

DIVERSIFIED METAL FABRICATORS, INC.



Parts & Service Manual RW-1016



October 2020

SERIAL NUMBER (FRONT) _____

SERIAL NUMBER (REAR) _____

NOTE:

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

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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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TABLE OF CONTENTS

SECTION 1.0	GENERAL INFORMATION	
	1.1 General Description, Weights & Capacities	1-2
	1.2 Currently Supported Chassis	1-4
	1.3 Railgear Components and Terminology	1-5
SECTION 2.0	OPERATIONS	
	2.1 Before You Operate the Railgear	2-2
	2.2 Highway Operation.....	2-4
	2.3 Getting On the Rail.....	2-4
	2.4 Getting Off the Rail	2-5
	2.5 Emergency Hand Pump.....	2-6
SECTION 3.0	ROUTINE MAINTENANCE	
	3.1 Inspection and Maintenance	3-2
	3.2 Fluids and Lubrication.....	3-3
	3.3 Rail Wheel Wear Gauge.....	3-5
	3.4 Troubleshooting.....	3-7
	3.5 Derailment.....	3-8
SECTION 4.0	RAILGEAR INSTALLATION	
	4.1 Before You Begin	4-3
	4.2 Wheel Modification Kit Installation	4-7
	4.3 Mounting Kit Installation	4-9
	4.4 Railgear Installation	4-10
	4.5 Alignment	4-12
	4.6 Rail Wheel Loads	4-14
	4.7 Exhaust Modification.....	4-17
	4.8 Rail Test, Weld-out, & Final Adjustment	4-20
	4.9 Install Provided Accessories	4-22
	4.10 Installation Review	4-27
SECTION 5.0	HYDRAULIC & ELECTRICAL SYSTEMS	
	5.1 Hydraulic System.....	5-2
	5.2 Electrical System	5-8
	5.3 Hydraulic & Electrical Schematics	5-9
	5.4 Hydraulic & Electrical Component Drawings	5-11
SECTION 6.0	RAILGEAR PARTS	
	6.1 Before Ordering Parts	6-2
	6.2 Railgear Mounting Kits.....	6-3
	6.3 Railgear Core Assemblies	6-17
	6.4 Suspension Assemblies, Bearings, & Wheels	6-20
	6.5 Optional Components	6-27
	6.6 Chassis/Wheel Modification Kits	6-31

SECTION 1.0 GENERAL INFORMATION

- 1.1 GENERAL DESCRIPTION, WEIGHTS & CAPACITIES..... 1-2
 - 1.1.1 Features and Description 1-2
 - 1.1.2 Weights and Capacities..... 1-3
- 1.2 CURRENTLY SUPPORTED CHASSIS 1-4
 - 1.2.1 GM 1-4
 - 1.2.2 Ford..... 1-4
 - 1.2.3 Ram..... 1-4
- 1.3 RAILGEAR COMPONENTS AND TERMINOLOGY..... 1-5
 - 1.3.1 Key Railgear Components 1-5

1.1 GENERAL DESCRIPTION, WEIGHTS & CAPACITIES

1.1.1 Features and Description

DMF's RW-1016 Railgear is designed for Class 2 & 3 single rear wheel heavy duty pickup trucks.

The front and rear Railgear assemblies are visually similar and share many common components. Railgear assemblies attach to the truck frame with bracketry specific to the vehicle make and model. All structural members and brackets are constructed of carbon steel. Select components are hot dip galvanized or zinc plated for additional corrosion resistance.

Each Railgear assembly is actuated by a single hydraulic cylinder. In the rail position, the Railgear is "over-center", which prevents a hydraulic failure from allowing the gear to collapse. In the highway position, hydraulic locking valves prevent the Railgear from falling due to a system leak. An emergency hand pump allows the gear to be lifted into the highway position in the event of hydraulic system failure while on rail.

RW-1016 Railgear features an independent suspension system at each railwheel. Rubber springs provide a smooth and quiet ride over uneven rail surfaces. The load on each railwheel can be adjusted individually. The 10" guide wheels are machined from cast steel, and mounted to automotive-style unitized hub bearings that maximize service life and minimize maintenance.

Unlike most of our larger models, RW-1016 does not lift the steer axle off the rail. All vehicle tires remain in contact with the rail. RW-1016 does not provide braking or drive power, and relies on the vehicle tires for those functions.

Most vehicles require installation of alternate wheels and tires to properly align the vehicle's track width to the rails. DMF offers Wheel Modification Kits for many popular chassis models for use on standard gage rail. These kits include the necessary rims, wheel adapters, TPMS sensors, steering stops, and steering wheel locks.

RW-1016 was engineered to meet a wide range of customer requirements in its standard configuration. DMF also offers many options for RW-1016 to meet your specialized needs. Contact DMF for additional information on standard and optional features.

RW-1016 Standard Features

- 56.5" rail gauge
- Steel tread railwheels
- Wireless Railgear controls
- 4-corner rail wheel insulation
- Hydraulic locking valves, highway & rail position (front & rear)
- Low-profile 12VDC hydraulic power unit and emergency hand pump
- Front and rear rail sweeps and de-rail skids

RW-1016 Optional Features

- Truck wheel and tire modification kits
- In-cab switchable rail shunting
- Heavy duty cable pinoff system (front & rear)
- Rubber tread railwheels
- Additional wireless handheld transmitter for backup/emergency use
- Hardwired Railgear controls @ bumpers and/or in cab
- Railgear position sensing for GPS/Telematics integration
- Custom rail gauges & wheel profiles

1.1.2 Weights and Capacities

Typical Chassis Application: Class 2-3 heavy duty pickup trucks with single rear wheels.

Capacity: 500-1,000 lb. per rail wheel @ 40 MPH.

Typical Railgear Weights:

Exact weights vary based on many factors, including options and chassis make/model. Table 1.1 below summarizes weights typical of installations using RW-1016 Railgear.

Item	Typical Weight (lbs.)
Front Railgear (Steel Railwheels)	285
Front Mounting Kit	20
Rear Railgear (Steel Railwheels)	290
Rear Mounting Kit	60
19.5" Steel Wheels, Adapters, and Typical Tires (4X/Each)	680
Hydraulic Pump and Hand Pump	40
Wiring, Hoses, Misc. Accessories	35
Removal of stock 17" steel wheels/tires, including spare	(415)
Removal of spare tire hoist and heat shielding	(10)
<i>Typical Net Weight of Railgear Installation</i>	<i>985</i>

1.2 CURRENTLY SUPPORTED CHASSIS

Chassis selection for Railgear applications is critical to ensure the finished upfit complies with manufacturer and federal guidelines. Many combinations of trim levels, engines, drivetrains, and cab/box sizes present installation challenges or entirely prevent the use of Railgear.

General Upfitting Notes:

- The Railgear installer is the party responsible for certifying that the completed vehicle complies with all federal safety regulations, gross axle weight ratings (GAWR), and gross vehicle weight rating (GVWR).
- Truck option content and upfitter installed equipment may cause some configurations approved below to be overweight.
- The completed vehicle must not exceed any GAWR or GVWR with 150 lbs. in every seat per 49 CFR 567.4.

Unless indicated otherwise, all models below include:

- Only single rear wheel variants. Dual rear wheel models are *not* typically supported.
- Only pickup or box delete variants. Chassis cab models are *not* typically supported.

The list below includes basic guidelines regarding chassis suitability, but is not exhaustive. See DMF Technical Reference Bulletin TRB009 for additional details.

Please contact DMF for assistance or questions with chassis and option selection for your project.

1.2.1 GM

- 2011 – 2019 2500 & 3500
 - Snow Plow Prep (VYU; 4x4 only) or Railgear Prep (8W9, gas only) required
 - No CNG engine
- 2020 – Present 2500 & 3500
 - Snow Plow Prep (VYU; 4x4 only) required
 - No CNG engine

1.2.2 Ford

- 2017 – Present F-250 & F-350
 - Snow Plow Prep Required (option 473; 4x4 only)
- 2008 – 2016 F-250 & F-350
 - Snow Plow Prep Required (option 473; 4x4 only)

1.2.3 Ram

- 2014 – Present 2500 and 3500
 - Coil spring rear suspension required (no air)
 - No CNG engine
 - No diesel engine

1.3 RAILGEAR COMPONENTS AND TERMINOLOGY

1.3.1 Key Railgear Components

Figure 1.3.1 identifies key components of RW-1016 Railgear assemblies. Appearances of some components may vary depending on chassis make/model/year, as well as selected Railgear options. These item descriptions will be used throughout this manual.

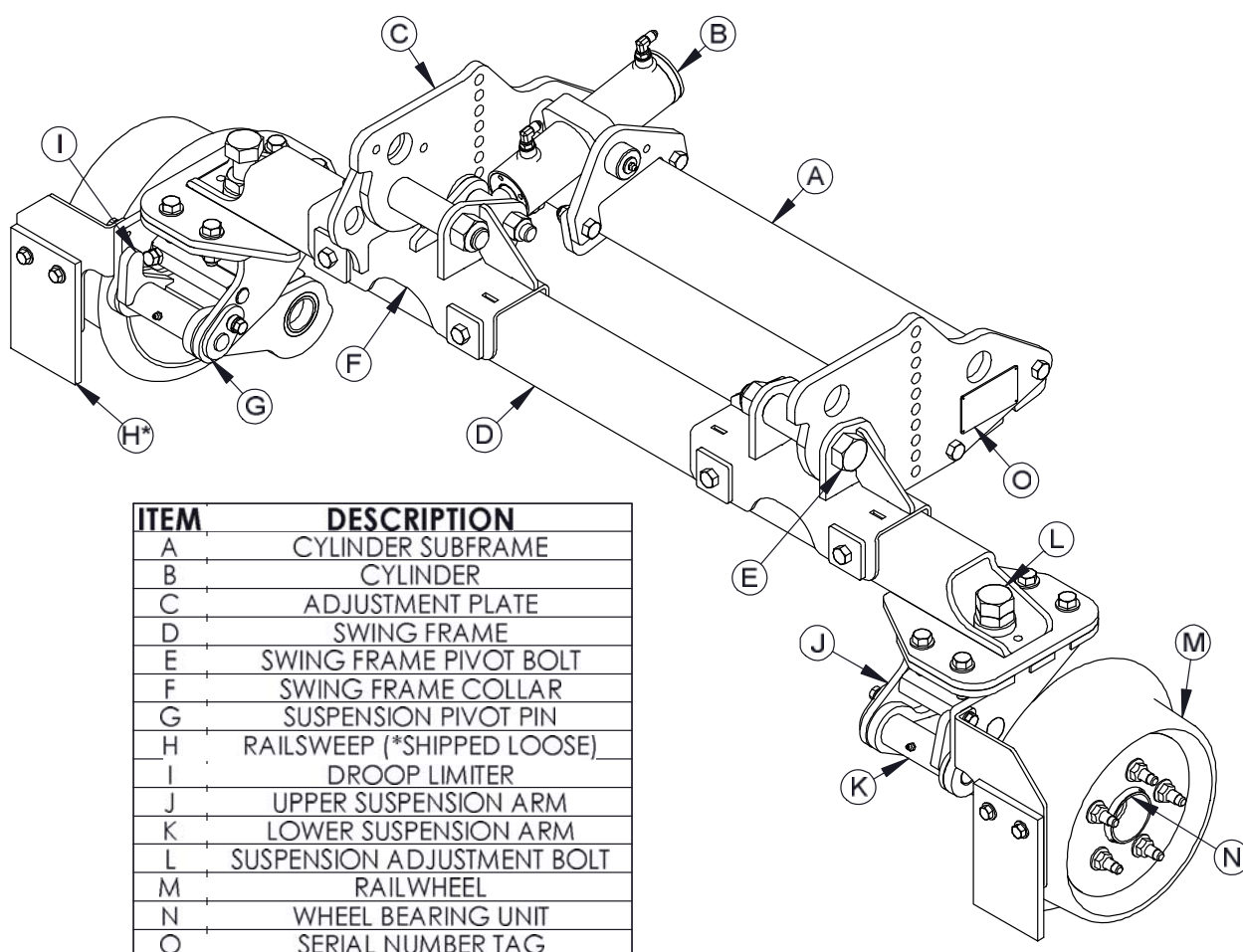


Figure 1.3.1 RW-1016 Key Railgear Components
(Front Shown – Rear Similar)

**FOR DETAILED INSTALLATION INSTRUCTIONS, SEE
SECTION 4.0**

FOR DETAILED PARTS DIAGRAMS, SEE SECTION 6.0

SECTION 2.0 OPERATIONS

2.1	BEFORE YOU OPERATE THE RAILGEAR	2-2
2.1.1	Vehicle Turning Radius, Clearances, and Approach Angles.....	2-2
2.1.2	Highway Speeds	2-2
2.1.3	Pinoff Systems and Locations	2-2
2.1.4	Railgear Controls	2-3
2.1.5	Daily Inspection.....	2-3
2.2	HIGHWAY OPERATION	2-4
2.3	GETTING ON THE RAIL	2-4
2.3.1	Getting onto the Tracks	2-4
2.3.2	Lower Rear Guide Wheels.....	2-4
2.3.3	Lower Front Guide Wheels.....	2-4
2.3.4	On the Tracks.....	2-4
2.4	GETTING OFF THE RAIL	2-5
2.4.1	Removing Truck from Track.....	2-5
2.5	EMERGENCY HAND PUMP OPERATION.....	2-6

2.1 BEFORE YOU OPERATE THE RAILGEAR

2.1.1 Vehicle Turning Radius, Clearances, and Approach Angles

Class 2-3 vehicles with Railgear installed typically require inset wheels and tires to properly align with the rails. Steering stops are normally installed to prevent the inset wheels and tires from contacting critical suspension, brake, and frame components. Compared to a stock vehicle, the installation of steering stops usually significantly increases the turning radius. Do not operate a vehicle equipped with steering stops on public roads until you are comfortable with the modified handling characteristics. If you hear any noises while making hard turns, immediately have the vehicle inspected for possible interference issues.

Installation of Railgear typically reduces front and rear ground clearance, as well as approach angles. In many installations, the guide wheels extend slightly beyond the corners of the front bumper. To avoid equipment and property damage, operators should be familiar with the modified clearances and working envelope before driving the vehicle.

2.1.2 Highway Speeds

Vehicles with Wheel Modification Kits should not exceed the wheel or tire ratings. The operator is responsible for maintaining lug nut torque. Lug nut torque must be checked according to Section 3.1.3. Operators should have access to a torque wrench.

2.1.3 Pinoff Systems and Locations

⚠ CAUTION

All RW-1016 Railgear assemblies feature cylinders that are equipped with external locking valves to prevent the Railgear from falling the in the event of a hydraulic system failure. Optional pinoff systems provide an added degree to protection against unintended Railgear movement.

When equipped, pinoff systems should always be used to secure the Railgear in the rail or highway position.

Walk around vehicle and identify the location of any pinoff systems installed on the Railgear. Familiarize yourself with how to engage/disengage the pinoff systems.

2.1.4 Railgear Controls

RW-1016 Railgear is typically controlled using a wireless handheld remote. The remote should be stored in a safe, easily accessible location inside the cab. A master power switch inside the cab must be turned on to supply power to the hydraulic pump and wireless receiver.

It may take several seconds for the handheld remote to “pair” with the base unit when the system is turned on by the master power switch. There is no power switch on the remote; it will power off after several minutes of inactivity to extend battery life. Pushing any button on the remote will “wake” the handheld remote.

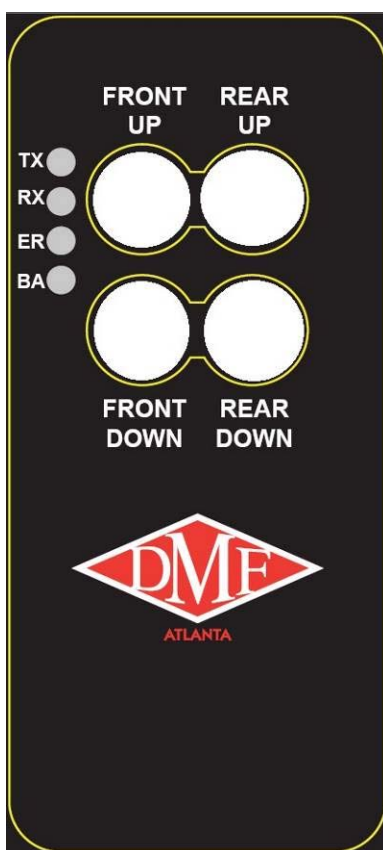


Figure 2.1.1 Wireless Handheld Remote

2.1.5 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.

CAUTION

If any issues are found during inspection, it is the operator's responsibility to take corrective action before using the vehicle.

2.2 HIGHWAY OPERATION

Before operating a Railgear-equipped vehicle on the highway:

1. Verify Railgear is in highway position.
2. Verify that any pinoff systems (front and rear) are properly engaged (if equipped).
3. Steering wheel lock has been removed (if applicable).
4. Verify that any in-cab switches for Railgear system power remain off when operating on-road.

2.3 GETTING ON THE RAIL

2.3.1 Getting onto the Tracks

1. At the track crossing, drive past the track, then back the vehicle onto the rails. Align the rear Railgear to the rail first; this makes it easier to engage the front Railgear.
2. Turn on the Railgear system power switch. Leave the truck running and in park, with the parking brake set.

2.3.2 Lower Rear Guide Wheels

1. Disengage the rear Railgear pinoff system (if equipped). If a pinoff is difficult to disengage, momentarily press the "up" button on the Railgear controls to remove load from the pin.
2. Use the wireless remote to lower the rear guide wheels. The flanges of the guide wheels should be to the inboard sides of the railheads. It may be necessary to adjust truck position slightly.
3. When both wheels are fully down and properly engaging rail, engage the pinoff (if equipped).

2.3.3 Lower Front Guide Wheels

1. If necessary, drive the truck into position to line up the front guide-wheels with the rail.
2. Ensure that the front Railgear pinoff is disengaged (if equipped).
3. Ensure that the vehicle tires are pointed straight ahead.
4. Use the wireless remote to lower the front guide wheels.
5. Once Railgear is fully engaged on rail, re-engage the front pinoff (if equipped).
6. Turn off the Railgear system power when not in use to prevent unintended movement.
7. Install the Velcro steering wheel lock between the top of the steering wheel and the steering column.
8. Disengage the truck's parking brake when you are ready to proceed.

2.3.4 On the Tracks

WARNING

Traction is reduced and braking distance is increased while on track especially when operating in wet conditions.

Do not exceed posted track speed limit, and at no time exceed 40 MPH while on track. Operator is responsible for determining safe speed.

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).

All four guide wheels on RW-1016 Railgear are typically insulated and **will not** operate crossing gate circuits. Optional switchable shunt systems can be installed to selectively control when the vehicle will be detected on rail.

⚠ CAUTION

Recommendations given here are for welded rail in good condition. Jointed rail or rail in poor condition, require further reductions in speed and additional caution.

- 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.

2.4 GETTING OFF THE RAIL

2.4.1 Removing Truck from Track

1. Safely pull onto the track crossing, paying attention to traffic and other obstacles.
2. Turn on the Railgear system power switch. Leave the truck running and the transmission in park with the parking brake set.
3. Disengage both the front and rear Railgear pinoffs (if equipped).
4. Lift both sets of Railgear (there is no preference for removal order).
5. Re-engage **ALL** pinoffs for safe travel in the highway position.
6. Turn off the railgear system power when not in use to prevent unintended movement.
7. Stow the Velcro steering wheel lock.

⚠ WARNING

Make sure surrounding area is free and clear of any obstacles and vehicles before pulling off of rail and onto road.

2.5 EMERGENCY HAND PUMP OPERATION

THE EMERGENCY HAND PUMP CAN ONLY BE USED TO RAISE THE RAILGEAR. IT IS NOT DESIGNED OR INTENDED TO DEPLOY THE RAILGEAR.

The emergency pump is provided to allow a malfunctioning vehicle to be removed from the rail in the event of an electrical fault or pump failure. The emergency pump rocker switch, typically installed near the hand pump, is held up to enable hydraulic flow to the rear Railgear & down for the front Railgear.

To stow the Railgear using the emergency hand pump:

1. Locate hand pump handle in the cab or another safe storage area.
2. Ensure that Railgear is clear from obstructions.
3. Disengage both front and rear Railgear pinoffs (if equipped).
4. Turn the vehicle key to the ignition position.
5. Insert hand pump handle.
6. Hold Emergency Pump Switch UP to select the REAR railgear.
7. Pump rear Railgear to stowed position and engage pinoff (if equipped).
8. Hold Emergency Hand Pump Switch DOWN to select the FRONT railgear.
9. Pump front Railgear to stowed position and engage pinoff (if equipped).

⚠ WARNING

Be aware of pinch points when manually raising Railgear. Do not drive vehicle at normal highway speeds if Railgear is not adequately restrained. If Railgear is changed up and not fully in highway position, be aware of the reduced ground clearance.

FOR HYDRAULIC SYSTEM DIAGRAMS, PLEASE SEE SECTION 5.3.

SECTION 3.0 ROUTINE MAINTENANCE

3.1	INSPECTION AND MAINTENANCE.....	3-2
3.1.1	Daily Maintenance.....	3-2
3.1.2	Weekly Maintenance.....	3-2
3.1.3	Bi-Annual Maintenance or as required	3-2
3.1.4	Annual Maintenance or as required.....	3-3
3.2	FLUIDS AND LUBRICATION	3-3
3.2.1	Grease Fitting Locations.....	3-4
3.3	RAIL WHEEL WEAR GAUGE	3-5
3.4	TROUBLESHOOTING	3-7
3.5	DERAILMENT	3-8

3.1 INSPECTION AND MAINTENANCE

To assure safe and reliable operation, Diversified Metal Fabricators recommends the inspection and maintenance guidelines detailed below. Government or corporate regulations may require additional inspections not covered below. Please ensure that you are aware of any additional recurring inspections that pertain to your Railgear, and have them completed according to required regulations.

Vehicles operated in the following severe-duty conditions may need more frequent inspection and maintenance than suggested below:

- Extreme hot or cold temperatures
- Operation on steep grades
- Extended exposure to road salt
- High mileage use

3.1.1 Daily Maintenance

- Verify Railgear is fully stowed and has not leaked down.
- Visually inspect for hydraulic fluid leaks and bent, broken or damaged components.
- Check hydraulic fluid level.
- Verify there are no loose or missing fasteners, including the lug nuts on rail wheels and vehicle wheels.
- Inspect the general condition of the rail wheels.
- With rail wheels in the highway position, spin each one to check for irregular noise, resistance or roughness in the bearing unit.
- Check and correct tire pressures. Inspect tires for abnormal wear, including inboard sidewalls

3.1.2 Weekly Maintenance

In addition to the daily maintenance outlined above:

- Lubricate front & rear pin-off assemblies (if equipped) with a light lubricant.
- Inspect railwheel flange wear. Uneven or excessive wear may indicate alignment or rail wheel load problem.
- Inspect rubber railwheel treads (if equipped).
- Inspect suspension components including rubber springs for excessive wear or cracking.
- Verify that ABS sensor wires and brake lines are restrained and not contacting the rims.
- Grease all grease fittings on front (7) and rear (7) Railgear assemblies.
 - When possible, apply grease with the Railgear in the highway position to maximize grease uptake.

NOTICE

See diagram M101601 in Section 3.2 for grease fitting locations and recommended lubricants.

3.1.3 Bi-Annual Maintenance or as required

In addition to the weekly maintenance outlined above:

- Check torque on all lug nuts (rail wheels, wheel adapters, and vehicle wheels).
- Check torque on wheel bearing adapter bolts (4X per rail wheel, see Section 6.4).

3.1.4 Annual Maintenance or as required

In addition to the weekly maintenance outlined above:

- Verify the operation of the emergency hand pump. If pump does not operate, check that the pump is properly primed (see Section 5.1).
- Check Railgear alignment (see Section 4.5).
- Check Railgear wheel loads (see Section 4.6).
- Replace handheld wireless remote batteries (QTY 3 AAA)

3.2 FLUIDS AND LUBRICATION

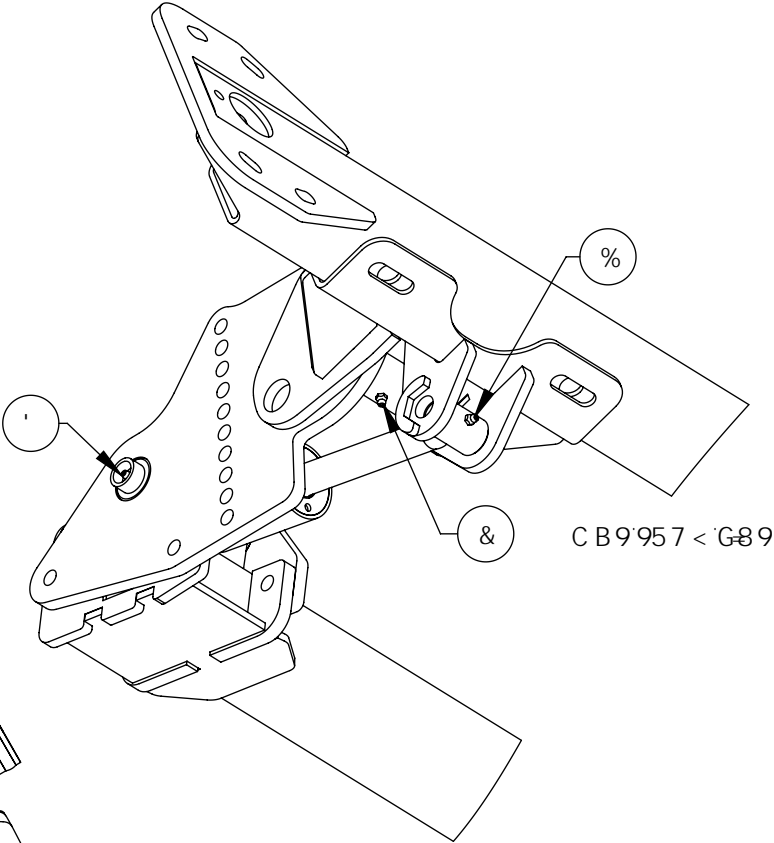
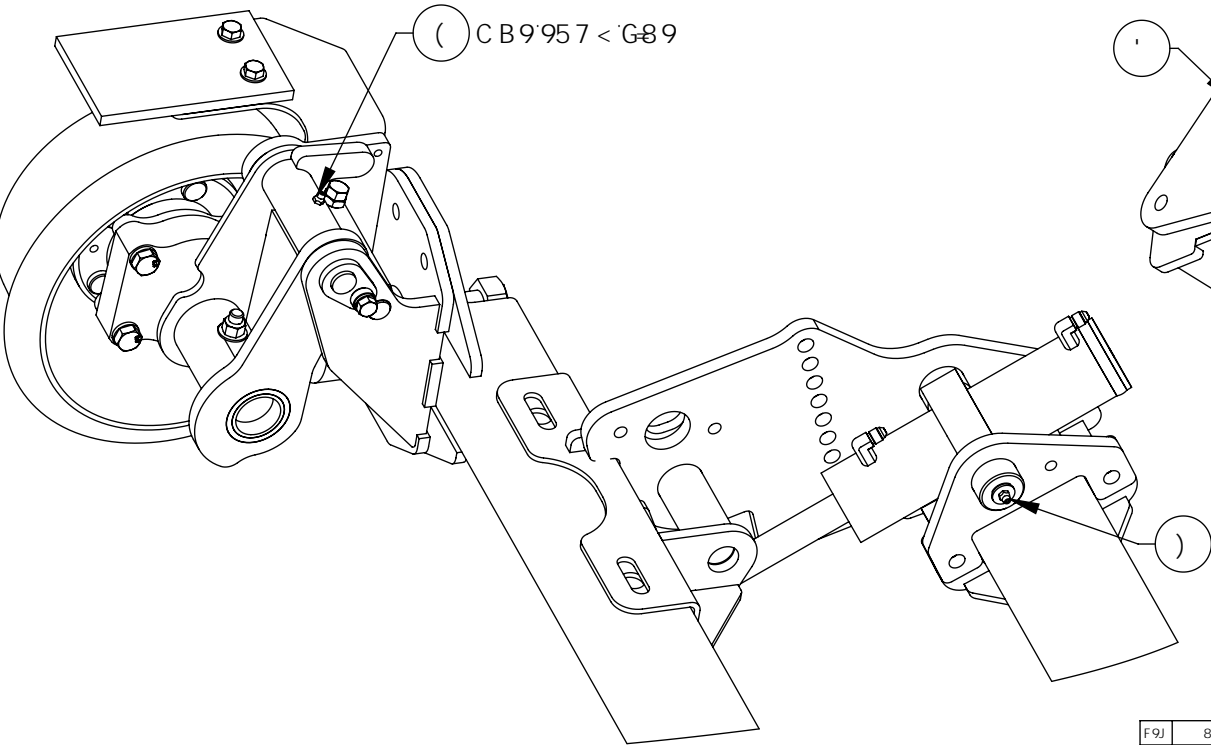
- Hydraulic Oil: Dexron III ATF (DMF supplied electric/hydraulic power units)
- Grease Fittings:
 - **Factory Standard:** Citgo Syndurance Premium Synthetic 460 #2
 - **Warm Climates:** Mystik JT-6 Hi-Temp Multi-Purpose Grease #2
- Wheel bearing hub units: Rail wheel bearing units are completely sealed. No lubrication or adjustment is necessary. They are not user serviceable and must be replaced as a unit. See Section 6 for replacement parts diagrams.

F97CA9B898; F95G9
8A: G5B85F8.

7 H C GMB8I F5B79DF9A ± A GMBHk9H7 &
K 5FA 7 @A 5HG
A MGH? >H* < H9A D'A I @HDI FDC G9' &

BCFHG

: FC BHF5 @ 95F'G<C K B/F95F'GA @5F''D5FHG<889B: CF'7 @5F#M
K <9B'DC GG-@Z; F95G9'B' < ÷ <K 5MDC G#C B'HC 'A 5LA #9'I DH5?9



@75HCB	EHM	89G7F-DHCB
%	%	7MB89F'FC8'9B8
&	&f%G89G<CKBL	GK-B; :F5A9'D#CH
'	%	7MB89F'FI BB€B'!CIH9F
(%	7MB89F'FI BB€B'!BB9F
)	&f%G89G<CKBL	GI GD9BG€B'D#CHD-B

F9J	85H9	89G7F-DHCB			6M	5DD
H-6F5B79G8B89G<D97+98L		FK !%\$%*		H#99 A 5BI 5@; F95G9DC-BHG/FK !%\$%*		
:F572A 57<-98' & :F572C H-9F- 1L -S'' -S' S -S\$) 8F-48GARG 5B: 145F G F: : 4 G- H-F95BG		8F5K B 6M	5DD8 6M	85H9	H-6F5K-B: 7CBH58G7CB: 89BH5@DFC9F5FMB: CFA5HCB C: 8J9FG-98 A 946@56F-75HCFQ-B7TBA: E'7CDMM<HBA: 250MF<HGF90FJ98"	
8F957G-5FD98: 903: L(1)5A55		H5A	!	\$&#%/(#%+ DMF	8F5K-B: BIA 69F	F9J
8A: T(\$ (L +) !%\$ %&				A %\$%* \$%		

3.3 RAIL WHEEL WEAR GAUGE

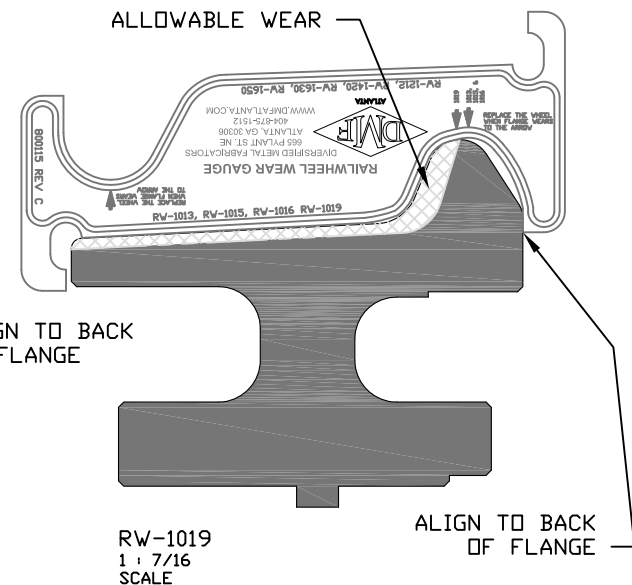
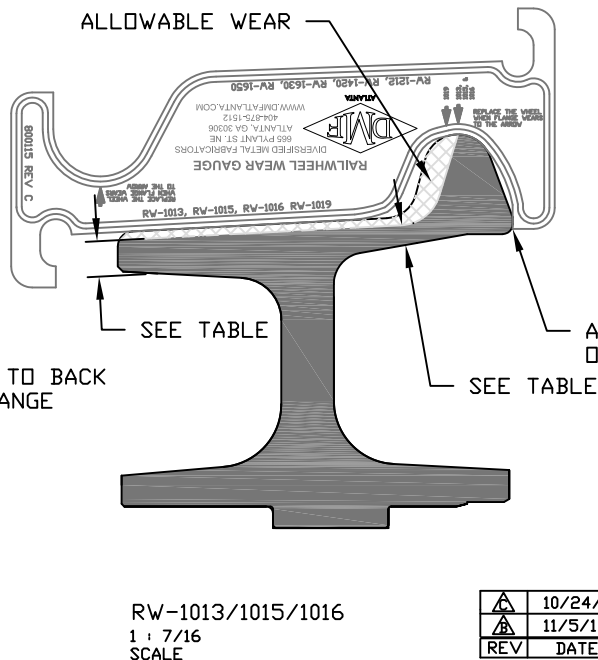
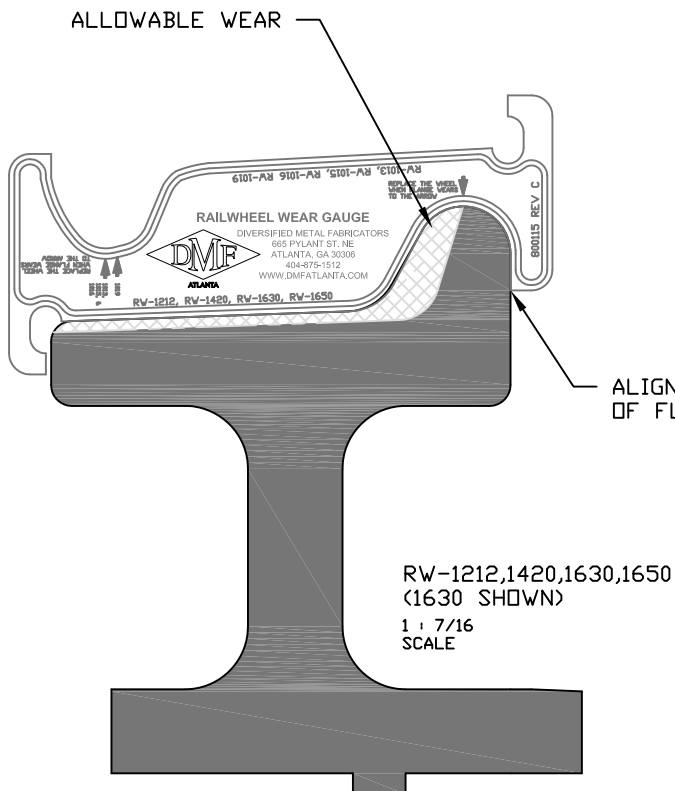
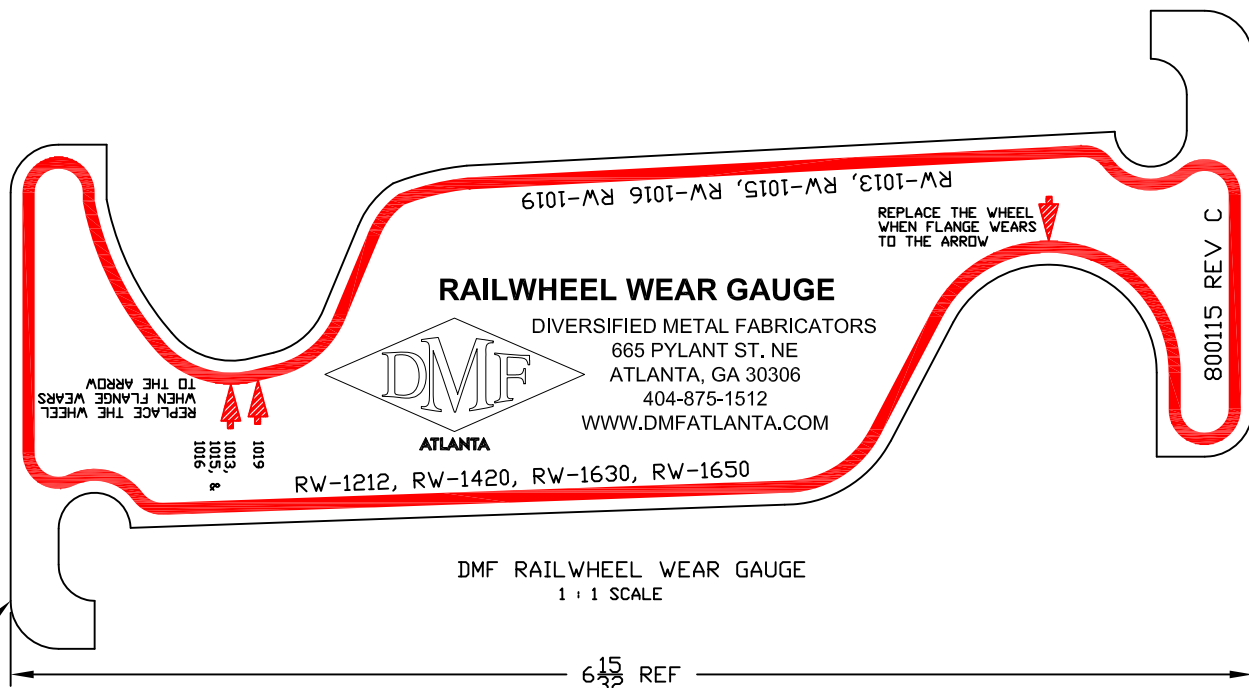
A metal wheel wear gauge (DMF part number 800115) is available to aid in inspecting worn wheels. The drawing on the next page illustrates how to use the gauge and also lists specifications for minimum wall thickness on the wheel tread as well as tolerance on wheel back-to-back spacing.

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: .015				
ANGULAR: 1°				
SURF FINISH: 125 MICRO				
THREADS: RA AND 2B				
SMALL SHOTS: 1/8" & 1/4" MAX				
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

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 and Lug Nuts	Check Lug Torque, Replace Wheel Bearing Unit if Necessary
Vehicle Tracking to One Side, Wandering	Misalignment	Check Alignment (see Section 4.5)	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 high	See Section 4.6	Set Rail Wheel Load
	Tires Worn	Inspect Tires	Replace Tires

3.5 DERAILMENT

The following are instructions for derailment inspection recommended by Diversified Metal Fabricators. In some circumstances, government or corporate regulations may require additional inspections to 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.

In the case of a minor derailment, the cause of the derailment 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 Section 4.0, 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 frame brackets, suspension assemblies, swing frames to ensure they 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 4.5.
- Inspect studs on wheel bearing units for damaged threads or missing lugs. Replace as necessary.

Any items noted should be repaired using Section 4.0, to ensure they are repaired to initial install standards.

Please contact DMF for any assistance you may require.

SECTION 4.0 RAILGEAR INSTALLATION

4.1	BEFORE YOU BEGIN.....	4-3
4.1.1	Working Safely	4-3
4.1.2	Work Area	4-3
4.1.3	Truck Condition	4-3
4.1.4	Recommended Installation Order	4-3
4.1.5	Required Tools & Materials	4-4
4.1.6	Test Rail	4-4
4.1.7	Welding Information.....	4-5
4.1.8	Bolt Torque Specifications	4-5
4.2	WHEEL MODIFICATION KIT INSTALLATION	4-7
4.2.1	General Information	4-7
4.2.2	Wheel Adapters and 19.5" Rims	4-7
4.2.3	Steering Stops	4-7
4.2.4	Tire Pressure Monitoring Systems (TPMS)	4-8
4.2.5	Speedometer Recalibration.....	4-8
4.3	MOUNTING KIT INSTALLATION.....	4-9
4.3.1	General Information	4-9
4.3.2	Model-Specific Mounting Kit Installation	4-9
4.4	RAILGEAR INSTALLATION.....	4-10
4.4.1	Railgear Assemblies – Identification and Orientation	4-10
4.4.2	Railgear Assembly Installation	4-10
4.5	ALIGNMENT.....	4-12
4.5.1	General Information	4-12
4.5.2	When to Check Alignment	4-12
4.5.3	Checking and Adjusting Alignment	4-12
4.6	RAIL WHEEL LOADS	4-14
4.6.1	General Information	4-14
4.6.2	When to check Rail Wheel Load.....	4-14
4.6.3	Target Rail Wheel Loads.....	4-14
4.6.4	Checking & Adjusting Rail Wheel Loads	4-15
4.7	EXHAUST MODIFICATION.....	4-17
4.7.1	General Information	4-17
4.7.2	2017+ Ford F-2/350 w/ 6.7L Diesel Engine.....	4-17
4.8	RAIL TEST, WELD-OUT, & FINAL ADJUSTMENTS.....	4-20
4.8.1	Rail Test	4-20
4.8.2	Weld-Out & Final Adjustments	4-20
4.9	INSTALL PROVIDED ACCESSORIES.....	4-22
4.9.1	Velcro Steering Wheel Lock	4-22
4.9.2	Install Operation and Safety Decals	4-23
4.10	INSTALLATION REVIEW	4-27
4.10.1	General Inspection.....	4-27
4.10.2	Railgear Function Test	4-27

4.10.3	Road Test.....	4-27
4.10.4	Before Customer Delivery	4-27

4.1 BEFORE YOU BEGIN

⚠ WARNING

Satisfactory adjustment of the Railgear alignment and weight settings are crucial to ensure safe and reliable operation. Do not attempt to use vehicle on rail until these steps have been completed. See Section 4.5 & 4.6 for detailed instructions.

