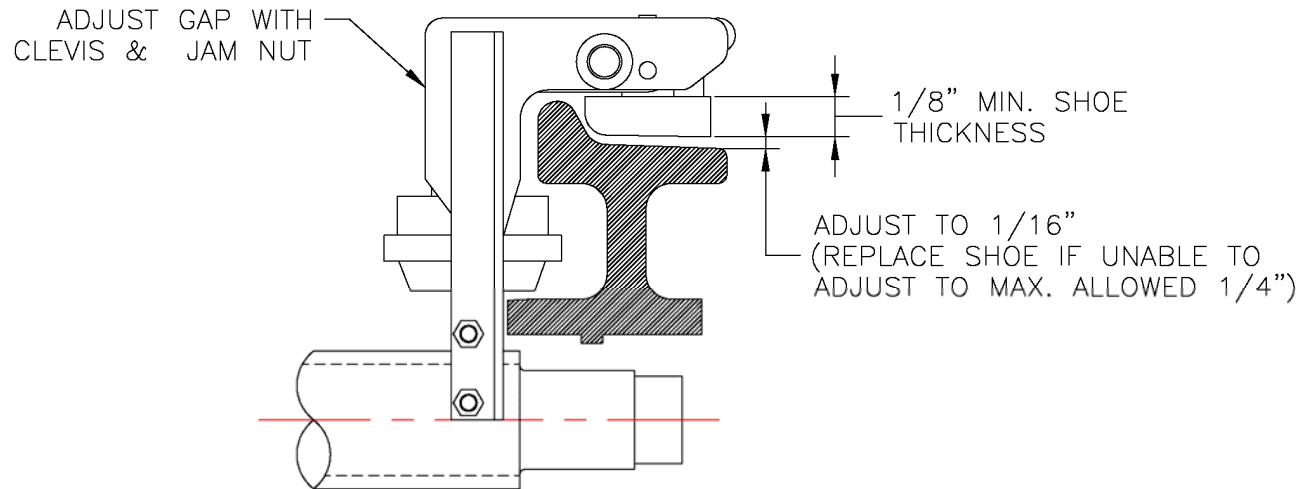
The guide wheel brake chambers are connected to the DELIVERY ports on the guide wheel air brakes relay valve.

Install air lines and valves per the drawing on next page. Make certain that the front air brake valve indicates that it has been preset to 75 psi and the rear air brake valve indicates 30 psi. The brake valves are already preset at the factory.

See drawing 818400 on the next page for more plumbing details.

5.4.4 Inspection and Adjustment

Inspect and adjust brake shoes per Figure 5.4.4.



FILENAME: M1630131

Figure 5.4.4 Air Brake Inspection and Adjustment

5.4.5 Testing

Operate the vehicle on a test track. With the "on/off" toggle valve "on" and the ball valve(s) open, check that:

1. When the vehicle brake pedal is depressed, the guide wheel brakes clamp the rail wheel enough to begin slowing its rotation, but not enough to totally lock the rail wheel. The rail wheels should not be allowed to lock up since that will cause a flat spot on the wheel due to the sliding action on the rail.
2. The brakes properly release when the brake pedal is released.

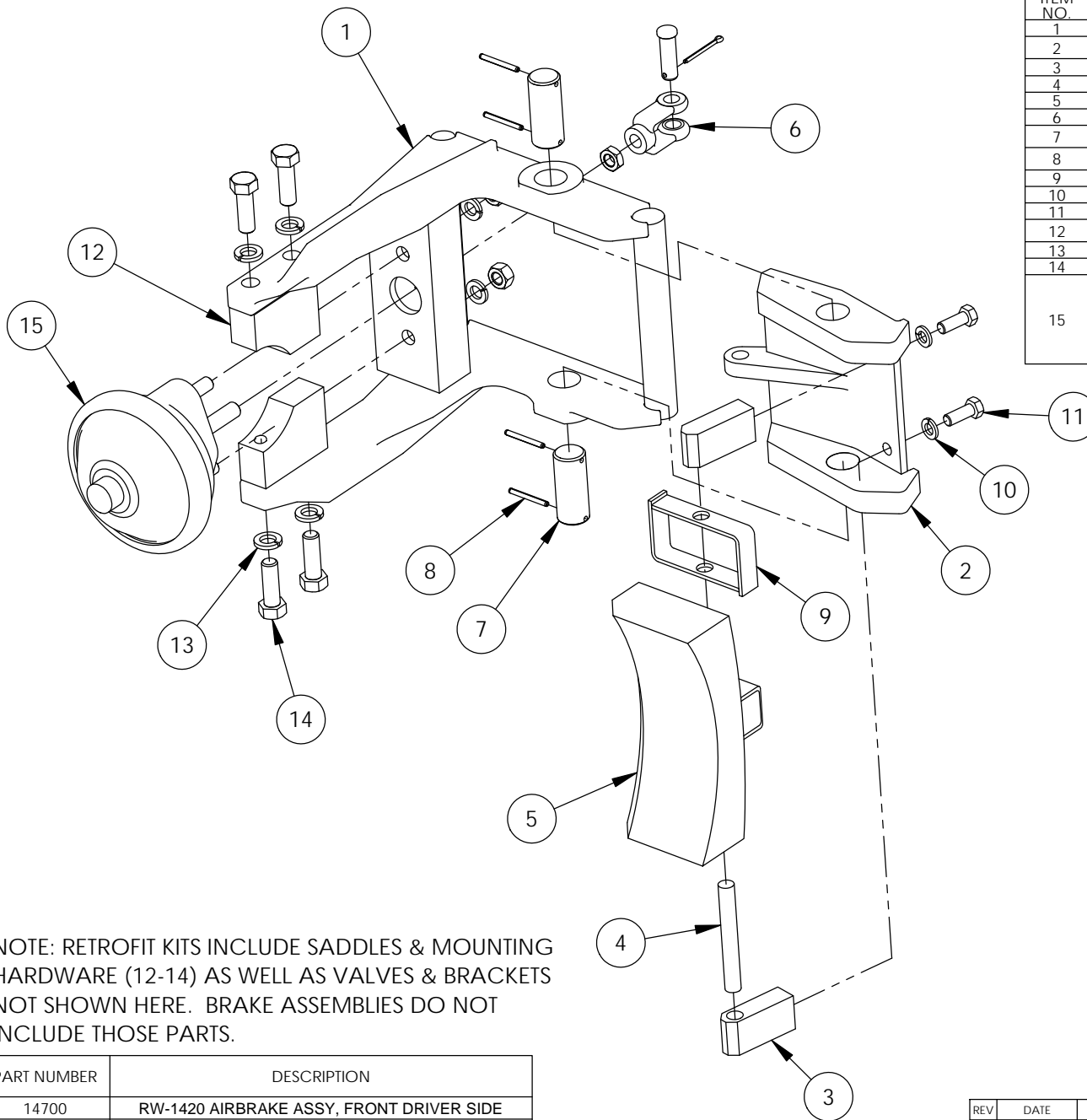
If brakes do not function properly, contact a service representative at DMF.

NOTE:

The rail wheel brake system is intended to assist the existing vehicle brakes when in the rail mode. As the vehicle's rear tires are in contact with the railhead, the primary braking effort is derived from the rubber tires. Rail wheel brakes alone are insufficient to stop the vehicle in a reasonable distance.

5.4.6 Brake Parts

See drawing M1214006 on the next page for an air brake parts schematic.



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	818407	1	AIR BRAKE BRACKET WELDMENT
2	818433	1	AIR BRAKE ARM INVESTMENT CASTING
3	14702	2	RW-1420 AIR BRAKE RETAINER BLOCK
4	14706	1	RW-1420 AIR BRAKE SHOE PIN
5	818470	1	AIR BRAKE SHOE, COBRA V-265
6	818457	1	AIR BRAKE CLEVIS ASSY., w/ COTTER PIN
7	818454	2	AIR BRAKE PIVOT PIN
8	818509	4	ROLL PIN 5/32" x 1-1/2"
9	818513	1	WELDMENT, BRAKE CLIP, FORMED&WELDED
10	12566	2	LOCK WASHER (3/8")
11	605172	2	HHCS, 3/8-16 X 1", GR8
12	14462	2	RW-1420 AIR BRAKE AXLE SADDLE 14" WHEEL
13	12481	4	LOCK WASHER, 1/2", GR8
14	818466	4	HHCS, 1/2-13 X 1-1/2", GR8
15	818458	1	AIR BRAKE CHAMBER, TYPE 9, FRONT DRIVER SIDE
	818459		AIR BRAKE CHAMBER, TYPE 9, FRONT PASSENGER SIDE
	818460		AIR BRAKE CHAMBER, TYPE 9, REAR DRIVER SIDE
	818461		AIR BRAKE CHAMBER, TYPE 9, REAR PASSENGER SIDE

NOTE: RETROFIT KITS INCLUDE SADDLES & MOUNTING HARDWARE (12-14) AS WELL AS VALVES & BRACKETS NOT SHOWN HERE. BRAKE ASSEMBLIES DO NOT INCLUDE THOSE PARTS.

PART NUMBER	DESCRIPTION
14700	RW-1420 AIRBRAKE ASSY, FRONT DRIVER SIDE
14701	RW-1420 AIRBRAKE ASSY, FRONT PASSENGER SIDE
14703	RW-1420 AIRBRAKE ASSY, REAR DRIVER SIDE
14704	RW-1420 AIRBRAKE ASSY, REAR PASSENGER SIDE
14705	RW-1420 AIRBRAKE RETROFIT KIT, FRONT
14708	RW-1420 AIRBRAKE RETROFIT KIT, REAR
14715	RW-1420 AIRBRAKE RETROFIT KIT, FRONT & REAR

REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X .063 .XX .030 .XXX .005 DRILL SIZES: ANGULAR: ± 1" SURF FINISH: 125 MICRO 2A AND 2B THREADS: ± 1" BREAK SHARP EDGES .03 X 45° MAX DMF (404)875-1512		RW-1420		
TITLE:		RW-1420 AIR BRAKE PARTS		
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DRAWN BY:	APPD BY:	DATE:	DRAWING NUMBER:	REV:
BJF	-	5/25/17	M1214006	#

SECTION 6.0 HYDRAULIC & ELECTRICAL SYSTEMS

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6.1 HYDRAULIC SYSTEM WITH HYDRAULIC RAILGEAR BRAKES

NOTE:

DMF only provides hydraulic hoses from front and rear control valves to Railgear cylinders. Customer is responsible for all other system components (tank, diverter, PTO, pump, filter, pressure relief valve, etc.)

6.1.1 System Pressures and Relief Settings

Various components within RW-1212 or RW-1420 Railgear with hydraulic brakes require different pressure setting to operate safely and reliably. Relief valves are typically factory set and should not require adjustment. Adjusting relief valves above or below the values shown below may result in damage to components and/or unsafe operation.

- **Railgear System Relief:** 2000 psi
- **Front Brake Relief (when equipped):** 1700 psi
- **Rear Brake Relief (when equipped):** 800 psi

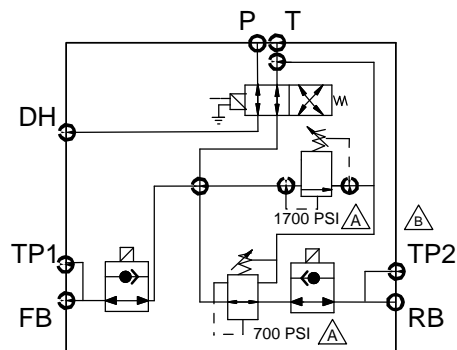
6.1.2 Using Hydraulic Power Unit Provided by DMF

DMF typically provides an electric over hydraulic power unit (Monarch M-304) to power the Railgear and rail brakes, when equipped.

The unit includes a pump, motor and reservoir. This unit can be located in the truck body, under the cab, or elsewhere as required. The unit should be protected from road spray and moisture. This unit operates with Dexron III hydraulic oil.

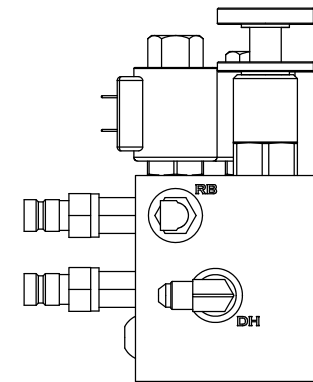
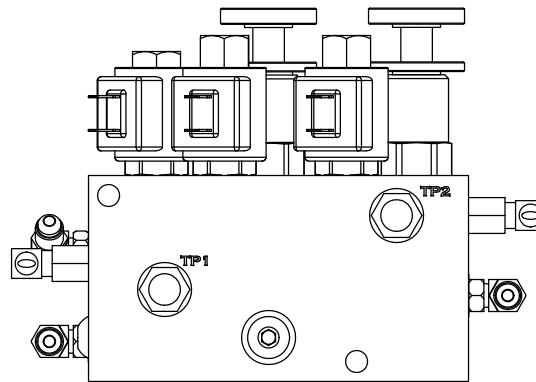
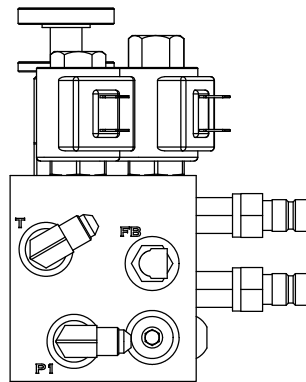
6.1.3 Hydraulic System for Multiple Uses (Railgear and other application(s))

DMF RW-1212 or RW-1420 Railgear with hydraulic brakes can be integrated with other hydraulic equipment through the use of a diverter valve. The Railgear requires 1.25gpm at 2000psi. A suitable relief and reservoir (3gal min) must be provided. Please contact DMF for assistance in integrating Railgear with other hydraulic equipment. If hydraulic Railgear brakes are used, they do require a dedicated hydraulic power unit but that can be run in parallel with a PTO and pump system for the other Railgear hydraulic functions.



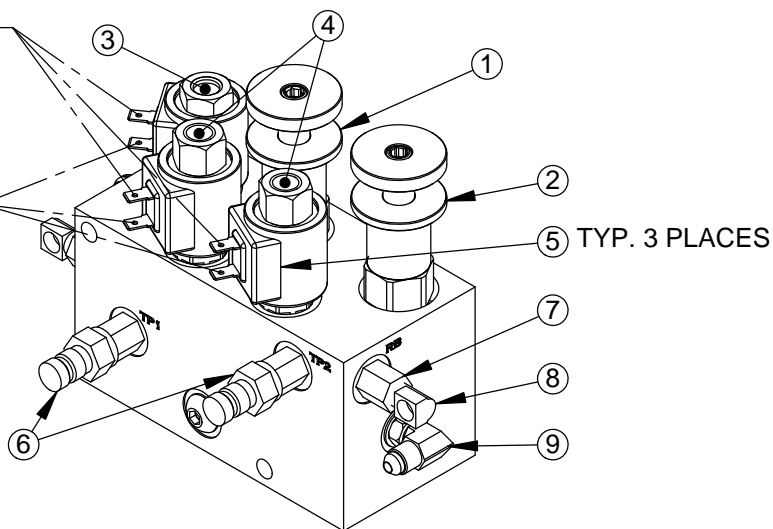
CIRCUIT DIAGRAM




ITEM	PART #	QTY	DESCRIPTION
1	10491	1	FRONT RELIEF VALVE
2	10469	1	REAR RELIEF VALVE
3	10471	1	BRAKE CIRCUIT ENABLE VALVE (CARTRIDGE ONLY)
4	10472	2	BRAKE LOCKING VALVE (CARTRIDGE ONLY)
5	500727	3	VALVE SOLENOID
6	10438	2	DIAGNOSTIC NIPPLE
7	10470	4	ADAPTER, 1/4 MORB X 1/8 FPT
8	10432	2	BRAKE LINE ELBOW, 1/8 MPT X 1/8 INV. FLARE
9	10457	3	1/4 MORB X #4 MJIC 90 DEG. ELBOW

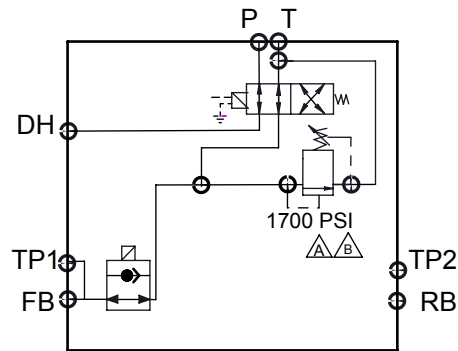


TO RED/BLACK
OUTPUT FROM
BRAKE CONTROLLER

DEDICATED
GROUND TO
BATTERY

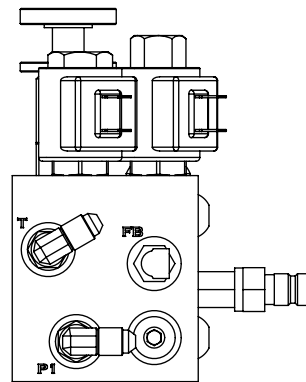


	7/2/14	1700 PSI WAS 1800 PSI		JDI		
	10/21/13	ADDED 1800 PSI, 700 PSI		JDI		
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES: (UNLESS SPECIFIED)		<div>TITLE: MANUAL, BRAKE VALVE MANIFOLD ASSY (F&R), HYDRAFORCE, RW-1019</div> <div>DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512</div>				
FRAC. MACH: ± 1/32"						
FRAC. OTHER: ± 1/16"						
X ± .063						
XX ± .030						
XXX ± .005						
DRILL SIZES: ± .015						
ANGULAR: ± 1°						
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B						
DRAWN BY: NEH		APPD BY:	DATE: 5/20/11		DRAWING NUMBER: M1019135	REV: B

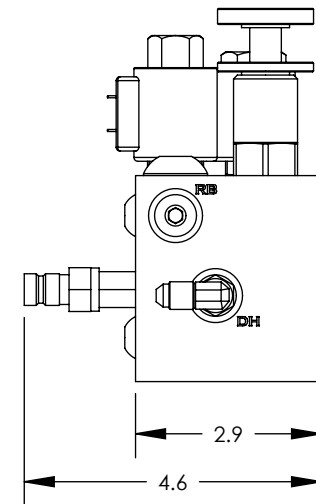
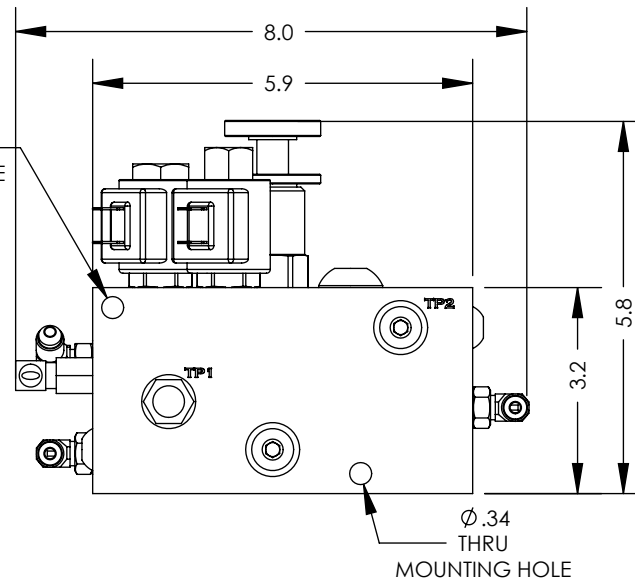


CIRCUIT DIAGRAM

ITEM	PART #	QTY	DESCRIPTION
1	10491	1	FRONT RELIEF VALVE
2	10471	1	BRAKE CIRCUIT ENABLE VALVE (CARTRIDGE ONLY)
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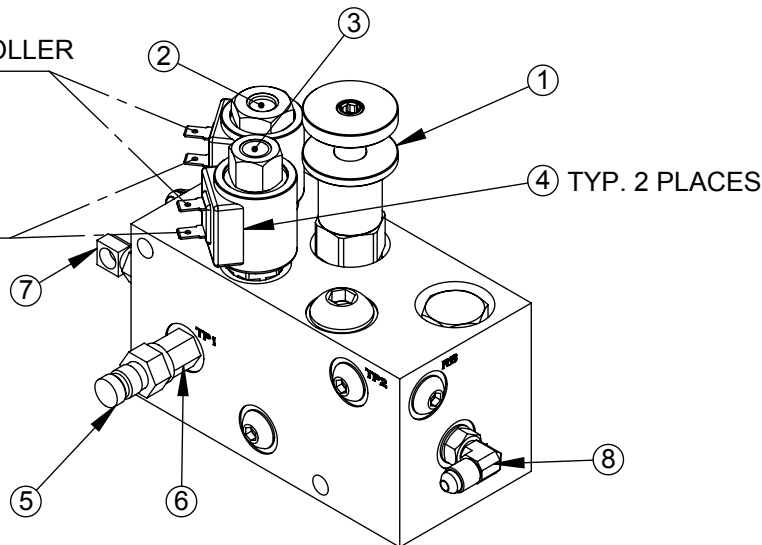






Ø.34
THRU
MOUNTING HOLE



TO RED/BLACK
OUTPUT FROM
BRAKE CONTROLLER

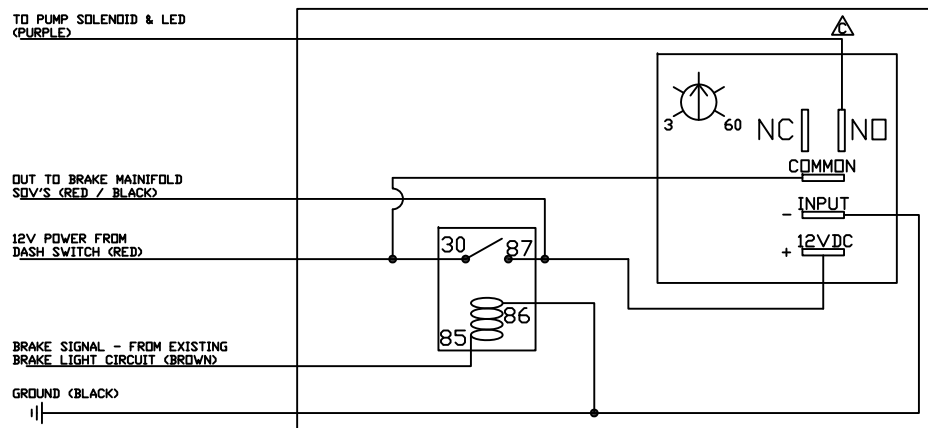
DEDICATED
GROUND TO
BATTERY



	12/2/14	CORRECTED QUANTITIES OF 10438, 10470, 10432		BJF		
	7/2/14	1700 PSI WAS 1800 PSI		JDI		
	10/21/13	ADDED 1800 PSI		JDI		
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES: (UNLESS SPECIFIED)						
FRAC. MACH: ± 1/32"						
FRAC. OTHER: ± 1/16"						
.X ± .063						
.XX ± .030						
.XXX ± .005						
DRILL SIZES: + .015						
ANGULAR: ± 1°						
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B						
DETAX SHARP EDGES (USE 4 RPT MAX)						
RW-1019		TITLE: MANUAL, BRAKE VALVE MANIFOLD ASSY (F ONLY), HYDRAFORCE, RW-1019				
		DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512				
DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:	
NEH		5/23/11		M1019137	C	

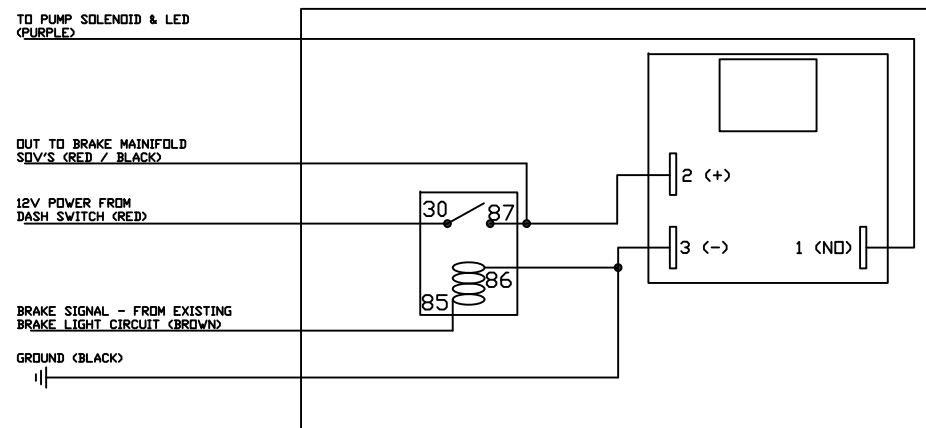
ITEM	PART NO.	QTY	DESCRIPTION
1	HAMMOND 1591TSBK	1	1019 BRAKE CONTROLLER BOX
2	10486	1	TIMER
3	HE87416	1	MICRO RELAY - HELLA 87416
4	HE87125	1	MICRO 5 TERMINAL MOUNT CON BLK - HELLA 87125
5	TERMINAL-HELLA87272	4	TERMINAL-HELLA87272




NCC TIMER (PART # Q4T-00060-346)
- TIMER IS RED IN COLOR
- HAS ADJUSTMENT DIAL (3-60 SEC)
- 5 TERMINALS



NOTES: 1) RELAY SHOWN IN DE-ENERGIZED STATE.
2) SET TIMER TO APPROXIMATELY 30 SECONDS.
3) NUMBERS ON RELAY DENOTE SPADE TERMINAL NUMBERS.
4) REFERENCE HD10481C FOR SYSTEM WIRING DETAILS.

AIROTRONICS TIMER (PART # TGLB730SC2H)
- TIMER IS BLACK IN COLOR
- NO ADJUSTMENT DIAL (FIXED 30 SECONDS)
- 3 TERMINALS



				
	8/22/11	FIXED ERROR FROM REV B: PURPLE ON NCC TIMER WENT TO NC		BJF
	1/7/11	ADDED AIROTRONICS OPTION		BJF
	2/25/09	HE87416 WAS HE87401; HE87125 WAS HE87122		BJF
REV	DATE	DESCRIPTION		BY APP
<div>TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS FRACTIONAL: DECIMAL: 1/32" .03125 FRACTIONAL: DECIMAL: 1/16" .0625 FRACTIONAL: DECIMAL: 1/8" .125 FRACTIONAL: DECIMAL: 3/16" .1875 FRACTIONAL: DECIMAL: 1/4" .25 FRACTIONAL: DECIMAL: 3/8" .375 FRACTIONAL: DECIMAL: 1/2" .5 FRACTIONAL: DECIMAL: 3/4" .75 FRACTIONAL: DECIMAL: 1" 1.0 FRACTIONAL: DECIMAL: 1 1/4" 1.25 FRACTIONAL: DECIMAL: 1 1/2" 1.5 FRACTIONAL: DECIMAL: 1 3/4" 1.75 FRACTIONAL: DECIMAL: 2" 2.0 FRACTIONAL: DECIMAL: 2 1/4" 2.25 FRACTIONAL: DECIMAL: 2 1/2" 2.5 FRACTIONAL: DECIMAL: 2 3/4" 2.75 FRACTIONAL: DECIMAL: 3" 3.0 FRACTIONAL: DECIMAL: 3 1/4" 3.25 FRACTIONAL: DECIMAL: 3 1/2" 3.5 FRACTIONAL: DECIMAL: 3 3/4" 3.75 FRACTIONAL: DECIMAL: 4" 4.0 FRACTIONAL: DECIMAL: 4 1/4" 4.25 FRACTIONAL: DECIMAL: 4 1/2" 4.5 FRACTIONAL: DECIMAL: 4 3/4" 4.75 FRACTIONAL: DECIMAL: 5" 5.0 FRACTIONAL: DECIMAL: 5 1/4" 5.25 FRACTIONAL: DECIMAL: 5 1/2" 5.5 FRACTIONAL: DECIMAL: 5 3/4" 5.75 FRACTIONAL: DECIMAL: 6" 6.0 FRACTIONAL: DECIMAL: 6 1/4" 6.25 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43 3/4" 43.75 FRACTIONAL: DECIMAL: 44" 44.0 FRACTIONAL: DECIMAL: 44 1/4" 44.25 FRACTIONAL: DECIMAL: 44 1/2" 44.5 FRACTIONAL: DECIMAL: 44 3/4" 44.75 FRACTIONAL: DECIMAL: 45" 45.0 FRACTIONAL: DECIMAL: 45 1/4" 45.25 FRACTIONAL: DECIMAL: 45 1/2" 45.5 FRACTIONAL: DECIMAL: 45 3/4" 45.75 FRACTIONAL: DECIMAL: 46" 46.0 FRACTIONAL: DECIMAL: 46 1/4" 46.25 FRACTIONAL: DECIMAL: 46 1/2" 46.5 FRACTIONAL: DECIMAL: 46 3/4" 46.75 FRACTIONAL: DECIMAL: 47" 47.0 FRACTIONAL: DECIMAL: 47 1/4" 47.25 FRACTIONAL: DECIMAL: 47 1/2" 47.5 FRACTIONAL: DECIMAL: 47 3/4" 47.75 FRACTIONAL: DECIMAL: 48" 48.0 FRACTIONAL: DECIMAL: 48 1/4" 48.25 FRACTIONAL: DECIMAL: 48 1/2" 48.5 FRACTIONAL: DECIMAL: 48 3/4" 48.75 FRACTIONAL: DECIMAL: 49" 49.0 FRACTIONAL: DECIMAL: 49 1/4" 49.25 FRACTIONAL: DECIMAL: 49 1/2" 49.5 FRACTIONAL: DECIMAL: 49 3/4" 49.75 FRACTIONAL: DECIMAL: 50" 50.0 FRACTIONAL: DECIMAL: 50 1/4" 50.25 FRACTIONAL: DECIMAL: 50 1/2" 50.5 FRACTIONAL: DECIMAL: 50 3/4" 50.75 FRACTIONAL: DECIMAL: 51" 51.0 FRACTIONAL: 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FRACTIONAL: DECIMAL: 131 1/4" 1</div>				

6.2 HYDRAULIC SYSTEM WITH AIR RAILGEAR BRAKES OR NO RAILGEAR BRAKES

NOTE:

DMF only provides hydraulic hoses from front and rear control valves to Railgear cylinders. Customer is responsible for all other system components (tank, diverter, PTO, pump, filter, pressure relief valve, etc.)

