

Maintenance Manual 8

Drive Axle Housings

Welding and Repair Procedures

Revised 02-18



Service Notes

About This Manual

This manual provides welding instructions for Meritor single rear, tandem and tridem drive axle housings.

Before You Begin

1. Read and understand all instructions and procedures before you begin to service components.
2. Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.
3. Follow your company's maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Hazard Alert Messages and Torque Symbols

WARNING

A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

CAUTION

A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components.

 This symbol alerts you to tighten fasteners to a specified torque value.

How to Obtain Additional Maintenance, Service and Product Information

Visit Literature on Demand at meritor.com to access and order additional information.

Contact the Meritor OnTrac™ Customer Call Center at 866-668-7221 (United States and Canada); 001-800-889-1834 (Mexico); or email OnTrac@meritor.com.

If Tools and Supplies are Specified in This Manual

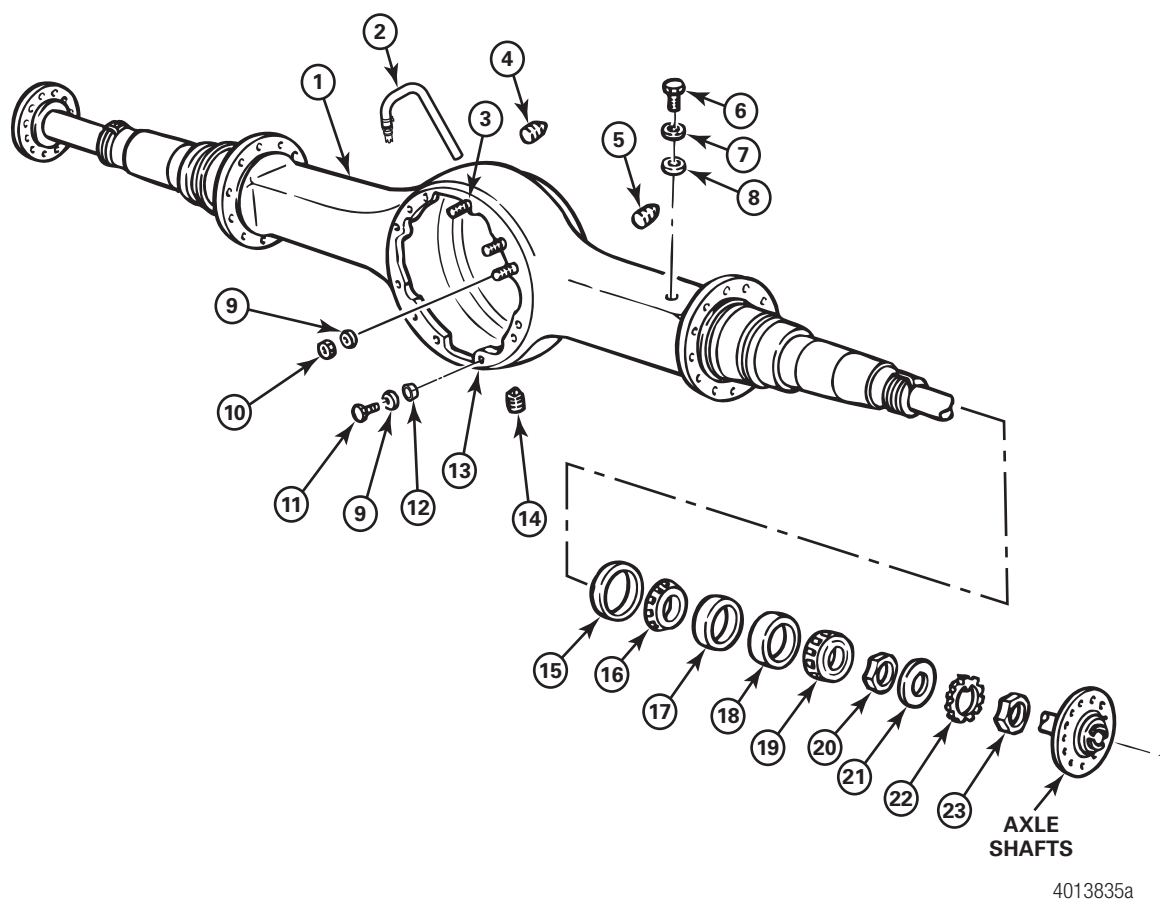
Contact Meritor's Commercial Vehicle Aftermarket at 888-725-9355.

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Exploded View

Conventional Axle Housing Assembly Components with Bottle Spindle



Item	Description	Axle Models
1	Conventional Axle Housing Assembly with Bottle Spindle	All Models
2	Breather Assembly	All Models
3	Stud — Housing-to-Carrier	All Forward Carriers
4	Plug — Heat Indicator	All Models
5	Plug — Non-Magnetic Oil Fill	All Models
6	Capscrew — Brake Line Bracket	All Models
7	Gasket — Brake Line Bracket	RS16140, RS17140, RS19145, RS21145 All Other Models
8	Washer — Brake Line Bracket	RS16140, RS17140, RS19145, RS21145 All Other Models

1 Exploded View

Item	Description	Axle Models
9	Washer — Carrier-to-Housing	All Models
10	Nut — Carrier-to-Housing Stud	All Forward Carriers
11	Capscrew — Carrier-to-Housing	All Forward Carriers RR22145 RS21145 All Other Single and Rear Carriers
12	Tapered Dowel — Carrier-to-Housing	160 and 14X Series Forward and Rear Carriers, If Equipped
13	Silastic Gasket — Housing-to-Carrier	All Models
14	Plug — Magnetic Oil Drain and Fill	All Models
15	Oil Seal — Wheel End	All Models
16	Cone — Wheel Bearing, Inner	All Models
17	Cup — Wheel Bearing, Inner	All Models
18	Cup — Wheel Bearing, Outer	All Models
19	Cone — Wheel Bearing, Outer	All Models
20	Nut — Wheel Bearing, Inner	All Models
21	Lock Washer and Tanged Lock Washer	All Models
22	Lock Washer and Tanged Lock Washer	All Models
23	Nut — Wheel Bearing, Outer	All Models

Description

On drive axles with unitized wheel ends, the hub, seal, lubricant and bearings are installed onto the axle spindle as an assembly.

To identify the axle, carrier and housing models, refer to the identification tags located on the main axle housing. Figure 2.1. Specify the information stamped on these tags when you order replacement parts.

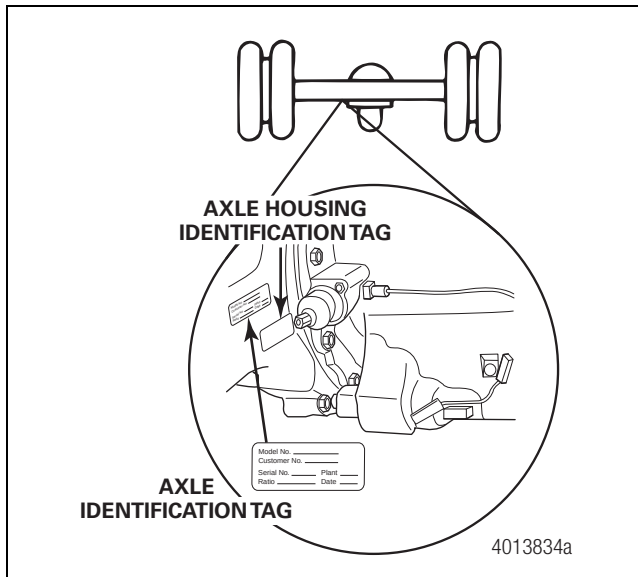


Figure 2.1

3 Welding

Repair

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Wear safe clothing and eye protection when you use welding equipment. Welding equipment can burn you and cause serious personal injury. Follow the operating instructions and safety procedures recommended by the welding equipment manufacturers.

Repair axle housing components covered in this manual only. Do not attempt to repair non-serviceable axle housing components. Serious personal injury and damage to components can result.

Axle weld locations and welding procedures must adhere to Meritor standards. Welding at locations other than those authorized by Meritor will void the warranty and can reduce axle beam fatigue life. Serious personal injury and damage to components can result.

Welding the Axle Housings

Meritor permits drive axle housing assembly repair welding in the following locations only.

- Housing-to-cover weld joints
- Snorkel welds
- Housing seam welds between the suspension attaching brackets
- Bracket welding to the drive axle housing

Prepare the Axle

WARNING

The high temperature caused by the open flame from the cutting torch can ignite the oil in the axle housing and can cause serious personal injury.

1. Remove the oil drain plug from the bottom of the axle housing and drain the lubricant from the assembly.

CAUTION

Remove the differential carrier from the axle housing before you weld onto an axle. Do not weld onto an axle with the differential carrier installed. Electrical arcing and damage to components can result.

2. Remove the differential carrier from the axle housing. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.

CAUTION

Remove the brake air chambers before you weld onto an axle. Do not expose a brake air chamber to more than 250°F (121°C). Damage to the air chamber can result.

3. Remove the wheel-end components and brake air chambers from the axle. Refer to the correct Meritor brake maintenance manual or the vehicle manufacturer's instructions.

WARNING

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear safe eye protection.
- Wear clothing that protects your skin.
- Work in a well-ventilated area.
- Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
- You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

4. For housing-to-cover welds, clean the outside housing-to-cover weld area two to three-inches (50.8-76.2 mm) past each end or side of the crack. Clean the inside area where the cover mates with the housing. Clean the area completely around the cover. Use a wire brush and a cleaning solvent that will remove dirt and grease from these areas. Figure 3.1.

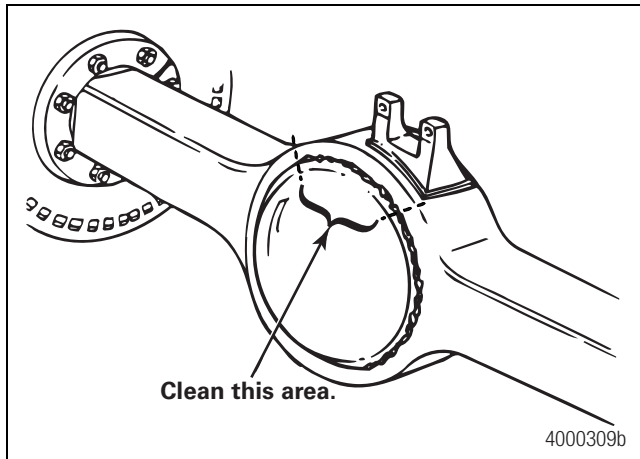


Figure 3.1

5. For suspension bracket welds, clean both lower and upper suspension brackets and the areas of the axle housing around each bracket. Use a wire brush and a cleaning solvent that will remove dirt and grease from these areas. Figure 3.2 and Figure 3.3.

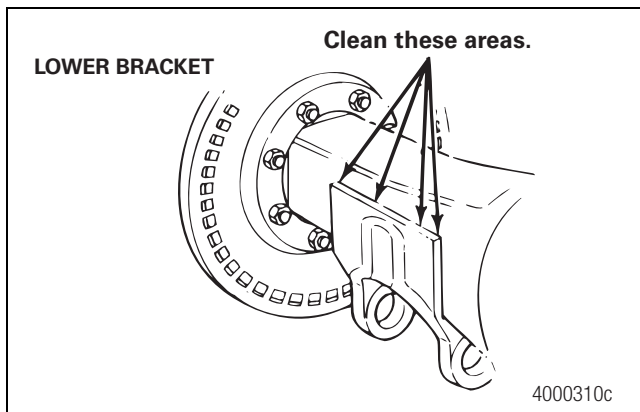


Figure 3.2

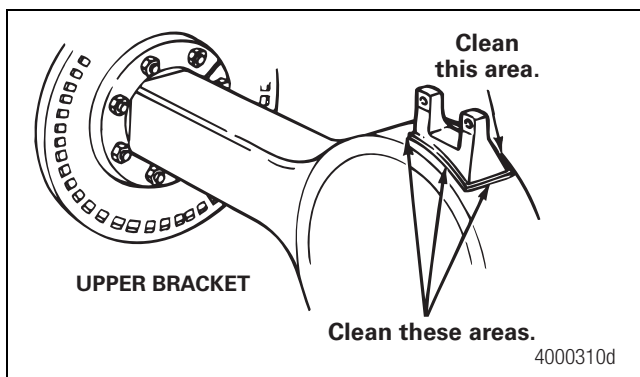


Figure 3.3

⚠ WARNING

The axle housing must be 70°F (21°C) or warmer before you weld onto the axle. Do not weld onto a cold axle or weld cold parts onto an axle. Cracks in the weld area, damage to components and serious personal injury can result.

6. Ensure that the axle housing temperature measures 70°F (21°C) or warmer.
 - If the axle housing temperature measures less than 70°F (21°C): Store the axle in a heated room until the housing reaches the correct temperature.
7. Heat the damaged area to approximately 300°F (149°C) before you begin welding.
8. Use suitable weld wire electrodes when you weld. Suitable weld wire electrodes include either BS EN 499 – E 42 2 B 32 H5 or BS EN 440 – G 42 2 M GSi (American Welding Society equivalents E7018 and ER70S3, respectively).

Remove the Cover Weld From the Axle Housing

1. Apply an anti-spatter compound on the housing areas around the weld that will be cut. If you do not have an anti-spatter compound, cover the axle housing with a nonflammable cloth.
2. Attach the ground cable as near as possible to the cracked weld area and only to components welded on the axle, such as a housing spring pad. Do not attach the ground cable at a suspension spring, U-bolt or at a point that places a wheel bearing between the ground connection and the weld area. Figure 3.4.

