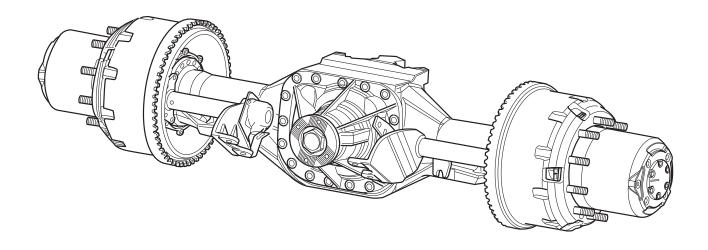


Maintenance Manual MM-0727

MC27610 Planetary Drive Axle

Revised 09-07



About This Manual

This manual provides maintenance and service procedures for Meritor's MC27610 planetary drive axle.

Before You Begin

- 1. Read and understand all instructions and procedures before you begin to service components.
- 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.
- 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.

A 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 and Service Information

On the Web

Visit Literature on Demand at meritor.com to access and order product, service, aftermarket, and warranty literature for Meritor's truck, trailer and specialty vehicle components.

- Maintenance Manual 23B, Bus and Coach Cam Brakes
- Technical Bulletin TP-0584, Service Instructions for Heavy Vehicle Components That Are Submerged in Contaminated Flood Water as a Result of the Recent Hurricanes
- Technical Bulletin TP-0586, Service Instructions for Meritor WABCO Components That Are Submerged in Contaminated Flood Water as a Result of the Recent Hurricanes
- Maintenance Manual MM-0763, Single-Reduction Differential Carrier DS70H
- Maintenance Manual 8, Drive Axle Housings Welding and Repair Procedures
- Maintenance Manual 28, Anti-Lock Braking Systems (ABS) for Trucks, Tractors and Buses
- Maintenance Manual 30, Anti-Lock Braking System (ABS) for Trucks, Tractors and Buses
- Maintenance Manual MM-0112, Anti-Lock Braking System (ABS) for Trucks, Tractors and Buses

Literature on Demand DVD (LODonDVD)

The LODonDVD contains product, service and warranty information for Meritor components. To order the DVD, visit Literature on Demand at meritor.com and specify TP-0742.

How to Obtain Tools and Supplies Specified in This Manual

Call Meritor's Commercial Vehicle Aftermarket at 888-725-9355 to obtain Meritor tools and supplies.

Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. Meritor Heavy Vehicle Systems, LLC, reserves the right to revise the information presented or to discontinue the production of parts described at any time.

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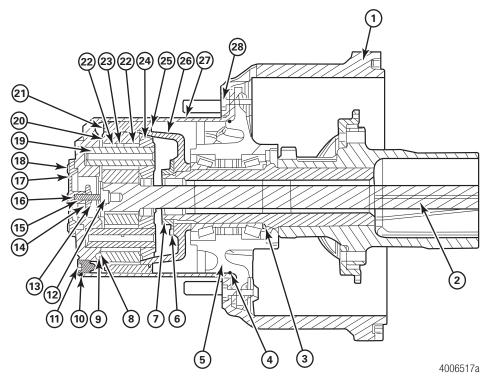
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MC27610 Wheel-End Cross Section

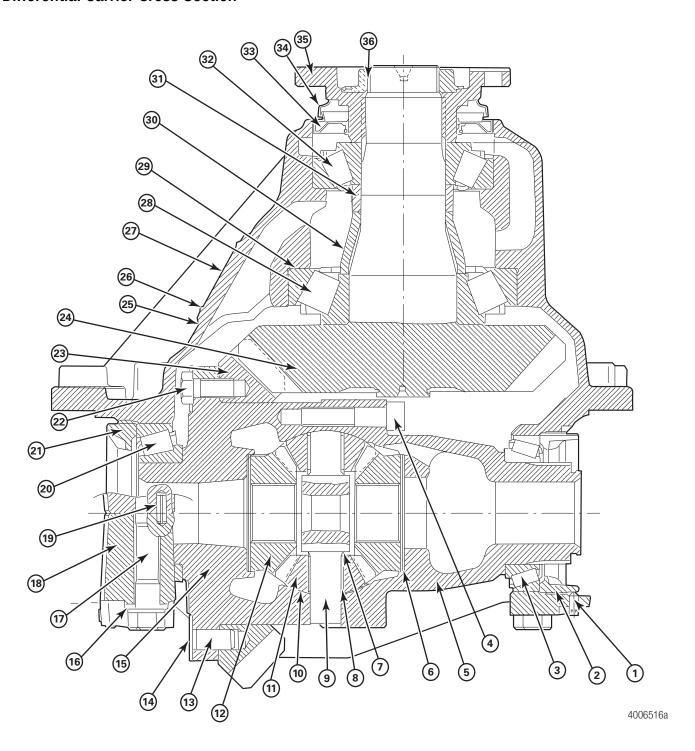


Item	Description			
1	Brake Drum			
2	Axle Shaft			
3	Seal			
4	0-Ring			
5	Wheel Hub Assembly			
6	Lock Screw			
7	Wheel Bearing Adjusting Nut			
8	Thrust Washer, Inner			
9	Thrust Washer, Outer			
10	Gasket			
11	Plug			
12	Thrust Button			
13	Snap Ring			
14	Wheel-End Magnet			
15	Thrust Block			
16	Shims			
17	End Cover			

	Description
	Wheel-End Capscrew and Washer
	Planetary Spider Shaft
	Planetary Pinion
	Planetary Ring Gear
	Needle Bearings
	Needle Bearing Spacer
	Planetary Pinion Carrier or Planetary Cage
	Retaining Ring
	Planetary Ring Gear Carrier
	Planetary Case
<u> </u>	Brake Drum Retention Capscrew

1 Exploded Views

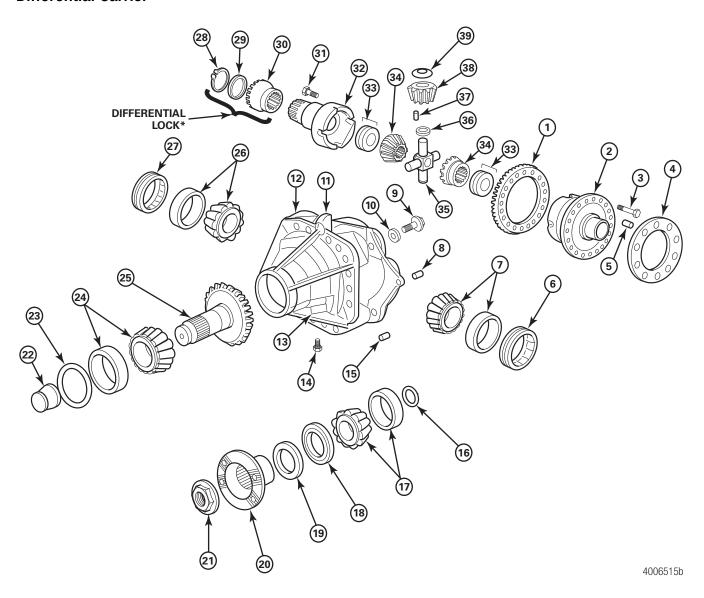
Differential Carrier Cross Section



Ref	Description	Qty.			
1	Set Screw	2			
2	Adjusting Ring, Right	1			
3	Differential Bearing, Right	1			
4	Hex Socket Screw	12			
5	Differential Housing, Right	1			
6	Thrust Washer, Differential Side Gear	6			
7	Spacer Plate	4			
8	Needle Bearing	35x4			
9	Differential Spider	1			
10	Thrust Washer, Differential Pinion	4			
11	Differential Pinion	4			
12	Differential Side Gear	2			
13	Dowel Pin	10			
14	Lock Plate	1			
15	Differential Housing, Left	1			
16	Washer	4			
17	Capscrew 4				
18	Bearing Cap	1			
19	Locating Roll Pin	2			
20	Differential Bearing, Left	1			
21	Adjusting Ring, Left 1				
22	Capscrew, Ring Gear 10				
23	Ring Gear 1				
24	Pinion	1			
25	Differential Carrier	1			
26	Drive Screw	4			
27	Identification Plate	1			
28	Pinion Bearing, Inner	1			
29	Shim	1			
30					
31	Cylindrical Spacer	1			
32	Pinion Bearing, Outer	1			
33	Seal 1				
34	Dirt Shield	1			
35	Companion Flange	1			
36	Pinion Locknut 1				

1 Exploded Views

Differential Carrier



Exploded Views

Ref	Description	Qty.	
1	Ring Gear	1	
2	Differential Housing, Left	1	
3	Capscrew, Ring Gear	10	
4	Lock Plate	1	
5	Dowel Pin	10	
6	Adjusting Ring, Left	1	
7	Differential Bearing, Left	1	
8	Set Screw	2	
9	Capscrew	4	
10	Washer	4	
11	Bearing Cap	1	
12	Differential Carrier	1	
13	Identification Plate	1	
14	Drive Screw	4	
15	Locating Roll Pin	2	
16	Cylindrical Spacer	1	
17	Pinion Bearing, Outer	1	
18	Seal	1	
19	Dirt Shield	1	
20	Companion Flange 1		
21	Pinion Locknut 1		
22	Conical Spacer	1	
23	Shim	1	
24	Pinion Bearing, Inner	1	
25	Pinion	1	
26	Differential Bearing, Right	1	
27	Adjusting Ring, Right	1	
28	Snap Ring*	1	
29	Spacer*	1	
30	Fixed Collar*	1	
31	Hex Socket Screw	12	
32	Differential Housing, Right	1	
33	Thrust Washer, Differential Side Gear	6	
34	Differential Side Gear	2	
35	Differential Spider 1		

Ref	Description	Qty.
36	Spacer Plate	4
37	Needle Bearing	35x4
38	Differential Pinion	4
39	Thrust Washer, Differential Pinion	4

^{*}Not available in all models

2 Introduction

Description

Meritor's MC27610 Series planetary axle is a double-reduction axle. The first reduction is in the carrier, and the second reduction is in the planetary wheel end. This allows for a smaller carrier ring gear and a lower bus floor. Ground gearing is used in both the carrier and wheel end to minimize the potential for gear noise. Figure 2.1.