6.2.1 New Hydraulic System for Vehicle Without Hydraulic System

If only DMF Railgear is to be installed and there is not an existing hydraulic system, outfit the truck with a 5 to 7 GPM, 2500 psi pump, suction filter (such as a Vickers OFSS-10), with an appropriate sized reservoir. The tank should have a minimum of one suction port (3/4 NPT), one 1/2" NPT return and a tank filler breather. Fill the tank with Unax RX-46 hydraulic oil, or equivalent. If other equipment is to be installed in addition to your DMF Railgear, you will need to adjust your tank specifications accordingly.

Once your new hydraulic system is installed, if your vehicle is going to have multiple applications for the hydraulic system, please proceed to Section 6.2.2 for instructions on installing a diverter valve.

6.2.2 Hydraulic System for Multiple Uses (Railgear and Other Application(s))

If the truck has an existing hydraulic system, you must first install an appropriately sized pressure relief valve in the pressure line after the pump. Install an appropriate sized diverter valve (depending on pump volume) in the pressure line after the pressure relief valve and before any existing equipment. One diverter outlet routes to the existing equipment's valves, the other diverter outlet routes to the front Railgear. See the Section 6.2.4 for additional information on installation of the pressure relief valve and diverter valve.

****WARNING****

Railgear control valves have built-in pressure reliefs and the hydraulic working pressure of the system is 2500 psi. The front valve should be set to 2300 psi at the relief. The rear valves should be set to 2000 psi and all other parts supplied by DMF are rated to 2500 psi. Care must be exercised so that the relief in any of the valves is not inadvertently exceeded. It is possible for a relief to be adjusted much higher than its valve can withstand. To ensure correct system pressure, check with a gauge.

6.2.3 Hydraulic System Installation Continued

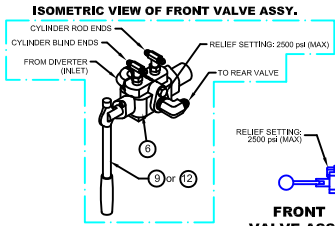
From the output side of the pressure relief valve (or the diverter valve, if appropriate), route a pressure line (SAE 100R2-8 and #8 JIC swivels at each end) to the center of the front bumper. Connect the pressure line to the "IN" port of the front Railgear valve. From the "OUT" port of the front Railgear valve, route a pressure line (SAE 100R2-8 and #8 JIC swivels at each end) to the "IN" port of the rear Railgear valve. Lastly, run a hydraulic line from the "OUT" port of the rear Railgear to the tank, ensuring that there are no obstructions, such as filters or other equipment. The remaining ports on the front and rear valve assemblies connect to the Railgear cylinders with SAE 100R1-4 hose and #4 JIC swivels. The rear cylinder hydraulic hoses are pre-installed at the factory. Check that proper hose clearance is obtained to avoid chafing. Shield hoses if necessary.

****WARNING****

Be certain that the front and rear valves are plumbed correctly. Each valve port is marked "IN" or "OUT". Plumbing the valves backward will cause an unsafe condition, resulting in possible injury and/or damage.

NOTE: DMF ONLY PROVIDES HYDRAULIC HOSES FROM FRONT & REAR CONTROL VALVES TO RAILGEAR CYLINDERS. CUSTOMER IS RESPONSIBLE FOR ALL OTHER SYSTEM COMPONENTS (TANK, DIVERTER, PTO, PUMP, FILTER, PRESSURE RELIEF VALVE, ETC.)

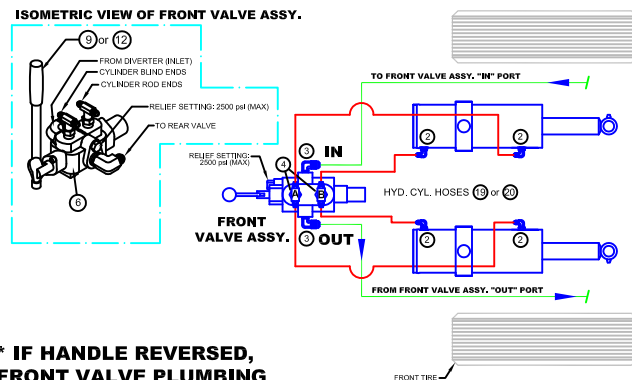
NOTE: ON THE FRONT VALVE THE RELIEF SETTING MAY BE LOCATED IN DIFFERENT LOCATIONS, DEPENDING ON THE MANUFACTURING BRAND. ALL ELSE REMAINS THE SAME. WE SHOW THE TWO MOST COMMON LOCATIONS BELOW FOR THE RELIEF SETTING.

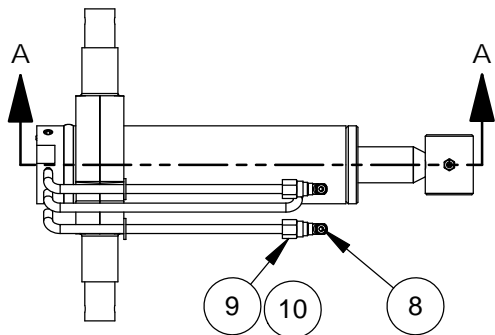


FRONT VALVE NOTE: DEPENDING ON DIRECTION OF HANDLE UP/DOWN, YOU MUST RE-PLUMB YOUR HOSES OPPOSITE FROM ABOVE. SEE DIAGRAM BELOW.....

**PULL TO RAISE
PUSH TO LOWER**

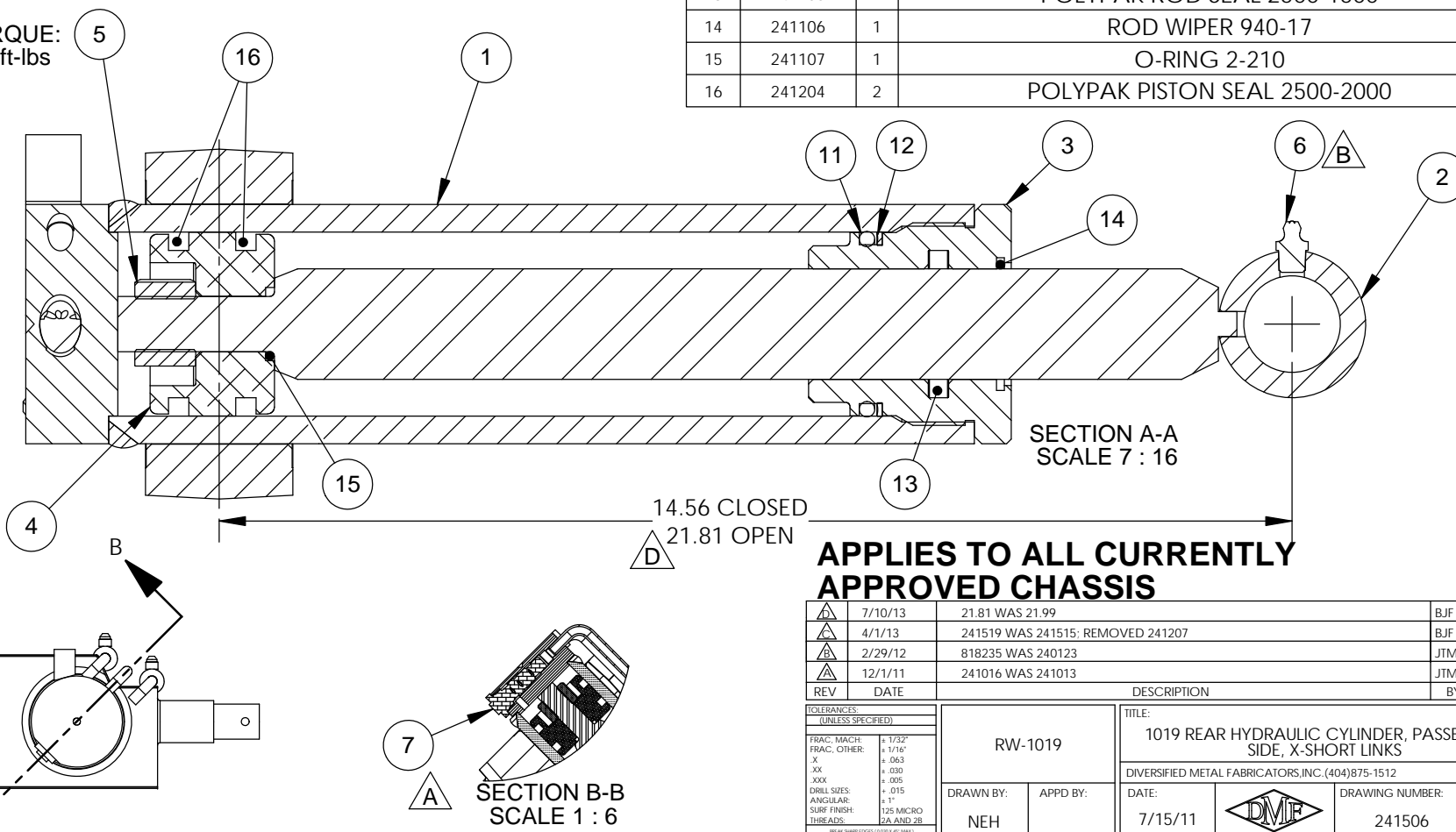
PLUMBING FOR REVERSED HANDLE ONLY *







NOTES:
SEE PP008 FOR CYLINDER ASSEMBLY & TEST PROCEDURE
DMF P/N 241225 - SEAL KIT INCLUDES ITEM #S 11, 12, 13, 14, 15, 16

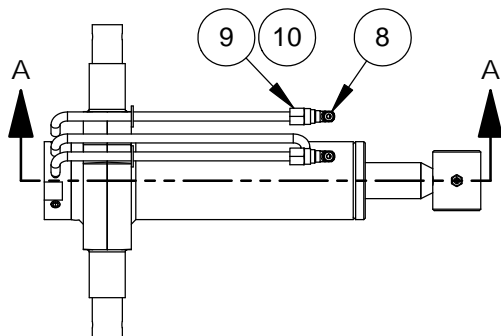
TORQUE:
300 ft-lbs



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	241519	1	WELDMENT, 2-1/2" TUBE, LVALVE, XTRA SHORT, REAR RH
2	241200	1	2-1/2" 1019 REAR CYLINDER ROD ASSY, LVL
3	241202	1	GLAND, 2-1/2" BORE X 1-1/2" ROD
4	241203	1	DETAIL, 2-1/2" PISTON, LV
5	241103	1	NYLOCK NUT, 3/4 - 16 UNF
6	818235	1	GREASE FITTING, 1/8" NPT, STRAIGHT
7	241016	1	VALVE, LOCKING, CPD-084P, PARKER
8	241335	2	3/8 TUBE COMPRESSION FITTING TO #4 JIC MALE, 90 DEGREE
9	108129	2	TUBE NUT, 3/8"
10	108130	2	TUBE FERRULE, 3/8"
11	241208	1	O-RING; 2-330
12	241209	1	BACK UP RING, 8-330
13	241105	1	POLYPAK ROD SEAL 2500-1500
14	241106	1	ROD WIPER 940-17
15	241107	1	O-RING 2-210
16	241204	2	POLYPAK PISTON SEAL 2500-2000

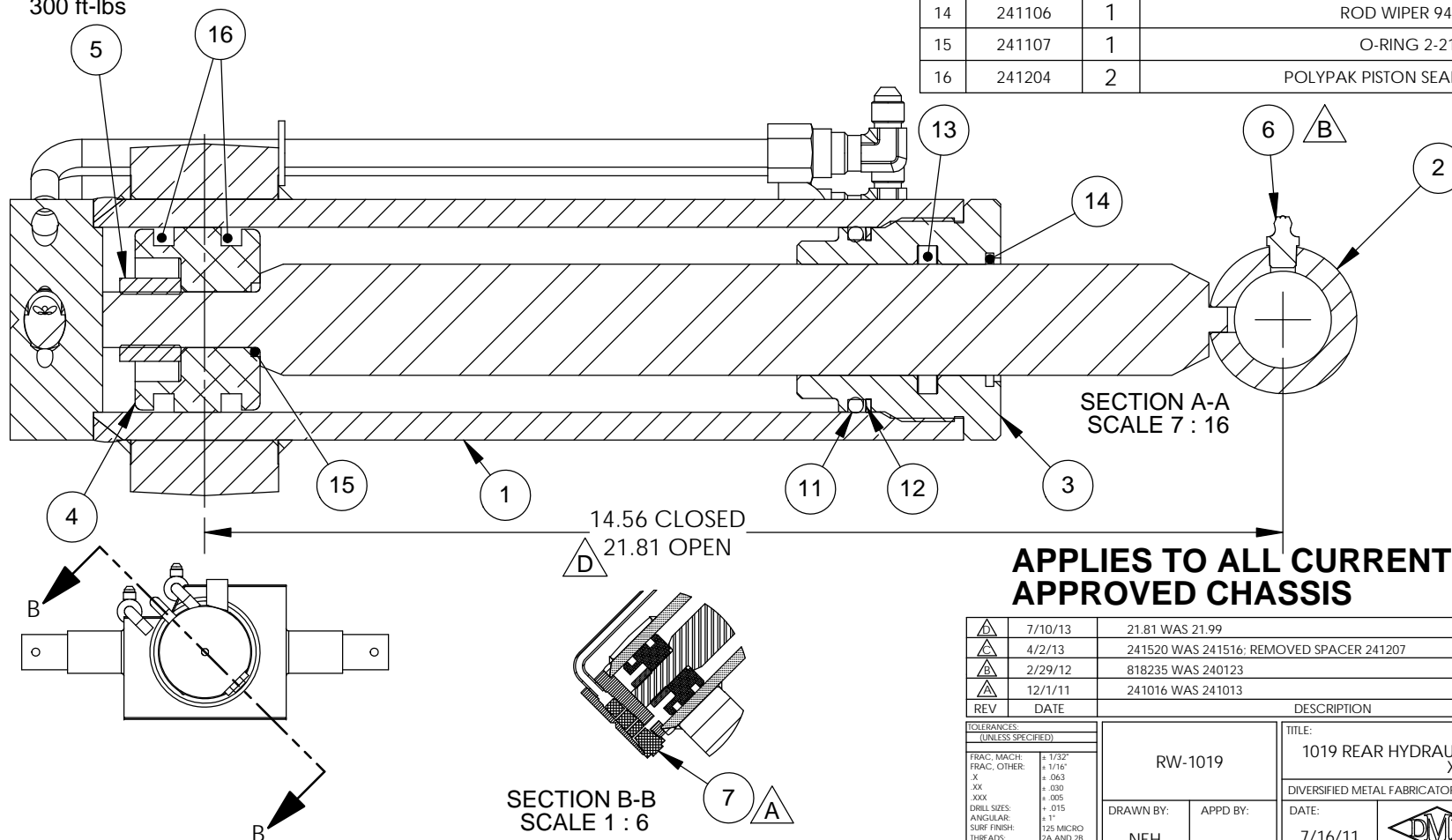
APPLIES TO ALL CURRENTLY APPROVED CHASSIS

	7/10/13	21.81 WAS 21.99		BJF		
	4/1/13	241519 WAS 241515; REMOVED 241207		BJF		
	2/29/12	818235 WAS 240123		JTM		
	12/1/11	241016 WAS 241013		JTM		
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES: (UNLESS SPECIFIED)						
FRAC. MACH: ± 1/32"		<div><div>RW-1019</div><div><div>DRAWN BY: NEH</div><div>APPD BY:</div></div><div><div>TITLE: 1019 REAR HYDRAULIC CYLINDER, PASSENGER SIDE, X-SHORT LINKS</div><div>DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512</div><div><div>DATE: 7/15/11</div><div></div><div><div>DRAWING NUMBER: 241506</div><div>REV: D</div></div></div></div></div>				
FRAC. OTHER: ± 1/16"						
X ± .063						
XX ± .030						
XXX ± .005						
DRILL SIZES: ± .015						
ANGULAR: ± 1°						
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B						
BREPAN SHARP EDGES (SEE 3D) IF NEEDED						










SEE PP008 FOR CYLINDER ASS'Y & TEST PROCEDURE
DMF P/N 241225 - SEAL KIT INCLUDES ITEM #S 11, 12, 13, 14, 15, 16

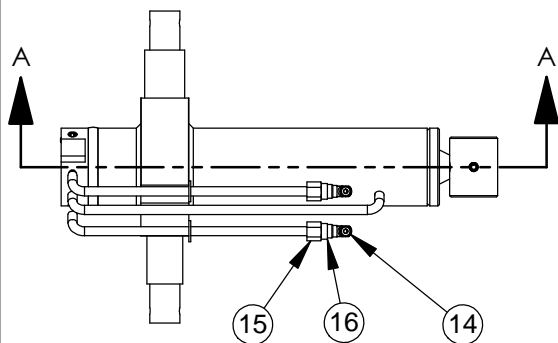
TORQUE:
300 ft-lbs



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	241520	1	WELDMENT, 2-1/2" TUBE, LVALVE, XTRA SHORT, REAR LH
2	241200	1	2-1/2" 1019 REAR CYLINDER ROD ASSY, LVL
3	241202	1	GLAND, 2-1/2" BORE X 1-1/2" ROD
4	241203	1	DETAIL, 2-1/2" PISTON, LV
5	241103	1	NYLOCK NUT, 3/4 - 16 UNF
6	818235	1	GREASE FITTING, 1/8" NPT, STRAIGHT
7	241016	1	VALVE, LOCKING, CPD-084P, PARKER
8	241335	2	3/8 TUBE COMPRESSION FITTING TO #4 JIC MALE, 90 DEGREE
9	108129	2	TUBE NUT, 3/8"
10	108130	2	TUBE FERRULE, 3/8"
11	241208	1	O-RING; 2-330
12	241209	1	BACK UP RING, 8-330
13	241105	1	POLYPAK ROD SEAL 2500-1500
14	241106	1	ROD WIPER 940-17
15	241107	1	O-RING 2-210
16	241204	2	POLYPAK PISTON SEAL 2500-2000

**APPLIES TO ALL CURRENTLY
APPROVED CHASSIS**

	7/10/13	21.81 WAS 21.99		BJF																	
	4/2/13	241520 WAS 241516; REMOVED SPACER 241207		BJF																	
	2/29/12	818235 WAS 240123		JTM																	
	12/1/11	241016 WAS 241013		JTM																	
REV	DATE	DESCRIPTION		BY	APP																
TOLERANCES: (UNLESS SPECIFIED)					<table><tr><td colspan="2">RW-1019</td><td colspan="2">TITLE: 1019 REAR HYDRAULIC CYLINDER, DRIVER SIDE, X-SH LINKS DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512</td></tr><tr><td>DRAWN BY:</td><td>APPD BY:</td><td>DATE:</td><td></td><td>DRAWING NUMBER:</td><td>REV:</td></tr><tr><td>NEH</td><td></td><td>7/16/11</td><td></td><td>241507</td><td>D</td></tr></table>	RW-1019		TITLE: 1019 REAR HYDRAULIC CYLINDER, DRIVER SIDE, X-SH LINKS DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512		DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:	NEH		7/16/11		241507	D
RW-1019		TITLE: 1019 REAR HYDRAULIC CYLINDER, DRIVER SIDE, X-SH LINKS DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512																			
DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:		REV:															
NEH		7/16/11		241507		D															
FRAC. MACH:	± 1/32"																				
FRAC. OTHER:	± 1/16"																				
X	± .063																				
.XX	± .030																				
.XXX	± .005																				
DRILL SIZES:	± .015																				
ANGULAR:	± 1"																				
SURF FINISH:	125 MICRO																				
THREADS:	2A AND 2B																				
SEE AN ISMAP CODES (LISTED BY PART)																					



DMF P/N 241225 - SEAL KIT
(SEAL KIT INCLUDES ITEM #'S 3,4,5,9,10,11)

B

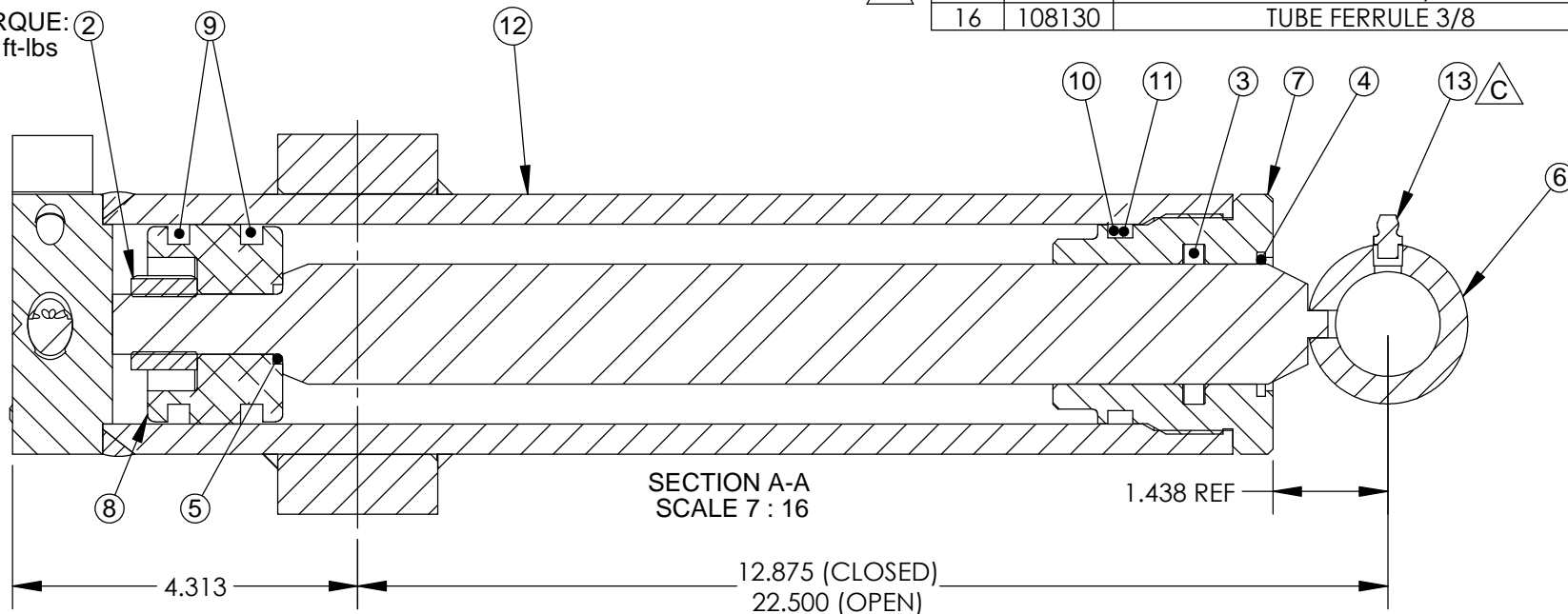
ITEM	PART #	DESCRIPTION	QTY.
1	241016	PARKER LOCKING VALVE	1
2	241103	3/4-16 LOCKNUT	1
3	241105	ROD SEAL	1
4	241106	ROD WIPER	1
5	241107	3/4" ORING	1
6	241200	ROD ASSEMBLY	1
7	241202	GLAND	1
8	241203	PISTON	1
9	241204	PISTON SEAL	2
10	241208	2-1/2" ORING	1
11	241209	2-1/2" BACKUP RING	1
12	241515	TUBE WELDMENT	1
13	818235	GREASE FITTING, 1/8"NPT, STRAIGHT	1
14	241335	REAR LVLV CYL. COMP. FITTING 90deg	2
15	108129	TUBE NUT 3/8	2
16	108130	TUBE FERRULE 3/8	2

C

A

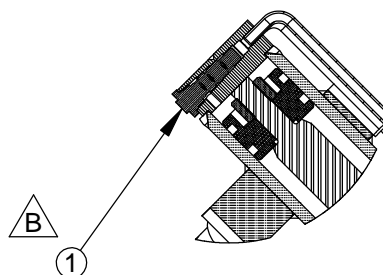
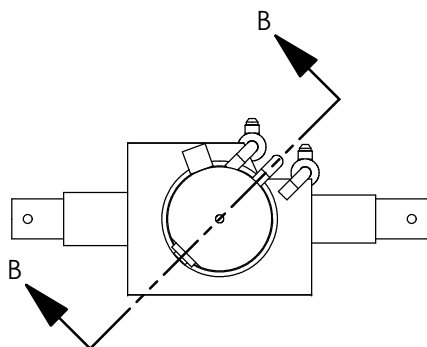
SEE PP008 FOR CYLINDER ASS'Y & TEST PROCEDURE

A TORQUE:
300 ft-lbs







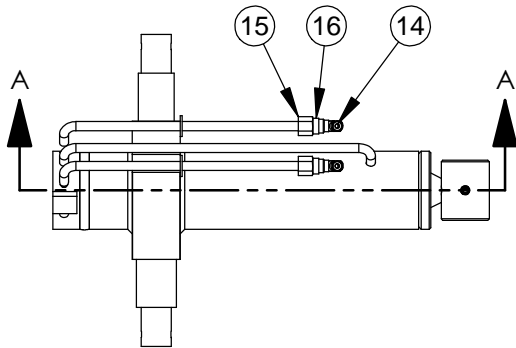
SECTION A-A
SCALE 7 : 16

**APPLIES TO ALL CURRENTLY
APPROVED CHASSIS**



SECTION B-B
SCALE 1 : 6

	2/17/12	818235 WAS 240123			JTM	
	12/1/11	241016 WAS 241013			JTM	
	7/16/11	ADDED ITEMS 14-16 TO BOM, ADDED TORQUE SPEC			NEH	
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES:						
(UNLESS SPECIFIED)						
RW-1019						
FRACTIONAL: MACH:		± 1/32"		TITLE: 1019 REAR HYDRAULIC CYLINDER, PASSENGER SIDE DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		
FRACTIONAL: OTHER:		± 1/16"				
.XX		± .003				
.XXX		± .005				
DRILL SIZES:		± .015				
ANGULAR:		± 1°				
SURF FINISH:		125 MICRO				
THREADS:		2A AND 2B				
DRAWN BY:		APPD BY:				
NEH						
DATE:		4/20/11		DRAWING NUMBER:		
				241503		
				REV:		
				C		



DMF P/N 241225 - SEAL KIT
(SEAL KIT INCLUDES ITEM #'S 3,4,5,9,10,11)