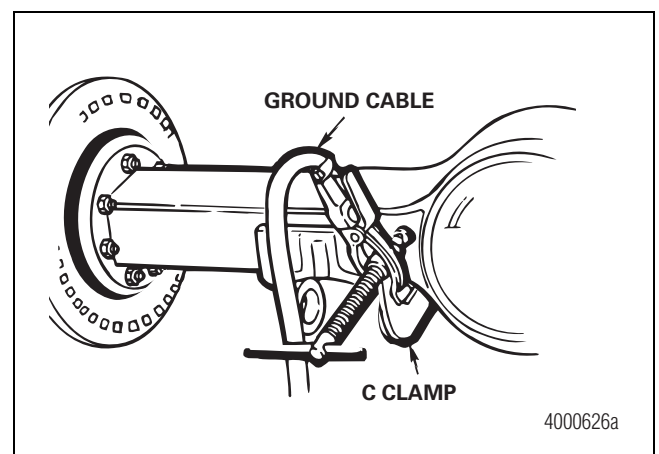


Figure 3.4

3 Welding

⚠ WARNING

To prevent serious personal injury, follow the arc gouging and grinding equipment manufacturers' operating and safety procedures when you perform Steps 3-6.

3. Remove the cracked part of the weld from the housing and cover with the plasma arc gouging process or equivalent. Extend removal of the weld one-inch (25.4 mm) past each end or side of the crack. Refer to Table A for plasma arc gouging specifications.

Table A

Input Power	440 Volts, 60 Hz, 3 Ph
Power Supply	AC power supply with a current capacity that is required for the recommended gouging tip size.
Torch	Plasma arc gouging torch of the correct size and current capacity for the gouging tip size used.
Recommended Gouging Tip Size	0.113-inch (2.87 mm)
Recommended Gouging Power	105 amps
Gas	Plasma — air, 40 psi (275 kPa), 22 SCFH Secondary — air, 75 psi (517 kPa), 470 SCFH
Air Pressure	80-100 psi (551-689 kPa) supplied through an air hose with a 0.25-inch (6.4 mm) minimum inside diameter.

4. Gouge approximately four grooves into the housing-to-cover weld crack area the full length of the crack plus an additional one-inch (25.4 mm) past each end or side of the crack. The grooves must not be more than 0.25-inch (6.4 mm) deep. Figure 3.5.

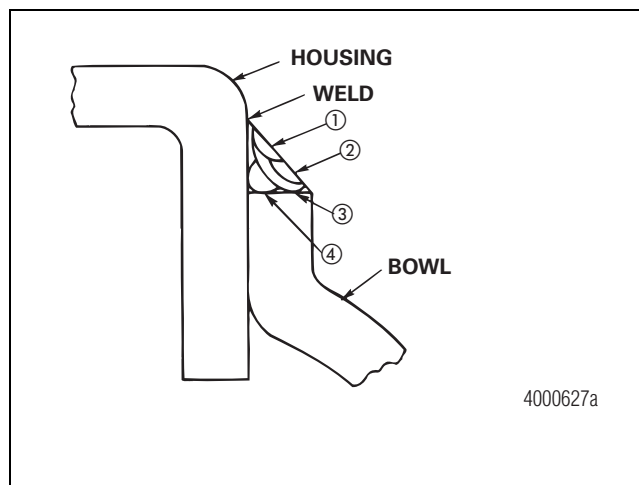


Figure 3.5

⚠ CAUTION

Do not gouge or grind below the surface of the housing wall. Gouges in the wall can weaken the housing. Damage to components can result.

5. After gouging is completed, remove any thick amounts of weld material that remain on the housing and cover with rough grinding. Figure 3.6.

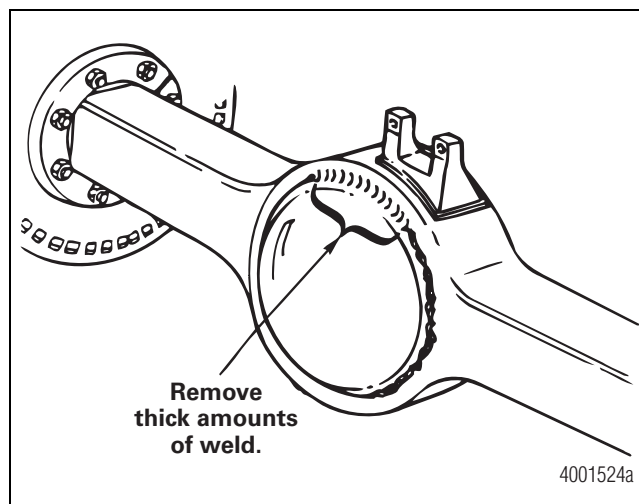


Figure 3.6

6. Use a disc grinder to grind the weld area flat with the housing wall. Lightly grind and remove any weld residue, ridges and ripples from the surface of the housing. Do not grind into the housing wall. All areas that you grind must be flat with the housing wall and cover material. Do not gouge or leave sharp edges on any surface.

⚠ CAUTION

Replace the housing if you find cracks in the housing material or cover material. Do not repair weld cracks in the housing material or cover material. Damage to components can result.

7. Use one of the inspection methods shown in Table B to inspect the following areas for cracks.
 - Open ends of the remaining housing-to-cover weld, created after removing the damaged weld area. Figure 3.7.
 - Housing and cover area next to the section of weld that was removed. Figure 3.7.

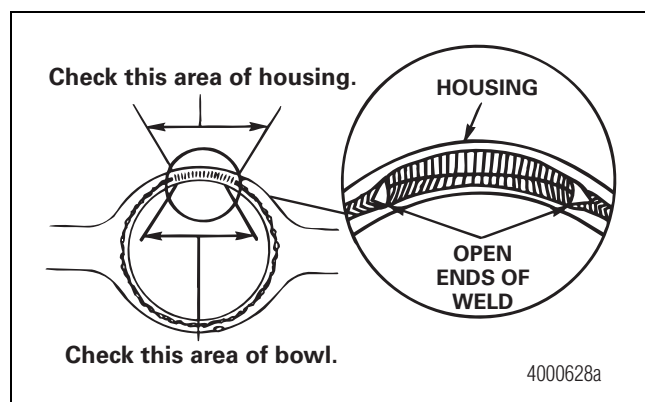


Figure 3.7

Table B: Inspection Methods

Magnetic Particle Inspection	Reference ASTM E709-80, typically dry powder, AC yoke method
Liquid Penetrant Inspection	Reference ASTM E165-80, typically dye-check method

8. If a crack is found in either of the open ends of the remaining housing-to-cover weld, repeat Steps 1-7 as many times as required to remove the crack. Each time the procedure is repeated, remove only one-inch (25.4 mm) more weld material from the end where the crack is located until the crack is removed completely.

- If the crack in the weld extends by more than 1/3 of the circumference of the cover, 20-inches (508 mm): The housing must be replaced.

Remove the Suspension Brackets From the Axle Housing

Spring alignment dowels are used for suspension alignment during initial vehicle assembly. If damaged, they do not need to be serviced or replaced.

1. Apply an anti-spatter compound on the housing areas around the weld that will be cut. If you do not have an anti-spatter compound, cover the axle housing with a nonflammable cloth.
2. Attach the ground cable as near as possible to the cracked weld area and only to components welded on the axle, such as a housing spring pad. Do not attach the ground cable at a suspension spring, U-bolt or at a point that places a wheel bearing between the ground connection and the weld area. Figure 3.4.

⚠ WARNING

To prevent serious personal injury, follow the arc gouging and grinding equipment manufacturers' operating and safety instructions when you perform Steps 3-6.

3. Cut the suspension brackets from the axle housing with the plasma arc gouging process or equivalent. Extend removal of the weld one-inch (25.4 mm) past each end or side of the crack. Refer to Table A for plasma arc gouging specifications.
4. Gouge approximately four grooves into the weld the full length of the bracket. The grooves must not be more than 0.25-inch (6.4 mm) deep. Follow the gouging pattern shown in Figure 3.8 until the bracket separates from the axle housing.

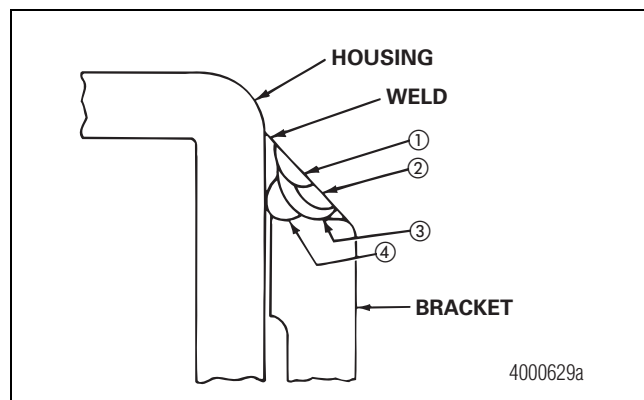


Figure 3.8

3 Welding

⚠ CAUTION

Do not gouge or grind below the surface of the housing wall. Gouges in the wall can weaken the housing. Damage to components can result.

5. Remove any thick amounts of weld material that remain on the housing with arc gouging or rough grinding. Figure 3.9.

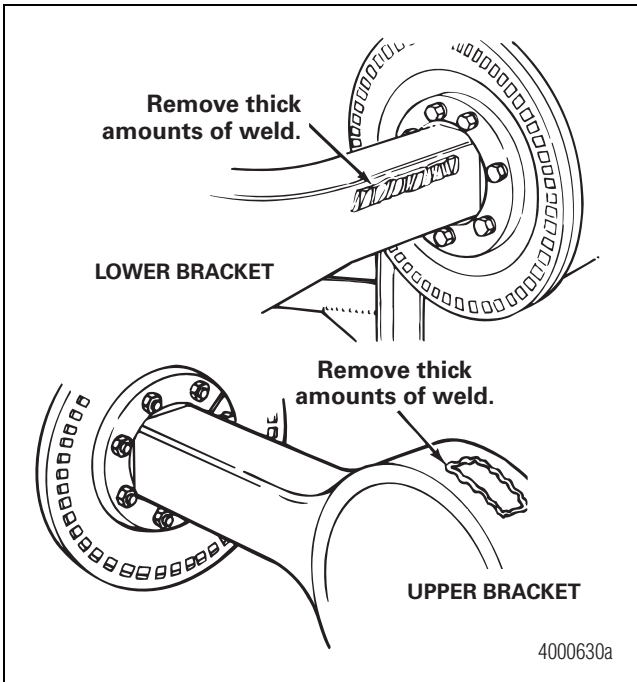


Figure 3.9

6. Use a disc grinder to grind the weld area flat with the housing wall. Lightly grind and remove any weld residue, ridges and ripples from the surface of the housing. Do not grind into the housing wall. All areas that you grind must be flat with the housing wall and cover material. Do not gouge or leave sharp edges on any surface.
7. Use one of the inspection methods shown in Table B to inspect the axle housing for cracks where the bracket was attached.

⚠ CAUTION

Replace housings with gouges or cracks greater than 0.125-inch (3.2 mm) deep. Do not attempt to repair housings with gouges or cracks that exceed 0.125-inch (3.2 mm) in depth. Damage to components can result.

8. Grind and repair all axle housing cracks that are less than 0.125-inch (3.2 mm) deep. Use 0.125-inch (3.2 mm) E-7018 electrodes to repair the cracks.

- If the depth of any crack exceeds 0.125-inch (3.2 mm): Replace the housing.

9. Repair all 0.063-0.125-inch (1.6-3.2 mm) deep axle housing gouges.

- If the depth of any gouge exceeds 0.125-inch (3.2 mm): Replace the housing.

10. If you repaired a crack or gouge in Steps 8 or 9, inspect the housing using one of the methods shown in Table B.
11. Grind the repaired area smooth and flat with the housing wall. Check the repaired area for cracks. Figure 3.10.

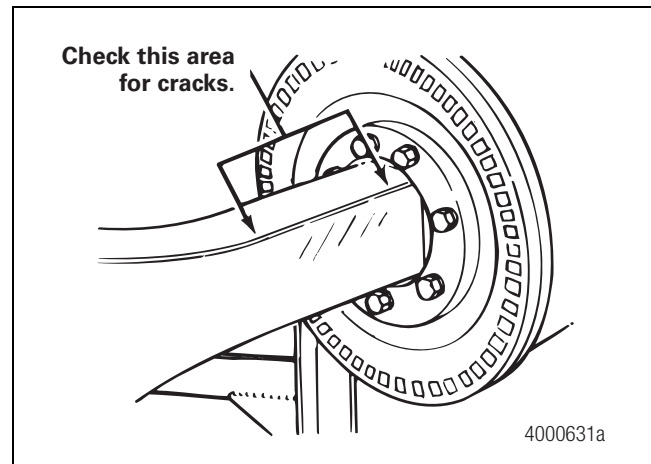


Figure 3.10

Welding

Outside of the Cover to the Housing

1. Position the housing for a flat weld by tilting it 45 degrees forward. Figure 3.11.

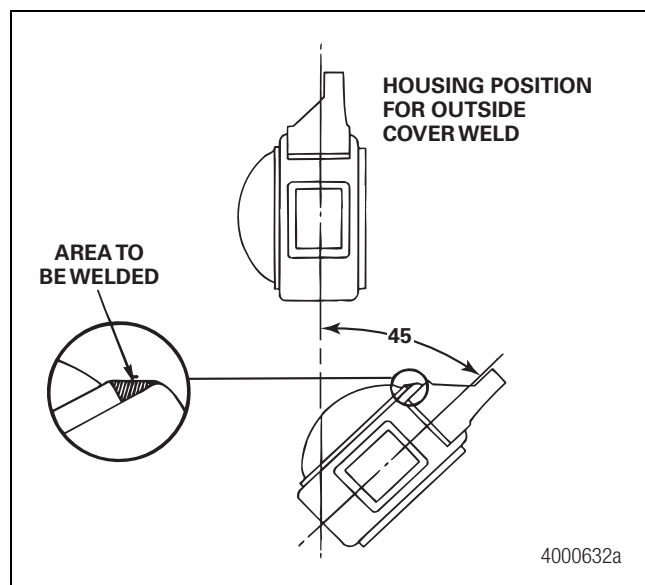


Figure 3.11

2. Beginning at one of the indicated start locations, one-inch (25.4 mm) into the old weld, back step 0.315-0.512-inch (8-13 mm) to prevent a cold start. Figure 3.12.