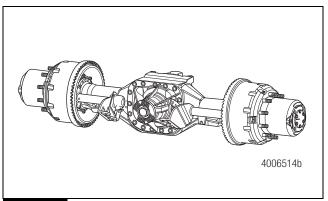
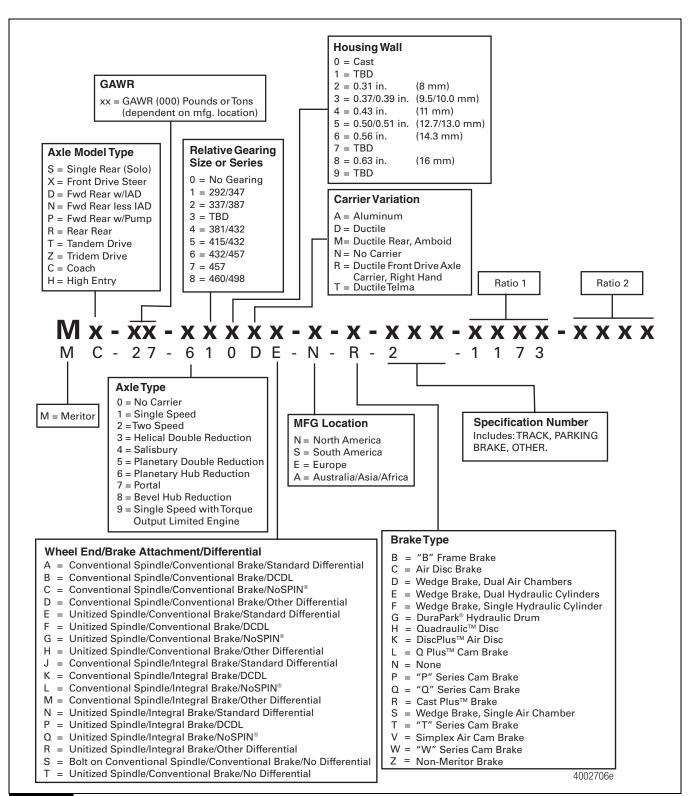


Figure 2.1

Identification



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.

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

Preparation of the Axle

If the axle has to be removed from the vehicle, refer to the vehicle manufacturer instructions. During removal, if the axle has to be supported, support the axle evenly and correctly on both legs of the axle housing as far outboard as possible to reduce the potential of structural damage to the axle and its components.

- Clean the axle breather and surrounding areas. Remove the axle breather.
- Clean the fill and drain plugs and surrounding areas.
- Remove the drain plugs and completely drain the oil from the differential carrier and both wheel ends. Each wheel end has one plug which serves as both the fill and drain plugs. Always use an appropriate receptacle to contain any residual oil.

Removal

Wheel End

Brake Drum

- 1. Wear safe eye protection.
- 2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
- 3. Raise the vehicle so the wheels to be serviced are off the ground. Support the axle to be serviced with safety stands.
- 4. Remove the wheel nuts, tire and rim assemblies from both wheel ends.
- 5. Remove the drum retention capscrews, if present. If the drum is difficult to remove, ensure that the brakes are released
- Install three M12 x 1.75 capscrews into the drum push holes.
 Tighten the capscrews sequentially until the drum separates from the hub.
- 7. Use a suitable lifting device to remove the brake drum.

Planetary Wheel-End Assembly

- Remove the end cover assembly capscrews. Remove the end cover assembly. Take care to save all the components. The assembly includes a thrust block, several shims, a magnet and a magnet retaining clip visible inside the axle. Figure 3.1.
 - If the end cover assembly does not easily come off:
 Use a rubber mallet to lightly tap on the sides of the end
 cover until the end cover can be easily removed. A
 screwdriver may be used, if needed, taking care not to
 damage any surfaces.

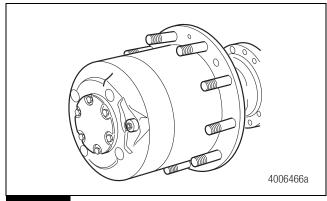
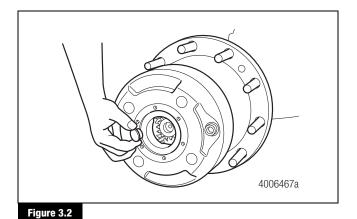
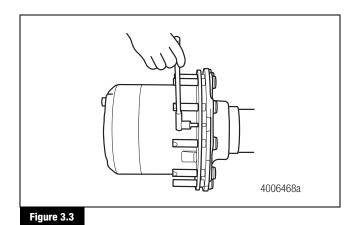


Figure 3.1

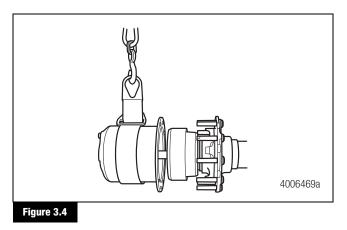
2. Remove the thrust button at the end of the sun gear. Figure 3.2.



3. Remove the planetary wheel-end assembly. Use M20 x 2.5 capscrews, approximately 2.36-inches to 2.56-inches (60 mm to 65 mm) in length, and tighten sequentially into the two M20 x 2.5 push holes in the planetary case flange until the planetary wheel-end assembly slides off the wheel hub pilot. Ensure that you do not damage the wheel hub mounting surface. Figure 3.3.

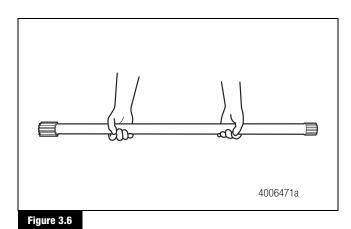


4. Carefully slide off the planetary wheel-end assembly. Use a suitable lifting device to remove the planetary wheel-end assembly. The sun gear which is part of the axle shaft may also be removed along with the planetary wheel-end assembly. If the sun gear is removed, ensure that the axle shaft is fully supported. Figure 3.4 and Figure 3.5.



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5. Carefully remove the axle shaft from the inboard end. Figure 3.6.



3 Removal and Disassembly

6. Remove the O-ring from the wheel hub and discard. Figure 3.7.

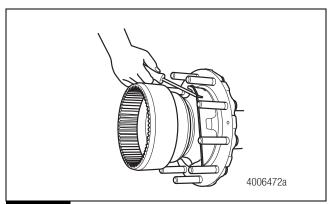
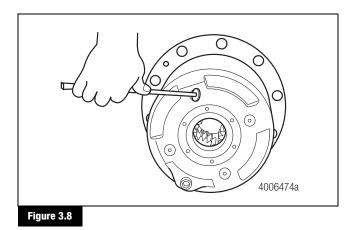


Figure 3.7

A CAUTION

Only disassemble the planetary wheel-end assembly when necessary. If disassembly is required, use caution and follow the instructions provided in this manual. Otherwise, damage to internal components can result, which can affect wheel-end and axle performance.

- 7. If the internal components of the planetary wheel-end assembly have to be removed, mount the planetary wheel-end assembly onto a suitable stand taking care not to damage any of the components. For convenience purposes, a drawing for a version of a stand is included in the Special Tools section as Tool 3. Refer to Section 8 for the drawing.
- Secure the planetary wheel end to the stand with at least four sufficient length M24 x 3.0 fasteners symmetrically located about the centerline. Tighten each to 200 lb-ft (271 N•m). Make sure the planetary case mounting surfaces are not damaged. •
- Drill a 0.24" (6 mm) diameter hole approximately in the middle of the expansion plugs and pry the expansion plugs out. Ensure that you drill only through the expansion plug and do not damage other internal components. Discard the expansion plugs. Figure 3.8.



10. Remove the capscrews that hold the planetary case to the planetary carrier. Figure 3.9.

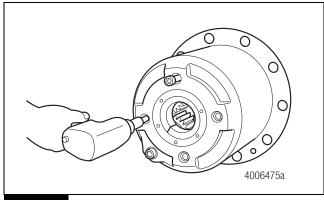


Figure 3.9

- 11. The capscrew holes in the planetary case have M16 x 1.5 threaded push holes. Use Tool 1 in the M16 x 1.5 threaded capscrew holes. Tighten sequentially taking care not to damage the planetary carrier threaded holes, until the planetary carrier separates from the planetary case. Refer to Section 8 for the tool drawing.
- 12. Now the planetary carrier rests on the support stand.
- 13. Carefully remove the planetary case from the support stand taking care not to damage or disturb the internal parts of the planetary wheel-end assembly.

A CAUTION

Use care when removing the pinion gears. The needle bearings may fall off. If the needle bearings are dropped, they may become contaminated and must be replaced.

14. Remove the thrust washers, planetary pinion gears along with needle bearings and needle bearing spacer. Refer to Section 4 for guidelines on reusing these parts. Figure 3.10.

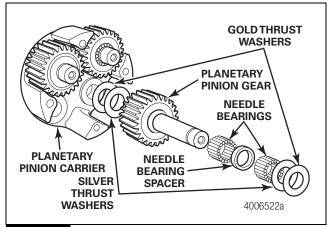
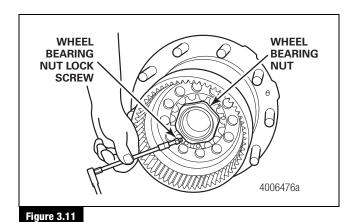


Figure 3.10

Planetary Ring Gear Assembly

1. If the planetary ring gear assembly has to be removed, remove the wheel bearing nut lock screw. Discard the lock screw and use a new lock screw during assembly. Figure 3.11.



2. Use a suitable socket to remove the wheel bearing nut. Refer to Figure 3.13 for the wheel bearing nut hex size. This wheel bearing nut has a nominal high torque level of 885 lb-ft (1200 N•m). Figure 3.12 and Figure 3.13. •

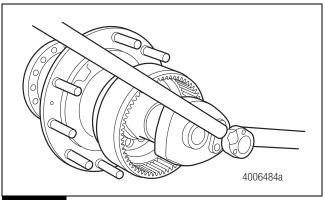


Figure 3.12

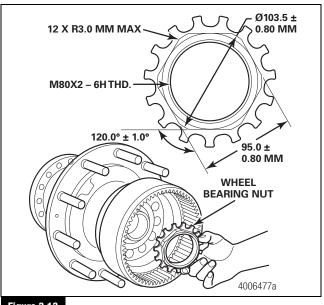


Figure 3.13

Slide the ring gear assembly off the spindle. Figure 3.14.

