

WEST VIRGINIA SCHOOL BUS INSPECTION AND MAINTENANCE GUIDELINES

West Virginia Department of Education Office of School Transportation

Items addressed are in concurrence with or in addition to all
currently established rules, regulations and guidelines.

Replacement Parts

- All parts replaced on a school bus must meet or exceed the Original Equipment Manufacturers (OEM) standards.

Rebuilding of Components

- Rebuilding of components shall only be done when the parts can be obtained that meet or exceed the Original Component Manufacturer's standards for that component (i.e. Bendix-Bendix, Meritor-Meritor). This shall assure the component performs as the manufacturer originally intended.

WVDE Inspection Guidelines

- **Our guidelines are being developed in concurrence with the following sources:**
 1. Navistar
 2. Freightliner/Thomas
 3. Blue Bird
 4. Arvin Meritor
 5. Bendix
 6. MGM
 7. Spicer
 8. Hendrickson
 9. National School Bus Standards
 10. FMVSS

Facilities

1. Must be clean and unobstructed with adequate lighting.
2. Properly equipped for safe performance of the duties required.
3. Inspection bay environment must be free of noise which would interfere with the proper and safe inspection of the bus.
4. All county owned facilities could be subject to inspection by the Office of School

Facilities staff per WV Code §18-9D-16(c)

5. All information pertinent to certification/re-certification of school bus operators including physical examinations may be subject to inspection by the Office of School Transportation staff.

Presentation of Bus

1. All buses shall be presented clean and properly prepared for inspection, which includes all components to be inspected.
 - a. Inside of bus shall be free of paper, candy, gum, mold, mildew and accumulation of dirt, etc.
 - b. No aerosol cans, spray bottles without labels or flammable products shall be stored inside of the bus.
2. Mechanic or driver (as per inspector's requirement) familiar with operation of the bus being inspected, must be with bus during inspection.
3. Maintenance records are to be available upon request. A copy of the last PM record must accompany the bus during inspection. The inspector may require additional records.
4. A Preventative Maintenance (PM) Schedule must be made readily available.
5. If wheel/nut covers are installed they must be removed (if requested) prior to inspection
6. If rear dust covers are installed the inspector may require them to be removed prior to inspection

Tires

Tire Replacement

1. Tread wear must be evenly matched / no excessive variance (1/2) in tread wear across the tire or the axle.
2. No mix matched tread across the axle.
3. Re-tread are permissible on the rear axle only.
4. If the lettering on tire cannot be read (curbing) the tire should be turned on the rim or moved to the other side of the bus to prevent further damage.
5. Re-inflation of any type of tire and wheel assembly that has been operated in a run-flat or underinflated condition (80% or less of recommended operating pressure) can result in serious injury or death.
6. Any tire suspected of having been run underinflated and/or overloaded must remain in the safety cage, be inflated to 20 psi OVER maximum pressure marked on the sidewall, and then be inspected. Do not exceed the maximum inflation pressure for the wheel. Be sure to reduce pressure to regular operating pressure before placing back in service if the tire has been deemed serviceable.

Brakes

Brake Lining and Drum Replacement Criteria.

****Prior to replacement of linings and drums the applied brake stroke must be examined to assure the stroke is in proper operating range.**

Brake Shoe

1. Wear
 - a. Excessive wear or uneven wear across the axle as determined by the inspector. No more than a ¼” across the axle
 - b. Uneven wear across the lining
2. Rust-jacking, as defined by the component manufacturer.
 - a. Excessive separation between lining and table
 - b. Loose lining
3. Lining or drum contamination
4. Cracked lining larger than 1 ½” long and/or 1/16” wide or any crack that demonstrates movement on a brake application
5. Brake drums may be reused provided the drums are inspected and the diameter measured to determine that it continues to meet the manufacturer’s specifications. The measurement must be recorded on the work order and made available to the inspector upon request. A drum micrometer is to be used for measurement.

5(a). **WHEN SHOULD A BRAKE DRUM BE REPLACED?**

The ability of a brake drum to perform safely is affected by a variety of factors. Conditions, which affect the life of brake drums, are listed, although this list is not intended to be all-inclusive it should serve as a useful guide. The brake drum should be replaced when any of these conditions appear.

1. Brake face diameter reaches maximum limit
2. Excessive heat checks
3. Cracks
4. Martensite spotted drums – “hot spots”
5. Worn or elongated bolt holes
6. Galling of brake surface
7. Brake drum known to have been overheated as occurs with dragging brakes
8. Brake drum warped....out of round
9. Replace brake drums in pairs in order to maintain proper brake balance and efficiency.

RECOMMENDATIONS FOR LONGER BRAKE DRUM AND ROTOR LIFE

When drums are forced to fit onto a hub, there is improper match of parts for installation. The cause must be determined and corrected.

Wheel bearings should be properly adjusted to prevent the drum from picking up the load created by the braking action.

Drums and linings should be checked at periodic intervals to detect operational patterns. The use of non-asbestos organic linings can cause linings to swell and drag resulting in hot spots and lower fuel economy.

Clearance between non-applied brake linings and the drum varies slightly. See the brake system manufacturer's recommendations for this adjustment. Proper clearance prevents excessively hot linings and drums and improves fuel economy.

Parking brakes should not be set while the drums are hot. Allow them to cool, otherwise, drum cracking and failure can result.

Regular and thorough inspection of your brake system is the best investment you can make for low cost per mile brake operation. Be sure you have a standard inspection timetable and follow it.

6. Use of OEM drums are preferred, but OEM equivalent drums shall be permissible. If brake wear goes to the maximum expected life, brake drums should be replaced based on condition and manufacturers specifications.
7. Brake Burnishing Procedure
 - Adjust the automatic slack adjuster using the initial manual setup procedure.
 - Find a service road or non-busy state road where the vehicle can be driven safely at 20-25 mph (32-40 km/h).
 - Drive the vehicle at a speed of 20-25 mph (32-40 km/h). While driving at this speed, apply a light service brake application while applying a slight engine throttle application for a duration of 15-20 seconds. Release the service brakes for 15-20 seconds.
 - Using a hand-held temperature gun, immediately check the temperatures on the outside of the brake drums. Repeat Step 3 as many times as needed to obtain brake drum temperatures at least 450° F (232° C) at the coolest wheel-end brake, but not to exceed 550° F (260° C) at the warmest wheel end.
 - Drum temperature differences from side-to-side of approximately 50° F (10° C) or greater can indicate brake imbalance. If this condition exists, correct the issue before continuing.
8. Upon completion of any brake replacement or repair the mechanic must check for proper ***applied*** brake stroke.
9. New or relined brake lining may be used. (However the same brand and compound must be used across the axle, even if a premature failure of a component occurs.)