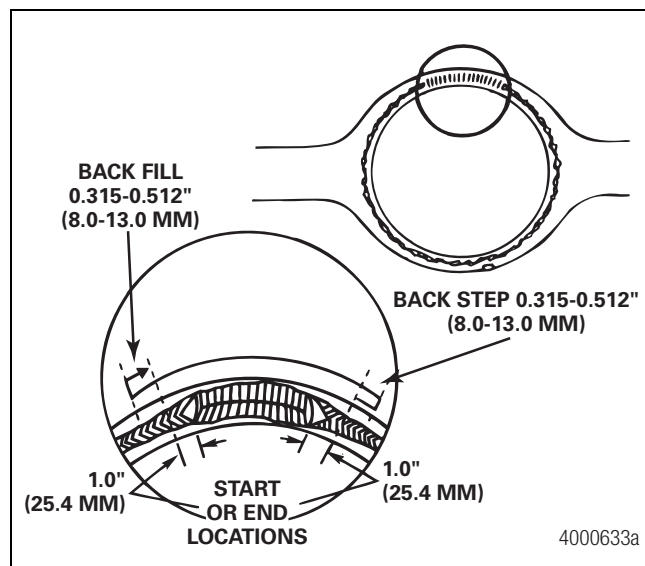


Figure 3.12

3. Lay a full fillet in a single pass, if possible, to the end where the damaged weld was removed plus one-inch (25.4 mm) past the end (into the old weld). Fillet size 0.315-0.500-inch (8.0-12.7 mm).
4. Back fill the end of the weld 0.315-0.512-inch (8-13 mm) to eliminate craters. Figure 3.12.
5. When multiple passes are required to obtain the correct fillet size, remove all slag and flux from the last weld before applying the next weld.
6. Clean and inspect the final weld. Refer to the procedures in this section.

Inside of the Cover to the Housing

1. Position the housing for a flat weld by rotating it 180 degrees from the operating position it would be in under the vehicle. The oil drain hole will be at the top position and the center line of the housing must be vertical. Figure 3.13.

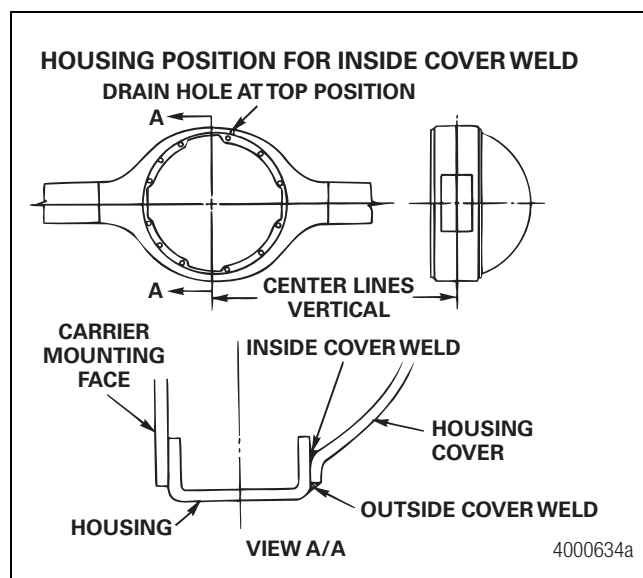


Figure 3.13

2. Beginning at start point 1, 60 degrees away from the vertical center line, back step 0.315-0.512-inch (8-13 mm) to prevent a cold start. Figure 3.14.

3 Welding

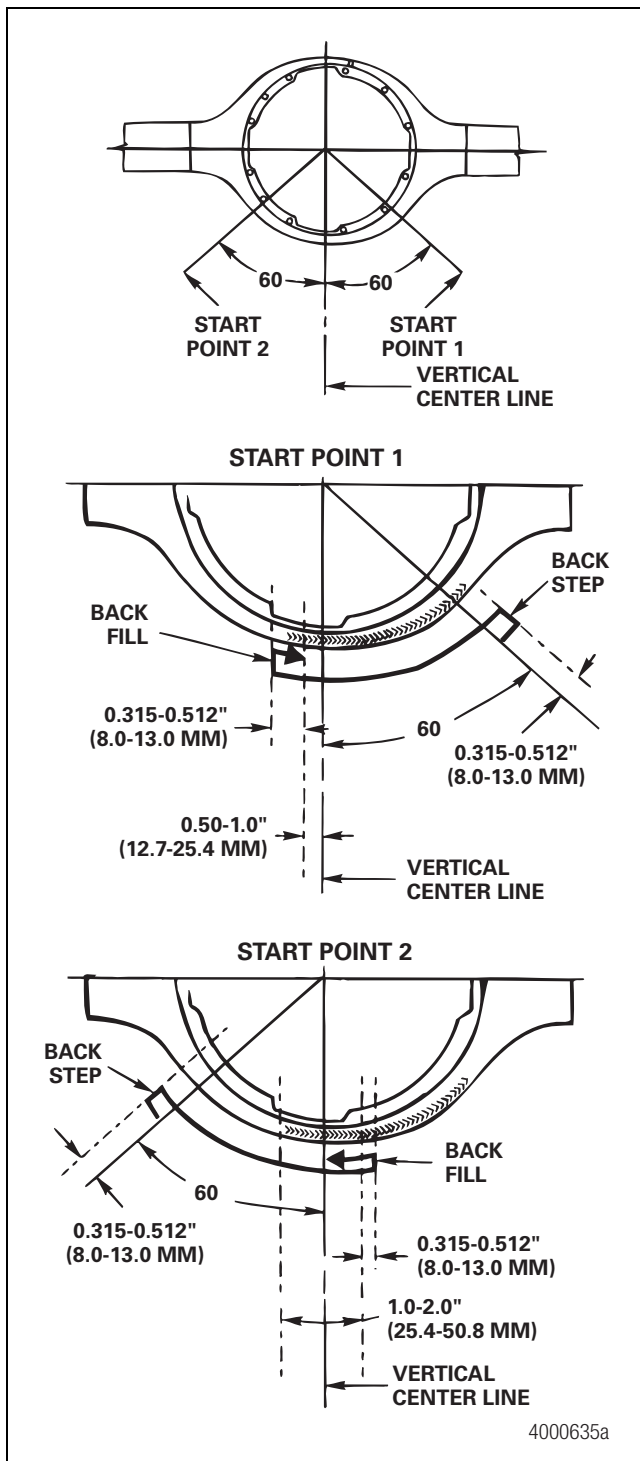


Figure 3.14

3. Lay a full single-flare bevel weld in a single pass, if possible, ending 0.50-1.00-inch (12.7-25.4 mm) past the vertical center line. Figure 3.14. Single flare-bevel weld size is 0.315-0.500-inch (8.0-12.7 mm).
4. Back fill the end of the weld 0.315-0.512-inch (8-13 mm) to eliminate craters. Figure 3.14.
5. When multiple passes are required to obtain the correct single-flare bevel weld size, remove all slag and flux from the last weld before applying the next weld.
6. Beginning at start point 2, opposite side of first weld, 60 degrees away from the vertical center line, repeat Steps 2-5. When you repeat Step 3, overlap the end of the first weld by one to two-inches (25.4-50.8 mm) before back filling the weld. Figure 3.14.
7. Let the axle housing air cool to room temperature. DO NOT use any other method of cooling. Other methods of cooling can cause the housing to crack or become weakened.
8. Clean and inspect the final weld. Refer to the procedures in this section.
9. Install the wheel-end components and brake air chambers on the axle. Refer to the correct Meritor brake maintenance manual or the vehicle manufacturer's instructions.
10. Install the differential carrier into the axle housing and fill the axle with the specified type and amount of lubricant. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.

Upper Torque Rod Brackets

On brackets that require welding all around (360 degrees), distortion and stress can be controlled by tack welding on opposite sides of the bracket alternately. Cover the tack welds as you deposit the required amount of metal with the final welds. One pass is preferred. Where a second pass is required, thoroughly remove the slag from the first weld between passes.

1. Position the bracket to the housing according to dimensions on the specific housing assembly drawing and associated layouts. Contact your Meritor representative.
2. Tack weld in four places as shown. Figure 3.15.

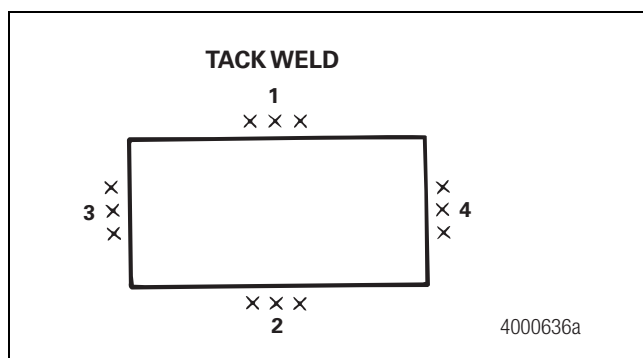


Figure 3.15

3. Position the housing for a flat weld. The housing must be at 45 degrees for front and rear faces. Figure 3.16.

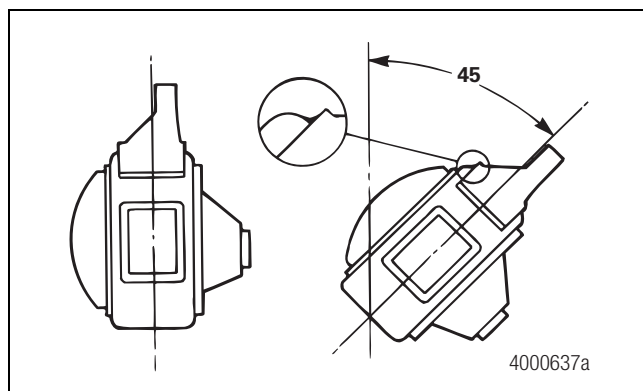


Figure 3.16

4. Beginning at the indicated location, back step the start of the weld from 0.315-0.512-inch (8-13 mm) to prevent a cold start. Figure 3.17.

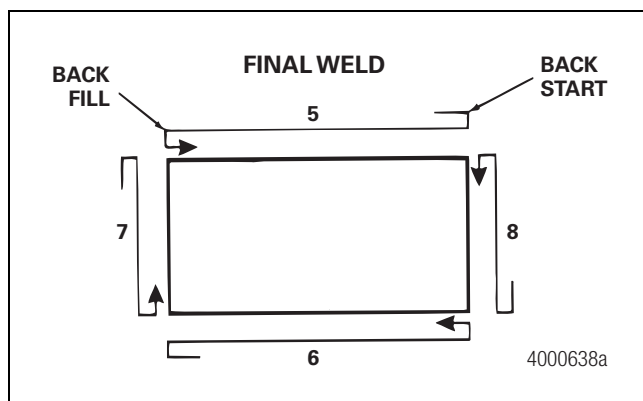


Figure 3.17

5. Lay a full fillet in a single pass: Fillet size 0.375-0.50-inch (9.5-12.7 mm).
6. Back fill the end of the weld 0.315-0.512-inch (8-13 mm) to eliminate craters. Figure 3.17.
7. Complete the welding on all sides of the bracket using Steps 3-6. Figure 3.17.
8. For Chalmers tower and saddle bracket tack and final weld details, refer to Figure 3.18 and Figure 3.19.

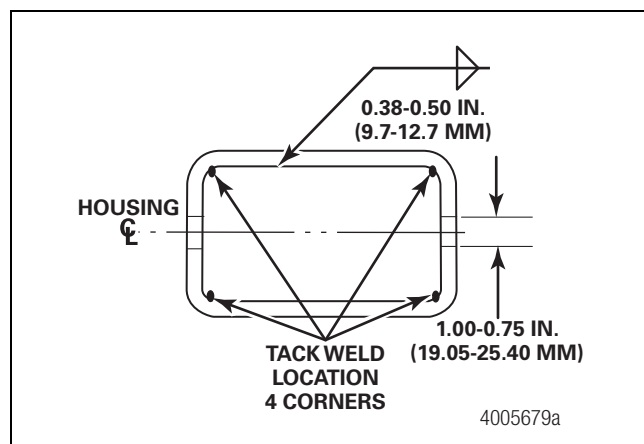


Figure 3.18

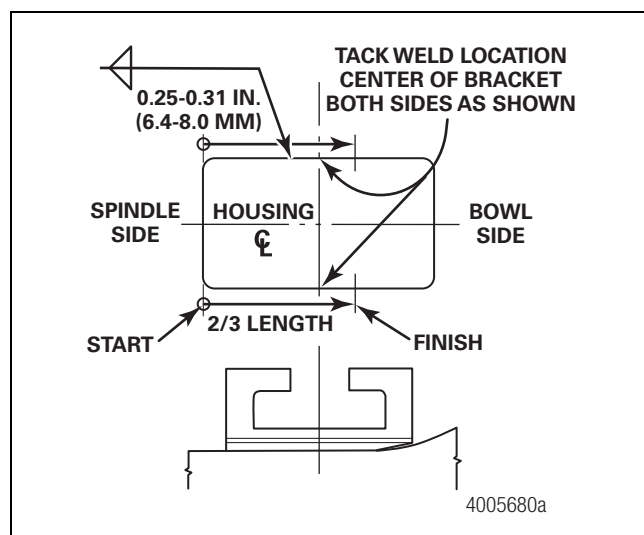


Figure 3.19

9. Let the axle housing air cool to room temperature. DO NOT use any other method of cooling. Other methods of cooling can cause the housing to crack or become weakened.

3 Welding

10. Clean and inspect the final weld. Refer to the procedures in this section.
11. Install the wheel-end components and brake air chambers on the axle. Refer to the correct Meritor brake maintenance manual or the vehicle manufacturer's instructions.
12. Install the differential carrier into the axle housing and fill the axle with the specified type and amount of lubricant. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.

Walking Beam Suspension Hanger Brackets

Spring alignment dowels are used for suspension alignment during the initial vehicle assembly. If damaged, they need not be serviced or replaced.

The same welding procedures are used for the following brackets. Refer to Table C for the bracket type and axle model. Additional welding procedures are contained in this section.