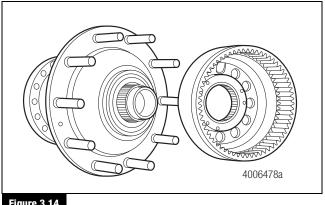


Figure 3.14

3 Removal and Disassembly

4. If the ring gear has to be separated from the ring gear carrier, remove the snap ring that holds the two together and separate them. Figure 3.15 and Figure 3.16.

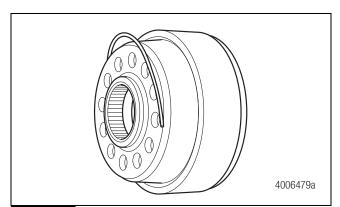
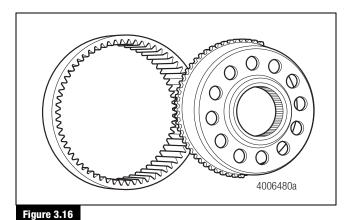


Figure 3.15

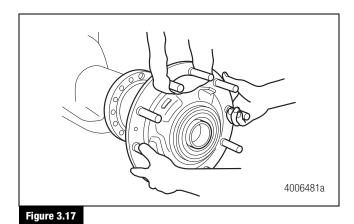


Wheel Hub Assembly

A CAUTION

Remove the unitized wheel hub only if necessary. Carefully slide the hub off the spindle. If the unitized wheel hub is not removed carefully and stored securely and free from all contaminants, damage to the wheel bearings and seals may occur. If this happens, a new unitized wheel hub must be used during assembly.

 If the wheel hub has to be removed from the spindle, carefully slide the hub out of the spindle. Use a suitable lifting device to remove the wheel hub. Store the wheel hub securely and free from all contaminants. Since this axle uses a unitized wheel hub, the wheel bearings and seals are integral to the hub. Figure 3.17.



Remove the spindle shoulder seal and discard. This seal may be sticking to the spindle shoulder or to the counter bore in the unitized wheel bearing.

Disassembly

Brakes

Refer to Maintenance Manual 23B for brake disassembly procedures. This axle uses 16.5×8.625 Cast PlusTM brakes. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

For non-Meritor automatic slack adjusters, refer to the slack adjuster or the vehicle manufacturer's instructions.

ABS Sensor

- If necessary, remove the ABS sensor by firmly pushing the sensor off, taking care not to damage the sensor. Note the orientation of the spring clip tangs for future assembly purposes, and remove the spring clip.
 - If the ABS sensor cable is restrained (tie-wrapped, etc.) to the axle housing: Make a note of the restraint to aid in future assembly and cut the tie wrap.
- Remove the busing in the brake spider and slide the ABS cable and sensor off the axle. Note the cable routing method to aid in future assembly purposes.

Brake Spider

 If necessary, disassemble the brake spider by removing the capscrews that hold the brake spider to the axle housing taking care not to damage the brake spider or the axle housing. Mark the side and the position of the brake spider original assembly with respect to the axle housing to aid in future assembly.

Differential Carrier

 Ensure that the differential carrier has been completely drained of oil. Place a suitable container underneath to catch any oil that may have been left in the carrier. Remove the capscrews and washers that hold the carrier to the axle housing taking care to support the carrier during disassembly. Figure 3.18.

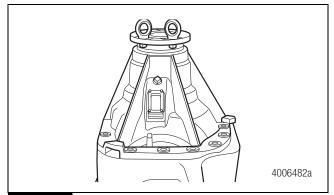


Figure 3.18

2. Use a suitable lifting device and support jack to remove the carrier from the axle housing. Store the carrier securely away from any contamination. Figure 3.19.

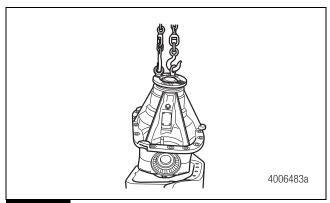


Figure 3.19

- 3. Refer to Maintenance Manual MM-0763 for differential carrier disassembly procedures. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.
- 4. Inspect the axle breather and magnets in the axle housing and remove, if necessary. Refer to Section 4 for more information.

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.

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.

Clean

Clean Ground and Polished Parts

- 1. Use a cleaning solvent, kerosene or diesel fuel to clean ground or polished parts or surfaces. Do not use gasoline.
- Use a tool with a flat blade if required, to remove sealant material from parts. Be careful not to damage the polished or smooth surfaces.

A CAUTION

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

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. Use cleaning solvent or a hot solution tank with a weak alkaline solution to clean parts with a rough finish.
- Parts must remain in the hot solution tank until they are completely cleaned and heated. When the parts are clean, remove them from the tank.
- 3. Wash the parts with water until you completely remove the alkaline solution.

Clean Axle Assemblies

- A complete axle assembly can be steam cleaned on the outside to remove dirt.
- 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.

Dry Parts After Cleaning

A CAUTION

Dry bearings with clean paper or rags. Do not use compressed air, which can cause abrasive particles to contaminate bearings. Damage to components and reduced life can result.

Immediately after cleaning, use clean paper, rags or compressed air to dry parts.

Prevent Corrosion on Cleaned Parts

A CAUTION

Absolutely no grease is allowed on the wheel mounting surface of the brake drum.

Just prior to axle assembly, the vehicle manufacturer must remove any grease and clean all mounting surfaces with an appropriate solvent to remove any traces of lubricant, rust, dirt and other foreign material.

NOTE: Parts must be clean and dry before you lubricate them.

- To prevent corrosion, apply grease to surfaces that are exposed after the axle is assembled. These surfaces include pinion yoke mounting surfaces and threads, suspension mounting pad surfaces and suspension bracketry mounting surfaces.
- Surfaces that are assembled immediately after cleaning must be completely free of grease, lubricant, rust, dirt, cleaning solvent residue and other foreign material unless otherwise specified.
- 3. If you store parts after you clean them, apply a corrosion-preventive material to all machined surfaces. Store parts in a special paper or other material that prevents corrosion. During assembly, clean and lubricate the parts as described in Step 1 and Step 2.

Painted Cast Surfaces

All exposed cast surfaces have been painted during axle manufacturing. If paint is not present or has been removed, the surface must be painted using a primer of a comparable color, unless otherwise specified by the vehicle manufacturer.

Inspect Parts

It is important to carefully inspect all parts for wear and damage before you assemble the axle. Replace damaged parts.

Magnets

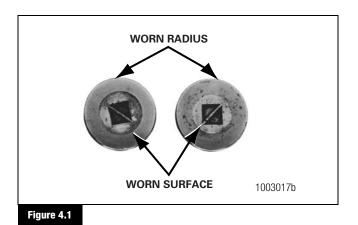
Inspect and clean the magnets in both wheel ends and in the axle housing.

- If excessive debris is found on a magnet: Inspect all components for the source of the debris and replace as required.
- If the magnets are chipped or broken: Replace the damaged magnets.

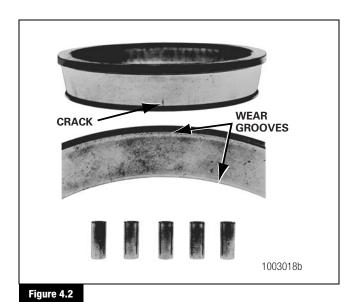
Tapered Roller Bearings

Inspect the cup, cone, rollers and cage of all tapered roller bearings in the assembly. If any of the following conditions exist, replace the bearing.

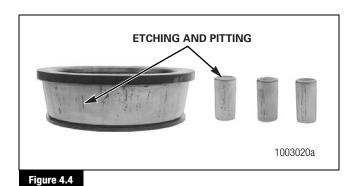
- The centers of the large diameter end of the rollers are worn level with or below the surface.
- The centers of the large diameter end of the rollers are worn to a sharp edge. Figure 4.1.
- A visible roller groove is worn in the cup or cone inner race surfaces. You can see the groove at the small or large diameter ends of both parts. Figure 4.2.
- Deep cracks or breaks are present in the cup, cone inner race or roller surfaces.
- Bright wear marks are present on the outer surface of the roller cage. Figure 4.3.
- Etching or pitting is present on rollers and on surfaces of the cup and cone inner race that touch the rollers. Figure 4.4.
- Spalling or flaking is present on the cup and cone inner race surfaces that touch the rollers. Figure 4.5.

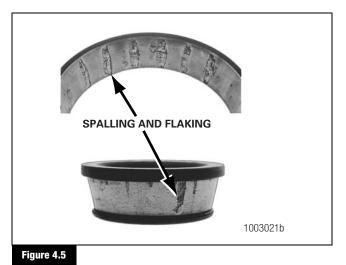


4 Prepare Parts for Assembly









Needle Roller Bearings

Replace the needles if there are any signs of pitting, etching, spalling, scoring, bruising, cracking, grooves or wear. If any of these signs are present, inspect other components for damage and replace as required.

 IF ONLY ONE OR A FEW NEEDLE BEARINGS IN A SET NEEDS REPLACEMENT: REPLACE ALL OF THE NEEDLE BEARINGS IN THAT SET.

If possible, use new needle bearings during reassembly.

Drive Pinion and Ring Gear

A CAUTION

A drive pinion and ring gear are machined as a matched set. When you replace either a drive pinion or a ring gear, you must replace both parts as a matched set. Do not mix old and new parts. Damage to components can result.

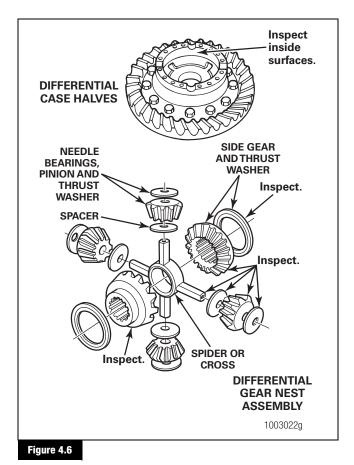
Inspect pinions and gears for wear and damage. Replace parts that are worn or damaged.

4 Prepare Parts for Assembly

Main Differential Assembly

Inspect the following main differential assembly parts for wear or stress. Replace parts that are damaged. Figure 4.6.

- All thrust washers and spacers
- Inside surfaces of both case halves
- Both surfaces of all thrust washers
- The four trunnion ends of the spider or cross
- · Teeth and splines of both differential side gears
- Teeth and bore of all differential pinions
- Needle bearings
- All thrust surfaces
- If multiple washers are used for the differential side gear and even if only one washer is damaged: Replace all of the washers.