Brake Adjustment

1. Brake adjustment shall be maintained as per manufacturers specification, however, variance across the axle of ½ inch or more on the applied stroke is out of service criteria.
2. A brake stroke of ½ inch or less will require the brake to be examined for brake drag on front brakes.
3. A brake stroke of ¾ inch or less will require the brake to be examined for brake drag on rear brakes.
4. Brakes shall not be adjusted manually when found out of adjustment - proper procedure shall be followed (see below). Manual brake adjustment shall only be made when replacing or testing brake components.
5. Slack adjusters must meet or exceed OEM and be same across axle.

Procedure to test brake slack adjuster (s)

- Back slack adjusters off to the maximum legal stroke across the axle evenly.
- Apply the brakes firmly 10 applications with air pressure maintained at 80 to 100 PSI during all application.
- If the brakes are working properly they should adjust to an even proper operating range.
- A slack adjuster that fails this test procedure must be replaced and the adjusters must be replaced across the axle.
- An applied brake stroke of ½ inch or less will require the brake to be examined for brake drag on front brakes.
- An applied brake stroke of ¾" or less will require the brake to be examined for brake drag on the rear.
- This procedure shall be to lift the vehicle and check for free wheel rotation. If the wheel fails to rotate or drags the slack adjusters shall be replaced.
- Brakes shall not be adjusted manually when found out of adjustment - proper procedure shall be followed.
- A brake slack adjuster that is at its maximum allowable stroke must be tested for proper operation and if found defective should be replaced.

Brake Chambers

1. Chambers to be OEM or equivalent and must meet all manufacturers' specifications.
2. Initial BSAP (base slack adjuster position – is determined from the center of the main pin to the face of the chamber).
3. Complete brake chamber may be replaced or piggy backing the brake chamber is permissible as long as the base is not damaged and the proper diaphragm is used.

4. Replacement across the axle is required.
5. After a brake application, upon the return of the brake push rod, the BSAP should be $\pm 1/8$ " in initial position. Further inspection may be required if the measurement exceeds this specification.
6. If there is any question regarding proper chamber operation, the chamber shall be replaced (i.e. noise, binding, dragging or leakage).
7. Clevis pins must rotate freely in the slack adjuster and in the clevis.

ABS

1. Check ABS service indicator light in dash and on control module for proper function
2. If the ABS light is on upon inspection, the bus is to be placed out of service.
3. ABS exciter ring must be properly cleaned and maintained. (ex. Clean thoroughly after wheel seal replacement)

Wheel Seals

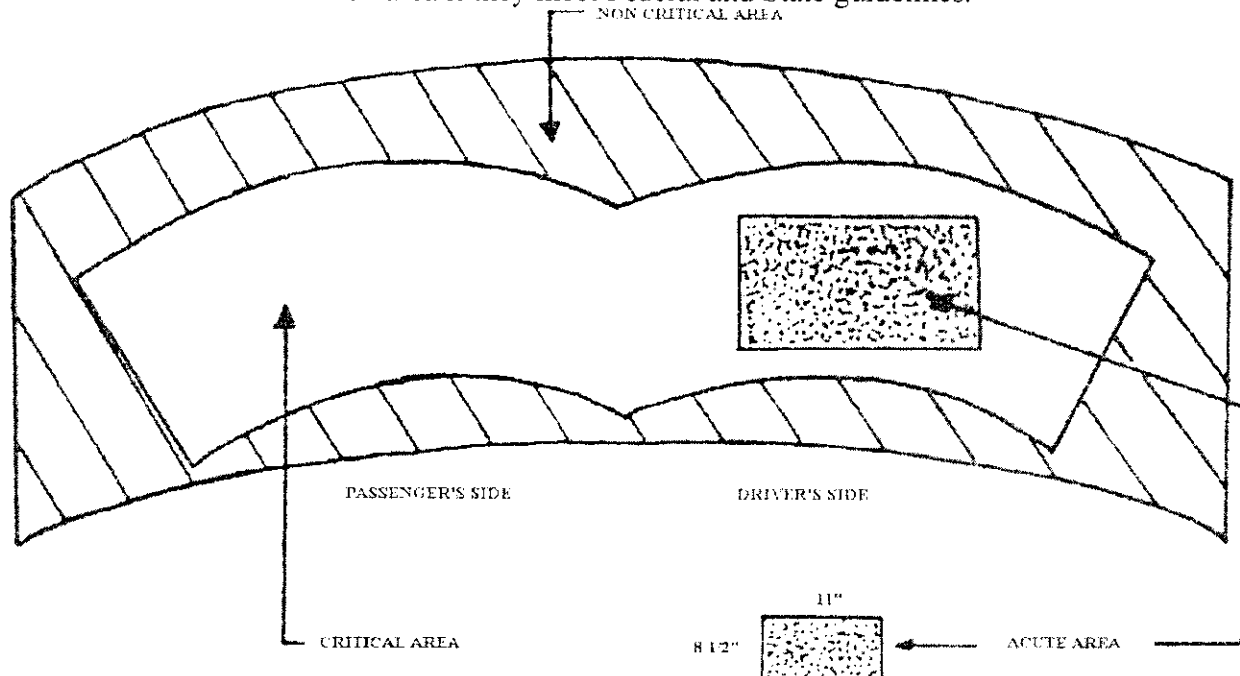
1. The seal must be replaced if any signs of leakage are present.
2. Proper cleaning of the components is required after completion of procedure.

Vehicle Road Test

After any safety sensitive repair which includes any steering, brakes or leaks, the vehicle must be road tested before it is presented for re- inspection or placed back in service.

Windshield

If replacement is necessary and the vehicle has a valid WVDE Insp. Sticker, a copy of the inspection form along with the documentation of the proper windshield replacement shall be carried with the vehicle. The state inspector shall be notified immediately and a replacement sticker will be affixed as soon as possible. Repairs may be permissible in the driver's critical vision area if they meet Federal and State guidelines.



Emergency Exits

Decals may be installed on the inside or on the outside of the vehicle glass. Decals must be within 6" of the handle. The instruction must be clearly stated (correct procedure to open the window). If installed on the outside of the glass, decals must be clearly visible from inside.

Seat Repair

Seat tape shall be used only on a limited basis and for temporary use only. Seat tape shall be replaced with proper repair prior to presentation of bus for WVDE inspection. Sewing or heat and glue types of repair are permissible. If bus is equipped with seat bottom latches, they must be secured.

Lights

If led lights are used, they are considered defective at 25% (1/4) failure.

