Reliability Driven™

# Service Bulletin No. 3076

| MODEL | TYPE | SECTION/GROUP | DATE |
|---|---|---|---|
| D / E / J Series Coaches | Service Information | 15 – Wheels | Mar. 26, 2013 |

**SUBJECT:** UNITIZED WHEEL END ( UWE ) INSPECTION

**CONDITIONS:** Service Information Only

## Description:

MCI is notifying our customers regarding the importance of routine unitized wheel end ( UWE ) assembly inspections on D / E / J series coaches.

MCI and Meritor recommend customers operating D / E / J series coaches perform a routine inspection and bearing end – play check every 30,000 miles / 48,000 km to ensure optimum performance and safety of the coach.

Although the unitized wheel end assembly is designed by Meritor to be maintenance free, the assembly has a finite life. The recommended replacement interval is 500,000 miles / 800,000 km or 5 years ( whichever interval occurs first ), regardless of the end play measured.

**NOTICE**

***As stated in MCI Service Information Bulletin 3027 as well as the MCI Maintenance Manual / Sub – Section 15B, "The unitized hub / bearing assembly is sealed and greased for life and does not require lubrication. If you disassemble, or attempt to repair or lubricate a hub bearing assembly you will void the ArvinMeritor warranty", as well as the MCI warranty.***

## ⚠ REFER TO MANUAL

***Detailed unitized wheel end ( UWE ) information is available in Section 15 of the MCI Maintenance Manual in addition to Meritor Maintenance Manual 0409, Revision 07 – 12 which is provided as an attachment to this Service Information bulletin.***

## PREVENTATIVE MAINTENANCE NOTICE

***MCI recommends that the attached inspection of routine unitized wheel end ( UWE ) assembly inspections on D / E / J series coaches be conducted at 30,000 miles / 48,000 km due to MCI's specific application and the environments in which the coaches are operated.***

**⚠WARNING**

**To avoid personal injury, follow all safety warnings in the attached Meritor MM – 0409, Revision 07 – 12 document.**

# 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.**

**Release all air from the air suspension system before you raise the vehicle or remove any components. Pressurized air can cause serious personal injury.**

**Verify that all personnel are clear of the vehicle before you inflate or deflate the air springs. The air suspension system has various pinch points that can cause serious personal injury.**

**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.**

# Inspection

## Unitized Wheel End

These procedures apply to bus and coach FH Series front and tag axles, and MC Series tag axles equipped with unitized wheel ends.

### ⚠ WARNING

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

- **Unitized wheel ends are not adjustable.**
- **Do not attempt to set or adjust the end play.**

You must perform detailed and basic inspections at the following intervals. In addition to scheduled preventive maintenance, if driver reports indicate the ABS light has been coming on, and ABS diagnostics indicate the sensor gap is out of adjustment, check for possible wheel end looseness as the cause.

### Detailed Inspections

- After the initial 100,000 miles (160 900 km) of operation or one year, whichever comes first
- After every additional 100,000 miles (160 900 km) of operation or one year, whichever comes first

### Unitized Wheel-End Bearing Replacement (North America Applications Only)

Meritor recommends the following guidelines for replacing unitized wheel-end bearings.

- Replace the bearings at 500,000 miles (804 682 km) or after five years of service, whichever comes first. This is to help ensure maximum bearing reliability while the vehicle is in service.
- Replace all unitized wheel end bearings that are exposed to extreme temperatures during operation. High temperatures can result from brake drag, which can cause excessive brake pad and rotor wear, and possible heat checking on the rotor.

### Unitized Wheel-End Bearing Monitoring Using Wheel-End Monitor Units

Meritor recommends the use of wheel-end monitor units. A unit is mounted onto the outboard side of each unitized wheel end and continuously monitors bearing vibration changes. Figure 3.1.

A green light indicates the bearing is in good condition, a red light indicates a potential bearing problem, and a blinking red light signals that the bearing needs to be replaced at the next service interval.