After inspecting the main differential assembly, lubricate the side gear and differential pinion teeth, thrust faces and needle bearings. Refer to Section 6 for the lubrication specifications.

Axle Shafts

If there is any wear or cracks at the sun gear, shaft and splines, replace the axle shaft.

If damage is found on the splines, the corresponding splines on the gear must also be checked for wear or damage. Replace the gear if necessary.

Axle Housing and Wheel-End Case/Cage

Inspect the axle housing and wheel-end case/cage for fractures paying attention to oil leak signs in areas other than joints, mounting surfaces, fill/drain hole locations and replace as necessary.

Axle Housing

WARNING

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 Meritor's warranty. Serious personal injury and damage to components can result.

Inspect wheel bearing journals, brake spider mounting surfaces, differential carrier mounting surface, torque rod/suspension beam mounting surfaces, any and all threaded holes, all machined areas, spindle splines and spindle threaded areas for any wear, damage, etc. Refer to "Repair or Replace Parts" in this section for more information.

Inspect differential carrier support lug machined surfaces for any damage and replace axle housing, if damaged beyond proper repair.

Wheel-End Case/Cage

WARNING

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 Meritor's warranty. Serious personal injury and damage to components can result.

Inspect wheel-end case/cage mounting surfaces, thrust surfaces, all machined areas and threaded areas for any wear or damage, and remedy as follows.

- For minor damages to mounting surfaces like nicks or burrs, repair carefully using a fine file or emery cloth, so as not to deviate from the original design intent. For other damages like cracks, replace the parts.
- For any damage to thrust surfaces, replace the parts. Inspect all other axle components for secondary damage and replace as necessary.
- For any damage to other machined areas like planetary shaft holes, replace the parts unless the damage is minor and can be repaired without deviating from the original design intent.
- For any damage to threaded areas, replace the parts if the threads cannot be repaired.

Axle Breather and Plugs

Inspect and clean the axle breather and surrounding areas. Remove and discard the breather if it is clogged or damaged. Take care not to damage the threads in the axle housing. Inspect and clean the fill and drain plugs.

Clean the area around the plugs to prevent contaminants from entering into the axle. Remove the plugs and discard them if they are damaged, rusted through or worn out. Take care not to damage the threads in the mating port.

Yoke

If there is excessive wear at the seal journal area, replace the yoke.

Brakes

Refer to Maintenance Manual 23B, Bus and Coach Cam Brakes, for Cast Plus™ Series brake information. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

Wheel-End Gears

Replace the wheel-end gears if there is evidence of scoring, pitting, ridging, spalling, wear or other damage on the gear teeth or thrust faces.

Repair or Replace Parts

NOTE: If a damaged or worn component cannot be evaluated for disposition, the component must be set aside for a disposition determination by a Meritor-authorized representative.

Replace worn or damaged parts of an axle assembly. The following are some of the components that may require repair, replacement or maintenance.

- Replace any fastener if the corners of the head are worn.
- · Replace washers if damaged.
- Replace any cracked or fractured parts. Inspect all other axle components for secondary damage and replace as necessary.
- Replace gaskets, oil seals or grease seals at the time of axle repair.
- Clean parts and apply new liquid gasket material where required when the axle is assembled.
- Use a fine file, India stone, emery cloth or crocus cloth to remove nicks, marks and burrs from parts having machined or ground surfaces. Do not leave repair marks on seal journals and other sealing surfaces.
- Use a die or tap of the correct size or a fine file to clean and repair threads of fasteners and holes. Parts with threads beyond repair must be replaced.
- Tighten all fasteners to the correct torque values. Refer to Section 7 for fastener torque values.

Repair Welding

WARNING

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

Do not bend or straighten a damaged drive axle housing in efforts to reclaim the housing.

DO NOT repair weld this drive axle assembly or any of its components. Repair welding can detract from the structural integrity of a component, particularly to heat-treated parts where the benefit of heat treatment may be nullified by welding.

Disassemble Locked Sets

WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

To disassemble sets originally locked with liquid adhesive, use the normal disassembly procedure.

A CAUTION

Heat a threaded area slowly to avoid thermal stresses in components.

If removing a capscrew, for example, becomes difficult due to a worn head or unusually high breakaway torque, you can reduce the locking strength by slowly heating the threaded area to approximately 300°F (150°C).

Cleaning

WARNING

Trichloroethylene solvent must not come in contact with your skin. Do not smoke. Avoid breathing vapors in a closed room without ventilation. Do not use trichloroethylene near flames, welding operations or hot surfaces exceeding 900°F (482°C). Serious personal injury can result.

Clean the capscrew, nut or bolt tapped hole and fastener thread carefully. Use a cleaning solvent such as trichloroethylene or equivalent to remove dirt, oil, grease or moisture.

Assembly

Check the type of liquid adhesive to be used and where the adhesive should be applied.

In threaded holes where fasteners did not require removal, check each fastener for tightness by applying the minimum amount of specified torque.

- If the fasteners do not rotate: They are tightened correctly.
- If the fasteners rotate: Remove them and apply liquid adhesive.

Liquid Adhesive Specifications

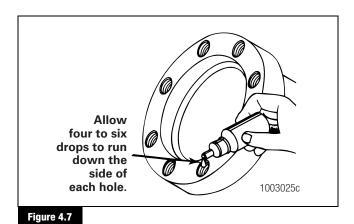
Product	Туре	Color	Cure Time
Loctite®	277 High	Red	2 hours
Adhesive	242 Medium	Blue	6 hours
	242 Low	Violet	6 hours
ThreeBond	1305 High	Red	5 hours
	1334 Medium	Green	5 hours
	1341 Low	Blue	10 hours

Application

Apply liquid adhesive to the bolt threads when the component has an open bolt hole. Before installing bolts, verify that liquid adhesive has filled the gap between the threads.

Apply liquid adhesive to the threaded bolt hole when the component has a blind hole. Allow four to six drops to run down the side of each hole. If liquid adhesive is applied to the bolt, trapped air in the hole will create back pressure and "blow out" liquid adhesive as the bolt advances. Figure 4.7.

4 Prepare Parts for Assembly



When two components are bolted together, verify that the mating surfaces are clean and free of any lubricants, rust or other foreign material unless otherwise specified.

Applying Adhesive and Silicone Gasket Material

NOTE: Any special requirements or deviations from the following instructions will be specified in the appropriate assembly procedures in Section 5.

The following silicone gasket products or equivalent can be used.

- ThreeBond 1216
- Loctite[®] 5699 adhesive sealant

WARNING

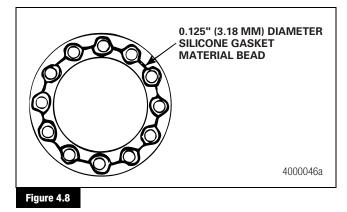
When you apply some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure that the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone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

- 1. Use a flat-blade tool to remove all old gasket material from the surfaces. Ensure that you do not damage the surfaces.
- Use a cleaning solvent to clean the surfaces where you will apply liquid gasket material. Remove all oil, grease, dirt and moisture.
- 3. Thoroughly dry both surfaces.

A CAUTION

Apply silicone gasket material in a continuous 0.125-inch (3.18 mm) bead unless otherwise specified. If you use more than this amount, the gasket material can break off and plug lubrication passages. Damage to components can result.

 Apply a 0.125-inch (3.18 mm) diameter continuous bead of the silicone gasket material around one surface. Also apply the gasket material around the edge of all the fastener holes on that surface. Figure 4.8.



- Assemble the components immediately to permit the gasket material to compress evenly between the parts. Tighten the fasteners to the required torque value for that size fastener. Refer to Section 7.
- 6. Wait 20 minutes before filling the assembly with lubricant. Refer to Section 6.

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.

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

Before you service a spring chamber, carefully follow the manufacturer's instructions to compress and lock the spring to completely release the brake. Verify that no air pressure remains in the service chamber before you proceed. Sudden release of compressed air can cause serious personal injury and damage to components.

Observe all warnings and cautions provided by the press manufacturer to avoid damage to components and serious personal injury.

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.

Installation Guidelines

Preparation of Axle

If the axle was removed from under the vehicle and has to be installed back under the vehicle, for optimal axle performance and service life, it is important that the following guidelines are followed.

These guidelines are intended only as an aid during axle installation and may not cover all the details and are by no means intended to replace any required due diligence or other instructions from the vehicle manufacturer.

- All axle interface/mounting surfaces must be clean, dry and free of rust, lubricants, paint, grease, transparent/protective masks and other foreign matter.
- All axle interface/mounting surfaces must be clear of any installation interferences.
- The axle must be filled with the correct volume and type of axle lubricant as recommended in the maintenance manual (including wheel hub lubrication, if any).
- All grease points on the axle must be checked for correct greasing, and re-greased, if necessary.
- The axle must be installed and applicated as approved in the appropriate application approval documents.
- All axle interface hardware and their respective torques must be correctly selected to be compatible with the axle and application requirements. Also, the torques for the various axle interface fasteners must be correctly maintained throughout the service life of the vehicle.
- Make certain that absolutely no working interference exists between the axle and other components of the vehicle during all situations (including worst cases of jounce, roll, etc., and their worst combinations).
- All lubrication schedules, maintenance and periodic inspections, specifications, etc., must be correctly followed as specified in the appropriate Meritor maintenance manuals. Also, refer to the appropriate maintenance manuals for other service information.

Installation

Component Installation

Magnets to Axle Housing

This axle uses six magnets in the axle housing in addition to fill and drain plugs. If magnets in the axle housing were removed during disassembly, install the magnets as follows.

- 1. Clean the inside of the axle so it is free of any lubricants, dirt and other foreign matter.
- 2. Clean the magnets so they are free of any lubricants, dirt and other foreign matter.
- Apply RTV silicone sealant to one of the larger surfaces of the magnet.
- 4. Install the magnets into the axle housing on the bottom of the axle housing internal flat surface, three magnets on either side of the drain hole. Locate the drain hole. The first magnet should be approximately one inch away from the drain hole on either side. Other magnets are approximately 1.5-inches (38 mm) away from the previous one.
- Press the magnets in location so that the adhesive squeezes evenly on all four sides. Make sure there is sealant beneath the magnet. Do not squeeze all the sealant from underneath the magnets.
 - Install the magnets paying careful attention to the sealant manufacturer cure times. After installation, the magnets are approximately symmetrical on either side of the drain hole.
 If installed correctly, the magnets will not interfere with any other component during axle operation.