4.1.1 Working Safely

⚠ WARNING

- Never work under a suspended load. Use appropriate blocking and restraints to secure loads before removing lifting equipment.
- Always use jack stands when jacking up vehicle.

⚠ CAUTION

- Use personal protective equipment and clothing.
- Be aware of flammable fluids and use caution with tools that may create sparks.

4.1.2 Work Area

The Railgear installation area should allow you to work safely, accurately and efficiently:

- 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 well lit.
- Space - There should be enough space to maneuver the Railgear components into position and to safely work around other equipment.

4.1.3 Truck Condition

Before installation, inspect the following areas:

- Alignment – Truck axles should be square with truck frame. DMF recommends that a reputable alignment shop check this, particularly on used or damaged vehicles. 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.

4.1.4 Recommended Installation Order

DMF recommends following the installation order below, which is how the manual is arranged. Your workspace, tools, personnel or other factors may dictate a different order. As long as the Alignment and Railwheel load adjustments, Rail Test, Road Test, and Installation Review processes can be satisfactorily completed, installation order is not critical.

1. Wheel Modification Kit (Section 4.2).
2. Front & Rear Railgear Mounting Kits (Section 4.3).
3. Railgear Assemblies (Section 4.4).
4. Hydraulic and Electrical Systems (Section 5).
5. Alignment, Weight Adjustment (Section 4.5-4.6)
6. Exhaust Modification (Section 4.7)
7. Rail Test (Section 4.8).

8. Installation of miscellaneous Railgear accessories (Section 4.9).
9. Installation Review (Section 4.10)

4.1.5 Required Tools & Materials

- Common hand/pneumatic tools in SAE and Metric sizes
- Hand drill and bits suitable for drilling high strength steel frame rails
- Arc or MIG Welder
- Surge Protector (Protects vehicle ECM/ECU from damage during welding)
- Hand Grinder
- Air Saw
- Test Rail – See Section 4.1.6
- ATF Fluid - DEXRON III
- Electrical Terminal Insulation (Spray-on or Brush-on)
- Wire ties, wire loom, and electrical tape

The following equipment and tools are not required, but may ease installation:

- Transmission Jack, Motorcycle Lift, Pallet Jack or Forklift
- Overhead Crane
- Work Lights
- Wheel Dolly

4.1.6 Test Rail

Several important steps in the installation process require access to a section of test rail, or fabrication of simulated rails. The gauge of the test rails (or simulated rails) must match the gauge the Railgear was manufactured for. One set of simulated rails is required for each end of the vehicle. Build simulated rails from heavy wall steel tubing. Recommended dimensions are shown below in Figure 4.1.6.

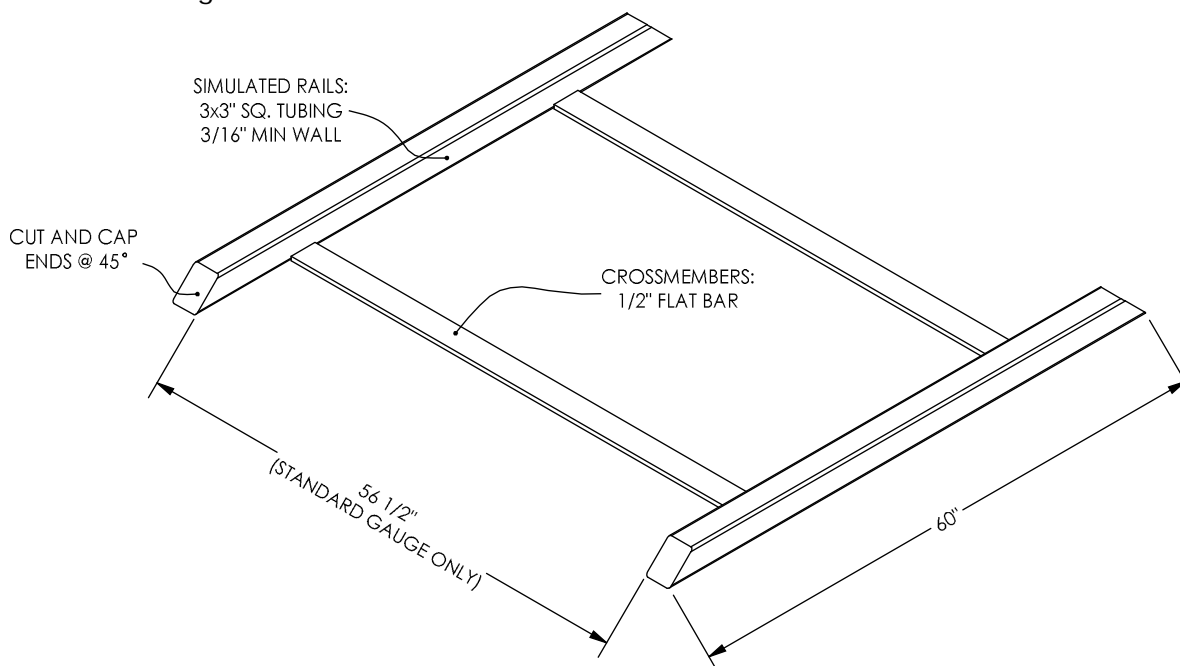


Figure 4.1.6 Simulated Rails

4.1.7 Welding Information

NOTICE

Select components of RW-1016 Railgear assemblies have been hot dip galvanized. DMF recommends grinding off the galvanized coating to raw steel where welding is required.

For vehicles with installed wireless Railgear controls, remove all electrical and antenna connections from the Cervis base unit before welding on vehicle or attached railgear components.

- 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

4.1.8 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

4.2 WHEEL MODIFICATION KIT INSTALLATION

FOR DETAILED PARTS DIAGRAMS OF MODEL-SPECIFIC WHEEL MODIFICATION KITS SEE SECTION 6.7

4.2.1 General Information

Most vehicles require installation of alternate wheels and tires to properly align the vehicle's track width to the rails. DMF offers Wheel Modification Kits for many popular chassis models for use on standard gage rail. Specific components and part numbers vary by application, but most wheel modification kits include appropriate wheel adapters and rims, steering stops, and TPMS sensors.

4.2.2 Wheel Adapters and 19.5" Rims

Wheel adapters and 19.5" rims are used to align the track width of the vehicle with the rails. Wheel adapters typically bolt onto the factory wheel studs and use the factory lugnuts.

19.5" rims are typically paired with 225/70R19.5 or 245/70R19.5 heavy duty truck tires. It is important to have the new wheel and tire combination accurately balanced. Tire installation facilities that specialize in serving commercial truck customers may be better equipped to mount and balance these types of tires.

4.2.3 Steering Stops

Hyrail vehicles usually require the installation of steering stops. These prevent the wheels and tires on vehicles with narrowed track widths from contacting the frame, brake lines, or suspension components during turns. After installation of steering stops, a thorough check should be performed to verify there are no component interference, particularly with the steering wheel in both extreme positions.

WARNING

INSTALL STEERING STOPS BEFORE MOVING THE VEHICLE! If you don't, you can cause serious tire damage and create a hazard for anyone operating the vehicle.

STEERING STOP INSTALLATION MUST BE VERIFIED ON EVERY VEHICLE BEFORE IT IS OPERATED ON THE HIGHWAY! Incorrectly installed Steering Stops can cause serious tire damage and create a hazard for anyone operating the vehicle.

Installation

- Verify that the steering stops limit the wheels or tires from any contact with frame, sway bar, wheelhouse, suspension etc. DMF recommends at least 1/8" clearance from any fixed obstruction to the wheel or tire in any suspension position.
- To check clearance in the normal suspension position, jack the vehicle under the axle, suspension or upright until the tire clears the ground.
- To check clearance in the drooped position, jack the vehicle under the frame, cross-member or body jack point until the tire clears the ground.
- Check the steering clearance on both sides. Many suspensions are not entirely symmetrical.

4.2.4 Tire Pressure Monitoring Systems (TPMS)

The TREAD act has made TPMS mandatory on passenger vehicles under 10K GVWR. Some models over 10k GVWR may also have factory TPMS systems installed. If the factory wheels/tires are replaced as a part of the upfit, the TPMS system must continue to function on the completed vehicle.

Wheel modification kits often use heavy duty tires that require substantially higher inflation pressures than the factory wheel/tire combination. The TPMS system must be recalibrated to work reliably with the higher required pressure ranges. This is normally done through the ECU at a dealership. Please refer to the model specific information in Section 6.7, and provide this information to the dealer when having TPMS recalibration work performed.

4.2.5 Speedometer Recalibration

Common work truck models are factory equipped with 16 or 17-inch rims and tires. The typical 19.5-inch rims and tires used in the wheel modification kits changes the rolling radius of the tires significantly, requiring the speedometer to be recalibrated to accurately reflect speed and mileage.

Dealerships are able to perform this work at a moderate cost. There are tools available to allow an installer to perform the calibration but they are expensive and often model-specific. Speedometer re-calibration is usually done at the same time as the TPMS re-calibration. See Section 6.7 for information specific to your chassis.

FOR DETAILED PARTS DIAGRAMS OF MODEL-SPECIFIC WHEEL MODIFICATION KITS SEE SECTION 6.7

4.3 MOUNTING KIT INSTALLATION

4.3.1 General Information

Your RW-1016 Railgear was shipped with front and rear mounting kits specific to your vehicle and the hardware necessary to install them. Before you begin your installation, please note:

- Your Railgear shipment includes many parts designed for your particular chassis year/make/model and selected options. Exact appearances of some items may vary from what is depicted in this manual.
- Many chassis manufactures prohibit the removal or modification of factory-installed trailer hitches, as they contribute to the crash worthiness of the vehicle. In most applications RW-1016 Railgear can be installed without interfering with the factory hitch. In rare circumstances, particularly very low or heavily loaded vehicles, additional suspension components may be required to obtain sufficient ground and hitch clearance. Please contact DMF for support if required.
- Installation of RW-1016 Railgear typically requires the removal of factory parts from the vehicle before the mounting brackets and Railgear can be installed. In most applications the following parts will need to be removed from the vehicle before beginning the Railgear installation. See model specific notes for additional information.
 - Underbody Spare Tire, including hoist and heat shielding (permanently)
 - Axle-back portion of the exhaust system (temporarily)
 - Front bumper (temporarily)
- Where drilling or cutting of factory frame components is required, deburr edges and apply a corrosion resistant paint.

4.3.2 Model-Specific Mounting Kit Installation

FOR DETAILED PARTS DIAGRAMS OF MODEL-SPECIFIC RAILGEAR MOUNTING KITS, SEE SECTION 6.2

4.4 RAILGEAR INSTALLATION

4.4.1 Railgear Assemblies – Identification and Orientation

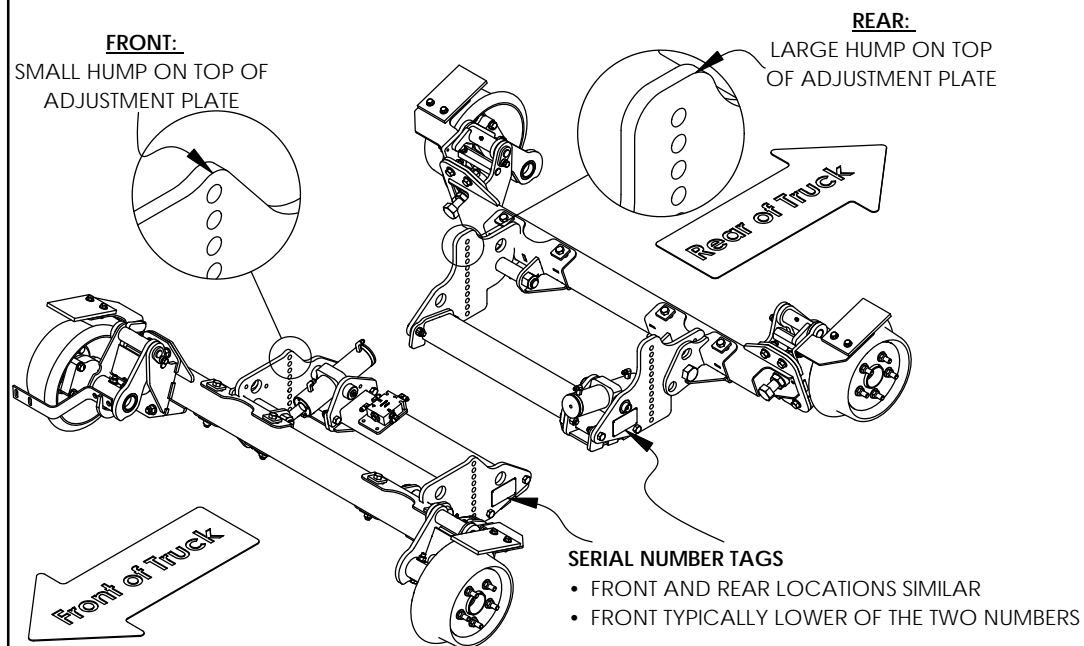
RW-1016 Railgear assemblies share many components between the front and rear assemblies and are visually similar. Make sure the correct Railgear assembly is installed on the proper end of the vehicle and facing the proper direction. See drawing M101602 on the following page for identification and orientation of Railgear assemblies.

4.4.2 Railgear Assembly Installation

The hardware and shims required to install the Railgear were included with your mounting kit. See drawing M101602 on the following page for additional information regarding Railgear installation.

1. Identify the front and rear Railgear assemblies.
2. Maneuver the railgear assemblies into position at the proper end of the vehicle, oriented correctly, roughly between the mounting brackets.
3. Slowly lift the Railgear assembly. Check frequently for interference or contact between the Railgear, truck components, and the mounting brackets.
4. Lift the Railgear until the bottom of the adjustment plates is ~9-1/2" off of level ground. Fine-tune height to align holes in mounting brackets with nearest holes in adjustment plates. (Suggested initial mounting height of ~9-1/2" assumes a vehicle near service weight, without suspension modifications, and with the proper wheels and tires installed for use on rail).
5. Install the bolts/washers/locknuts provided with the mounting kit, but leave loose.
6. Fit included shims between brackets and Railgear adjustment plates. Use similar shim combinations (less than a 1/4" difference) on both sides of the Railgear to roughly center the assembly between the brackets. Do not leave gaps larger than 1/16" between the Railgear and mounting brackets.
7. Verify that all hardware has adequate clearance around cylinder assembly. Shorter bolts may be required in some cases. Verify bottom edge of adjustment plates are parallel with ground, and tighten bolts.
8. After installation of both sets of Railgear, as well as the hydraulic/electrical systems, alignment and weight adjustment must be completed (see M101603, M101604 and Sections 4.5-4.6).

RAILGEAR ASSEMBLIES - IDENTIFICATION AND ORIENTATION

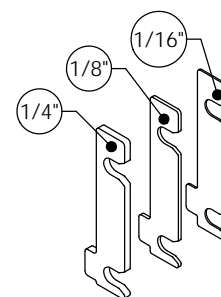


RAILGEAR INSTALLATION

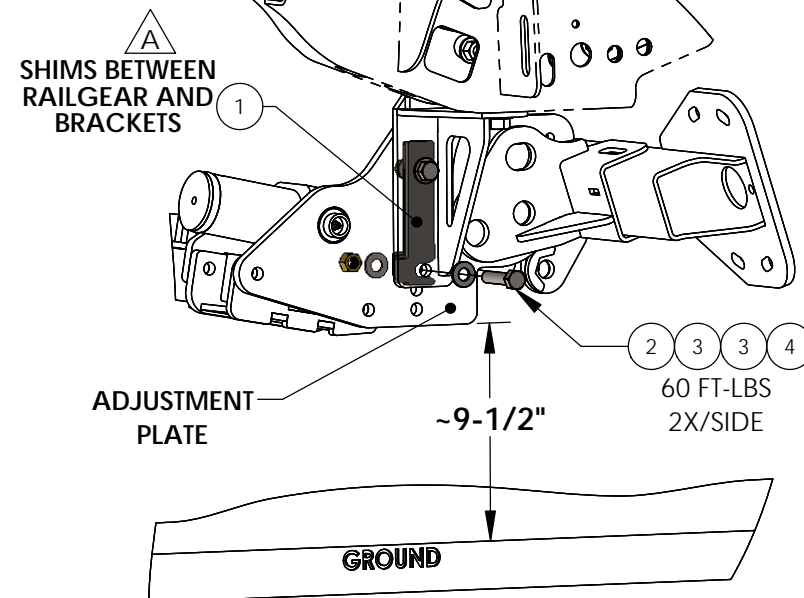
- FRONT SHOWN - REAR SIMILAR
- TRUCK FRAME AND BRACKETS SHOWN VARY BY MODEL
- SOME COMPONENTS HIDDEN FOR CLARITY


1. Identify the front and rear Railgear assemblies.
2. Maneuver the railgear assemblies into position at the proper end of the vehicle, oriented as shown, roughly between the mounting brackets.
3. Slowly lift the Railgear assembly. Check frequently for interference or contact between the Railgear, truck components, and the mounting brackets.
4. Lift the Railgear until the bottom of the adjustment plates is ~9-1/2" off of level ground. Fine-tune height to align holes in mounting brackets with nearest holes in adjustment plates. (Suggested initial mounting height of ~9-1/2" assumes a vehicle near service weight, without suspension modifications, and with the proper wheels and tires installed for use on rail).
5. Install the bolts/washers/locknuts provided with the mounting kit, but leave loose.
6. Fit included shims between brackets and Railgear adjustment plates. All shims included are typically not required. Use similar shim combinations (less than a 1/4" difference) on both sides of the Railgear to roughly center it between the brackets. Do not leave gaps larger than 1/16" between the Railgear and mounting brackets.
7. Verify that all hardware has adequate clearance around cylinder assembly. Shorter bolts may be required in some cases. Verify bottom of adjustment plates are parallel with ground, and tighten bolts.
8. After installation of both sets of Railgear, alignment and weight adjustment must be completed (see M101603, M101604 and manual sections 4.5-4.6).

RAILGEAR INSTALLATION



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703057	1	MOUNTING SHIM SET: RW-1016
	703059	2	MOUNTING SHIM: .25"; RW-1016
	703060	2	MOUNTING SHIM: .125"; RW-1016
	703061	2	MOUNTING SHIM: .0625"; RW-1016
2	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
3	500691	8	FLAT WASHER, 1/2", GR8
4	113014	4	1/2"-13 NYLOCK NUT, GR8



A	08/11/17	REMOVED 703058 FROM SHIMS				DJJ	
REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE: MANUAL; RAILGEAR INSTALLATION; RW-1016					
FRACTIONAL: ± 1/32"							
FRACTIONAL, OTHER: ± 1/16"		RW-1016					
X ± .063							
XX ± .030		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DISCOVERED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
XXX ± .005							
DRILL SIZES: ± .015		DRAWN BY: TAM					
ANGULAR: ± 1°							
SURF FINISH: 125 MICRO		APPD BY: -		DATE: 02/14/17		DRAWING NUMBER: M101602	
THREADS: 2A AND 2B						REV: A	
BREAK SHARP EDGES .03 X .45" MAX							
DMF (404)875-1512							

4.5 ALIGNMENT

4.5.1 General Information

NOTICE

DMF Recommends the alignment procedure be done AFTER the hydraulic and electrical systems have been installed. A fully functional hydraulic system will make it possible to repeatedly lift and lower the Railgear to check and verify adjustments. See Section 5 for Hydraulic and Electrical system instructions.

With the front and rear Railgear assemblies both installed, it is necessary to align them to the vehicle. Accurate railgear alignment is crucial to safe operation and long component life.

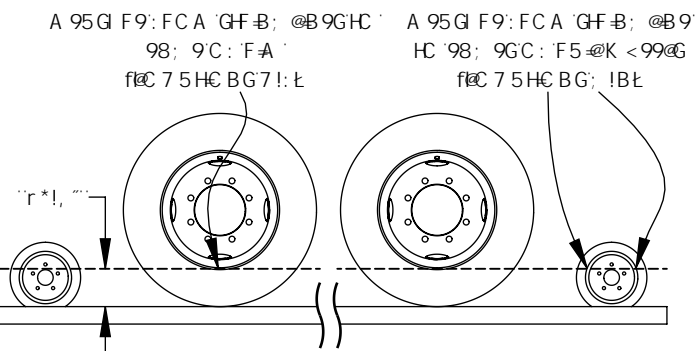
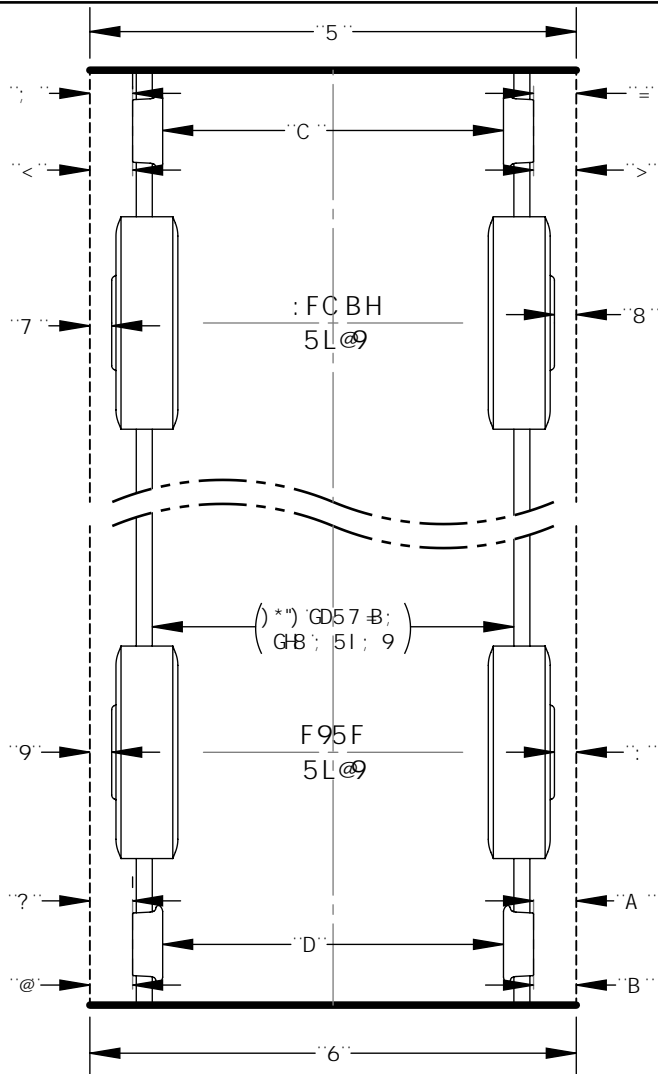
4.5.2 When to Check Alignment

- Initial installation.
- Once per year, or more frequently as conditions dictate.
- If you are experiencing premature tread wear.
- After a derailment.

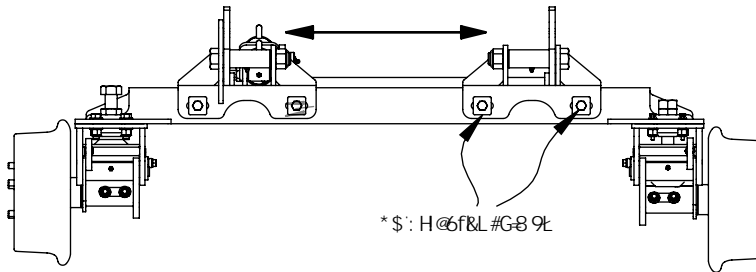
4.5.3 Checking and Adjusting Alignment

DMF recommends a “String Line” method to properly align the railgear to the vehicle axles. See drawing M101603 on the following page for recommended setup details, adjustment points, and tolerances.

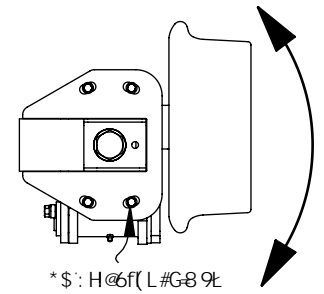
When performing the alignment procedure, record **final** alignment measurements on the loose copy of Drawing M101603, and provide it to the customer with all documentation.



5H5@58> GA 9BH



HC958> GA 9BH



GHD	@75HC B	GD97	A 95G F98	
%LGE I 5F9 GF B; @B9GHC FI 7? 5L@G	516	±%# &		
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	91:			
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a Umi gY XZYfYbhfUW_k j XhgUhhY ZcbhUbx fYUfHf W_U i Yg'
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HC 95B7 9C8 B9GCD97 + 98I : F572A 57 < : F572C H9F: 1: LL LL 8F 40GARG 5B: I 46F GF: : 4 G: H F95BG 8F957 G: 5FD 98: 9C3 L I 5A 55		FK !%\$%*		H89 A 5B1 5@/5@; BA 9BH58> GA 9BHG/FK ! %\$%* H: G8F5K B: 7CBH5 8G7CB: 89BH5@DFC DF 95FMB: CFA 5HC B C: 8J 9G G: 98 A 98@ 56f 7 5HC FQ 87 fBA: L7 CDM s <HBA: 25 00F s <HGF 90G J 98"	
8F5K B 6M		5DD8 6M	85H9	8F5K B: BIA 69F:	F9J:
H5A		!	\$&#%/(#)%+	DMF	A %\$%* '\$

4.6 RAIL WHEEL LOADS

4.6.1 General Information

NOTICE

DMF Recommends the weight adjustment procedure be done AFTER the hydraulic and electrical systems have been installed. A fully functional hydraulic system will make it possible to repeatedly lift and lower the Railgear to check and verify adjustments.

Rail wheel load is the amount of weight carried by each rail wheel while on rail. Too little rail wheel load can lead to derailment. Too much rail wheel load can cause premature wear or failure of the Railgear components. It will also reduce traction and decrease braking performance. Proper adjustment of rail wheel loads will ensure that the completed vehicle operates safely, and offers good ride quality and component life. RW-1016 Railgear features an independent suspension system at all 4 wheels. The rail wheel loads at each corner can be independently adjusted.

- **NEVER OPERATE A VEHICLE ON RAIL WITH RAIL WHEEL LOADS OUTSIDE OF THE LIMITS AS DESCRIBED IN TABLE 4.6.3.**
- **CHECK FOR PROPER TIRE INFLATION BEFORE ADJUSTING RAIL WHEEL LOADS OR OPERATING VEHICLE ON RAIL.**
- **ADDING OR REMOVING EQUIPMENT WILL CHANGE RAIL WHEEL LOADS.**
- **ALWAYS CHECK RAIL WHEEL LOADS BEFORE OPERATING THE VEHICLE ON RAIL.**

4.6.2 When to check Rail Wheel Load

- Initial installation.
- Once per year, or more frequently as conditions dictate.
- If you have changed the empty weight of your truck by adding or subtracting fixed equipment or tools.
- If you suspect low rail wheel load.
- If you are experiencing premature tread wear.
- If the Railgear fails to deploy fully due to overloading.
- If poor traction or braking performance on rail is experienced.

4.6.3 Target Rail Wheel Loads

Rail wheel loads should be set with the vehicle in an operational configuration. If rail wheel loads are set on a bare truck, and later equipment is added, rail wheel loads may exceed allowable limits. Likewise, if rail wheel weights are set for a heavily loaded truck, and equipment is later removed, the rail wheel weights may fall below allowable limits.

Rail wheel loads should be maintained at the target rail wheel loads listed in Table 4.6.3. Minimum and maximum values are given as limits on individual rail wheel loads when the vehicle is carrying a non-fixed payload, and are not ranges within which to set rail wheel loads on an empty vehicle.

WARNING

RAIL WHEEL LOADS MUST REMAIN WITHIN 50lbs LEFT-TO-RIGHT ON AN AXLE. UNEVEN RAIL WHEEL LOADING CAN CAUSE DERAILMENT.

	Min. rail wheel load (each, lbs.)	Target rail wheel load (each, lbs.)	Max. rail wheel load (each, lbs.)
Front Railgear	500	625±25	1,000
Rear Railgear	500	525±25	1,000

Table 4.6.3 Target rail wheel loads

4.6.4 Checking & Adjusting Rail Wheel Loads

Rail wheel loads can be determined by use of a bottle jack with an attached pressure gauge. DMF recommends the use of a DMF 501749 Jack and Pump Assembly (Fig. 4.6.4). Using this model will allow the gauge to display force directly (PSI gauge = pounds force). If another jack is used you will need to determine the conversion factor to relate gauge pressure to force.

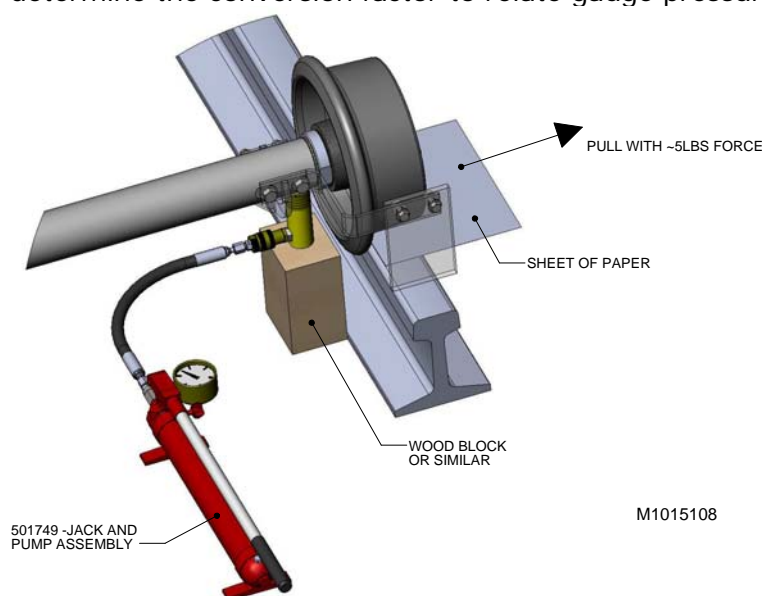
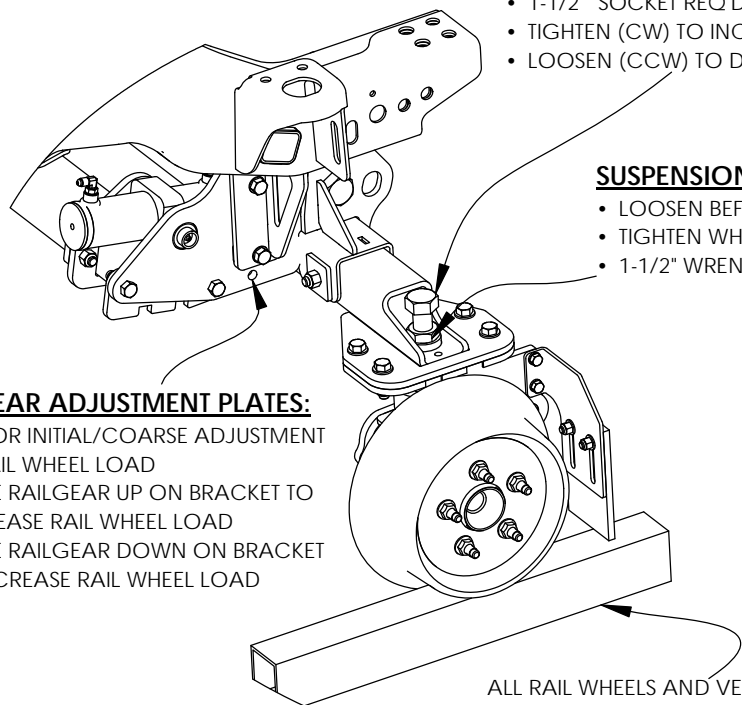


Figure 4.6.4. Checking rail wheel load

Procedure:

1. Confirm that the truck is at its operational weight, the chassis and rail wheels are in alignment, and that all 4 tires are properly inflated (85 psi when using DMF wheel modification kits).
2. Place truck on rail or simulated rails (see Section 4.1.6). Apply parking brake and shut off engine. If using simulated rail, verify that the rail wheel flange is not touching the ground. Ensure that none of the rail wheel flanges are riding right up against the rail, as this may affect weight settings.
3. Place the jack under the Railgear axle tube as close as possible to the rail wheel.
4. Support jack as necessary with wooden blocks so that the distance from the jack to the axle tube is less than ½" with the jack in the retracted position.
5. Jack up slightly and place a piece of paper between the rail wheel and track.
6. Lower the rail wheel back onto the track.
7. Jack the rail wheel up very slowly while pulling on the paper.
8. When the paper begins to slip out from under the wheel note the gauge pressure.
9. If using the DMF 501749 jack, the reading on the gauge in PSI is equivalent to the rail wheel load on the adjacent wheel.
10. Repeat this procedure for the remaining rail wheels and note the measured loads.
11. After any adjustments are made repeat this procedure for each wheel.

**WHEN CHECKING AND/OR ADJUSTING RAIL WHEEL LOADS,
BOTH FRONT AND REAR RAILGEAR MUST BE IN THE RAIL POSITION.**



SUSPENSION ADJUSTMENT BOLT:

- USE FOR FINE ADJUSTMENT OF RAIL WHEEL LOAD
- 1-1/2" SOCKET REQ'D
- TIGHTEN (CW) TO INCREASE RAIL WHEEL LOAD
- LOOSEN (CCW) TO DECREASE RAIL WHEEL LOAD

SUSPENSION LOCKNUT:

- LOOSEN BEFORE ADJUSTING BOLT
- TIGHTEN WHEN ADJUSTMENT COMPLETE
- 1-1/2" WRENCH REQ'D

RAILGEAR ADJUSTMENT PLATES:

- USE FOR INITIAL/COARSE ADJUSTMENT OF RAIL WHEEL LOAD
- MOVE RAILGEAR UP ON BRACKET TO DECREASE RAIL WHEEL LOAD
- MOVE RAILGEAR DOWN ON BRACKET TO INCREASE RAIL WHEEL LOAD

ALL RAIL WHEELS AND VEHICLE TIRES ON RAIL OR SIMULATED RAIL

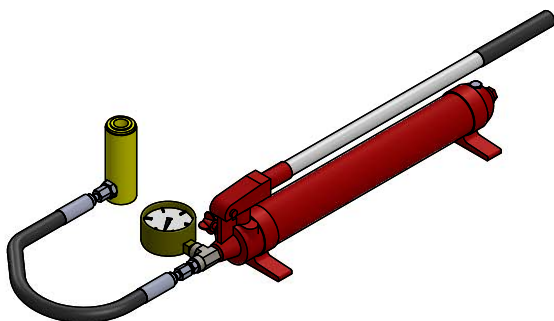
RAIL WHEEL LOAD ADJUSTMENT NOTES:

- SEE MANUAL SECTION 4.6 FOR ADDITIONAL DETAILS ON RAIL WHEEL LOAD ADJUSTMENT.
- RAIL WHEEL LOADS SHOULD BE ADJUSTED WITH THE VEHICLE NEAR SERVICE WEIGHT AND FULL OF FUEL.
- BALLAST VEHICLE AS NECESSARY TO SIMULATE ANTICIPATED PAYLOADS AND PASSENGERS.
- VEHICLE TIRES SHOULD BE PROPERLY INFLATED BEFORE ADJUSTING RAIL WHEEL LOADS.
- ADJUST RAIL WHEEL LOADS ON LEVEL GROUND, WITH ALL VEHICLE TIRES AND RAIL WHEELS CONTACTING RAILS (OR SIMULATED RAILS AT PROPER GAUGE).
- ADJUSTING LOADS AT ONE CORNER/END OF VEHICLE WILL AFFECT LOADS AT OTHER LOCATIONS.
- MAKE SMALL ADJUSTMENTS AND RE-CHECK LOADS OFTEN.
- INSTALLERS SHOULD ATTEMPT TO AVOID "MAXING OUT" THE SUSPENSION ADJUSTMENT BOLTS IN EITHER DIRECTION, SO THAT FIELD ADJUSTMENT AT A LATER DATE IS MADE EASIER. THIS MAY REQUIRE MOVING THE RAILGEAR UP OR DOWN SLIGHTLY ON THE ADJUSTMENT PLATES.
- SUSPENSION LOCKNUTS MUST BE TIGHTENED WHEN ADJUSTMENT IS COMPLETE.

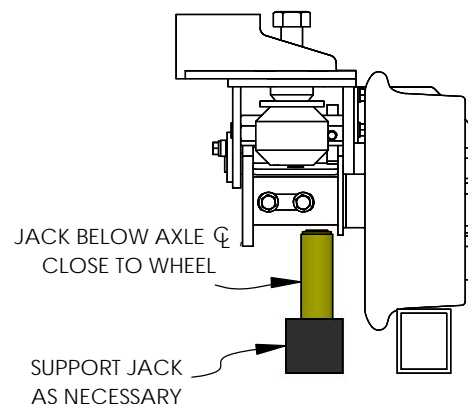
RAILWHEEL LOADS MUST REMAIN WITHIN 50 lbs. LEFT-TO-RIGHT ON AN AXLE.
UNEVEN RAILWHEEL LOADING CAN CAUSE DERAILMENT

Railwheel Loads (per wheel, lbs.) ⚠					
	Min	Target	Max	Installed	
				DS	PS
Front	500	625 ± 25	1,000		
Rear	500	525 ± 25	1,000		

DMF #501749 RAIL WHEEL LOAD JACK & PUMP (NOT INCLUDED W/RAILGEAR)



JACK POSITION



A	08/10/17	ADDED DS/PS COLUMNS TO RAILWHEEL LOAD TABLE			TAM	
REV	DATE	DESCRIPTION			BY	APP
		RW-1016		TITLE: MANUAL; RAILWHEEL LOAD ADJUSTMENTS; RW-1016		
				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
		DRAWN BY:	APPD BY:	DATE:	DRAWING NUMBER:	REV:
		TAM	-	02/4/17	M101604	A

4.7 EXHAUST MODIFICATION

4.7.1 General Information

- Installation of RW-1016 Railgear often requires modification of the rear section of the exhaust system.
- Guidelines for several popular chassis and engine configurations are included below.
- General recommendations include:
 - Modifying the exhaust system in accordance with body builder guidelines published by chassis manufacturer, particularly on diesel model.
 - Maintaining **4" minimum clearance** between any portion of the exhaust system and the rear vehicle tires.
 - Maintaining **3/4" minimum clearance** between any portion of the exhaust system and the rear Railgear when in both the deployed and stowed positions.
 - Modifying and relocating hangers and brackets such that they do not restrict growth along the length of the exhaust system due to thermal expansion.
 - Modifying or relocating mud flaps and brackets to provide adequate clearance to hot exhaust components.
 - Any factory heat shields protecting vital components should be retained (modify as necessary).
 - Use smooth transitions in pipe sections to avoid increasing exhaust backpressure.

4.7.2 2017+ Ford F-2/350 w/ 6.7L Diesel Engine

This section outlines best practices for exhaust modification on 2017 model year and newer F-250 and F-350 trucks with a 6.7L diesel engine for use with RW-1016 rear Railgear. Please see [Ford SVE Bulletin Q-253](https://fordbbas.com/vehicleModel/SuperDuty) (<https://fordbbas.com/vehicleModel/SuperDuty>) for additional information regarding Ford's recommendations regarding exhaust modifications on these models.

After installation of railgear, DMF recommends following the basic exhaust modification steps below. Depending on body configuration, it may be necessary to raise the back end of the truck to gain sufficient clearance to remove and install exhaust.

1. Remove over-axle portion of exhaust system from the truck.
2. Cut the exhaust pipe just below the resonator so that the back section of the exhaust can be freely rotated. See Figure 4.7.2.A.
3. Cut the rear most exhaust hanger rod from the exhaust system, leaving enough of the leg on the removed portion to be rewelded. Remove the heat shield as indicated in Figure 4.7.2.B.
4. Bolt over-axle portion of exhaust back in place.
5. Rotate exhaust at cut to achieve clearances with Railgear and rear tire noted above. It is recommended to temporarily place a 4" spacer between the exhaust and tire to ensure sufficient clearance. Tack weld cut portion of exhaust in new orientation.
6. Remove rear most exhaust frame bracket from the truck frame noting its orientation. All hardware will be reused. Reference Figure 4.7.2.C.
7. Measure the outboard exhaust frame bracket hole locations relative to the top of the frame. Translate these locations 1-3/4" forward for new hole positions. Drill 1/2" holes at all locations through one frame wall only. Use the same process for the inboard holes. Flip the exhaust frame bracket so that the rear facing side is now facing the front of the truck. Use the existing hardware to mount the bracket. Reference Figure 4.7.2.C.
8. The cutoff hanger rod should be inserted from the back of the exhaust frame bracket. Position it so that the exhaust is able to grow an inch rearward. Tack weld to the exhaust.

9. Remove the over-axle portion of the exhaust and completely weld the tailpipe in its new orientation and the hanger rod.
10. Install exhaust system on truck and verify clearances to tire and Railgear.