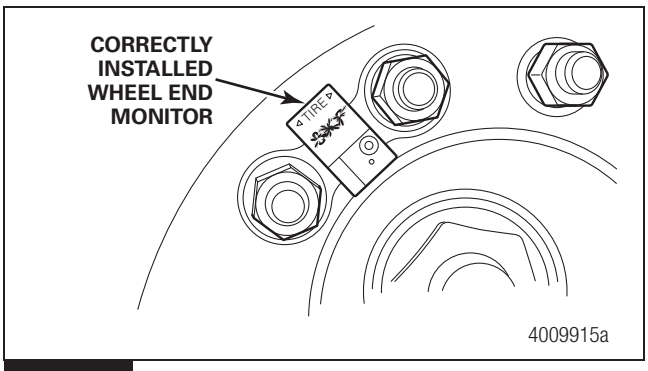


**Figure 3.1**

### How to Obtain Wheel-End Monitor Units and Additional Information

Wheel-end monitor units, and installation and operating instructions can be obtained through the OEM.

## Wheel Adapter Fasteners Inspection

- Recheck the torque on the wheel adapter bolts every 30,000 miles (48 280 km), or sooner.
- Refer to the procedure in this section.

## Basic Inspections

- Perform a basic inspection between every two detailed inspections but not to exceed 50,000 miles (80 467 km) or six months of operation, whichever comes first.

# Basic Inspection

1. Park the vehicle on a level surface. Block the rear wheels to prevent the vehicle from moving.
2. Raise the vehicle so that the inspected axle is off the ground. Support the vehicle with safety stands. Do not use a jack to support the vehicle.
3. Back off the brake caliper until the rotor is clear from the pad linings about 1/16-inch (1.588 mm) gap or more. Refer to Maintenance Manual MM-0467, DiscPlus™ EX225 Air Disc Brake, for more information about EX225 disc brake inspection and adjustment. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.
4. Visually inspect the unitized wheel end as you rotate the tire. Verify that it rotates smoothly and without noise.
   - **If a clicking sound is detected during rotation:** This does not necessarily indicate a hub problem. The clicking noises may emanate from ABS sensor to tooth wheel contact or the brake pads being loose. If necessary, the ABS sensor can be temporarily backed out of position to better determine the noise source.

   While rotating the wheel, grasp the brake chamber to feel for unitized wheel-end hub vibration.
   - **If the tire and unitized wheel-end assembly does not rotate smoothly, or you hear noise such as wheel bearing grind or feel wheel-end hub vibration during rotation:** Replace the unitized wheel-end hub. Refer to Section 4, Disassembly; and Section 6, Assembly, for the procedures.
   - **If the wheel end rotates smoothly:** Proceed to Step 5.
5. Grasp the tire and wheel-end assembly at the nine and three o'clock positions. Check for vertical and horizontal movement. With your hands, apply approximately 50 lb (23 kg) of force to the assembly. You should not feel or see any looseness or movement.
   - **If you feel or see any movement or looseness in the tire and wheel-end assembly:** Perform more inspections to determine the cause of the movement. Check for worn king pin bushings or pins; wheel-to-hub-mounting end play; unitized hub bearing end play; or a combination of them all. To determine unitized hub bearing end play, refer to the detailed inspection procedure in this section.

## Wheel-to-Hub Mounting

Before proceeding with the detailed inspection, first check the wheel-to-hub mounting.

1. Verify that the wheel is mounted correctly and all wheel-end fasteners and hardware are tightened to the correct specification. Figure 3.2.