Differential Carrier

Refer to "Differential Carrier" section below for the differential carrier installation procedures.

Brake Spider

If the brake spider was removed, install the brake spider as follows.

- Ensure that the mounting surfaces of both the brake spider and axle housing is dry and free of any lubricants, rust preventative, rust, dirt and all other foreign matter.
- Install the brake spider in the original position using the marked references during disassembly.
- Install washers and capscrews and tighten to specification.
 Refer to Section 7 for torque value.

Brakes

This axle uses 16.5 x 8.625 Cast Plus[™] brakes. Refer to Maintenance Manual 23B for the brake assembly procedures. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

ABS Sensor

Refer to the appropriate Meritor WABCO maintenance manuals (Maintenance Manual 28 for the C version ECU; Maintenance Manual 30 for the D version ECU; and Maintenance Manual MM-0112 for the E version ECU) for ABS sensor installation. To obtain these publications, refer to the Service Notes page on the front inside cover of this manual.

The ABS sensor holder is integral to the axle housing in the MC27610 planetary drive axle. Lubricate the sensor assembly as specified in the appropriate Meritor WABCO maintenance manual and assemble the bushing in the brake spider through which the ABS cable is routed and restrain the cable as during disassembly.

Wheel Ends

Refer to "Wheel End" in this section.

Miscellaneous Hardware

 If removed, install the axle breather and tighten to specification. Refer to Section 7 for the torque value. Two versions of the axle breather are available — the older non-pressurized axle breather and the newer pressurized version. The pressurized axle breather has pre-applied thread sealant at the threads. If the pre-applied thread sealant is not present in the pressurized breather, use Loctite® PST® 592TM thread sealant at the threads. Figure 5.1 and Figure 5.2.

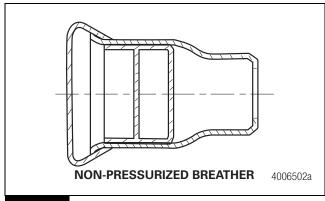


Figure 5.1

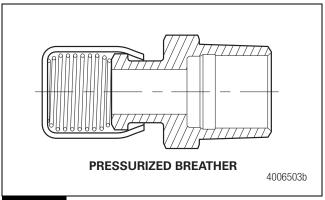


Figure 5.2

- 2. If removed, install the axle housing fill and drain plugs and tighten to specification. This axle uses the same magnetic plug for both locations. The plugs have taper threads and a pre-applied thread sealant. If the pre-applied thread sealant is not present, use Loctite[®] PST[®] 592™ thread sealant at the plug threads. Refer to Section 7 for the torque value.
- 3. If removed, install the wheel-end plug and gasket and tighten to specification. The wheel-end magnetic plug has a pre-applied thread sealant. If the pre-applied thread sealant is not present, use Loctite[®] PST[®] 592™ thread sealant at the plug threads. Refer to Section 7 for the torque value.

Differential Carrier

For further differential carrier assembly procedures, refer to Maintenance Manual MM-0763. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual. Figure 5.3.

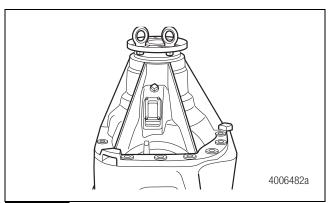


Figure 5.3

- Make sure the mating surfaces on both the carrier and axle housing are dry, clean and free of rust, lubricants, dirt, paint, prior gasket material and all other foreign matter.
- 2. Apply a continuous 0.125-inch (3.18 mm) bead of silicone gasket material to the axle housing mounting face and around the tapped holes to eliminate all leak paths. Do not use Three Bond 1216E. The carrier casting has some raised edges at two corners. Apply the silicone gasket material so that it is inboard of the carrier casting's raised edges. When fully installed, ensure that the silicone gasket material is evenly compressed all around to eliminate all leak paths. After the silicone gasket application, install the differential carrier within the gasket manufacturer's recommended cure time.
- 3. Position the differential carrier appropriately over the axle housing using a suitable lifting device and support jacks.

A CAUTION

Ensure that the differential carrier is adequately centered and carefully installed into the axle housing. Damage to the four support lugs in the axle housing during installation voids Meritor's warranty. If the lugs inside the axle housing are damaged, replace the axle housing to avoid damage to other components.

4. Lower/insert the carrier carefully into the axle housing.

A CAUTION

Follow the correct installation procedures. Do not grind or remove material from the axle housing lugs or carrier supports to install the carrier. Grinding the axle housing lugs or carrier supports reduces structural integrity and voids Meritor's warranty. Serious personal injury and damage to components can result.

- 5. There are four support lugs towards the bottom bowl end of the axle housing. Take care not to damage these lugs. Use guide pins, if necessary, at the four corner mounting holes to center the carrier. Carefully finish installing the carrier so that the carrier mounting flange surface is fully resting against the corresponding axle housing surface all around.
- 6. Remove the guide pins, if used. Assemble the washer and 16 capscrews. One capscrew is longer than the others. Assemble the longer capscrew at the raised boss in the carrier.

5 Assembly and Installation

- Tighten four corner capscrews in a crisscross pattern to 50 lb-ft (68 N•m). Make sure the carrier is fully seated. Then, tighten the four corner capscrews to specification. Refer to Section 7 for the torque value.
- Tighten the remaining capscrews to specification. Make sure all capscrews are tightened to specification. Refer to Section 7 for the torque value.

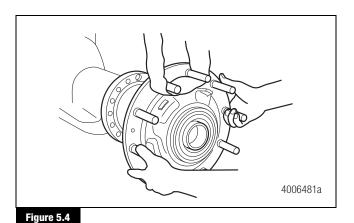
Wheel End

1. Install a new spindle shoulder seal into the unitized wheel hub inner bearing counterbore so that the serrated edge is against the bearing. Ensure that the seal is correctly seated.

WARNING

Lubricate the wheel bearing inner diameter only and not the spindle bearing journal outer diameter to prevent any potential hydraulic lock.

- Coat the entire wheel hub bearing inner diameter, both the inner and outer portions of the bearing, with Dow Corning[®] D General Purpose White Paste lubricating compound. Wipe off any excessive lubricant. Absolutely no lubricant is allowed at the spindle threads.
- 3. Assemble the wheel hub assembly onto the spindle until the inner wheel bearing cone of the unitized wheel bearing rests solidly against the spindle bearing shoulder. Ensure that the spindle shoulder seal does not fall off and is correctly seated. Again, wipe off any excessive lubricant and make sure the spindle threads are free of any lubricant. Figure 5.4.



4. If the planetary ring gear assembly was disassembled, assemble the planetary ring gear and ring gear hub with the snap ring in place. Figure 5.5 and Figure 5.6.

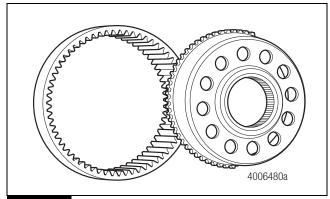
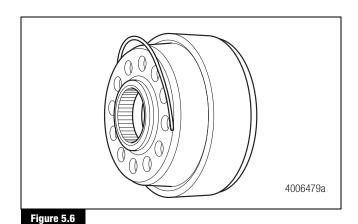


Figure 5.5



WARNING

Step B provides only the initial torque value for the wheel bearing adjusting nut. You must tighten the adjusting nut to the final torque value in Step D before returning the vehicle to service. Also, the lock screw specified in Step E must be assembled and tightened to the correct torque specification.

A wheel bearing adjusting nut that is not tightened to the correct torque specification or a lock screw that is not assembled and tightened to the correct torque specification can allow the wheel bearing adjusting nut to loosen during operation and cause a wheel to separate from the vehicle. Serious personal injury and damage to components can result.

- Assemble the planetary ring gear assembly onto the spindle and lock it in place with the wheel bearing adjusting nut and lock screw as follows. Figure 5.7 and Figure 5.8.
 - A. Ensure that the planetary ring gear assembly is correctly seated against the wheel hub bearing all around before assembling the adjusting nut.
 - B. Tighten the adjusting nut initially to 110 \pm 20 lb-ft $(149 \pm 27 \text{ N} \cdot \text{m})$.
 - C. Rotate the wheel hub several revolutions in each direction to seat the components.
 - D. Tighten the wheel bearing adjusting nut to the final torque specification of 887.5 \pm 87.5 lb-ft (1203 \pm 119 N•m), targeting the nominal value.
 - E. Ensure that the lock screw can be assembled in one of the adjusting nut slots so that the lock screw head will fit into the slot against an adjacent tab. Use a new lock screw. Tighten to 22-28 lb-ft (30-38 N•m). **①**
- 6. Assemble a new hub O-ring in its slot in the hub pilot so that it seats correctly all around. Lubricate the O-ring with axle lubricant. Refer to Section 6 for information about axle lubricants. Figure 5.9.

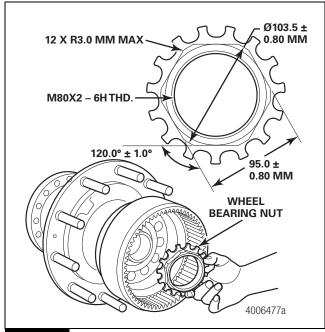


Figure 5.7

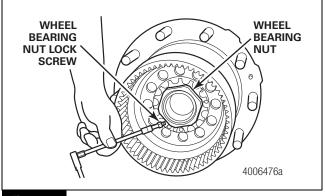


Figure 5.8

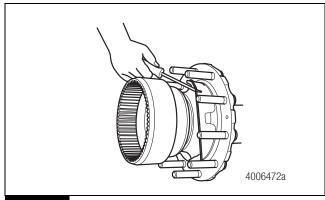


Figure 5.9

5 Assembly and Installation

7. Assemble the correct axle shaft on each side so that it rests against the differential spider. Figure 5.10.

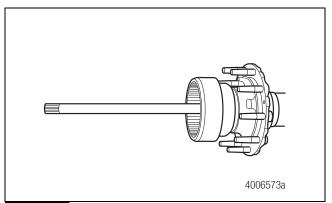
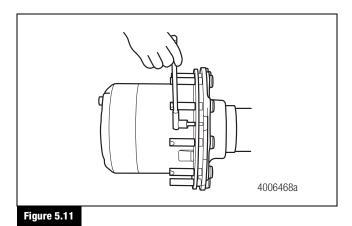


Figure 5.10

A CAUTION

Follow the correct assembly procedures. The dowel in the wheel hub cannot protrude above the brake drum mounting surface. Clamp load loss at the wheel nuts may occur.