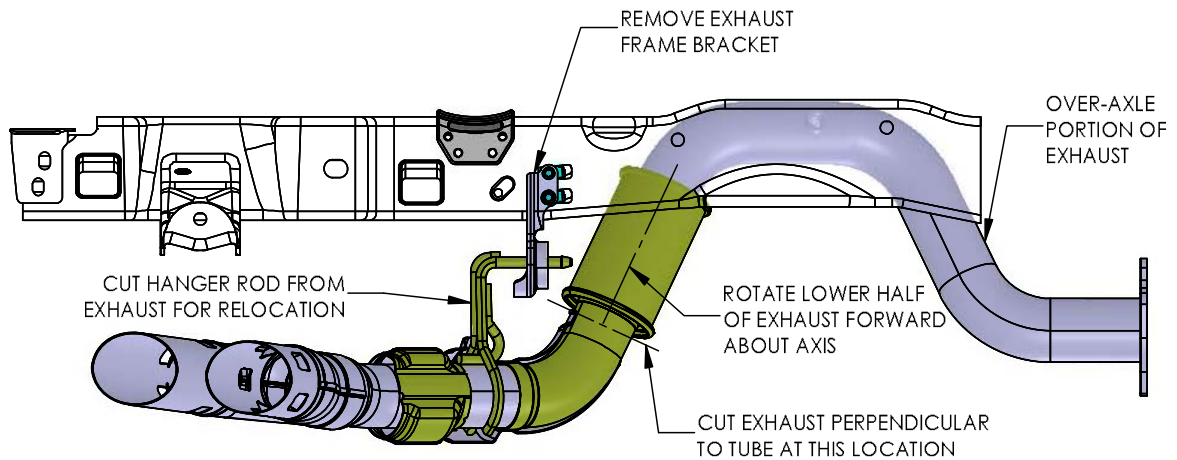


Figure 4.7.2.A F250/350 Diesel Exhaust Modifications

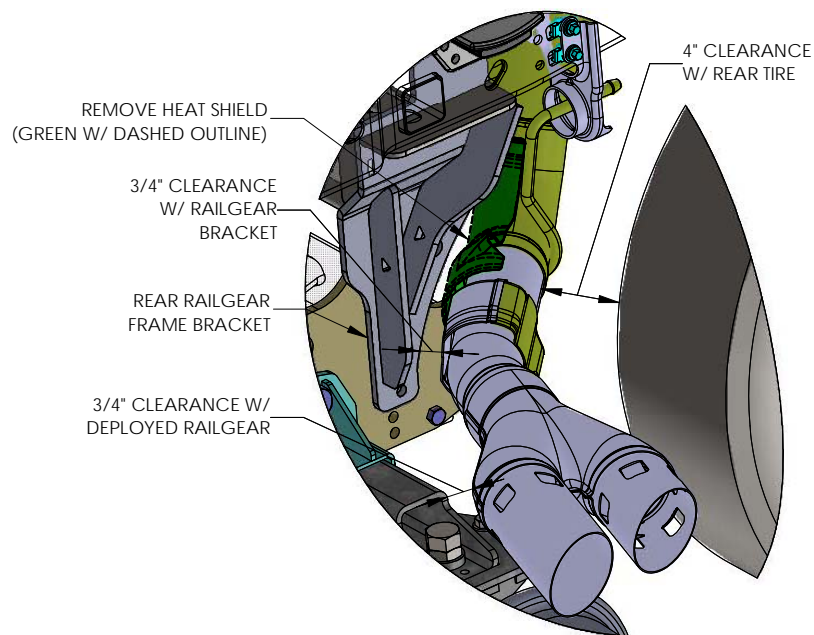


Figure 4.7.2.B F250/350 Diesel Exhaust Clearances

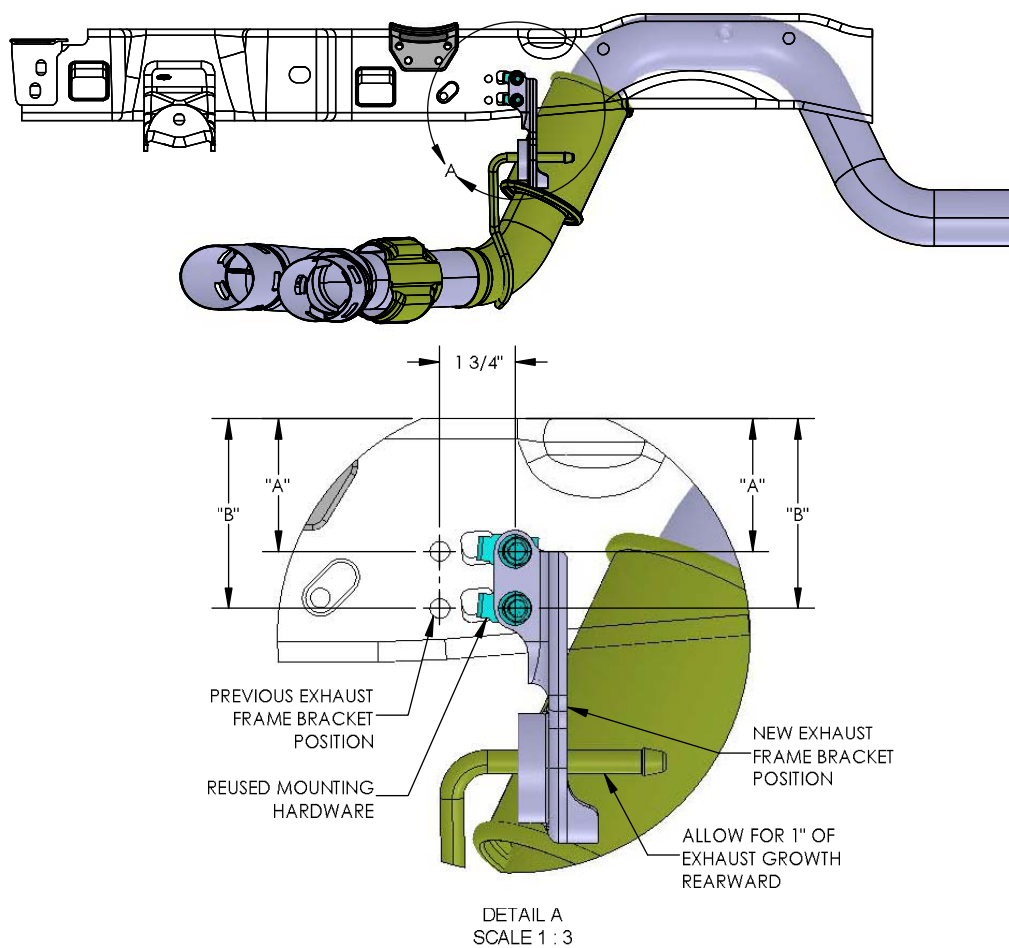


Figure 4.7.2.C F-250/350 Diesel Exhaust Hanger Modification

4.8 RAIL TEST, WELD-OUT, & FINAL ADJUSTMENTS

4.8.1 Rail Test

After aligning the Railgear and adjusting the rail wheel loads, put the vehicle on a segment of suitable test track and run the following tests:

- Run vehicle forwards and backwards on rail.
- If available, run the vehicle through curves and switches.
- Verify that the vehicle has sufficient traction to accelerate and brake smoothly and within acceptable distances.
- Verify alignment by observing the wear pattern on the wheel and the behavior of the vehicle. If adjustments are made, re-check alignment and weight settings.

After the Railgear has been aligned and tested satisfactorily on rail, it is necessary to perform final welding procedures to ensure the safe and repeatable operation.

4.8.2 Weld-Out & Final Adjustments

NOTICE

Select components of RW-1016 Railgear assemblies have been hot dip galvanized. DMF recommends grinding off the galvanized coating to raw steel where welding is required.

For vehicles with installed wireless Railgear controls, remove all electrical and antenna connections from the Cervis base unit before welding on vehicle or attached railgear components.

After a successful rail test, the following tasks should be completed to finalize the Railgear installation. Always repaint any ground or welded areas to prevent corrosion. See Drawing M101606 on the following page.

- Weld off square washers to adjustment collars (top edge only, 2X side)
 - Preserves alignment adjustment
- Weld off suspension assemblies to swing frame (1X/side)
 - Preserves alignment adjustment
- Adjust rail sweeps to contact rail
 - Ensures proper function
- Adjust droop-limiting bolts with gear in stowed position (optional)
 - Reduces suspension down travel, but will limit noise/movement in suspension when in highway position.

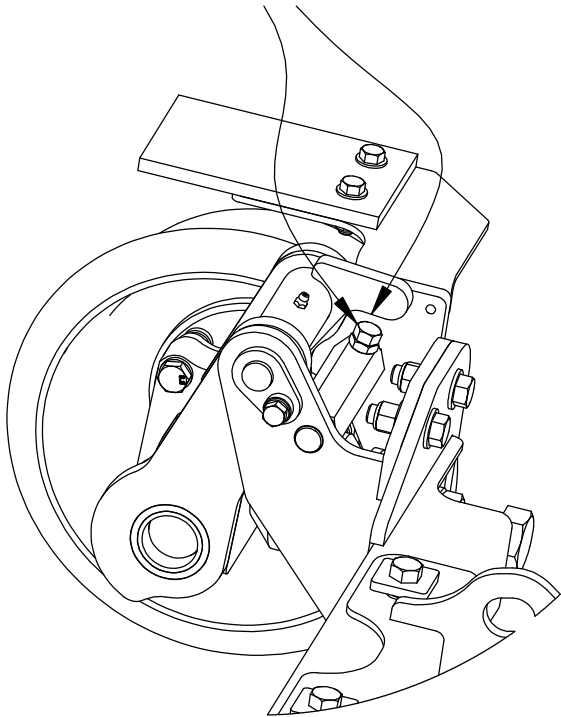
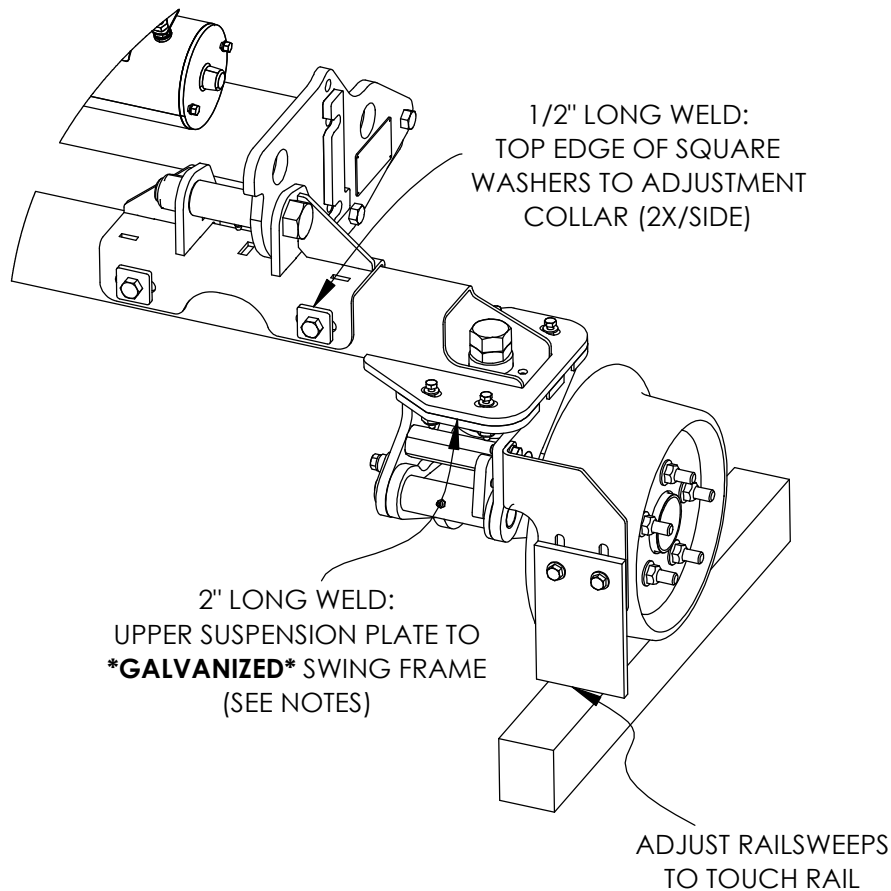
WELD-OUT NOTES:

- Select components of RW-1016 Railgear assemblies have been hot dip galvanized. DMF recommends grinding off the galvanized coating to raw steel where welding is required.
- For vehicles with installed wireless Railgear controls, remove all electrical and antenna connections from the Cervis base unit before welding on vehicle or attached railgear components.
- Repaint any ground or welded areas to prevent corrosion.

DROOP LIMITER ADJUSTMENT (OPTIONAL):

SMALLER GAP BETWEEN BOLT HEAD AND FINGER WITH RAILGEAR STOWED:

- REDUCES SUSPENSION DOWNTRAVEL
- LIMITS NOISE/MOVEMENT IN SUSPENSION IN HIGHWAY POSITION.



REV	DATE	DESCRIPTION			BY	APP		
TOLERANCES (UNLESS SPECIFIED):								
FRAC. MACH:	± 1/32"	RW-1016	DRAWN BY:	APPD BY:	DATE:	DMD	DRAWING NUMBER:	REV:
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								

4.9 INSTALL PROVIDED ACCESSORIES

4.9.1 Velcro Steering Wheel Lock

The DMF 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.

1. Clean the top of 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, pull on the 'D' ring and store the piece of Velcro fabric.

4.9.2 Install Operation and Safety Decals

Install the provided operation and safety decals where shown on the following pages. Surfaces should be clean of oil and dirt before application.

INSTRUCTIONS:

(SEE PRODUCT MANUAL FOR MORE DETAILS)



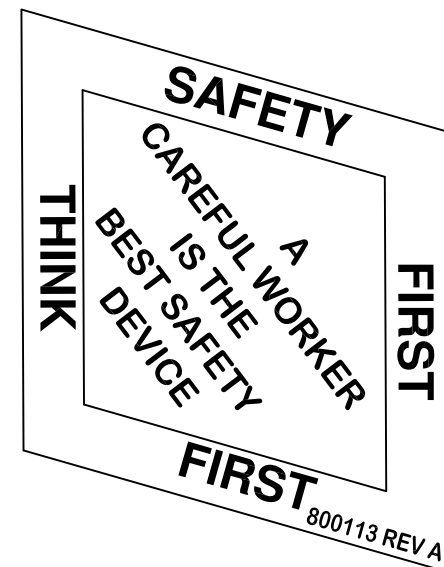
1. DISENGAGE RAILGEAR RETENTION SYSTEM
 2. MOVE RAILGEAR
"UP" = HIGHWAY POSITION
"DOWN" = RAIL POSITION
 3. RE-ENGAGE RAILGEAR RETENTION SYSTEM
- 705021 REV #

INSTRUCTIONS:

(SEE PRODUCT MANUAL FOR MORE DETAILS)



1. DISENGAGE RAILGEAR RETENTION SYSTEM
 2. MOVE RAILGEAR
"UP" = HIGHWAY POSITION
"DOWN" = RAIL POSITION
 3. RE-ENGAGE RAILGEAR RETENTION SYSTEM
- 705021 REV #



SAFETY INSTRUCTIONS

VISUALLY INSPECT DAILY FOR TIRE AND WHEEL DAMAGE.
CHECK WHEEL NUT TORQUE AT 50 MI, THEN 6 MOS/2000 MI.
CHECK TIRE PRESSURE DAILY.

800168 REV A

SAFETY INSTRUCTIONS

VISUALLY INSPECT DAILY FOR TIRE AND WHEEL DAMAGE.
CHECK WHEEL NUT TORQUE AT 50 MI, THEN 6 MOS/2000 MI.
CHECK TIRE PRESSURE DAILY.

800168 REV A

OPERATION OF DMF RW-1016 RAILGEAR

PRIOR TO OPERATING VEHICLE

1. See Parts & Service Manual for detailed operation and adjustment instructions as well as important safety information.
2. Refer to Inspection & Maintenance legend prior to operating this equipment.

TO PLACE VEHICLE ON RAIL

1. Drive vehicle onto crossing, centering it over tracks.
2. Turn hydraulic power unit on.
3. Disengage front and rear Railgear retention systems.
4. Use the push-button or wireless controls to lower rear guide wheels.
5. With rear guide wheels fully extended and properly seated on rail, re-engage rear Railgear retention system.
6. If front guide wheels are not centered over rail, maneuver truck so that it is and then turn the front vehicle tires so that they are pointed straight ahead.
7. Use the push-button or wireless controls to lower front guide wheels.
8. With front guide wheels fully extended and properly seated on rail, re-engage front Railgear retention system.
9. Engage steering wheel lock (if equipped).
10. Turn off hydraulic power unit.

Safe operating speeds on rail will be governed by track conditions and existing railroad rules and regulations. Under no conditions should vehicle be operated over 40 MPH on track.

TO REMOVE VEHICLE FROM RAIL

1. Drive vehicle onto road crossing.
2. Turn hydraulic power unit on.
3. Disengage front and rear Railgear retention systems.
4. Lift both sets of Railgear. There is no preference for removal order.
5. Re-engage front and rear Railgear retention systems.
6. Turn off hydraulic power unit.
7. Disengage steering wheel lock (if equipped).

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705022 Rev #

SAFETY INSTRUCTIONS

VISUALLY INSPECT DAILY FOR TIRE AND WHEEL DAMAGE.
CHECK WHEEL NUT TORQUE AT 50 MI, THEN 6 MOS/2000 MI.
CHECK TIRE PRESSURE DAILY.

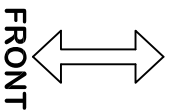
800168 REV A

EMERGENCY PUMP INSTRUCTIONS:

1. TURN KEY TO IGNITION POSITION
2. INSERT HAND PUMP HANDLE
3. PRESS AND HOLD SWITCH TO DESIRED POSITION
4. PUMP RAILGEAR TO STOWED POSITION
5. RELEASE SWITCH
6. REPEAT FOR OTHER END IF NECESSARY



REAR



FRONT

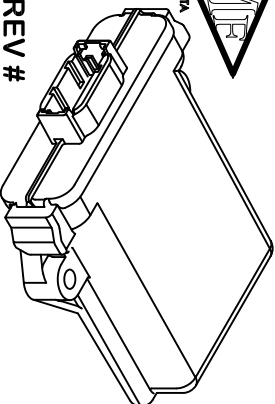
701051 REV #

WARNING



REMOVE ALL ELECTRICAL AND ANTENNA CONNECTIONS FROM CERVIS BASE UNITS BEFORE WELDING ON VEHICLE

701052 REV #

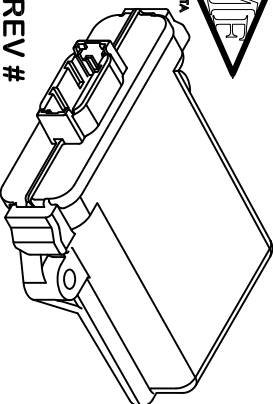


WARNING



REMOVE ALL ELECTRICAL AND ANTENNA CONNECTIONS FROM CERVIS BASE UNITS BEFORE WELDING ON VEHICLE

701052 REV #



SAFETY INSTRUCTIONS

VISUALLY INSPECT DAILY FOR TIRE AND WHEEL DAMAGE.
CHECK WHEEL NUT TORQUE AT 50 MI, THEN 6 MOS/2000 MI.
CHECK TIRE PRESSURE DAILY.

800168 REV A

HI-RAIL VEHICLE COMPLETED BY: _____

WITH APPLICATION OF HI-RAIL AND FINISHED
BODY, THIS VEHICLE HAS _____
POUNDS OF AVAILABLE PAYLOAD.

DATE OF COMPLETION OF HI-RAIL EQUIPPED
VEHICLE: mo _____ yr _____

CAUTION: THIS MULTIPURPOSE VEHICLE HAS SPECIAL DESIGN AND EQUIPMENT FEATURES FOR OFF-ROAD USE. IT HANDLES DIFFERENTLY FROM AN ORDINARY PASSENGER CAR IN DRIVING CONDITIONS WHICH MAY OCCUR ON STREETS, HIGHWAYS, AND OFF-ROAD.

WEIGHT AND LOCATIONS OF AVAILABLE PAYLOAD MAY ALSO AFFECT THE HANDLING OF THIS VEHICLE. DRIVE WITH CARE AND WEAR SAFETY BELTS AT ALL TIMES.

FOR PRECAUTIONS, READ THE VEHICLE OWNERS GUIDE AND RAILGEAR OPERATORS SERVICE & PARTS MANUAL.

800118 REV B

SAFETY INSTRUCTIONS

VISUALLY INSPECT DAILY FOR TIRE AND WHEEL DAMAGE.
CHECK WHEEL NUT TORQUE AT 50 MI, THEN 6 MOS/2000 MI.
CHECK TIRE PRESSURE DAILY.

800168 REV A

LOCKING PINS (RAILGEAR)

RELEASE - LIFT & PULL OUT
THEN LOWER
ENGAGE - LIFT & PUSH IN
THEN LOWER

705024 REV #

LOCKING PINS (RAILGEAR)

RELEASE - LIFT & PULL OUT
THEN LOWER
ENGAGE - LIFT & PUSH IN
THEN LOWER

705024 REV #

SAFETY INSTRUCTIONS

Lock front wheels
straight ahead for
on-rail travel.

800119 REV A

INSPECTION & MAINTENANCE OF DMF RW-1016 RAILGEAR

DAILY:

Visually inspect Railgear for hydraulic leaks, loose fasteners, excessive wear, and damaged components.
Spin all four rail wheels noting any bearing noise, excessive end-play, or resistance.
Compare left and right rail wheels for wear, particularly diagonal flanges.
Check tire pressure and inspect tires and wheels for damage.
Inspect rail wheel temperature regularly throughout the day.

WEEKLY:

Grease all fittings (in highway position if possible).
7 on front Railgear
7 on rear Railgear
Check level of hydraulic oil and adjust as needed.

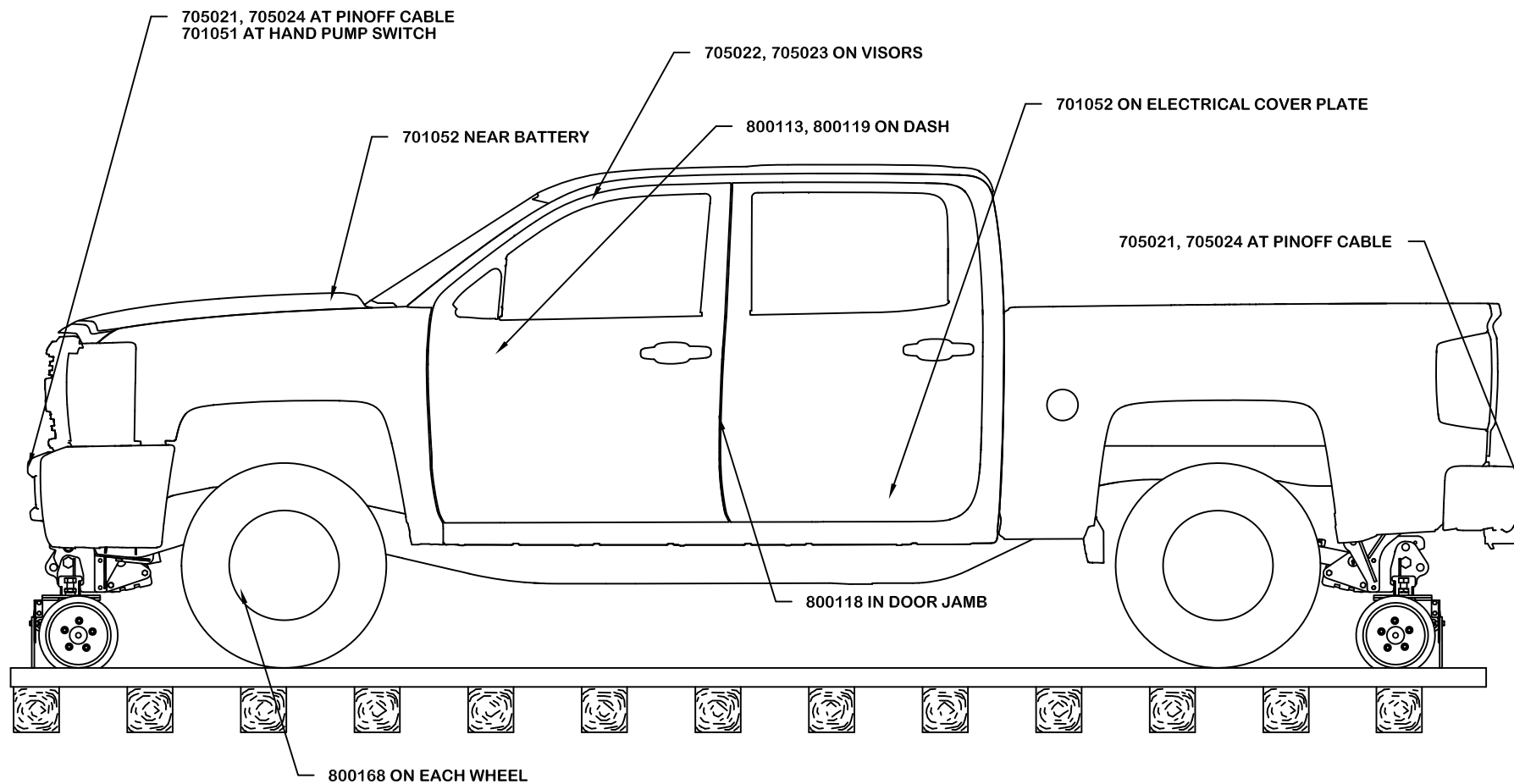
BI-ANNUAL & ANNUAL MAINTENANCE:

See Railgear manual for details.

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705023 REV #



NOTES:
PRINT PAGE 3 ON THE BACKING FOR
PAGE 1 AND THE BACKING FOR PAGE 2

4.10 INSTALLATION REVIEW

4.10.1 General Inspection

- ☐ Check that all fasteners are tight.
- ☐ Verify lug nut torque.
- ☐ Check tire inflation pressures (cold).
- ☐ Verify final weld out has been performed as detailed in section 4.8.
- ☐ Touch up paint welded or drilled areas as necessary.
- ☐ Check that all hoses and wire are routed properly and protected from abrasion, heat, and pinch points.
- ☐ Verify that all electrical terminations are insulated and protected.
- ☐ Verify that the hydraulic reservoir is full and labeled.
- ☐ Verify that all bodywork is replaced and secure.

4.10.2 Railgear Function Test

- ☐ Verify that the Railgear does not operate with the power switch in the off position.
- ☐ Verify the power indication on the power switch in the cab.
- ☐ Test the wireless railgear controls, and any hardwired controls.
- ☐ Verify the pin-offs work in both the rail and highway positions (if equipped).
- ☐ Follow Section 2.4 to verify emergency pump function.
- ☐ Load test vehicle to GVWR and verify Railgear function.

4.10.3 Road Test

- ☐ Before road testing: inspect steering stops, wheel and tires. Verify that the lug nuts have been properly torqued.
- ☐ In a parking lot or open area, verify that the steering stops prevent the tire or rim from contacting the frame, suspension or other items.
- ☐ Inspect brake lines and ABS sensor lines to verify clearance from rim.
- ☐ Check for any rattles and vibration.
- ☐ Verify speedometer calibration by timing a distance, GPS or from another vehicle. (This may not be necessary for every install.)
- ☐ Verify that no TPMS malfunction lights on the dash are illuminated.

4.10.4 Before Customer Delivery

- ☐ Verify that the wireless control unit is safely stowed and easily accessible.
- ☐ Verify that the emergency pump handle is safely stowed.
- ☐ Include this manual in the vehicle for operator reference.
- ☐ Include this checklist and a completed alignment sheet in the vehicle for the customer's records.

SECTION 5.0 HYDRAULIC & ELECTRICAL SYSTEMS

5.1	HYDRAULIC SYSTEM.....	5-2
5.1.1	Hydraulic Power Unit	5-2
5.1.2	Locating Hydraulic Components	5-2
5.1.3	Hydraulic Hose Installation	5-2
5.1.4	Hydraulic Fitting Installation	5-2
5.1.5	Emergency Hand Pump.....	5-7
5.2	ELECTRICAL SYSTEM	5-8
5.2.1	Locating Electrical Components.....	5-8
5.2.2	Routing Wires.....	5-8
5.2.3	Electrical Insulation.....	5-8
5.3	HYDRAULIC & ELECTRICAL SCHEMATICS	5-9
5.4	HYDRAULIC & ELECTRICAL COMPONENT DRAWINGS	5-11

5.1 HYDRAULIC SYSTEM

5.1.1 Hydraulic Power Unit

DMF supplies a 12V DC hydraulic power unit with RW-1016 Railgear with the following specifications. The unit includes a pump, motor and reservoir.

- **Flow:** 1.25 GPM @ 2,000 psi
- **Recommend Fluid:** Dexron III Automatic Transmission Fluid
- **Pressure Relief:** Internal; factory set at 2,000 psi
- **Power:** 150A circuit breaker required, 4 GA minimum welding cable connections
- **Ground:** Dedicated ground to frame required; 4 GA welding cable minimum

5.1.2 Locating Hydraulic Components

DMF has provided several options for mounting hydraulic components with RW-1016 Railgear. In some cases, chassis specific kits are available to mount the hydraulic pump (see Section 6.2). Certain applications may require devising custom mounting solutions. The pump should be protected from high heat and road spray. Access to the fluid fill port should be considered. The pump solenoid should be protected from accidental contact with loose tools or cargo. See Drawing M101605 on the following pages for additional information.

Suggested Pump Mounting Locations

- Chassis specific mounting kit (some models, see Section 6.2)
- Bolted to the weld-on pump bracket (front or rear)
- Inside the cab (installer designed)
- Under hood (installer designed, avoid heat sources)
- Inside a tool box (installer designed)

Suggested Locking Valve Manifold Locations (1 front, 1 rear)

- Bolted to the rear cross brace
- Bolted to the weld-on pump bracket
- Bolted to the included universal mounting plate

5.1.3 Hydraulic Hose Installation

DMF supplies hydraulic hoses appropriate for standard installations. Take care to use the indicated hose lengths where shown on the hydraulic schematics. Observe the following guidelines when routing hoses:

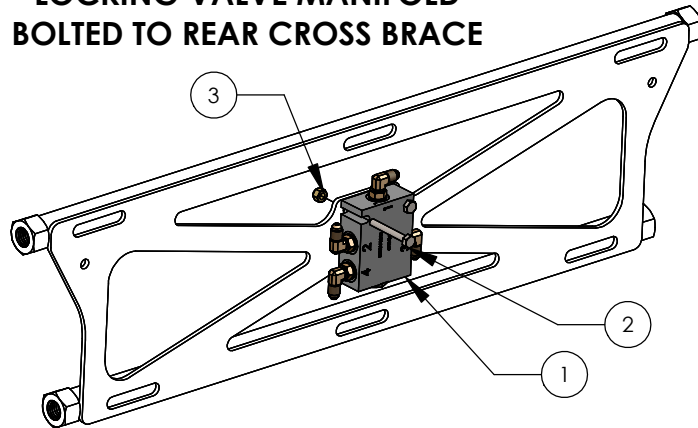
- Route all hoses away from the drive train, exhaust, and any moving parts.
- Ensure that hoses do not interfere with the Railgear.
- Hoses can be routed inside the frame.
- Support and restrain hoses with wire ties or wire clips.
- Hoses should be marked and capped before routing through the frame to prevent collecting debris.
- Allow slack in hoses where connected components may move while operating, such as hydraulic cylinders.
- Neatly secure excess hose length as required.

5.1.4 Hydraulic Fitting Installation

DMF supplies hydraulic fittings appropriate for standard installations. Certain fittings may need to be reoriented from what is shown in schematics for clearance or to optimize hose routing.

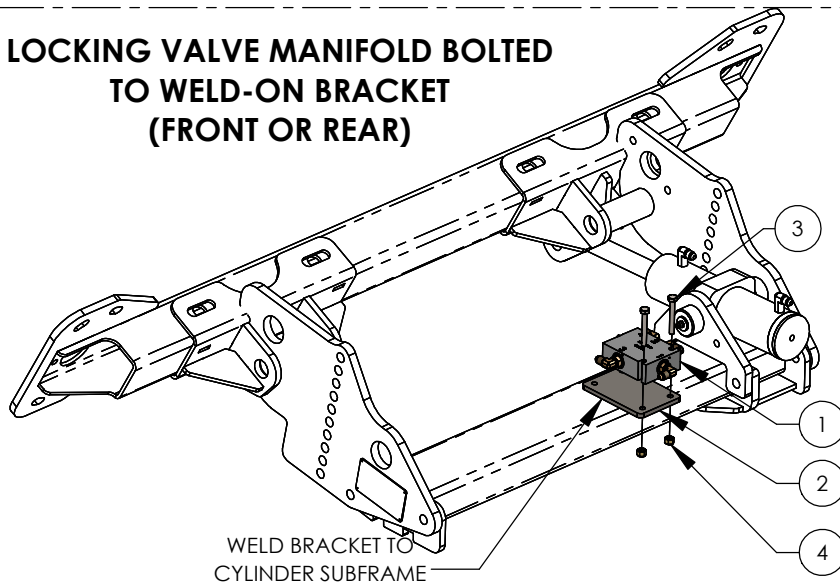
To reduce the risk of system leaks, refer to the guidelines on the following pages for recommended installation practices of JIC, NPT and O-Ring hydraulic fittings.

LOCKING VALVE MANIFOLD BOLTED TO REAR CROSS BRACE



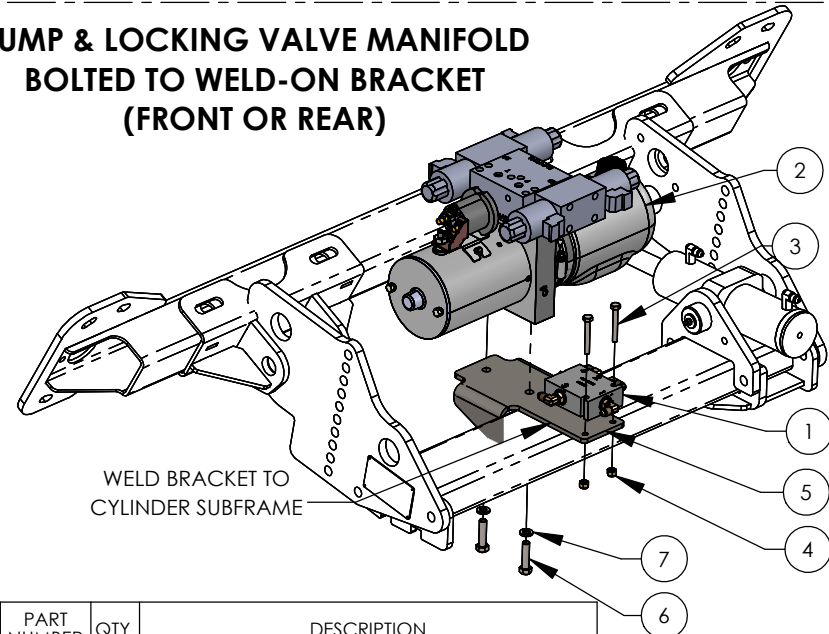
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701035	1	LOCKING VALVE w/ ORFICE/FTGS/CART; RW-1016
2	605328	2	HHCS, 1/4-20 X 2", GR5
3	11257	2	1/4"-20 NYLOCK NUT; GR8

LOCKING VALVE MANIFOLD BOLTED TO WELD-ON BRACKET (FRONT OR REAR)



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701035	1	LOCKING VALVE w/ ORFICE/FTGS/CART; RW-1016
2	701034	1	LOCKING VALVE MOUNTING PLATE; RW-1016
3	605328	2	HHCS, 1/4-20 X 2", GR5
4	11257	2	1/4"-20 NYLOCK NUT; GR8

PUMP & LOCKING VALVE MANIFOLD BOLTED TO WELD-ON BRACKET (FRONT OR REAR)



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701035	1	LOCKING VALVE w/ ORFICE/FTGS/CART; RW-1016
2	REF	1	12VDC HYDRAULIC PUMP FOR RW-1016
3	605328	2	HHCS, 1/4-20 X 2", GR5
4	11257	2	1/4"-20 NYLOCK NUT; GR8
5	701030	1	PUMP BRACKET; WELD ON; RW-1016
6	102408	2	HHCS, 3/8-16 X 1-1/2", GR8
7	12566	2	LOCK WASHER, 3/8", GR8

CHASSIS-SPECIFIC PUMP MOUNTING KITS (NOT SHOWN):

- **701055:** 2017+ FORD FRONT MOUNT KIT; GAS ENGINE ONLY
- **701060:** BATTERY TRAY PUMP KIT; '14+ GM; GAS ENGINE ONLY

REV	DATE	DESCRIPTION	BY	APP
<div> <div> 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 </div> <div> <div> RW-1016 </div> <div> DRAWN BY: TAM APPD BY: - </div> </div> <div> <div> DATE: 02/15/17 </div> <div> DMD </div> </div> <div> <div> THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF, ALL RIGHTS RESERVED. </div> <div> DRAWING NUMBER: M101605 REV: # </div> </div> </div>				
<div> <div> TITLE: MANUAL; HYDRAULIC MOUNTING OPTIONS; RW-1016 </div> </div>				

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>				<small> TITLE: PRODUCTION PROCEDURE 004 PIPE FITTING INSTALLATION DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512 </small>	
DRAWN BY: TSH		APPD BY:		DATE: 06/02/94	
				DRAWING NUMBER: PP004	REV: #

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

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

5.1.5 Emergency Hand Pump

The emergency pump is provided to allow a malfunctioning vehicle to be removed from the rail in the event of an electrical fault or pump failure. The emergency hand pump can only be used to raise the Railgear. It is not designed or intended to deploy the Railgear.

Location

Location of the emergency hand pump is an important consideration. The mounting location for the emergency hand pump should meet the following requirements.

- The hand pump should be readily accessible and offer enough room to install and operate the included handle.
- The hand pump should be securely mounted to a part of the vehicle that will withstand vigorous pumping. Common locations include bumper brackets, cargo boxes, etc.
- Hand pump and selector switch should be installed within easy reach of each other, as they must be operated simultaneously.
- If the hand pump is mounted far away from the primary hydraulic pump, longer hoses may need to be fabricated. The wiring on the selector switch will also need to be extended.
- Verify the handle for the hand pump is stowed in a location where it will be readily accessible and not discarded.

Assembly & Priming

Assemble the hand pump units as shown in Figure 5.1.1 below. The emergency hand pump must be primed and tested after initial installation. It must be re-primed and tested after any components of the hydraulic system are removed or replaced. Failure to do so may render the hand pump inoperable. The following procedure is one method of priming that DMF has found to be quick and effective.

Loosen the hose connected to emergency hand pump inlet port (port 1) slightly, such that air can bleed from the line. Activate the hydraulic pump and cycle the Railgear cylinders. There is sufficient back pressure in the tank return line to force air out of the hand pump inlet line. When oil begins to escape from the connection stop activation of the cylinders, and re-tighten. Check operation of the emergency hand pump. You may have to cycle the hand pump several times before the pump will work throughout its full range.

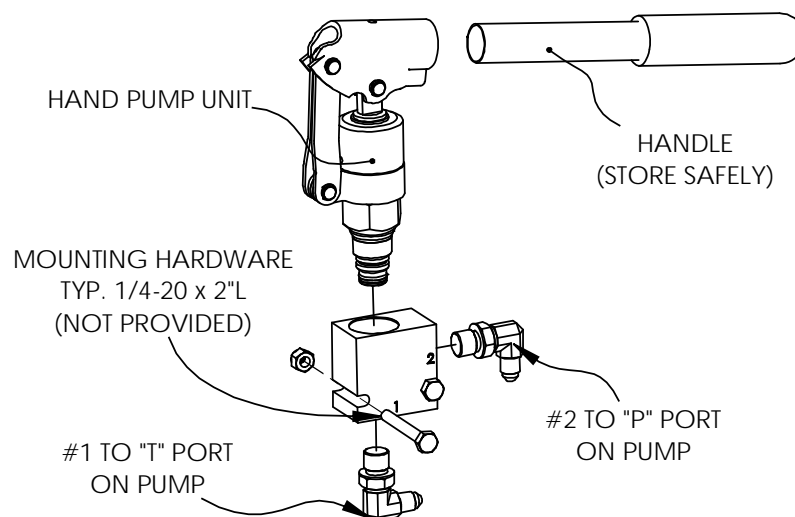


Figure 5.1.1 Emergency Hand Pump

5.2 ELECTRICAL SYSTEM

5.2.1 Locating Electrical Components

- Determine location under the hood for the circuit breakers and terminal strip. It should be accessible and protected from road spray. High on the firewall, along the inside of the fender, and attached to the battery box are typical locations. The terminal strip can also be located inside the cab.
- When installing the terminal strip in an area subject to moisture, such as under the hood, the large connector on the wireless control box must be oriented DOWNWARDS to prevent water intrusion.
- The pump solenoid should be protected from accidental contact with loose tools or cargo with covers if necessary. See section 5.1.2 for additional information on pump locations.