Brooms

If brooms are stored inside of the bus they must be securely stored & concealed. (Not in view)

Body and Frame Repairs

All critical repairs (i.e. structural repairs) to include main roof bow damage and floor structure etc.(not including individual body cross member replacement) shall be made in accordance with each individual manufacturer's specifications.

All cosmetic damage, rust etc. shall be repaired as soon as possible. Panel replacement by county shops is permissible to include full body panels, rub rails and front and rear roof caps. Like for like fasteners shall be used. Example: steel rivets for steel rivets.

When it is determined a frame or structural repair is needed, the bus shall be taken to the appropriate (specific) dealer for repair. The dealer shall determine what repairs are to be made in accordance with the manufacturers' specifications so as to maintain the original intended structural design and integrity as much as possible. The dealer may make repairs or authorize repairs to be made at another facility. Written specifications and documentation, including photos before, during and after repair should be provided to the counties and available to the WVDE School Bus Inspector upon request.

Defect Rating & Zonar

All defects are recorded with Zonar and recorded on their web site.

P- Signifies a Primary defect, which will place the vehicle out of service and a rejection sticker will be affixed to the windshield until the proper repair (s) have been made and the bus has been re-inspected by a WVDE School Bus Inspector and the proper inspection sticker has been affixed to the windshield.

S- Signifies a Secondary defect, which will allow the vehicle to receive a proper WVDE inspection sticker. However all such repairs shall be made within 15 working days from the original inspection date. Any “notation” or “recommendation” included in the inspector’s supplemental notes and provided to the County shall be subject to review within the 15 working days as well.

X- Signifies a primary defect that is bus operator specific in nature which will place the vehicle out of service. Example: broom stored on bus, unsanitary/dirty bus or emergency exit decals missing. A rejection sticker shall be affixed to the windshield.

O- Signifies a secondary defect that is bus operator specific in nature which will allow the vehicle to receive a proper WVDE inspection sticker. Example: fire extinguisher tag unsigned or heater inoperable on high speed.

Bushing Inspection (End Play)

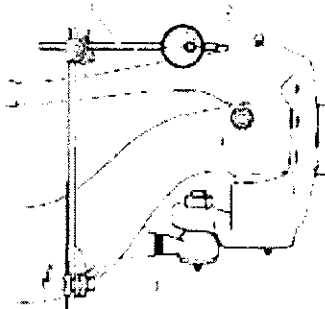
Following regular and thorough greasing practices will maximize bushing life.

Upper Bushing Lateral Inspection

This procedure measures upper bushing wear due to side and vertical loading.

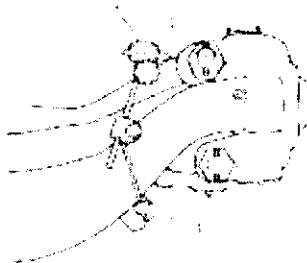
1. Mount dial indicator on the axle. Reference the upper part of the steering knuckle.

E Family



- 1 - Dial indicator
- 2 - Reference on top lip of steering knuckle
- 3 - Attach to axle beam

EFA, I and D Family



- 1 - Dial indicator
 - 2 - Reference on top lip of steering knuckle
 - 3 - Attach to axle beam
2. Move the tire and wheel assembly in and out with a push/pull motion and have an assistant record the dial indicator reading.
 3. Replace the upper bushing if readings are in excess of .015" (0.38 mm).

Lower Bushing Lateral Inspection

This procedure measures lower bushing wear due to side and vertical loading.

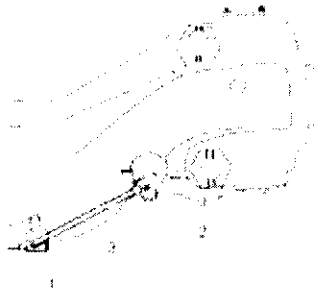
1. Mount dial indicator on the axle. Reference the base of the lower arm on the steering knuckle.

E Family



- 1 - Attach to axle beam
- 2 - Reference on lower steering knuckle
- 3 - Dial indicator

EFA, I and D Family



- 1 - Attach to axle beam
 - 2 - Reference on lower steering knuckle
 - 3 - Dial indicator
2. Move bottom of tire and wheel assembly in and out with a push/pull motion and have an assistant record dial indicator reading.
 3. Replace the lower bushing if dial indicator readings are in excess of .015" (0.38 mm).

Note: To avoid inaccurate measurements, be careful not to let the knuckle turn while moving assembly in and out. Applying brakes will help lock wheel assembly.

Note: Locate indicator on a smooth, flat surface for best reading.

Inspection

General Inspection

Inspect the axle to ensure proper assembly and to identify broken parts and loose fasteners each time the vehicle is lubricated. Make sure spring to axle beam mounting nuts and steering connection fasteners are secure.

Wheel Alignment - Follow vehicle manufacturer's instructions for wheel alignment inspection intervals. If excessive steering effort, vehicle wander, or uneven and/or excessive tire wear is evident, check wheel alignment. Refer to Wheel Alignment.

Steering Axle Stops - Inspect for missing, loose or bent steer stops. Damaged or missing steering axle stops may indicate other problems with the steering system. This can result in damage to steering system components. Replace missing or damaged stops and reset steering system geometry. Refer to vehicle manufacturer's instructions for proper steering system settings.

Tie Rod Ends - Inspect each time axle is lubricated. Check for seal damage, worn ball socket or loose fasteners.

Knuckle Thrust Bearings - When disassembled, visually inspect for any damage and check for oil both operation. For maximum service life, replace the thrust bearing whenever the knuckle assembly is serviced.

Kingpins - For maximum service life, replace kingpins when servicing knuckle assembly.

Component Inspection

Prepare for axle inspection as follows:

- 1 - Set parking brake and block drive wheels to prevent vehicle movement.
- 2 - Raise the vehicle onto steering axle wheels are off the ground. Support raised vehicle with safety stands.

WARNING

Never work under a vehicle supported only by a jack. Always use safety stands.

Knuckle Vertical Play Inspection

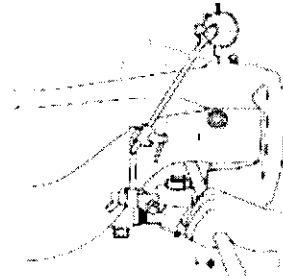
- 1 - Mount dial indicator on axle beam. Reference the dial indicator probe on the knuckle cap.
- 2 - Using a lever, pry steering knuckle downward.

3 - Zero the dial indicator.

4 - Using a lever, pry the steering knuckle upward. Note indicator reading. If reading exceeds 0.040" (1.02 mm), refer to Removal and Disassembly for overhaul procedure.