C

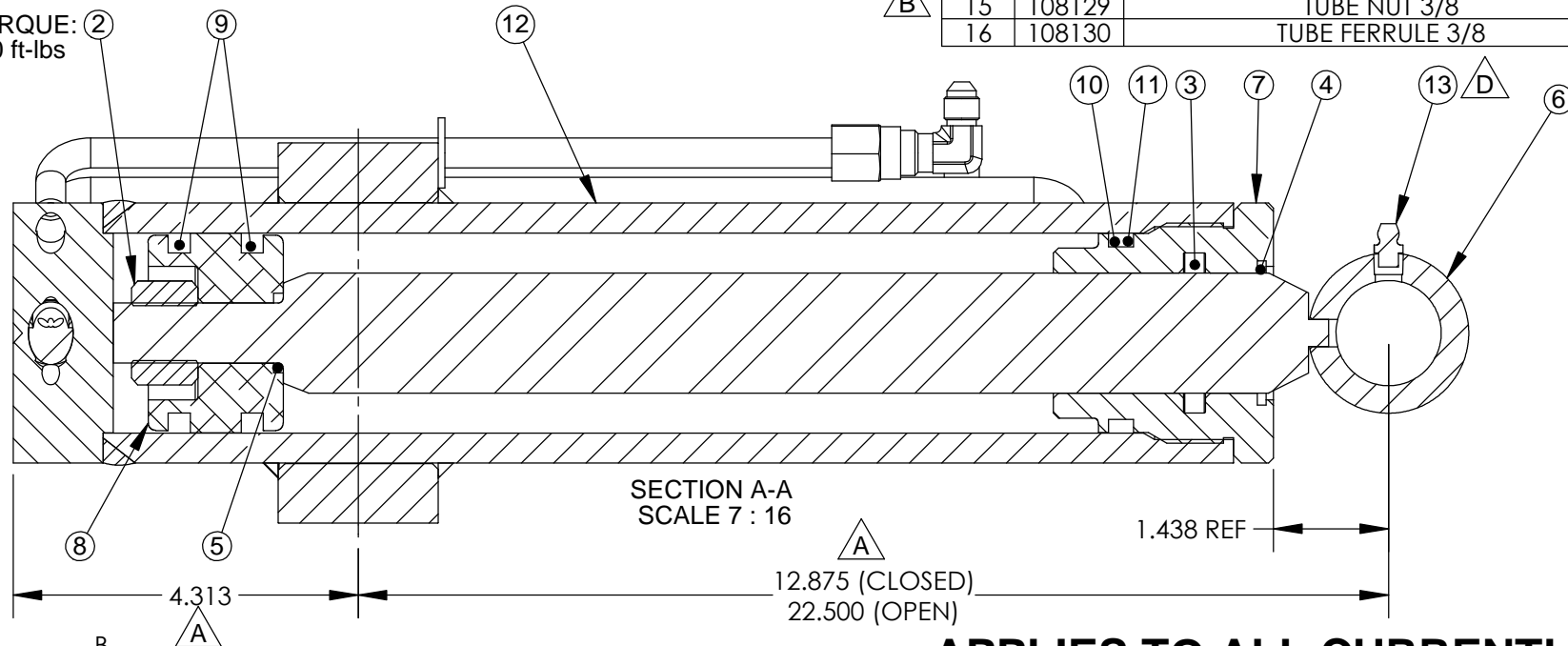
SEE PP008 FOR CYLINDER ASS'Y & TEST PROCEDURE

TORQUE: 300 ft-lbs
B

D

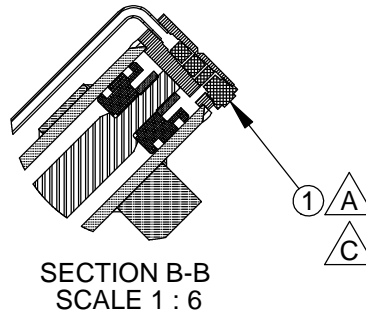
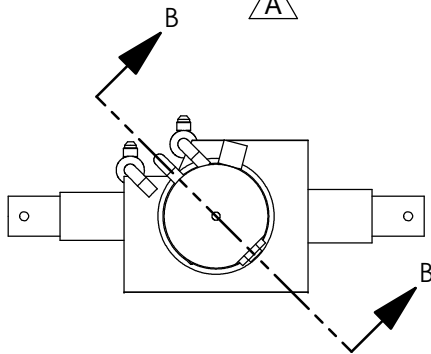
B

ITEM	PART #	DESCRIPTION	QTY.
1	241016	PARKER LOCKING VALVE	1
2	241103	3/4-16 LOCKNUT	1
3	241105	ROD SEAL	1
4	241106	ROD WIPER	1
5	241107	3/4" ORING	1
6	241200	ROD ASSEMBLY	1
7	241202	GLAND	1
8	241203	PISTON	1
9	241204	PISTON SEAL	2
10	241208	2-1/2" ORING	1
11	241209	2-1/2" BACKUP RING	1
12	241516	TUBE WELDMENT	1
13	818235	GREASE FITTING, 1/8"NPT, STRAIGHT	1
14	241335	REAR LVLV CYL. COMP. FITTING 90deg	2
15	108129	TUBE NUT 3/8	2
16	108130	TUBE FERRULE 3/8	2







SECTION A-A
SCALE 7 : 16


**APPLIES TO ALL CURRENTLY
APPROVED CHASSIS**



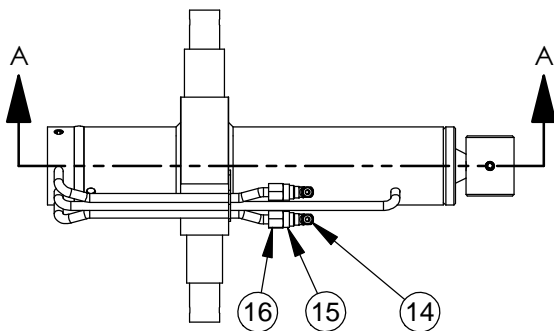
SECTION B-B
SCALE 1 : 6

	2/29/12	818235 WAS 240123	JTM	
	12/1/11	241016 WAS 241013	JTM	
	7/16/11	ADDED ITEMS 14-16, ADDED TORQUE SPEC	NEH	
	5/2/11	ADDED DIMENSIONS AND BALLOON FOR ITEM #1	NEH	
REV	DATE	DESCRIPTION	BY	APP

TOLERANCES: (UNLESS SPECIFIED)	
FRAC. MACH: ± 1/32"	
FRAC. OTHER: ± 1/16"	
.X ± .003	
.XX ± .003	
.XXX ± .005	
DRILL SIZES: + .015	
ANGULAR: ± 1°	
SURF FINISH: 125 MICRO	
THREADS: 2A AND 2B	
BREAK SHARP EDGES (LESS 1/8" RPT MAX)	

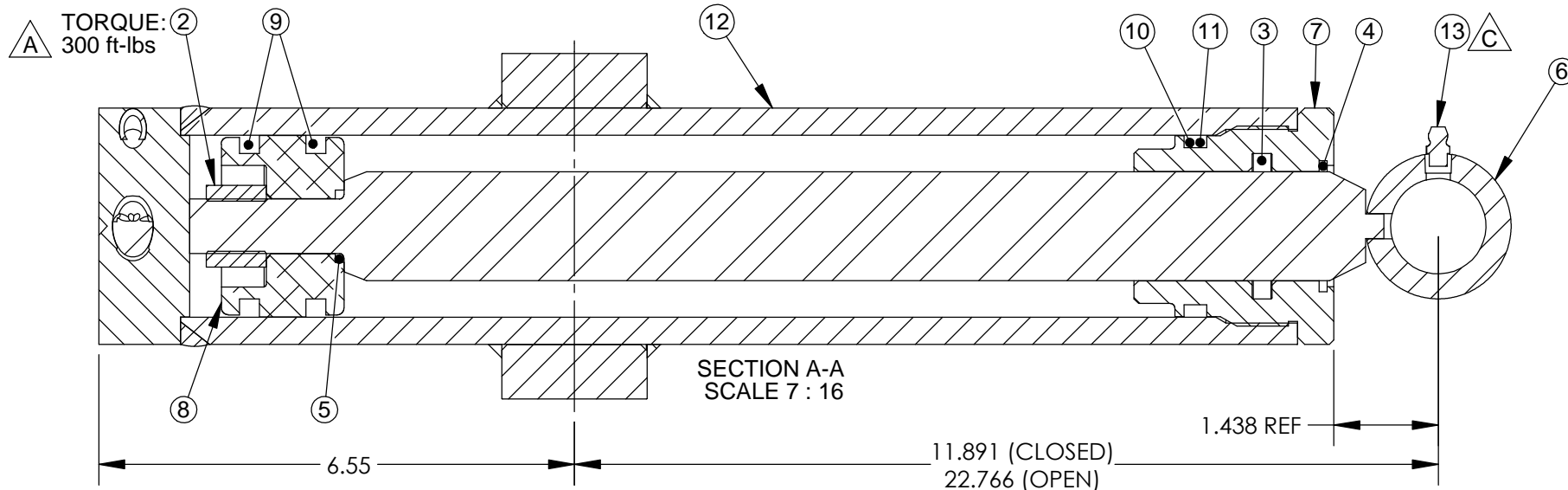
RW-1019		TITLE: 1019 REAR HYDRAULIC CYLINDER, DRIVER SIDE			
		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
NEH		4/20/11		241504	D

DMF P/N 241225 - SEAL KIT
(SEAL KIT INCLUDES ITEM #'S 3,4,5,9,10,11)

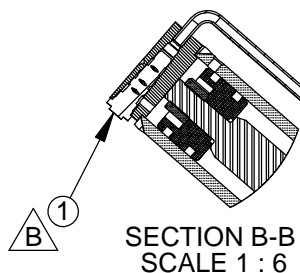
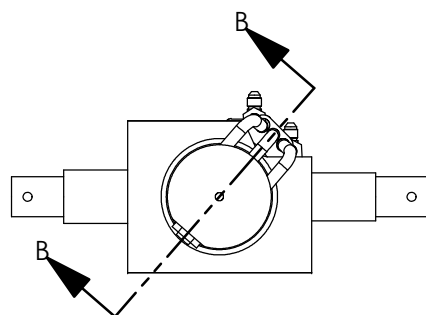








SEE PP008 FOR CYLINDER ASS'Y & TEST PROCEDURE

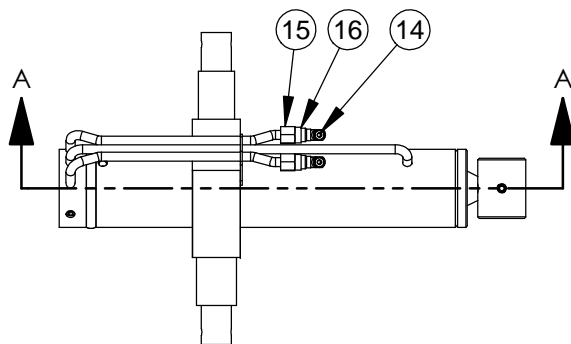
ITEM	PART #	DESCRIPTION	QTY.
1	241016	PARKER LOCKING VALVE	1
2	241103	3/4-16 LOCKNUT	1
3	241105	ROD SEAL	1
4	241106	ROD WIPER	1
5	241107	3/4" ORING	1
6	241216	ROD ASSEMBLY	1
7	241202	GLAND	1
8	241203	PISTON	1
9	241204	PISTON SEAL	2
10	241208	2-1/2" ORING	1
11	241209	2-1/2" BACKUP RING	1
12	241415	TUBE WELDMENT	1
13	818235	GREASE FITTING, 1/8"NPT, STRAIGHT	1
14	241335	REAR LVLV CYL. COMP. FITTING 90deg	2
15	108129	TUBE NUT 3/8	2
16	108130	TUBE FERRULE 3/8	2



**APPLIES TO ALL CURRENTLY
APPROVED CHASSIS**



	2/20/12	818235 WAS 240123			JTM																	
	12/1/11	241016 WAS 241013			JTM																	
	7/16/11	ADDED ITEMS 14-16, ADDED TORQUE SPEC			NEH																	
REV	DATE	DESCRIPTION			BY	APP																
TOLERANCES: (UNLESS SPECIFIED)		<table><tr><td colspan="2" rowspan="3">RW-1019</td><td colspan="4">TITLE: 1019 REAR HYDRAULIC CYLINDER, LONG LINKS, PASSENGER SIDE</td></tr><tr><td colspan="4">DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512</td></tr><tr><td>DRAWN BY: NEH</td><td>APPD BY:</td><td>DATE: 4/20/11</td><td></td><td>DRAWING NUMBER: 241403</td><td>REV: C</td></tr></table>					RW-1019		TITLE: 1019 REAR HYDRAULIC CYLINDER, LONG LINKS, PASSENGER SIDE				DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512				DRAWN BY: NEH	APPD BY:	DATE: 4/20/11		DRAWING NUMBER: 241403	REV: C
RW-1019									TITLE: 1019 REAR HYDRAULIC CYLINDER, LONG LINKS, PASSENGER SIDE													
									DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512													
							DRAWN BY: NEH	APPD BY:	DATE: 4/20/11		DRAWING NUMBER: 241403	REV: C										
FRAC. MACH: ± 1/32"																						
FRAC. OTHER: ± 1/16"																						
X ± .063																						
XX ± .030																						
XXX ± .005																						
DRILL SIZES: + .015																						
ANGULAR: ± 1°																						
SURF FINISH: 125 MICRO																						
THREADS: 2A AND 2B																						

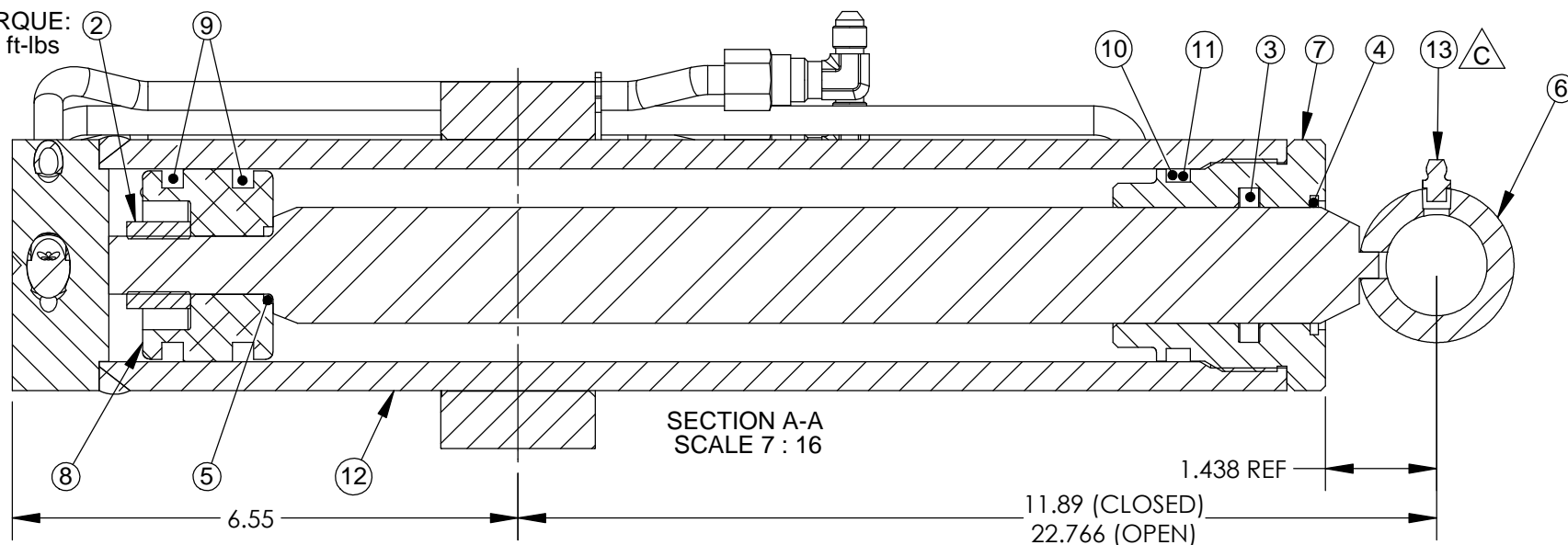


DMF P/N 241225 - SEAL KIT
(SEAL KIT INCLUDES ITEM #'S 3,4,5,9,10,11)

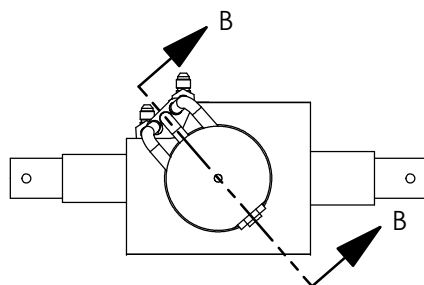
SEE PP008 FOR CYLINDER ASS'Y & TEST PROCEDURE



TORQUE:
300 ft-lbs



SECTION A-A
SCALE 7 : 16







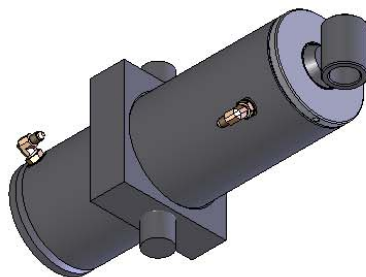
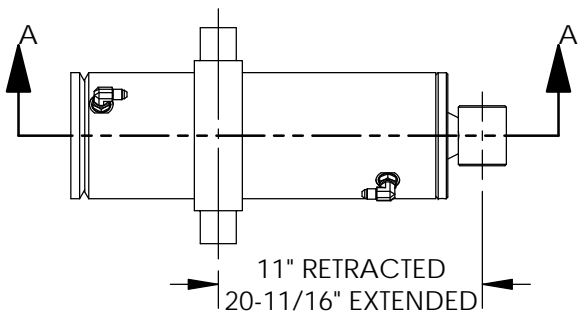
SECTION B-B
SCALE 1 : 6



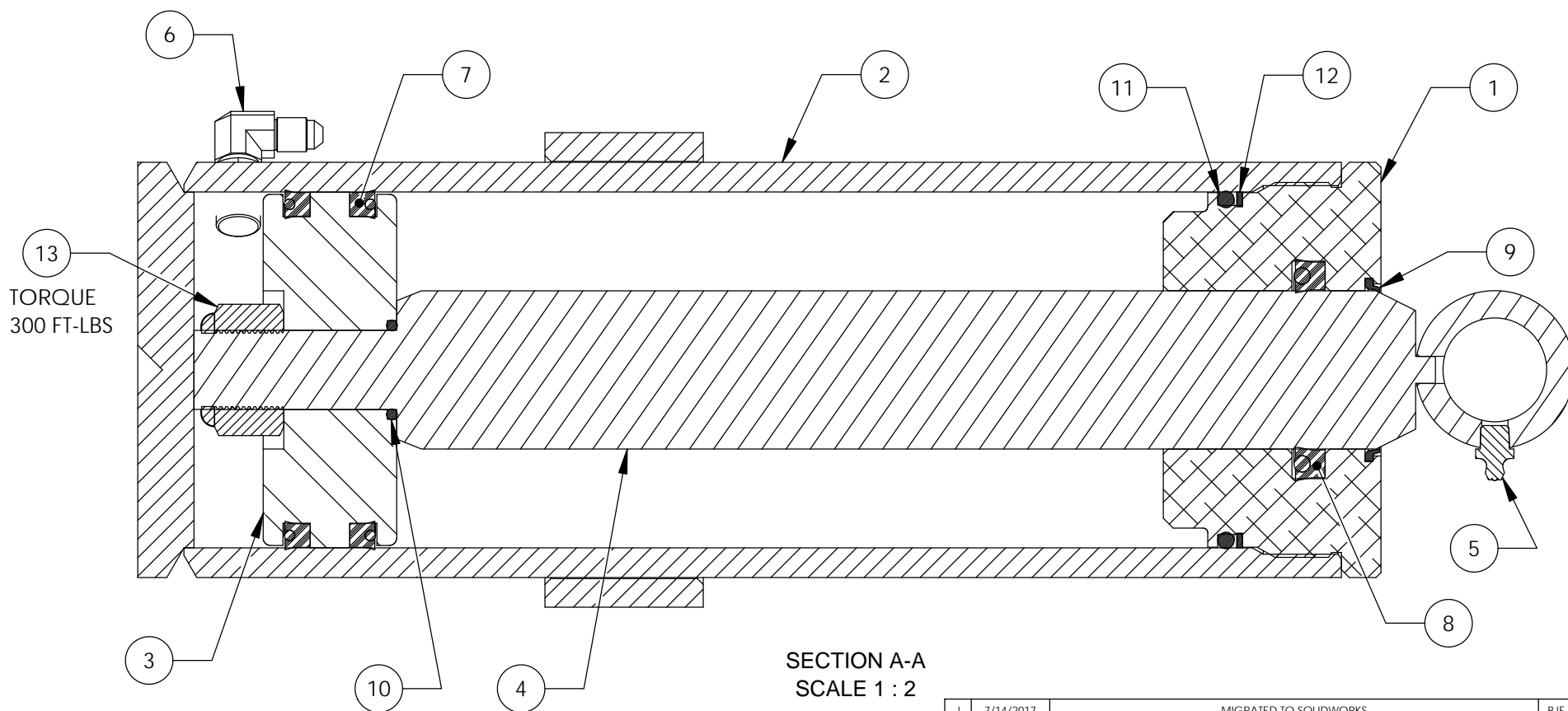
ITEM	PART #	DESCRIPTION	QTY.
1	241016	PARKER LOCKING VALVE	1
2	241103	3/4-16 LOCKNUT	1
3	241105	ROD SEAL	1
4	241106	ROD WIPER	1
5	241107	3/4" ORING	1
6	241216	ROD ASSEMBLY	1
7	241202	GLAND	1
8	241203	PISTON	1
9	241204	PISTON SEAL	2
10	241208	2-1/2" ORING	1
11	241209	2-1/2" BACKUP RING	1
12	241416	TUBE WELDMENT	1
13	818235	GREASE FITTING, 1/8"NPT, STRAIGHT	1
14	241335	REAR LVLV CYL. COMP. FITTING 90deg	2
15	108129	TUBE NUT 3/8	2
16	108130	TUBE FERRULE 3/8	2

**APPLIES TO ALL CURRENTLY
APPROVED CHASSIS**

	2/20/12	818235 WAS 240123			JTM		
	12/1/11	241016 WAS 241013			JTM		
	7/16/11	ADDED ITEMS 14-16, ADDED TORQUE SPEC			NEH		
REV	DATE	DESCRIPTION			BY	APP	
TOLERANCES: (UNLESS SPECIFIED)							
FRAC. MACH: ± 1/32"							
FRAC. OTHER: ± 1/16"							
.XX ± .003							
.XXX ± .005							
DRILL SIZES: + .015							
ANGULAR: ± 1°							
SURF FINISH: 125 MICRO							
THREADS: 2A AND 2B							
MFG. UNAPPROVED COPY							
RW-1019		TITLE: 1019 REAR HYDRAULIC CYLINDER, LONG LINKS, DRIVER SIDE					
		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512					
		DRAWN BY: APPD BY:					
NEH		DATE: 4/21/11				DRAWING NUMBER: 241404	REV: C



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	240102	1	HYDRAULIC CYLINDER GLAND, 4-1/2" BORE
2	240110	1	RW-1630 FRONT CYLINDER BBL WELDMENT, DS
3	240101	1	PISTON DETAIL, 4-1/2" CYLINDER
4	240120	1	HYDRAULIC CYLINDER ROD ASSEMBLY, RW-1630 FRONT
5	818235	1	GREASE FITTING, 1/8" NPT, STRAIGHT
6	18952	2	#04 MJIC X #06 MAORB X 90 FITTING
7	240104	2	PISTON SEAL, POLYPAK, 4.5" ID, .312"W, 3.875" BORE (3120-3875)
8	240105	1	GLAND SEAL, POLYPAK, 2.75" BORE, .375"W, 2" ROD (3750-2000)
9	240106	1	2" ROD WIPER (AN-21)
10	240107	1	O-RING, 1" ID X 1-1/4" OD (2-214)
11	240108	1	O-RING 4-1/2" OD X 3/16" (2-346)
12	240109	1	BACKUP RING FOR 4-1/2" OD X 3/16" WALL O-RING (8-346)
13	605119	1	NYLON LOCK NUT, 1-14




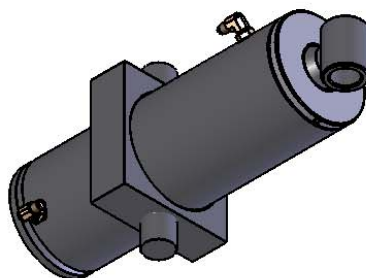
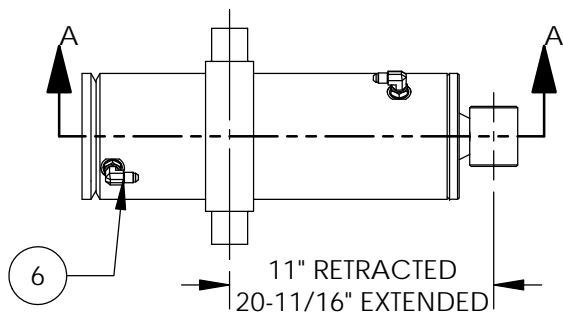
SECTION A-A
SCALE 1 : 2

NOTES:

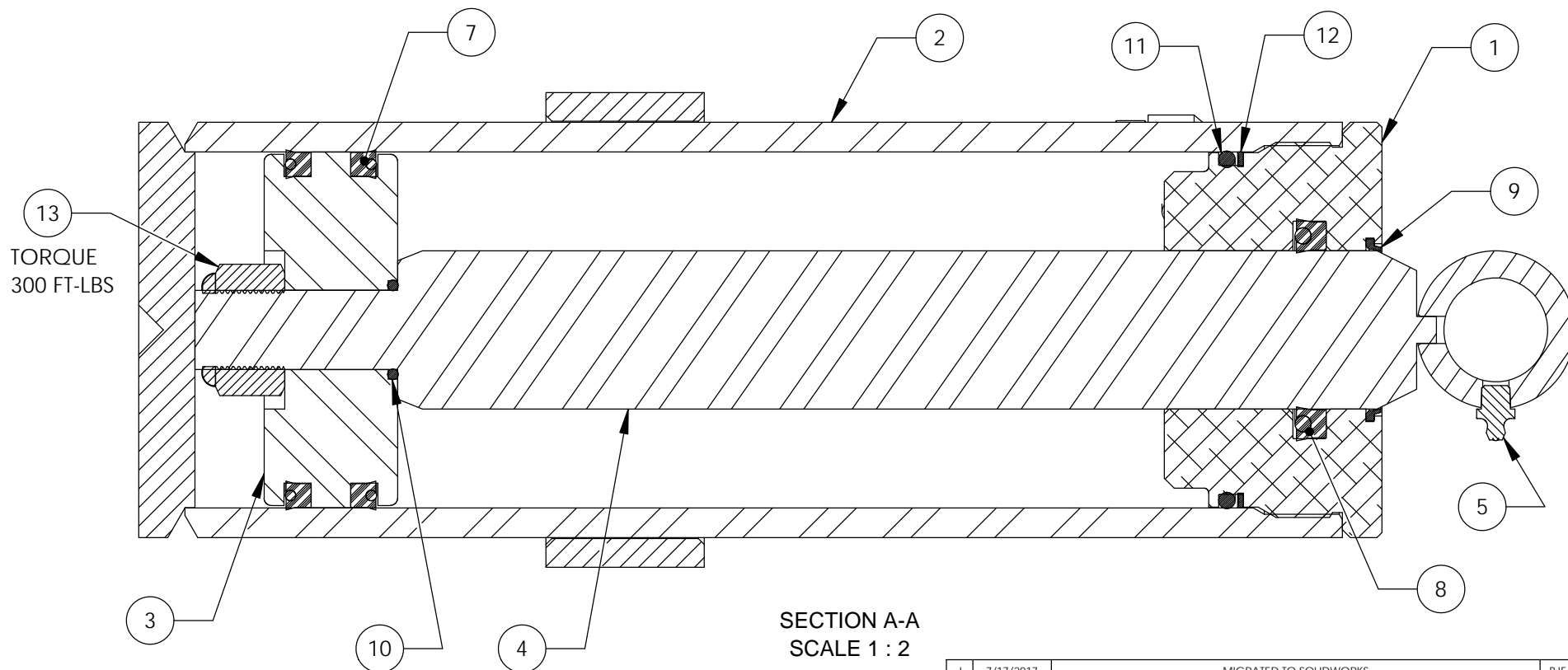
DMF P/N 240125 SEAL KIT INCLUDES ITEM #'S 7, 8, 9, 10, 11, 12

SEE PP008 FOR CYLINDER ASSEMBLY & TEST PROCEDURE

J	7/14/2017	MIGRATED TO SOLIDWORKS				BJF	
REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1630 / 1420 / 1212 / 1019		TITLE:			
FRAC. MACH: ± 1/32"				HYDRAULIC CYLINDER ASSEMBLY, FRONT DRIVER SIDE, RW-1630/1420/1212/1019			
FRAC. OTHER: ± 1/16"				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.			
X: ± .063							
XX: ± .030							
XXX: ± .005							
DRILL SIZES: ± .015							
ANGULAR: ± 1°		DRAWN BY:		APPD BY:		DATE:	
SURF FINISH: 125 MICRO		TSH		-		11/10/92	
THREADS: ± 1"							
BREAK SHARP EDGES .03 X 45° MAX						DRAWING NUMBER:	
DMF (404)875-1512						240099	
						REV:	
						J	



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	240102	1	HYDRAULIC CYLINDER GLAND, 4-1/2" BORE
2	240115	1	RW-1630 FRONT CYLINDER BARREL WELDMENT (PS)
3	240101	1	PISTON DETAIL, 4-1/2" CYLINDER
4	240120	1	HYDRAULIC CYLINDER ROD ASSEMBLY, RW-1630 FRONT
5	818235	1	GREASE FITTING, 1/8" NPT, STRAIGHT
6	18952	2	#04 MJIC X #06 MAORB X 90 FITTING
7	240104	2	PISTON SEAL, POLYPAK, 4.5" ID, .312"W, 3.875" BORE (3120-3875)
8	240105	1	GLAND SEAL, POLYPAK, 2.75" BORE, .375"W, 2" ROD (3750-2000)
9	240106	1	2" ROD WIPER (AN-21)
10	240107	1	O-RING, 1" ID X 1-1/4" OD (2-214)
11	240108	1	O-RING 4-1/2" OD X 3/16" (2-346)
12	240109	1	BACKUP RING FOR 4-1/2" OD X 3/16" WALL O-RING (8-346)
13	605119	1	NYLON LOCK NUT, 1-14



NOTES:
DMF P/N 240125 SEAL KIT INCLUDES ITEM #'S 7, 8, 9, 10, 11, 12

SEE PP008 FOR CYLINDER ASSEMBLY & TEST PROCEDURE

J	7/17/2017	MIGRATED TO SOLIDWORKS		BJF	
REV	DATE	DESCRIPTION		BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1630 / 1420 / 1212 / 1019		TITLE: HYDRAULIC CYLINDER ASSEMBLY, FRONT PASSENGER SIDE, RW-1630/1420/1212/1019	
FRAC. MACH:				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.	
FRAC. OTHER:					
.X					
.XX					
.XXX					
DRILL SIZES:					
ANGULAR:					
SURF FINISH:					
THREADS:					
BREAK SHARP EDGES .03 X 45° MAX					
DMF (404)875-1512					
DRAWN BY: TSH		APPD BY: -		DATE: 11/10/92	
				DRAWING NUMBER: 240100	
				REV: J	

ITEM	PART NO.	QTY	DESCRIPTION
1			
2			

TITLE: SAE (JIC) 37 Degree Fitting Installation.