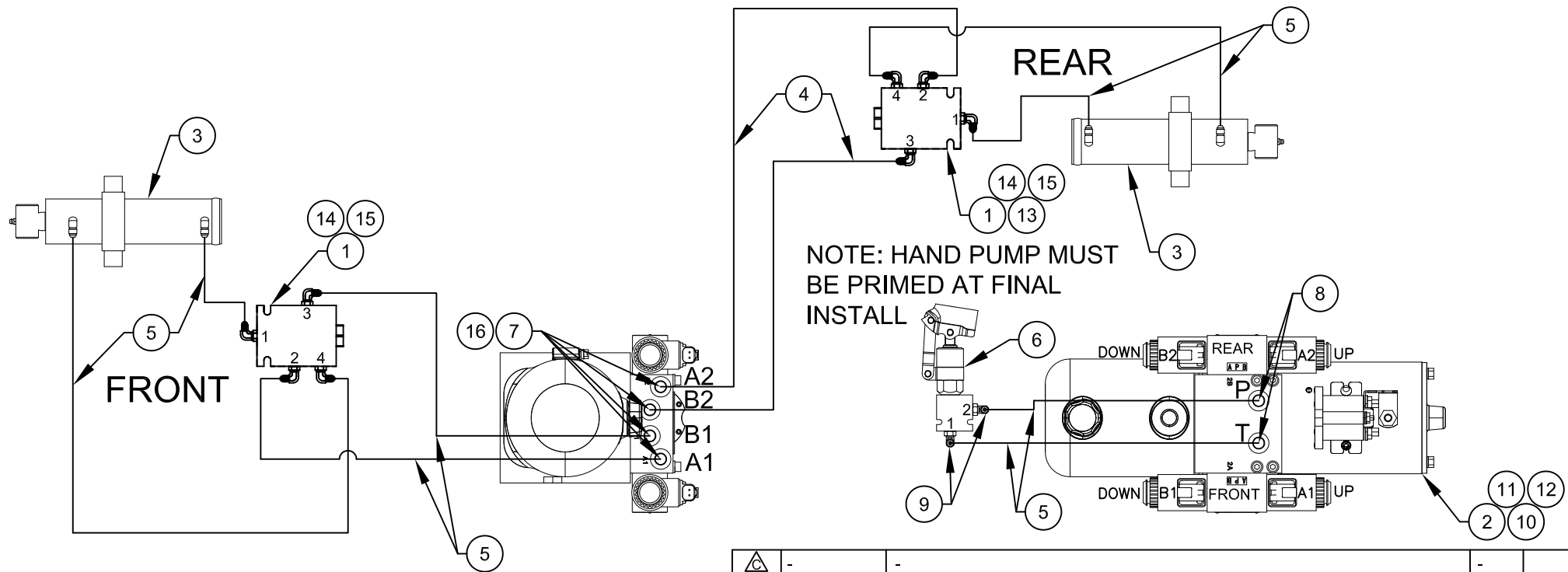
5.2.2 Routing Wires

- Route the electrical harness according to 5.3 Electrical Schematics. Observe the following guidelines:
 - We recommend running the wires in split loom.
 - Route wires away from the drive train, exhaust, and any moving parts.
 - Ensure that wires do not interfere with Railgear motion.
 - Wires can be routed inside the frame.
 - Support and restrain wires with wire ties or wire clips as necessary.
- **All electrical terminations should be protected with liquid electrical tape or other means.**
- **Heat shrink terminals are provided and should be used wherever possible.**
- Run wires from chassis locations to the terminal strip under the hood.
- All bulkhead or firewall penetrations must be protected with grommets.
- Attach wires to the terminal strip as shown in 5.3 Electrical System.
- Attach the (2) Battery Source leads and the (1) Ignition Source Lead. The ignition source is made using the provided mini-ATO fuse tap.
- Where possible attach grounds to the battery posts or remote ground provided.
- The hydraulic pump requires a dedicated ground to the frame, 4 GA welding cable minimum. Tapped holes on the aluminum pump block provide an easy and secure attachment point.

5.2.3 Electrical Insulation

All electrical terminations should be protected with a spray or brush-on electrical insulation product. This includes pump grounds, solenoid connections, terminal strip connections and the terminal strip ground. Failure to adequately protect the electrical components can lead to corrosion and system malfunction. The manufacturer does not warranty the installation of a third-party installer. This is the installer's responsibility.

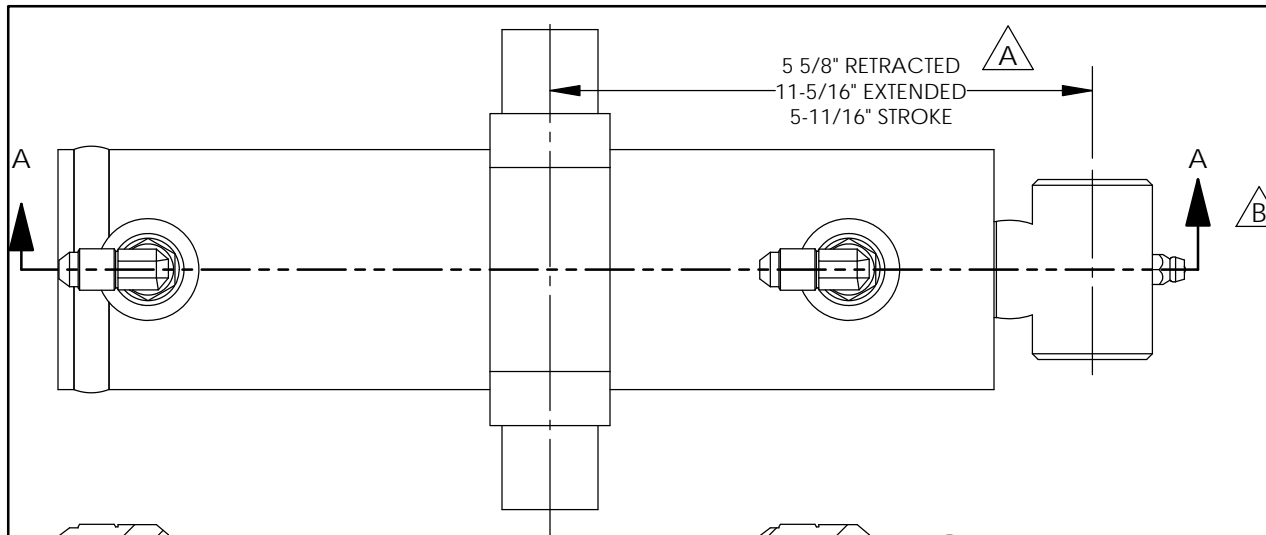
ITEM	PART NO.	QTY	DESCRIPTION	KIT #
1	701035	2	LOCKING VALVE w/ ORIFICE & FITTINGS FOR RW-1016	-
2	701044	1	12VDC HYDRAULIC PUMP & HAND PUMP FOR RW-1016 (SA-6765)	-
3	701022	REF	CYLINDER ASSEMBLY, 2" BORE, RW-1016	-
4	600602	2	6.4MM (1/4") RHINOHide HYD. HOSE - 22' SECTION	-
5	605326	8	6.4MM (1/4") RHINOHide HYD. HOSE - 22" SECTION	-
6	701037	REF	EMERGENCY HAND PUMP W/ HANDLE	-
7	605324	4	#04 MJIC X #04 MORB STRAIGHT FTG (6400-04-04)	701040
8	10457	2	#04 MJIC X #04 MORB 90 DEG FTG (6801-04-04)	701040
9	18952	2	#04 MJIC X #06 MORB 90 DEG FTG (6801-04-06)	701040
10	701030	1	PUMP BRACKET; WELD ON; RW-1016	701040
11	102408	2	HHCS 3/8-16 UNC X 1-1/2" LONG, GRADE 8	701040
12	12566	2	3/8" LOCK WASHER, GRADE 8	701040
13	701034	1	LOCKING VALVE MOUNTING PLATE; WELD ON; RW-1016	701040
14	605328	4	HHCS 1/4-20 UNC X 2" LONG	701040
15	11257	4	NYLOCK NUT, 1/4-20 UNC	701040
16	605131	4	#04 MJIC X #04 FJIC SWIVEL 45 DEG FTG (6502-04-04)	701040



NOTES:

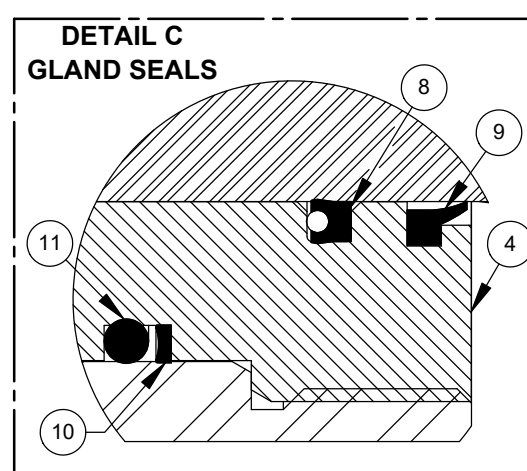
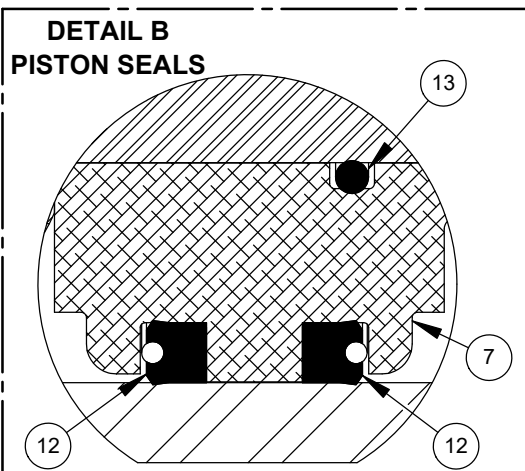
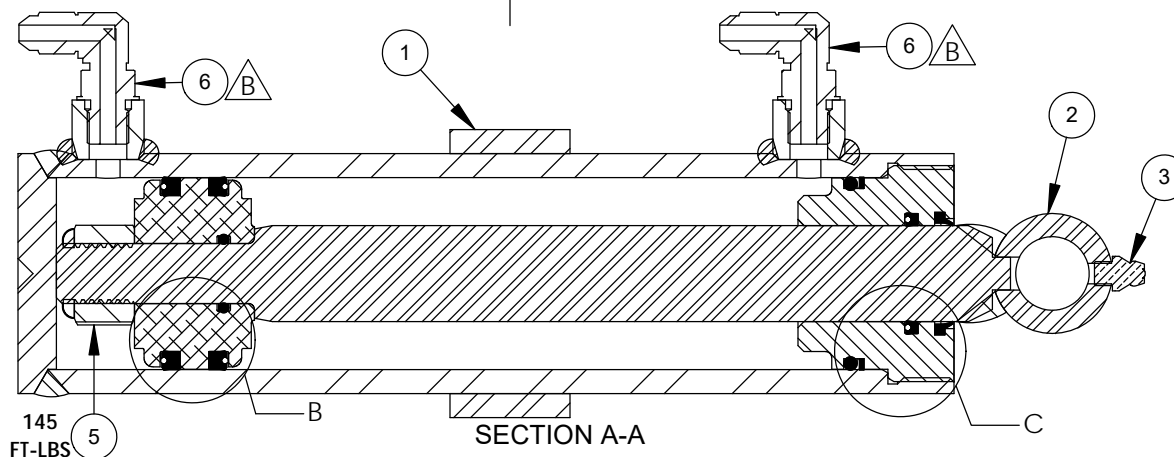
1. CONFIGURATION SHOWN IS FOR FRONT-OF-TRUCK MOUNTED PUMP
2. FOR ELECTRICAL DIAGRAM SEE DRAWING # 701049

	-	-	-	-
	-	-	-	-
	-	-	-	-
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES: (UNLESS SPECIFIED)				
FRAC, MACH: $\pm 1/32"$ FRAC, OTHER: $\pm 1/16"$.X $\pm .063$.XX $\pm .030$.XXX $\pm .005$ DRILL SIZES: $+.015$ ANGULAR: $\pm 1^\circ$ SURF FINISH: 125 MICRO THREADS: 2A AND 2B BREAK SHARP EDGES $< 0.030 \times 45^\circ \text{ MAX}$				
RW-1016		TITLE: ASSEMBLY, HYDRAULIC, RW-1016		
DRAWN BY: BJF		APPD BY:		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512
DATE: 5/17/16		DRAWING NUMBER: 701033		REV: #



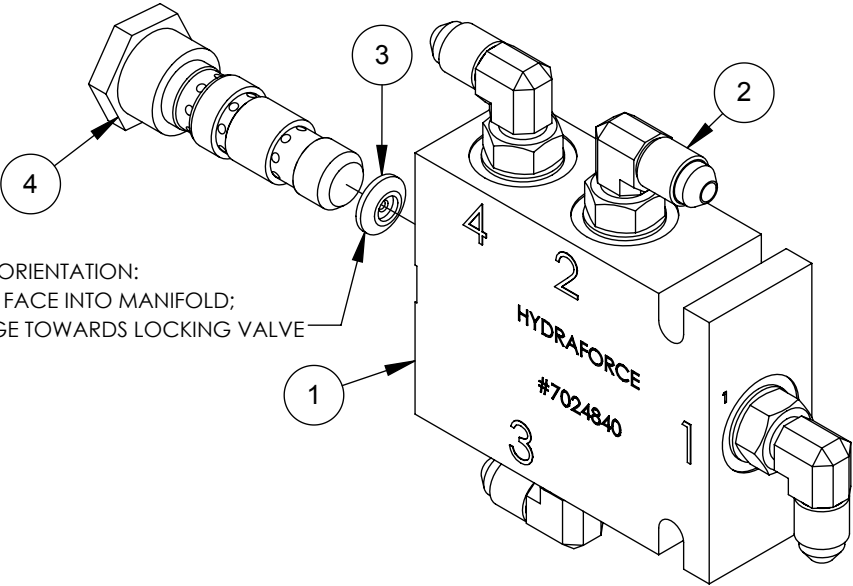
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701023	1	WELDMENT, CYL. BARREL, 2" BORE, RW-1016
2	701028	1	ROD WELDMENT; RW-1016
3	818105	1	GREASE FITTING, 1/4"-28 (ALEMITE 1641-B)
4	501789	1	DETAIL, CYL GLAND, 2" BORE x 1" ROD, RW-1013
5	605038	1	5/8"-18 NYLOCK NUT; GR8
6	10457	2	#04 MJIC X #04 MAORB X 90 FITTING (6801-04-04)
7	501786	1	DETAIL, PISTON 2" ID
8	605041	1	ROD SEAL, POLYPAK, 1" ID, 1/8"W
9	605042	1	ROD WIPER, AN 959/940, 1" ID, 1/8"
10	605044	1	BACK UP RING, #224
11	605043	1	O-RING; #224
12	605040	2	PISTON SEAL, POLYPAK, 1.625" ID, 3/16"W, 2" BORE
13	605039	1	O-RING, #114, N70

SEAL KIT #600710 INCLUDES ITEMS 8-13



B	04/04/18	SAE O-RING ELBOWS (10457) REPLACED NPT ELBOWS (605047)	TAM	
A	07/07/16	TRUNNION POSITION CHANGED	TAM	
TOLERANCES: (UNLESS SPECIFIED)		TITLE: CYLINDER ASSY; 2" BORE; RW-1016		
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512		
FRAC. OTHER: ± 1/16"		DRAWN BY: TAM		
.X ± .063		APPD BY: -		
.XX ± .030		DATE: 08/12/15		
.XXX ± .005		DRAWING NUMBER: 701022		
DRILL SIZES: ± .015		REV: B		
ANGULAR: ± 1"				
SURF FINISH: 125 MICRO				
THREADS: 2A AND 2B				

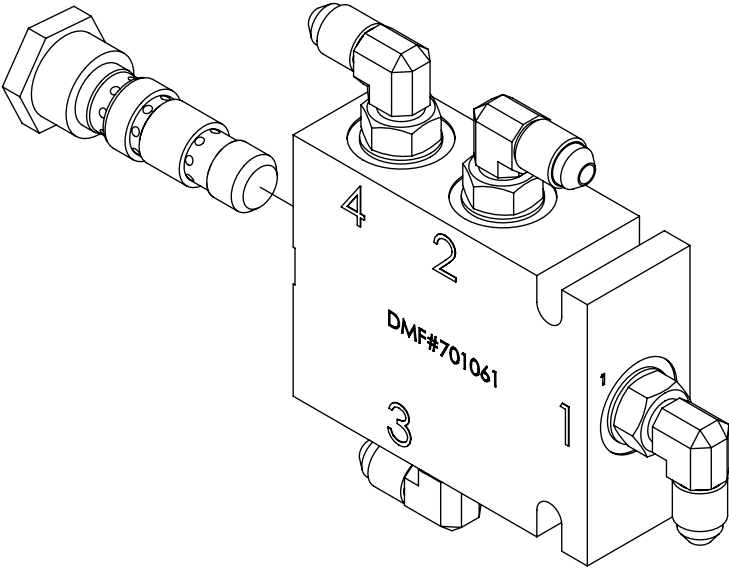
MANIFOLD LABELED "HYDRAFORCE 7024840"
REQUIRES ORRIFICE



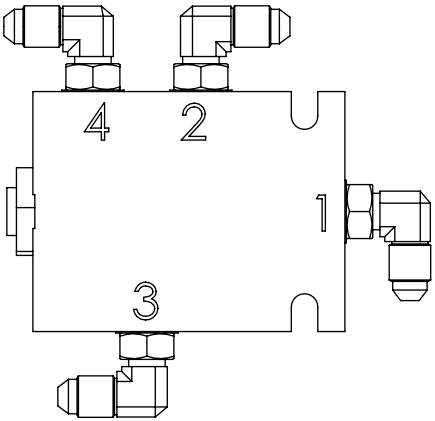
ORIFICE ORIENTATION:
BEVELED FACE INTO MANIFOLD;
FLAT EDGE TOWARDS LOCKING VALVE


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	600612	1	1015 LOCKING VLV BODY ONLY (7024840)
2	10457	4	#04 MJIC X #04 MAORB X 90 FITTING (6801-04-04)
3	600613	1	ORIFICE .070" (7051-070)
4	241016	1	VALVE, LOCKING, CPD-084P, PARKER

MANIFOLD LABELED "DMF#701061"
NO ORRIFICE REQUIRED (INTEGRATED INTO MANIFOLD)



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	10457	4	#04 MJIC X #04 MAORB X 90 FITTING (6801-04-04)
2	241016	1	VALVE, LOCKING, CPD-084P, PARKER
3	701061	1	LOCKING VALVE BODY W/ BUILT-IN .070" ORIFICE



A	11/20/17	ADDED INTEGRAL ORIFICE CONFIGURATION			TAM		
REV	DATE	DESCRIPTION			BY	APP	
TOLERANCES: (UNLESS SPECIFIED)		RW-1016	TITLE: LOCKING VALVE w/ ORIFICE/FTGS/CART; RW-1016				
FRAC. MACH: ± 1/32"			DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512				
FRAC. OTHER: ± 1/16"							
X ± .063							
XX ± .030							
XXX ± .005							
DRILL SIZES: + .015		DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
ANGULAR: ± 1°							
SURF FINISH: 125 MICRO							
THREADS: 2A AND 2B							
SMALL SHARP CORNERS (1/32" & 1/16" MIN.)		TAM	-	12/03/15		701035	A

SECTION 6.0 RAILGEAR PARTS

6.1	BEFORE ORDERING PARTS	6-2
6.1.1	Serial Numbers and Locations.....	6-2
6.1.2	Common Terminology	6-2
6.1.3	Custom Applications.....	6-2
6.1.4	Returns	6-2
6.1.5	Labor	6-2
6.2	RAILGEAR MOUNTING KITS	6-3
6.2.2	2020+ Chevrolet 2500/3500	6-4
6.2.3	2011-2019 Chevrolet 2500/3500	6-6
6.2.4	2017+ Ford F-250/350 4x4	6-8
6.2.5	2008-2016 Ford F-250/350 4x4	6-12
6.2.6	2019+ Ram 2500/3500	6-14
6.2.7	2014-2018 Ram 2500/3500	6-15
6.3	RAILGEAR CORE ASSEMBLIES	6-17
6.3.1	Front Core Assembly, Standard Gauge, Steel Wheels	6-18
6.3.2	Rear Core Assembly, Standard Gauge, Steel Wheels	6-19
6.4	SUSPENSION ASSEMBLIES, BEARINGS, & WHEELS	6-20
6.4.1	Suspension Assembly – Side A, Steel Wheels	6-21
6.4.2	Suspension Assembly – Side B, Steel Wheels	6-22
6.4.3	Wheel and Lower Suspension Arm– Side A, Steel Wheels.....	6-23
6.4.4	Wheel and Lower Suspension Arm– Side B, Steel Wheels.....	6-24
6.4.5	Railsweeps, Side A.....	6-25
6.4.6	Railsweeps, Side B.....	6-26
6.5	OPTIONAL COMPONENTS	6-27
6.5.1	Railgear Position Sensor	6-28
6.5.2	Shunt Kit.....	6-29
6.5.3	Heavy Duty Cable Pinoff Assembly	6-30
6.6	CHASSIS/WHEEL MODIFICATION KITS.....	6-31
6.6.1	2017+ Chevrolet 2/3500.....	6-32
6.6.2	2017+ Ford F-2/350 4x4	6-36
6.6.3	2014+ Ram 2/3500	6-40

6.1 BEFORE ORDERING PARTS

6.1.1 Serial Numbers and Locations

To ensure parts order accuracy, DMF requires serial number information from your Railgear assemblies. If you are placing a parts order through a maintenance facility, please inform them of the serial numbers, so they can be communicated with your orders. Serial numbers uniquely identify your Railgear, as it was built to your specifications, and also allows DMF to help you maintain an order and repair history. DMF normally assigns serial numbers sequentially. The front railgear assembly typically has a lower serial number than the rear.

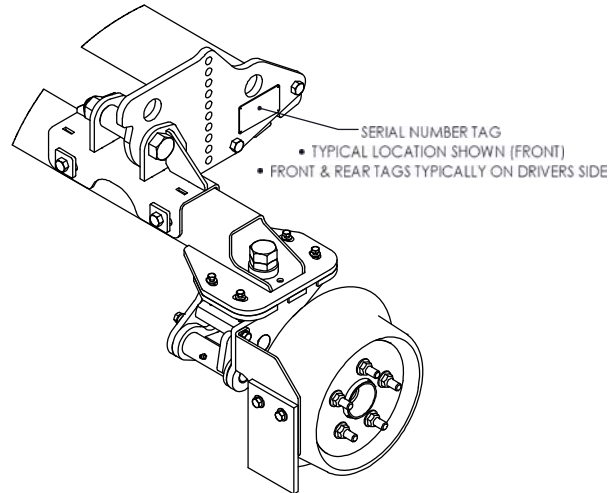


Figure 6.1.1 RW-1016 Typical Serial Number Locations

6.1.2 Common Terminology

RW-1016 Railgear assemblies share many components between the front and rear assemblies. The following terminologies are used to describe many shared parts and assemblies:

- **"SIDE A" (without cylinder)**
 - Driver side on front assemblies; Passenger side on rear assemblies.
- **"SIDE B" (with cylinder)**
 - Passenger side on front assemblies; Driver side on rear assemblies.

6.1.3 Custom Applications

If your Railgear was built for a non-standard rail gauge or using special wheel profiles (this is especially prevalent on transit systems), please inform the DMF Parts Department when ordering. Part numbers for these custom applications are not included in the following diagrams. Many components for custom applications are visually similar to the standard components shown here, but are not interchangeable.

6.1.4 Returns

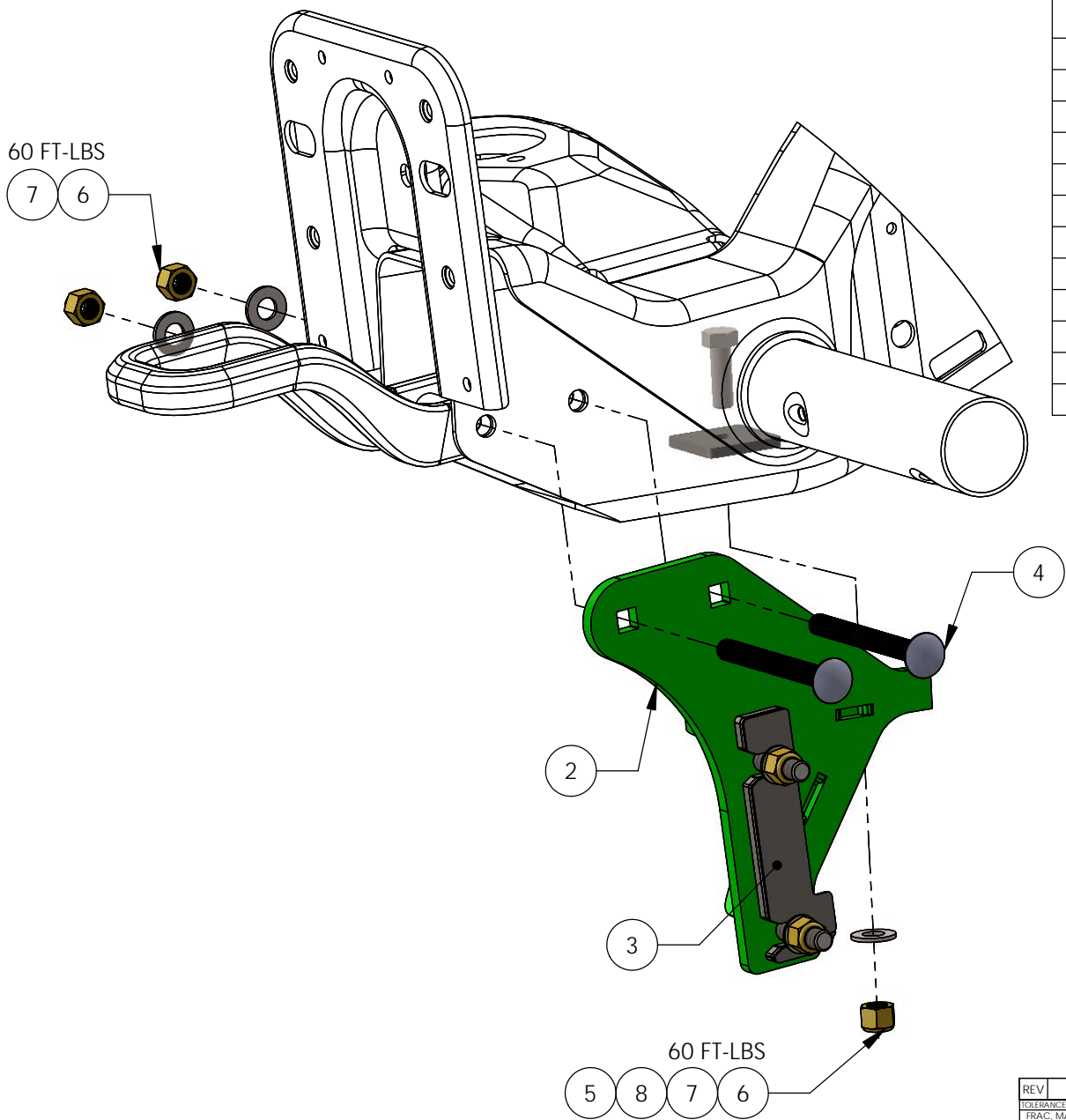
DMF has a Return Authorization Procedure. You must contact DMF for an RA# before returning any parts for any reason. Parts will not be credited without an RA#.

6.1.5 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.

6.2 RAILGEAR MOUNTING KITS

2020+ GM 2500/3500 FRONT

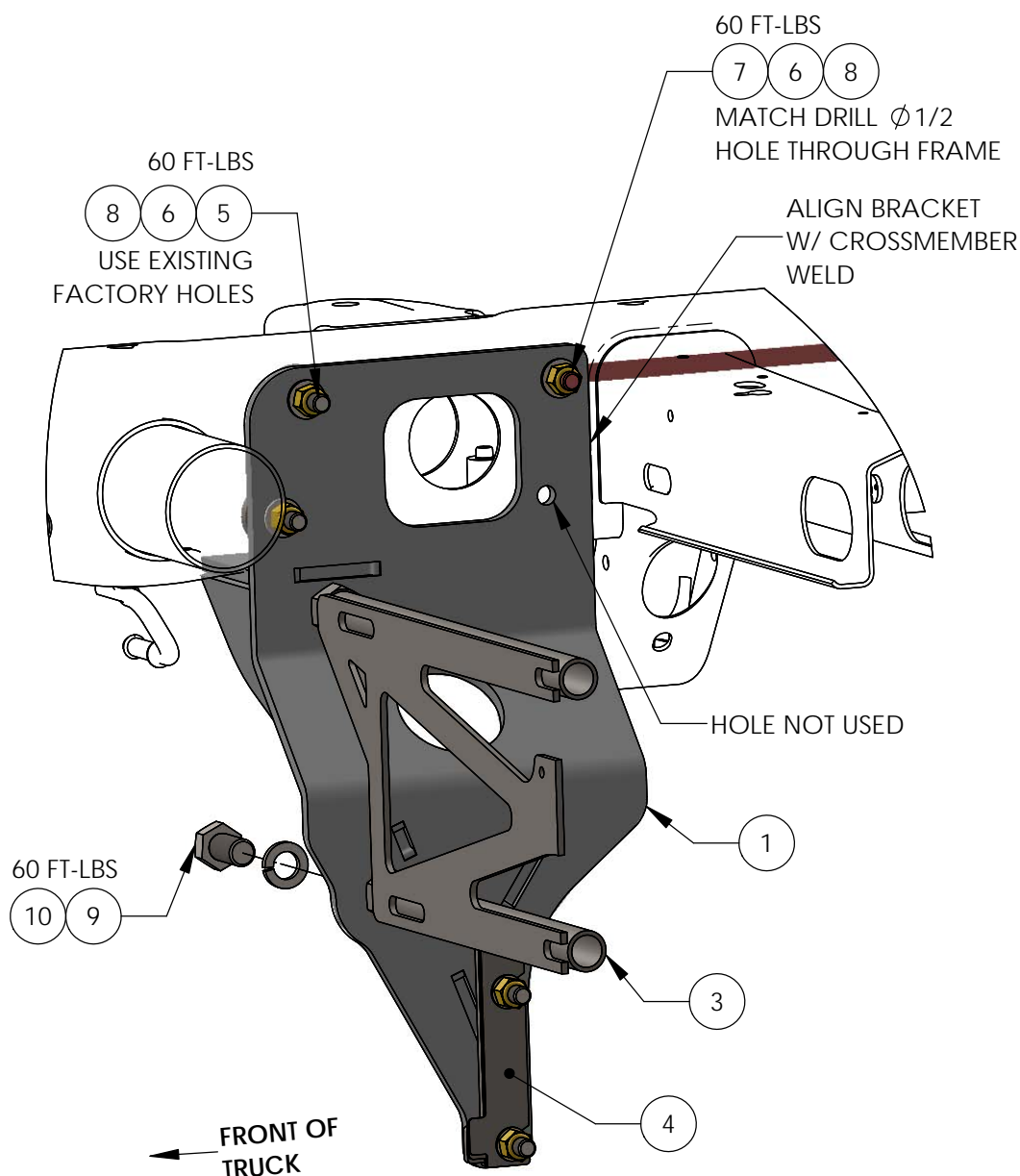


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703156	1	WELDMENT, FRONT FRAME BRACKET, DS, '20 GM, RW-1016
2	703157	1	WELDMENT, FRONT FRAME BRACKET, PS, '20 GM, RW-1016
3	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8
4	605736	4	CARRIAGE BOLT, 1/2-13 X 5, GRADE 8
5	818466	2	HHCS, 1/2-13 X 1-1/2", GR8
6	113014	6	1/2"-13 NYLOCK NUT; GR8
7	500691	6	FLAT WASHER, 1/2", GR8
8	600318	2	SQUARE WASHER, 1/2"

- NOTES:
- 1. PASSENGER'S SIDE FRAME BRACKET INSTALLATION SHOWN, SIMILAR TO DRIVER'S SIDE INSTALLATION
 - 2. CARRIAGE BOLTS ARE TO REPLACE EXISTING TOW HOOK HARDWARE, LEAVE CRUSH TUBES IN PLACE
 - 3. PLACE HEX HEAD BOLT & SQUARE WASHER THROUGH FRONT OF FRAME & OUT FACTORY HOLE IN BOTTOM OF TUBE
 - 4. SECURE HARDWARE TO BOTTOM OF FRAME BRACKET
 - 5. RETAIN SHIMS & REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR, SEE DRAWING M101602 & MANUAL SECTION 4.4

REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED): FRACTIONAL: ± 1/32" DECIMAL: ± 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		RW-1016	TITLE: FRONT MOUNT KIT, '20 GM PICKUP, RW-1016	
DRAWN BY: DJJ		APPD BY: -	DATE: 12/19/19	THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.
DMF (404)875-1512			DRAWING NUMBER: 703151	REV: #

2020+ GM 2500/3500 REAR



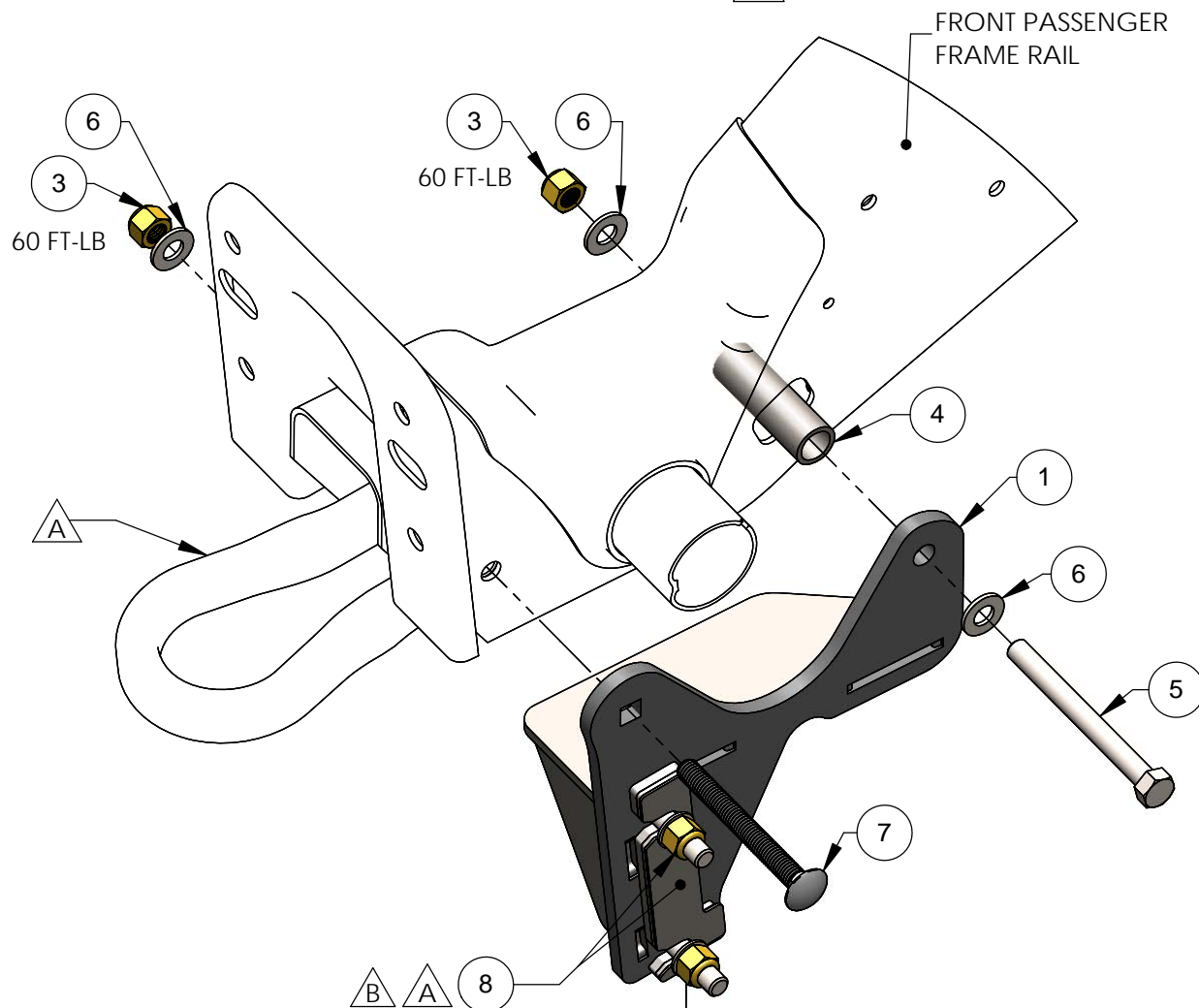
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703042	1	PS REAR FRAME BRACKET; '11 GM PICKUP
2	703043	1	DS REAR FRAME BRACKET; '11 GM PICKUP
3	703062	1	REAR BRACKET CROSS BRACE; '11 GM; RW-1016
4	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8
5	703049	2	BOLT PLATE WELDMENT; REAR BRACKET; '11 GM PICKUP
6	500691	6	FLAT WASHER, 1/2", GR8
7	304147	2	HANDLE BOLT ASSEMBLY, 11-9/16 HANDLE, 1/2-13 X 1-1/2 BOLT
8	113014	6	1/2"-13 NYLOCK NUT; GR8
9	605541	4	HHCS 3/4-10 X 1-1/2"; GR8
10	820462	4	LOCK WASHER, 3/4", GR8

NOTES:

1. PASSENGER'S SIDE BRACKET SHOWN ONLY, SIMILAR PROCESS FOR DRIVER'S SIDE
2. FIT BRACKET SNUG AGAINST BOTTOM OF FRAME
3. MOVE BRACKET AS FAR BACK AS POSSIBLE CONTACTING CROSSMEMBER WELD, ENSURE REAR MOUNTING HOLES ALIGN W/ HOLES IN FRAME
4. MARK/MATCH DRILL Ø 1/2 HOLE IN FRAME AS INDICATED
5. MOUNT OPPOSING BRACKET USING SAME PROCEDURE, ENSURING BRACKETS ARE OF EQUAL DISTANCE FROM CROSSMEMBER
6. INSTALL CROSS BRACE BETWEEN BRACKETS
7. RETAIN SHIMS & REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR, SEE DRAWING M101602 & MANUAL SECTION 4.4

REV	DATE	DESCRIPTION	BY	APP
<div> <div> 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 </div> <div> RW-1016 DRAWN BY: DJJ APPD BY: - DATE: 12/16/19 </div> <div> TITLE: REAR MOUNT KIT, '20 GM PICKUP, RW-1016 THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED. DATE: 12/16/19 DWF DRAWING NUMBER: 703152 REV: # </div> </div>				

2011-2019 GM 2500/3500 FRONT C



FACTORY TOW HOOK BOLT
REMOVE AND REINSTALL THRU
BOTTOM OF FRAME BRACKET

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703034	1	PS FRONT FRAME BRACKET; '11 GM PICKUP
2	703035	1	DS FRONT FRAME BRACKET; '11 GM PICKUP
3	113014	4	1/2"-13 NYLOCK NUT; GR8
4	703048	2	FRONT CRUSH TUBE, '11 GM PICKUP; RW-1016
5	605020	2	HHCS, 1/2-13 X 5", GR8
6	500691	6	FLAT WASHER, 1/2", GR8
7	605599	1	CARRIAGE BOLT; 1/2-13 X 4-1/2"; GRADE 8
8	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

NOTES:

- PASSENGER SIDE FRAME BRACKET INSTALLATION SHOWN. DRIVERS SIDE SIMILAR.
- TOW HOOK REMOVAL REQUIRED WHEN MOUNTING RAILGEAR IN HIGHEST POSITION. INSTALLER MUST PROVIDE HARDWARE AS REQUIRED.
- SOME FRAME COMPONENTS HIDDEN FOR CLARITY.
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