Table C:

Bracket Type	Axle Model
Thru-Pin Set Screw Service Brackets	RT-34-140/145
	RT-40-140/145
	RT-44-145
	RT-46-160
	RT-46-164EH
	RT-48-180
	RT-23-180 Rear Drive Axles
Thru-Pin Brackets without Set Screws	SL-100
	SQ-100
	RT-44-145
	SQHP
	SQR-100, puddle weld also required
Bar Pin Brackets with Set Screws	SSHD, puddle weld also required
	RT-145 and RT-160 only

1. Position the bracket to the housing as shown. Figure 3.20.

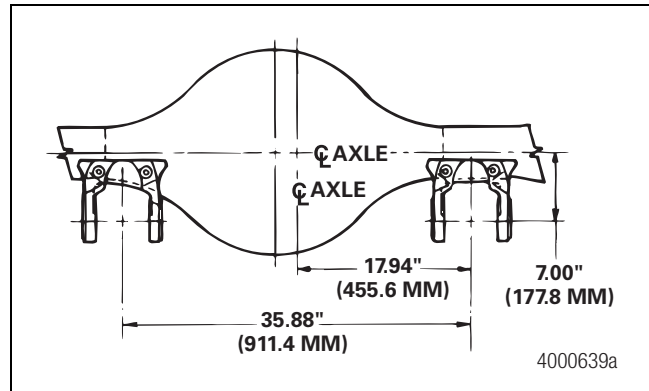


Figure 3.20

2. Verify that there is an equal space between each bracket and housing wall on the front and back of the axle housing. Also verify that the center line of the bracket bore is seven-inches (177 mm) below the center line of the housing. Figure 3.21.

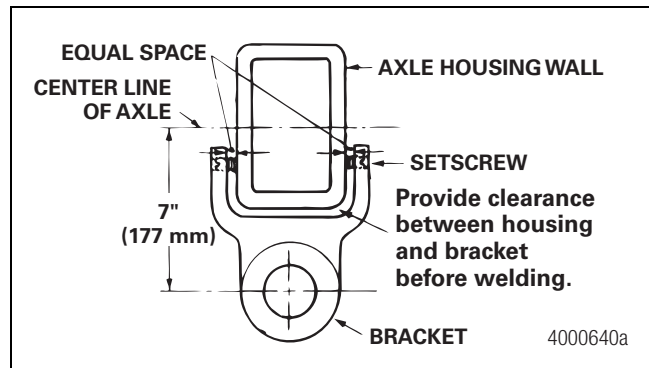


Figure 3.21

3. Tighten the set screws to 8-20 lb-ft (11-27 N·m) preload. ①
4. Tack weld each bracket as shown in Figure 3.22. Make two tack welds on the front of the axle housing and two tack welds on the back of the axle housing.

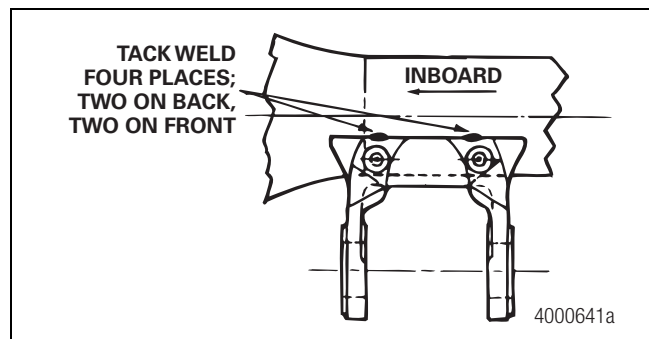


Figure 3.22

5. If the clearance between the bracket and the axle housing is between 0.090-0.125-inch (2.3-3.2 mm), you must make a root pass to close the clearance and provide an adequate throat dimension. Figure 3.23.

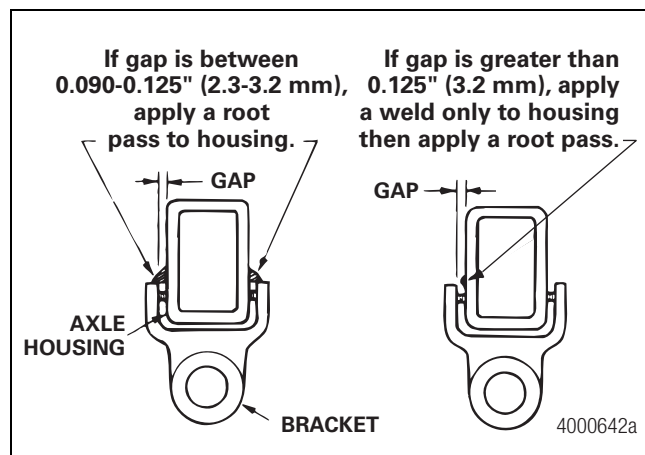


Figure 3.23

6. If the clearance between the bracket and the axle housing is greater than 0.125-inch (3.2 mm), apply a weld to the axle housing. Figure 3.23. Then make a root pass.
7. Verify that each bracket weld has a flat or slightly convex contour. A concave contour is not allowed because it reduces the throat dimension of the weld. Figure 3.24.

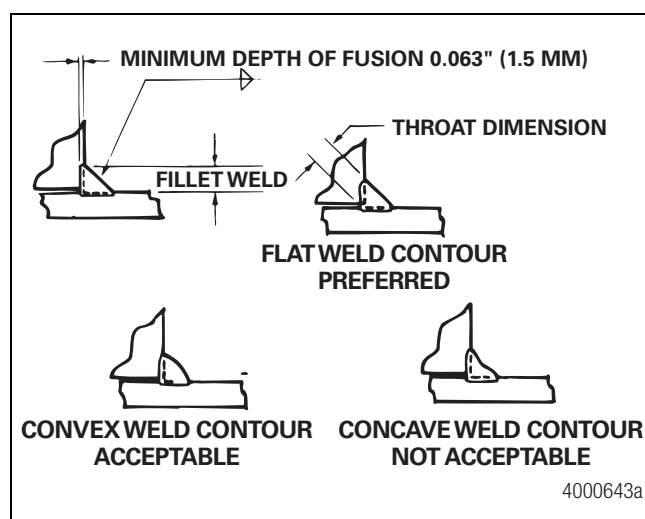


Figure 3.24

8. Position the axle housing so that the front and rear faces are at 45-degree angles. Figure 3.25.

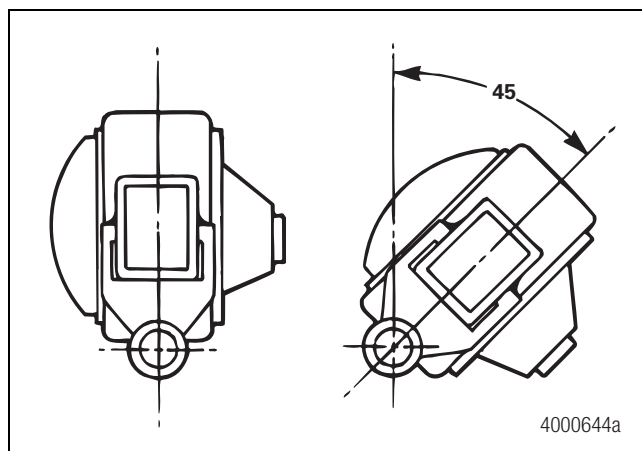


Figure 3.25

9. For RT-34-140/145, RT-40-140/145, RT-44-145 and RT-46-160 rear drive axles, proceed as follows.
 - A. Back step the start of the weld from 0.315-0.50-inch (8-12.7 mm) to prevent a lack of fusion. Figure 3.26.
 - B. Lay the first fillet weld 0.375-inch (9.5 mm) in a single pass. The tolerance of the fillet welds must be +0.050-inch/-0.0-inch (+1.27 mm/-0.0 mm). Work toward the inboard end. If the weld is larger than this dimension, there may not be enough clearance for the slack adjuster. Figure 3.27.
 - C. Back fill the end of the weld 0.315-0.50-inch (8-12.7 mm) to eliminate craters.
 - D. Verify that the tack weld is completely consumed by the final weld. Remove any slag.
 - E. Apply the second fillet weld to increase the fillet size to 0.50-inch (12.7 mm) only at each end of the bracket as shown in Figure 3.28 and Figure 3.29. This will allow clearance for the slack adjuster.
 - F. Back step the start of the weld from 0.315-0.50-inch (8-12.7 mm) to prevent a lack of fusion. The weld must be three-inches $\pm$ 0.125-inch (76 mm $\pm$ 3 mm) long.
 - G. Back fill the end of the weld 0.315-0.50-inch (8-12.7 mm) to eliminate craters.
 - H. Verify that you weld the front and back of the bracket.

3 Welding

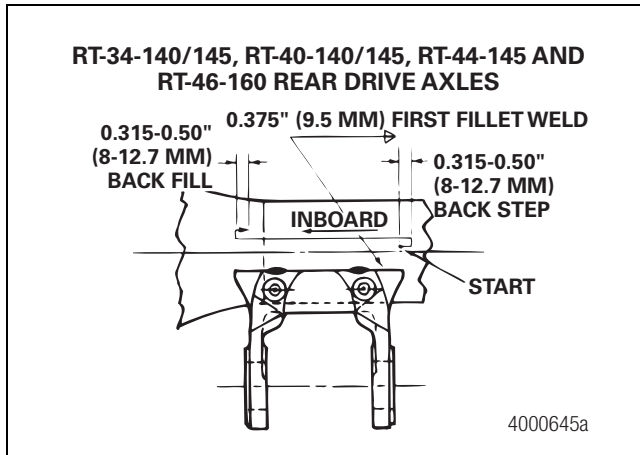


Figure 3.26

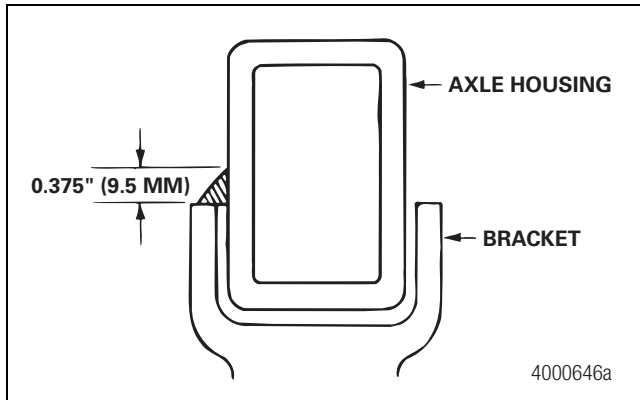


Figure 3.27

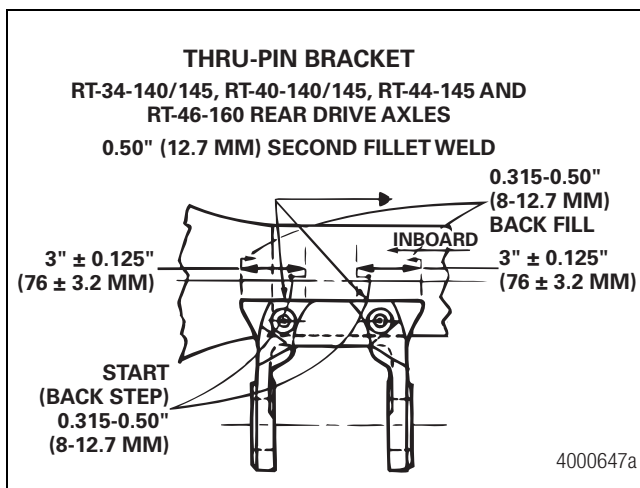


Figure 3.28

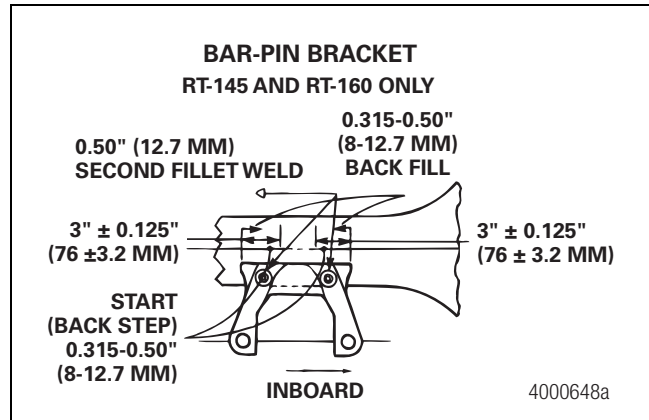


Figure 3.29

10. For RT-48-180 and RS-23-180 rear drive axles, proceed as follows.

- Back step the start of the weld from 0.315-0.50-inch (8-12.7 mm) to prevent a lack of fusion. Figure 3.30.
- Lay the first fillet weld 0.50-inch (12.7 mm) in a single pass. The tolerance of the fillet welds must be +0.050-inch/-0.0-inch (+1.27 mm/-0.0 mm). Work toward the inboard end.
- Back fill the end of the weld 0.315-0.50-inch (8-12.7 mm) to eliminate craters.
- Verify that the tack weld is completely consumed by the final weld. Remove any slag.

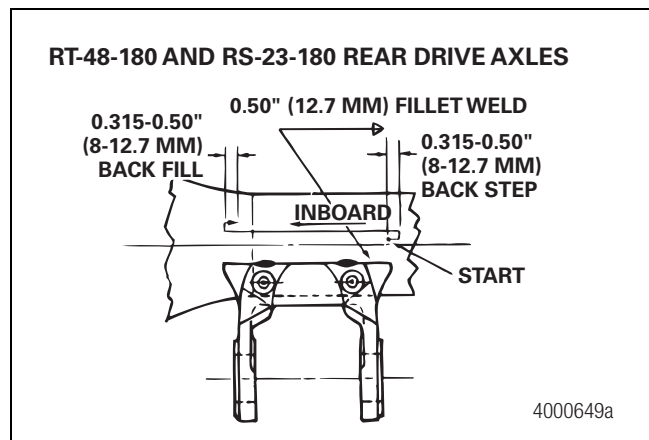


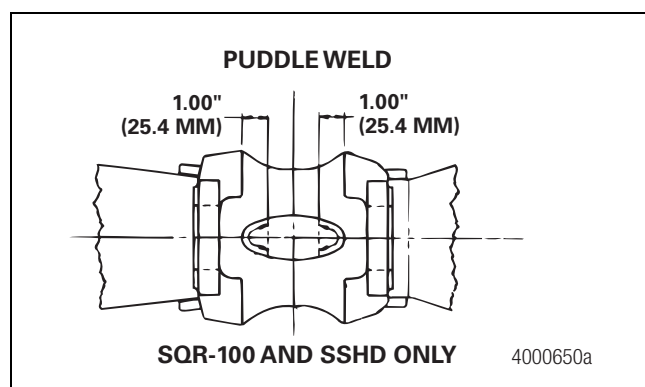
Figure 3.30

11. Tighten each set screw in the bracket to 90-115 lb-ft (122-156 N•m). **1**

⚠ WARNING

Allow the axle housing and brackets to air cool until they reach room temperature. Do not use any other cooling method. Other cooling methods can cause the axle housing, brackets or welds to crack or become weakened.