PURPOSE: To Establish Production Methods For The Installation Of SAE (JIC) Medium Pressure Hydraulic Fittings.

COMMON USAGE: Hydraulic Systems Operating With Petroleum-Based Fluids At Pressures Below 4000 PSI Or Minimum Component Rating.

PARTS GENERALLY ENCOMPASSED BY THIS PROCEDURE: Purchased Fittings With SAE (JIC) 37 Degree Flared Ends.




PROCEDURE: A) Inspect fitting components to ensure that mating parts are free of burrs, nicks, scratches or any foreign material.

B) Align tube flare against nose of fitting body and screw on the nut, finger tight, clamping the tube flare between the fitting nose and the nut.

C) Tighten the nut the indicated Flats From Finger Tight (F.F.F.T.) listed in the chart below. Use a second wrench to hold the hose in proper alignment while tightening to avoid twisting the lay line. One flat on a hex is equal to 1/6th of a full turn. Tolerance on tightening is plus or minus 1/4 flat (1/24th of full turn).

SAE (JIC) 37° Flare Fittings

Size	Thread Size	Tube Connection F.F.F.T.	Swivel Nut or Hose Connection F.F.F.T.
-4	7/16-20	2	2
-6	9/16-18	1.5	1.25
-8	3/4-16	1.5	1
-12	1 1/16-12	1.25	1
-16	1 5/16-12	1	1
-20	1 5/8-12	1	1
-24	1 7/8-12	1	1

					
					
REV	DATE	DESCRIPTION			BY APP
<small> TOLERANCES: (UNLESS SPECIFIED) COMMON SIZE PREVAILS FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X ± .063 .XX ± .030 .XXX OR .XXXX ± .005 DRILL SIZES: ± .005 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES </small>		<small> TITLE: PRODUCTION PROCEDURE 005 JIC FITTING INSTALLATION DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512 </small>		<small> DATE: 06/02/94 </small>	
<small> DRAWN BY: TSH </small>		<small> APPD BY: </small>			<small> DRAWING NUMBER: PP005 </small>
				<small> REV: # </small>	

ITEM	PART NO.	QTY	DESCRIPTION
1			
2			

TITLE: SAE O-Ring Fitting Installation

PURPOSE: To Establish Production Methods For The Installation Of O-Ring Medium And High Pressure Hydraulic Fittings.

COMMON USAGE: Hydraulic Systems Operating With Petroleum-Based Fluids At Pressures Below 4000 PSI Or Minimum Component Rating.

PARTS GENERALLY ENCOMPASSED BY THIS PROCEDURE: Purchased Fittings With O-Ring Seals And SAE Straight Threads.

PROCEDURE:




- A) Inspect to ensure that both mating parts are free of burrs, nicks, scratches or any foreign particles.
- B) Lubricate O-Ring with light coat of system fluid or compatible oil.
- C) For adjustable fittings, back off lock nut as far as possible. Make sure back up washer is not loose and is pushed up to nut.
- D) Screw fitting into port until finger tight. Back up washer (adjustable) or hex face (non-adj.) should contact port face. Light wrenching may be necessary.
- E) To align an adjustable fitting, unscrew by desired amount but not more than one full turn. Use wrench to hold in position. Screw nut down to port face until finger tight.
- F) Tighten lock nut (adjustable) or fitting (non-adj.) the indicated Flats From Finger Tight (F.F.F.T.) in either the Adjustable chart or the Non-Adjustable chart below. One Flat on a hex is equal to 1/6th of a full turn. Tolerance on tightening is plus or minus 1/4 flat (1/24th of full turn).
- G) Inspect to ensure that O-Ring is not pinched and back up washer/hex seats flat on face of port.

ADJUSTABLE FITTINGS

Fitting Size	SAE Port Thread Size	F.F.F.T.
2	5/16-24	1.0
4	7/16-20	1.5
6	9/16-18	1.5
8	3/4-16	1.5
10	7/8-14	1.5
12	1 1/16-12	1.5
14	1 3/16-12	1.5
16	1 5/16-12	1.5
20	1 5/8-12	2.0
24	1 7/8-12	2.0

NON-ADJUSTABLE FITTINGS

Fitting Size	SAE Port Thread Size	F.F.F.T.
2	5/16-24	1.0
4	7/16-20	1.0
6	9/16-18	1.5
8	3/4-16	1.5
10	7/8-14	1.5
12	1 1/16-12	1.5
14	1 3/16-12	1.5
16	1 5/16-12	1.5
20	1 5/8-12	1.5
24	1 7/8-12	1.5

					
					
REV	DATE	DESCRIPTION			BY APP
TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS FRAC. MACH: $\pm 1/32$ FRAC. OTHER: $\pm 1/16$.X $\pm .063$.XX $\pm .030$.XXX OR .XXXX $\pm .005$ DRILL SIZES: $\pm .005$ ANGULAR: $\pm 1^\circ$ SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES				TITLE: PRODUCTION PROCEDURE 003 O-RING FITTING INSTALLATION DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512	
DRAWN BY: TSH		APPD BY:		DATE: 06/02/94	
				DRAWING NUMBER: PP003	REV: #

ITEM	PART NO.	QTY	DESCRIPTION
1			
2			

TITLE: National Pipe Thread (NPT) Fitting Installation.

PURPOSE: To Establish Production Methods For The Installation Of NPT Medium Pressure Hydraulic Fittings.

COMMON USAGE: Hydraulic Systems Operating With Petroleum-Based Fluids At Pressures Below 3000 PSI Or Minimum Component Rating.

PARTS GENERALLY ENCOMPASSED BY THIS PROCEDURE: Purchased Fittings With Tapered Pipe Threads.

PROCEDURE: A) Inspect port components to ensure that male and female threads are free of nicks, burrs, dirt etc.

B) Apply sealant/lubricant to male pipe threads. Use only Permatex #14D "Thread Sealant With Teflon" paste (or Engineering approved equal). The first few threads must be left uncovered to avoid system contamination.



C) Screw fitting into female pipe port to the finger tight position.

D) Wrench tighten the fitting to the appropriate Turns From Finger Tight (T.F.F.T.) shown in chart below. Make sure that tube end of shaped fitting is aligned to receive in coming tube or hose assembly.

STEEL PIPE THREAD FITTINGS

Fitting Size	Pipe Thread Size, NPT	T.F.F.T.
2	1/8-27	2.0-2.5
4	1/8-27	2.0-2.5
6	1/4-18	1.5-2.0
8	3/8-18	2.0-2.5
10	1/2-14	2.0-2.5
12	3/4-14	1.5-2.0
14	3/4-14	1.5-2.0
16	1-11 1/2	1.5-2.0
20	1 1/4-11 1/2	1.5-2.0
24	1 1/2-11 1/2	1.5-2.0

COMMENTS: Teflon Tape May Be Used In Certain Situations With Engineering Approval. A Pipe Fitting Is Limited To One Or Two Re-Uses.

					
REV	DATE	DESCRIPTION			BY APP
<small> TOLERANCES: (UNLESS SPECIFIED) COMMON SENSE PREVAILS FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X ± .063 .XX ± .030 .XXX OR .000 ± .005 DRILL SIZES: ± .005 ANGULAR: ± 1° SURF. FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES </small>				TITLE: PRODUCTION PROCEDURE 004 PIPE FITTING INSTALLATION DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512	
DRAWN BY: TSH		APPD BY:		DATE: 06/02/94	
				DRAWING NUMBER: PP004	REV: #

SECTION 7.0 REAR RAILGEAR PARTS

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7.1. BEFORE ORDERING PARTS – REAR RAILGEAR

Required Information for Ordering Parts:

- You must have the Railgear serial number when ordering parts. This uniquely identifies your Railgear, as it was built to your specifications, and also allows DMF to help you maintain a history of your Railgear. If you are placing a parts order through a maintenance facility, please inform them of the serial number, so that they can relay the information when placing your order.
- Returns: DMF has a Return Authorization Procedure. You must contact DMF for an RA# before returning any parts for any reason. Parts will not be credited without an RA#.
- Labor: In extremely rare situations, on a discretionary basis, and with prior approval, DMF will reimburse certain, specific labor costs. If you feel this may apply in your situation, you must contact DMF's Service Department for a Service Authorization Number (SA#). No labor will be reimbursed without an SA#. The SA# must be included on your request for reimbursement.
- Please use driver's side / passenger's side terminology (instead of left/right side) when describing issues with your Railgear. This ensures that everyone involved is clear about where the issue is occurring.

Other Considerations for Ordering Parts:

This is a list of considerations to make before placing a parts order with DMF. There are many variations and customer requirements that we strive to accommodate, and as a result, the more information you can provide to us when placing an order, the more likely that we will be able to help you quickly and efficiently.

Wheels:

- If you are a customer using special wheel profiles (this is especially prevalent in Metros), please be sure to inform the DMF Parts Department that there may be a special wheel profile involved in your order.
- DMF offers both insulated and non-insulated wheels – Please confirm which wheel you need before ordering. Insulated wheels can be identified by a grooved ring machined around the inside of the Rail wheel. This grooved ring can be seen and felt, and is located about an inch in from the outside tread.

Links:

- DMF's links come in 3 sizes: x-short, short, and long. The sizes cannot be mixed between upper and lower links (i.e. Long upper link can only be used with long lower link. Each link has a slotted version as well.
- Links are sold individually, unless you require an entire set of 8 (4 front, 4 rear). See drawings for additional clarification on link type (i.e. long, short, or extra-short), and the appropriate part numbers for ordering.
- Note: Short links are DMF's default configuration for our Railgear.

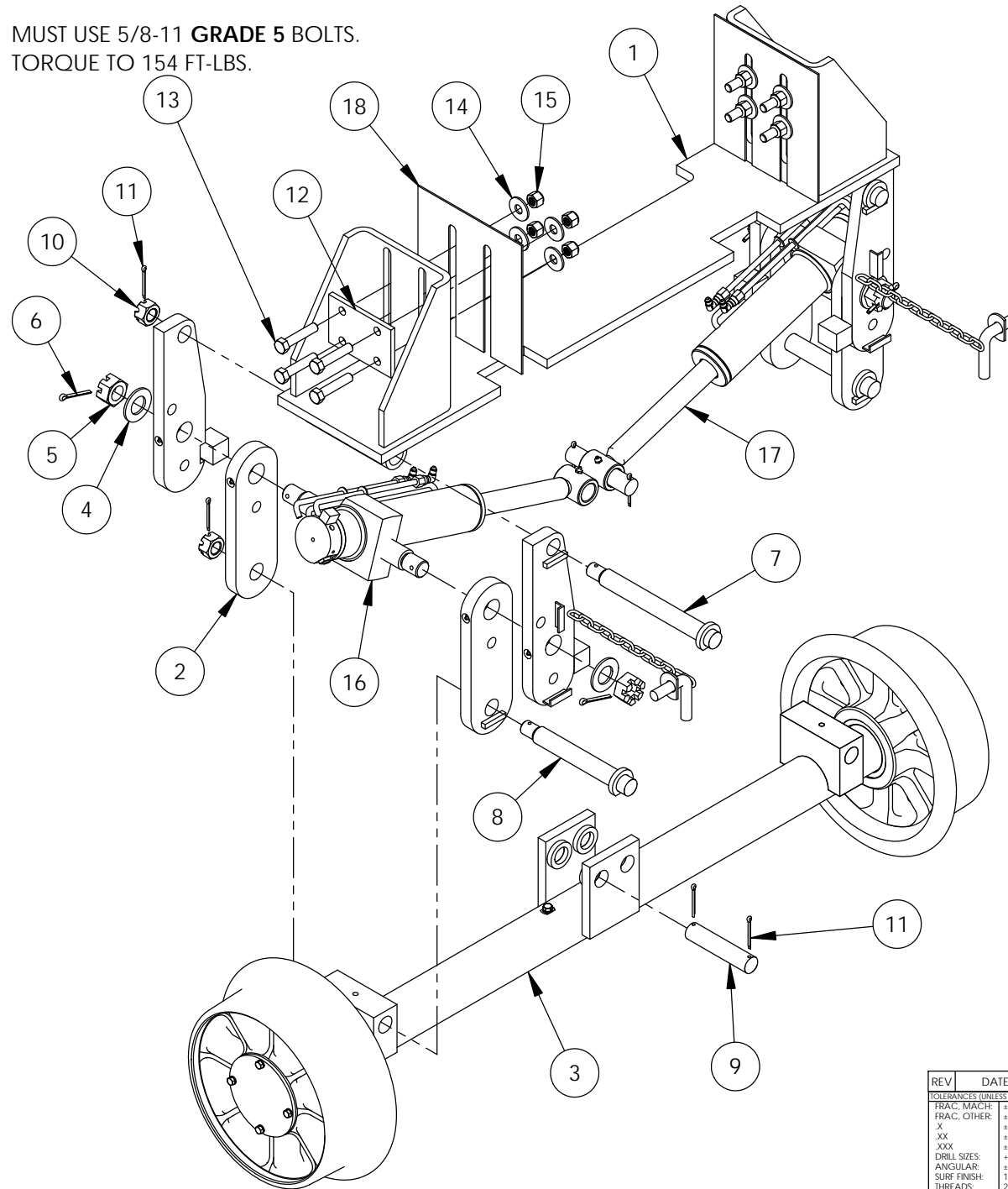
Cylinders / Brakes (also see drawing on next page):

- When ordering rear cylinders, it is important to note which way the pin-offs are facing – if they are facing toward the rear of the truck, then this is considered our standard mounting configuration, then “driver’s side” and “passenger’s side” terminology is consistent with the layout of the vehicle. HOWEVER, if the pin-offs are facing toward the front of the truck (i.e. underneath the truck), which is usually done to accommodate clearance issues when installing air remote pin-offs, terminology is reversed. In that case, the “driver’s side” cylinder is actually on the passenger’s side of the vehicle, and should be ordered as the driver’s side. The reverse applies for the other side of the vehicle. If you are unsure or have questions, please speak to an DMF parts representative for clarification.
- Note that there are three sizes of rear cylinders and they match with each of the three length variants of rear links. Please confirm the length of your cylinder and select the appropriate drawing for part numbers.

Rear Mounting Bracket:

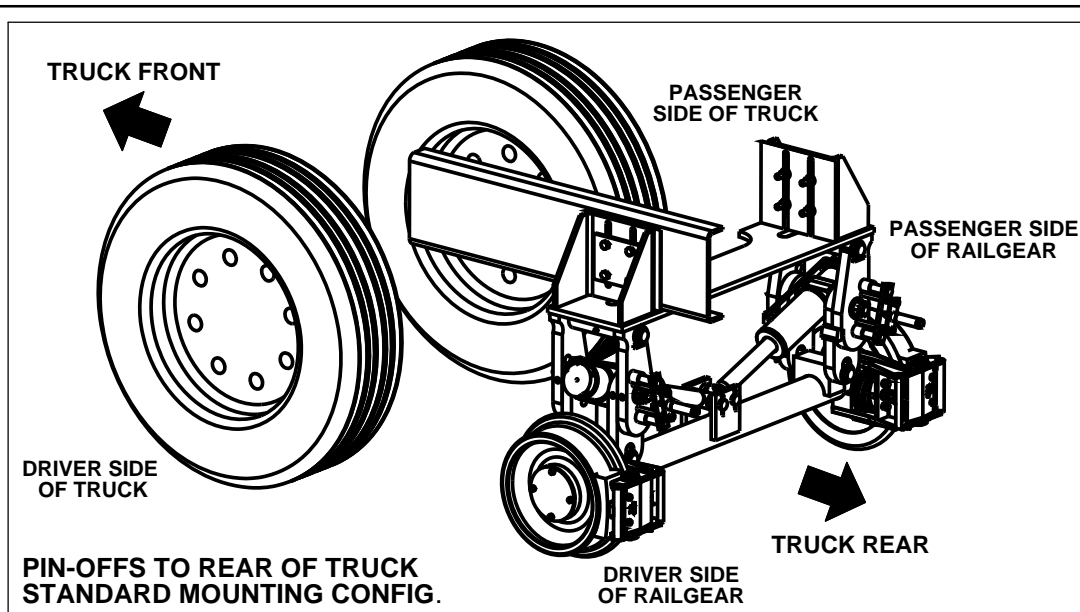
- It is important to know your rear frame width first and then refer to the Rear Frame Drawing and use the provided chart to find your part number.
- It is also important to note the thickness of the rear mounting bracket flat plate, because we offer different thickness.
- Please note the height of your rear mounting bracket side plates, because we offer different heights.
- Shims are available to adapt wider brackets to different frame widths. If your exact measurements are not available on the parts list, please discuss this with the DMF Parts department and we will work with you to get the appropriate rear bracket and necessary shims.

MUST USE 5/8-11 **GRADE 5** BOLTS.
TORQUE TO 154 FT-LBS.



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	REF	1	RW-1212 HEAVY DUTY REAR MYG. BRKT.
2	REF	1	REAR LINK ASSY
3	REF	1	REAR AXLE ASSEMBLY
4	818289	4	FLAT WASHER, 1-1/4", GR5
5	818256	4	REAR SLOTTED NUT 1-1/4"-7
6	818258	4	COTTER PIN, 1/4" X 2-1/2" LONG
7	10250	2	RW-1019 PIN ASSY, REAR UPPER MOUNTING
8	10251	2	RW-1019 PIN ASSY, REAR LOWER MOUNTING
9	12240	2	RW-1212/1420 REAR CYLINDER ROD PIN
10	818127	4	SLOTTED HEX NUT, 1"-8, GR8
11	108078	8	COTTER PIN, 3/16" X 2"
12	10047	2	RW-1019/1212/1420 REAR BRACKET 4 HOLE PLATE
13	REF	8	HHCS, 5/8-11, GRADE 5
14	605076	8	FLAT WASHER, 5/8
15	605075	8	5/8"-11 NYLOCK NUT
16	241507	1	RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, DRIVER SIDE, XTRA SHORT
	241504		RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, DRIVER SIDE, SHORT
	241404		RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, DRIVER SIDE, LONG
17	241506	1	RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, PASSENGER SIDE, XTRA SHORT
	241503		RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, PASSENGER SIDE, SHORT
	241403		RW-1019 REAR HYDRAULIC CYL, LOCKING VALVE, PASSENGER SIDE, LONG
18	12265	REF	RW-1019/1212/1420 REAR BRACKET SHIM, 1/16"
	12267		RW-1019/1212/1420 REAR BRACKET SHIM, 1/8"
	12268		RW-1019/1212/1420 REAR BRACKET SHIM, 1/4"
	12269		RW-1019/1212/1420 REAR BRACKET SHIM, 3/8"

REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X ± .063 .XX ± .030 .XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES .03 X 45° MAX DMF (404)875-1512				
RW-1212 / 1420		TITLE: RW-1212 & 1420 REAR RAILGEAR PARTS THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
DRAWN BY: BJF	APPD BY: -	DATE: 6/8/2017	DMF	DRAWING NUMBER: M1214007 REV: #

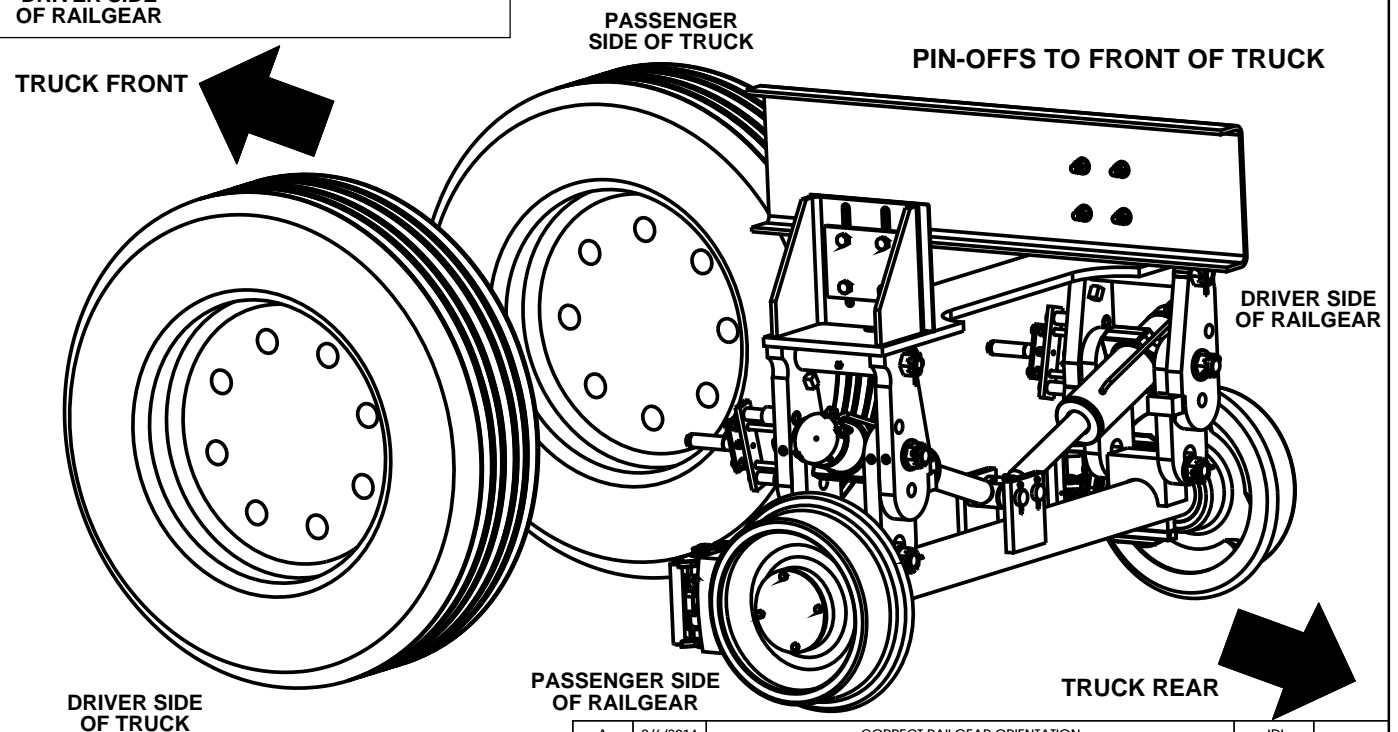



BEFORE ORDERING REAR CYLINDERS, LINKS, AND/OR BRAKES ONLY:

WHEN ORDERING REAR PARTS, IT IS IMPORTANT TO NOTE WHICH WAY THE PIN-OFFS ARE FACING - IF THEY ARE FACING TOWARD THE REAR OF THE TRUCK, THEN THIS IS CONSIDERED OUR STANDARD MOUNTING CONFIGURATION. THEN "DRIVER'S SIDE" & "PASSENGER'S SIDE" TERMINOLOGY IS CONSISTENT WITH THE LAYOUT OF THE VEHICLE. **HOWEVER**, IF THE PIN-OFFS ARE FACING TOWARD THE FRONT OF THE TRUCK (IE. UNDERNEATH THE TRUCK), WHICH IS USUALLY DONE TO ACCOMMODATE THE CLEARANCE ISSUES WHEN INSTALLING AIR REMOTE PIN-OFFS, (IE. THE "DRIVER'S SIDE" CYLINDER IS ACTUALLY ON THE PASSENGER'S SIDE OF THE VEHICLE, & SHOULD BE ORDERED AS THE DRIVER'S SIDE. THE REVERSE APPLIES FOR THE OTHER SIDE OF THE VEHICLE).