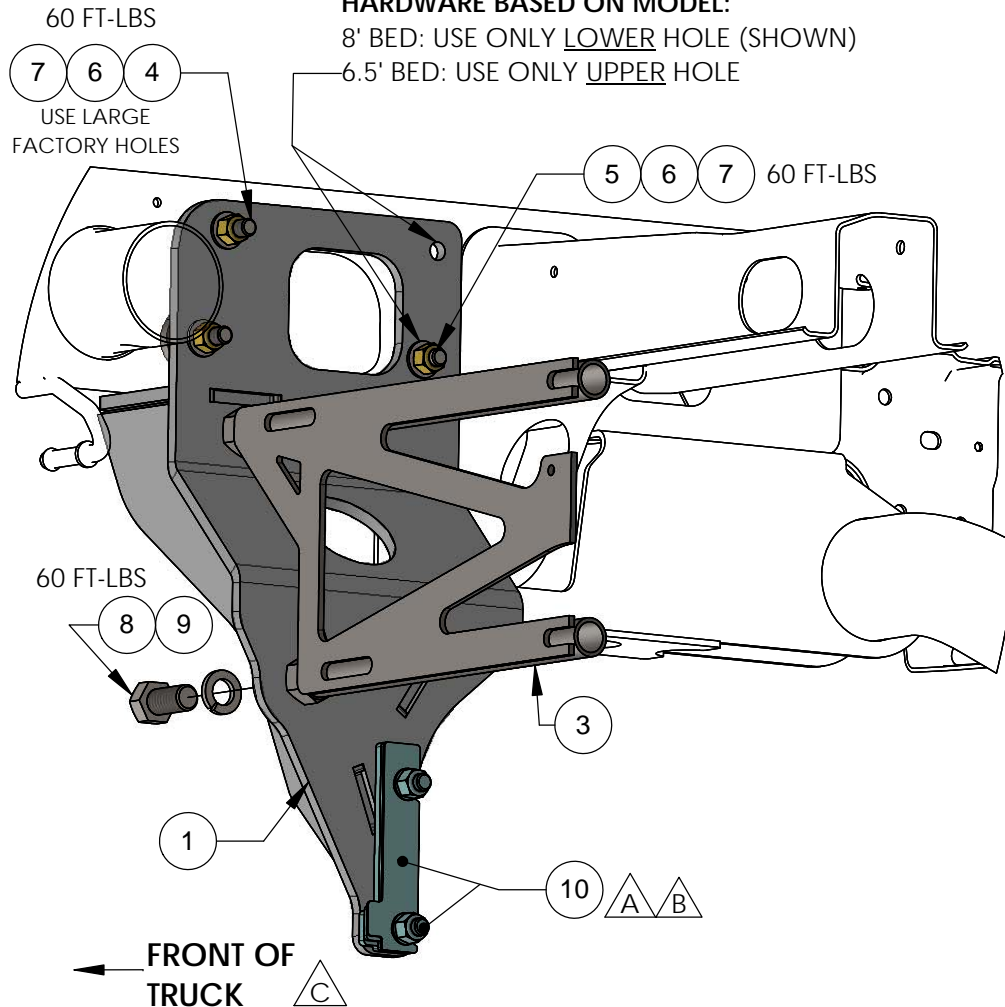
C	12/19/19	2011-2019 WAS 2011+	DJJ	
B	08/10/17	REMOVED 703058 FROM SHIMS	DJJ	
A	05/17/17	BRACKETS AND HARDWARE MODIFIED TO RETAIN TOW HOOKS. REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES: (UNLESS SPECIFIED)		TITLE: FRONT MOUNT KIT; '11-'19 GM PICKUP; RW-1016		
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512		
FRAC. OTHER: ± 1/16"		DATE: 08/14/15		
.XX ± .063		DRAWING NUMBER: 703040		
.XX ± .030		REV: C		
.XXX ± .005				
DRILL SIZES: ± .015				
ANGULAR: ± 1"				
SURF FINISH: 125 MICRO				
THREADS: 2A AND 2B				
RW-1016				
DRAWN BY: TAM				
APPD BY: -				

2011-2019 GM 2500/3500 REAR

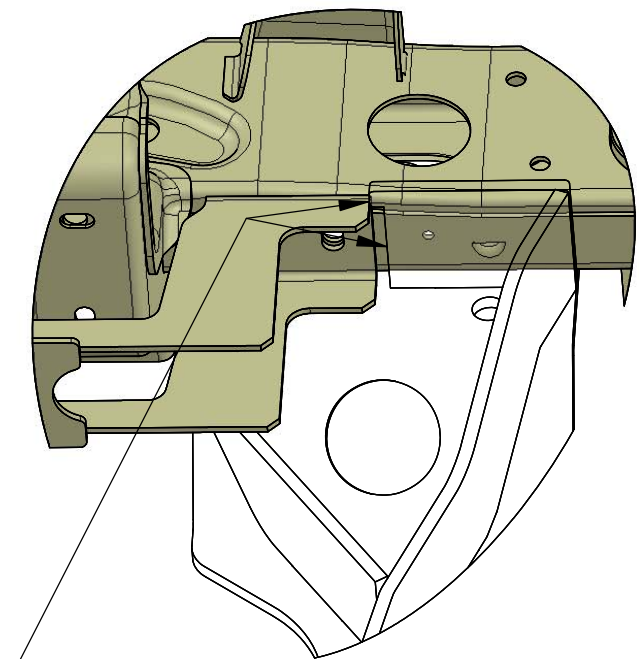
**MATCH DRILL ϕ 1/2" HOLE AND INSTALL
HARDWARE BASED ON MODEL:**

8' BED: USE ONLY LOWER HOLE (SHOWN)

6.5' BED: USE ONLY UPPER HOLE



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703042	1	PS REAR FRAME BRACKET: '11 GM PICKUP
2	703043	1	DS REAR FRAME BRACKET: '11 GM PICKUP
3	703062	1	REAR BRACKET CROSS BRACE: '11 GM: RW-1016
4	703049	2	BOLT PLATE WELDMENT: REAR BRACKET: '11 GM PICKUP
5	818466	2	HHCS, 1/2-13 X 1-1/2", GR8
6	113014	6	1/2"-13 NYLOCK NUT: GR8
7	500691	8	FLAT WASHER, 1/2", GR8
8	605541	4	HHCS 3/4-10 X 1-1/2", GR8
9	820462	4	LOCK WASHER, 3/4", GR8
10	703057	1	MOUNTING SHIM SET: RW-1016
	703059	2	MOUNTING SHIM: .25": RW-1016
	703060	2	MOUNTING SHIM: .125": RW-1016
	703061	2	MOUNTING SHIM: .0625": RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT: GR8



LOCATE BRACKET BOTTOM PLATE AGAINST HITCH:

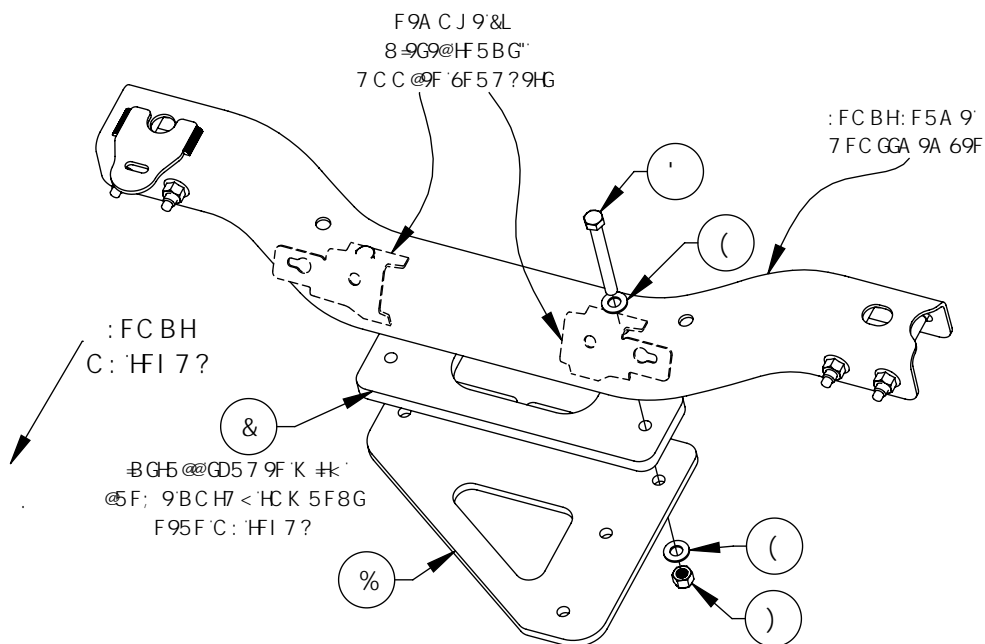
- 8' BED: HITCH CONTACTING SHORT EDGE (SHOWN)
- 6.5' BED: HITCH CONTACTING LONG EDGE

NOTES:

- FIT BRACKETS SNUG AGAINST BOTTOM OF FRAME BEFORE MARKING/DRILLING HOLES.
- PASSENGER SIDE FRAME BRACKET INSTALLATION SHOWN. DRIVERS SIDE SIMILAR.
- INSTALL CROSSBRACE AFTER BRACKETS ARE MOUNTED.
- SOME FRAME COMPONENTS HIDDEN FOR CLARITY.
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

C	12/17/19	2011-2019 WAS 2011+, ADDED ORIENTATION OF TRUCK	DJJ	
B	08/10/17	REMOVED 703058 FROM SHIMS	DJJ	
A	05/17/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES: (UNLESS SPECIFIED)		TITLE: REAR MOUNT KIT; '11-19' GM PICKUP; RW-1016		
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512		
FRAC. OTHER: ± 1/16"		DRAWN BY: APPD BY:		
XX ± .063		DATE: 08/15/15		
XXX ± .030		DRAWING NUMBER: 703041		
XXX ± .005		REV: C		
DRILL SIZES: ± .015				
ANGULAR: ± 1"				
SURF FINISH: 125 MICRO				
THREADS: 2A AND 2B				

&\$%+Ž:CF8:!!&\$#)\$ /; 5G9B; B9CB@M



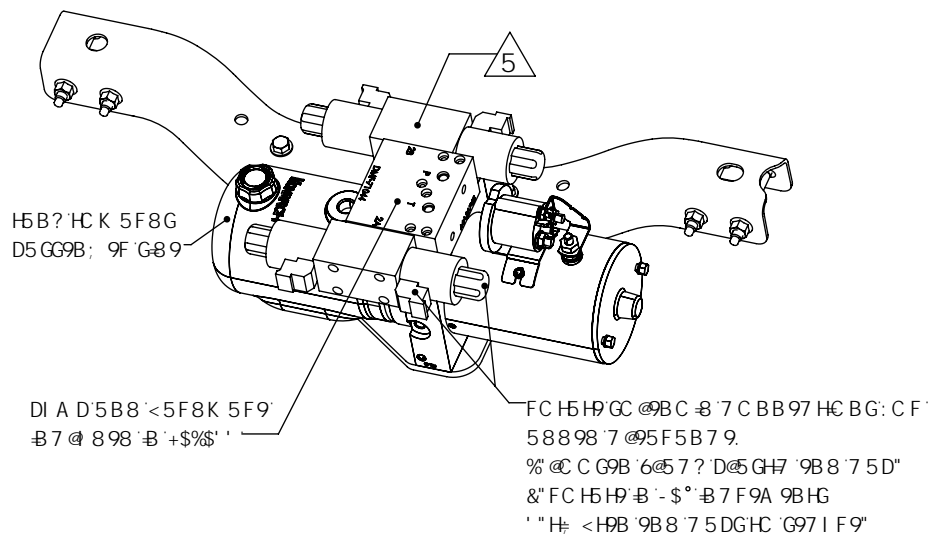
5

#PA 'BC"	D5FH BIA 69F	E HM	89G7 F-DHC B
%	+\$%)\$	%	:FCBHDI A D'6F57?9H?#6C@HCB/9%+:CF8!: 5G9B: B9ZFK !%\$%
&	+\$%)\$	%	DI A D'GD57 9FZ9%+:CF8!: 5GCB@ZFK !%\$%
'	*\$)'(*	&	<<7G? #1%L' !%#&Z: F,
(%)\$	(:6HK 5G<9FZ' #, 'Z: F,
)	*\$)\$++	&	' #, 1% BM&C 7? B1H: F,

DI A D'6F57?9H-BG5@5HCB.

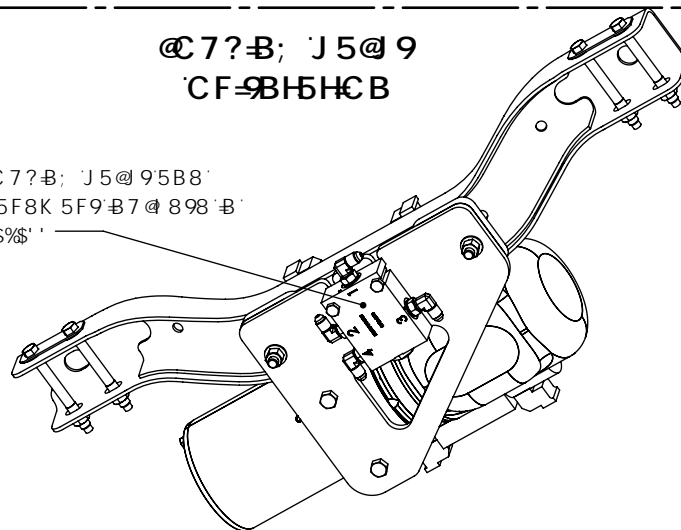
%'A C I B H D I A D'5B8'6F57?9H69: CF9F5@ 95F"
&'7<69@CF'7I H&L'8-9G9@H5BGA 6G€B'7CC@F'6F57?9HG'
fG<CK B'85G<98E: FCA'7FC GGA 9A 69F"
'"; F-B8'C::'5BMF9A 5-B-B; 'K 9@8'6958'5B8'HC17<'I D'
D5-BH7FC GGA 9A 69F'5GB97 9G5FM
("BG5@DI A D'6F57?9H5; 5-BGH6C HCA 'C: '
7FC GGA 9A 69F'I GB; :57HC FM<C@G5B8'B7@ 898'
<5F8K 5F9"

DI A D'ACI BHB; 'CF-9BH5HCB



@7?B; J5@9
'CF-9BH5HCB

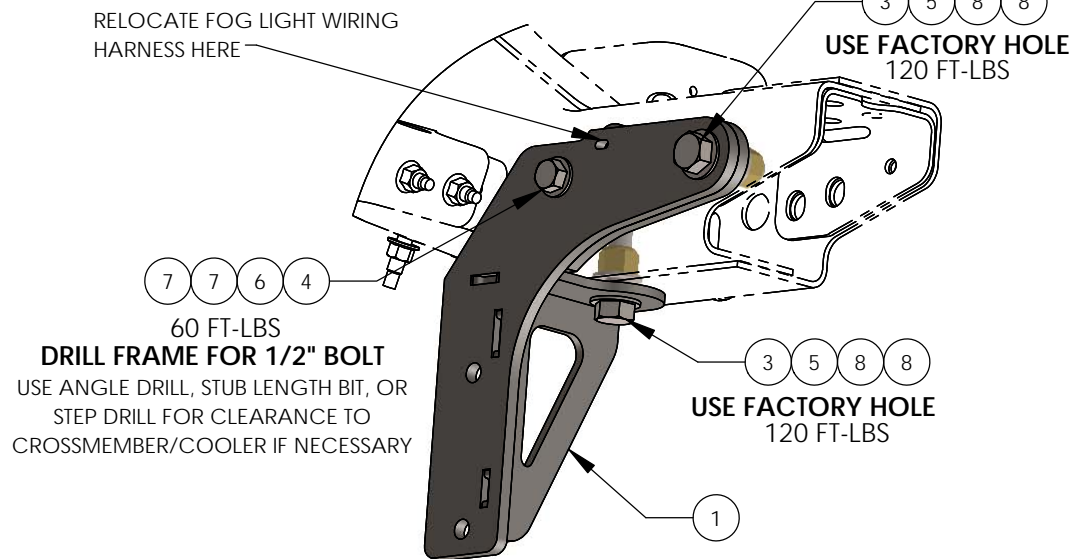
@7?B; J5@95B8'
<5F8K 5F9'B7@ 898'B'
+'\$%''



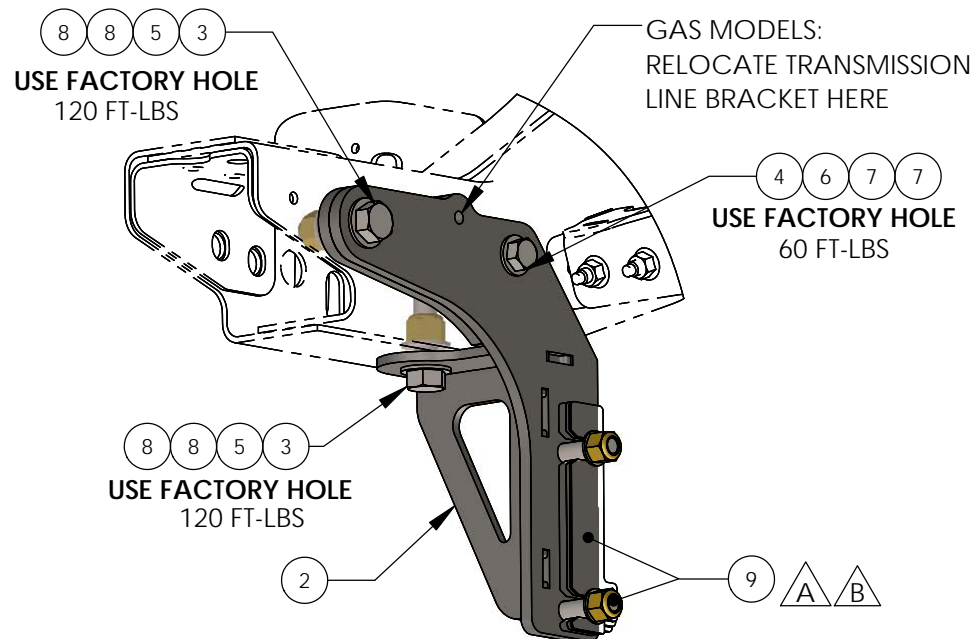
5	\$(%#%)	588 DI A D'GD57 9F'+'\$%)\$) /(')\$' (*'K 5G*\$)' &-/1 D85H98 DI A D'AC B9@5B8 @C7?B; J5@9@C75HCB	H5A	
F9J	85H9	89G7 F-DHC B	6M	5DD
FC H5H'GC @9BC-8'7CBB97HC BG: CF' 58898'7@5F5B79		FK !%\$%		
:F57A 57< -'9F' & :F57C H&9F: -'998" -'S" -'S' S -'S\$) -'S\$) 8F'@GARG 2'59) 5B: 146F -'98 G F: :4 G: -'98) A 7FC H&F95BG 85 588 86 8F957G:5FD98: 9C'3' L(1)2A 55		:FCBHDI A D'6F57?9H?#V6C@HCB/9%+:CF8!: 5GCB@ZFK !%\$%		
8A: T(\$L+)!9) %&		H-K-68F5K-B: 7CBH5@G7CB: 89BH5@DFC DF 9H5FM: CFA 5HCB C: B J 9F G-98 A 946@56F-75HC F&Z B7 FBA: E'7CDM: <HBA: 25@MF: <HGF909F J 98"		
8F5K B 6M		5DD8 6M	85H9	
H5A	!	\$%#&*#%+	DMF	8F5K B: BIA 69F: F9J: +\$%)\$) 5

2017+ FORD F-250/350 FRONT

DRIVER SIDE BRACKET INSTALLATION



PASSENGER SIDE BRACKET INSTALLATION



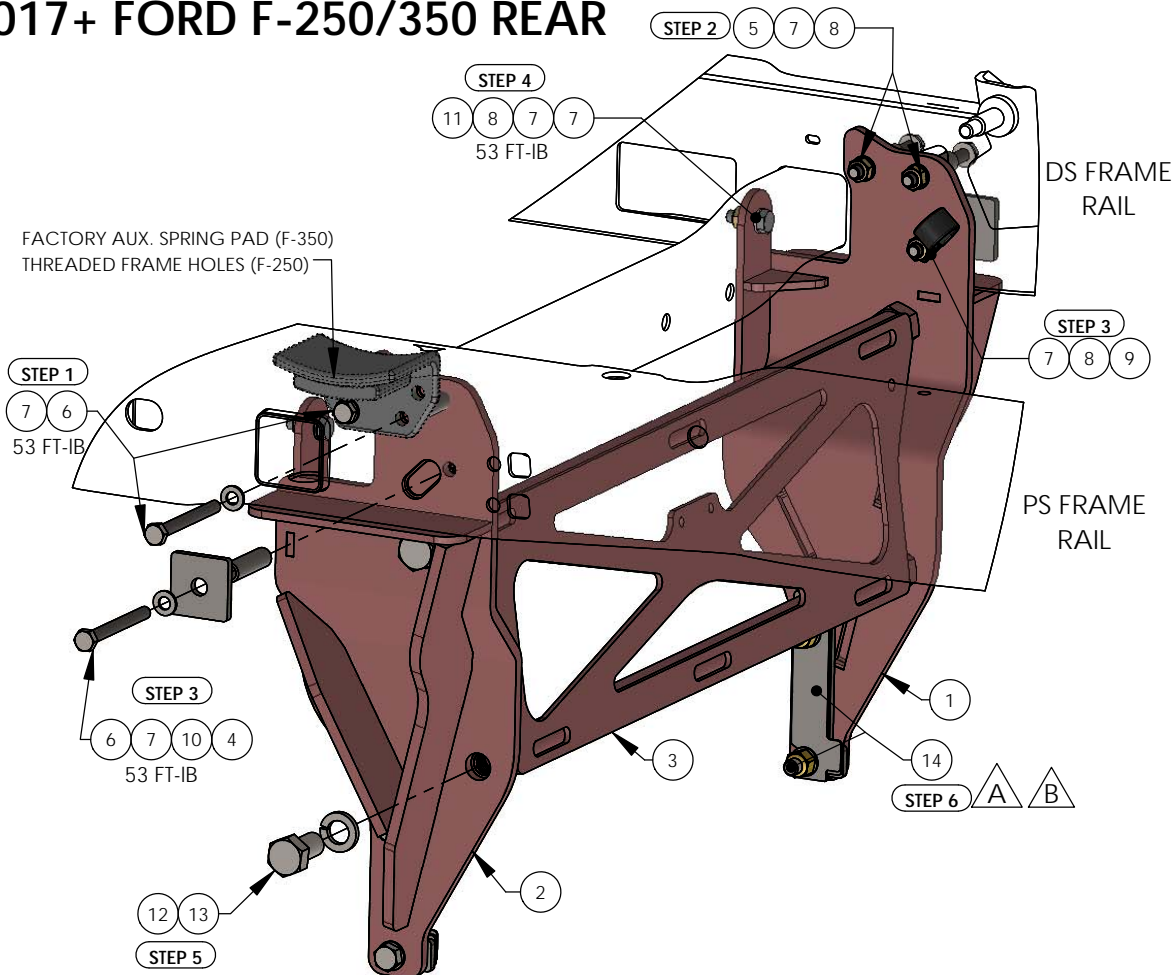
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703102	1	DS FRONT BRACKET; '17 FORD PICKUP; 4X4; RW-1016
2	703103	1	PS FRONT BRACKET; '17 FORD PICKUP; 4X4; RW-1016
3	605573	4	HHCS, 5/8-11 X 2-1/4", GR8
4	605276	2	HHCS, 1-2/13 X 2-1/4", GR8
5	605075	4	5/8"-11 NYLOCK NUT; GR8
6	113014	2	1/2"-13 NYLOCK NUT; GR8
7	500691	4	FLAT WASHER, 1/2", GR8
8	605076	8	FLAT WASHER, 5/8", GR8
9	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

INSTALLATION NOTES:

- WHEN USING FRONT MOUNT PUMP KIT 701055, INSTALL PUMP BRACKET AND PUMP **BEFORE** MOUNTING RAILGEAR TO BRACKETS.
- SOME FRAME COMPONENTS HIDDEN FOR CLARITY. REMOVE FACTORY RUN-UNDER BRACKETS. TOW HOOKS CAN BE LEFT IN PLACE.
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

B	08/10/17	REMOVED 703058 FROM SHIMS	DJJ	
A	05/16/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE:		
FRAC. MACH:	± 1/32"	RW-1016		
FRAC. OTHER:	± 1/16"			
.X	± .063	FRONT MOUNT KIT; '17 FORD PICKUP; 4X4; RW-1016		
.XX	± .030			
.XXX	± .005	THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
DRAWING SIZES:	± .015			
ANGULAR:	± 1"	DRAWN BY: APPD BY: DATE: 09/06/16		
SURF FINISH:	125 MICRO			
THREADS:	2A AND 2B	DMD		
BREAK SHARP EDGES .03 X 45° MAX				
DMF (404)875-1512		DRAWING NUMBER: 703100		
		REV: B		

2017+ FORD F-250/350 REAR



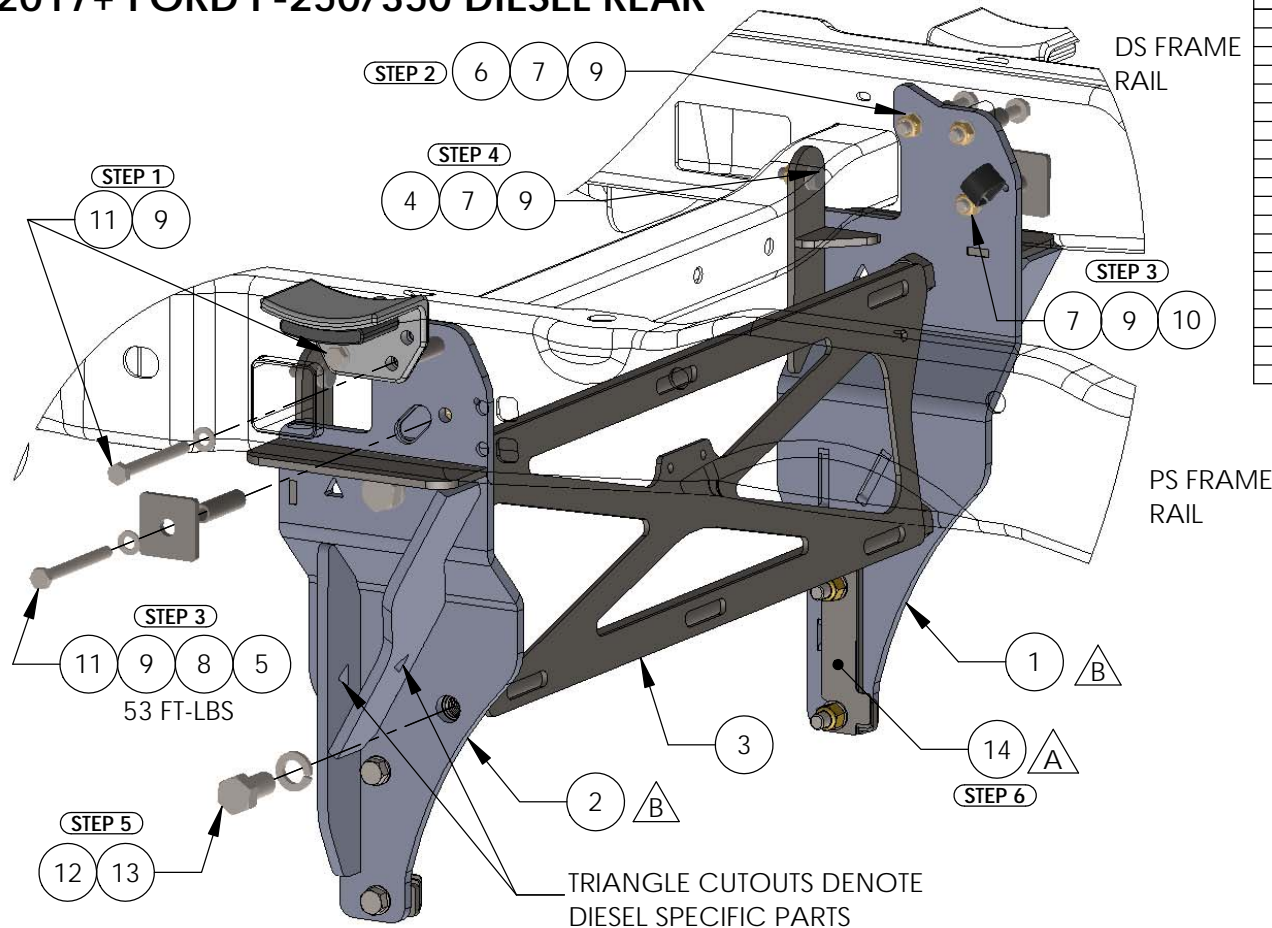
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703112	1	DS REAR BRACKET; '17 FORD PICKUP; 4X4; RW-1016
2	703113	1	PS REAR BRACKET; '17 FORD PICKUP; 4X4; RW-1016
3	703124	1	REAR BRACKET CROSS BRACE; '17 FORD PICKUP; RW-1016
4	703121	2	LONG CRUSH TUBE; REAR BRACKET; '17 FORD; RW-1016
5	703120	4	SHORT CRUSH TUBE; REAR BRACKET; '17 FORD; RW-1016
6	605589	6	HHCS; M10x1.5, 100mm FULL THRD, CLASS 10
7	605429	16	FLAT WASHER, M10
8	605551	8	NYLOCK NUT; M10x1.5; CLASS 10.9
9	605591	1	CUSHION CLAMP; 1" DIA
10	600318	2	SQUARE WASHER, 1/2"
11	605590	2	HHCS, M10X1.5, 30MM, CLASS 10
12	820462	4	LOCK WASHER, 3/4", GR8
13	605541	4	HHCS 3/4-10 X 1-1/2"; GR8
14	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

INSTALLATION STEPS (BOTH SIDES SIMILAR):

- F-350:** REMOVE AND REPLACE THE TWO LOWER BOLTS IN THE AUX. SPRING PAD. **F-250:** INSTALL THE PROVIDED BOLTS IN THE TWO LOWER THREADED FRAME HOLES.
- FROM INBOARD SIDE, INSTALL SHORT CRUSH TUBES (2/SIDE) ON BOLTS. HANG REAR BRACKETS ON BOLTS. ENSURE BOTTOM OF FRAME IS CONTACTING TOP OF FRAME BRACKET AND SECURE BRACKETS WITH WASHERS AND LOCKNUTS.
- MATCH DRILL $\varnothing 7/16"$ THROUGH BRACKET AND INBOARD FRAME RAILS. INSTALL BOLT, WASHERS, AND LONG CRUSH TUBE THROUGH OUTBOARD FRAME SLOT AND BRACKET. SECURE WITH WASHER AND LOCKNUT FROM INBOARD SIDE. **DS ONLY:** TRIM PLASTIC WIRING HARNESS CONDUIT TO FIT, SECURE HARNESS WITH INCLUDED CLAMP.
- DS ONLY:** MATCH DRILL $\varnothing 7/16"$ THROUGH BRACKET AND CROSSMEMBER. SECURE WITH BOLTS, WASHERS, LOCKNUTS (**USE EXISTING HOLE ON PS SIDE, REMOVE FACTORY SLIP NUT**).
- INSTALL CROSSMEMBER BETWEEN BRACKETS. PLATE FACES FRONT OF TRUCK. SECURE WITH BOLTS AND LOCKNUTS.
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

B	08/10/17	REMOVED 703058 FROM SHIMS		DJJ	
A	05/17/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057		TAM	
REV	DATE	DESCRIPTION		BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1016		TITLE:	
FRAC. MACH:				REAR MOUNT KIT; '17 FORD PICKUP; 4x4; RW-1016	
FRAC. OTHER:				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.	
X				DRAWN BY:	
XX				TAM	
XXX				APPD BY:	
DRILL SIZES:				DATE:	
ANGULAR:				09/06/16	
SURF FINISH:				DRAWING NUMBER:	
THREADS:				703101	
BREAK SHARP EDGES .03 X 45° MAX				REV:	
DMF (404)875-1512				B	

2017+ FORD F-250/350 DIESEL REAR



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703182	1	DS REAR BRACKET, DIESEL, '17 FORD PICKUP, 4X4, RW-1016
2	703130	1	PS REAR BRACKET, DIESEL, '17 FORD PICKUP, 4X4, RW-1016
3	703124	1	REAR BRACKET CROSS BRACE, '17 FORD PICKUP, RW-1016
4	605590	2	HHCS, M10X1.5, 30MM, CLASS 10
5	600318	2	SQUARE WASHER, 1/2"
6	703120	4	SHORT CRUSH TUBE: REAR BRACKET, '17 FORD: RW-1016
7	605551	8	NYLOCK NUT: M10X1.5: CLASS 10.9
8	703121	2	LONG CRUSH TUBE: REAR BRACKET, '17 FORD: RW-1016
9	605429	16	FLAT WASHER, M10
10	605591	1	CUSHION CLAMP: 1" DIA
11	605589	6	HHCS: M10x1.5, 100mm FULL THRD, CLASS 10
12	820462	4	LOCK WASHER, 3/4", GR8
13	605541	4	HHCS 3/4-10 X 1-1/2", GR8
14	703057	1	MOUNTING SHIM SET: RW-1016
	703059	2	MOUNTING SHIM: .25": RW-1016
	703060	2	MOUNTING SHIM: .125": RW-1016
	703061	2	MOUNTING SHIM: .0625": RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT: GR8

INSTALLATION STEPS (BOTH SIDES SIMILAR):

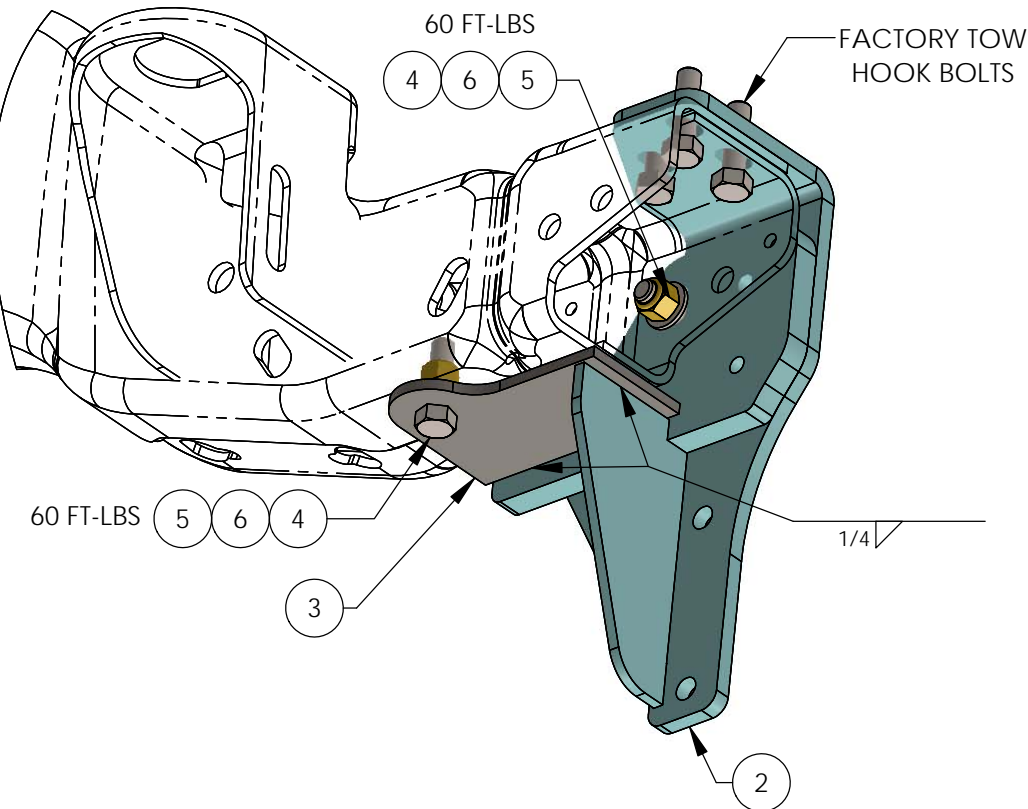
- F-350:** REMOVE AND REPLACE THE TWO LOWER BOLTS IN THE AUX. SPRING PAD. **F-250:** INSTALL THE PROVIDED BOLTS IN THE TWO LOWER THREADED FRAME HOLES.
- FROM INBOARD SIDE, INSTALL SHORT CRUSH TUBES (2/SIDE) ON BOLTS. HANG REAR BRACKETS ON BOLTS. ENSURE BOTTOM OF FRAME IS CONTACTING TOP OF FRAME BRACKET AND SECURE BRACKETS WITH WASHERS AND LOCKNUTS.
- MATCH DRILL $\varnothing 7/16"$ THROUGH BRACKET AND INBOARD FRAME RAILS. INSTALL BOLT, WASHERS, AND LONG CRUSH TUBE THROUGH OUTBOARD FRAME SLOT AND BRACKET. SECURE WITH WASHER AND LOCKNUT FROM INBOARD SIDE. **DS ONLY:** TRIM PLASTIC WIRING HARNESS CONDUIT TO FIT, SECURE HARNESS WITH INCLUDED CLAMP.
- DS ONLY:** MATCH DRILL $\varnothing 7/16"$ THROUGH BRACKET AND CROSSMEMBER. SECURE WITH BOLTS, WASHERS, LOCKNUTS (**USE EXISTING HOLE ON PS SIDE, REMOVE FACTORY SLIP NUT**).
- INSTALL CROSSMEMBER BETWEEN BRACKETS. PLATE FACES FRONT OF TRUCK. SECURE WITH BOLTS AND LOCKWASHERS.
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

EXHAUST MODIFICATIONS:

REFER TO RW-1016 INSTALLATION MANUAL FOR EXHAUST RELOCATION RECOMMENDATIONS BEFORE BEGINNING INSTALLATION OF REAR RAILGEAR

B	08/26/20	703182 WAS 703112, UPDATED BRACKET PROFILE, ADDED EXHAUST NOTE		DJJ		
A	8/15/2019	CORRECTED BOM QUANTITIES FOR SHIM SET			TAM	
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE: REAR MOUNT KIT; '17 FORD DIESEL PICKUP; 4x4; RW-1016				
FRACTIONAL: ± 1/32"						
FRACTIONAL, OTHER: ± 1/16"		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.				
.XX: ± .063						
.XXX: ± .030		DRAWN BY: ARB				
DRILL SIZES: ± .005						
ANGULAR: ± .015		DATE: 06/27/18				
SURF FINISH: 125 MICRO						
THREADS: 2A AND 2B		DRAWING NUMBER: 703126				
BREAK SHARP EDGES .03 X .45" MAX						
DMF (404)875-1512		REV: B				

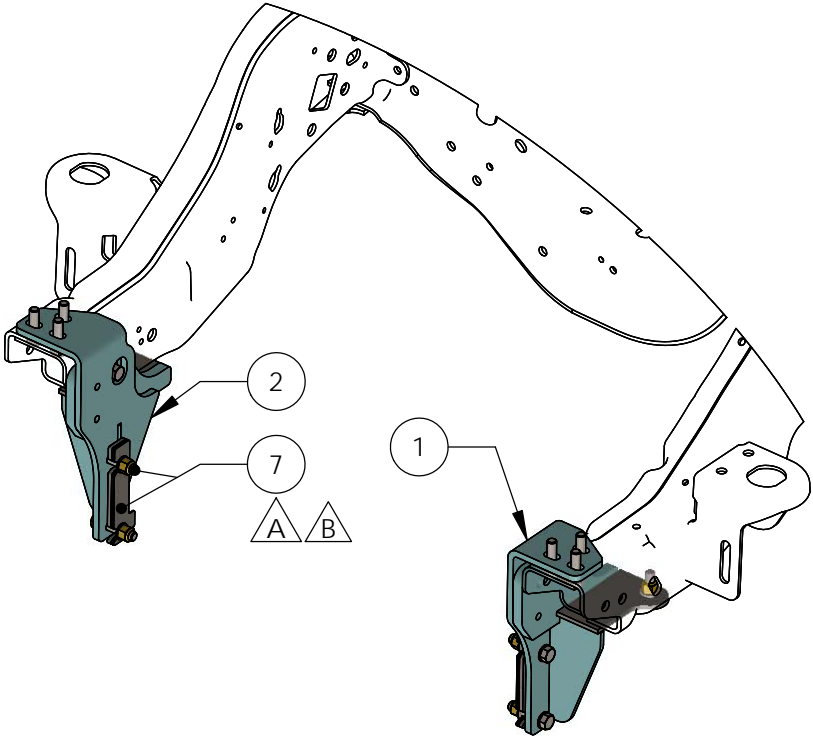
2008-2016 FORD F-250/350 FRONT



BRACKET INSTALLATION:

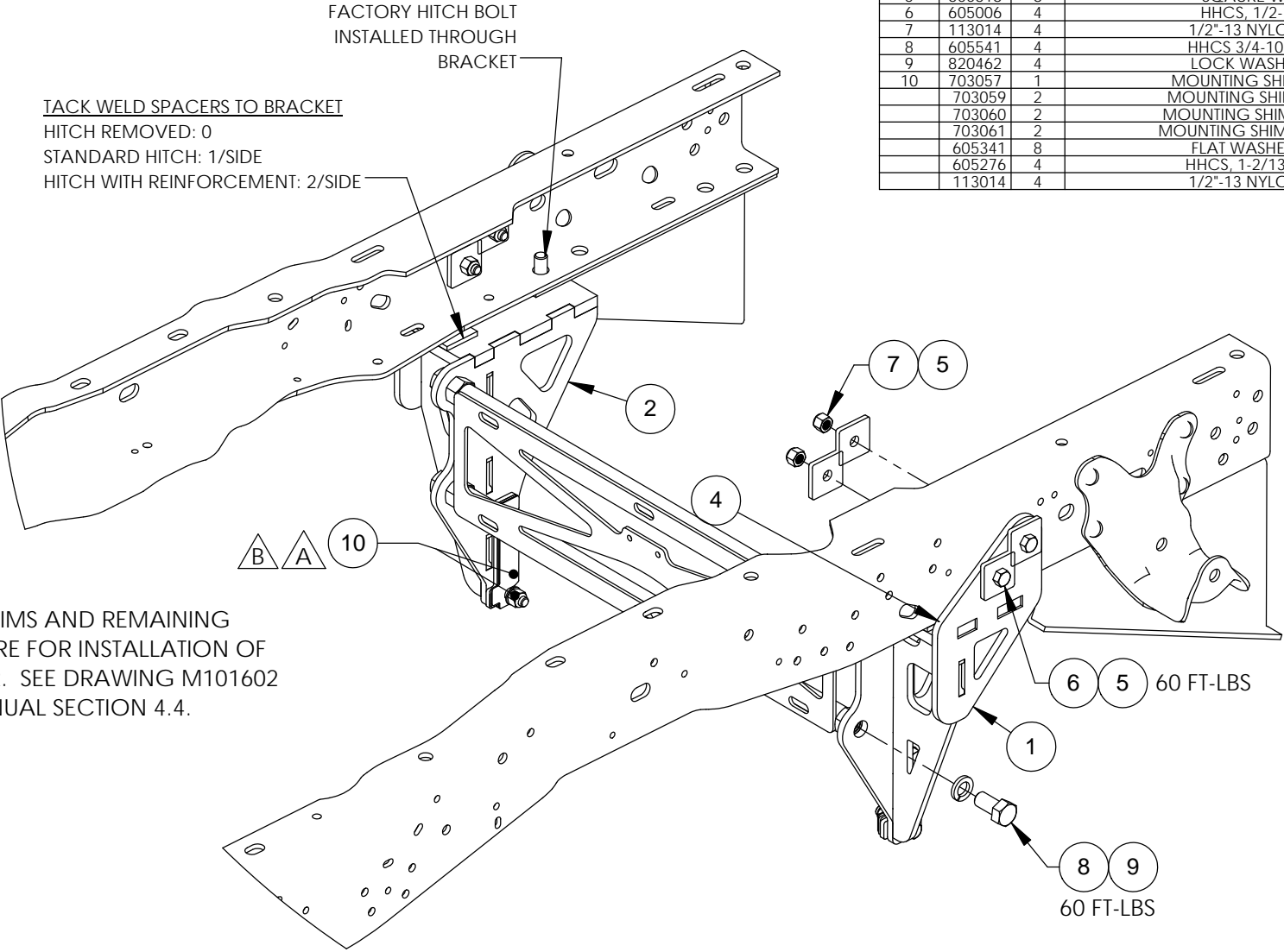
- 1. PASSENGER SIDE SHOWN, DRIVER SIDE SIMILAR.
- 2. REMOVE FACTORY TOW HOOK BOLTS (3X/SIDE).
- 3. INSTALL BRACKETS ON FRAME USING HARDWARE ON INBOARD SIDE, AND TOW HOOK BOLTS (REINSTALL TOW HOOKS ON TOP OF BRACKETS).
- 4. POSITION BOTTOM PLATES AS SHOWN NAD CLAMP IN PLACE AGAINST BOTTOM OF FRAME RAILS.
- 5. WELD BOTTOM PLATES TO BRACKTS WHERE INDICATED. REPAINT BRACKETS AS NECESSARY.
- 6. MATCH DRILL THROUGH BOTTOM PLATES AND FRAME. INSTALL HARDWARE AS SHOWN.
- 7. RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703077	1	DS FRONT FRAME BRACKET; '08-16 FORD F-2/350; RW-1016
2	703076	1	PS FRONT FRAME BRACKET; '08-16 FORD F-2/350; 4X4; RW-1016
3	703082	2	BOTTOM PLATE; FT BRKT; '08-16 FORD F-2/350; RW-1016
4	605259	4	HHCS, 1/2-13 X 1-3/4", GR8
5	113014	4	1/2"-13 NYLOCK NUT; GR8
6	500691	4	FLAT WASHER, 1/2", GR8
7	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8



B	08/10/17	REMOVED 703058 FROM SHIMS		DJJ	
A	05/17/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057		TAM	
REV	DATE	DESCRIPTION		BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1016		TITLE:	
FRAC, MACH:				FRONT MOUNT KIT; '08-16 FORD F-2/350; RW-1016	
FRAC, OTHER:				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.	
.X				DRAWN BY:	
.XX				APPD BY:	
.XXX				DATE:	
DRILL SIZES:				08/08/16	
ANGULAR:				DMF	
SURF FINISH:				DRAWING NUMBER:	
THREADS:				703075	
BREAK SHARP EDGES .03 X .45" MAX				REV:	
DMF (404)875-1512				B	

2008-2016 FORD F-250/350 REAR

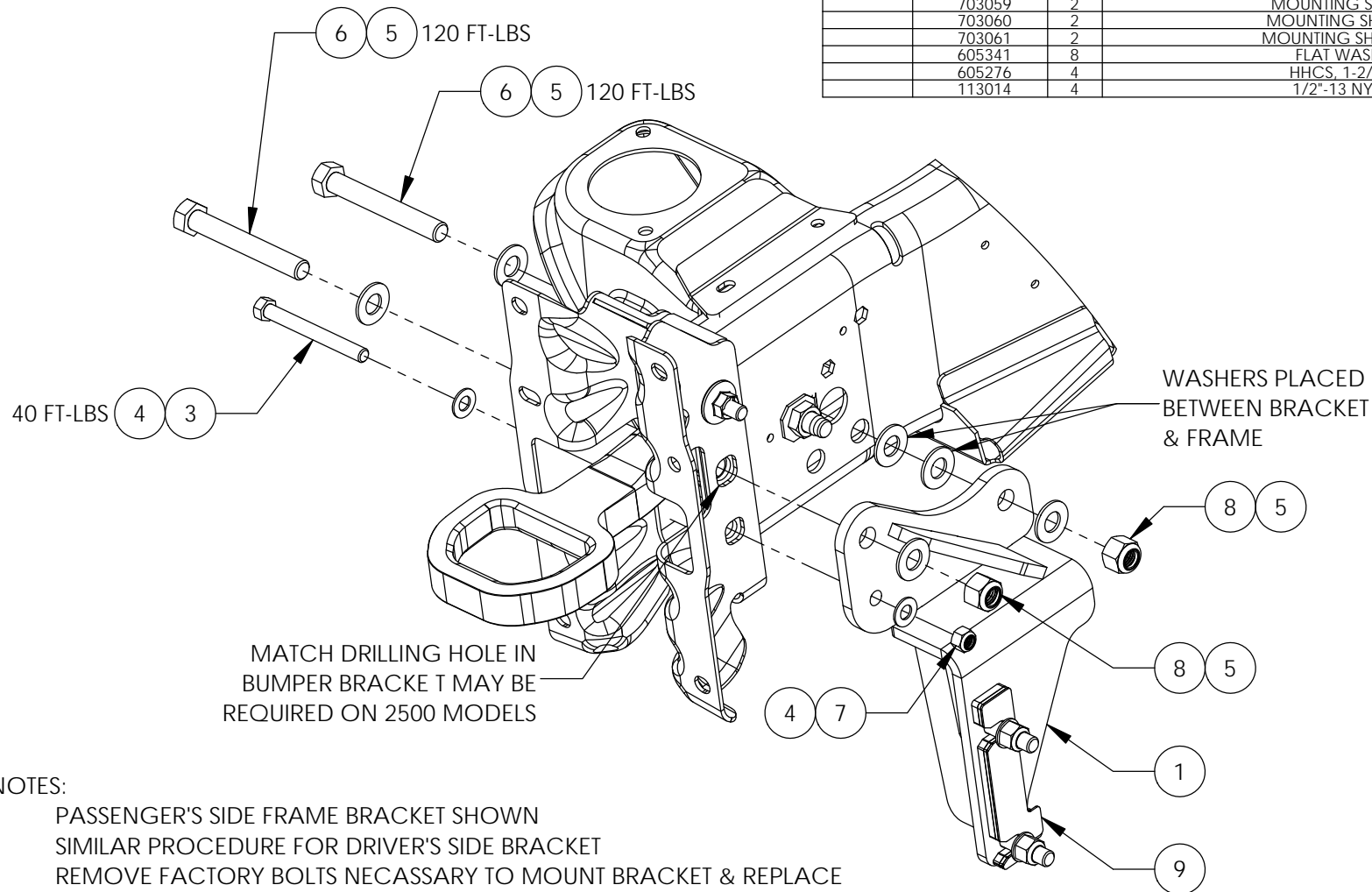


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703067	1	PS REAR FRAME BRACKET; '08+ FORD F-2/350
2	703066	1	PS REAR FRAME BRACKET; '08+ FORD F-2/350
3	703072	1	REAR BRACKET CROSS BRACE; '08+ FORD; RW-1016
4	703098	4	HITCH SPACER; '08-16 FORD F-2/350; 4X4; RW-1016
5	600318	8	SQAURE WASHER, 1/2"
6	605006	4	HHCS, 1/2-13 X 2", GR8
7	113014	4	1/2"-13 NYLOCK NUT; GR8
8	605541	4	HHCS 3/4-10 X 1-1/2"; GR8
9	820462	4	LOCK WASHER, 3/4", GR8
10	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

B	08/10/17	REMOVED 703058 FROM SHIMS	DJJ	
A	05/17/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057	TAM	
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				
		RW-1016	TITLE: REAR MOUNT KIT; '08 FORD F-2/350; 4X4; RW-1016	
			DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512	
DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:
TAM	-	05/15/16		703074
			REV:	B

2019+ RAM 2500/3500 FRONT

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703162	1	PS FRONT FRAME BRACKET WELDMENT, '19 RAM PICKUP, RW-1016
2	703161	1	DS FRONT FRAME BRACKET WELDMENT, '19 RAM PICKUP, RW-1016
3	605753	2	HHCS 7/16-14 X 4 GR8
4	605341	4	FLAT WASHER, 7/16", GR8
5	605076	12	FLAT WASHER, 5/8", GR8
6	605019	4	HHCS, 5/8-11 X 4-1/2", GR8
7	605111	2	7/16"-14 NYLOCK NUT: GR8
8	605075	4	5/8"-11 NYLOCK NUT: GR8
9	703057	1	MOUNTING SHIM SET: RW-1016
	703059	2	MOUNTING SHIM: .25": RW-1016
	703060	2	MOUNTING SHIM: .125": RW-1016
	703061	2	MOUNTING SHIM: .0625": RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT: GR8

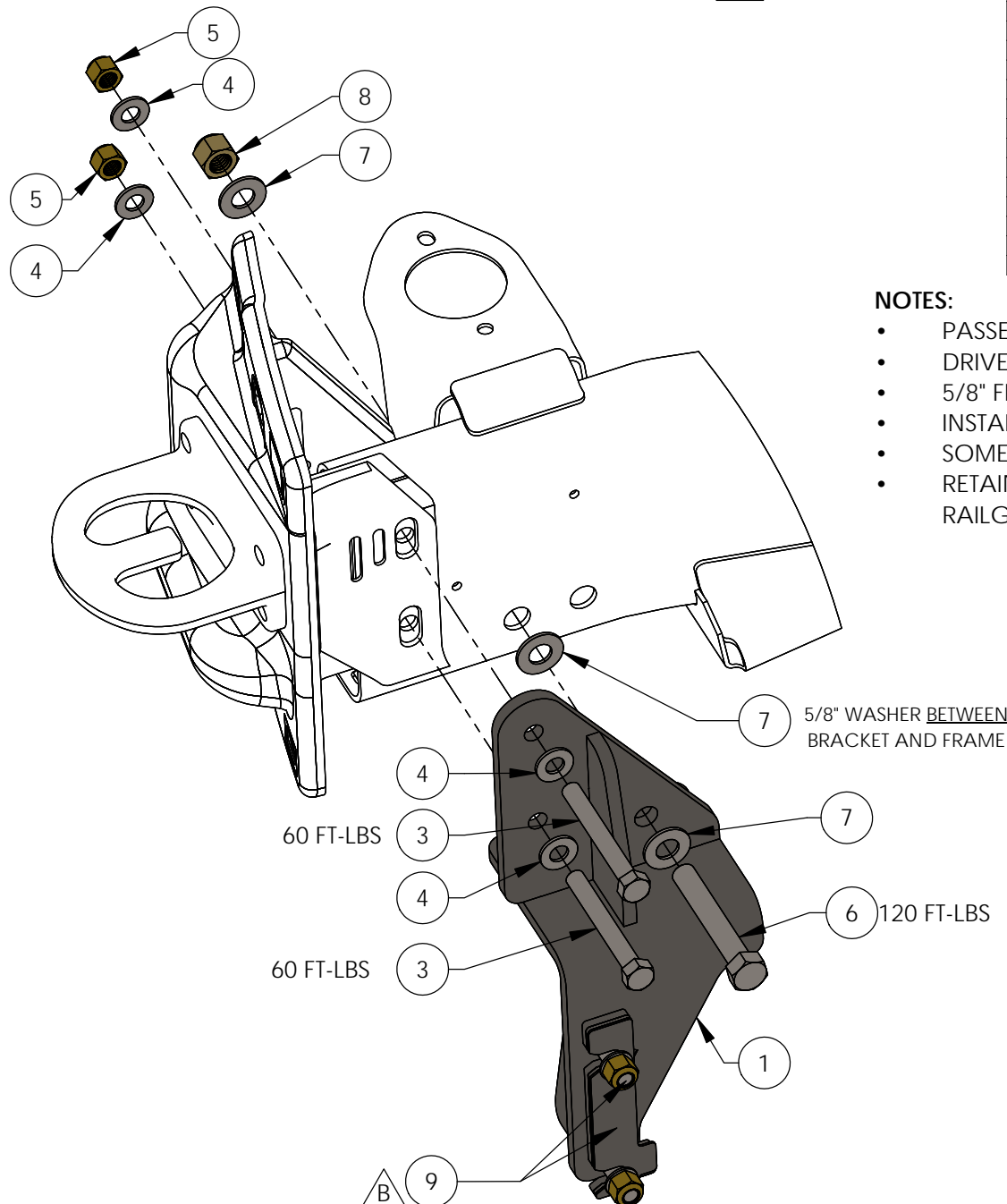


NOTES:

- PASSENGER'S SIDE FRAME BRACKET SHOWN
- SIMILAR PROCEDURE FOR DRIVER'S SIDE BRACKET
- REMOVE FACTORY BOLTS NECESSARY TO MOUNT BRACKET & REPLACE W/ PROVIDED HARDWARE
- PLACE 2 FLAT WASHERS BETWEEN BRACKET & FRAME AS SHOWN FOR REAR MOST HOLE
- INSTALL BRACKETS OVER FACTORY BUMPER BRACKETS
- RETAIN SHIM & REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR
- SEE DRAWING M101602 & MANUAL SECTION 4.4 FOR RAILGEAR INSTALLATION

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: BREAK SHARP EDGES .03 X .45" MAX DMF (404)875-1512		TITLE: FRONT MOUNT KIT, '19 RAM PICKUP THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
RW-1016		DRAWN BY: DJJ APPD BY: - DATE: 02/18/20		DRAWING NUMBER: 703163 REV: #

2011-2018 RAM 2500/3500 FRONT C



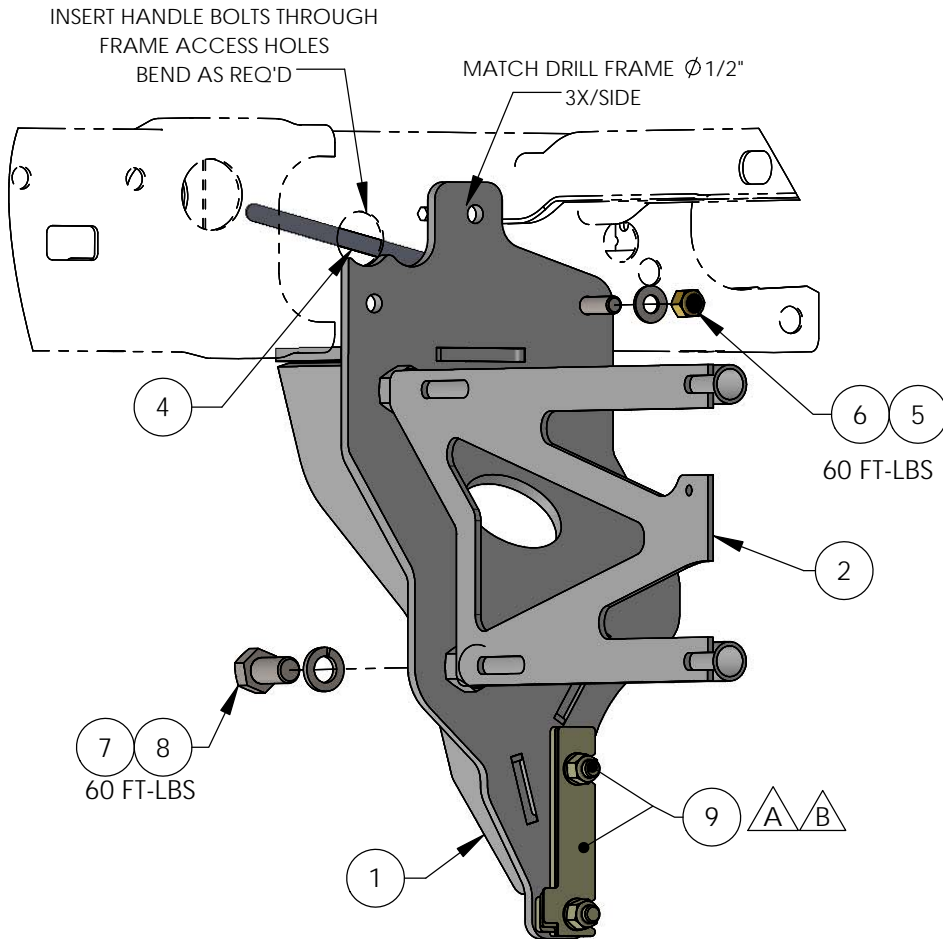
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703085	1	PS FRONT FRAME BRACKET WELDMNT, '11 RAM PICKUP, RW-1016
2	703084	1	DS FRONT FRAME BRACKET WELDMNT, '11 RAM PICKUP, RW-1016
3	605569	4	HHCS, 1/2-13 X 4", GR8
4	500691	8	FLAT WASHER, 1/2", GR8
5	113014	4	1/2"-13 NYLOCK NUT; GR8
6	820486	2	HHCS, 5/8-11 X 4", GR8
7	605076	6	FLAT WASHER, 5/8", GR8
8	605075	2	5/8"-11 NYLOCK NUT; GR8
9	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

NOTES:

- PASSENGER SIDE FRAME BRACKET INSTALLATION SHOWN.
- DRIVERS SIDE SIMILAR.
- 5/8" FLAT WASHER REQUIRED BETWEEN RAILGEAR BRACKET AND FRAME.
- INSTALL RAILGEAR BRACKETS OVER FACTORY BUMPER BRACKETS.
- SOME FRAME COMPONENTS HIDDEN FOR CLARITY
- RETAIN SHIMS AND REMAINING HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

C	6/22/2020	2011-2018 WAS 2011+		BJF	
B	08/04/17	REMOVED 703058 FROM SHIMS		DJJ	
A	5/16/2017	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057		TAM	
REV	DATE	DESCRIPTION		BY	APP
TOLERANCES (UNLESS SPECIFIED):		TITLE:			
FRAC. MACH: ± 1/32"		RW-1016			
FRAC. OTHER: ± 1/16"					
X: ± .063		FRONT MOUNT KIT; '11-'18 RAM PICKUP; RW-1016			
XX: ± .030					
XXX: ± .005		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.			
DRILL SIZES: ± .015					
ANGULAR: ± 1°		DRAWN BY: APPD BY: DATE: 02/07/17			
SURF FINISH: 125 MICRO					
THREADS: 2A AND 2B		DMD			
BREAK SHARP EDGES .03 X .45" MAX					
DMF (404)875-1512		TAM		-	703091
				C	

2014+ RAM 2500/3500 REAR



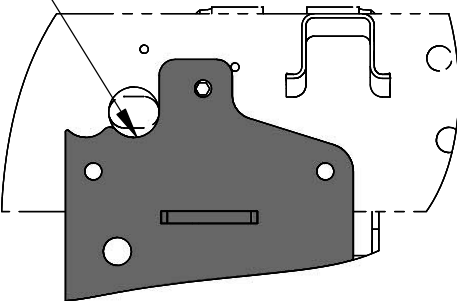
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	703094	1	PS REAR FRAME BRACKET; '14 RAM 2500/ 3500 PICKUP
2	703109	1	REAR BRACKET CROSS BRACE, '14 RAM 2500, RW-1016
3	703093	1	DS REAR FRAME BRACKET, '14 RAM 2500/3500 PICKUP
4	304099	6	HANDLE BOLT ASSEMBLY, 11-9/16 HANDLE, 1/2-13 X 2 BOLT, RW-1019B
5	500691	6	FLAT WASHER, 1/2", GR8
6	113014	6	1/2"-13 NYLOCK NUT; GR8
7	820462	4	LOCK WASHER, 3/4", GR8
8	605541	4	HHCS 3/4-10 X 1-1/2"; GR8
9	703057	1	MOUNTING SHIM SET; RW-1016
	703059	2	MOUNTING SHIM; .25"; RW-1016
	703060	2	MOUNTING SHIM; .125"; RW-1016
	703061	2	MOUNTING SHIM; .0625"; RW-1016
	605341	8	FLAT WASHER, 7/16", GR8
	605276	4	HHCS, 1-2/13 X 2-1/4", GR8
	113014	4	1/2"-13 NYLOCK NUT; GR8

NOTES:

- MOST FACTORY EXHAUST SYSTEMS DO NOT REQUIRE MODIFICATION.
- FIT BRACKETS SNUG AGAINST BOTTOM OF FRAME BEFORE MARKING/DRILLING HOLES.
- PASSENGER SIDE FRAME BRACKET INSTALLATION SHOWN. DRIVERS SIDE SIMILAR.
- SOME FRAME COMPONENTS HIDDEN FOR CLARITY.
- RETAIN SHIMS AND HARDWARE FOR INSTALLATION OF RAILGEAR. SEE DRAWING M101602 AND MANUAL SECTION 4.4.

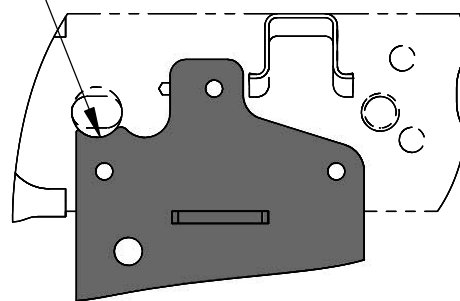
3500 MODELS

BRACKET POSITION - PS VIEW
DS SIMILAR



2500 MODELS

BRACKET POSITION - PS VIEW
DS SIMILAR



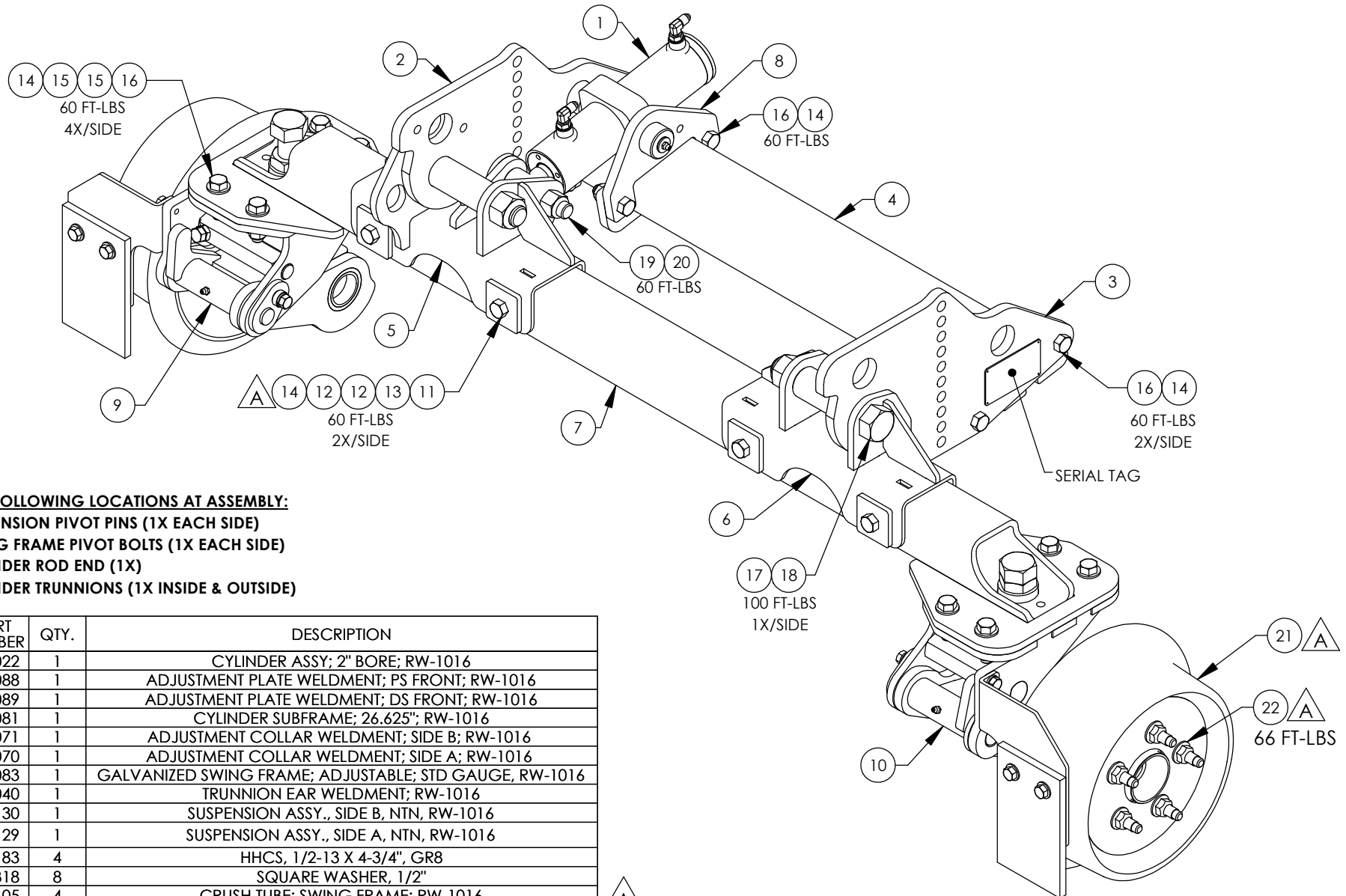
B	08/04/17	REMOVED 703058 FROM SHIMS	DJJ	
A	05/16/17	REMOVED SHIM MOUNTING HARDWARE - NOW INCLUDED IN 703057	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1016		
FRACTIONAL:	± 1/32"	TITLE: REAR MOUNT KIT, '14 RAM 2500/3500 PICKUP, RW-1016		
DECIMAL:	± 0.005"			
ANGULAR:	± 0.015"	THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.		
DRILL SIZES:	± 1"			
SURF FINISH:	125 MICRO	DRAWN BY:	APPD BY:	DATE:
THREADS:	2A AND 2B	TAM	-	09/16/16
BREAK SHARP EDGES .03 X .45" MAX		DMF (404)875-1512		
		DRAWING NUMBER: 703092		REV: B

6.3 RAILGEAR CORE ASSEMBLIES

RW-1016 Railgear assemblies share many components between the front and rear assemblies. The following terminologies are used to describe many shared parts and assemblies:

- **"SIDE A" (without cylinder)**
 - Drivers side on front assemblies
 - Passenger side on rear assemblies
- **"SIDE B" (with cylinder)**
 - Passenger side on front assemblies
 - Drivers side on rear assemblies

FRONT - STANDARD GAUGE, STEEL TREAD WHEELS



GREASE FOLLOWING LOCATIONS AT ASSEMBLY:

- SUSPENSION PIVOT PINS (1X EACH SIDE)
- SWING FRAME PIVOT BOLTS (1X EACH SIDE)
- CYLINDER ROD END (1X)
- CYLINDER TRUNNIONS (1X INSIDE & OUTSIDE)

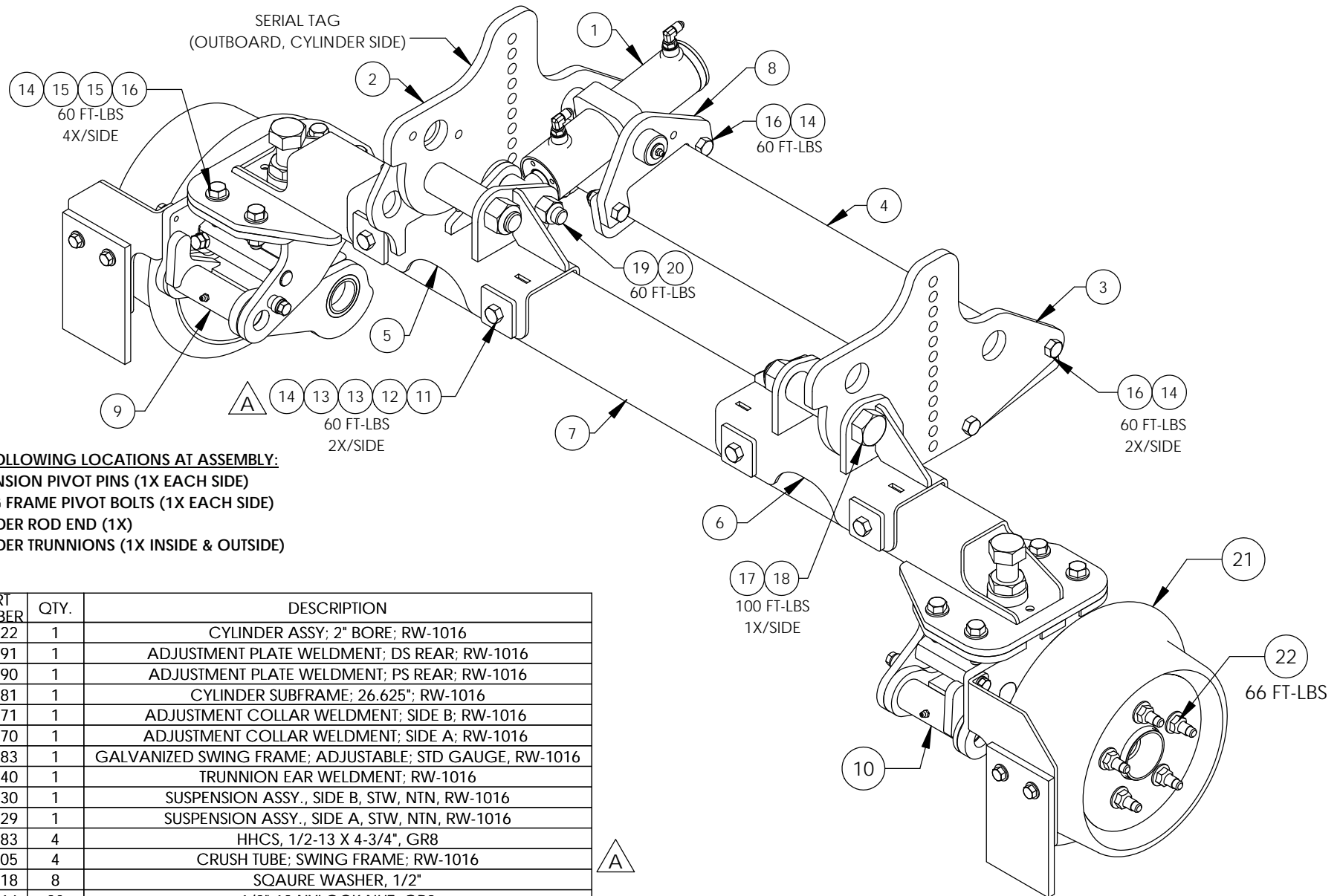
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701022	1	CYLINDER ASSY; 2" BORE; RW-1016
2	704088	1	ADJUSTMENT PLATE WELDMENT; PS FRONT; RW-1016
3	704089	1	ADJUSTMENT PLATE WELDMENT; DS FRONT; RW-1016
4	704081	1	CYLINDER SUBFRAME; 26.625"; RW-1016
5	704071	1	ADJUSTMENT COLLAR WELDMENT; SIDE B; RW-1016
6	704070	1	ADJUSTMENT COLLAR WELDMENT; SIDE A; RW-1016
7	704083	1	GALVANIZED SWING FRAME; ADJUSTABLE; STD GAUGE, RW-1016
8	704040	1	TRUNNION EAR WELDMENT; RW-1016
9	702130	1	SUSPENSION ASSY., SIDE B, NTN, RW-1016
10	702129	1	SUSPENSION ASSY., SIDE A, NTN, RW-1016
11	605183	4	HHCS, 1/2-13 X 4-3/4", GR8
12	600318	8	SQUARE WASHER, 1/2"
13	704105	4	CRUSH TUBE; SWING FRAME; RW-1016
14	113014	20	1/2"-13 NYLOCK NUT; GR8
15	500691	16	FLAT WASHER, 1/2", GR8
16	605259	14	HHCS, 1/2-13 X 1-3/4", GR8
17	819508	2	1"-8 NYLOCK NUT
18	605534	2	HHCS, 1-8 X 6", GR8
19	605535	1	HHCS 3/4-10 X 4", GR8
20	605110	1	3/4"-10 NYLOCK NUT, GR8
21	702117	2	WHEEL DETAIL, STEEL TREAD, 10" DIA, FOR NTN P-HUB598T-1
22	605528	10	1/2-20 UNF FLANGED LOCKNUT, GRADE G

A

A

A		3/12/19		CRUSH TUBE 704105 REPLACED 303008; WHEEL 702117 AND LOCKNUTS 605528 NOW PART OF CORE ASSEMBLY				TAM			
REV		DATE		DESCRIPTION				BY		APP	
TOLERANCES (UNLESS SPECIFIED):				RW-1016				TITLE: RW-1016 CORE ASSY, FRONT, STD GAUGE, STW			
FRACTIONAL: ± 1/32"											
DECIMAL: ± 0.005				THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF, ALL RIGHTS RESERVED.				DRAWING NUMBER: 706009			
ANGULAR: ± 1°											
SURF FINISH: 125 MICRO				DRAWN BY: TAM				APPD BY: -			
THREADS: 2A AND 2B				DATE: 10/17/16				REV: A			
BREAK SHARP EDGES .03 X 45° MAX				DMF (404)875-1512				DMF			


REAR - STANDARD GAUGE, STEEL TREAD WHEELS



GREASE FOLLOWING LOCATIONS AT ASSEMBLY:

- SUSPENSION PIVOT PINS (1X EACH SIDE)
- SWING FRAME PIVOT BOLTS (1X EACH SIDE)
- CYLINDER ROD END (1X)
- CYLINDER TRUNNIONS (1X INSIDE & OUTSIDE)

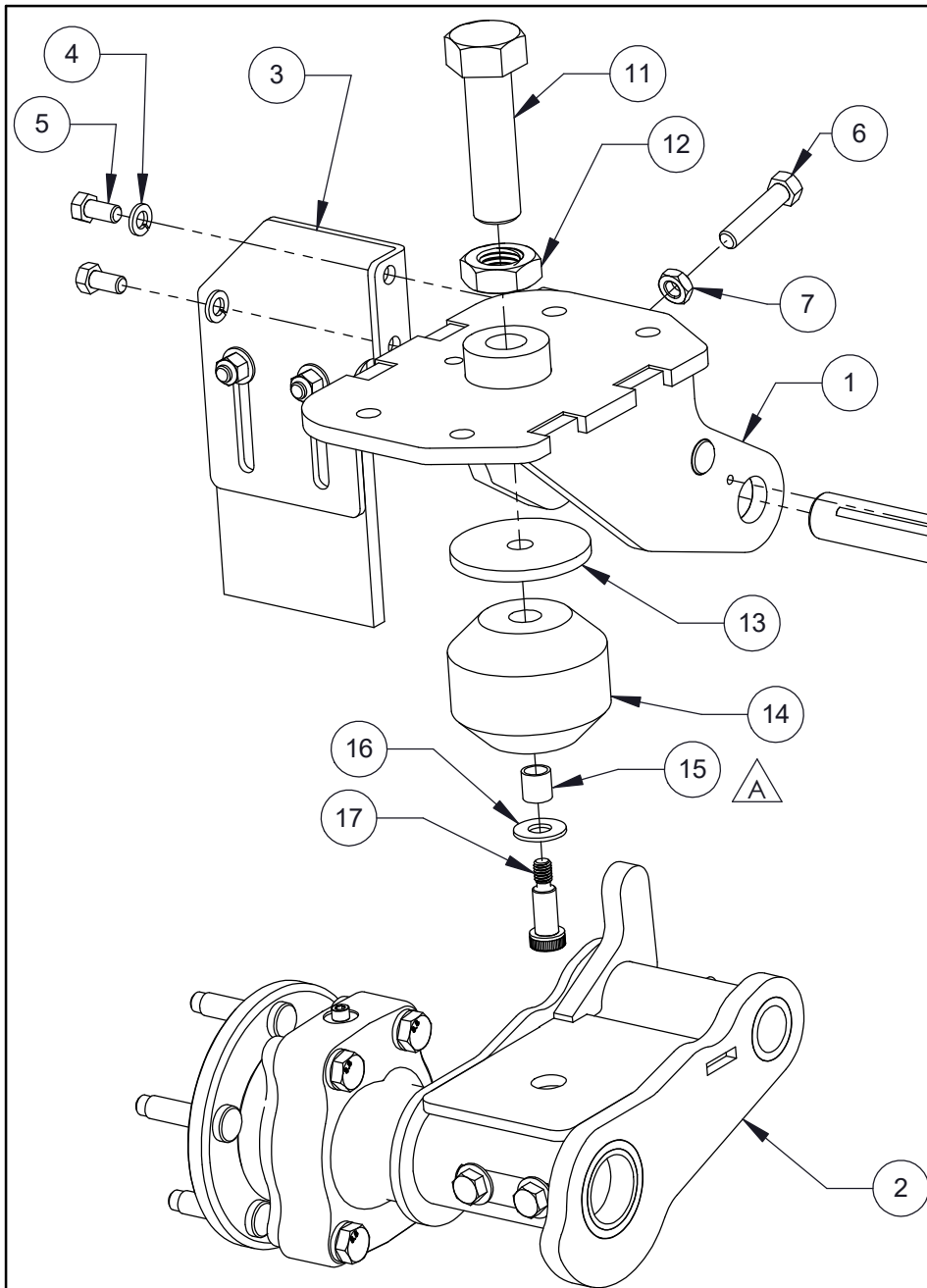
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	701022	1	CYLINDER ASSY; 2" BORE; RW-1016
2	704091	1	ADJUSTMENT PLATE WELDMENT; DS REAR; RW-1016
3	704090	1	ADJUSTMENT PLATE WELDMENT; PS REAR; RW-1016
4	704081	1	CYLINDER SUBFRAME; 26.625"; RW-1016
5	704071	1	ADJUSTMENT COLLAR WELDMENT; SIDE B; RW-1016
6	704070	1	ADJUSTMENT COLLAR WELDMENT; SIDE A; RW-1016
7	704083	1	GALVANIZED SWING FRAME; ADJUSTABLE; STD GAUGE, RW-1016
8	704040	1	TRUNNION EAR WELDMENT; RW-1016
9	702130	1	SUSPENSION ASSY., SIDE B, STW, NTN, RW-1016
10	702129	1	SUSPENSION ASSY., SIDE A, STW, NTN, RW-1016
11	605183	4	HHCS, 1/2-13 X 4-3/4", GR8
12	704105	4	CRUSH TUBE; SWING FRAME; RW-1016
13	600318	8	SQAURE WASHER, 1/2"
14	113014	20	1/2"-13 NYLOCK NUT; GR8
15	500691	16	FLAT WASHER, 1/2", GR8
16	605259	14	HHCS, 1/2-13 X 1-3/4", GR8
17	819508	2	1"-8 NYLOCK NUT
18	605534	2	HHCS, 1-8 X 6", GR8
19	605535	1	HHCS 3/4-10 X 4", GR8
20	605110	1	3/4"-10 NYLOCK NUT, GR8
21	702117	2	WHEEL DETAIL, STEEL TREAD, 10" DIA, FOR NTN P-HUB598T-1
22	605528	10	1/2-20 UNF FLANGED LOCKNUT, GRADE G

A	3/12/19	CRUSH TUBE 704105 REPLACED 303008: WHEEL 702117 AND LOCKNUTS 605528 NOW PART OF CORE ASSEMBLY				TAM	
REV	DATE	DESCRIPTION				BY	APP
TOLERANCES (UNLESS SPECIFIED):		RW-1016		TITLE: RW-1016 CORE ASSY, REAR, STD GAUGE, STW			
FRAC. MACH: ± 1/32"							
FRAC. OTHER: ± 1/16"							
X: ± .063							
XX: ± .030							
XXX: ± .005		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DISCOVERED METAL FABRICATORS, INC. (DMF) COPYRIGHT DMF, ALL RIGHTS RESERVED.					
DRILL SIZES: ± .015							
ANGULAR: ± 1°							
SURF FINISH: 125 MICRO		DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
THREADS: 2A AND 2B							
BRIK A4 SHARP EDGES .03 X .45" MAX		TAM	-	10/17/16		706010	A
DMF (404)875-1512							

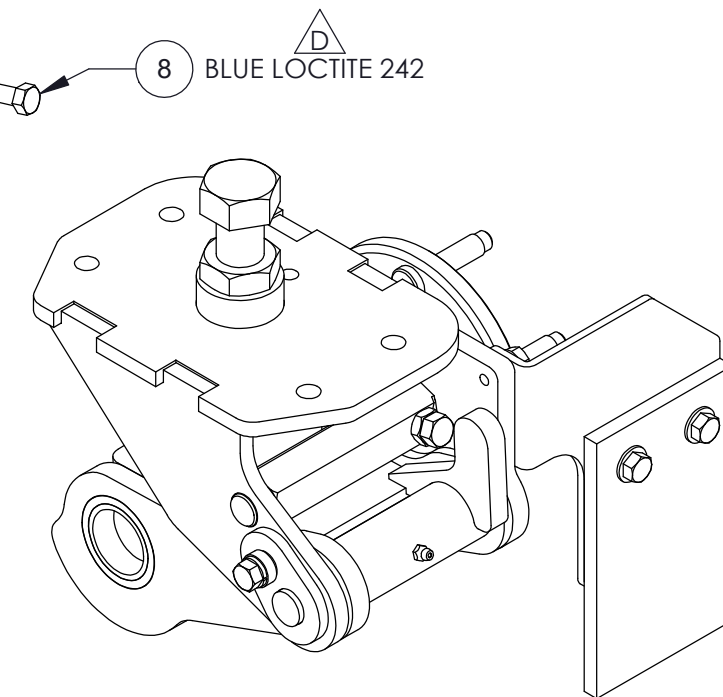
6.4 SUSPENSION ASSEMBLIES, BEARINGS, & WHEELS

RW-1016 Railgear assemblies share many components between the front and rear assemblies. The following terminologies are used to describe many shared parts and assemblies:

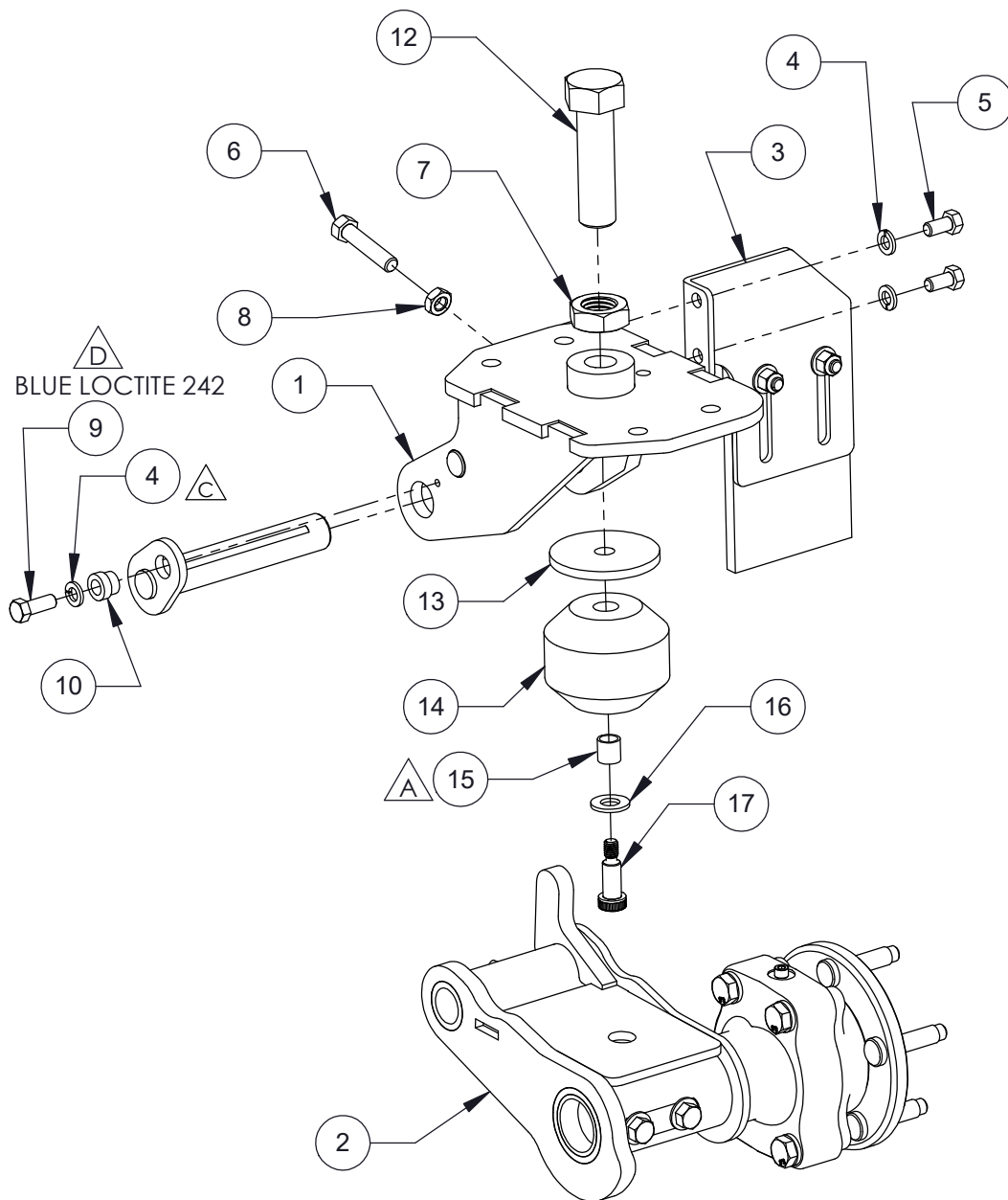
- **"SIDE A" (without cylinder)**
 - Driver side on front assemblies; Passenger side on rear assemblies.
- **"SIDE B" (with cylinder)**
 - Passenger side on front assemblies; Driver side on rear assemblies.