8. Assemble the planetary cage assembly until the planetary case flange rests solidly against the wheel hub flange, paying careful attention not to damage the O-ring on the wheel hub. Also when assembling the planetary cage assembly, position the planetary cage assembly so that the dowel in the wheel hub and the corresponding dowel hole in the planetary case are aligned. For the planetary cage assembly procedures, refer to "Planetary Cage Assembly" in this section. Follow the assembly procedures carefully to ensure correct wheel-end functioning. Figure 5.11.



A CAUTION

Follow the correct brake drum assembly procedures. The drum retention screw must not protrude above the wheel mounting surface. Clamp load loss at the wheel nuts may occur.

- 9. Assemble the brake drum and drum retention screws, if present. Tighten the drum retention screws to specification. Apply anti-seize compound to the drum retention screw threads, making sure absolutely no anti-seize compound is present on the wheel mounting surface. Refer to Section 7 for the torque value. Ensure that the brake drum is correctly piloted on all pilots and rests flush against the planetary case flange before assembling the drum retention screws.
- Assemble the wheel nuts so that the brake drum, planetary cage assembly and wheel hub assembly are securely clamped. Figure 5.11.
- Assemble the thrust button to the sun gear end of the axle shaft, making sure the thrust button is fully seated. Figure 5.12.

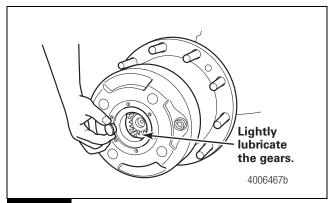


Figure 5.12

12. Lightly lubricate the wheel end gear teeth with axle lubricant. Refer to Section 7 for axle lubrication information. Figure 5.12.

Sun Gear End Play

The end play of the sun gear/axle shaft system must be within specification for correct functioning of the wheel end and to prevent premature wear and failure to the wheel end components. Set the sun gear end play to 0.04-0.069-inch (1-1.75 mm) as follows.

Measure and record dimension A. Also, measure and record dimension B using Tool 2. The difference between the two dimensions is the end play, i.e., end play = A - B. Refer to Section 8 for the tool drawing. Figure 5.13 and Figure 5.14.

A CAUTION

It is important that the larger diameter end of the thrust block goes into the cover first and that the block is assembled straight. Do not use excessive force. Damage to the aluminum cover may occur.

- If the end play is not within specification and the thrust button has to be removed: Carefully remove the magnet clip and magnet. Discard the magnet clip.
 - Gently grip the thrust block in a vise with soft jaws taking care not to damage the thrust block.
 - Tap on the end cover with a small wooden mallet or a small brass hammer sequentially at several places so as to remove the end cover from the thrust block taking care not to damage or crack the aluminum cover.
 - Small shims having the same nominal thickness are present behind the thrust block to adjust the end play. Add or remove shims as needed to achieve the required end play. If the shims already present are damaged, deformed or lost, add new shims to achieve the required end play. Measure the shims to get the shim thickness.
 - Assemble the thrust block into the cover by using a suitable drift and a small brass hammer so that the block is assembled straight. Position the block so that the larger diameter end (with the grooves flared out) goes into the cover first. If the thrust block is damaged or the thrust surface is worn, use a new thrust block and follow the above procedures to achieve the required end play.
 - Assemble the magnet and magnet clip onto the thrust block. Position the magnet clip so that the tangs at the inner diameter of the clip point away from the magnet. Gently push the clip against the magnet, being careful not to damage the clip.

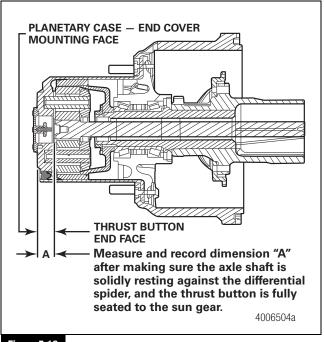


Figure 5.13

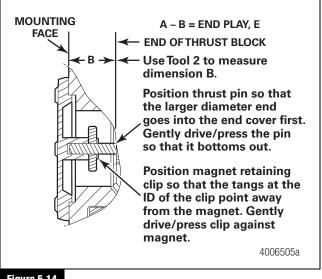
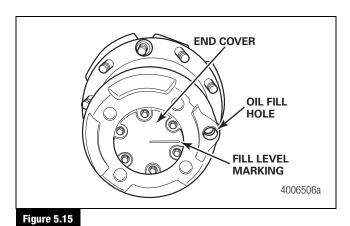


Figure 5.14

End Cover Assembly

The end cover will assemble only one way because of the fastener hole pattern. Do not force the fasteners. Read all of the steps below before installing the end cover assembly.

- Apply a continuous 0.125-inch (3.18 mm) bead of silicone gasket material (do not use ThreeBond 1216E) to the end cover mounting face on the planetary case and around the tapped holes so as to eliminate all leak paths. Before application of the silicone gasket material, the mounting face on the planetary case must be dry, clean and free of rust, any lubricants, dirt, paint and all other foreign matter.
- Install the end cover assembly securely, per Step 3 below, against the planetary case mounting face, paying careful attention to cure times of the silicone gasket material manufacturer. Also, the end cover mounting face must be dry, clean and free of rust, any lubricants, dirt, paint and all other foreign matter.
- 3. When installing, align the oil fill level marking on the cover with the oil fill/drain plug on the planetary case. The fasteners will assemble only in this position. Do not force the fasteners. This aligning must be done during the installation process and not after installation by rotating to prevent removal of the silicone gasket material. Figure 5.15.



4. Apply Loctite® Threadlocker 242® to the capscrew holes and install the fasteners. Refer to Section 7 for the torque value.

Planetary Cage Assembly

The planetary cage assembly must be done in the correct sequence for correct functioning of the planetary wheel end and to prevent any premature wheel-end failure. All mounting and thrust surfaces must be clean and free of grease, rust, any lubricants, paint, damage, moisture and other foreign matter before assembly.

1. Install the planetary gear pins into the planetary gear cage. Ensure that the shoulder in the pins rests solidly against the shoulder in the cage. The fit between the planetary gear pin and cage is an interference fit. Apply Loctite[®] 635 retaining compound evenly all around the planetary gear pins to the portion that goes into the cage before installing the pin.

A CAUTION

Install the steel thrust washer against the gear and the brass washer against the cage or case. Do not reverse the thrust washers. Damage to the wheel-end components can result.

Install the planetary gear thrust washers. Position the steel
thrust washer against the gear and the brass washer (gold
color) against the cage/case. If the thrust washers are
reversed, premature wear to wheel-end components will
result. Figure 5.16.

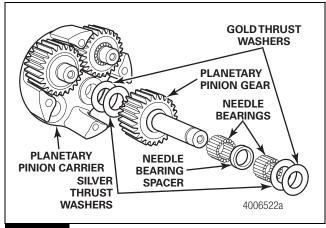


Figure 5.16

3. Install the planetary gears and needle bearings onto the planetary gear pins. There are two rows of needle bearings separated by a spacer. Each row has 19 needle bearings. Use sufficient grease spec O-617-A (NLGI Grade 1) when assembling the needle bearings to hold the needle bearings in place during assembly. Also, lightly lubricate the planetary pinion gear teeth with axle lubricant. Refer to Section 6 for information about axle lubricants. Figure 5.16.

5 Assembly and Installation

A CAUTION

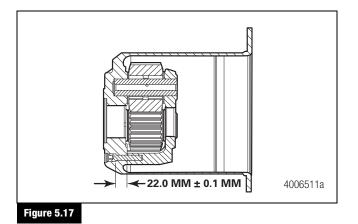
Install the steel thrust washer against the gear and the brass washer against the cage or case. Do not reverse the thrust washers. Damage to the wheel-end components can result.

4. Install the planetary gear thrust washers. Position the steel thrust washer against the gear and the brass washer (gold color) against the cage/case. If the thrust washers are reversed, premature wear to the wheel end components will result. Figure 5.16.

A CAUTION

To align the correct planetary gear pin holes, when installing the planetary gear case, ensure that the drain hole in the case is closest to the center drill mark on one of the planetary cage bolt hole lugs. If the correct planetary gear pin holes are not aligned, assembly of the case will be extremely difficult and damage to components may occur. If damage occurs, replace all damaged components and start the planetary cage assembly again.

5. Install the planetary gear case onto the planetary gear pins. Ensure that the case solidly rests against the planetary gear cage by confirming the depth at all capscrew holes as shown below and ensure that a 0.002-inch (0.05 mm) feeler gauge does not pass between the mounting surfaces at the capscrew holes. The fit between the planetary gear pin and case is an interference fit. If the planetary case has been assembled correctly, the end play of the planetary gears will be 0.02-0.06-inch (0.50-1.50 mm) for each planetary gear. Figure 5.17.



- 6. Install the planetary case-to-cage capscrews and tighten them to 140-170 lb-ft (190-230 N•m) in steps in a crosswise pattern. Apply four to six drops of Loctite[®] Threadlocker 277[™] to the side of capscrew hole before installing the capscrew. ◆
- 7. Apply a continuous 0.125-inch (3.18 mm) bead of silicone gasket material (do not use ThreeBond 1216E) to the capscrew hole shoulder in the planetary gear case and install new expansion plugs, paying attention to cure times of the sealant manufacturer. Retain the expansion plugs in place for effective sealing and rust protection by upsetting the plugs, making sure the plugs are permanently contained in their slots and are not damaged.

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.

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

Specifications

Oil Fill Procedure

- 1. Wear safe eye protection.
- 2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
- 3. Remove the fill plugs and gasket from the differential and planetary wheel ends.
- 4. Fill the differential with oil until oil is to the bottom of the oil fill hole and oil just starts to flow out of the fill hole.
- Rotate the planetary wheel ends until the oil level mark on the wheel-end cover is horizontal to the ground. At this position, fill the wheel ends to the bottom of the oil fill hole and oil just starts to flow out of the fill/drain hole. Do this for both wheel ends.