** NOTE: ALL OTHER REAR PARTS ARE NOT (DS) DRIVER SIDE OR (PS) PASSENGER SIDE SPECIFIC.*

**PLEASE NOTE THAT IF YOU HAVE INSULATED RAILGEAR & YOU MOUNT THE GEAR BACKWARDS, YOU MUST SWAP THE WHEELS. INSULATED WHEEL SHOULD ALWAYS BE ON THE ACTUAL DRIVER'S SIDE OF THE TRUCK.*



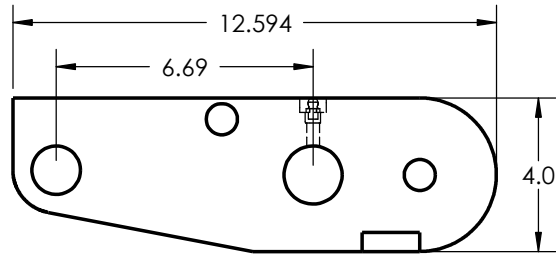
A	8/6/2014	CORRECT RAILGEAR ORIENTATION			JDI	
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES:		TITLE: PIN-OFFS TO FRONT/REAR OF TRUCK				
(UNLESS SPECIFIED)						
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512				
FRAC. OTHER: ± 1/16"						
X ± .063		DRAWN BY: JBG				
XX ± .030						
XXX ± .005		APPD BY:				
DRILL SIZES: ± .015						
ANGULAR: ± 1"		DATE: 8/10/2010				
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B						
		DRAWING NUMBER: M1630110				
		REV: A				

X-SHORT

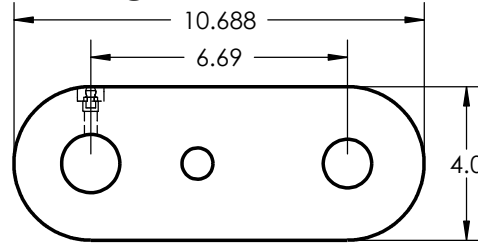
STANDARD/SHORT

LONG

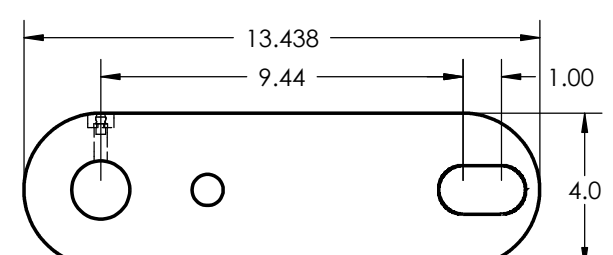
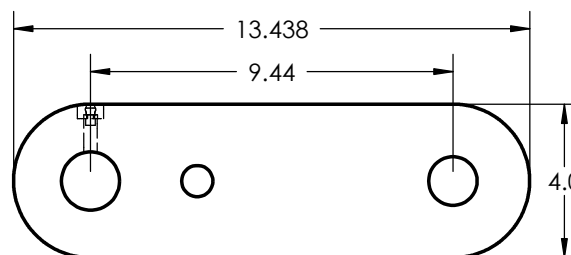
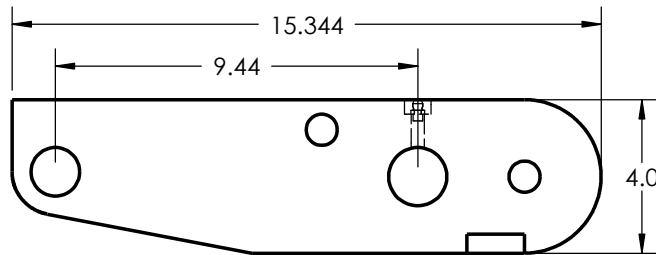
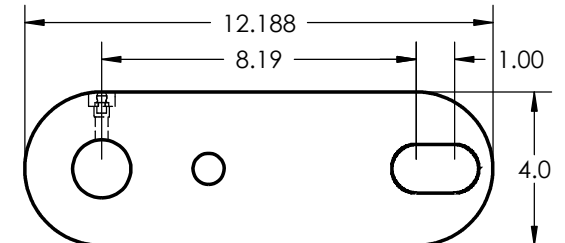
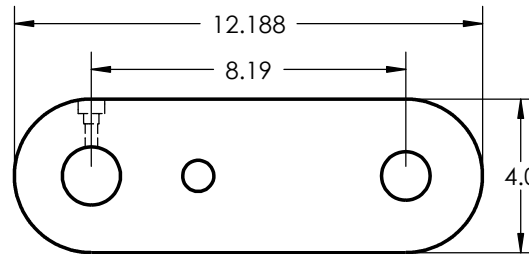
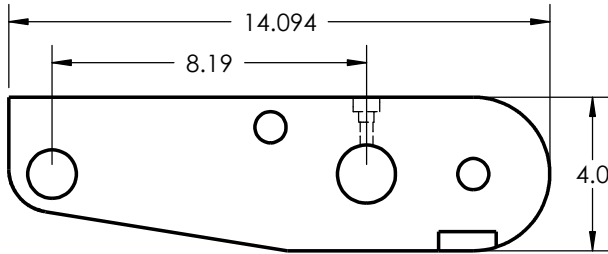
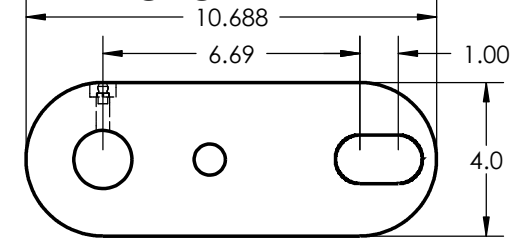
UPPER






LOWER - STANDARD



LOWER-SLOTTED

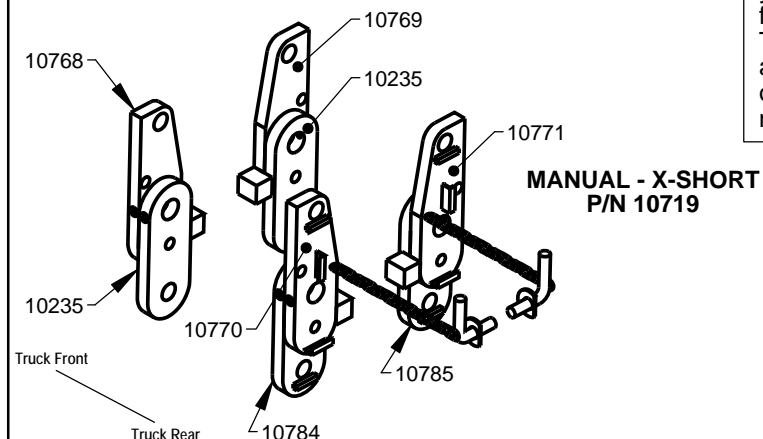


NOTE: DMF LINKS COME IN 3 SIZES: X-SHORT, STD./SHORT, & LONG.
THE SIZES CAN NOT BE MIXED BETWEEN UPPER & LOWER LINKS.
EXAMPLE: LONG UPPER LINK CAN ONLY BE USED WITH LONG LOWER
LINK. EACH LINK HAS A SLOTTED VERSION.

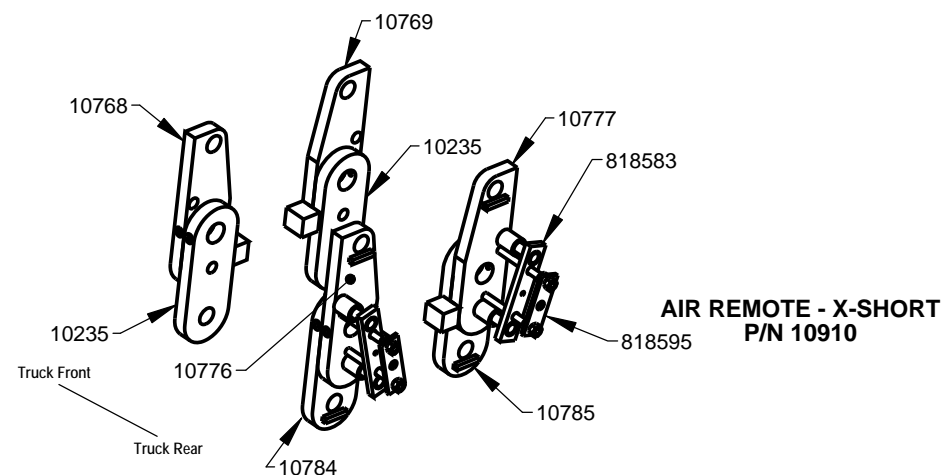
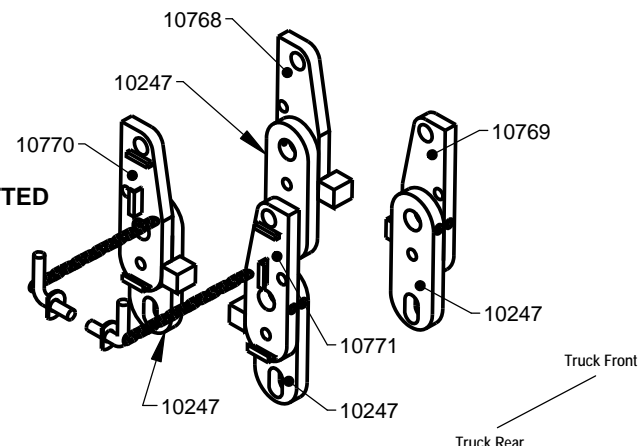
					
	5/16/11	ADDED CLARIFICATION OF UPPER VS. LOWER			NEH
REV	DATE	DESCRIPTION			BY APP
TOLERANCES: (UNLESS SPECIFIED)		TITLE:			
FRAC. MACH: ± 1/32"		RW- 1019 REAR LINK OPTIONS & DIMENSIONS			
FRAC. OTHER: ± 1/16"					
.X ± .063		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
.XX ± .030					
.XXX ± .005					
DRILL SIZES: + .015					
ANGULAR: ± 1°					
SURF FINISH: 125 MICRO					
THREADS: 2A AND 2B					
RW-1019/1212/1420					
DRAWN BY:	APPD BY:	DATE:	DRAWING NUMBER:		REV:
JBG		4/23/10	M1019111		A

X-SHORT LINKS

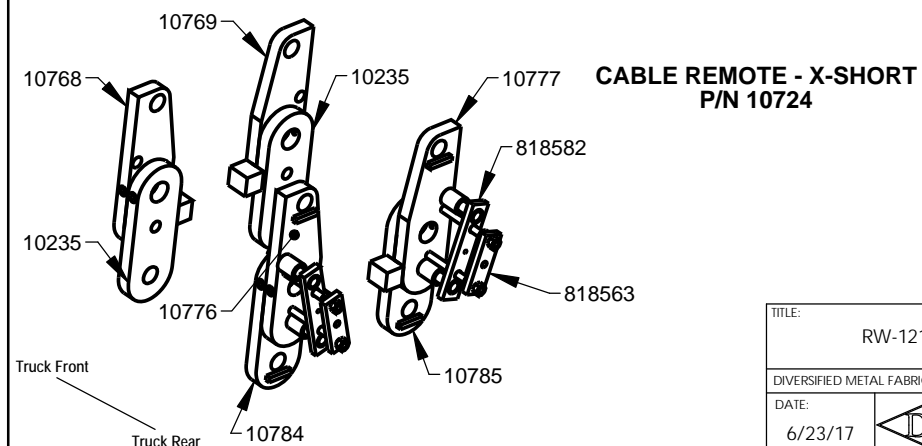
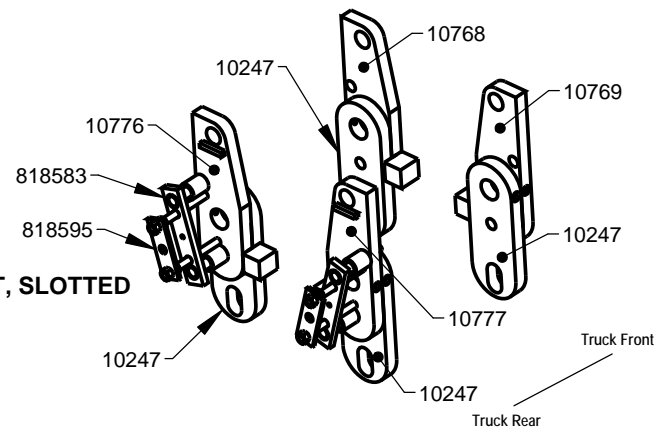
Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.



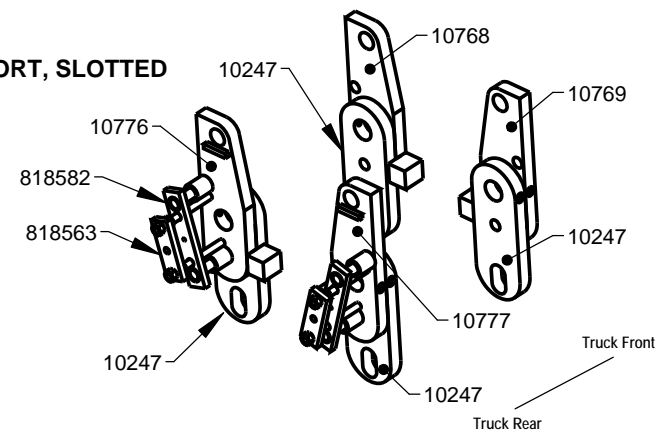
**MANUAL - X-SHORT, SLOTTED
P/N 10726**



**AIR REMOTE - X-SHORT, SLOTTED
P/N 10911**

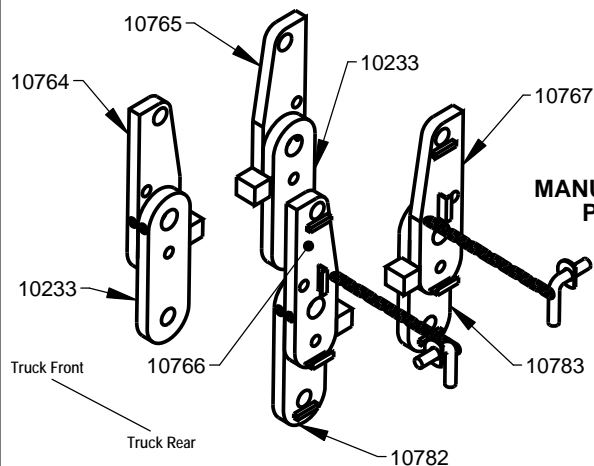


**CABLE REMOTE - X-SHORT, SLOTTED
P/N 10725**



TITLE: RW-1212 & 1420 X-SHORT LINKS			
DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DATE: 6/23/17		DRAWING NUMBER: M1214008	REV: #

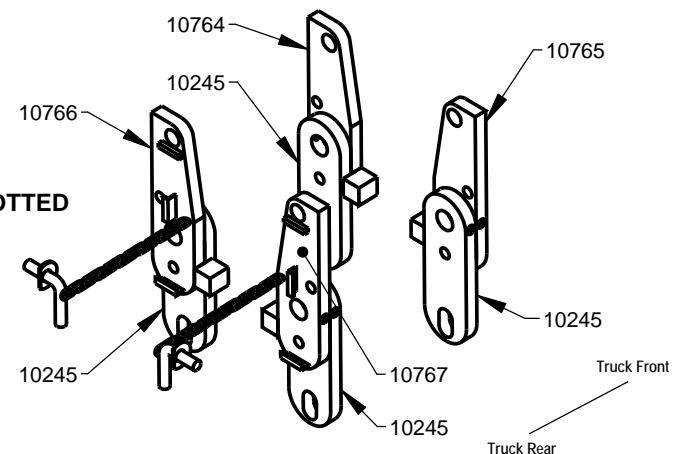
SHORT LINKS



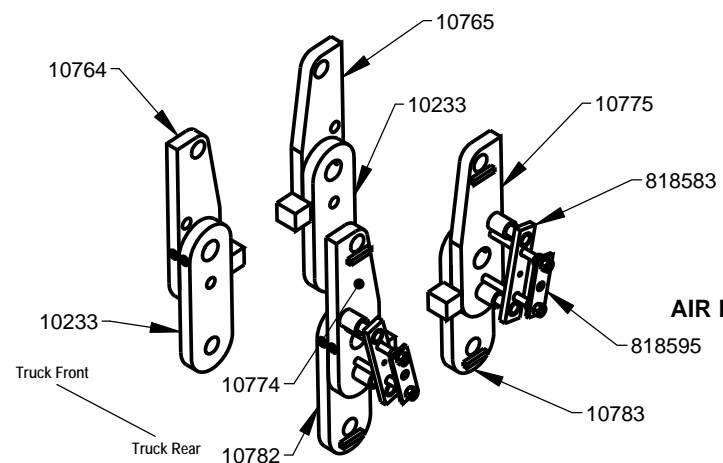
**MANUAL - SHORT
P/N 10717**

Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.

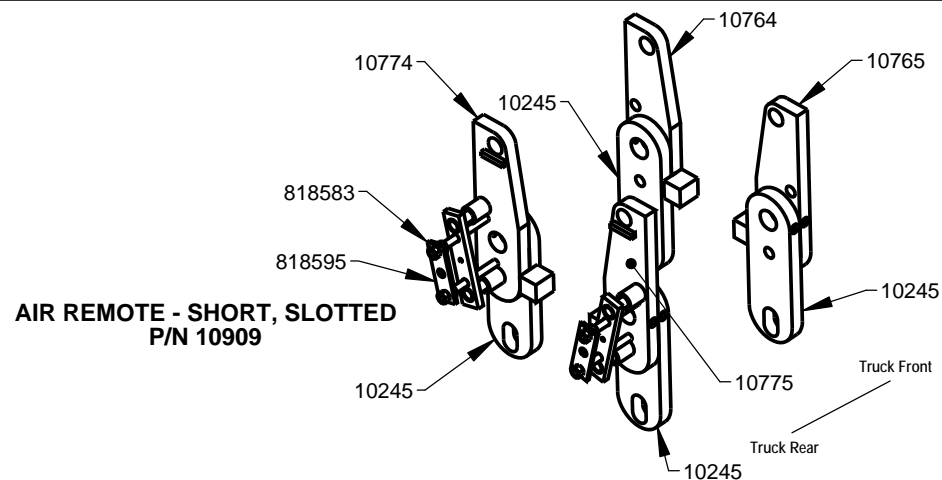
SHORT, SLOTTED LINKS



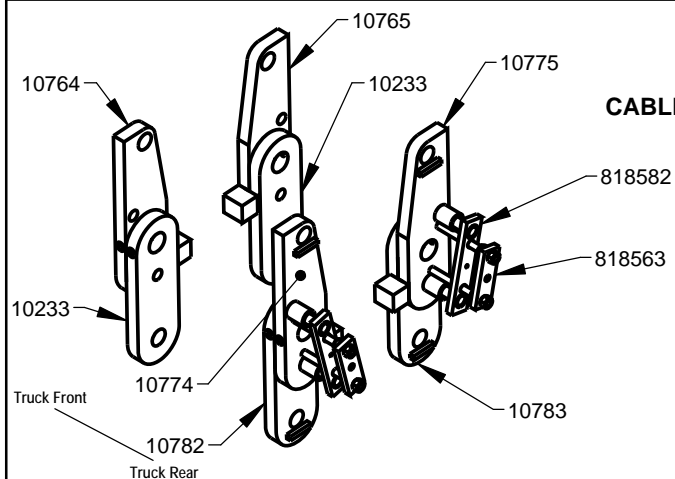
**MANUAL - SHORT, SLOTTED
P/N 10718**



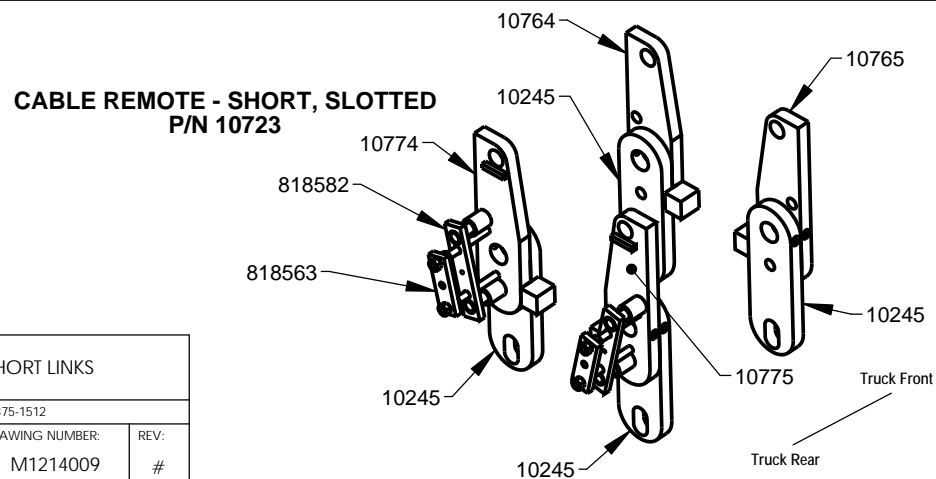
**AIR REMOTE - SHORT
P/N 10908**



**AIR REMOTE - SHORT, SLOTTED
P/N 10909**



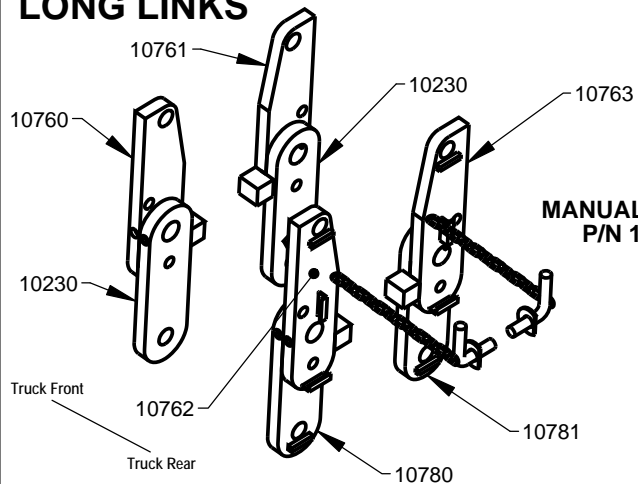
**CABLE REMOTE - SHORT
P/N 10722**



**CABLE REMOTE - SHORT, SLOTTED
P/N 10723**

TITLE: RW-1212 & 1420 SHORT LINKS			
DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DATE: 6/26/17		DRAWING NUMBER: M1214009	REV: #

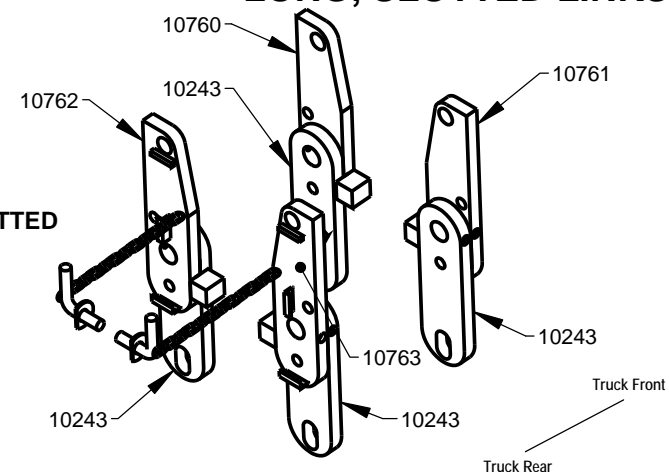
LONG LINKS



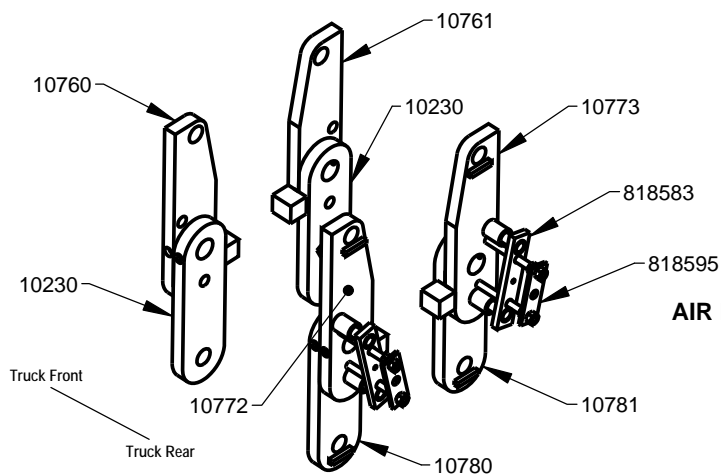
**MANUAL - LONG
P/N 10715**

Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.

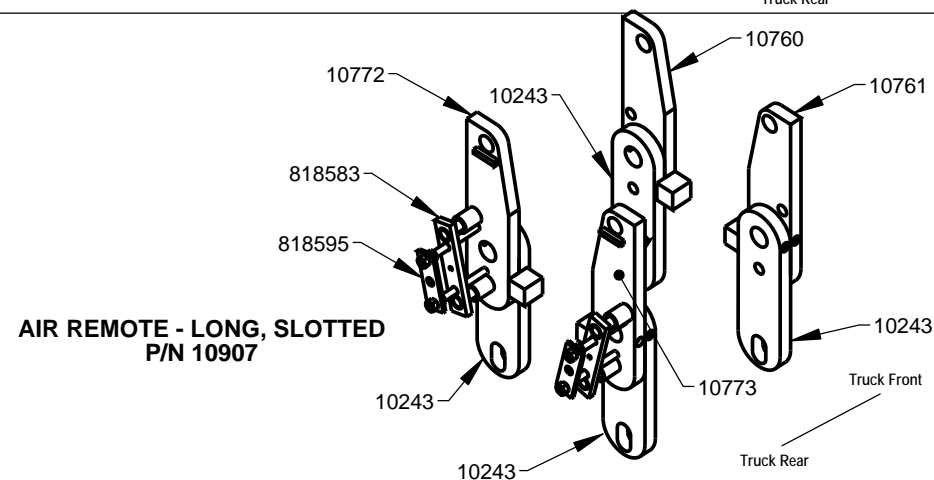
LONG, SLOTTED LINKS



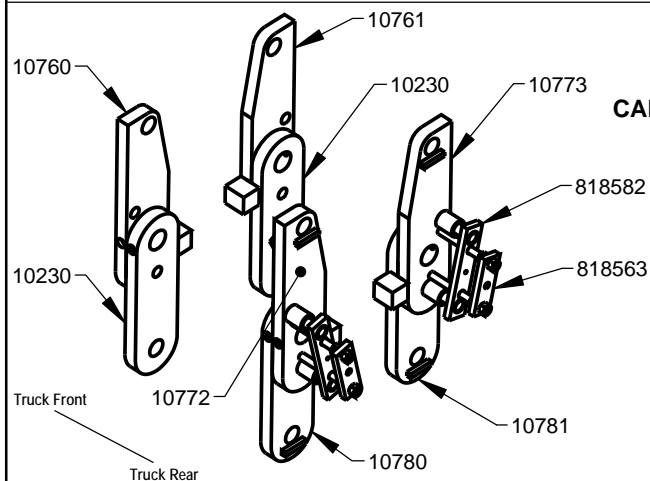
**MANUAL - LONG, SLOTTED
P/N 10716**



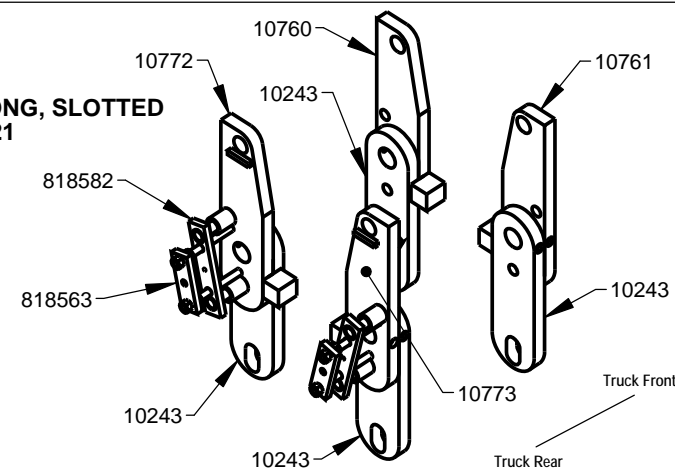
**AIR REMOTE - LONG
P/N 10906**



**AIR REMOTE - LONG, SLOTTED
P/N 10907**



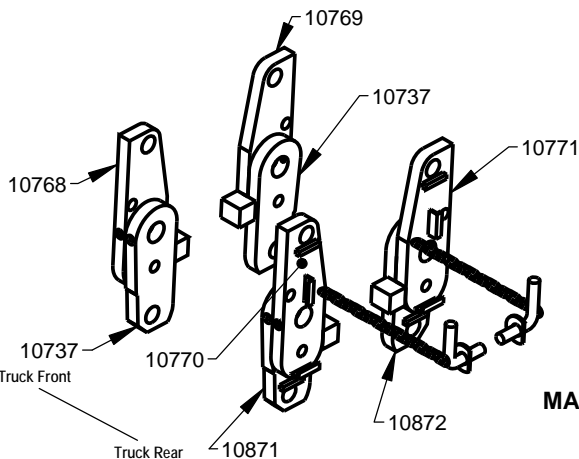
**CABLE REMOTE - LONG
P/N 10720**



**CABLE REMOTE - LONG, SLOTTED
P/N 10721**

TITLE: RW-1212 & 1420 LONG LINKS			
DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
DATE: 6/26/17		DRAWING NUMBER: M1214010	REV: #

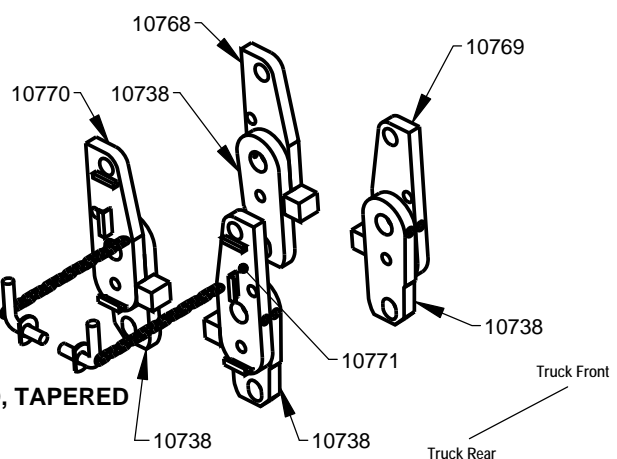
X-SHORT, TAPERED LINKS



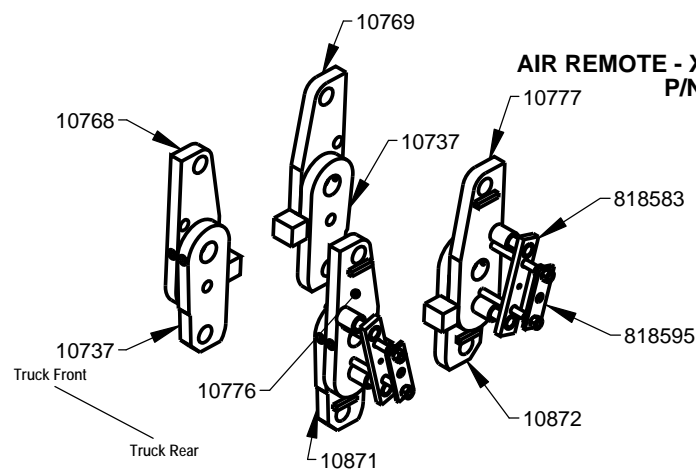
MANUAL - X-SHORT, TAPERED
P/N 10797

Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.