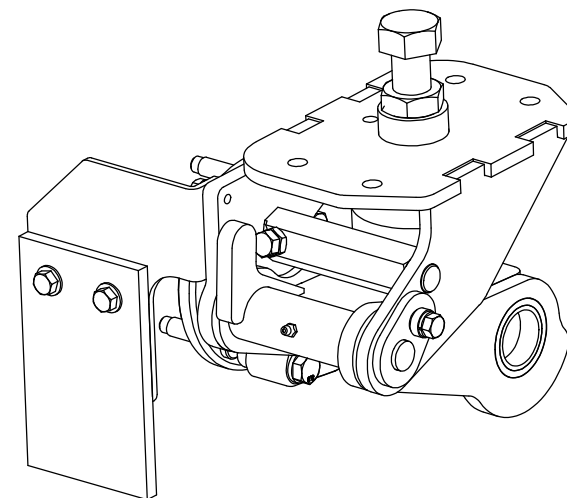
ITEM NO.	PART NUMBER	QTY	DESCRIPTION
1	702138	1	UPPER SUSPENSION ARM WELDMENT, SIDE A, RW-1016
2	702122	1	LOWER ARM ASSY, SIDE A, NTN, RW-1016
3	702091	1	RAILSWEEP ASSY, SIDE A, RW-1016
4	12566	3	LOCK WASHER, 3/8", GR8
5	605356	2	HHCS, 3/8-16 X 3/4", GR8
6	605529	1	HHCS, 7-16-14 X 2", GR8, FULL THREAD
7	605530	1	JAMB NUT, 7/16-14
8	605172	1	HHCS, 3/8-16 X 1", GR8
9	306053	1	TOPHAT, 3/8" BOLT, 1019B FRONT PIN
10	702114	1	PIN, PLATED, ANTI-ROTATION HOLE, 1" DIA X 5-11/16" GRIP
11	702094	1	SUSPENSION ADJUSTMENT BOLT, RW-1016
12	605531	1	JAM NUT, 1-8 UNC X 35/64" THICK
13	702093	1	SPRING PLATE, RW-1016
14	702051	1	TIMBREN SPRING, A00170-800; RW-1016
15	605611	1	BUSHING; 1/2" OD, 5/8" OD, 5/8" LONG
16	500691	1	FLAT WASHER, 1/2", GR8
17	605340	1	THREAD LOCKING SHOULDER SCREW, 1/2" DIA X 1" L X 3/8-16



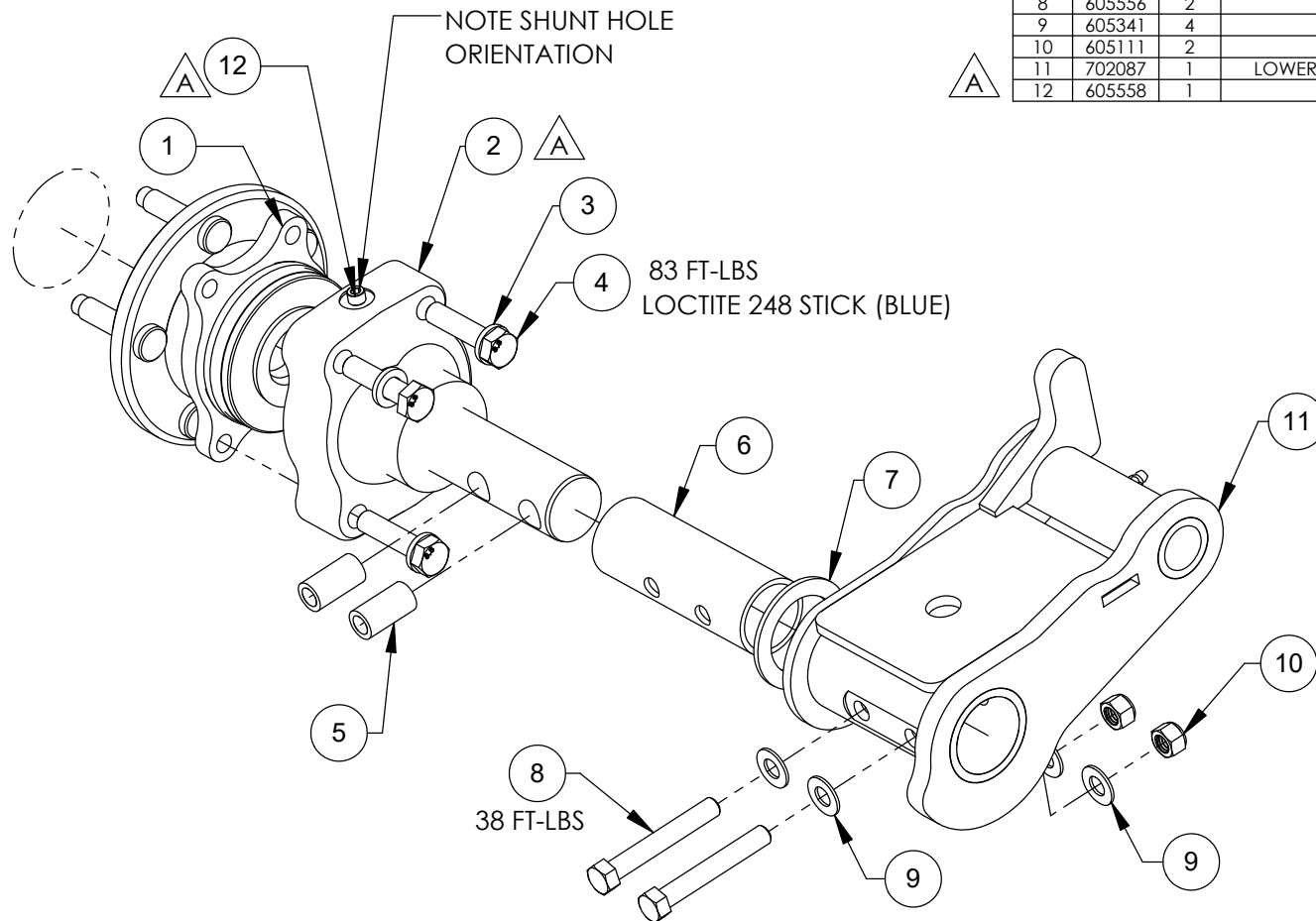
D	6/22/2020	12566 X 1 WAS 605715; ADDED BLUE LOCTITE 242	BJF	
C	10/24/2019	NORD-LOCK WASHER 605715 REPLACED SPRING LOCK WASHER FOR PIN	TAM	
B	3/12/2019	WHEEL & LOCKNUTS MOVED TO CORE RAILGEAR ASSEMBLY	TAM	
A	12/05/17	BUSHING 605611 REPLACED BEARING 605339	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES: (UNLESS SPECIFIED)		TITLE: RW-1016 SUSPENSION ASSY., SIDE A, NTN, RW-1016		
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		
FRAC. OTHER: ± 1/16"		DRAWN BY: APPD BY: DATE: 10/14/16		
.XX ± .003		TAM -		
.XXX ± .005		10/14/16		
DRILL SIZES: + .015		DRAWING NUMBER: 702129		
ANGULAR: ± 1°		REV: D		
SURF FINISH: 125 MICRO				
THREADS: 2A AND 2B				



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	702139	1	UPPER SUSPENSION ARM WELDMENT, SIDE B, RW-1016
2	702123	1	LOWER ARM ASSY, SIDE B, NTN, RW-1016
3	702092	1	RAILSWEEP ASSY, SIDE B, RW-1016
4	12566	3	LOCK WASHER, 3/8", GR8
5	605356	2	HHCS, 3/8-16 X 3/4", GR8
6	605529	1	HHCS, 7-16-14 X 2", GR8, FULL THREAD
7	605531	1	JAM NUT, 1-8 UNC X 35/64" THICK
8	605530	1	JAMB NUT, 7/16-14
9	605172	1	HHCS, 3/8-16 X 1", GR8
10	306053	1	TOPHAT, 3/8" BOLT, 1019B FRONT PIN
11	702114	1	PIN, PLATED, ANTI-ROTATION HOLE, 1" DIA X 5-11/16" GRIP
12	702094	1	SUSPENSION ADJUSTMENT BOLT, RW-1016
13	702093	1	SPRING PLATE, RW-1016
14	702051	1	TIMBREN SPRING, A00170-800; RW-1016
15	605611	1	BUSHING; 1/2" OD, 5/8" OD, 5/8" LONG
16	500691	1	FLAT WASHER, 1/2", GR8
17	605340	1	THREAD LOCKING SHOULDER SCREW, 1/2" DIA X 1" L X 3/8-16



D	6/22/2020	12566 X 1 WAS 605715; ADDED BLUE LOCTITE 242	BJF	
C	10/24/2019	NORD-LOCK WASHER 605715 REPLACED SPRING LOCK WASHER FOR PIN	TAM	
B	3/12/2019	WHEEL & LOCKNUTS MOVED TO CORE RAILGEAR ASSEMBLY	TAM	
A	12/05/17	BUSHING 605611 REPLACED BEARING 605339	TAM	
REV	DATE	DESCRIPTION	BY	APP
TOLERANCES: (UNLESS SPECIFIED)		TITLE: RW-1016 SUSPENSION ASSY., SIDE B, NTN, RW-1016		
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512		
FRAC. OTHER: ± 1/16"		DRAWN BY: APPD BY: DATE: 10/14/16		
.XX ± .003		TAM -		
.XXX ± .005		10/14/16		
DRILL SIZES: + .015		DRAWING NUMBER: 702130		
ANGULAR: ± 1°		REV: D		
SURF FINISH: 125 MICRO				
THREADS: 2A AND 2B				




A

A

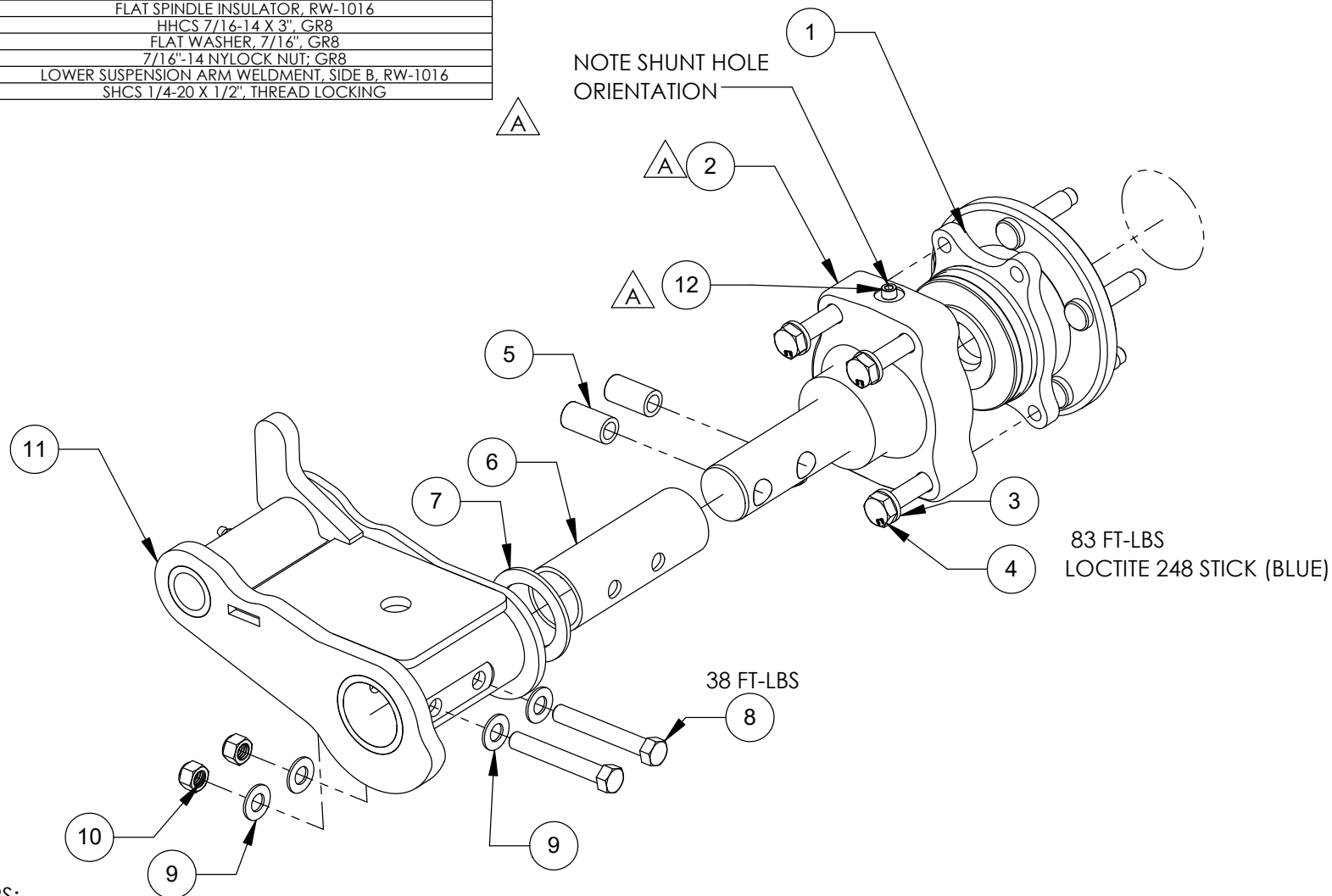
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	702116	1	NTN P-HUB598T-1 BEARING & HUB ASSY
2	702144	1	DETAIL, CASTING, SPINDLE BEARING ADAPTER, P-HUB598T-1
3	12481	4	LOCK WASHER, 1/2", GR8
4	605557	4	HHCS, M12x1.5 50MM, CLASS 8.8
5	702028	2	SPINDLE BOLT INSULATOR, RW-1016
6	702024	1	SPINDLE INSULATOR TUBE, RW-1016
7	702006	1	FLAT SPINDLE INSULATOR, RW-1016
8	605556	2	HHCS 7/16-14 X 3", GR8
9	605341	4	FLAT WASHER, 7/16", GR8
10	605111	2	7/16"-14 NYLOCK NUT; GR8
11	702087	1	LOWER SUSPENSION ARM WELDMENT, SIDE A, RW-1016
12	605558	1	SHCS 1/4-20 X 1/2", THREAD LOCKING

ASSEMBLY STEPS:

1. PRESS SPINDLE INSULATOR INTO LOWER SUSPENSION ARM.
2. DRILL SPINDLE INSULATOR HOLES USING SUSPENSION ARM HOLES AS A GUIDE USING 1/2" DRILL.
3. INSERT SPINDLE BOLT INSULATORS ONTO SPINDLE.
4. PRESS SPINDLE INTO LOWER SUSPENSION ARM.
5. INSERT BOLTS THRU SUSPENSION ARM AND SPINDLE ASSEMBLY & TORQUE AS SHOWN.


A		3/12/2019		WHEEL & LOCKNUTS MOVED TO CORE ASSEMBLY; BEARING ADAPTER 702144 REPLACED 702121, ADDED 605558				TAM			
REV		DATE		DESCRIPTION				BY		APP	
TOLERANCES: (UNLESS SPECIFIED)				<div>RW-1016</div> <div>TITLE: LOWER ARM ASSY, SIDE A, NTN, RW-1016</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:		BJF		APPD BY:		-		DATE:		4/11/16	
								<div></div>		DRAWING NUMBER:	
										702122	
										REV:	
										A	

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	702116	1	NTN P-HUB598T-1 BEARING & HUB ASSY
2	702144	1	DETAIL, CASTING, SPINDLE BEARING ADAPTER, P-HUB598T-1
3	12481	4	LOCK WASHER, 1/2", GR8
4	605557	4	HHCS, M12x1.5 50MM, CLASS 8.8
5	702028	2	SPINDLE BOLT INSULATOR, RW-1016
6	702024	1	SPINDLE INSULATOR TUBE, RW-1016
7	702006	1	FLAT SPINDLE INSULATOR, RW-1016
8	605556	2	HHCS 7/16-14 X 3", GR8
9	605341	4	FLAT WASHER, 7/16", GR8
10	605111	2	7/16"-14 NYLOCK NUT; GR8
11	702088	1	LOWER SUSPENSION ARM WELDMNT, SIDE B, RW-1016
12	605558	1	SHCS 1/4-20 X 1/2", THREAD LOCKING



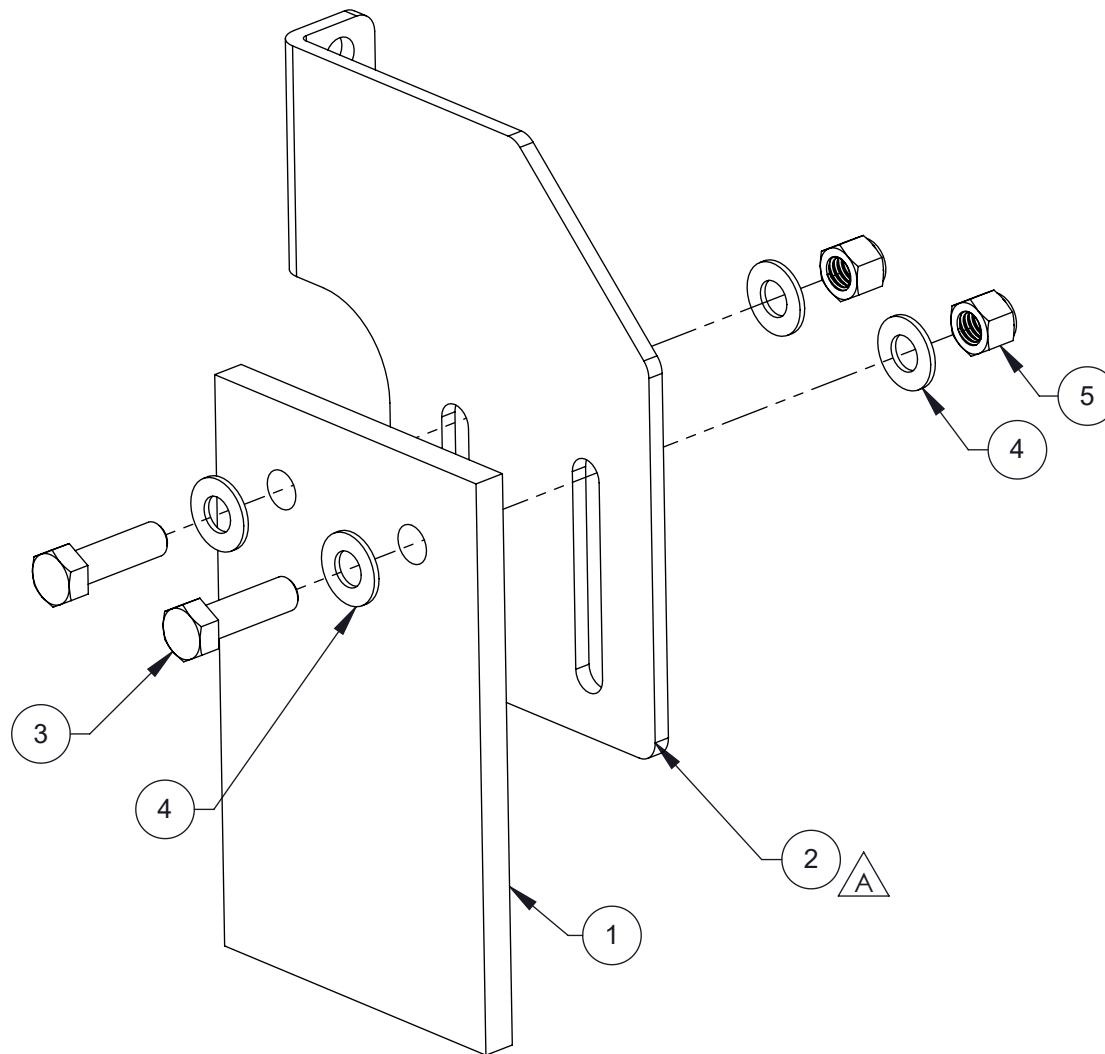
ASSEMBLY STEPS:


1. PRESS SPINDLE INSULATOR INTO LOWER SUSPENSION ARM.
2. DRILL SPINDLE INSULATOR HOLES USING SUSPENSION ARM HOLES AS A GUIDE USING 1/2" DRILL.
3. INSERT SPINDLE BOLT INSULATORS INTO SPINDLE.
4. PRESS SPINDLE INTO LOWER SUSPENSION ARM.
5. INSERT BOLTS THRU SUSPENSION ARM AND SPINDLE ASSEMBLY & TORQUE AS SHOWN.

A	3/12/2019	WHEEL & LOCKNUTS MOVED TO CORE ASSEMBLY; BEARING ADAPTER 702144 REPLACED 702121, ADDED 605558				TAM					
REV	DATE	DESCRIPTION				BY	APP				
TOLERANCES: (UNLESS SPECIFIED)		RW-1016				TITLE: LOWER ARM ASSY, SIDE B, NTN, RW-1016					
FRAC. MACH: ± 1/32"		DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512									
FRAC. OTHER: ± 1/16"											
.X ± .063											
.XX ± .030											
.XXX ± .015											
DRILL SIZES: ± .015		DRAWN BY: BJJ				APPD BY: -					
ANGULAR: ± 1°											
SURF FINISH: 125 MICRO											
THREADS: 2A AND 2B		DATE: 4/11/16						DRAWING NUMBER: 702123		REV: A	
RECALL SHARP POINTS (SEE DETAIL 1 OF PART 1)											

A

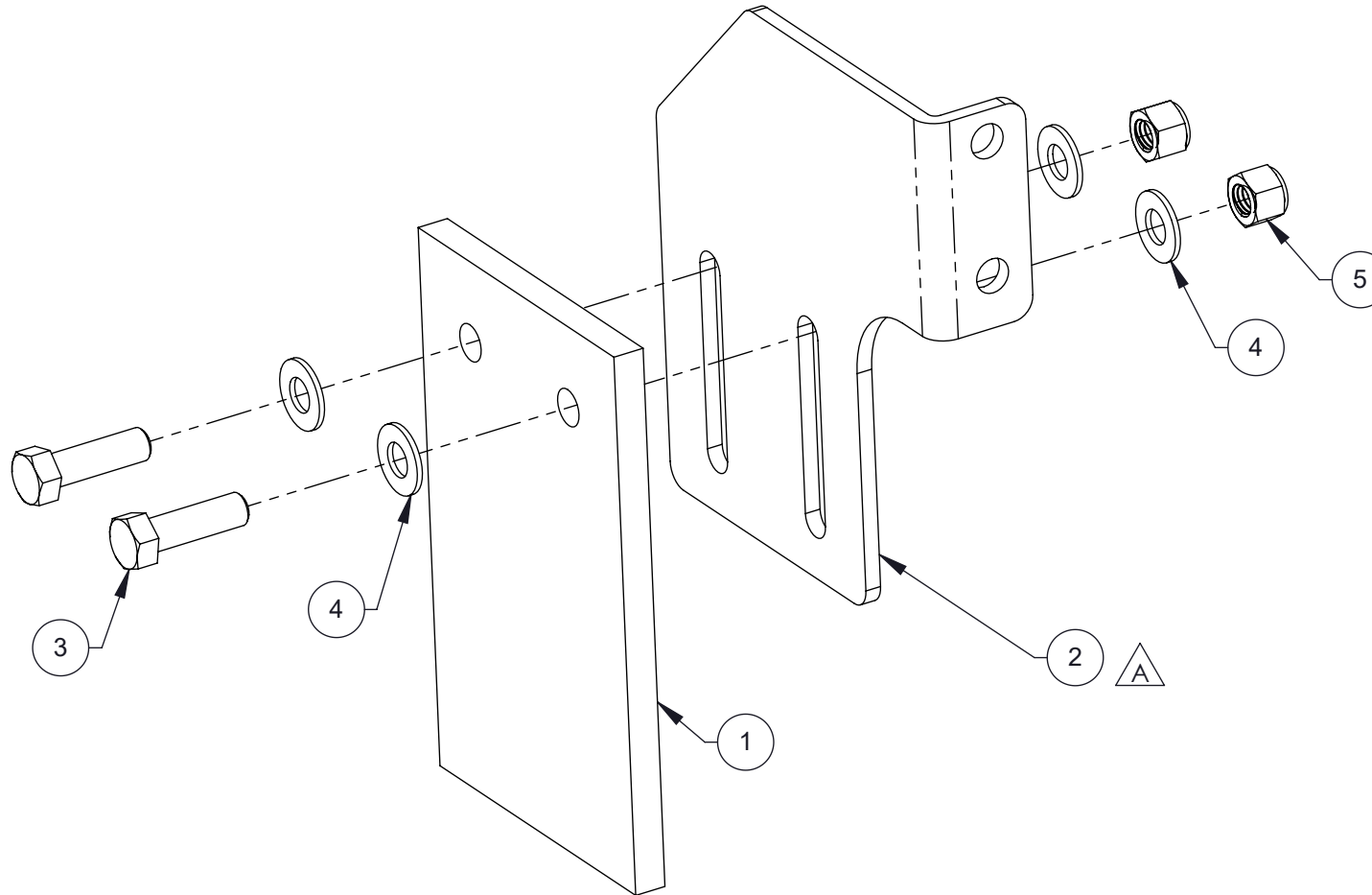
ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	818503	1	RAILSWEEP RUBBER BELTING DETAIL
2	702160	1	RAILSWEEP BRACKET - TUBE LASER, SIDE A, RW-1016
3	605121	2	HHCS 3/8-16 UNC x 1-1/4", GRADE 8
4	818508	4	FLAT WASHER, 3/8", GR8
5	605077	2	3/8"-16 NYLOCK NUT: GR8




A		8/24/2018		BRACKET 702089 REPLACED BY 702160			TAM						
REV		DATE		DESCRIPTION					BY		APP		
TOLERANCES: (UNLESS SPECIFIED)				RW-1016								TITLE: RAILSWEEP ASSY, SIDE A, RW-1016	
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												DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512	
DRAWN BY:		APPD BY:		DATE:				DRAWING NUMBER:		REV:			
JDI		-		2/5/14				702091		A			

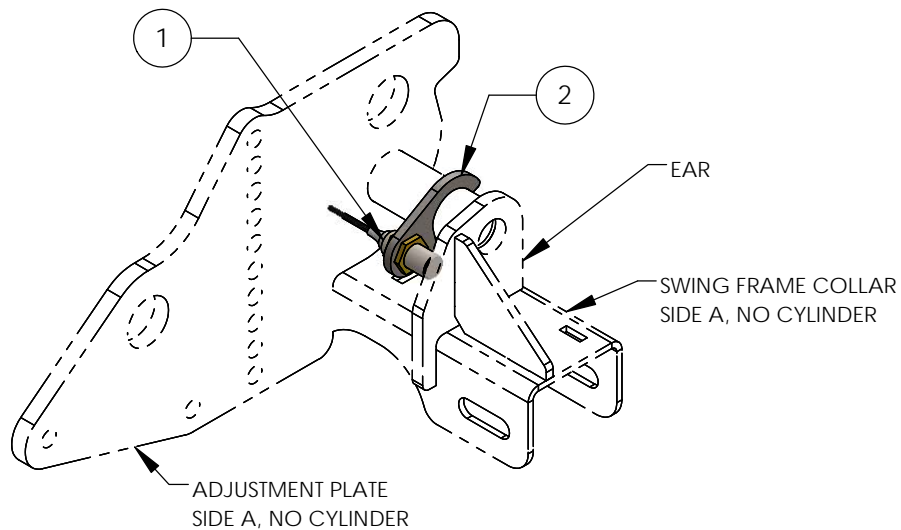
A

ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	818503	1	RAILSWEEP RUBBER BELTING DETAIL
2	702161	1	RAILSWEEP BRACKET - TUBE LASER, SIDE B, RW-1016
3	605121	2	HHCS 3/8-16 UNC x 1-1/4", GRADE 8
4	818508	4	FLAT WASHER, 3/8", GR8
5	605077	2	3/8"-16 NYLOCK NUT; GR8

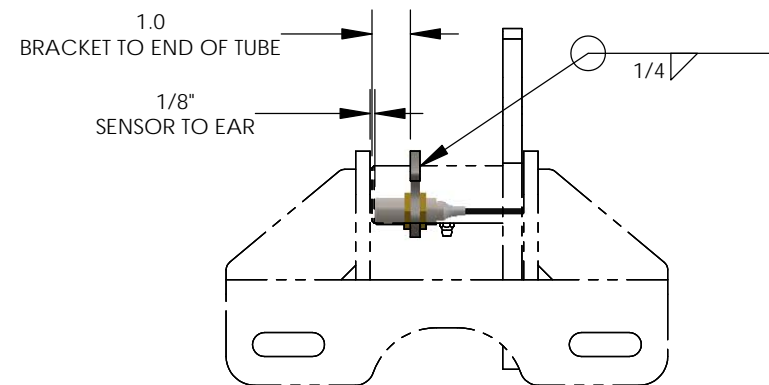


A		8/24/2018		BRACKET 702090 REPLACED BY 702161		TAM							
REV		DATE		DESCRIPTION				BY		APP			
TOLERANCES: (UNLESS SPECIFIED)				RW-1016		TITLE: RAILSWEEP ASSY, SIDE B, RW-1016							
						DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512							
FRAC. MACH: ± 1/32"		FRAC. OTHER: ± 1/16"		DRAWN BY:		APPD BY:		DATE:		DRAWING NUMBER:		REV:	
.X ± .063		.XX ± .030		JDI		-		2/5/14		702092		A	
.XXX ± .005													
DRILL SIZES: ± .015													
ANGULAR: ± 1°													
SURF FINISH: 125 MICRO													
THREADS: 2A AND 2B													
MILITARY STANDARD (MIL-STD-123)													

6.5 OPTIONAL COMPONENTS

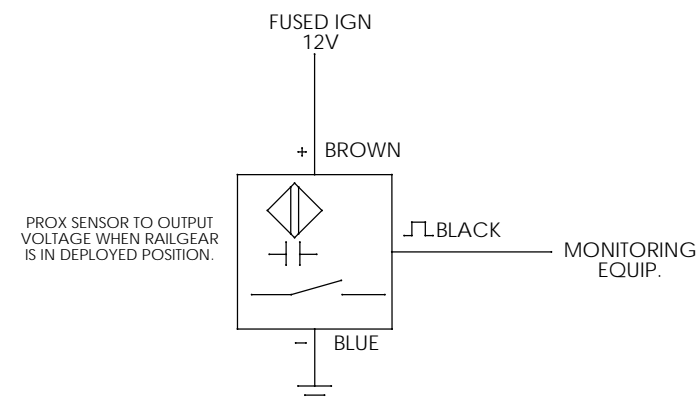
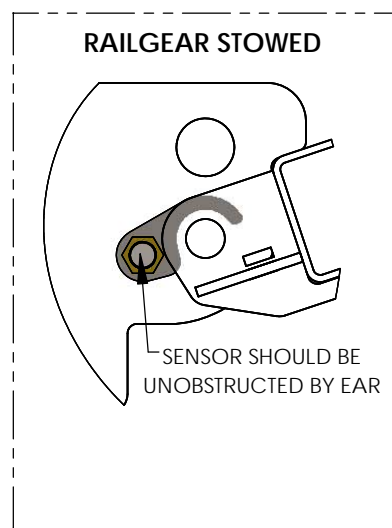
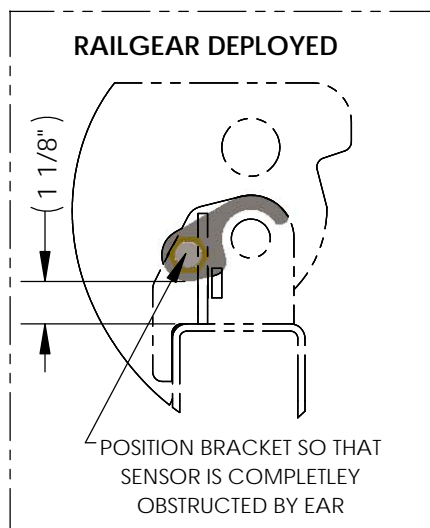



ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	20256	1	PROX SWITCH, PNP, 18MM
2	704060	1	PROX SENSOR EAR: WELD ON; RW-1016



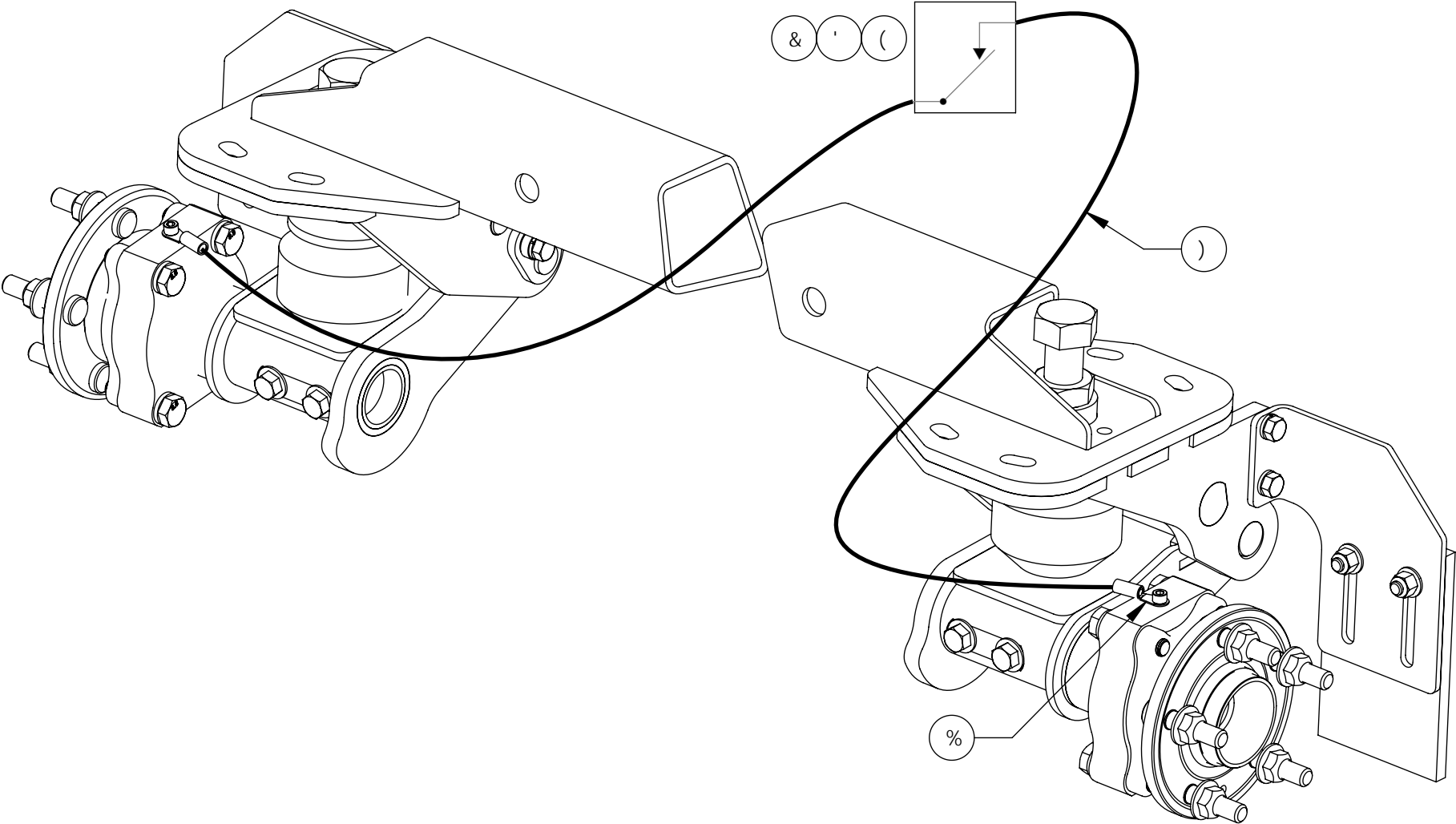
INSTALLATION NOTES:


- FRONT COMPONENTS SHOWN, REAR INSTALLATION SIMILAR.
- TACK BRACKET IN PLACE AND VERIFY THAT SENSOR IS COMPLETELY UNCOVERED BY EAR WITH RAILGEAR STOWED, AND COMPLETELY COVERED BY EAR WHEN DEPLOYED BEFORE FULLY WELDING BRACKET.