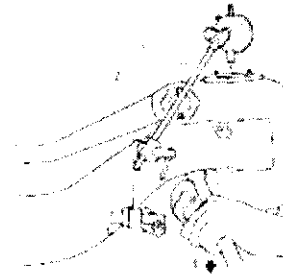
Note Perform above inspection procedure with axle assembled and installed on vehicle with tires and wheels attached. To check knuckle vertical play during axle assembly. Refer to Steering Knuckle Assembly.

E Family



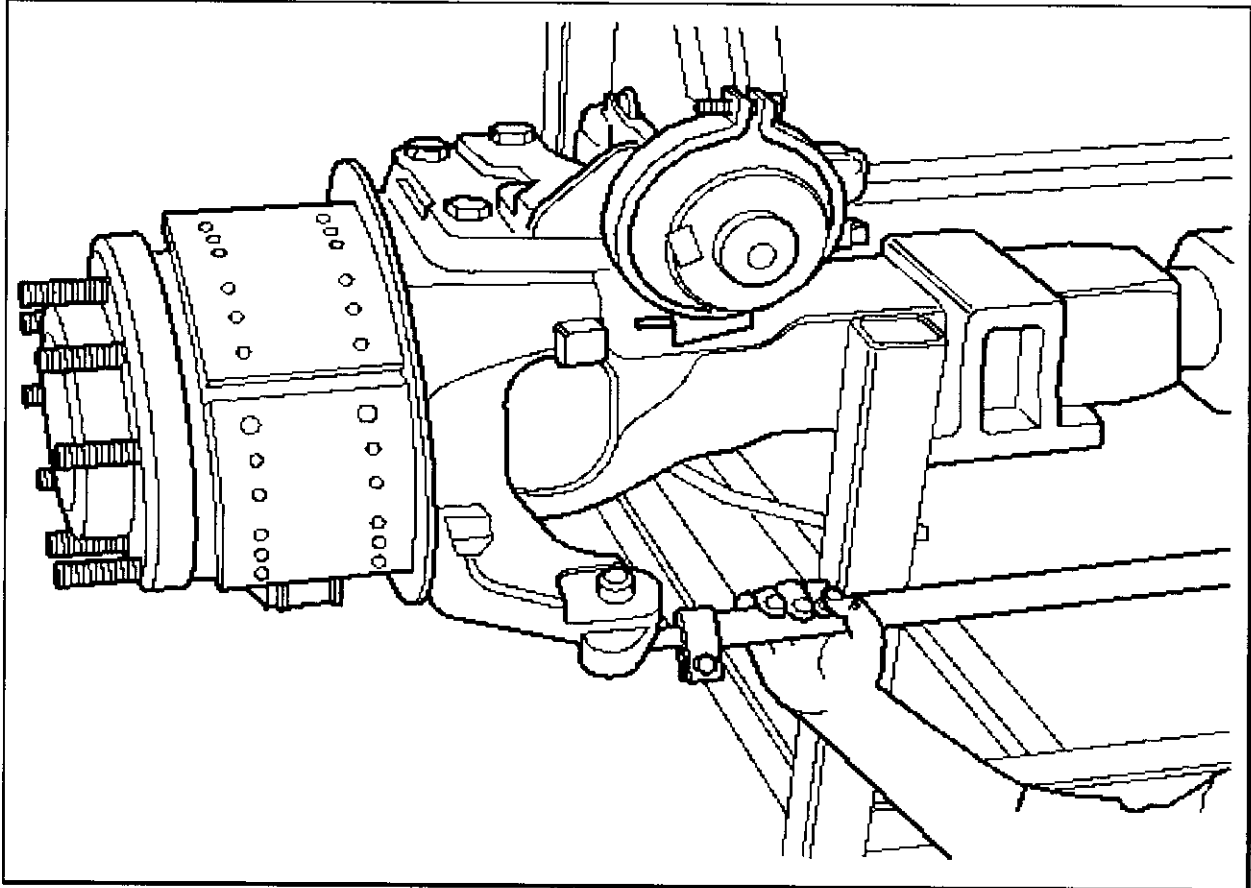
- 1 - Reference on top of knuckle
- 2 - Dial indicator
- 3 - Pry bar
- 4 - Pry knuckle downward

EFA, 1 Family



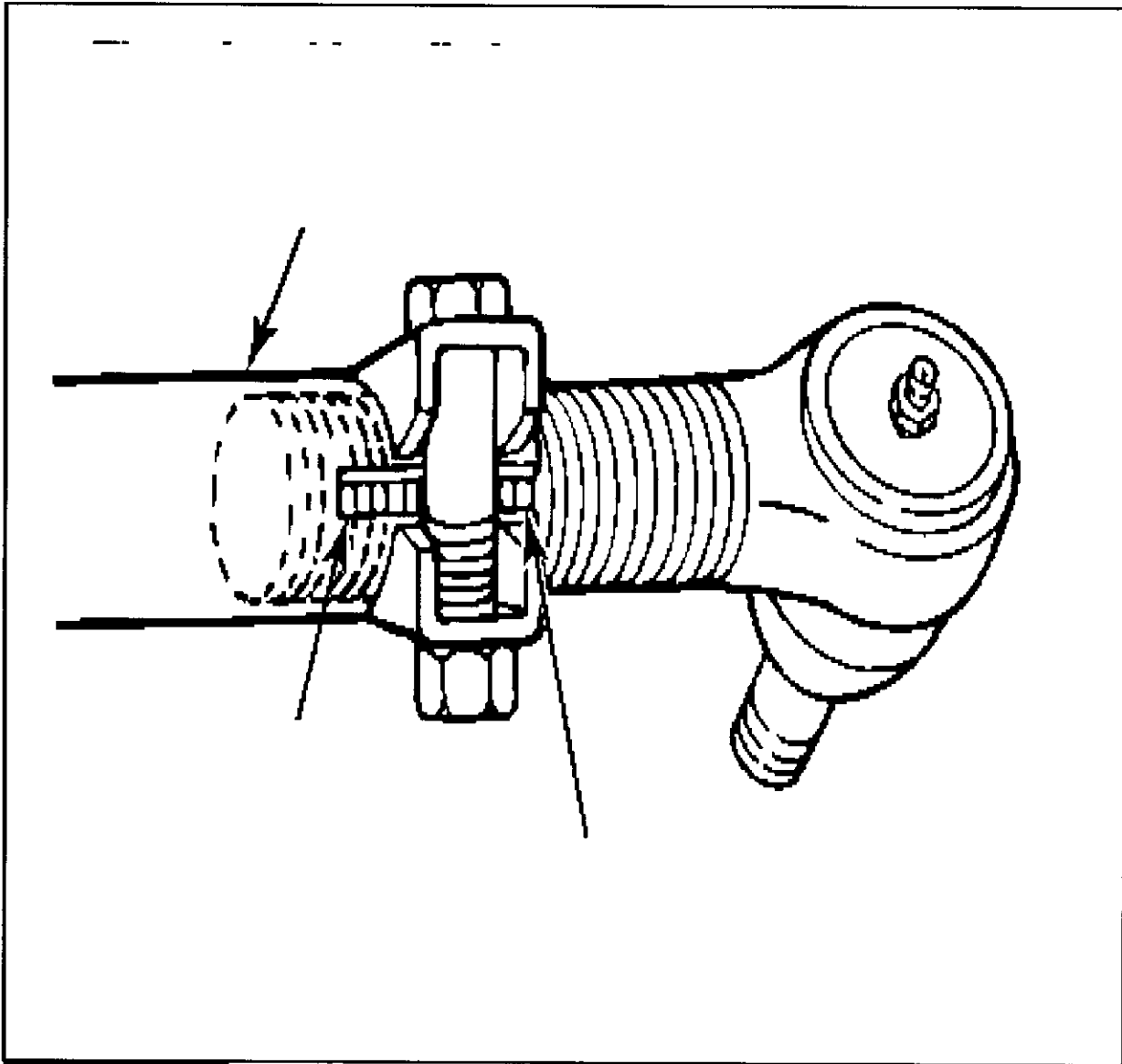
- 1 - Reference on top of knuckle
- 2 - Dial indicator
- 3 - Pry bar
- 4 - Pry knuckle downward