12. Allow the axle housing and brackets to air cool until they reach room temperature.
13. For brackets with set screws, apply a tack weld to each set screw.
14. For brackets without set screws (SQR-100 and SSHD), puddle weld the bracket bottom hole. Do not puddle weld brackets with set screws. Figure 3.31.

**Figure 3.31**

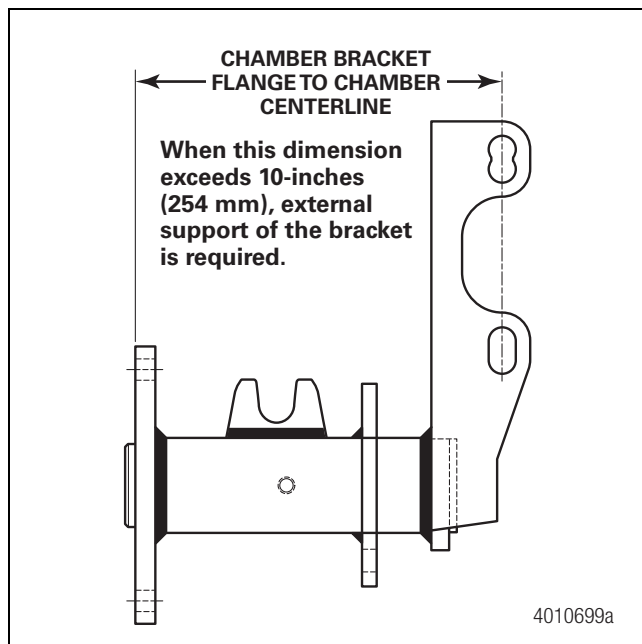
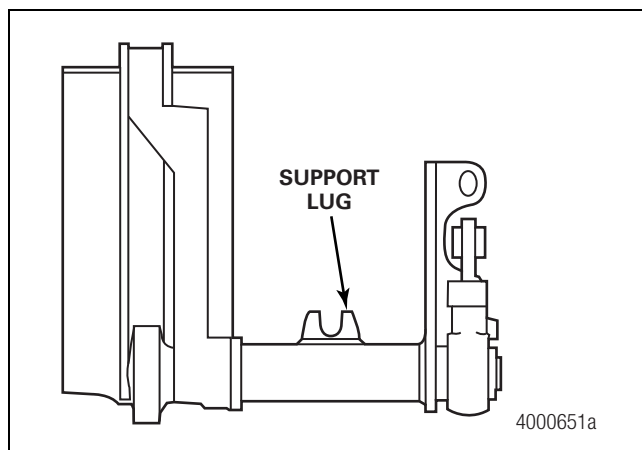
15. Allow the tack welds or puddle welds to air cool to room temperature. Paint the repaired area of the brackets and axle housing with black primer.
16. Install the differential carrier into the axle housing and fill the axle with the specified type and amount of lubricant. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.
17. Install the wheel-end components and brake air chambers on the axle. Refer to the correct Meritor brake maintenance manual or the vehicle manufacturer's instructions.

Brake Chamber Support Lug

1. When the brake chamber flange-to-chamber centerline exceeds 10-inches (254 mm), auxiliary chamber bracket support is required. Figure 3.32.

Meritor furnishes the support lug on certain brake chamber brackets. Figure 3.33. The original equipment manufacturer must weld the mating support lug to the axle housing, mating it with the support lug on the brake chamber bracket tube.

When the Meritor provided support lug is not provided on the chamber bracket, the vehicle manufacturer must provide an alternate-design auxiliary chamber bracket support.

**Figure 3.32****Figure 3.33**

2. Meritor can supply the mating support lug along with the bolt, nut and washer (0.75"-10 x 1.5"). Contact your Meritor representative. Figure 3.34.

3 Welding

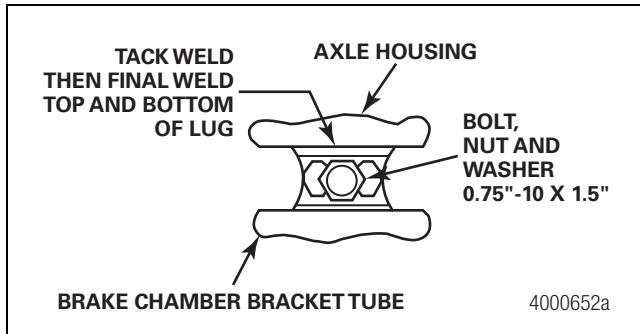


Figure 3.34

3. Before welding, assemble the housing lug to the chamber tube lug loosely. One washer should be placed between the head of the bolt and the support lug. The other washer should be placed between the nut and the opposite support lug. Slide the housing support lug toward the housing until it touches the housing wall. Figure 3.34.
4. Tack weld the housing lug on top and bottom. Torque the lug bolt and nut provided by Meritor to 180-230 lb-ft (244-311 N•m). **ⓘ**
5. Weld the lug to the housing on top and bottom. Back step the start of the weld approximately 0.125-inch (3.2 mm) to prevent lack of fusion. Lay the fillet weld 0.25-inch (6.4 mm) in a single pass toward the inboard end. Back fill the end of each weld approximately 0.25-inch (6.4 mm) to eliminate craters.
6. Verify that the tack weld is completely consumed by the final weld. Remove any slag.

Specifications

Fillet Weld Depth of Fusion

Fillet weld depth of fusion applies to both sides of the fillet. Unless otherwise specified, the depth of fusion on housing-to-cover welds is 0.100-inch (2.54 mm) +0.05/−0.0-inch (+1.27/−0.0 mm). The tolerance applies to weld size and depth of fusion. Figure 3.35. Unless otherwise specified, the depth of fusion on suspension brackets is 0.063-inch (1.5 mm) +0.05/−0.0 inch (+1.27/−0.0 mm). The tolerance applies to weld size and depth of fusion. Figure 3.36.

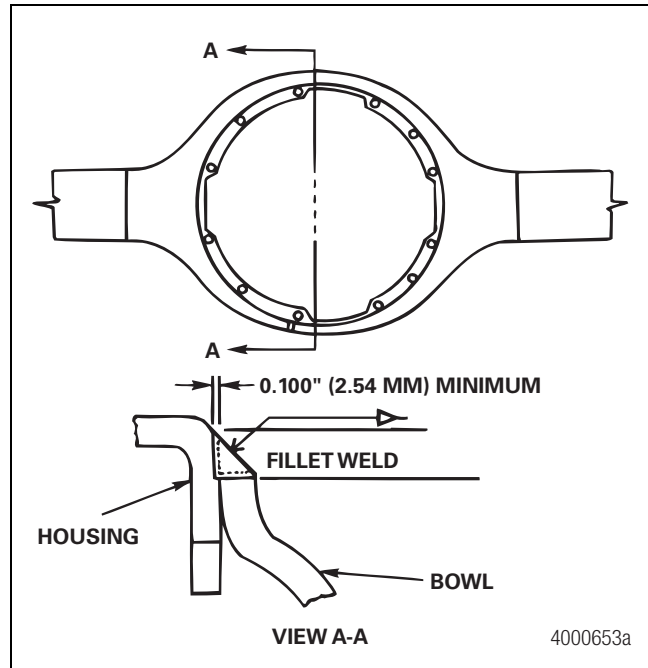


Figure 3.35

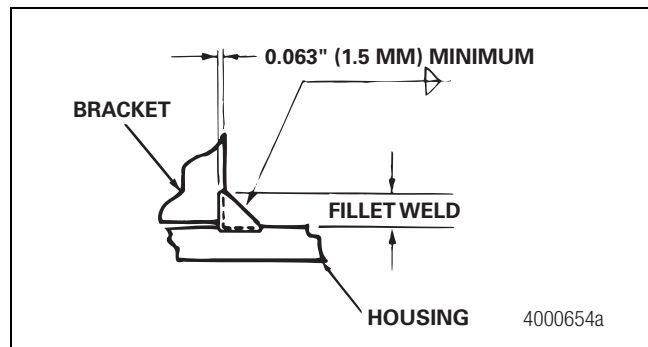


Figure 3.36

Verify that the weld has a flat or slightly convex contour with a sufficient depth of fusion on both side walls. Figure 3.37.

A concave contour is not allowed because it reduces the throat dimension of the weld.

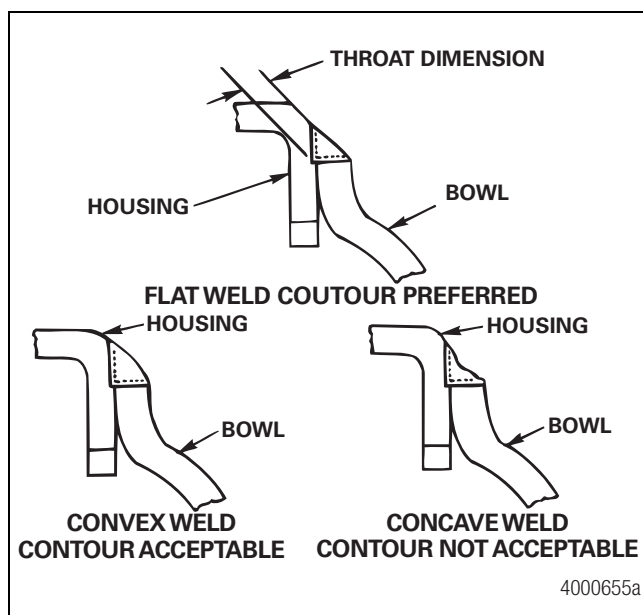


Figure 3.37

Root Pass

If the gap is 0.090-0.125-inch (2.3-3.2 mm), a root pass is required to bridge the gap and provide an adequate throat dimension. Figure 3.38. If the gap is wider than 0.125-inch (3.2 mm), build up the housing with the weld before application of the root pass. Figure 3.38.

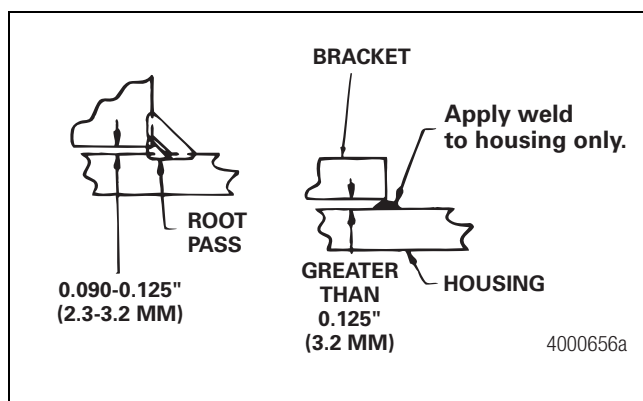


Figure 3.38

Verify that the weld has a flat or slightly convex contour with a sufficient depth of fusion on both side walls. Figure 3.39.

A concave contour is not allowed because it reduces the throat dimension of the weld.

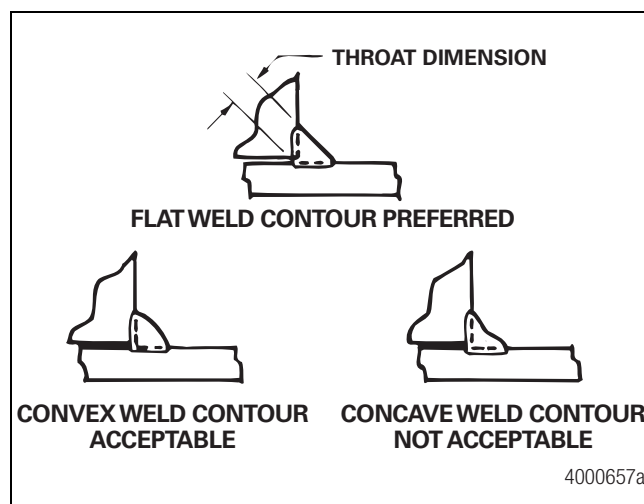


Figure 3.39

Welding Process

Recommended Process

Semi-automatic flux-cored arc welding (FCAW) process using a flux-cored electrode, E70T-1, with CO₂ shielding gas for fillet, final weld.

Acceptable Process

Multi-pass using gas metal arc welding (GMAW) process with an ER70S-6 electrode for tack, filler, if needed, and root pass welds. GMAW may also be used for fillet, final welds.

Filler Metal Specifications

- FCAW Process — AWS class E70T-1
- GMAW Process — AWS class ER70S-6
- SMAW Process — AWS class E7018

Gas Shielding for Arc Welds

- E70T-1 — Welding grade CO₂, dew point -40°F (-40°C)
- ER70S-6 — Welding grade 85% argon, 15% CO₂

Electric Current

Direct current, reverse polarity, electrode positive

Position

- Horizontal fillet (2F) position for tack welding

3 Welding

- Flat fillet (1F) position for filler, if needed, root pass and fillet, final weld

Recommended Parameters

CAUTION

Low-hydrogen electrodes should be stored at an appropriate temperature in portable field ovens or used from freshly opened, airtight containers. The moisture content of low-hydrogen electrode coatings can be reduced following exposure to the atmosphere by drying them according to the manufacturer's recommendations, usually at temperatures between 500-800°F (260-427°C) and storing at temperatures above 200°F (93°C).