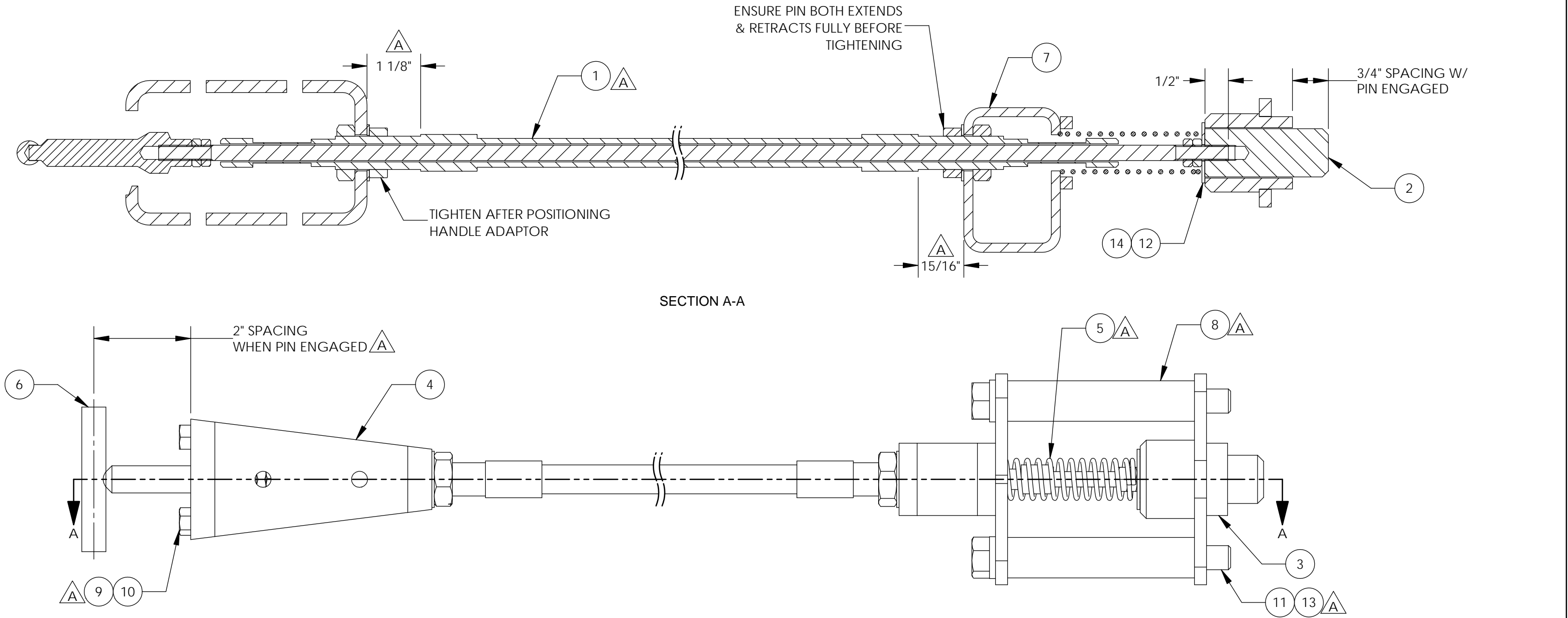
REV	DATE	DESCRIPTION				BY	AP
TOLERANCES (UNLESS SPECIFIED):		TITLE:					
FRAC. MACH: ± 1/32"		PROX SENSOR KIT, WELD ON, 18MM, RW-1016					
FRAC. OTHER: ± 1/16"		RW-1016					
.X ± .063							
.XX ± .030							
.XXX ± .005							
DRILL SIZES: ± .015							
ANGULAR: ± 1°		THIS DRAWING CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION OF DIVERSIFIED METAL FABRICATORS, INC. (DMF). COPYRIGHT DMF. ALL RIGHTS RESERVED.					
SURF FINISH: 125 MICRO		DRAWN BY:	APPD BY:	DATE:		DRAWING NUMBER:	REV:
THREADS: 2A AND 2B				10/18/16		701053	#
BREAK SHARP EDGES .03 X 45° MAX		DMF (404)875-1512					

#B A B C "	D5FH B I A 69F	E H M	8 9G7 F-DHC B
%	* \$) %+,	&	F-B; 'HFA B5@%#('2%(!%* ' ; 5
&	* \$) &* %	%	GK #7 < ZGDG#&) '5 A D
'	* \$) &* &	&	F-B; 'HFA B5@ , 'Z%(!%* ' ; 5
(, % , %\$	%	G<I BHGK #7 < @569@
)	, % , %8%	%	6@57? 'K #9Z%* ' ; 5 'L " \$: H




F9J	85H9	8 9G7 F-DHC B			6M	5DD
H-68F5B7 9C8 B88C0D97 + 981 :F572A 57 < -'9F & :F572C H-9F- -'S" 7L -'S" 7LL -'S' S 8F-48GARG -'S\$) 8F-48GARG 2 'S\$) 5B: 1 45F -'98 G F: : 4 G-: 98) A 7 FC H-F95BG 85 588 86		FK !%\$%*		H-68F5K-B: 7CBH5 8G7CB: 89BH5@DFC DF 945FMB: CFA5HCBC: 8J 9FG-98 A 946@ 56F 7 5HC FG 87 TBA: E'7CDM s <HBA: 25@MF s <HGF90F J 98"		
8F957 G-5FD 98: 9C3 'L (1) 5A 55 8A: T(\$ (L +) 19) %&		8F5K B 6M	5DD8 6M	85H9		8F5K-B: B I A 69F: F9J:
H5A		!	\$&#%+/#%+		+\$(%) *	.


ITEM NO.	PART NUMBER	QTY.	DESCRIPTION
1	305077	1	CABLE PINOFF, BULKHEAD SWIVEL ENDS, 60" LENGTH, 1" TRAVEL
2	705013	1	PINOFF PIN, PLATED, FOR CABLE ACTUATION, RW-1016
3	705012	1	PINOFF BASE, PLATED, RW-1016
4	305071	1	CABLE PINOFF, MOUNTING TUBE, MACHINING, 1" STROKE
5	305070	1	CABLE PINOFF, PIN EXTENSION SPRING, SS
6	305069	1	CABLE PINOFF, HANDLE ASSEMBLY, 1" STROKE
7	305056	1	CABLE PINOFF, MOUNT ASSEMBLY, 1" STROKE
8	305057	2	CABLE PINOFF, SPRING DETENT SPACER TUBE, 1" STROKE
9	20342	2	5/16"-18 NYLOCK NUT; GR8
10	108062	2	HHCS, 5/16-18 X 1", GR5
11	605020	2	HHCS, 1/2-13 X 5", GR8
12	605522	1	5/16" FENDER WASHER W/ 1-1/4" OD
13	12481	2	LOCK WASHER, 1/2", GR8
14	818599	2	JAM NUT, 5/16-24



NOTE:
ALL DIMENSION PROVIDED ARE APPROXIMATED FOR ASSEMBLY PURPOSES. ENSURE THE CABLE FUNCTION WORKS CORRECTLY BEFORE TIGHTENING ALL BULKHEAD FITTINGS.

A	02/22/17	605020 WAS 605183; 305071 WAS 305053; 305070 WAS 305058; 108062 WAS 818421; 305077 WAS 305052; REMOVED 108220 & 500691; ADDED 818599; 15/16 WAS 1-1/16; 2 WAS 1-15/16; 1-1/8 WAS 7/8			DJJ	
REV	DATE	DESCRIPTION			BY	APP
TOLERANCES (UNLESS SPECIFIED)		RW-1016		TITLE: CABLE PINOFF, SPRING DETENT ASSEMBLY, 60" X 1" STROKE		
FRACTIONAL: MACH: ± 1/32" FRACTIONAL: OTHER: ± 1/16" X: ± .063 XX: ± .030 XXX: ± .015 DRILL SIZES: ± .015 ANGULAR: ± 125 MICRO SURF FINISH: 2A AND 2B THREADS: (BREAK SHARP EDGES (ROUND BY .005))				DIVERSIFIED METAL FABRICATORS, INC. (404)875-1512		
DRAWN BY: DJJ		APPD BY: -	DATE: 09/16/16		DRAWING NUMBER: 705025	REV: A

6.6 CHASSIS/WHEEL MODIFICATION KITS

	TITLE: WHEEL MOD KIT, 2017+ F-2/350 4X4, W/RIMS & TPMS			
	DRAWING #:	509067	BY: TAM	DATE: 3-9-17
RW-1013/15/16	DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
REV:	DATE:	DESCRIPTION:		BY:
-	-	-		-
-	-	-		-

#509067: 2017+ Chevrolet 2/3500 Wheel Adapter Kit

Description

Diversified Metal Fabricator's 509067 Wheel Adapter Kit allows for the use of aftermarket 19.5" rims on 2017+ Chevrolet 2500 and 3500 vehicles for use on rail.

Kit Contents

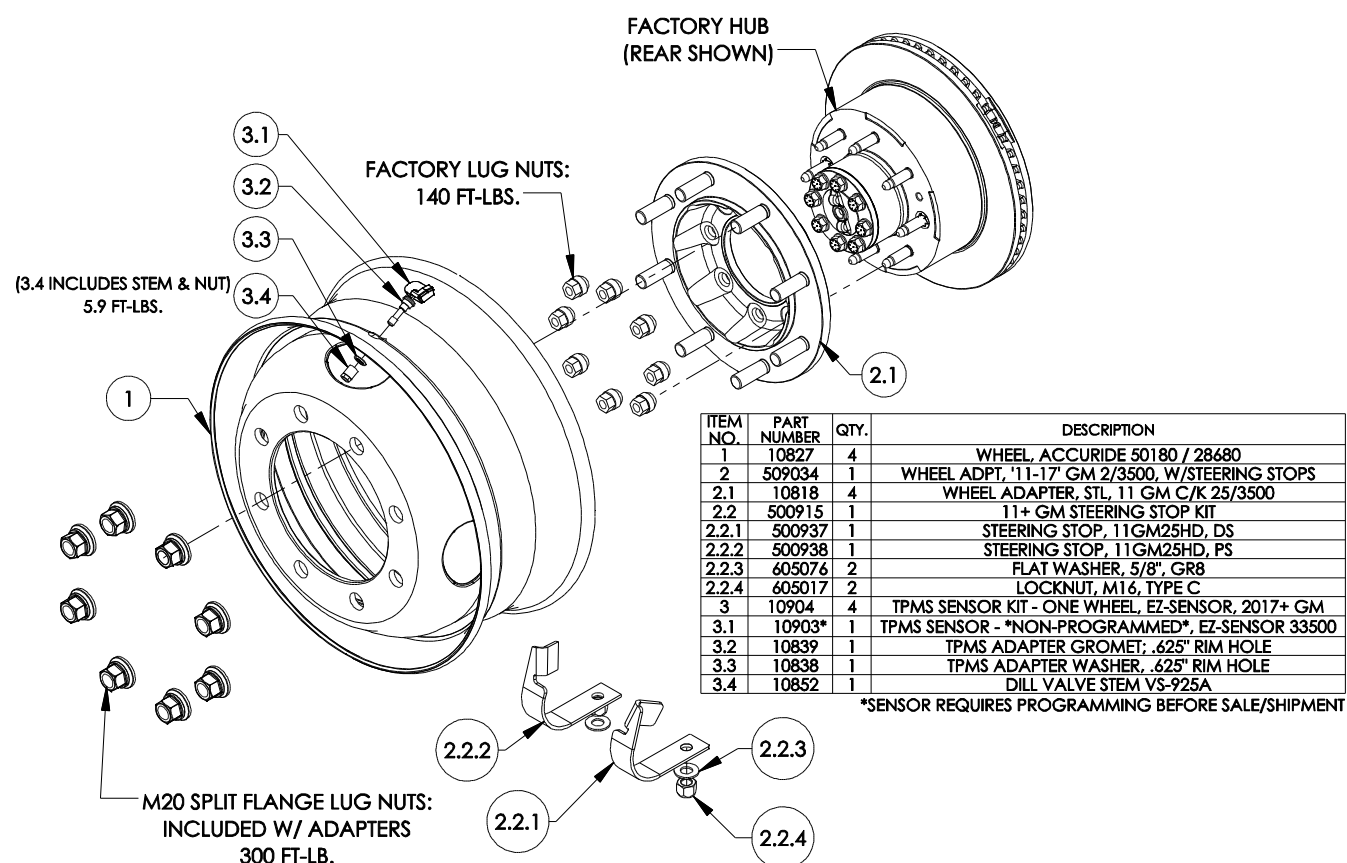


Figure 1 – Installation/Exploded Parts Diagram

Recommended Tires

DMF does not typically include tires with wheel modification kits. Recommended tire models and sizes are shown below. Using different tire sizes than shown below can result in component interference or poor performance on rail.

Mud/Snow/All position

- Goodyear G622 - 245/70R19.5
- Michelin XDS2 - 245/70R19.5

Steer/Highway

- Goodyear G647 - 245/70R19.5

Installation

Warnings:

- **Never use anti-seize on studs or lug nuts.**
- **Hand-torque all fasteners to the provided specifications using a torque wrench.**
- **Improper installation or failure to perform a thorough check for clearances once this unit is installed may lead to damage to the chassis, wheels/tires, or personnel.**

1. Install TPMS Sensors and Tires

- a. Mount sensors to 19.5" rims as detailed in Figure 1.
- b. Mount and balance selected tires.
- c. Inflate tires to a cold pressure of 85 psi.

2. Remove Stock Wheels and Tires

- a. Lift the vehicle and properly support using jack-stands.
- b. Remove the stock wheels and tires, retaining the stock lug nuts for reuse.

3. Install Wheel Adapters and 19.5" Rims

- a. Remove and discard the factory spring clips on the factory studs.
- b. Mount the wheel adapters to factory hubs using factory lug nuts; torque as specified in Figure 1.
- c. Mount the 19.5" rims to the Wheel Adapter using the provided M20 Split Flange Nuts; torque as specified in Figure 1.

4. Install Steering Stops

- a. Steering stops are "handed" and must be installed on the correct side of the vehicle.
- b. Remove the lower kingpin nut from each front steering knuckle as shown in Figure 2.
- c. Install steering stops as shown, and secure with the included washer M16 Type C locknuts.
- d. Turn the steering wheel to its extents in both directions and verify the steering stops are contacting the stop surfaces. It is usually necessary to have someone hold the steering wheel at full lock in both directions while looking for interference.

5. Verify Steering Clearances

- a. Verify that neither the rims nor tires contact any frame or suspension components in any combination of steering positions and axle droop/jounce conditions.
- b. Verify that all brake, ABS sensor and other wires or hoses are clear in all steering and suspension positions. Restrain if necessary.

****STEPS 6-8 REQUIRE SPECIALIZED EQUIPMENT OR SOFTWARE AND NEED TO BE PERFORMED BY A DEALERSHIP****

6. Change Speedometer Calibration

- a. The suggested 19.5" tires have a larger rolling diameter than the tires found on most "work truck" trim level vehicles.
- b. The speedometer calibration is limited to stock tire sizes. As the tires we recommend are not a stock size for this vehicle, the stock LT265/60R20 tire setting should be selected as it is the most comparable in size.

7. Change TPMS Threshold Pressures

- a. The suggested cold inflation pressure of 85 psi is typically higher than factory tires, which can cause errant TPMS warnings if the system threshold pressures are not adjusted.
- b. Adjust the TPMS system for a nominal pressure of 85 psi.

8. "Re-Learn" New TPMS Sensors

- a. The TPMS system will not operate properly until the new sensors are paired with the vehicle.
- b. Use factory tools and techniques to "re-learn" the new sensors to the vehicle.

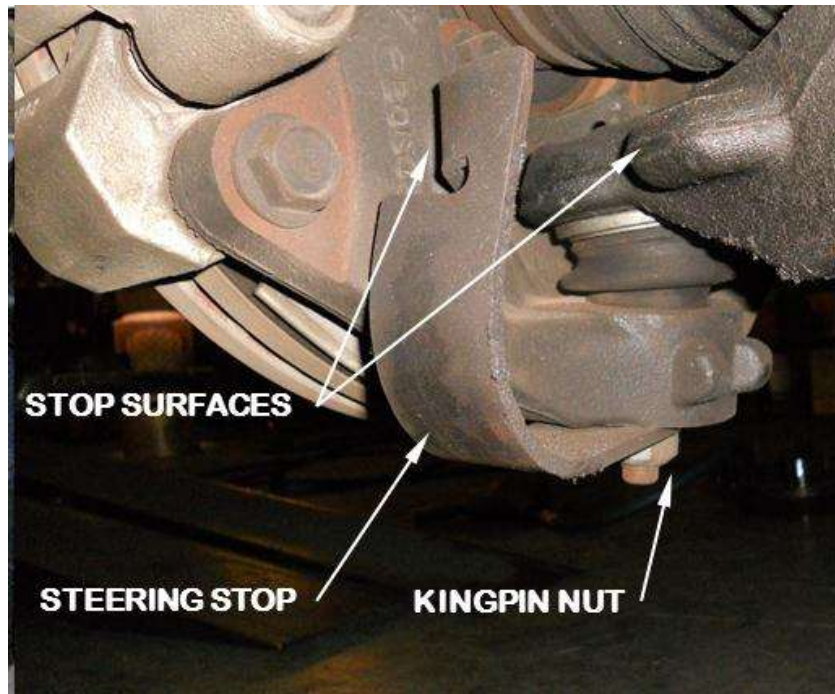


Figure 2 – Steering Stop Installation and Adjustment


9. Testing

- a. It is the responsibility of the installer to certify that the truck complies with all applicable State and Federal regulations.
- b. In particular, the regulations and test procedures outlined in FMVSS Standard 138 must be performed in order to ensure compliance.

10. Inspection & Maintenance

- a. Visually inspect wheels & tires both prior to and after use on rail (look for damage, loose hardware, etc.)
- b. Check the fastener torque 50 miles after wheel/tire change and every 2000 miles or 6 months.

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	TITLE: WHEEL MOD KIT, 2017+ F-2/350 4X4, W/RIMS & TPMS			
	DRAWING #:	509065	BY: TAM	DATE: 3-9-17
RW-1013/15/16	DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
REV: A	DATE: 6/19/18	DESC: updated TPMS/Speedo Calibration		BY: TAM
-	-	-		-
-	-	-		-

#509065: 2017+ Ford F-2/350 4x4 Wheel Adapter Kit

Description

Diversified Metal Fabricator's 509065 Wheel Adapter Kit allows for the use of aftermarket 19.5" rims on 2017+ Ford F-2/350 4x4 vehicles for use on rail.

Kit Contents

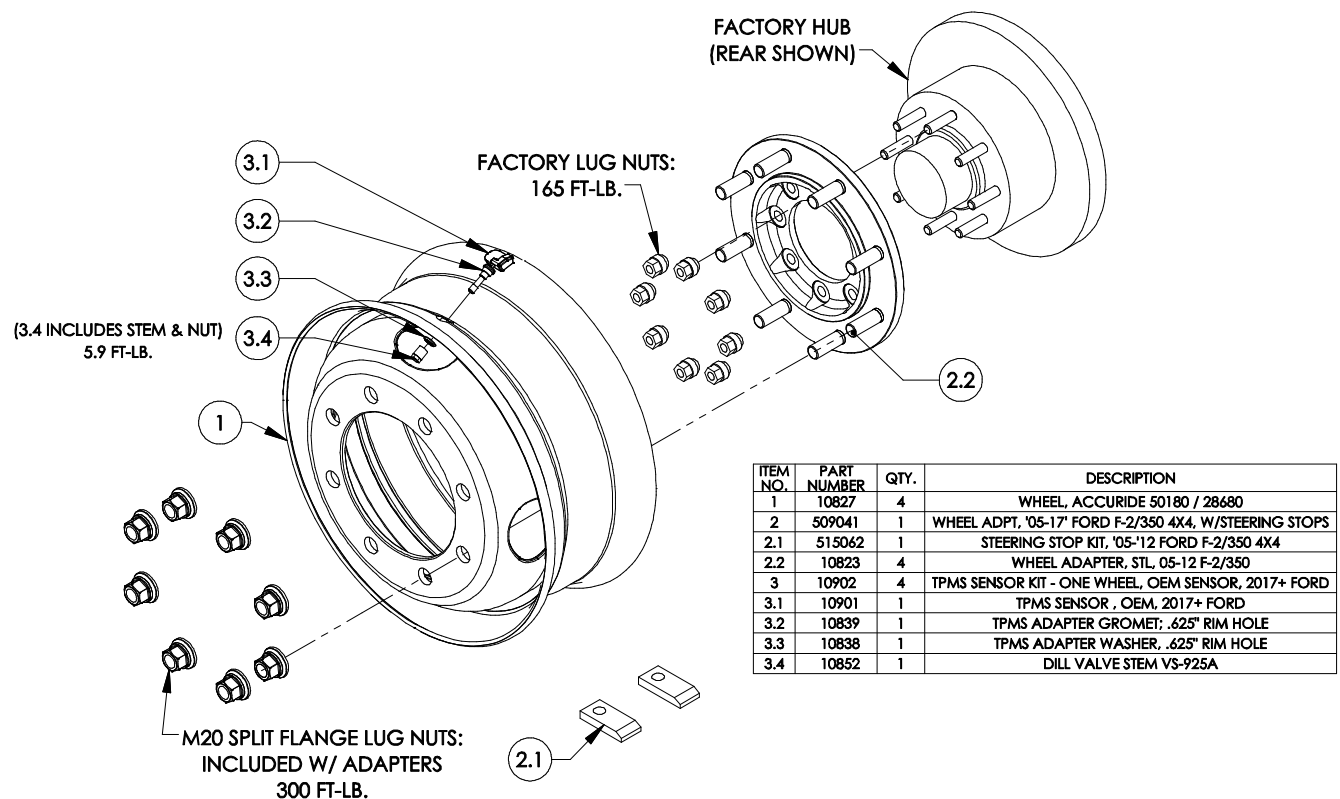


Figure 1 – Installation/Exploded Parts Diagram

Recommended Tires

DMF does not typically include tires with wheel modification kits. Recommended tire models and sizes are shown below. Using different tire sizes than shown below can result in component interference or poor performance on rail.

Mud/Snow/All position

- Goodyear G622 - 225/70R19.5
- Michelin XDS2 - 225/70R19.5

Steer/Highway

- Goodyear G647 - 225/70R19.5

Installation

Warnings:

- **Never use anti-seize on studs or lug nuts.**
- **Hand-torque all fasteners to the provided specifications using a torque wrench.**
- **Improper installation or failure to perform a thorough check for clearances once this unit is installed may lead to damage to the chassis, wheels/tires, or personnel.**

1. Install TPMS Sensors and Tires

- a. Mount sensors to 19.5" rims as detailed in Figure 1.
- b. Mount and balance selected tires.
- c. Inflate tires to a cold pressure of 85 psi.

2. Remove Stock Wheels and Tires

- a. Lift the vehicle and properly support using jack-stands.
- b. Remove the stock wheels and tires, retaining the stock lug nuts for reuse.

3. Install Wheel Adapters and 19.5" Rims

- a. Remove and discard the factory spring clips on the factory studs.
- b. Mount the wheel adapters to factory hubs using factory lug nuts; torque as specified in Figure 1.
- c. Mount the 19.5" rims to the Wheel Adapter using the provided M20 Split Flange Nuts; torque as specified in Figure 1.

4. Install Steering Stops

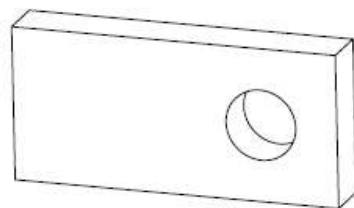
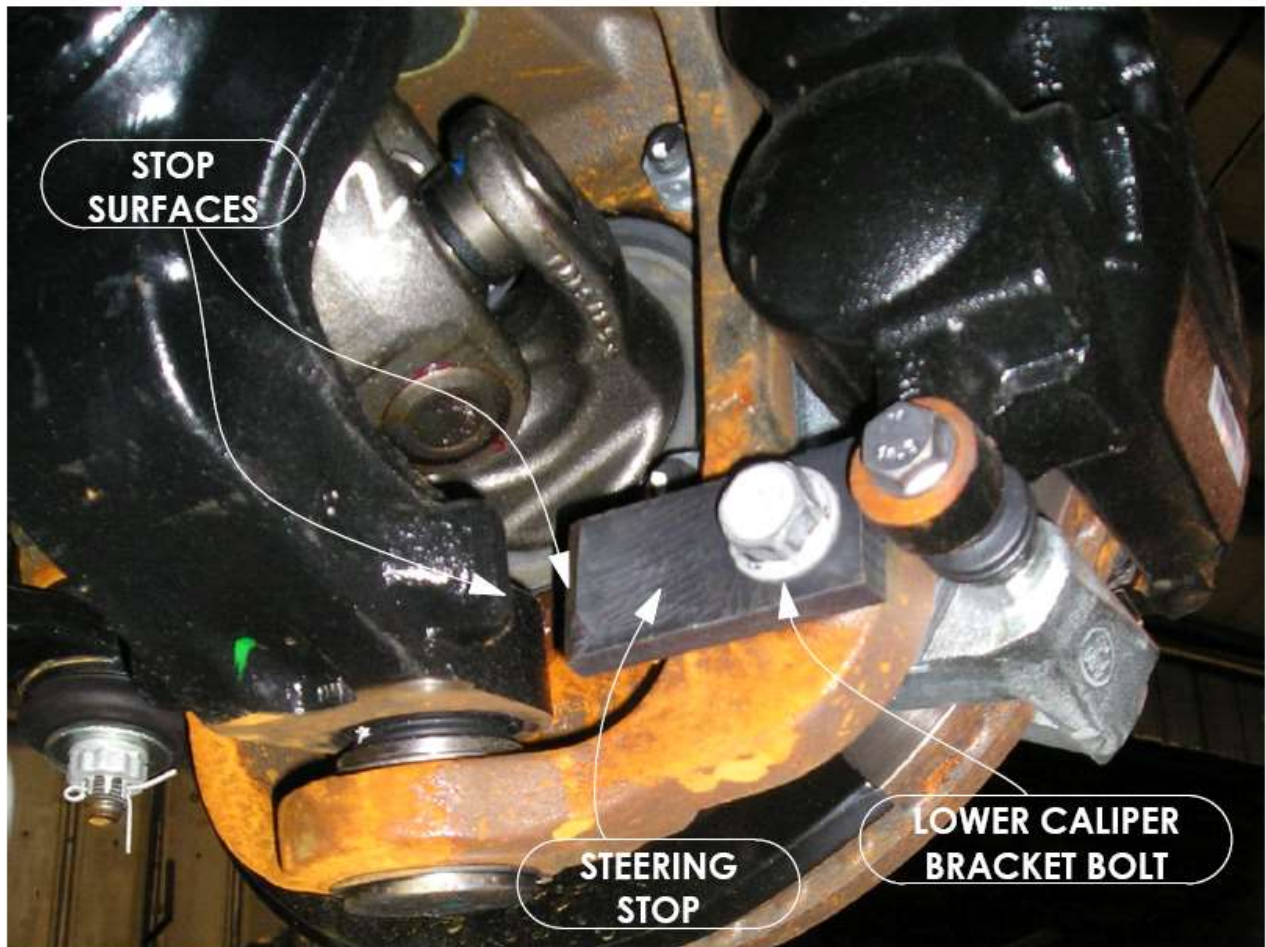
- a. Remove the lower brake caliper bracket bolt from each side of the front steering knuckles.
- b. Install steering stops as shown, re-using the stock bolt, as shown in Figure 2.

5. Adjust Steering Stops

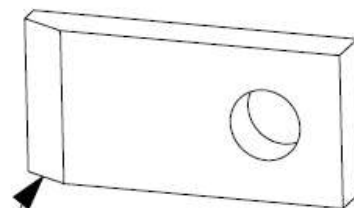
- a. To increase the maneuverability of the completed vehicle, the steering stops should be adjusted to maximize available steering angles in both directions.
- b. Adjust steering stops by gradually grinding a chamfer into the leading edge of the stop surface as shown in Figure 2 to increase available steering angle.
- c. Check frequently for interference between the tires and suspension or brake components in both directions. It is usually necessary to have someone hold the steering wheel at full lock in both directions while looking for interference.

6. Verify Steering Clearances

- a. Verify that neither the rims nor tires contact any frame or suspension components in any combination of steering positions and axle droop/jounce conditions.
- b. Verify that all brake, ABS sensor and other wires or hoses are clear in all steering and suspension positions. Restrain if necessary.



STEERING STOP
AS PROVIDED



GRADUALLY GRIND CHAMFER
INTO STOP SURFACE TO INCREASE
STEERING ANGLE

Figure 2 – Steering Stop Installation and Adjustment

****STEPS 7-9 REQUIRE SPECIALIZED EQUIPMENT OR SOFTWARE. ****

7. Change Speedometer Calibration

- a. The suggested 19.5" tires have a larger rolling diameter than the tires found on most "work truck" trim level vehicles.
- b. **Ford Dealership Service Center:** The speedometer calibration is limited to stock tire sizes. As the tires we recommend are not a stock size for this vehicle, the stock LT265/60R20 tire setting should be selected as it is the most comparable in size.
- c. **Using FORScan Software:** The speedometer calibration can be adjusted to more accurately reflect the installed tires using freely available FORScan software and a supported OBDII interface adapter. **See DMF TRB0012 for detailed information.**

8. Change TPMS Threshold Pressures

- a. The suggested cold inflation pressure of 85 psi is higher than factory tires, which can cause errant TPMS warnings if the system threshold pressures are not adjusted.
- b. **Ford Dealership Service Center:** Typical factory cold inflation pressures are 75F/80R. Dealerships are unable to set cold inflation pressures above 80 psi. Installer testing and verification may show this to be an adequate setting to comply with the FMVSS 138 requirements for TPMS telltale indicator illumination.
- c. **Using FORScan Software:** Cold inflation pressures can be set to 85 psi using freely available FORScan software and a supported OBDII interface adapter. Road testing by DMF has shown this this procedure typically complies with FMVSS requirements, but certifying compliance of the completed vehicle is the responsibility of the installer. **See DMF TRB0012 for detailed information.**

9. "Re-Learn" New TPMS Sensors


- a. The TPMS system will not operate properly until the new sensors are paired with the vehicle.
- b. 2017+ models should "re-learn" sensors/locations automatically within several miles of driving.
- c. If automatic pairing is unsuccessful, factory tools and techniques for TPMS re-learning may provide better results.

10. Testing

- a. It is the responsibility of the installer to certify that the truck complies with all applicable State and Federal regulations.
- b. In particular, the regulations and test procedures outlined in FMVSS Standard 138 must be performed in order to ensure compliance.

11. Inspection & Maintenance

- a. Visually inspect wheels & tires both prior to and after use on rail (look for damage, loose hardware, etc.)
- b. Check the fastener torque 50 miles after wheel/tire change and every 2000 miles or 6 months.

	TITLE: 2014+ Ram Wheel Adapter Kits			
	DRAWING #:	509068	BY: TAM	DATE: 3/24/17
RW-1013/15/16	DIVERSIFIED METAL FABRICATORS, INC. (404) 875-1512			
REV:	DATE:	DESCRIPTION:		BY:
A	6/22/20	CORRECTED BOM TABLE		BJF
-	-	-		-

2014+ Ram Wheel Adapter Kits

Description

Diversified Metal Fabricator's Wheel Adapter Kits allows for the use of aftermarket 19.5" rims on 2014+ Ram 2500/3500 4x4 pickups for use on rail.

509068: 2014+ Ram SRW 2/3500 pickups equipped with factory TPMS (4 wheel set)

509062: 2014+ Ram SRW 2/3500 pickups equipped with factory TPMS (5 wheel set)

509063: 2014+ Ram SRW 3500 pickups ***NOT EQUIPPED*** with factory TPMS.

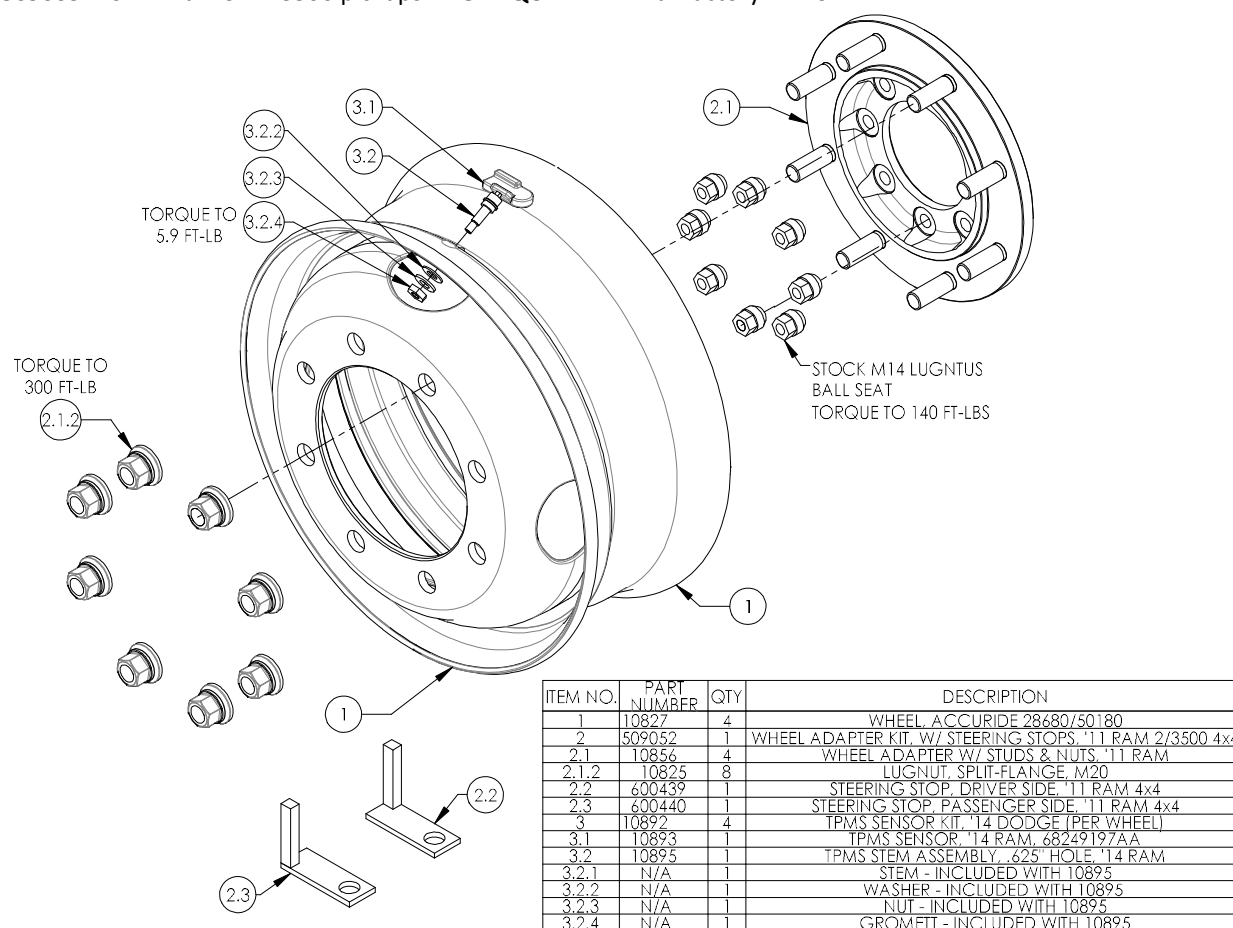


Figure 1 - Installation/Exploded Parts Diagram (509068 shown)

Recommended Tires

DMF does not typically include tires with wheel modification kits. Recommended tire models and sizes are shown below. Using different tire sizes than shown below can result in component interference or poor performance on rail.

Mud/Snow/All position

- Goodyear G622 - 245/70R19.5
- Michelin XDS2 - 245/70R19.5

Steer/Highway

- Goodyear G647 - 245/70R19.5

Installation

Warnings:

- **Never use anti-seize on studs or lug nuts.**
- **Hand-torque all fasteners to the provided specifications using a torque wrench.**
- **Improper installation or failure to perform a thorough check for clearances once this unit is installed may lead to damage to the chassis, wheels/tires, or personnel.**

1. Install TPMS Sensors and Tires

- a. Mount sensors to 19.5" rims as detailed in Figure 1 (where included).
- b. Mount and balance selected tires.
- c. Inflate tires to a cold pressure of 85 psi.

2. Remove Stock Wheels and Tires

- a. Lift the vehicle and properly support using jack-stands.
- b. Remove the stock wheels and tires, retaining the stock lug nuts for reuse.

3. Install Wheel Adapters and 19.5" Rims

- a. Remove and discard the factory spring clips on the factory studs.
- b. Mount the wheel adapters to factory hubs using factory lug nuts; torque as specified in Figure 1.
- c. Mount the 19.5" rims to the Wheel Adapter using the provided M20 Split Flange Nuts; torque as specified in Figure 1.

4. Install Steering Stops

- a. Steering stops are "handed" and must be installed on the correct side of the vehicle.
- b. Remove the lower kingpin nut from each front steering knuckle as shown in Figure 2.
- c. Install steering stops as shown, and secure with the factory kingpin nut.
- d. Turn the steering wheel to its extents in both directions and verify the steering stops are contacting the stop surfaces. It is usually necessary to have someone hold the steering wheel at full lock in both directions while looking for interference.
- e. Trim rear fender well liners if required for tire clearance. See Figure 3.

5. Verify Steering Clearances

- a. Verify that neither the rims nor tires contact any frame or suspension components in any combination of steering positions and axle droop/jounce conditions.
- b. Verify that all brake, ABS sensor and other wires or hoses are clear in all steering and suspension positions. Restrain if necessary.

6. TPMS Sensor Association and Programming (where included)

- a. There is no separate sensor association or "learning" step required for these vehicles.
- b. The sensors should automatically associate with the truck within several miles of normal driving.
- c. Dealerships are prohibited from adjusting the TPMS threshold pressures on Ram vehicles.
- d. Testing has shown that the recommended cold inflation pressure of 85 psi will not cause the TPMS indicator on the dash to illuminate. The TPMS dash indicator will typically illuminate when a tire drops below ~65 psi.

****STEPS 7 REQUIRES SPECIALIZED EQUIPMENT OR SOFTWARE AND NEED TO BE PERFORMED BY A DEALERSHIP****

7. Change Speedometer Calibration

- a. The suggested 19.5" tires have a larger rolling diameter than the tires found on most "work truck" trim level vehicles.
- b. The speedometer calibration is limited to stock tire sizes. As the tires we recommend are not a stock size for this vehicle, the stock LT265/60R20 tire setting should be selected as it is the most comparable in size.

8. Testing

- a. It is the responsibility of the installer to certify that the truck complies with all applicable State and Federal regulations.
- b. In particular, the regulations and test procedures outlined in FMVSS Standard 138 must be performed in order to ensure compliance.

9. Inspection & Maintenance

- a. Visually inspect wheels & tires both prior to and after use on rail (look for damage, loose hardware, etc.)
- b. Check the fastener torque 50 miles after wheel/tire change and every 2000 miles or 6 months.

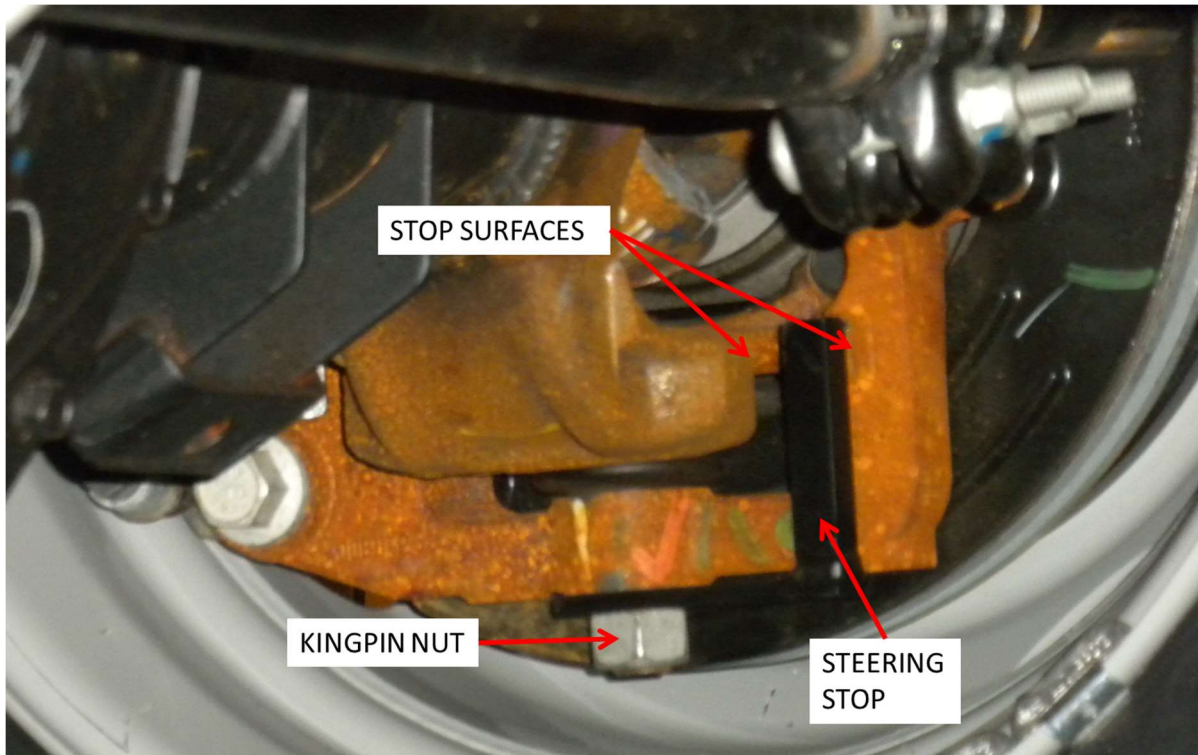


Figure 2 – Steering Stop Details, Driver Side



Figure 3 – Rear Fender Trim

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 manufacturer to be free of defects in material and workmanship, under normal use and service, for a period of **TWO CALENDAR YEARS**. **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.



ATLANTA

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