- Use a push-pull movement to apply approximately 100 pounds (45 kg) of hand pressure several times to the tie rod assembly. Check for movement or looseness at both tie rod ends.
- If there is movement or looseness in the tie rod assembly: Replace both tie rod ends.



5

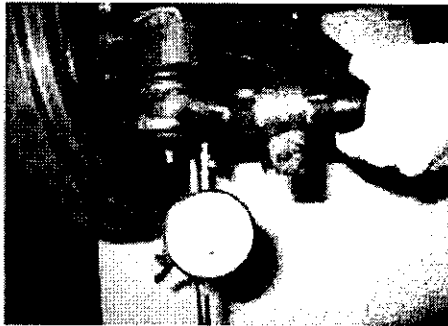
1. Check that the tie rod end is threaded correctly into the tube



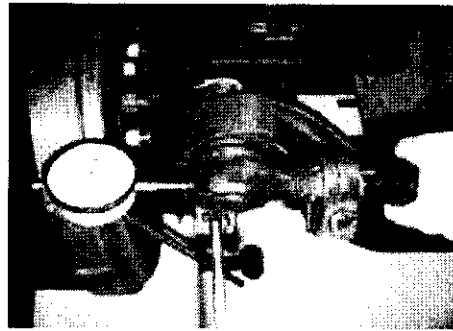
6. To protect the cross tube, use only your hands or a pipe wrench with jaw protectors to rotate the cross tube
7. Where zerk fittings are necessary, make sure they are installed correctly
8. Park the vehicle with the wheels in the "straight ahead" position, then turn the vehicle off
9. Place Blocks in front of and behind the front and rear tires to prevent the vehicle from moving
10. There are two separate methods that can be used to check the degree of movement in the tie rod end

Caution: Do not use a pry bar or other mechanical method on the steering knuckle. This could result in damage to the tie rod end and/or create a false indication of wear.

- a. To check axial (up and down) movement, set the dial indicator so that the base of the indicator is on the tie rod arm. Then, place the tip of the indicator on the bottom of the tie rod end at an area that is most flat



- b. To check radial (back and forth) movement, set the dial indicator so that the base of the indicator is on the tie rod arm. Then, place the tip of the indicator socket at the tie rod end. Be sure to position the indicator so that it is in line with the direction of movement



11. Set the dial indicator to zero.
12. Again, move the cross tube assembly by hand up and down or back and forth, depending on which direction you are checking for movement. If the indicator reads .060" or more, replace the tie rod end immediately. If the indicator reading is above .030", it should be replaced at the next service interval.

Caution: Do not remove the tie rod end from the tie rod arm to check for ball joint torque. This may damage the seal if a removal tool is used. Additionally, the tie rod end seal can cause a false indication of internal torque.

13. Repeat Steps 10 through 12 for the other tie rod ends.

Note: When one tie rod end requires replacement, it is recommended to replace both to allow for even wear on both sides of the vehicle.

Roadranger
MORE TIME ON THE ROAD

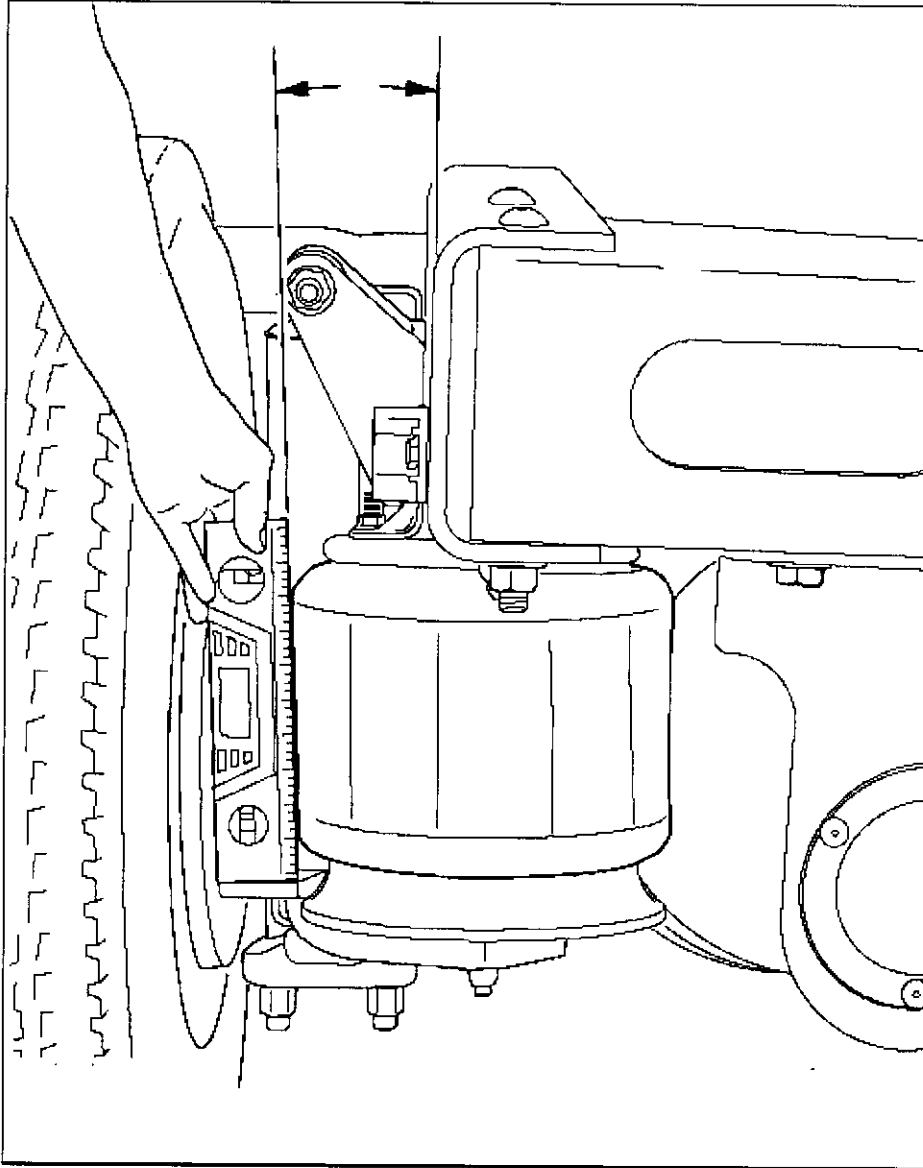
For speaking or service assistance, call 1-800-826-HELP (4357), 24 hours a day, 7 days a week (Mexico, 8-332-1515). Or visit our web site at:

AXWP-0403
6/04

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Dana Corporation
Commercial Vehicle Axle Division
P.O. Box 4097
Kalamazoo, MI 49003

Place the level tool vertically, against the outside of the air-spring bag as shown. If the angle is less than 6.0 degrees the air-spring bag angle is within specifications and no further action is required. If the angle is more than 6.0 degrees from vertical, corrective action must be taken



INSPECTION INTERVALS

Inspect the suspension annually or at regular intervals during normal operation.

Before each trip, visually inspect the suspension system and listen for air leaks.

Inspect the shock absorbers, air springs, trailing arms, trailing-arm bushings, sway bar bushings and V-rod bushings when the axle or brakes are inspected. Replace the components as necessary.

After 3,000 miles (4828 km) of service on a new vehicle and after component replacement, tighten all fasteners to the specified torque.

At each preventive maintenance inspection, visually inspect all fasteners for looseness or movement. Tighten loose fasteners to the specified torque.

Replace damaged fasteners to maintain the specified torque and to comply with warranty requirements.

When replacing any suspension component, never reuse capscrews, washers or locknuts.

TRAILING ARMS

Inspect the hanger brackets and trailing arms for cracks. Inspect for metal-to-metal contact either between the arm and the hanger or the arm and other components.

Use a two-foot (61 cm) pry bar to check the arm pivot bushings for looseness and wear. Replace the bushings if any free play is detected.

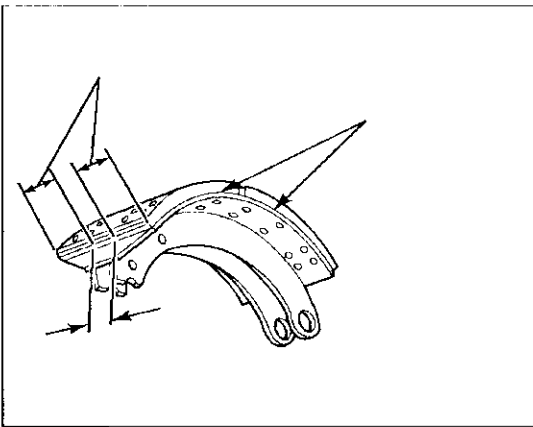
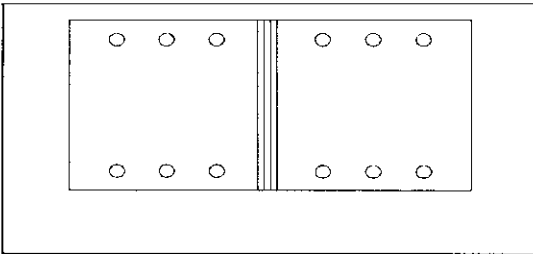
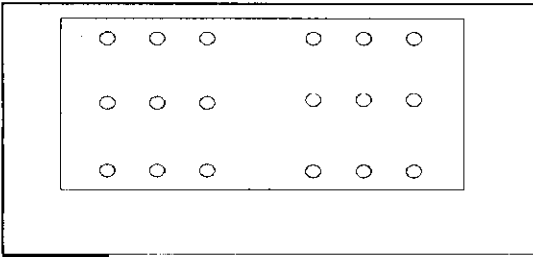
Inspect the axle pivot for play in the bushing. If the bond between the outer sleeve and the elastomer is broken or if large pieces of the elastomer are missing, replace the bushing.

V-ROD Track bar- Top Torque Arm

Inspect both leg bushings and the pivot bushing of the V-rod. Use a two-foot (61 cm) pry bar to check the arm pivot bushings for looseness and wear. Replace the bushings if any free play is detected. Check each location in both axial and radial directions. Separation of the elastomer off the bar pin is permissible up to a third (1/3) of the circumference. Replacement is also necessary if the following wear characteristics are determined:

1. Cracks or fracture of the metal parts of the bushing.
2. Plastic deformation of the sheet-metal race
3. Inadequate bolted connection, i.e., loosened, broken, or lost bolt
4. Damage to the cir-clip, cir-clip detached from the groove, broken or lost.

If damage to the inner housing contour or the cir-clip groove is determined during replacement of the elastomeric bearing: Replace the entire V-rod.