- Wait for approximately 10 minutes to allow enough time for the oil to settle. Refill as above, if necessary. Continue this sequence until the oil level does not drop anymore.
 - The approximate oil fill quantity for the differential carrier is 6 gallons (27 liters) and for planetary wheel ends is 0.625 gallons (2.84 liters) each. This quantity is for reference only.
- 7. Install the differential fill plug and tighten to a minimum of 25 lb-ft (34 N•m). ①
- 8. Install the wheel-end fill/drain plugs and gaskets and tighten to 45-75 lb-ft (34 N•m). •
- Road test the vehicle in the unloaded condition for one to two miles at a speed of no more than 25 mph (40 km/h).
 Check the oil levels and add oil, if necessary. Retighten the fill plugs.

Use only the recommended lubricants given below for correct axle functioning and to prevent premature wear or other lubrication-related failure.

Intervals

Table A: Oil Change Schedule

Initial Oil Change	1000 miles (1609 km)	
Check Oil	Every 2500-3000 miles (4023-4828 km)	
Change Oil	Every 25,000-30,000 miles (40 233-48 280 km)	

Table B: Recommended Lubricants

Meritor Lubricant			Minimum Outside	Maximum Outside
Specification	Description	Cross Reference	Temperature	Temperature
0-76-A	Hypoid Gear Oil	GL-5, S.A.E. 85W/140	10°F (-12°C)	*
0-76-D	Hypoid Gear Oil	GL-5, S.A.E. 80W/90	–15°F (–26°C)	*
0-76-E	Hypoid Gear Oil	GL-5, S.A.E. 75W/90	-40°F (-40°C)	*

^{*}There is no upper limit on these outside temperatures, but the differential and wheel-end sump temperatures must never exceed 240°F (121°C).

Use only the recommended lubricants shown in Table B for correct axle functioning and to prevent premature wear or other lubrication-related problems. Also, use the same lubricant for axle assembly and for filling the axle. DO NOT MIX LUBRICANTS.

Brake Component Lubrication

For brake component lubrication procedures, refer to Maintenance Manual 23B. This axle uses 16.5 x 8.625 Cast PlusTM brakes. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

For non-Meritor automatic slack adjusters, refer to the slack adjuster or the vehicle manufacturer's instructions.

ABS Sensor Lubrication

For ABS sensor lubrication procedures, refer to the appropriate Meritor WABCO maintenance manuals (Maintenance Manual 28 for the C version ECU; Maintenance Manual 30 for the D version ECU; and Maintenance Manual MM-0112 for the E version ECU). To obtain these publications, refer to the Service Notes page on the front inside cover of this manual.

7 Specifications

Torque Specifications

Table C: MC27610 Planetary Drive Axle — Torque Values

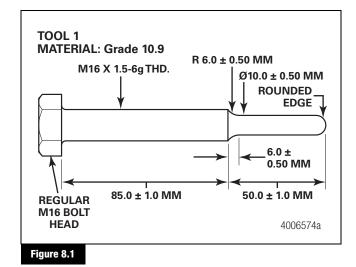
Fastener	Fastener Size	Torque Value*	
Axle			
Axle breather — non-pressurized version	0.375 - 18 NPT	20-24 lb-ft (27-33 N•m)	
Axle breather — pressurized version	0.375 - 18 NPTF	12-18 lb-ft (16-24 N•m)	
Brake spider attaching capscrews	M16 x 2	180-230 lb-ft (244-312 N•m)	
Differential carrier mounting capscrews	M16 x 2	190-240 lb-ft (258-325 N•m)	
Drain/fill plug for axle housing (plug has taper threads)	M24 x 1.5	min 25 lb-ft (34 N•m)	
Brake chamber bracket mounting capscrews	0.500 - 13	90-120 lb-ft (122-163 N•m)	
Brake chamber bracket support lug capscrew	M16 x 2	180-230 lb-ft (244-312 N•m)	
Slack adjuster retaining capscrew	0.500 - 13	85-115 lb-ft (115-156 N•m)	
Slack adjuster strap-to-brake chamber bracket nut	0.375 - 16	20-30 lb-ft (27-41 N•m)	
Slack adjuster strap-to-slack adjuster control arm flange nut	Haldex supplied	8-15 lb-ft (11-20 N•m)	
Wheel End			
Wheel bearing adjusting nut	M80 x 2	$887.5 \pm 87.5 \text{ lb-ft } (1203 \pm 119 \text{ N-m})$ (final)	
Lock screw for wheel bearing adjusting nut	M8 x 1.25	22-28 lb-ft (30-38 N•m)	
Planetary cage-to-case capscrews	M14 x 2	140-170 lb-ft (190-230 N•m)	
Brake drum retention capscrews	M10 x 1.5	25-30 lb-ft (34-41 N•m)	
End cover capscrews	M8 x 1.25	12-18 lb-ft (16-24 N•m)	
Wheel-end drain/fill plug	M24 x 1.5	45-75 lb-ft (61-102 N•m)	

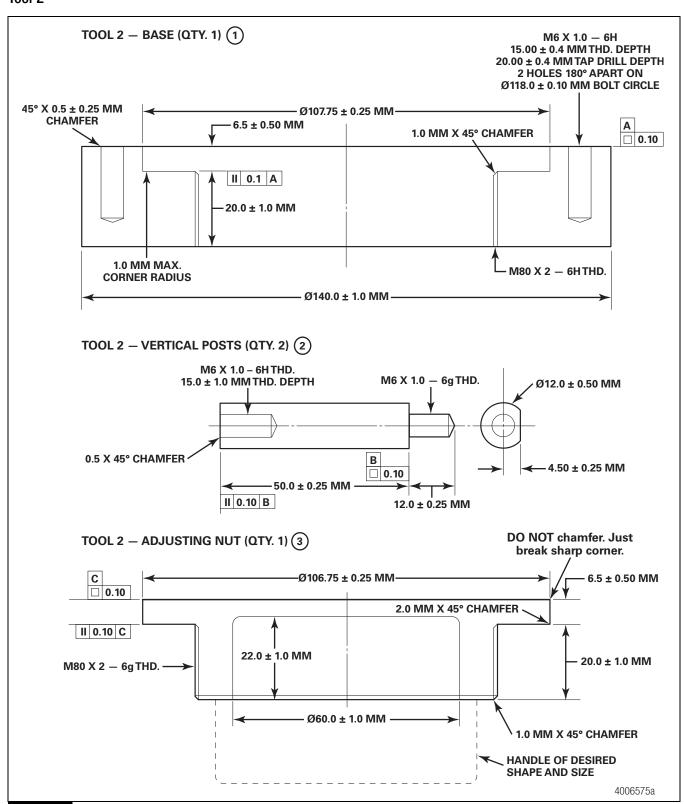
^{*}Target nominal torque value in the range shown in Table C.

Tools Required

Tool Drawings

Tool 1





Tool 2 requires assembly to measure dimension B as follows.

- Thread 3 into 1 so that the mating surfaces solidly contact each other.
- Thread 2 into 1 so that they are tight and the clipped surface is toward the inboard side. Take care not to break off the threaded end.
- Assemble the end cover assembly onto 2 with two M6x1x15.0 mm capscrews and washers. Make sure the capscrews are tight, but not overtightened. When selecting the holes for assembling the end cover assembly onto 2, select the holes on the end cover that align with 2.
- Raise 3 until 3 just touches the thrust block in the end cover assembly. Do not apply any more pressure.
- Use a caliper to measure and record dimension B.

Tool 2 Material

- Use cold rolled steel. For wear and tear, depending on the user's environment, the tool can be hardened and made from a compatible material.
- The dimensions and tolerances given should be maintained.

8 Special Tools

Tool 3

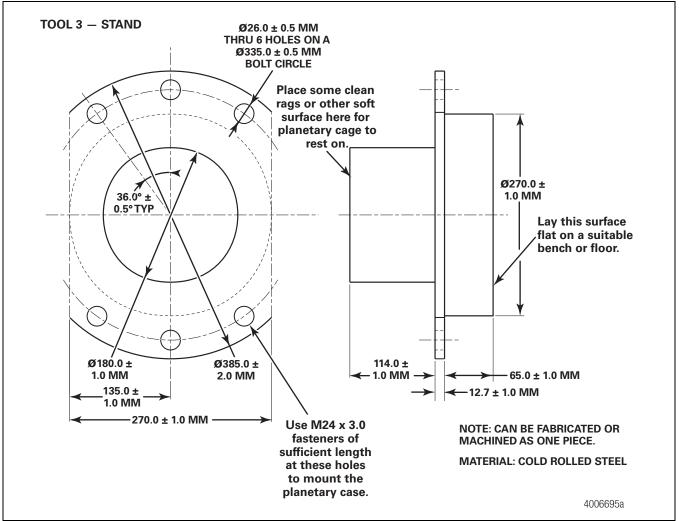


Figure 8.3

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.

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

Maintenance

The intent of this section is to aid the end user in periodic inspection and maintenance efforts and may not cover all the periodic maintenance items. Also, this section is not intended to replace any required due diligence on the part of the user or other instructions specified elsewhere in this or other maintenance manuals or from the vehicle manufacturer. Further severe and abusive operating environments may require more frequent maintenance and periodic inspections.

Axle Breather

Due to the location and the closeness of the axle breather-to-road debris, the breather may become clogged or covered by the road debris. If the breather is clogged, the seals may begin leaking in order to relieve the internal pressure. To ensure that the breather does not become clogged or corroded, periodically clean the breather and the surrounding area to keep it free of road debris.

Wheel-End Maintenance

During every 25,000-30,000 mile oil change, remove the end cover at each end of the axle and replace the thrust button at the sun gear end of the axle shaft. Also, pull the sun gear out using the M16 x 2 threaded hole provided at the bottom of the thrust button counter bore so that the gear mating surfaces of the sun gear and planetary pinions can be visually inspected for any wear. Replace as needed.

Wheel Hub Maintenance

WARNING

You must follow the unitized wheel hub maintenance and periodic inspection as explained here to prevent serious personal injury and damage to components.

The unitized wheel hub is sealed and greased for life and does not require lubrication. If you disassemble, or attempt to repair or lubricate a unitized wheel hub assembly, you will void the Meritor warranty.

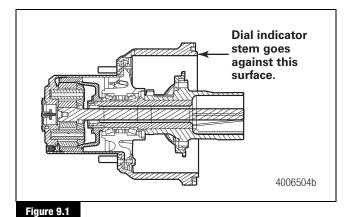
The MC27610 Series planetary axle uses unitized wheel hub assembly. The unitized wheel hub bearings are sealed and greased for life and do not require lubrication. But these unitized hubs require periodic inspection as explained here to maintain performance.