Weld Process	Wire Type	Wire Diameter	Current (amps)	DCRP (volts)	Gas Flow (cfh)
FCAW	E70T-1	0.094" (2.3 mm)*	425- 475	26-31	30-35
GMAW	ER70S-6	0.045" (1.1 mm)*	260- 280	27-29	30-40
SMAW	E7018*	0.156" (4.0 mm)*	Follow the manufacturer's recommendations.		

*E7018 welding rod must be kept dry. Follow the manufacturer's instructions for moisture content and drying procedures.

Base Metal Preparation

- The housing-to-cover weld area, external and internal, to be repaired must be cleaned before welding begins. Remove all oil, grease, moisture, paint, scale (flakes), rust and other foreign material.
- No preheating is required if the ambient temperature is above 50°F (10°C).
- Preheat to 100°F (37°C) if the ambient temperature is below 50°F (10°C).

Base Weld Appearance

- The weld current and manner of depositing the weld metal must result in practically no undercutting of the base metal, 0.030-inch (0.76 mm) maximum undercut.
- Craters must be back filled before breaking the arc.

- The weld must be essentially flat.
- The weld must be full size as specified or an additional weld layer will be needed.

Cleaning and Inspection

- Remove all slag and flux from the weld before applying the next bead.
- Remove all slag from the completed weld.
- All cracks, notches or holes in the surface of the weld must be removed by grinding before applying the next bead.
- Check the weld for cracks with magnetic particle inspection, reference ASTM E709-80 or liquid penetrant inspection, reference ASTM E165-80.
- When checking welds for damage, refer to ANSI/AWS D1.1-86 Handbook, Section 9.25 — Structural Welding Code for Steel.

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear safe eye protection.
- Wear clothing that protects your skin.
- Work in a well-ventilated area.
- Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
- You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

When you apply some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure that the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into your eyes, follow the manufacturer's emergency procedures. Have your eyes checked by a physician as soon as possible.

Take care when you use Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into your eyes, follow the manufacturer's emergency procedures. Have your eyes checked by a physician as soon as possible.

Repair

Bending or Straightening Drive Axle Housings

WARNING

Repair the axle housing components covered in this manual only. Do not attempt to repair non-serviceable axle housing components. Serious personal injury and damage to components can result.

Replace damaged or out-of-specification axle components. Do not bend, repair or recondition axle components by welding or heat-treating. A bent axle beam reduces axle strength, affects vehicle operation and voids the Meritor warranty. Serious personal injury and damage to components can result.

Do not bend or straighten drive axle housings. Modifying axle housings by bending or straightening will void the Meritor axle warranty. Always replace damaged non-serviceable drive axle housings.

Breather Inspection

In addition to regularly-scheduled maintenance, the breather should be inspected whenever a seal leak is found. A breather that is plugged with road debris, ice, etc. can cause pressure to build up in the carrier housing and affect the seal assembly. If a breather is damaged or missing the cap or hose, the carrier can also be exposed to contamination.

Use the following procedure to inspect the breather.

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Set the parking brake. Block the wheels to prevent the vehicle from moving.
3. Remove the breather from the axle housing.
4. Check the breather for a missing cap or hose. Replace the breather if parts are missing. Figure 4.1 and Figure 4.2.

4 Repairs

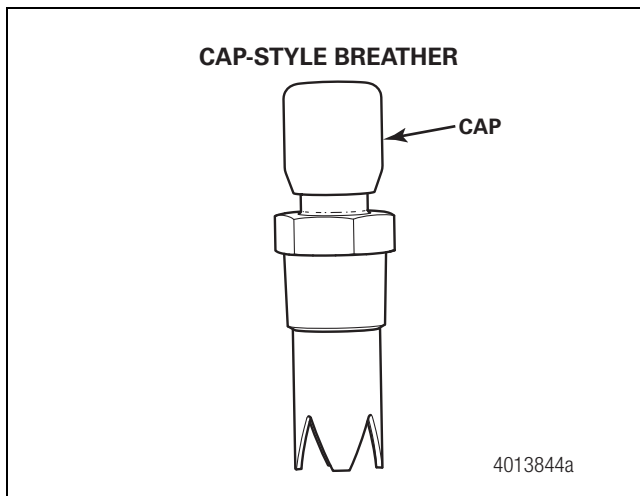


Figure 4.1

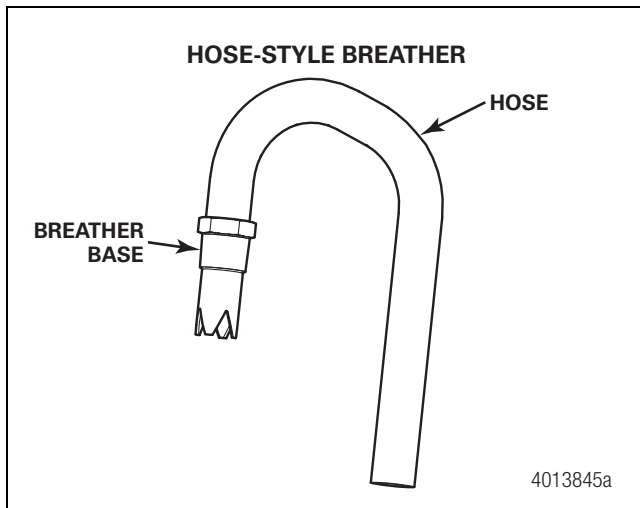


Figure 4.2

5. Visually inspect the breather for damage on the base and hose. Replace the breather if damage is found.
6. Clean the breather. If the breather remains dirty after cleaning, replace the breather.
7. Apply compressed air to the breather. If compressed air does not pass through the breather, replace the breather.
8. Install the breather in the axle housing.

Resealing the Carrier-to-Housing Joint after Repairs

Before You Begin

- Complete all welding procedures before you apply sealants. Heat produced by welding can damage sealants.
- Remove the carrier completely from the axle housing. The carrier **MUST** be completely out of the axle housing in order to perform the resealing procedure correctly. Loosening the carrier-to-axle housing bolts and sliding it out on studs is not a suitable method and may result in a poor quality seal. The carrier must be out from under the vehicle to perform correct cleaning and housing flatness checks.
- Obtain a new fastener kit with new bolts and correct sealant. Refer to Table E for the correct kit to use.

Carrier-to-Housing Joint Resealing Procedure

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Set the parking brake. Block the wheels to prevent the vehicle from moving.
3. Remove the carrier from the housing. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.
4. Remove all debris from inside the housing.

⚠ CAUTION

Use a rotary tool with a 3M™ brand Roloc™ green bristle disc to clean the sealant from the housing and carrier face. Use of other types of discs may damage the mating surfaces.

⚠ CAUTION

When cleaning, take care not to remove the base housing flange material. Removal of flange material, especially near the 6 o'clock position, may make the axle more susceptible to leaks. Without sufficient lubricant, damage to components can occur.

⚠ CAUTION

When cleaning, take care not to remove milling marks on the carrier and housing mating surfaces. Removal of these milling marks may affect the adhesion of the sealant to the mating surface and the bond strength of the adhesive, making the axle more susceptible to leaks. Removal of these milling marks may also affect flatness of the interface surfaces which can affect the seal between the housing and carrier, making the axle more susceptible to leaks. Without sufficient lubricant, damage to components can occur.

5. Use a rotary tool with a 3M™ brand **Roloc™ green bristle disc** to clean all sealant residue from the housing and carrier faces. Figure 4.3 and Figure 4.4. Use of other types of discs may damage the mating surfaces. **After cleaning, surfaces must be clean, dry and free of foreign matter. The surfaces must not be oily to the touch.** Figure 4.5.

IMPORTANT! Do not remove the **milling marks** on the carrier and housing mating surfaces. The milling marks provide a textured surface necessary for the sealant to adhere to the parts. Removal of the milling marks may also affect the flatness of the mating surfaces. Figure 4.6.

NOTE: The use of other types of discs with a rotary tool is not recommended for cleaning. Other types of discs may remove component material and may reduce flatness on the mating surfaces which can make the axle more susceptible to leaks.

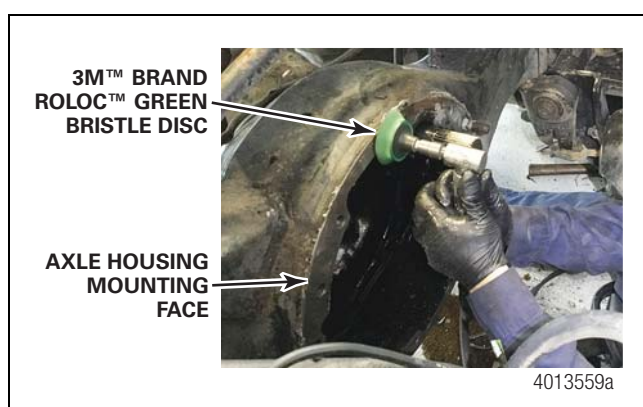


Figure 4.3



Figure 4.4

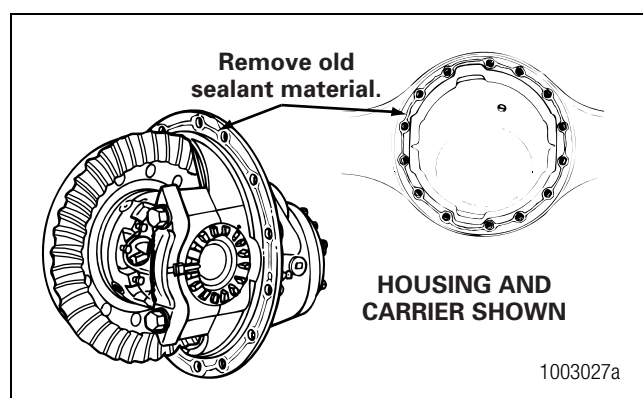


Figure 4.5

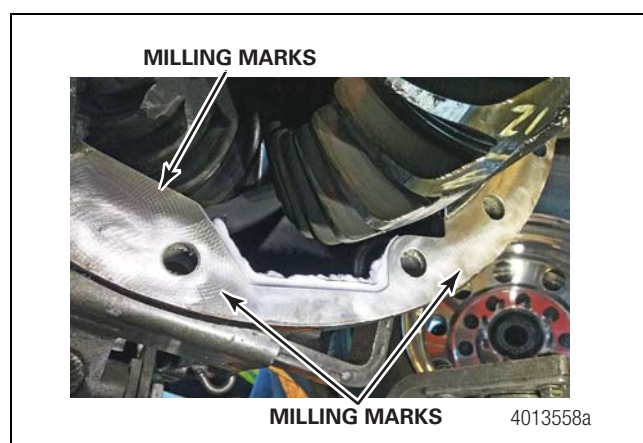


Figure 4.6

6. Check the flatness of the carrier and axle housing mating surfaces as follows. Place a good machined straight edge against the carrier or housing mating surface and try to insert a feeler gauge to check for a gap of 0.003" (0.076 mm) or greater. Figure 4.7.

4 Repairs

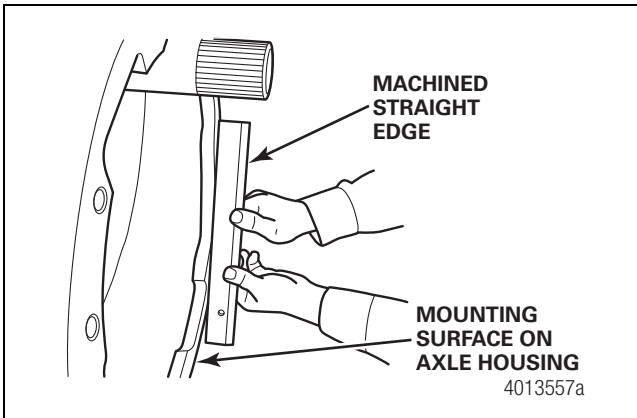


Figure 4.7

7. Remove metal filings from the magnets inside the housing.
8. Clean the mounting face of the axle housing using Loctite® ODC Free cleaner, brake cleaner or other suitable solvent that will air dry.
9. Use Loctite® ODC Free cleaner or brake cleaner to clean the carrier faces. Also, spray brake cleaner on the lower internal carrier casting area at the 6 o'clock position near the carrier flange and clean this area in order to prevent an oil drip from leaking down/across the carrier flange during assembly. An oil drip at this position may prevent correct adhesion of sealant and may result in a leak.
10. Dry the housing and carrier faces.
11. Use a 5/8" x 11 bottoming tap to clean all old Dri-Loc® from the threaded holes in the axle housing.
12. If you are working on a pre-tapered dowel carrier (14X or 160 series models) to repair a leak, Meritor recommends that you retrofit the carrier to accommodate tapered dowels at this time. Refer to the retrofit procedures at the end of this technical bulletin for complete instructions and tooling information.

NOTE: Retrofitting the carrier for tapered dowels is not covered under warranty unless it is performed during an authorized repair of a leak.

⚠ CAUTION

Apply RTV sealant in a continuous 0.25-inch (6 mm) bead. If you use more than this amount, sealant can break off and plug lubrication passages. Damage to components can result.

13. Apply a 0.25-inch (6 mm) bead of Loctite® 5699 RTV sealant to the housing face. **ONLY** Loctite® 5699, which is included in the fastener kit, can be used. You must circle each bolt hole for correct sealing. Figure 4.8.

NOTE: Applying excessive RTV sealant is **NOT BETTER** for achieving correct sealing. Sealant in excess of a 0.25-inch (6 mm) bead will take longer to cure and will plug lubricant passages.

NOTE: Use care to prevent any lubricant from leaking down on the cleaned flanges prior to applying the sealant. Oil will prevent correct sealing and weaken the bond.

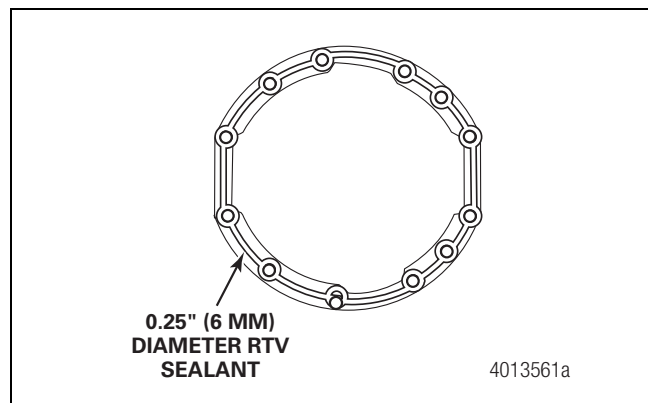


Figure 4.8

⚠ CAUTION

Do not allow oil to drip onto the new cleaned flanges. Oil will prevent correct bonding of the joint and will result in a leak.