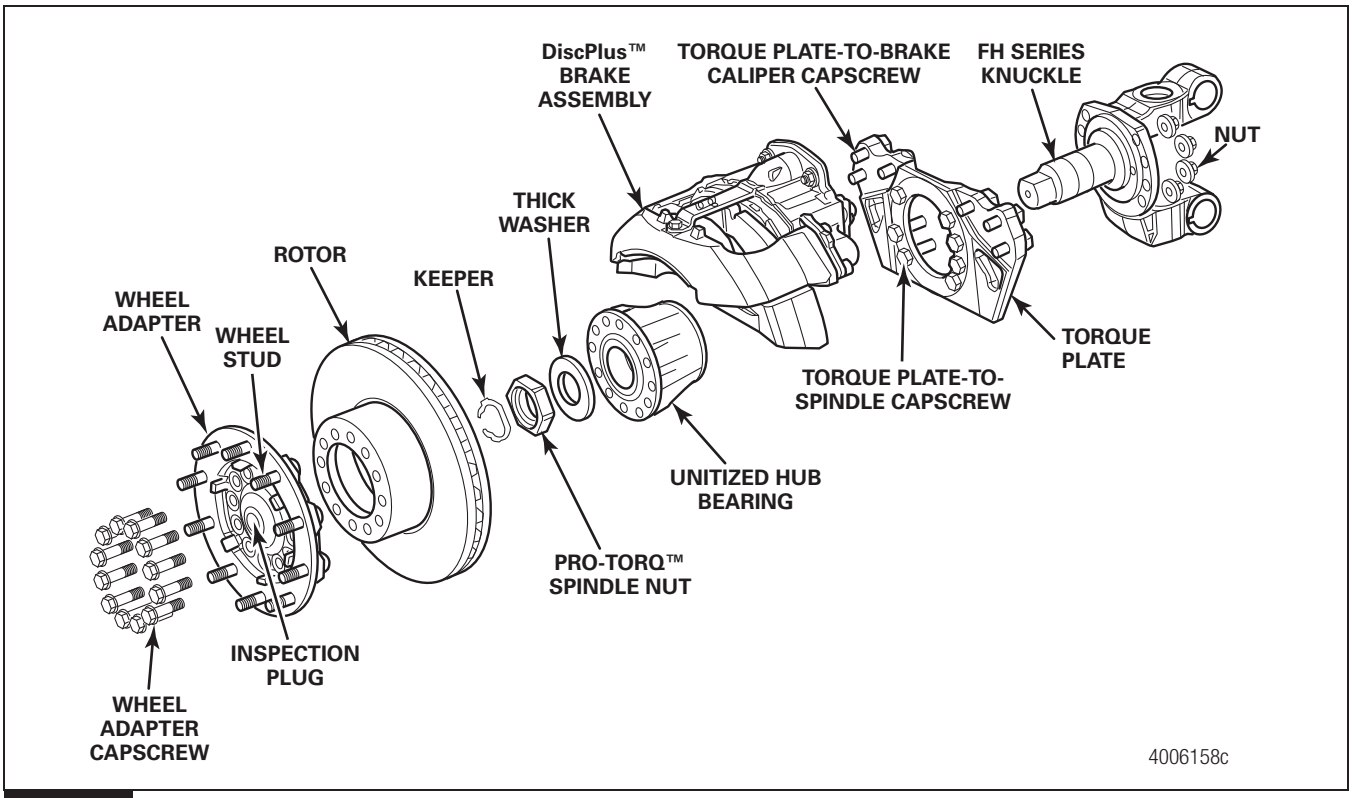


**Figure 3.2**

2. Grasp the tire and wheel-end assembly at the nine and three o'clock positions. Check for vertical and horizontal movement. With your hands, apply approximately 50 lb (23 kg) of force to the assembly. You should not feel or see any looseness or movement.

   - **If you detect movement or looseness on a tag axle:** Proceed to the Detailed Inspection.
   - **If you detect movement or looseness on a front axle:** Inspect the king pin, bushings and seals for wear, leakage or damage. Refer to the procedures in Maintenance Manual 23, Bus and Coach Front Axles. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.
   - **If applying the service brake eliminates movement or looseness:** Proceed to the detailed inspection procedures to determine the unitized hub bearing end play.

## Wheel Adapter Fasteners Inspection

1. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Set the parking brake.
2. Using a calibrated torque wrench, tighten the wheel adapter bolts in a star pattern to 275 ±25 lb-ft (373 ±34 N•m). Repeat to ensure consistent torques.