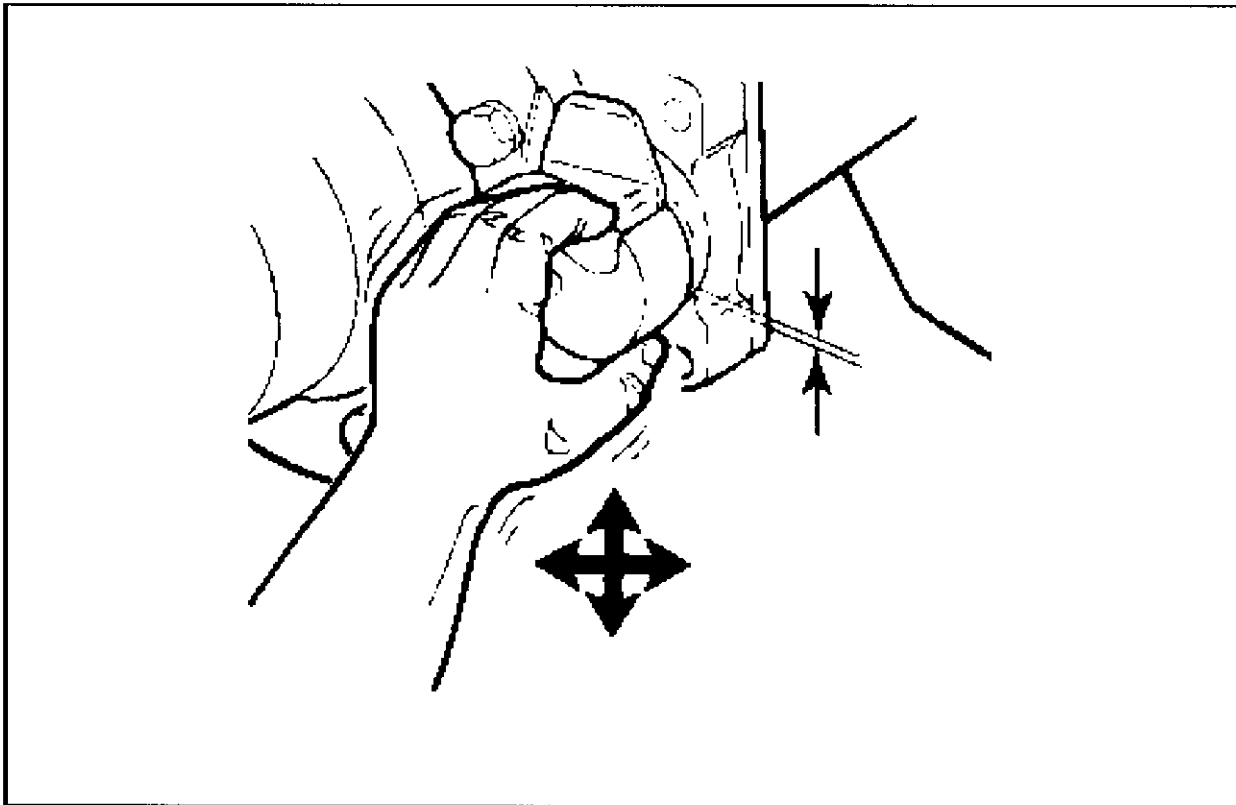
Separation between lining and table 0.010-inch (0.25 mm) maximum gap is acceptable between the shoe and linings along the sides and ends of the assembly,) refer to diagram above.

Check Cam-to-Bushing Radial Free Play

Meritor recommends that you replace the camshaft bushings if the S-cam is replaced, if the radial movement exceeds 0.030-inch (0.762 mm), and at every brake shoe reline. Always replace the S-cam seals when you replace the S-cam bushings.

Before you remove the automatic slack adjuster and camshaft, move the camshaft as shown in. Use a dial indicator to verify that the cam-to-bushing radial free play is within specification.

If radial free play movement exceeds 0.030-inch (0.76 mm):
Replace the bushings and seals.



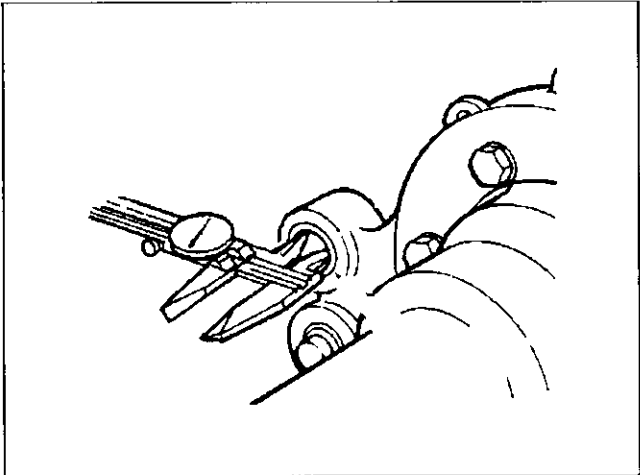
- If the axial end play exceeds 0.060-inch (1.52 mm): Remove the snap ring. Add an appropriate number of spacing washers to achieve the correct specification.

Inspection of anchor pin bushings

Inspect Parts

Meritor recommends that you replace the following parts at each reline.

- Brake Shoe Springs
- Clevis Pin Clips
- Rollers
- Camshaft Seals and Bushings
- Anchor Pins



Check the inside diameter of the anchor pin bushings. (Figure above) The inside diameter of the bushing must not exceed 1.259-inches (31.98 mm). Replace worn bushings.

Chamber Adjustment Stroke

Table E:
Standard Stroke Clamp-Type Brake Chamber Data
Outside Diameter Brake Adjustment Limit

| Type | (inches) | (inches) | |
|------|----------|----------|---|
| 6 | 4-1/2 | 1-1/4 | |
| 9 | 5-1/4 | 1-3/8 | |
| 12 | 5-4/16 | 1-3/8 | |
| 16 | 6-3/8 | 1-3/4 | Should be as short as possible without lining-to-drum contact |
| 20 | 6-25/32 | 1-3/4 | |
| 24 | 7-7/32 | 1-3/4 | |
| 30 | 8-3/32 | 2 | |
| 36 | 9 | 2-1/4 | |

Table F:
Long Stroke Clamp-Type Brake Chamber Data
Outside Diameter Brake Adjustment Limit

| Type | (inches) | (inches) | |
|------|----------|----------|---|
| 16 | 6-3/8 | 2.0 | |
| 20 | 6-25/32 | 2.0 | Should be as short as possible without lining-to-drum contact |
| 24 | 7-7/32 | 2.0 | |
| 24* | 7-7/32 | 2.5 | |
| 30 | 8-3/32 | 2.5 | |

* For 3-inch maximum stroke, Type 24 chambers.

Slip Yoke

NOTE: Check a slip yoke for movement with the driveline installed and the vehicle on a level surface with its wheels on the ground.

1. Check that the vehicle is on a level surface with its wheels on the ground. The driveline should be installed.
2. Firmly mount a dial indicator with a magnetic base onto the slip yoke barrel next to the dust seal. Figure 4.13. You don't want the dial indicator to move when you check the slip yoke for looseness, or the measurement will not be correct.
3. Extend the dial indicator arm from the base, so that it contacts the neck of the spline plug within 3/4-inch (19.05 mm) from the dust seal. Figure 4.13.