14. Use care to prevent any lubricant from leaking down on the new applied RTV sealant or cleaned flanges during installation.

A previously oiled or "wet" carrier will retain oil in the IAD/input shaft area. To prevent oil from leaking in this area, you may create a lubricant "dam" at the bottom of the carrier casting using chassis grease. This dam will help capture oil that may drip as the "wet" carrier is maneuvered into the housing. Leaking lubricant will not be a concern with a new/dry carrier as the new part has not been oiled and will not be "wet". Figure 4.9.



Figure 4.9

15. Install two, 4-inch long studs into the housing to guide the carrier into the housing.
16. Immediately install the carrier into the housing to permit the RTV sealant to compress evenly between the faces.

CAUTION

New capscrew kits have blue Dri-Loc® STS threadlocker, an equivalent to Loctite® 242 threadlocker, applied to the capscrews. Do not remove the blue Dri-Loc® STS threadlocker from the capscrews. Damage to components can result.

NOTE: Use the fasteners provided in the kit for installation. Do NOT reuse the old fasteners.

NOTE: Use the 1/4" longer, 2" 10X1595 capscrews at standard carrier flange thickness tapered dowel locations. The 10X1595 and 10X1594 capscrews are interchangeable at non-tapered dowel locations.

17. For tapered dowel carriers (13X rear, 14X forward, 160 forward and rear carriers), use the following procedure to install the dowels, washers and capscrews. If tapered dowels are not being used, proceed to Step 18.
 - A. Install the tapered dowels and washers and use the longest bolts (2.75" or 3.5") in the high-boss tapered dowel locations and the second longest bolts (2.0") in the standard carrier thickness tapered dowel locations. Use a crisscross pattern to tighten the tapered dowel bolts to a target torque of 225 lb-ft (range 210-240 lb-ft [285-325 N•m]). Figure 4.10, Figure 4.11, Figure 4.12 and Figure 4.13. 

NOTE: The fasteners at the tapered dowel locations must be tighten to specification FIRST before the other fasteners in order to seat the carrier on the housing correctly.

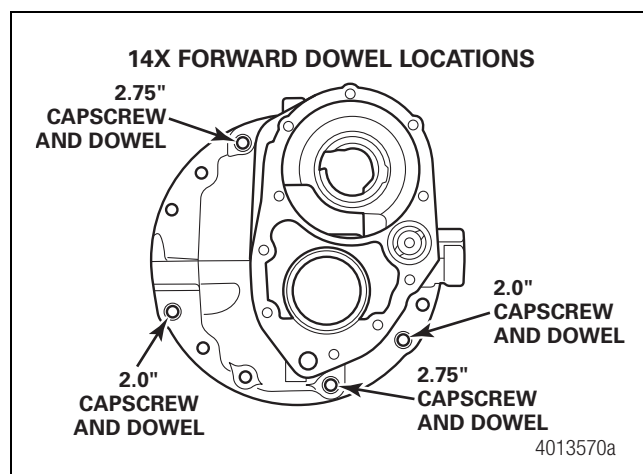


Figure 4.10

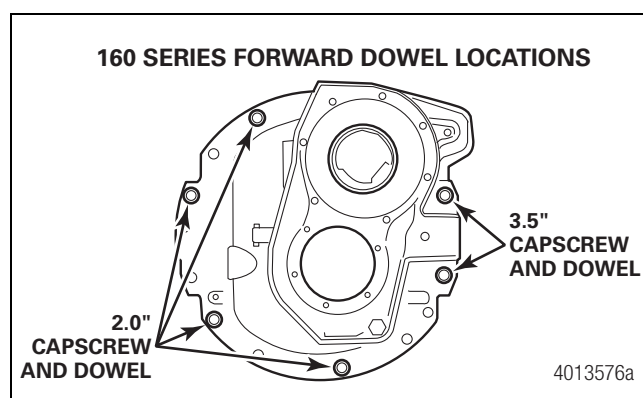


Figure 4.11

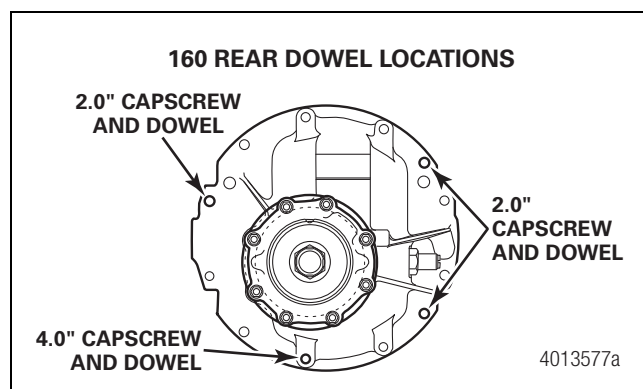


Figure 4.12

4 Repairs

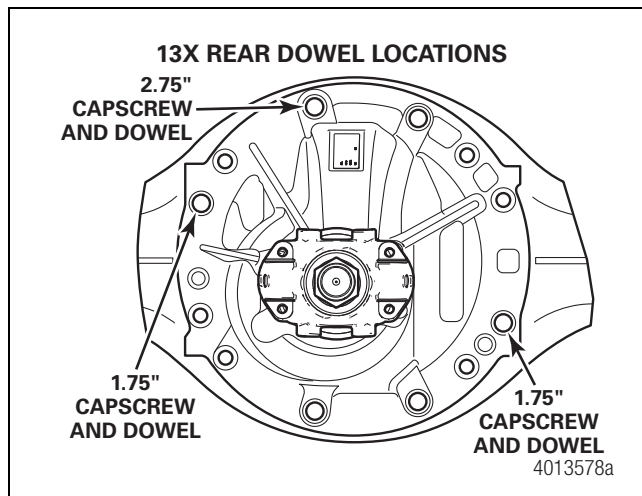


Figure 4.13

- B. Install the remaining washers and capscrews (1.75" length, part number 10X1594, shortest bolts in the kit, unless otherwise noted). Using a crisscross pattern, tighten the 1.75" capscrews to 100 lb-ft. Then, angle tighten the capscrew 40 degrees. Use a torque wrench for this process. Use of an impact gun is not recommended. For the other size capscrews, use a crisscross pattern to tighten the fasteners to a target torque of 225 lb-ft (range 210-240 lb-ft [285-325 N•m]). Figure 4.14, Figure 4.15, Figure 4.16 and Figure 4.17.

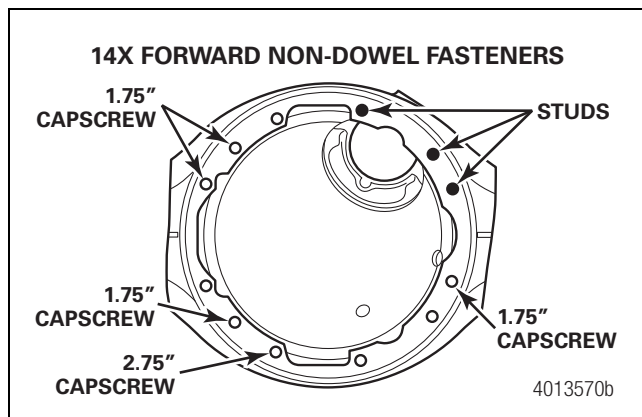


Figure 4.14

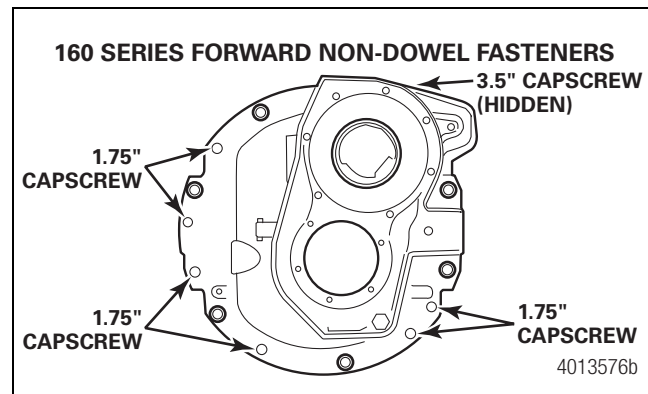


Figure 4.15

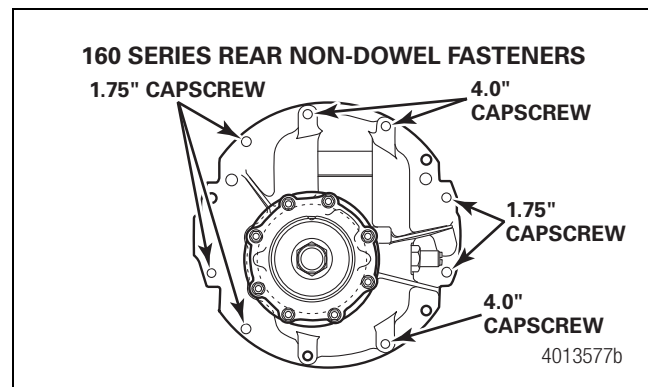


Figure 4.16

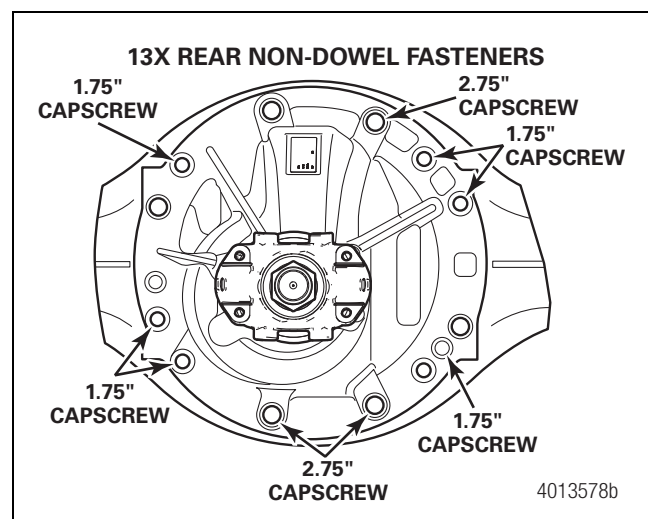


Figure 4.17

18. On non-tapered dowel carriers, use the following procedure to install the washers and capscrews.

- A. Install the washers and capscrews according to the height of the bolt hole on the carrier with the longest capscrews in the highest boss holes and the shortest capscrews in the standard flange thickness holes.
- B. Using a crisscross pattern, tighten the 1.75" capscrews to 100 lb-ft. Then, angle tighten the capscrews 40 degrees. Use a torque wrench for this process. Use of an impact gun is not recommended. For the other size capscrews, use a crisscross pattern to tighten the capscrews to a target torque of 225 lb-ft (range 210-240 lb-ft [285-325 N·m]). 

19. Wait a minimum of 60 minutes before filling the assembly with lubricant. Refer to the correct Meritor carrier maintenance manual or the vehicle manufacturer's instructions.

NOTE: Meritor recommends a longer wait time of 8 hours or overnight, if possible, to allow for the RTV sealant to cure.

Tapered Dowel Retrofit Procedure

If you are performing an authorized leak repair on a pre-tapered dowel carrier, either 14X or 160 series, Meritor recommends that you retrofit the carrier to accommodate tapered dowels. Use the following procedure to modify the carrier bolt holes, then follow the rest of the sealing procedures to prepare and install the carrier.

The tapered dowel retrofit procedure requires you to obtain the reamer tools in KIT 164 REAMER TOOL. Call Meritor's Commercial Vehicle Aftermarket at Florence, Kentucky (888-725-9355); or Brampton, Ontario, Canada (905-454-7070).

Table D: KIT 164 REAMER TOOL

Contents	Description	Quantity
Bit 164 Reamer	To replace the reamer only	1
Jig 164 Bit Tool	To replace the jig only	1

1. Verify that the tapered reamer bit pilot fits in the carrier flange holes. Figure 4.18, Figure 4.19 and Figure 4.20.
 - **If the pilot does not fit:** Use the reamer bit to drill the carrier flange holes.

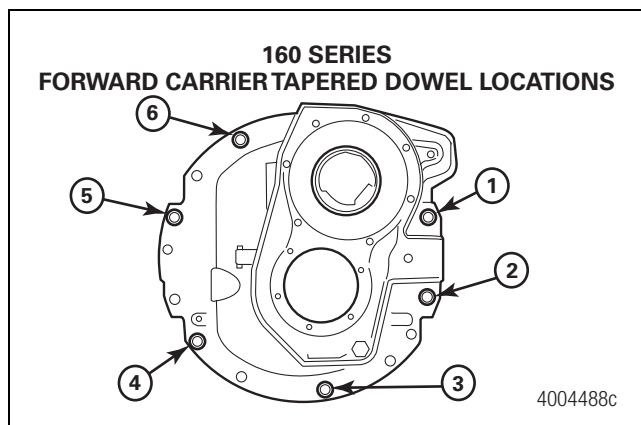


Figure 4.18

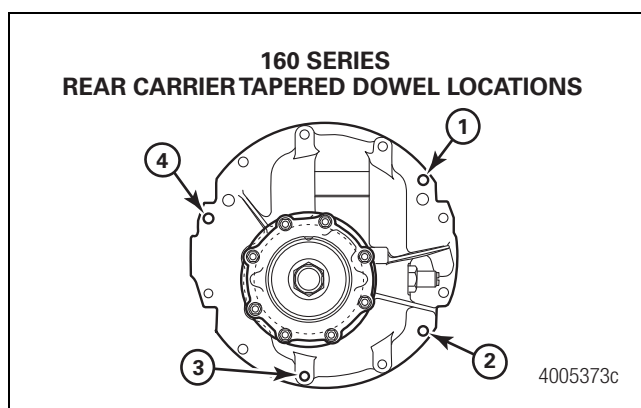


Figure 4.19

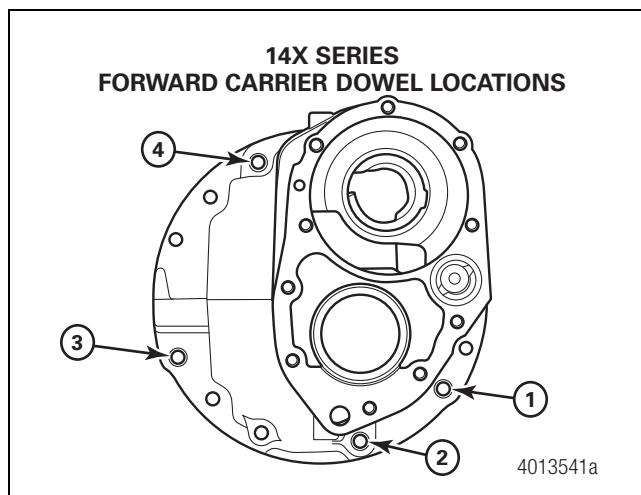


Figure 4.20

2. Slide the tapered reamer bit into the jig hole. Attach the jig to the adjacent bolt hole. Figure 4.21 and Figure 4.22.