The following wheel hub maintenance is to be done once every 50,000 miles or once every year, whichever is earlier.

- 1. Wear safe eye protection.
- 2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
- 3. Raise the vehicle so that the rear axle is off the ground. Follow all of the safety precautions and vehicle manufacturer instructions.
- 4. Verify the wheels are mounted correctly and the wheel nuts are tightened to specification. Refer to the vehicle manufacturer instructions.
- 5. Support the vehicle with safety stands so that the wheels are free to rotate. Also, release the rear axle brakes so that the rear wheels can rotate.
 - If the axle has to be supported: Support the axle evenly and correctly on both legs of the axle housing as far outboard as possible to reduce the potential of structural damage to the axle and its components.
- 6. Rotate the wheel-end assembly several revolutions in each direction to seat the wheel-end bearings.

9 Inspection and Maintenance

7. Attach a dial indicator so that the dial indicator stem is perpendicular against the inboard end face of the brake drum. Clean the brake drum end face, only as needed, to ensure that you have a clean and flat surface for the dial indicator stem. PROTECT THE BRAKE LININGS AND BRAKING SURFACE FROM CONTAMINATION. Figure 9.1.



- Ensure the dial indicator base is firmly mounted on a flat and even surface, either to the axle housing or to the suspension beam.
- 9. Set the dial indicator to ZERO. Once the dial indicator is set to ZERO, do not rotate the wheel or disturb the dial indicator.
- 10. With one operator on the outboard end, hold the tire and wheel-end assembly at the nine and three o'clock positions and push the wheel end straight IN. Have another operator note the dial indicator reading. Note only the end play reading, and not any deflections due to suspension movement.
- 11. Now, pull the wheel end straight OUT. Note the dial indicator reading. The difference between the two readings is the unitized wheel hub bearing end play on that side.
- 12. Repeat the above measurements until two consecutive and consistent end play readings are obtained.
 - If the end play is between 0-0.002-inch (0-0.05 mm):
 The inspection is complete for this side. Go to Step 13.

- If the end play is greater than 0.002-inch (0.05 mm), but less than 0.004-inch (0.10 mm): Remove the tire assembly, brake drum and the planetary wheel-end assembly. Check and retighten the wheel bearing adjusting nut to specification. Refer to Section 3 and Section 5 for the correct disassembly and assembly procedures. Follow all of the instructions carefully. Also, follow all of the vehicle manufacturer instructions. Recheck the end play as explained above to ensure there is no unitized wheel hub bearing end play.
- If the end play is equal to or greater than 0.004-inch (0.10 mm): Replace the unitized wheel hub assembly as soon as possible since the hub assembly may not be safe to operate. Refer to Section 3 and Section 5 for the correct disassembly and assembly procedures. Follow all instructions carefully.
- Repeat these steps for the unitized wheel hub assembly on the other side.

Axle Interface Fasteners

For optimal axle performance and service life, all of the axle interface fasteners (wheel nut, suspension mounting fasteners, torque rod fasteners, etc.) must be correctly maintained and the torque values correctly selected and maintained, following the vehicle manufacturer instructions and compatible with the end user operating environment, throughout the service life of the vehicle.

Axle Lubrication

The axle and wheel end must be filled with the correct volume and type of axle lubricant as recommended in this maintenance manual (including wheel hub lubrication, if any) throughout the service life of the vehicle. Also, all grease points on the axle must be checked for correct greasing, and re-greased, if necessary, following recommendations in the appropriate maintenance manuals and vehicle manufacturer instructions.

Axle Operation

Follow the recommended guidelines specified in "Preparation of Axle" in Section 5 of this manual throughout the service life of the vehicle for optimal axle performance and service life. Any damage to the axle and its components due to abnormal and excessive operating conditions must be correctly and promptly attended.

Axle Leaks

Monitor the entire axle during every oil check for leaks, paying close attention to the following areas.

- Differential pinion seal and wheel hub seal
- Fill and drain plugs (both in the wheel end and center section)
- Differential carrier-to-axle housing interface
- Wheel end cover-to-planetary case interface

If a leak is found, identify and rectify the cause. Replace parts as needed. If the axle has been running with low oil, possible damage to internal components, especially gears, splines, O-rings, bearings, bearing journal surfaces, seals, thrust and wear surfaces, may have occurred. Check all of the internal components and replace as needed.

Axle Maintenance

Due to the easy accessibility of the axle-to-road debris and other harsh environments, periodically inspect the entire axle for debris buildup and damage, paying close attention to the areas listed below. Clean, repair or replace, as needed.

- Axle breather
- Differential pinion seal (if the seal area has to be cleaned, take care not to damage the seal or allow foreign particles into the axle)
- Fill and drain plugs (both in the wheel end and center section)
- Brake lining and other brake components
- Areas where paint has chipped or peeled off (retouch with primer of a comparable color, unless otherwise specified by the vehicle manufacturer)

Avoid exposure of the axle to a damp environment for extended periods of time. If the axle has been submerged in water, the axle must be drained and fully disassembled. Thoroughly review all of the parts, including all bearings, bearing journals, seals, seal journals, gears, splines, 0-rings, thrust and wear surfaces, breather, ABS sensors, ABS tooth wheel, etc., for any signs of damage. Replace, as needed. The MC27610 Series planetary axle uses unitized wheel hubs that must be replaced, along with the spindle and axle housing, if the spindle has been damaged. Refer to Technical Bulletins TP-0584 and TP-0586 for more information.

Troubleshooting

Symptom	Possible Causes	Action		
Oil leak in the pinion seal	Clogged breather	Clear the breather area and replace the breather, if necessary.		
area ^{1,2,3}	Damaged pinion seal	Replace the seal.		
	Excessive oil	Check the oil level and correct, as necessary.		
	Damaged companion flange seal journal	Replace the companion flange and pinion seal.		
	Damaged internal differential components	Replace damaged components.		
Oil leak at the differential	Missing sealant	Disassemble the differential carrier from the axle housing. Clea		
carrier-to-axle housing interface ^{1,2,3}	Incorrectly applied sealant	the mating surfaces and apply the appropriate sealant correctly. Follow the disassembly and assembly procedures in this manual.		
	Incorrect fastener torque	Disassemble the differential carrier from the axle housing. Clean the mating surfaces and apply the appropriate sealant correctly. Assemble and tighten the fasteners to the correct torque. Follow the disassembly and assembly procedures in this manual.		
	Damaged fasteners	Disassemble the differential carrier from the axle housing. Clean the mating surfaces and apply the appropriate sealant correctly. Check to see if the housing threads are damaged. If the housing threads are damaged beyond repair, replace the housing. Assemble and use new fasteners and tighten to the correct torque. Follow the disassembly and assembly procedures in this manual. Also refer to Section 4.		
	Damaged mating surfaces	Replace damaged components, as needed.		
Oil leak at the wheel-end	Missing sealant	Disassemble the wheel-end cover from the planetary case. Clean		
cover-to-planetary case interface ^{1,2,3}	Incorrectly applied sealant	the mating surfaces and apply the appropriate sealant correctles. Follow the disassembly and assembly procedures in this manu-		
	Incorrect fastener torque	Disassemble the wheel-end cover from the planetary case. Clean the mating surfaces and apply the appropriate sealant correctly. Follow the disassembly and assembly procedures in this manual.		
	Damaged fasteners	Disassemble the wheel-end cover from the planetary case. Clean the mating surfaces and apply the appropriate sealant correctly. Check to see if the housing threads are damaged. If the housing threads are damaged beyond repair, replace the housing. Assemble and use new fasteners and tighten to the correct torque. Follow the disassembly and assembly procedures in this manual. Also refer to Section 4.		
	Damaged mating surfaces	Replace damaged components, as needed.		
Oil leak at the fill and drain plugs ^{1,2,3}	Damaged plug	Replace the plug. Check the housing threads for damage and replace, as needed.		
	Incorrect torque	Apply the correct torque.		
	Damaged housing threads	Replace damaged components, as needed.		

For diagnostic information on brakes, refer to Maintenance Manual 23B. For diagnostic information on the differential carrier, refer to Maintenance Manual MM-0763. To obtain these publications, refer to the Service Notes page on the front inside cover of this manual.

¹ For all of the above symptoms, follow the correct assembly and disassembly procedures, torque values, etc.

 $^{^{2}\,}$ For all of the above symptoms, inspect all of the related components for secondary damage and replace, as needed.

³ If the axle has been running with low oil, possible damage to internal components, especially gears, splines, 0-rings, bearings, bearing journal surfaces, seals, thrust and wear surfaces, may have occurred. Check all of the internal components, and replace, as needed.

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.

To avoid serious personal injury and damage to components, take care when using lifting devices during service and maintenance procedures. Inspect a lifting strap to ensure that it is not damaged. Do not subject the lifting straps to shocks or drop-loading.

Always follow all vehicle manufacturer guidelines and recommendations for towing.

Always follow all safety procedures to avoid serious personal injury and damage to components.

Towing Procedures

Before Towing

WARNING

Engage the parking brake to prevent the vehicle from moving before you begin maintenance or service procedures that require you to be under the vehicle. Serious personal injury can result.

Since the axle is used in a rear engine vehicle, follow the guidelines below if the vehicle is towed by lifting the front of the vehicle so that the rear drive axle wheels are on the ground.

- Make sure the vehicle is empty and then lift the vehicle up only as little as needed. This will allow the angle at the rear axle to be as close as possible to the normal vehicle operating mode.
- Because of the dynamic vehicle articulation during towing, make sure there is no interference or potential interference between the drive axle and any other vehicle component.

- The rear drive axle is now tow-ready. Limit the towing distance for MC27610 planetary drive axle to as short a distance as possible, i.e., from the disabled site to the nearest available garage.
- 4. Limit the speed at which the drive wheels move during towing to 20 or 25 mph (32 or 40 km/h) or lower.

The above guidelines are not needed if the vehicle is towed by lifting the rear of the vehicle so that the rear drive axle wheels are off the ground.

After Towing

WARNING

Engage the parking brake to prevent the vehicle from moving before you begin maintenance or service procedures that require you to be under the vehicle. Serious personal injury can result.

- After towing and before putting the vehicle back in service, make sure the drive axle is not damaged in any way. Repair or replace as needed.
- If leaks are noticed, identify and rectify the cause and repair or replace parts as needed. Always check for all possible primary and secondary damages and rectify as needed.