**NOTE: It is important that the torque on the wheel adapter bolts be rechecked every 30,000 miles (48 280 km), or sooner.**

## Detailed Inspection

1. Park the vehicle on a level surface. Block the rear wheels to prevent the vehicle from moving.
2. Raise the vehicle so that the inspected axle is off the ground. Support the vehicle with safety stands. Do not use a jack to support the vehicle.
3. Back off the brake caliper until the rotor is clear from the pad linings about 1/16-inch (1.588 mm) gap or more. Refer to Maintenance Manual MM-0467, DiscPlus ™ EX225 Air Disc Brake, for more information about EX225 disc brake inspection and adjustment. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.
4. Verify that the unitized wheel end rotates smoothly and without noise.

   If a clicking sound is detected during rotation, this does not necessarily indicate a hub problem. The clicking noises may emanate from ABS sensor to tooth wheel contact or the brake pads being loose. If necessary, the ABS sensor can be temporarily backed out of position to better determine the noise source.

   While rotating the wheel, grasp the brake chamber to feel for unitized wheel-end hub vibration.

   - **If the tire and unitized wheel end assembly does not rotate smoothly, or you hear noise such as wheel bearing grind or feel wheel-end hub vibration during rotation:** Replace the unitized hub bearing. Inspect the unitized hub bearing before installing it. Refer to the new hub inspection procedure in Section 6.
   - **If the wheel end rotates smoothly:** Proceed to Step 5.
5. Use a 5/16-inch drive tool to remove the pipe plug at the center of the wheel adapter. Install and tighten the adapter fitting into the hole. Refer to Figure 11.10 in Section 11.
6. Attach the dial indicator. Loosen the locking set screw and slowly slide the dial indicator through the fitting hole. Position the dial indicator against the hub face and tighten the locking set screw as the needle starts moving. Set the dial indicator to ZERO. Do not rotate the wheel end. Figure 3.3.

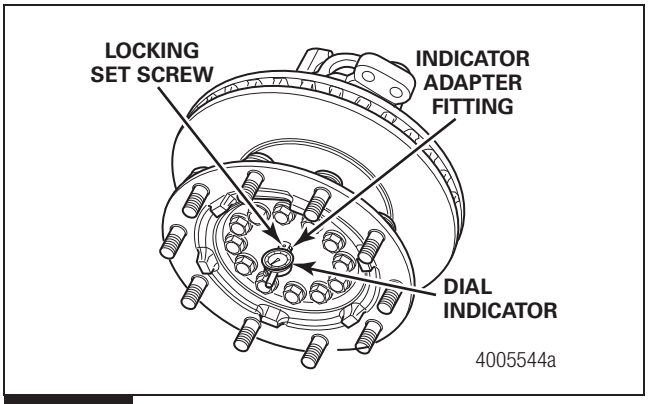


**Figure 3.3**

7. Place your hands on the wheel hub at the nine and three o'clock positions. Push the wheel end straight IN. Note the reading. Then pull the wheel end straight OUT. Note the reading. The difference between the first and second readings in the total bearing end play.

   Take at least two readings to obtain a correct end play measurement.

   - **If the total movement of the dial indicator is 0-0.002-inch (0.05 mm):** The inspection is complete. Go to Step 8.
   - **If the total movement of the dial indicator is greater than 0.002-inch (0.05 mm) but less than 0.004-inch (0.1 mm):** Check and retighten the spindle nut to specifications. Set the dial indicator to ZERO and measure the end play again. Take at least two readings and record the measurement in a maintenance log. Perform another detailed inspection at the next regularly-scheduled maintenance interval, or up to 50,000 miles (80 467 km), whichever comes first.
   - **If the total movement of the dial indicator is equal to or greater than 0.004-inch (0.1 mm):** Replace the unitized hub bearing as soon as possible. The unitized hub bearing may not be safe to operate. Refer to Section 6.
8. Remove the dial indicator and adapter fitting.
9. Apply a thin coat of sealant to the pipe plug threads. Install it into the wheel adapter and tighten it to a minimum of 15 lb-ft (20.34 N•m).