4 Repairs

- If the carrier is equipped with a driver-controlled differential lock (DCDL): You must use a 5/8-inch nut to secure the jig to the carrier housing. Figure 4.23 and Figure 4.24.

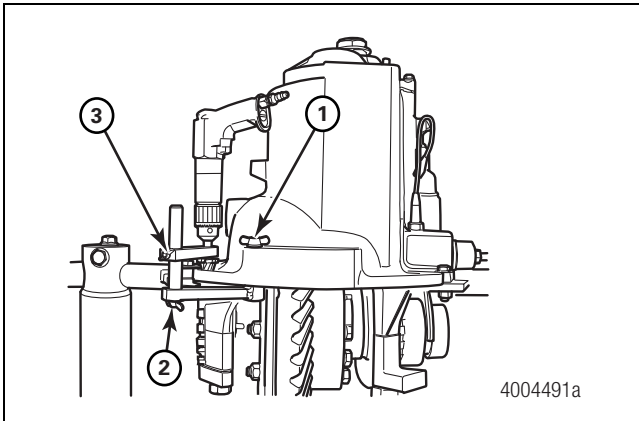


Figure 4.21

3. Align the tapered reamer bit pilot in the carrier hole. The bit must fit at a 90-degree angle to the carrier flange surface. Figure 4.22.
4. Tighten the jig bolts in the order shown. Figure 4.21. The tapered reamer bit pilot must be all the way in the carrier hole and positioned 90 degrees to the carrier flange.
5. Lubricate the carrier hole and the reamer bit shaft that contacts the jig.

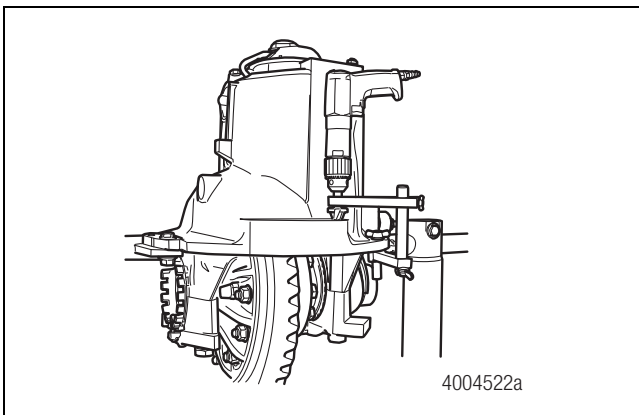


Figure 4.22

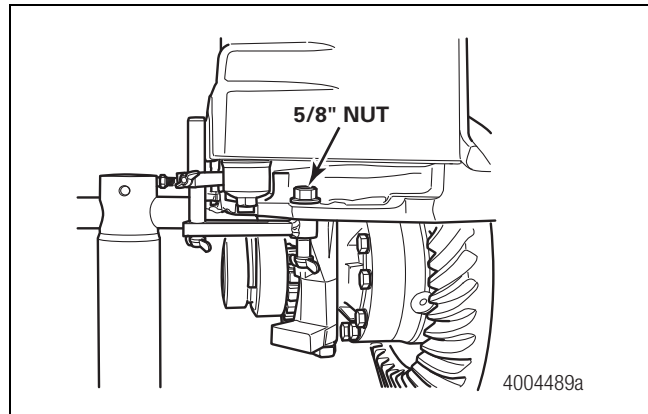


Figure 4.23

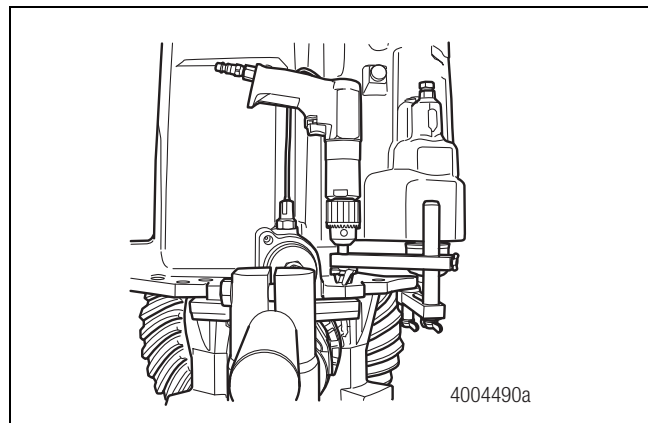


Figure 4.24

6. Drill slowly until the reamer bit stop reaches the carrier flange surface.
7. Clean any debris from the drilled hole. Insert the tapered dowel into the hole. The dowel must fit tight in the hole and must not move back and forth or side to side.
 - If you can move the tapered dowel back and forth or side to side in the hole: The tapered dowel does not fit tight enough. Remove the dowel. Use the drill bit and jig to drill the hole slightly deeper. Clean any debris from the hole. Insert the tapered dowel.
8. Repeat Steps 2-7 for the remaining holes.
9. Return to the sealing procedure to continue the installation.

Table E: Part Numbers and Kits

		Axle Series											
		Note: Series is based on the 5th and 6th character of the model. For instance, an RR23160 is a 16* series.											
		13X	143/145		14X/14H			16*				18*/38*	
		Single	Forward	Rear/ Single	Forward		Rear/ Single	Forward		Rear/Single		Forward	Rear/ Single
					with Dowels	without Dowels		with Dowels	without Dowels	with Dowels	without Dowels		
		KIT 4313	KIT 4301	KIT 4302	KIT 4294	KIT 4301	KIT 4302	KIT 4285	KIT 4303	KIT 4289	KIT 4304	KIT 4305	KIT 4306
Part Number	Description												
10X1594	Capscrew (1.75")	8	8	8	4	6	8	5	9	5	8	9	
10X1595	Capscrew (2.0")				2			4		3			4
10X1597	Capscrew (2.75")	4	3	4	3	3	4						2
10X1599	Capscrew (3.5")							3	3				4
10X1600	Capscrew (4.0")									4	4		
1246V1166	Dowel	3			4			6		4			
1229W1557	Hardened Washer	12	12	12	12	12	12	15	15	12	12	14	14
N-110P-1	Nut		3		3	3		3	3			5	4
2297A7021	Sealant	1	1	1	1	1	1	1	1	1	1	1	1
TP-0753	Instructions	1	1	1	1	1	1	1	1	1	1	1	1

5 Cleaning

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.

- Wear safe eye protection.
- Wear clothing that protects your skin.
- Work in a well-ventilated area.
- Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
- You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

Clean, Dry and Inspect Parts

Clean Ground and Polished Parts

1. Use a cleaning solvent to clean ground or polished parts or surfaces. Kerosene or diesel fuel oil can be used for this purpose. Do not use gasoline.
2. Use a tool with a flat blade if required, to remove the sealant material from parts. Be careful not to damage the polished or smooth surfaces.

CAUTION

Do not use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Damage to parts can result.

3. Do not clean ground or polished parts with water or steam. Do not immerse ground or polished parts in a hot solution tank or use strong alkaline solutions for cleaning, or the smooth sealing surface may be damaged.

Clean Rough Parts

1. Clean rough parts with the same method as cleaning ground and polished parts.
2. Rough parts can be cleaned in hot solution tanks with a weak or diluted alkaline solution.
3. Parts must remain in hot solution tanks until heated and completely cleaned.
4. Parts must be washed with water until all traces of the alkaline solution are removed.

Clean Axle Assemblies

1. A complete axle assembly can be steam cleaned on the outside to remove dirt.
2. Before the axle is steam cleaned, close or place a cover over all openings in the axle assembly. Examples of openings are breathers or vents in air chambers.

Clean Axles Equipped with Meritor Lubrication Management System (MLMS)

MLMS-equipped axles have a collector tube in the upper portion of the housing and baffles in the housing legs. If the carrier is being replaced due to damage or if any other event has occurred that would generate a significant amount of debris, clean the debris from the baffles on either side of the bowl and ensure the holes are clear. Also, clear debris from inside the tube mounted at the top of the housing and the lube holes on the back side of the tube. This can be accomplished by blowing air through the tube with the lube holes open, then by blowing air through the tube with the lube holes covered. Before you reinstall the carrier, clean and remove all debris from inside the axle housing. Figure 5.1.

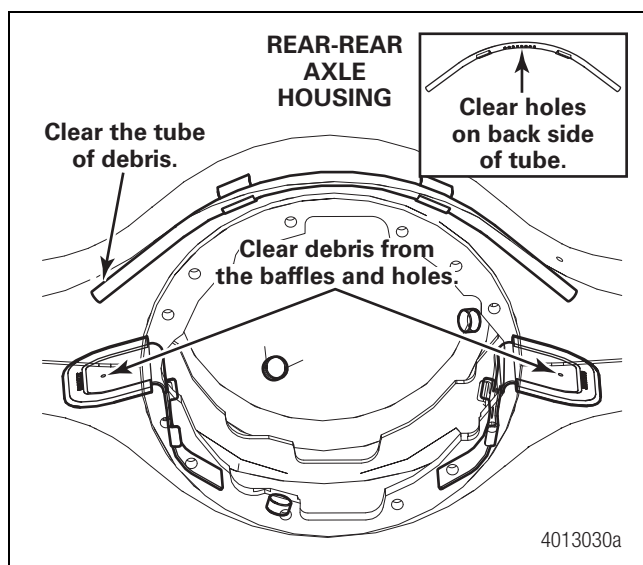


Figure 5.1

Check the drain plug for metal particles every 100,000 miles (160 000 km). A magnetic drain plug can be used if the plug has a minimum pick-up capacity of 1.5 lbs (0.7 kg) of low carbon steel after cleaning.

Dry Parts After Cleaning

1. Dry parts immediately after cleaning using clean paper, rags or compressed air.
2. Do not use compressed air to dry bearings. This can cause small abrasive particles to contaminate the bearings and can result in reduced bearing life.

Prevent Corrosion on Cleaned Parts

1. Apply axle lubricant to cleaned and dried parts that are not damaged and are to be assembled.
2. To store parts, apply a special material that prevents corrosion to all surfaces. Wrap the cleaned parts in a special paper that will protect the parts from moisture and prevent corrosion.

Magnets and Magnetic Drain Plugs

Inspect the magnetic drain plug each time the oil is changed. Use the correct part. Pipe plugs will leak if used as a drain plug.

Although axles are normally equipped with magnetic plugs having a minimum pick-up capacity of 1.5 lbs (0.7 kg) of low carbon steel, Advanced Lube axles have stronger magnetic cleansing features.

These axles are equipped with strong five-lb (2.2 kg) pull magnets, and high-grade magnetic fill and drain plugs that collect damaging particles at the bottom of the axle housing.

Single and tandem axles have four magnets in each housing and high-grade magnetic fill and drain plugs.

6 Specifications

Torque Specifications

Table F: Axle Housing Component Torque Specifications

Fastener	Thread Size	Torque Value	
		lb-ft	N•m
Capscrew, Axle Shaft*	00.50-13	18-24	24-33
	18.00-24	85-115	115-156
Nut, Axle Shaft*	Stud Plain Nut		
	0.44-20	50-75	68-102
	0.50-20	75-115	102-156
	0.56-18	110-165	149-224
	0.62-18	150-230	203-312
	Locknut		
	0.44-20	40-65	54-88
	0.50-20	65-100	88-136
	0.56-18	100-145	136-197
	0.62-18	130-190	176-258
Stud, Axle Shaft	All	Install the coarse thread end of stud into hub and tighten to last thread.	
Breather	0.38-18	20 minimum	27 minimum
Plug, Housing Oil Fill*	0.75-14	35 minimum	47.5 minimum
Plug, Heat Indicator*	0.50-14	25 minimum	34 minimum
Plug, Oil Drain	0.50-14	25 minimum	34 minimum
Nut, Housing-to-Carrier Stud	0.44-20	50-75	68-102
	0.50-20	75-115	102-156
	0.56-18	110-165	149-224
	0.62-18	190-230	258-312
Capscrew, Carrier-to-Housing	0.44-14	50-75	68-102
	0.50-13	75-115	102-156
	0.56-12	110-165	149-224
	0.62-11	210-240	285-325
	0.75-10	270-400	366-542
	M12 x 1.75	74-89	100-120
	M16 x 1.5 (Preferred)	Torque plus angle: 74 lb-ft (100 N•m) + 105-115 degrees	
	M16 x 1.5 (Optional)	191-207	260-280
	M16 x 2	181-221	245-300

6 Specifications

Fastener	Thread Size	Torque Value	
		lb-ft	N•m
Nut, Drive Pinion	Refer to technical bulletin TP-0688, Tandem Axle Torque Specifications and Loctite® 277 Threadlocker Requirement. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.		
Plug, Carrier Oil Fill	0.75-14	25 minimum	34 minimum
	1.50-11.5	120 minimum	163 minimum
	M24 x 1.5	35 minimum	47 minimum

*Some Meritor axles do not have these described parts.

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