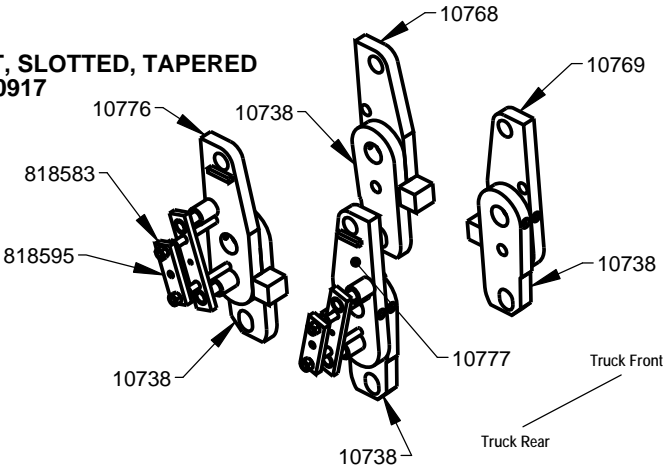
X-SHORT, SLOTTED, TAPERED LINKS



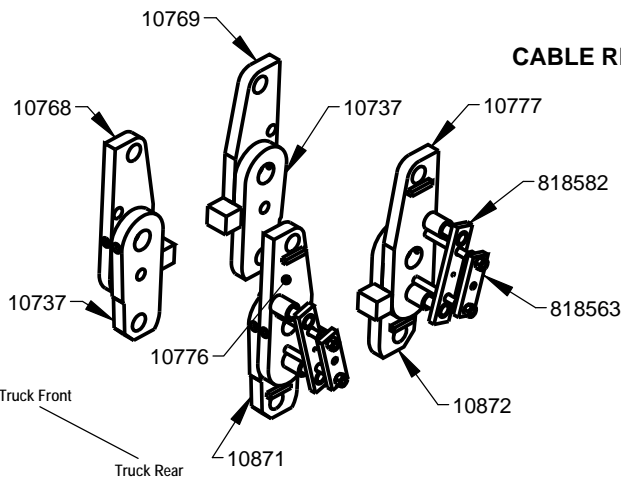
MANUAL - X-SHORT, SLOTTED, TAPERED
P/N 10799



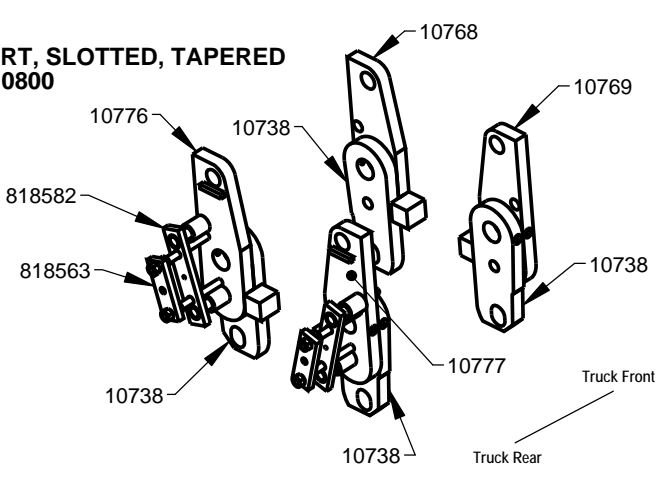
AIR REMOTE - X-SHORT, TAPERED
P/N 10916




AIR REMOTE - X-SHORT, SLOTTED, TAPERED
P/N 10917



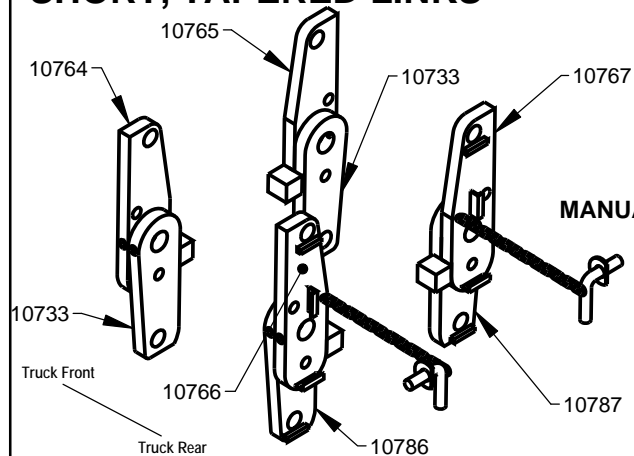
CABLE REMOTE - X-SHORT, TAPERED
P/N 10798



CABLE REMOTE - X-SHORT, SLOTTED, TAPERED
P/N 10800

TITLE: RW-1420 X-SHORT TAPERED LINKS (USED WITH AIR BRAKES)			
DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DATE: 6/23/17		DRAWING NUMBER: M1214011	REV: #

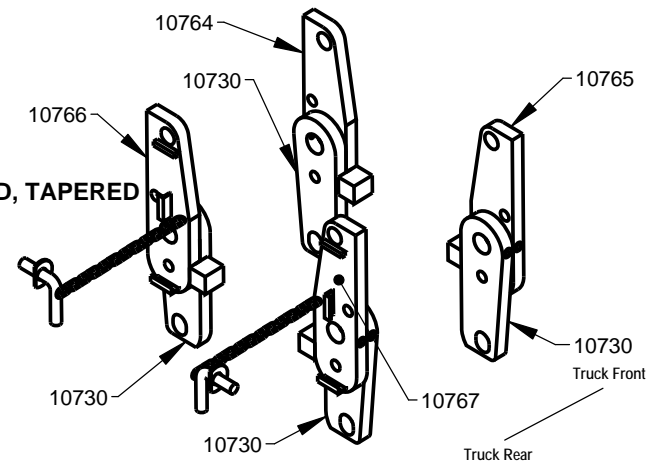
SHORT, TAPERED LINKS



**MANUAL - SHORT, TAPERED
P/N 10735**

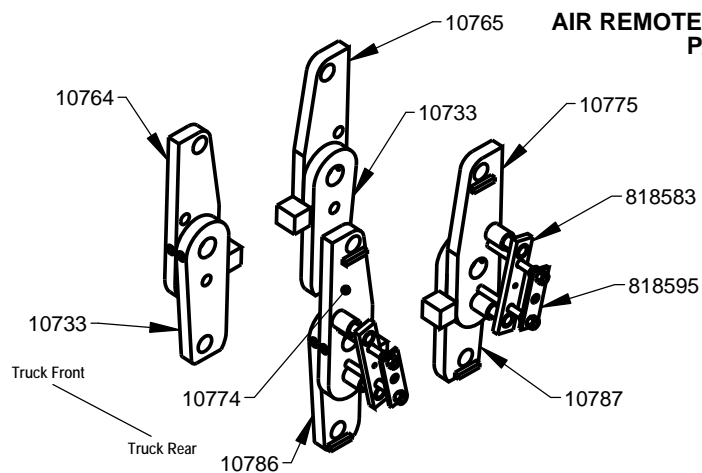
Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.

SHORT, SLOTTED, TAPERED LINKS

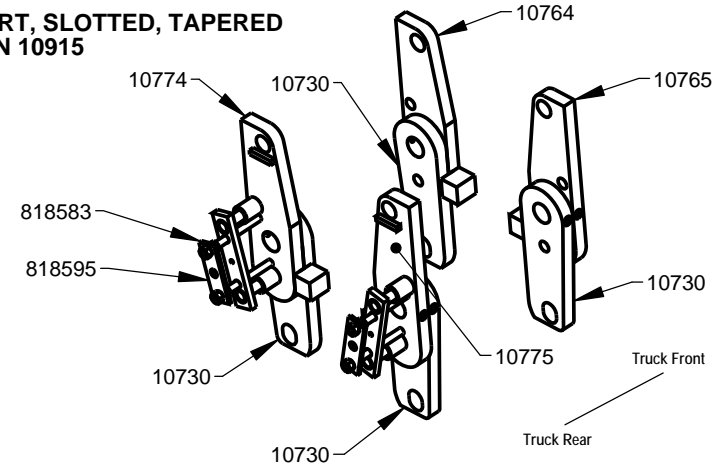


**MANUAL - SHORT, SLOTTED, TAPERED
P/N 10736**

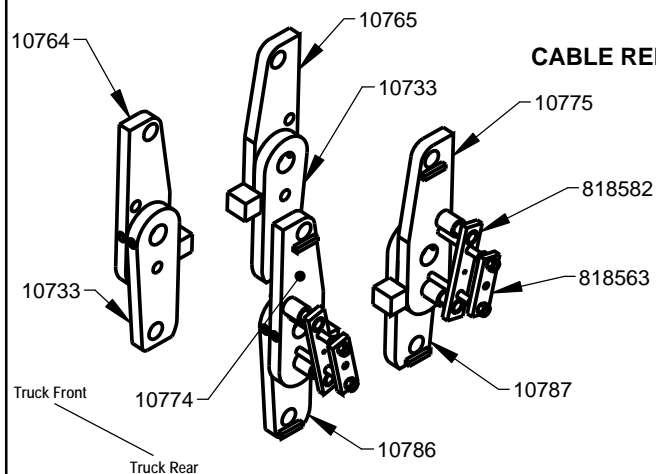
**AIR REMOTE - SHORT, TAPERED
P/N 10914**



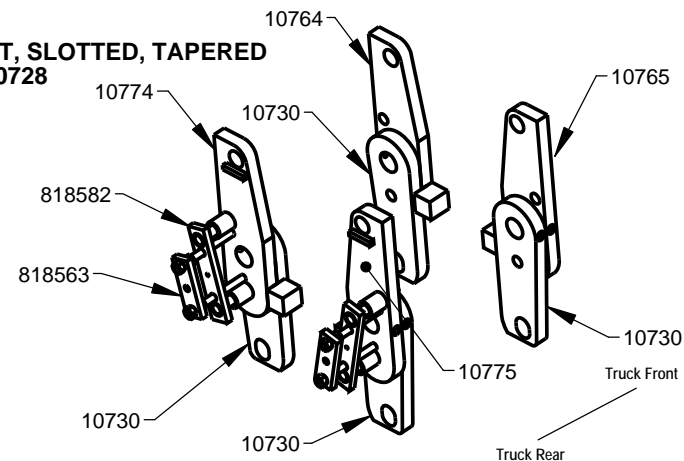
**AIR REMOTE - SHORT, SLOTTED, TAPERED
P/N 10915**




**CABLE REMOTE - SHORT, TAPERED
P/N 10727**

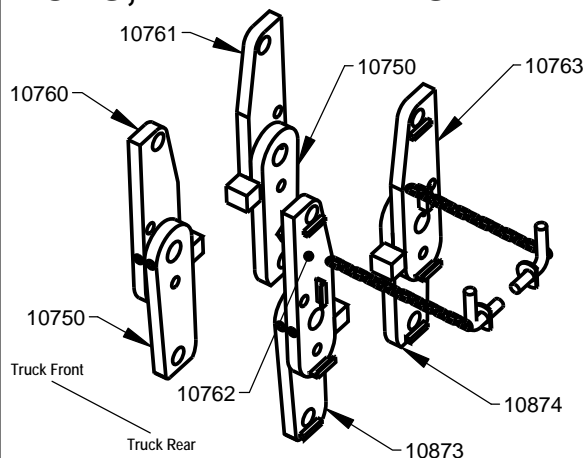


**CABLE REMOTE - SHORT, SLOTTED, TAPERED
P/N 10728**



TITLE: RW-1420 SHORT TAPERED LINKS (USED WITH AIR BRAKES)			
DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DATE: 6/26/17		DRAWING NUMBER: M1214012	REV: #

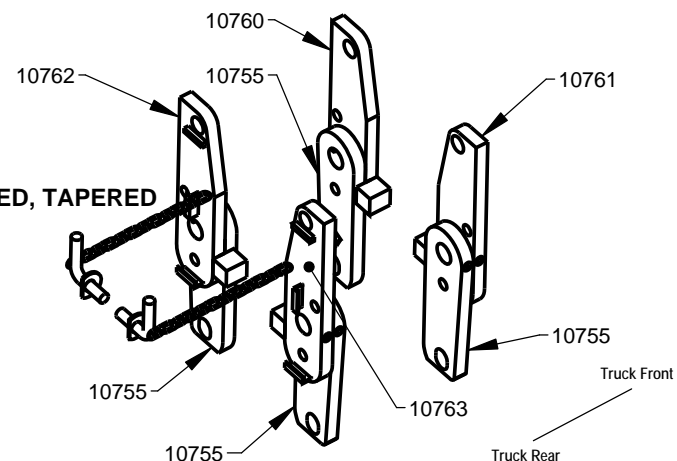
LONG, TAPERED LINKS



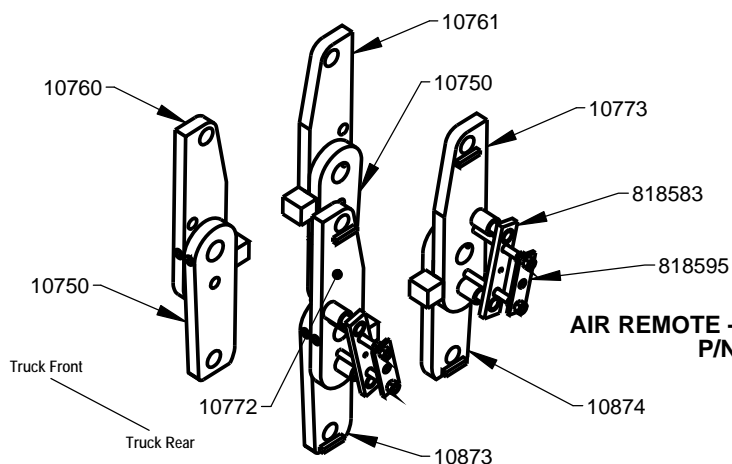
**MANUAL - LONG, TAPERED
P/N 10695**

Note: Links are sold individually unless you want a full set of all 8. Please refer to full set p/n's shown below.
The "Rear Set of Rear Links" differ in p/n's according to pin-off option. Your "Front Set of Rear Links" are the same, for x-short links, no matter what pin-off option you have.

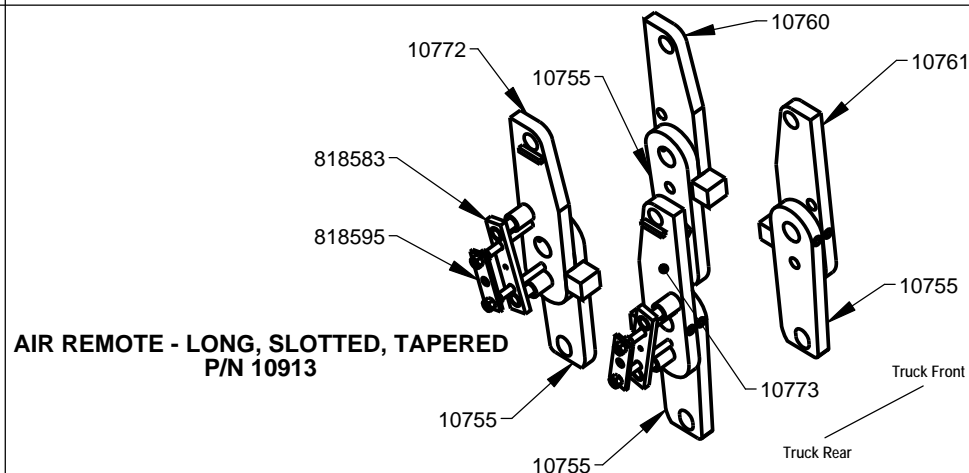
LONG, SLOTTED, TAPERED LINKS



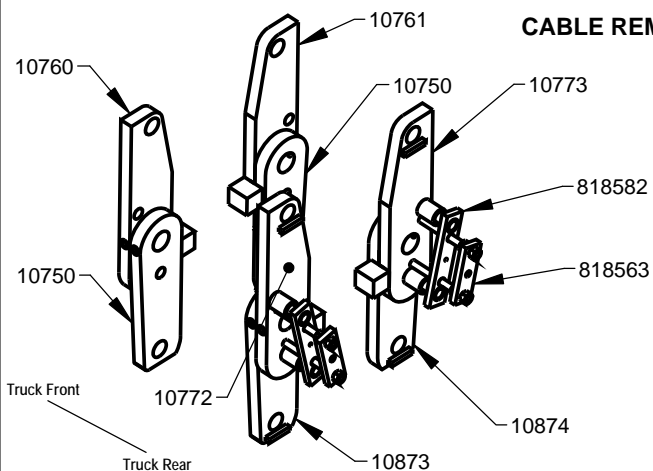
**MANUAL - LONG, SLOTTED, TAPERED
P/N 10697**



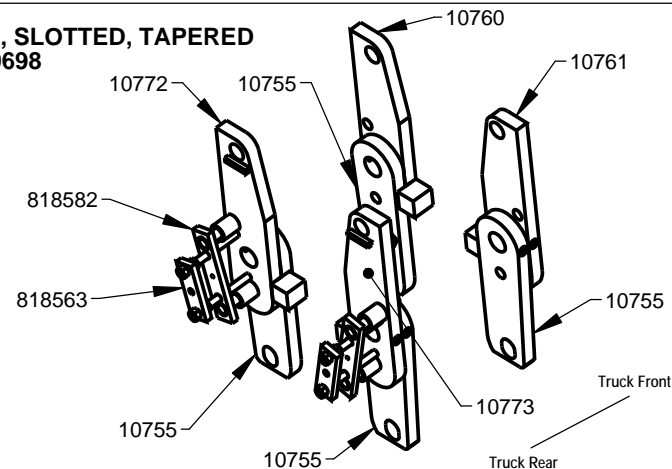
**AIR REMOTE - LONG, TAPERED
P/N 10912**



**AIR REMOTE - LONG, SLOTTED, TAPERED
P/N 10913**



**CABLE REMOTE - LONG, TAPERED
P/N 10696**



**CABLE REMOTE - LONG, SLOTTED, TAPERED
P/N 10698**

TITLE: RW-1420 LONG TAPERED LINKS (USED WITH AIR BRAKES)			
DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DATE: 6/30/17		DRAWING NUMBER: M1214013	REV: #

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	800108	8	HHCS 5/16-18" x 3/4"
2	800109	8	5/16" LOCK WASHER, GRADE 8
3	12560	2	RW-1212/1420 HUBCAP DETAIL
4	12595	2	AXLE NUT: TIMKEN TN-10
5	12598	2	TAB WASHER: TIMKEN TW-110
6	12596	2	TONGUE WASHER: HARDENED, TIMKEN K-91510
7	12591	4	BEARING: TIMKEN HM-807049
8	12593	2	SEAL: NATIONAL 416624
9	REF	2	RW-1212 WHEEL, w/RACES
9.1	12590	2	BEARING RACE (TIMKEN HM-807010)
10	12892	1	RW-1212 REAR AXLE & TUBE WELDMENT, HYDRAULIC BRAKES
	12890	1	RW-1212/1420 REAR AXLE & TUBE WELDMENT, NO BRAKES
10.1	12605	1	RW-1212/1420 AXLE DETAIL

COMPLETE RW-1212 WHEEL & REAR AXLE ASSEMBLIES:

INSULATED, NO BRAKES - 12882

INSULATED, HYDRAULIC BRAKES - 12886

NON-INSULATED, NO BRAKES - 12880

NON-INSULATED, HYDRAULIC BRAKES - 12884

RW-1212 WHEELS:

NON-INSULATED W/ RACES - 12510

INSULATED W/ RACES - 12530

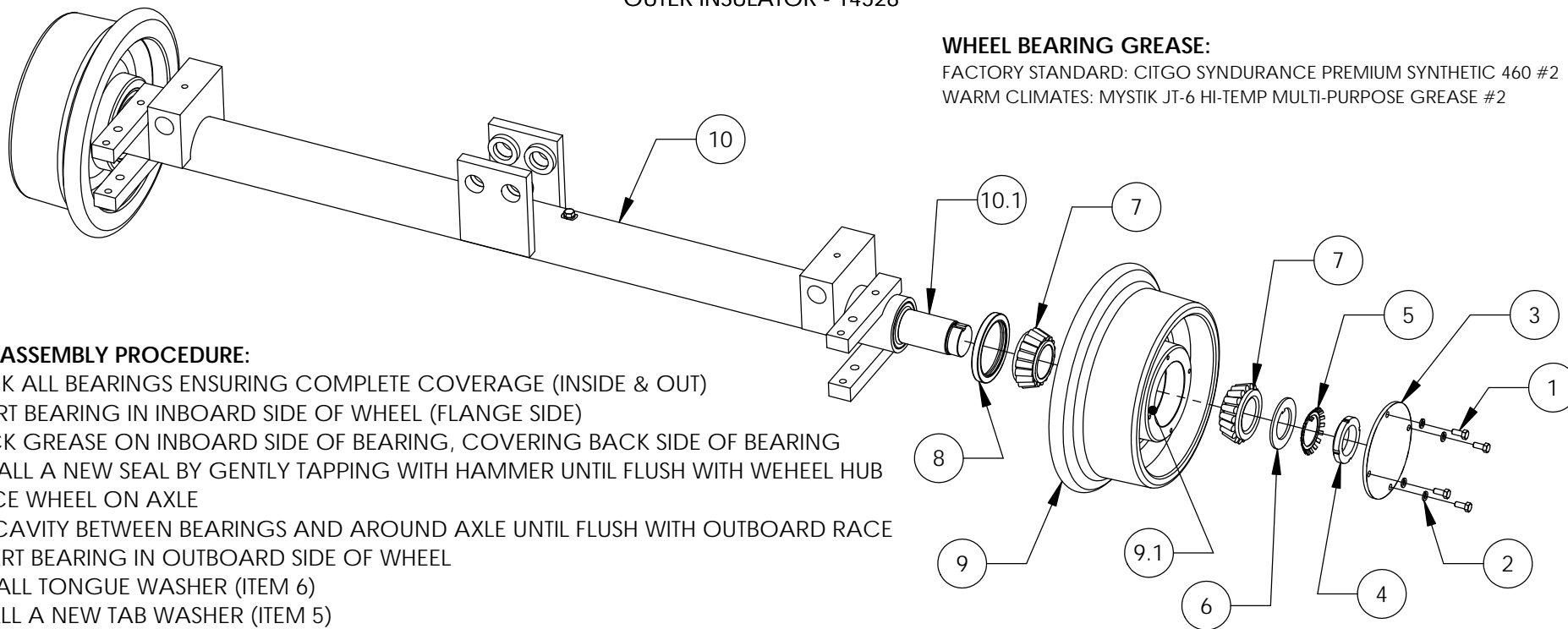
INNER INSULATOR - 14527

OUTER INSULATOR - 14528

WHEEL BEARING GREASE:

FACTORY STANDARD: CITGO SYNDURANCE PREMIUM SYNTHETIC 460 #2

WARM CLIMATES: MYSTIK JT-6 HI-TEMP MULTI-PURPOSE GREASE #2



WHEEL ASSEMBLY PROCEDURE:

- PACK ALL BEARINGS ENSURING COMPLETE COVERAGE (INSIDE & OUT)
- INSERT BEARING IN INBOARD SIDE OF WHEEL (FLANGE SIDE)
- PACK GREASE ON INBOARD SIDE OF BEARING, COVERING BACK SIDE OF BEARING
- INSTALL A NEW SEAL BY GENTLY TAPPING WITH HAMMER UNTIL FLUSH WITH WHEEL HUB
- PLACE WHEEL ON AXLE
- FILL CAVITY BETWEEN BEARINGS AND AROUND AXLE UNTIL FLUSH WITH OUTBOARD RACE
- INSERT BEARING IN OUTBOARD SIDE OF WHEEL
- INSTALL TONGUE WASHER (ITEM 6)
- INSTALL A NEW TAB WASHER (ITEM 5)
- INSTALL AXLE NUT (ITEM 4)
- ADJUST BEARING END-PLAY
 - TIGHTEN AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT ONE FULL TURN
 - TIGHTEN AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT BY ONE TAB OF THE TAB WASHER
- BEND DOWN THE TAB THAT MOST NEARLY LINES UP WITH A NOTCH IN THE AXLE NUT
- VERIFY BEARING END-PLAY IS 0.001"-0.005" WITH A DIAL INDICATOR
- FILL OUTBOARD CAVITY WITH GREASE
- RUN A BEAD OF SILICONE ON HUBCAP MOUNTING SURFACE (OUTBOARD FACE OF HUB)
- INSTALL HUBCAP WITH PROVIDED HEX SCREWS AND LOCK WASHERS

REV	DATE	DESCRIPTION		BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" X ± .063 XX ± .030 XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES .03 X .45" MAX DMF (404)875-1512		TITLE: RW-1212 WHEEL & REAR AXLE ASSEMBLY			
RW-1212		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.			
DRAWN BY: BJF	APPD BY: -	DATE: 7/3/17	DRAWING NUMBER: M1214014	REV: #	

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	800108	8	HHCS 5/16-18" x 3/4"
2	800109	8	5/16" LOCK WASHER, GRADE 8
3	12560	2	RW-1212/1420 HUBCAP DETAIL
4	12595	2	AXLE NUT; TIMKEN TN-10
5	12598	2	TAB WASHER; TIMKEN TW-110
6	12596	2	TONGUE WASHER; HARDENED, TIMKEN K-91510
7	12591	4	BEARING; TIMKEN HM-807049
8	12593	2	SEAL; NATIONAL 416624
9	REF	2	RW-1420 WHEEL W/ RACES
9.1	12590	2	BEARING RACE (TIMKEN HM-807010)
11	14890	1	RW-1420 REAR AXLE & TUBE WELDMENT, AIR BRAKES
	14894		RW-1420 REAR AXLE & TUBE WELDMENT, HYDRAULIC BRAKES
	12890		RW-1212/1420 REAR AXLE & TUBE WELDMENT, NO BRAKES
11.1	12605	1	RW-1212/1420 AXLE DETAIL

COMPLETE RW-1420 WHEEL & REAR AXLE ASSEMBLIES:

INSULATED, NO BRAKES - 14876

INSULATED, AIR BRAKES - 14884

INSULATED, HYDRAULIC BRAKES - 14888

NON-INSULATED, NO BRAKES - 14874

NON-INSULATED, AIR BRAKES - 14878

NON-INSULATED, HYDRAULIC BRAKES - 14886

RW-1420 WHEELS:

NON-INSULATED W/ RACES - 14512

INSULATED W/ RACES - 14517

INNER INSULATOR - 14527

OUTER INSULATOR - 14528

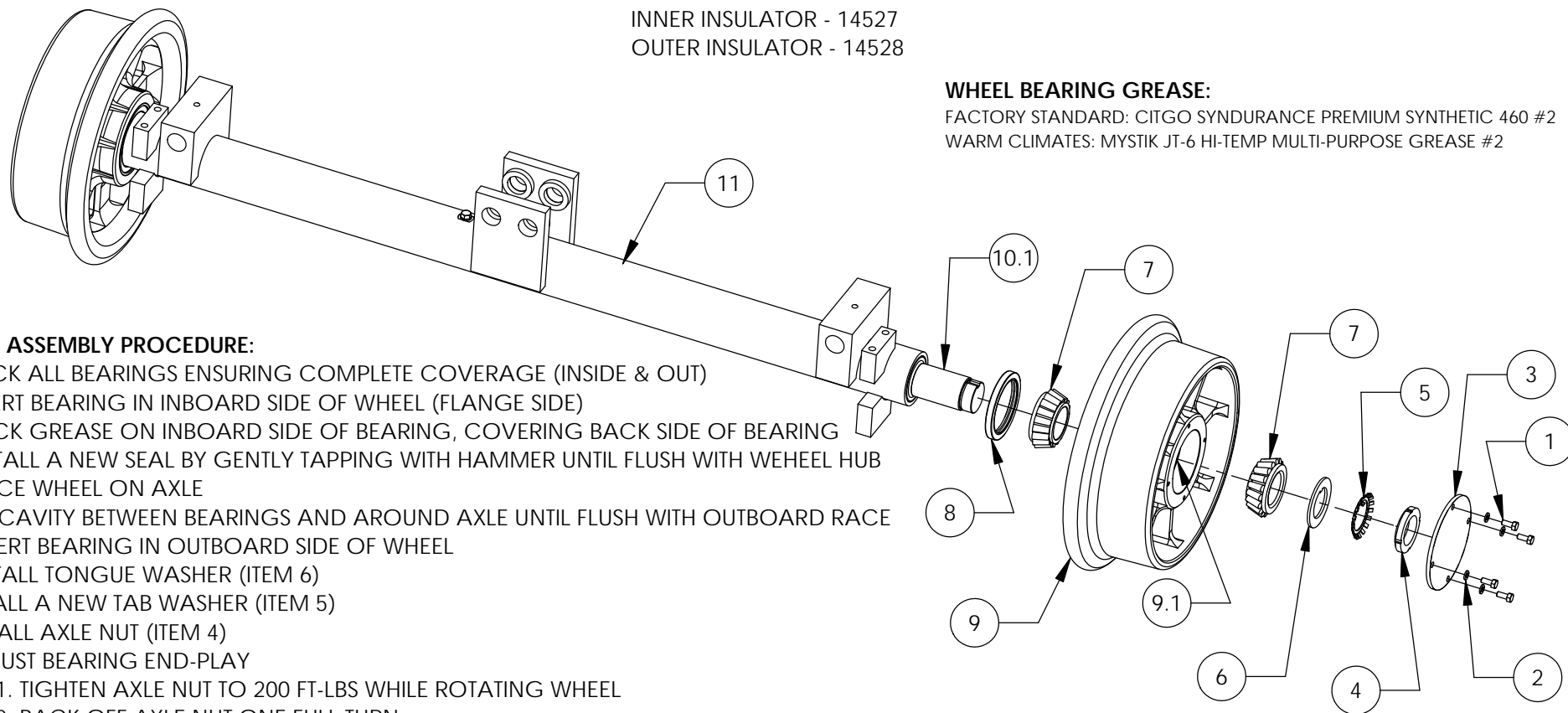
WHEEL BEARING GREASE:


FACTORY STANDARD: CITGO SYNDURANCE PREMIUM SYNTHETIC 460 #2

WARM CLIMATES: MYSTIK JT-6 HI-TEMP MULTI-PURPOSE GREASE #2

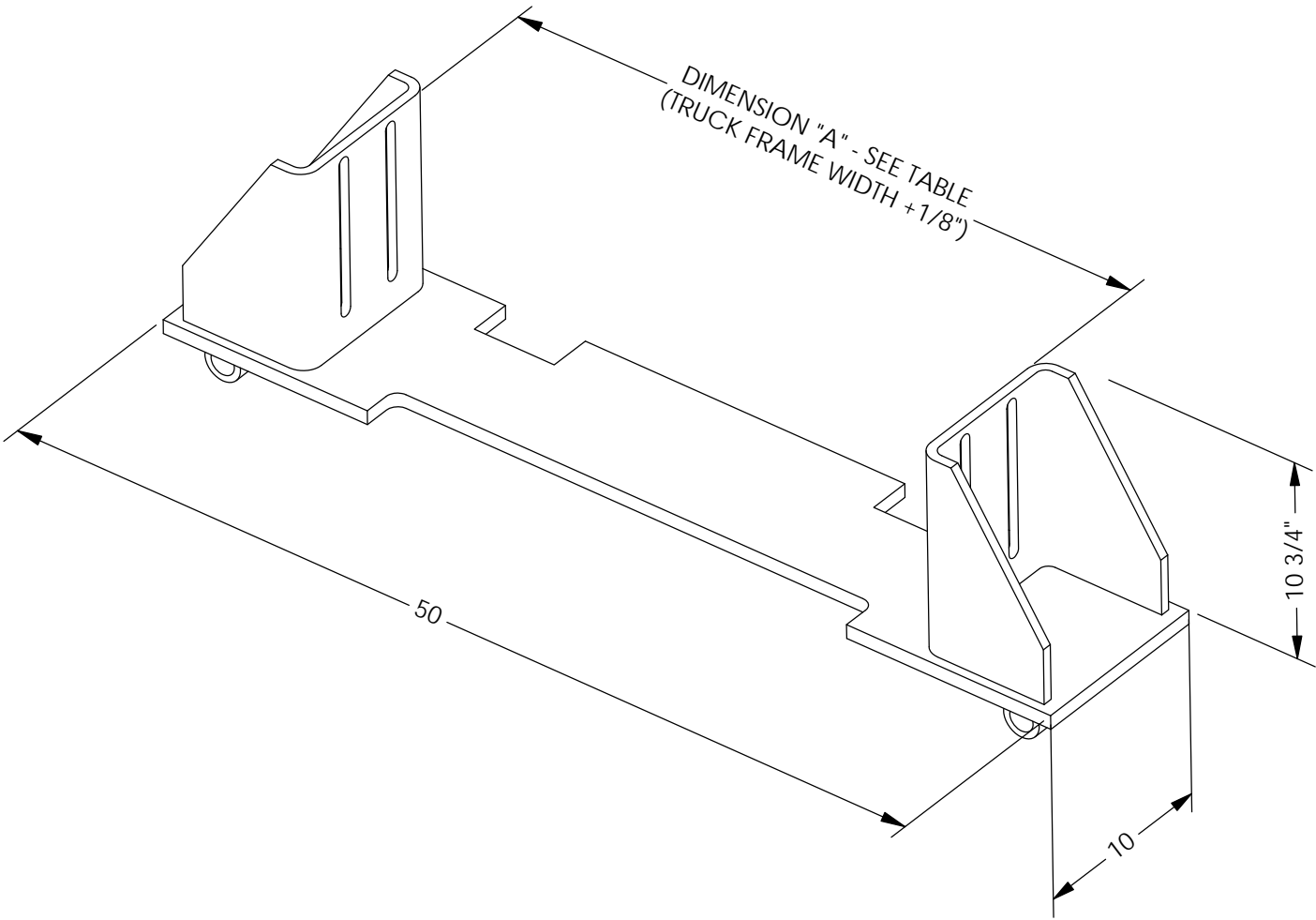
WHEEL ASSEMBLY PROCEDURE:

- PACK ALL BEARINGS ENSURING COMPLETE COVERAGE (INSIDE & OUT)
- INSERT BEARING IN INBOARD SIDE OF WHEEL (FLANGE SIDE)
- PACK GREASE ON INBOARD SIDE OF BEARING, COVERING BACK SIDE OF BEARING
- INSTALL A NEW SEAL BY GENTLY TAPPING WITH HAMMER UNTIL FLUSH WITH WHEEL HUB
- PLACE WHEEL ON AXLE
- FILL CAVITY BETWEEN BEARINGS AND AROUND AXLE UNTIL FLUSH WITH OUTBOARD RACE
- INSERT BEARING IN OUTBOARD SIDE OF WHEEL
- INSTALL TONGUE WASHER (ITEM 6)
- INSTALL A NEW TAB WASHER (ITEM 5)
- INSTALL AXLE NUT (ITEM 4)
- ADJUST BEARING END-PLAY
 - TIGHTEN AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT ONE FULL TURN
 - TIGHTEN AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT BY ONE TAB OF THE TAB WASHER
- BEND DOWN THE TAB THAT MOST NEARLY LINES UP WITH A NOTCH IN THE AXLE NUT
- VERIFY BEARING END-PLAY IS 0.001"-0.005" WITH A DIAL INDICATOR
- FILL OUTBOARD CAVITY WITH GREASE
- RUN A BEAD OF SILICONE ON HUBCAP MOUNTING SURFACE (OUTBOARD FACE OF HUB)
- INSTALL HUBCAP WITH PROVIDED HEX SCREWS AND LOCK WASHERS



REV	DATE	DESCRIPTION			BY	APP	
TOLERANCES (UNLESS SPECIFIED):		TITLE:					
FRAC. MACH:	± 1/32"	RW-1420	RW-1420 WHEEL & REAR AXLE ASSEMBLY				
FRAC. OTHER:	± 1/16"		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.				
.X	± .063						
.XX	± .030						
.XXX	± .005						
DRILL SIZES:	± .015						
ANGULAR:	± 1°						
SURF FINISH:	125 MICRO	DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
THREADS:	2A AND 2B						
BREAK SHARP EDGES .03 X .45" MAX							
DMF (404)875-1512							

PART NO.	DIMENSION "A"
12234HD	33-3/4"
12231HD	34"
12229HD	34-1/8"
12226HD	34-1/4"
12228HD	34-3/8"
12230HD	34-1/2"
12232HD	34-5/8"
12240HD	34-3/4"
12236HD	34-7/8"
12238HD	35"
12239HD	35-1/8"
12244HD	35-1/4"
12243HD	35-1/2"
12242HD	36-7/8"



REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACHINE: ± 1/32" FRAC. OTHER: ± 1/16" .X ± .063 .XX ± .030 .XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO 2A AND 2B THREADS: BREAK SHARP EDGES .03 X .45" MAX DMF (404)875-1512		TITLE: RW-1212 & 1420 REAR FRAME BRACKETS THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
DRAWN BY: BJB APPD BY: -		DATE: 7/3/17		DRAWING NUMBER: M1214016 REV: #

SECTION 8.0 FRONT RAILGEAR PARTS

8.1.	BEFORE ORDERING PARTS – FRONT RAILGEAR.....	8-2
8.2.	FRONT PARTS DETAIL DRAWING	8-3
8.3.	LONG ARM VARIATIONS.....	8-4
8.4.	RW-1212 WHEEL & FRONT AXLE ASSEMBLY.....	8-5
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8.7.	SPRING HANGER CONFIGURATIONS	8-8

8.1. BEFORE ORDERING PARTS – FRONT RAILGEAR

Required Information for Ordering Parts:

- You must have the Railgear serial number when ordering parts. This uniquely identifies your Railgear, as it was built to your specifications, and also allows DMF to help you maintain a history of your Railgear. If you are placing a parts order through a maintenance facility, please inform them of the serial number, so that they can relay the information.
- Returns: DMF has a Return Authorization Procedure. You must contact DMF for an RA# before returning any parts for any reason. Parts will not be credited without an RA#.
- Labor: In extremely rare situations, on a discretionary basis, and with prior approval, DMF will reimburse certain, specific labor costs. If you feel this may apply in your situation, you must contact DMF's Service Department for a Service Authorization Number (SA#). No labor will be reimbursed without an SA#. The SA# must be included on your request for reimbursement.
- Please use driver's side / passenger's side terminology (instead of left/right side) when describing issues with your Railgear. This ensures that everyone involved is clear about where the issue is occurring.

Other Considerations for Ordering Parts:

This is a list of considerations to make before placing a parts order with DMF. There are many variations and customer requirements that we strive to accommodate, and as a result, the more information you can provide to us when placing an order, the more likely that we will be able to help you quickly and efficiently.

- Cross Tubes, Spring Hangers, and Long Arms are available in a variety of sizes and lengths. Please be sure to check drawings for details before placing your order.

Wheels:

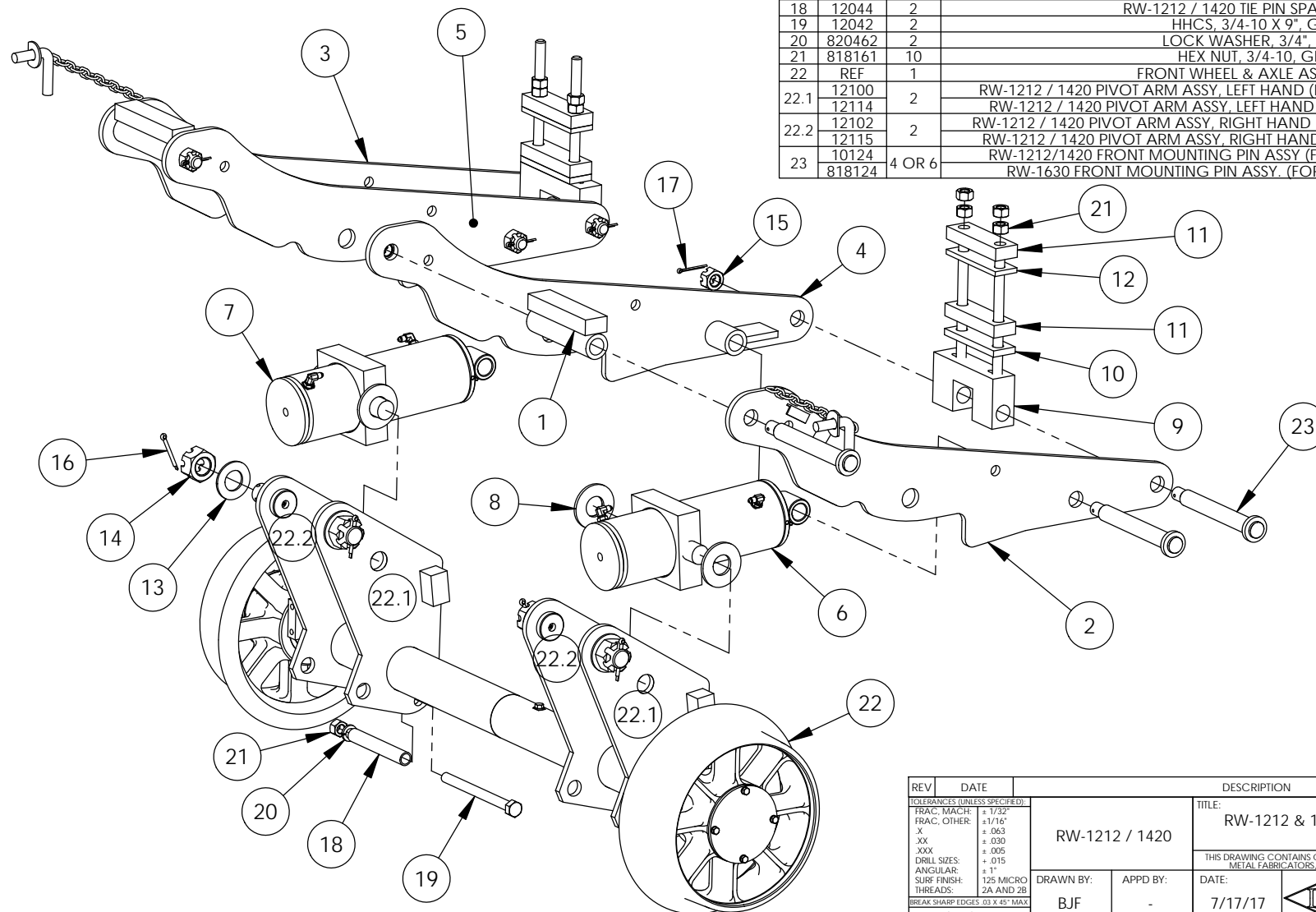
- If you are a customer using special wheel profiles (this is especially prevalent in Metros), please be sure to inform the DMF Parts Department that there may be a special wheel profile involved in your order.
- DMF offers both insulated and non-insulated wheels. Please confirm which wheel you need before ordering. Insulated wheels can be identified by a grooved ring machined around the inside of the Rail wheel. This grooved ring can be seen and felt, and is located about an inch in from the outside tread.

Cylinders:


- The driver's side and passenger's side cylinders are different – please see information on drawing to determine which cylinder you need to order.

Frame Extensions:

- Please call DMF for assistance. The truck year and model number must be provided, so that DMF can correctly identify the frame extension needed.

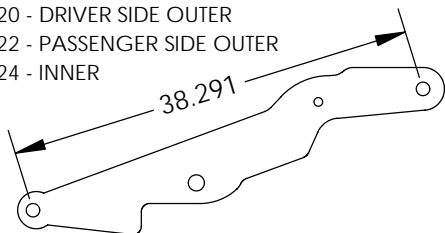


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	REF	2	CROSS TUBE MTG. BLOCK
2	REF	1	LONG ARM ASSY, DRIVER SIDE OUTER
3	REF	1	LONG ARM ASSY, PASSENGER SIDE OUTER
4	REF	1	LONG ARM ASSY, DRIVER SIDE INNER
5	REF	1	LONG ARM ASSY, PASSENGER SIDE INNER
6	240099	1	HYDRAULIC CYLINDER ASSEMBLY, FRONT DRIVER SIDE, RW-1630/1420/1212/1019
7	240100	1	HYDRAULIC CYLINDER ASSEMBLY, FRONT PASSENGER SIDE, RW-1630/1420/1212/1019
8	12052	4	RW-1212 / 1420 FRONT CYLINDER SPACER
9	REF	2	SPRING HANGER BRACKET
10	818158	REF	RW-1630 FRONT SPRING BRACKET 1/2" SPACER
11	818160	REF	RW-1630 FRONT SPRING BRACKET 1" SPACER
12	818153	2	RW-1630 SPRING BRACKET RUBBER SPACER
13	818136	4	FLAT WASHER, 1-1/2" GR5
14	818134	4	SLOTTED HEX NUT, 1-1/2"-6, GR5
15	818127	4 OR 6	SLOTTED HEX NUT, 1"-8, GR8
16	818137	4	COTTER PIN, 1/4"x2-1/2"
17	818128	4 OR 6	COTTER PIN, 3/16" X 2"
18	12044	2	RW-1212 / 1420 TIE PIN SPACER TUBE
19	12042	2	HHCS, 3/4-10 X 9", GR5
20	820462	2	LOCK WASHER, 3/4", GR8
21	818161	10	HEX NUT, 3/4-10, GR5
22	REF	1	FRONT WHEEL & AXLE ASSEMBLY
22.1	12100	2	RW-1212 / 1420 PIVOT ARM ASSY, LEFT HAND (FOR STANDARD LONG ARMS)
	12114		RW-1212 / 1420 PIVOT ARM ASSY, LEFT HAND (FOR CARGO LONG ARMS)
22.2	12102	2	RW-1212 / 1420 PIVOT ARM ASSY, RIGHT HAND (FOR STANDARD LONG ARMS)
	12115		RW-1212 / 1420 PIVOT ARM ASSY, RIGHT HAND (FOR CARGO LONG ARMS)
	10124		RW-1212/1420 FRONT MOUNTING PIN ASSY (FOR 1/2" THICK LONG ARMS)
23	818124	4 OR 6	RW-1630 FRONT MOUNTING PIN ASSY. (FOR 3/4" THICK LONG ARMS)

REV	DATE	DESCRIPTION			BY	APP	
TOLERANCES (UNLESS SPECIFIED):							
FRAC. MACH:	± 1/32"	RW-1212 / 1420	TITLE:	RW-1212 & 1420 FRONT RAILGEAR PARTS			
FRAC. OTHER:	± 1/16"						
.X	± .063						
.XX	± .030						
.XXX	± .005						
DRILL SIZES:	± .015	THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
ANGULAR:	± 1°	DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
SURF FINISH:	125 MICRO						
THREADS:	2A AND 2B						
BREAK SHARP EDGES .03 X .45" MAX		BJF	-	7/17/17		M1214017	#
DMF (404)875-1512							

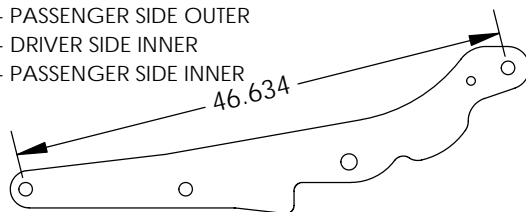
1/2" THICK LONG ARMS

12120 - DRIVER SIDE OUTER
12122 - PASSENGER SIDE OUTER
12124 - INNER



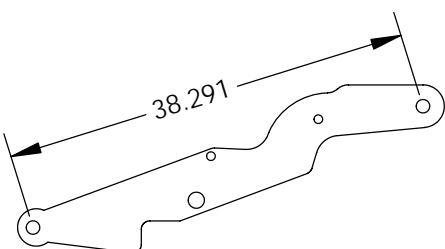
STANDARD LONG ARM

12163 - DRIVER SIDE OUTER
12164 - PASSENGER SIDE OUTER
12165 - DRIVER SIDE INNER
12166 - PASSENGER SIDE INNER



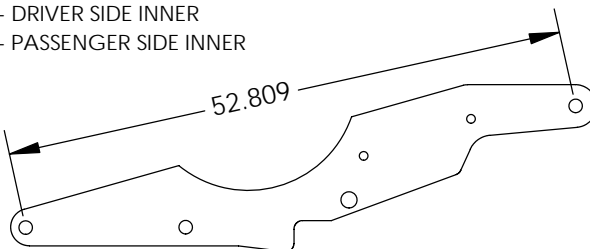
XTRA CLEARANCE EXTENDED LONG ARM

12128 - INNER



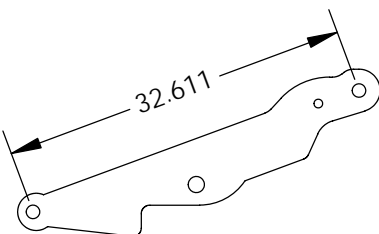
STD LONG ARM, NOTCHED (INNER ONLY)

12130 - DRIVER SIDE OUTER
12132 - PASSENGER SIDE OUTER
12150 - DRIVER SIDE INNER
12151 - PASSENGER SIDE INNER



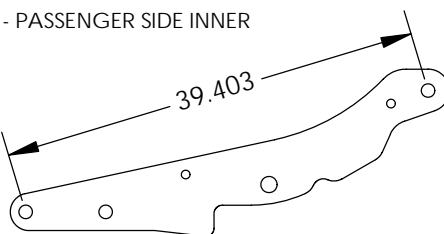
EXTENDED LONG ARM, NOTCHED FOR M2 FREIGHTLINER

12140 - DRIVER SIDE OUTER
12142 - PASSENGER SIDE OUTER
12144 - INNER



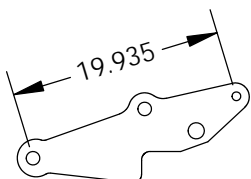
SNUB NOSE LONG ARM

12153 - DRIVER SIDE OUTER
12154 - PASSENGER SIDE OUTER
12155 - DRIVER SIDE INNER
12156 - PASSENGER SIDE INNER



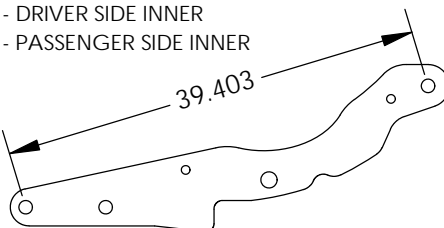
SHORT EXTENDED LONG ARM

12170 - ALL POSITIONS



CARGO LONG ARM

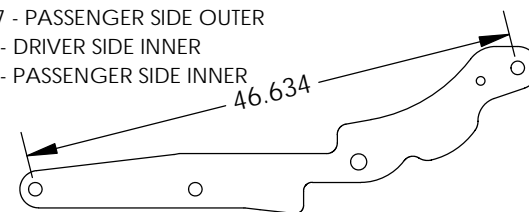
12172 - DRIVER SIDE OUTER
12173 - PASSENGER SIDE OUTER
12174 - DRIVER SIDE INNER
12175 - PASSENGER SIDE INNER



SHORT EXTENDED ARM, NOTCHED

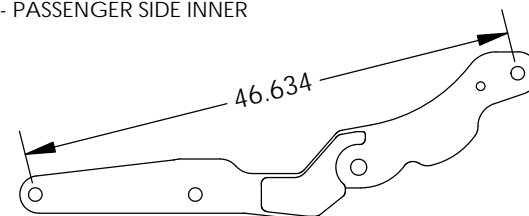
3/4" THICK LONG ARMS

808158 - DRIVER SIDE OUTER
808157 - PASSENGER SIDE OUTER
12176 - DRIVER SIDE INNER
12177 - PASSENGER SIDE INNER



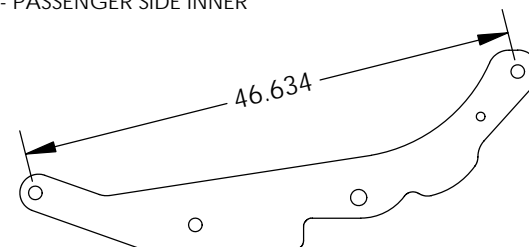
XTRA CLR EXT NOTCHED (ONLY INNERS NOTCHED)

12187 - DRIVER SIDE OUTER
12188 - PASSENGER SIDE OUTER
12185 - DRIVER SIDE INNER
12186 - PASSENGER SIDE INNER



XTRA CLR EXT NOTCHED, INTL 4300 LOW PRO

12200 - DRIVER SIDE OUTER
12199 - PASSENGER SIDE OUTER
12198 - DRIVER SIDE INNER
12197 - PASSENGER SIDE INNER



XTRA CLEARANCE EXTENDED, PETE 210/220

NOTES: IF ORDERING A DRIVER SIDE OUTER ARM, MUST PROVIDE SERIAL # IN ORDER TO GET REPLACEMENT SERIAL TAG ON NEW ARM.

3/4" ARMS USE LONGER PINS THAN 1/2" ARMS. SEE DRAWING M1214017 FOR DETAILS.

REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .X ± .063 .XX ± .030 .XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO 2A AND 2B THREADS: ± 1° BREAK SHARP EDGES .03 X 45° MAX DMF (404)875-1512				
RW-1212 / 1420		TITLE: RW-1212 & 1420 LONG ARMS THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
DRAWN BY: BJF	APPD BY: -	DATE: 7/19/17		DRAWING NUMBER: M1214018 REV: #

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	800108	8	HHCS 5/16-18" x 3/4"
2	800109	8	5/16" LOCK WASHER, GRADE 8
3	12560	2	RW-1212/1420 HUBCAP DETAIL
4	12595	2	AXLE NUT: TIMKEN TN-10
5	12598	2	TAB WASHER: TIMKEN TW-110
6	12596	2	TONGUE WASHER: HARDENED, TIMKEN K-91510
7	12591	4	BEARING: TIMKEN HM-807049
8	12593	2	SEAL: NATIONAL 416624
9	12605	1	RW-1212/1420 AXLE DETAIL
10	12842	1	RW-1212 AXLE TUBE ASSY, FRONT RH, HYD
11	12840	1	RW-1212 AXLE TUBE ASSY, FRONT LH, HYD
12	12566	1	3/8" LOCK WASHER, GRADE 8
13	12564	1	PIN, AXLE, ANTI-ROTATION
14	12100	2	RW-1212/1420 PIVOT ARM ASSY., FRONT LH (FOR STD. LONG ARMS)
	12114		RW-1212/1420 PIVOT ARM ASSY., FRONT LH (FOR CARGO ARMS)
15	12102	2	RW-1212/1420 PIVOT ARM ASSY., FRONT RH (FOR STD. LONG ARMS)
	12115		RW-1212/1420 PIVOT ARM ASSY., FRONT RH (FOR CARGO ARMS)
16	REF	1	RW-1212 WHEEL, w/RACES
16.1	12590	2	BEARING RACE (TIMKEN HM-807010)

COMPLETE RW-1212 WHEEL & FRONT AXLE ASSEMBLIES:

INSULATED, NO BRAKES - 12832

INSULATED, HYDRAULIC BRAKES - 12836

NON-INSULATED, NO BRAKES - 12830

NON-INSULATED, HYDRAULIC BRAKES - 12834

NON-INSULATED, HYDRAULIC BRAKES, CARGO PIVOT ARMS - 12835

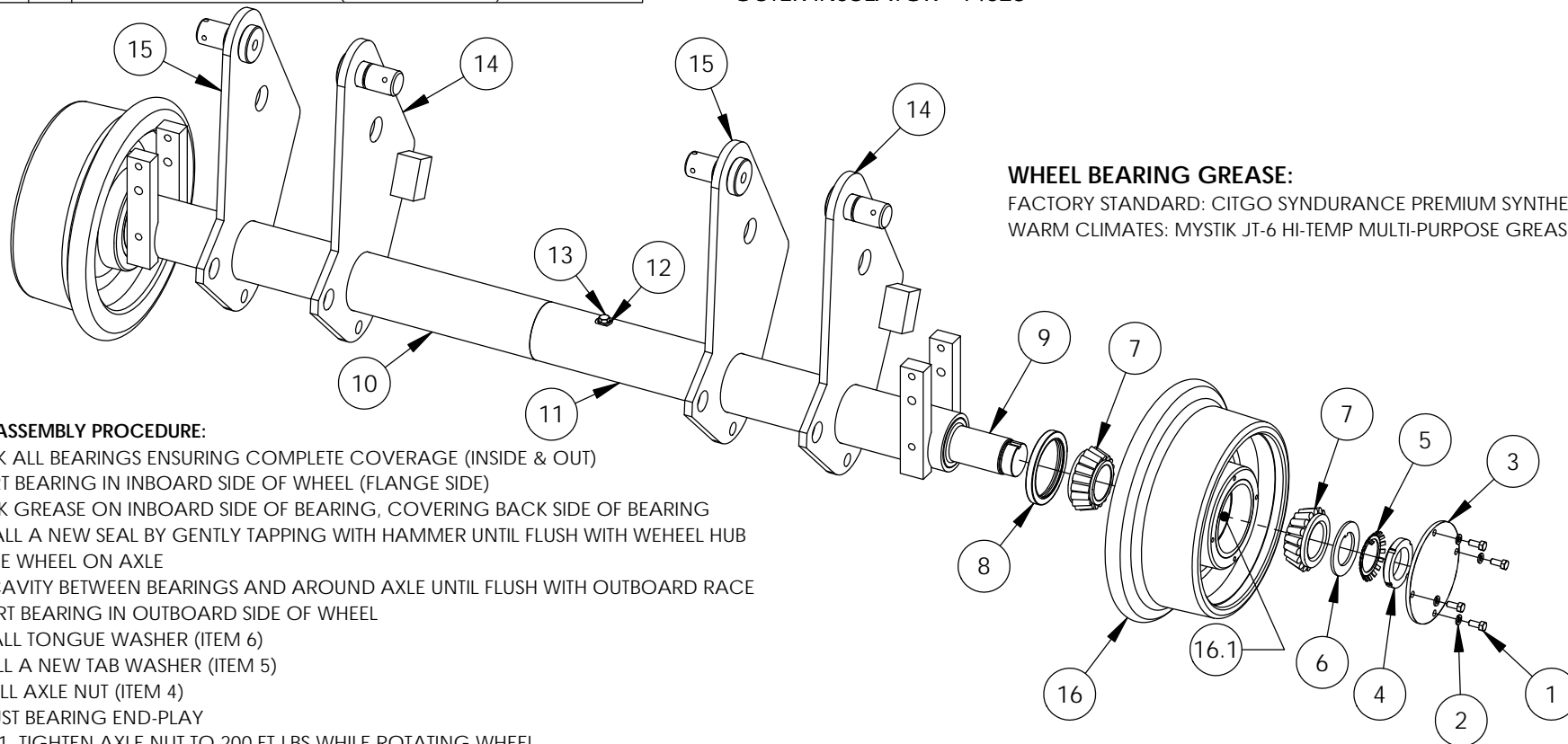
RW-1212 WHEELS:

NON-INSULATED W/ RACES - 12510

INSULATED W/ RACES - 12530

INNER INSULATOR - 14527

OUTER INSULATOR - 14528




WHEEL BEARING GREASE:

FACTORY STANDARD: CITGO SYNDURANCE PREMIUM SYNTHETIC 460 #2

WARM CLIMATES: MYSTIK JT-6 HI-TEMP MULTI-PURPOSE GREASE #2

WHEEL ASSEMBLY PROCEDURE:

- PACK ALL BEARINGS ENSURING COMPLETE COVERAGE (INSIDE & OUT)
- INSERT BEARING IN INBOARD SIDE OF WHEEL (FLANGE SIDE)
- PACK GREASE ON INBOARD SIDE OF BEARING, COVERING BACK SIDE OF BEARING
- INSTALL A NEW SEAL BY GENTLY TAPPING WITH HAMMER UNTIL FLUSH WITH WHEEL HUB
- PLACE WHEEL ON AXLE
- FILL CAVITY BETWEEN BEARINGS AND AROUND AXLE UNTIL FLUSH WITH OUTBOARD RACE
- INSERT BEARING IN OUTBOARD SIDE OF WHEEL
- INSTALL TONGUE WASHER (ITEM 6)
- INSTALL A NEW TAB WASHER (ITEM 5)
- INSTALL AXLE NUT (ITEM 4)
- ADJUST BEARING END-PLAY
 - TIGHTEN AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT ONE FULL TURN
 - TIGHTEN AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT BY ONE TAB OF THE TAB WASHER
- BEND DOWN THE TAB THAT MOST NEARLY LINES UP WITH A NOTCH IN THE AXLE NUT
- VERIFY BEARING END-PLAY IS 0.001"-0.005" WITH A DIAL INDICATOR
- FILL OUTBOARD CAVITY WITH GREASE
- RUN A BEAD OF SILICONE ON HUBCAP MOUNTING SURFACE (OUTBOARD FACE OF HUB)
- INSTALL HUBCAP WITH PROVIDED HEX SCREWS AND LOCK WASHERS

REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED): FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" X ± .063 XX ± .030 XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES .03 X .45" MAX DMF (404)875-1512		RW-1212		TITLE: RW-1212 WHEEL & FRONT AXLE ASSEMBLY			
		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
DRAWN BY: BJF		APPD BY: -		DATE: 8/14/17		DRAWING NUMBER: M1214019	REV: #

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	800108	8	HHCS 5/16-18" x 3/4"
2	800109	8	5/16" LOCK WASHER, GRADE 8
3	12560	2	RW-1212/1420 HUBCAP DETAIL
4	12595	2	AXLE NUT: TIMKEN TN-10
5	12598	2	TAB WASHER: TIMKEN TW-110
6	12596	2	TONGUE WASHER: HARDENED, TIMKEN K-91510
7	12591	4	BEARING: TIMKEN HM-807049
8	12593	2	SEAL: NATIONAL 416624
9	12605	1	RW-1212/1420 AXLE DETAIL
10	14842	1	RW-1420 FT AXLE TUBE ASSY: 3", PASS, AIR
11	14840	1	RW-1420 FT AXLE TUBE ASSY: 3", DRIVERS, AIR
12	12566	1	3/8" LOCK WASHER, GRADE 8
13	12564	1	PIN, AXLE, ANTI-ROTATION
14	12100	2	RW-1212/1420 PIVOT ARM ASSY., FRONT LH (FOR STD. LONG ARMS)
	12114		RW-1212/1420 PIVOT ARM ASSY., FRONT LH (FOR CARGO ARMS)
15	12102	2	RW-1212/1420 PIVOT ARM ASSY., FRONT RH (FOR STD. LONG ARMS)
	12115		RW-1212/1420 PIVOT ARM ASSY., FRONT RH (FOR CARGO ARMS)
16	REF	1	RW-1420 WHEEL, w/RACES
16.1	12590	2	BEARING RACE (TIMKEN HM-807010)

COMPLETE RW-1420 WHEEL & FRONT AXLE ASSEMBLIES:

INSULATED, NO BRAKES - 14830

INSULATED, AIR BRAKES - 14834

INSULATED, AIR BRAKES, CARGO PIVOT ARMS - 14670

INSULATED, HYDRAULIC BRAKES - 14838

NON-INSULATED, NO BRAKES - 14828

NON-INSULATED, AIR BRAKES - 14832

NON-INSULATED, AIR BRAKES, CARGO PIVTO ARMS - 14671

NON-INSULATED, HYDRAULIC BRAKES - 14836

RW-1420 WHEELS:

NON-INSULATED W/ RACES - 14512

INSULATED W/ RACES - 14517

INNER INSULATOR - 14527

OUTER INSULATOR - 14528

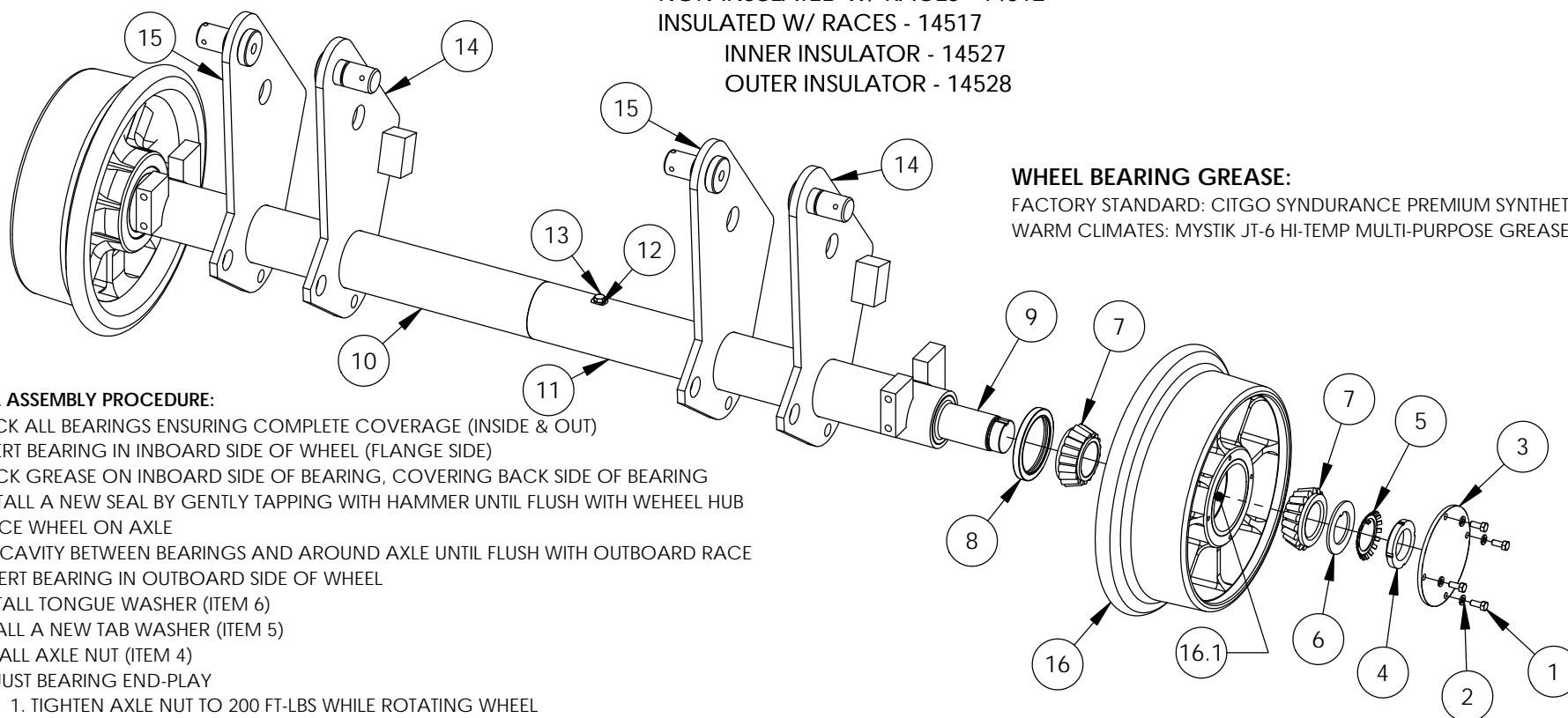
WHEEL BEARING GREASE:


FACTORY STANDARD: CITGO SYNDURANCE PREMIUM SYNTHETIC 460 #2

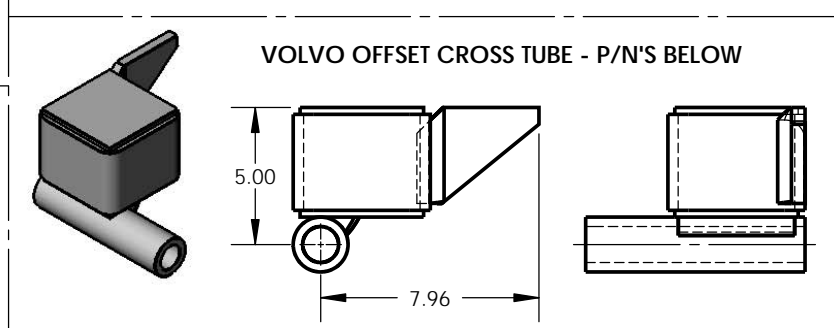
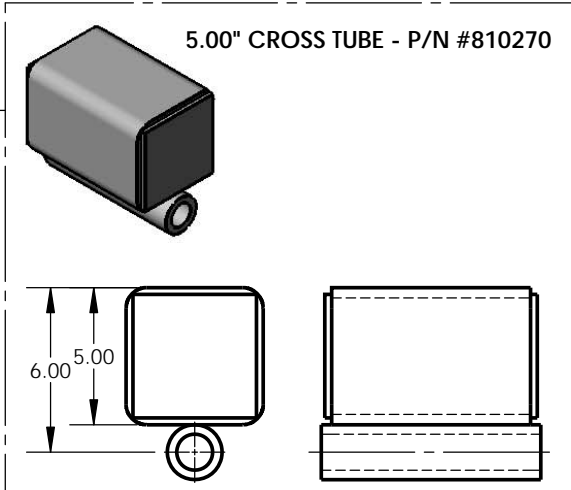
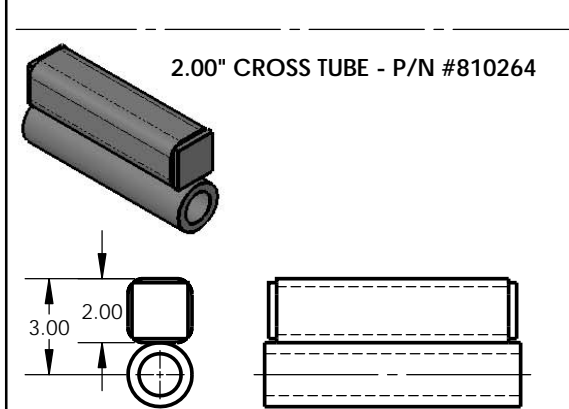
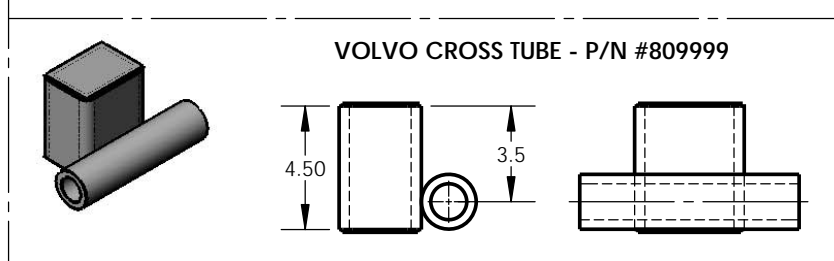
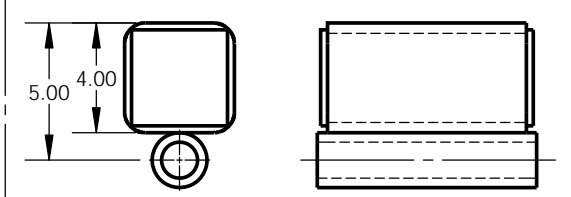
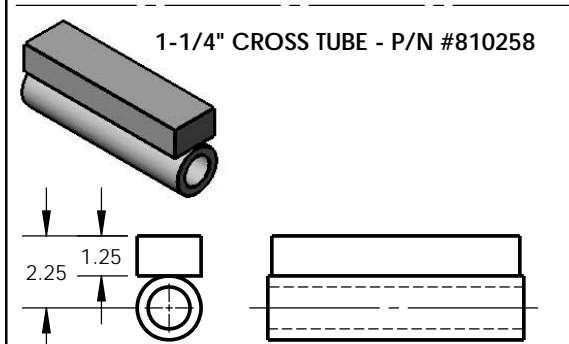
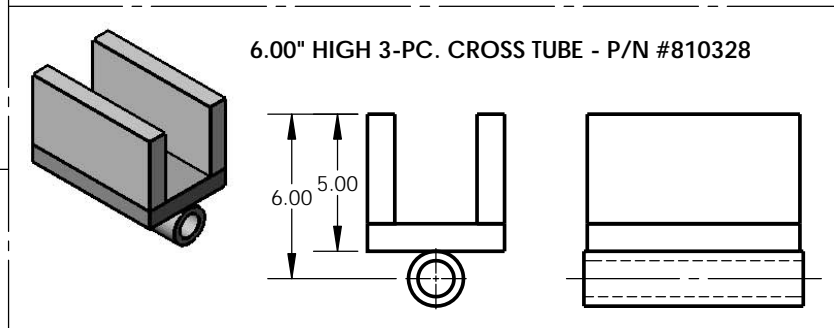
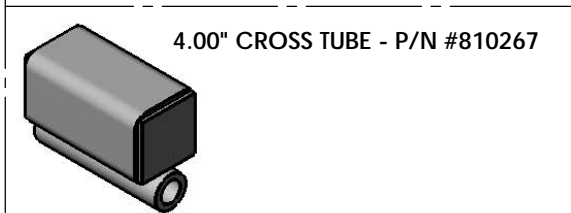
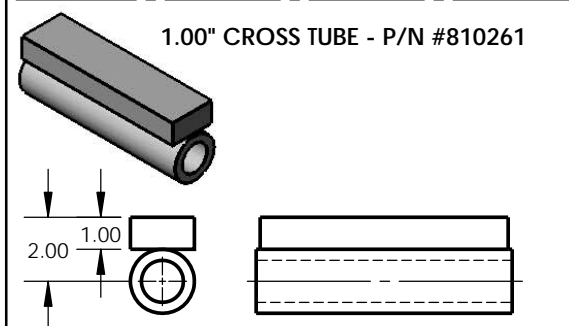
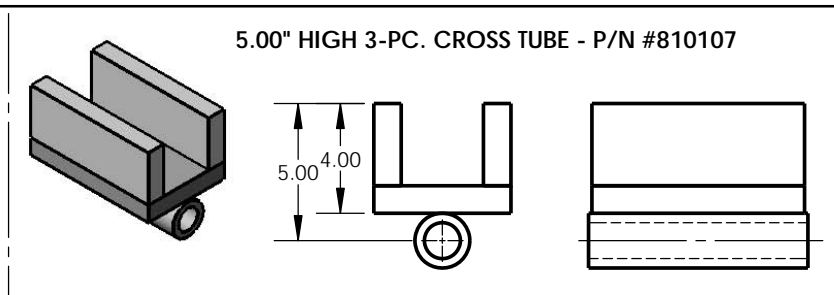
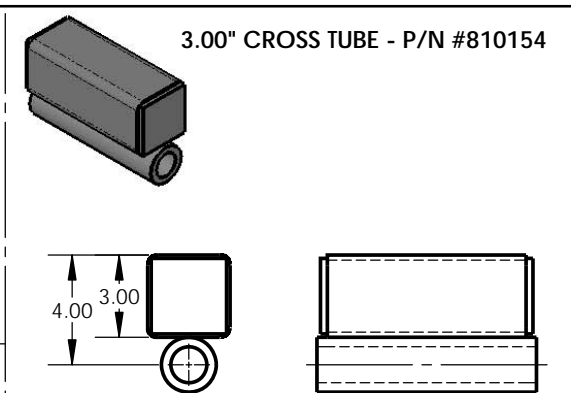
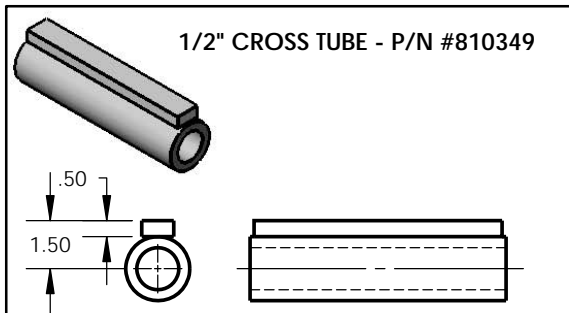
WARM CLIMATES: MYSTIK JT-6 HI-TEMP MULTI-PURPOSE GREASE #2

WHEEL ASSEMBLY PROCEDURE:

- PACK ALL BEARINGS ENSURING COMPLETE COVERAGE (INSIDE & OUT)
- INSERT BEARING IN INBOARD SIDE OF WHEEL (FLANGE SIDE)
- PACK GREASE ON INBOARD SIDE OF BEARING, COVERING BACK SIDE OF BEARING
- INSTALL A NEW SEAL BY GENTLY TAPPING WITH HAMMER UNTIL FLUSH WITH WEHEEL HUB
- PLACE WHEEL ON AXLE
- FILL CAVITY BETWEEN BEARINGS AND AROUND AXLE UNTIL FLUSH WITH OUTBOARD RACE
- INSERT BEARING IN OUTBOARD SIDE OF WHEEL
- INSTALL TONGUE WASHER (ITEM 6)
- INSTALL A NEW TAB WASHER (ITEM 5)
- INSTALL AXLE NUT (ITEM 4)
- ADJUST BEARING END-PLAY
 - TIGHTEN AXLE NUT TO 200 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT ONE FULL TURN
 - TIGHTEN AXLE NUT TO 50 FT-LBS WHILE ROTATING WHEEL
 - BACK OFF AXLE NUT BY ONE TAB OF THE TAB WASHER
- BEND DOWN THE TAB THAT MOST NEARLY LINES UP WITH A NOTCH IN THE AXLE NUT
- VERIFY BEARING END-PLAY IS 0.001"-0.005" WITH A DIAL INDICATOR
- FILL OUTBOARD CAVITY WITH GREASE
- RUN A BEAD OF SILICONE ON HUBCAP MOUNTING SURFACE (OUTBOARD FACE OF HUB)
- INSTALL HUBCAP WITH PROVIDED HEX SCREWS AND LOCK WASHERS

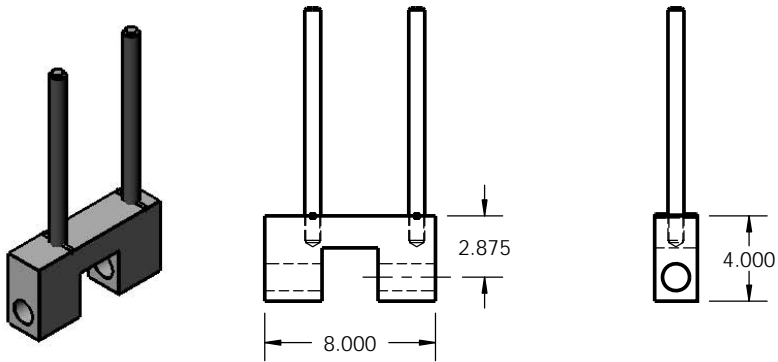


REV	DATE	DESCRIPTION			BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE:				
FRAC. MACH: ± 1/32"		RW-1420 WHEEL & FRONT AXLE ASSEMBLY				
FRAC. OTHER: ± 1/16"						
X ± .063		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.				
XX ± .030						
XXX ± .005		DRAWN BY: BJF APPD BY: - DATE: 8/14/17  DRAWING NUMBER: M1214020 REV: #				
DRILL SIZES: ± .015						
ANGULAR: ± 1°						
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B						
BREAK SHARP EDGES .03 X .45" MAX						
DMF (404)875-1512						

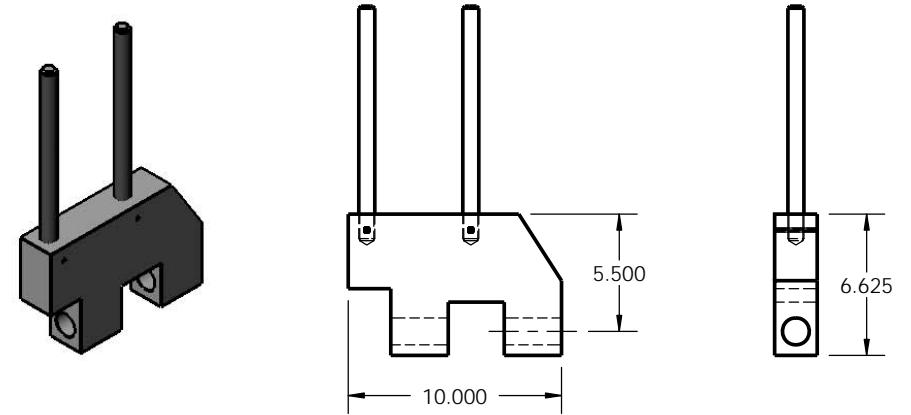


DRIVER SIDE (SHOWN) - P/N #810388
PASSENGER SIDE (OPPOSITE HAND) - P/N #810389

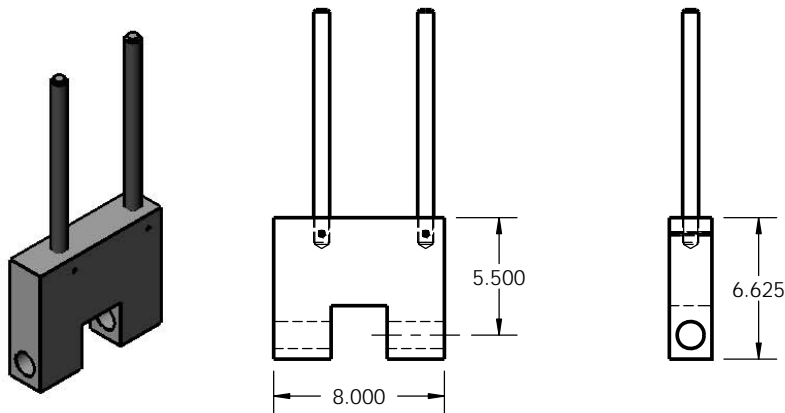
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<div><div><div><div></div></div></div><div><div></div></div></div>					
REV		DATE		DESCRIPTION	
BY		APP			
TOLERANCES: (UNLESS SPECIFIED)		TITLE: VARIOUS CROSS TUBE DETAILS			
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
FRAC. OTHER: ± 1/16"					
X ± .063		DRAWN BY: JBG			
.XX ± .030					
.XXX ± .005		APPD BY:			
DRILL SIZES: ± .015					
ANGULAR: ± 1°		DATE: 8/11/2010			
SURF FINISH: 125 MICRO					
THREADS: 2A AND 2B		<div><div><div></div></div></div>			
SEE ALL DIMENSIONS LISTED ON DRAWING		DRAWING NUMBER: MGENN101			
		REV: #			



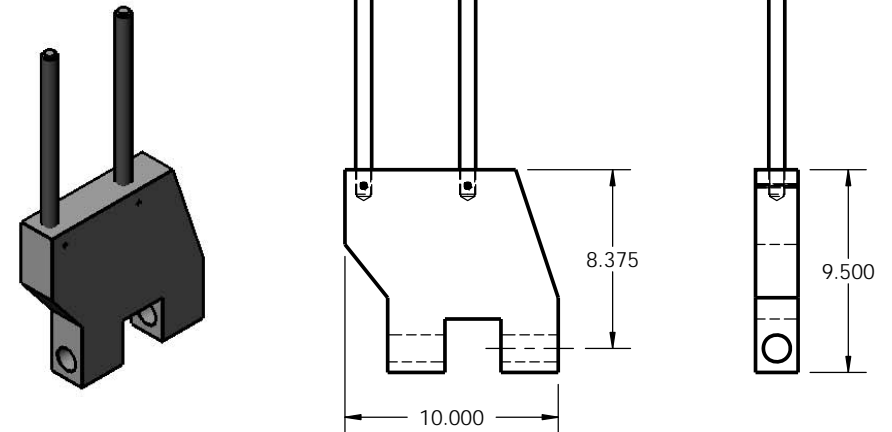
4" SPRING HANGER - P/N #818155



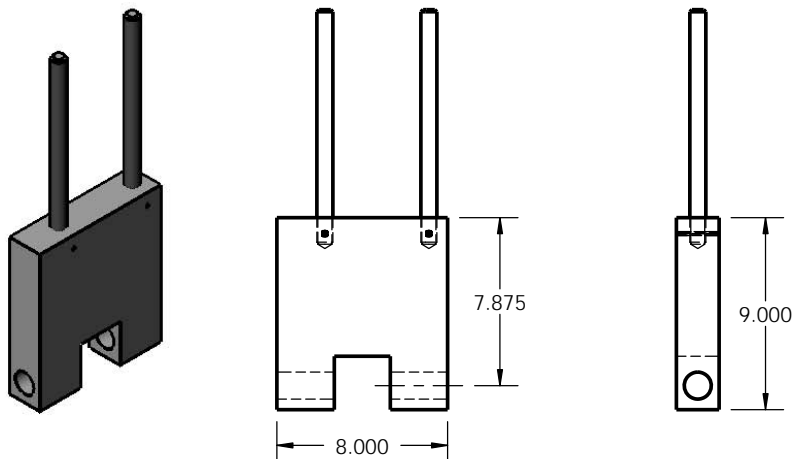
6-5/8" OFFSET SPRING HANGER - P/N #818172



6-5/8" SPRING HANGER - P/N #818170



9-1/2" OFFSET SPRING HANGER - P/N #810136



9" SPRING HANGER - P/N #818142

REV	DATE	DESCRIPTION			BY APP
TOLERANCES: (UNLESS SPECIFIED) FRAC. MACH: ± 1/32" FRAC. OTHER: ± 1/16" .XX ± .063 .XXX ± .030 .XXX ± .005 DRILL SIZES: ± .015 ANGULAR: ± 1° SURF FINISH: 125 MICRO THREADS: 2A AND 2B		TITLE: VARIOUS SPRING HANGER BRACKETS DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512			
DRAWN BY: JBG		APPD BY:		DATE: 4/01/10	
				DRAWING NUMBER: MGENN100	REV: #

DMF LIMITED WARRANTY POLICY

Diversified Metal Fabricators (DMF) products are designed to provide the utmost service and reliability. Competent workmen, guided by stringent quality standards, manufacture the products from high-grade material. **DMF** warrants products of its manufacture to be free of defects in material and workmanship, under normal use and service, for a period of **ONE CALENDAR YEAR**. **DMF's** obligation under this warranty is limited to repairing or replacing at its factory, or other location designated by us, any part or parts there-of which shall, within 30 DAYS of the date of failure or notice of defect, be returned, and which upon examination shall appear to **DMF's** satisfaction to have been defective. Such repair or replacement does not include the cost of installing the new part or any other expenses incident thereto; however, the outbound direct ground freight on the part will be prepaid to locations within the continental United States and Canada. **DMF** shall not be liable for other loss, damage, or expense directly or indirectly arising from the use of its products.

Ordinary wear and tear, abuse, misuse, neglect, or alteration is not covered by this warranty. **DMF** assumes no liability for expenses or repairs made outside its factory except by written consent. Warranty is null and void if instructions and operating procedures specifically referring to warranty coverage are not followed.

Equipment or parts not manufactured by this company, but which are furnished in connection with **DMF** products are covered directly and solely by the warranty of the manufacturer supplying them.

This warranty is in lieu of other warranties, expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose and any liability for special or consequential damages.

All warranty claims must reference a serial number. Returns must reference a RA number.