With your hands near the center of the driveline, move the slip yoke UP-AND-DOWN. Check the dial indicator measurement. Movement between the spline plug and slip yoke must not exceed 0.017-inch if movement exceeds 0.017-inch: Components are worn or damaged. Replace as

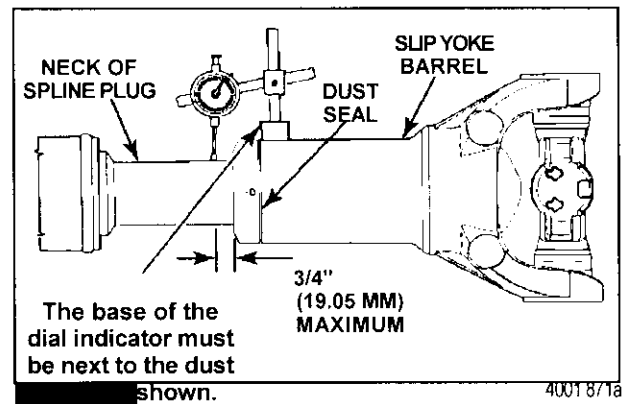


Figure 4.13

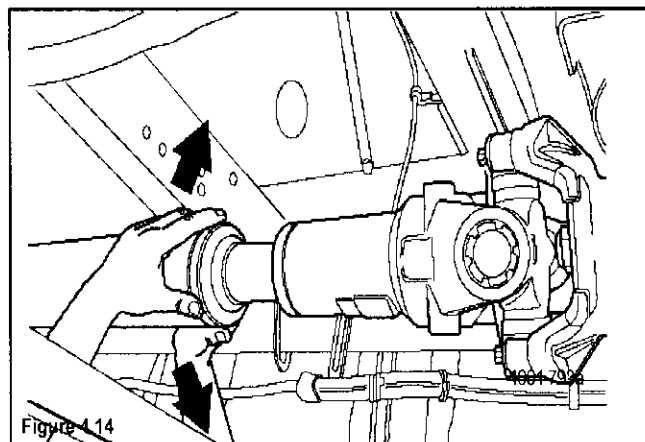
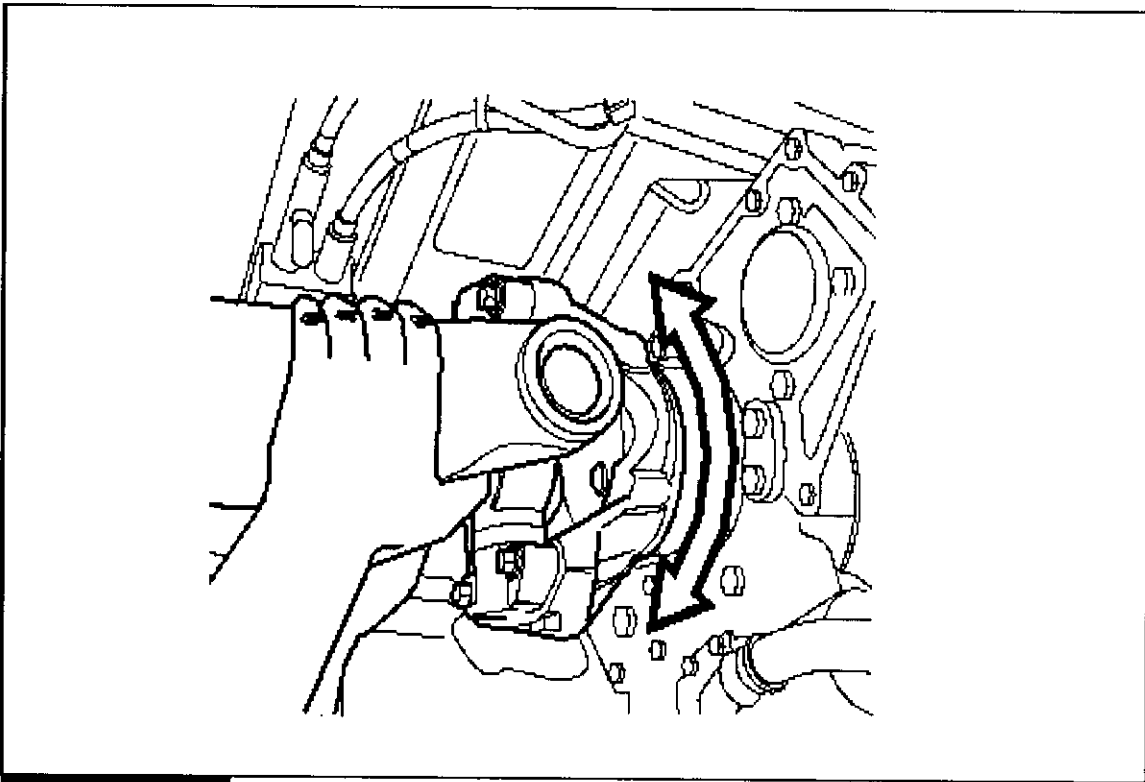
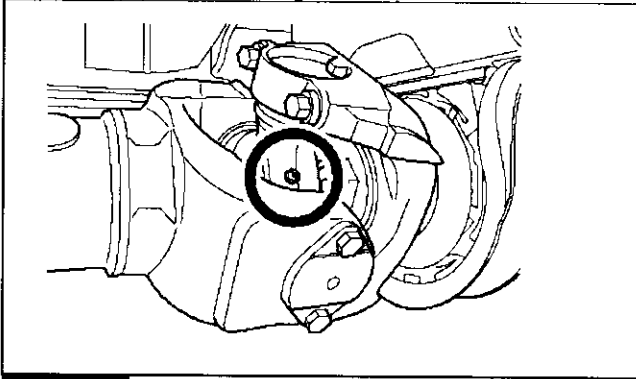


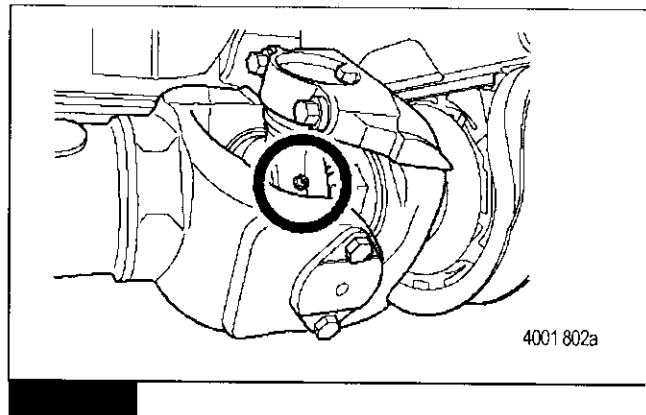
Figure 4.14

Drive line Inspection

Inspect for worn universal joints. Apply vertical force of about 50 pounds (22.7 kg) to the driveline near the universal joints.

If movement is greater than 0.006-inch (0.152 mm): Replace the universal joint. Use a dial indicator to examine the slip yoke spline for wear (Refer to diagram #2)





Center Bearings (Carrier bearings)

Inspect all center bearing and end yoke mid-ship nuts for gaps between the mating surfaces.

If you can see gaps between the mating surfaces:

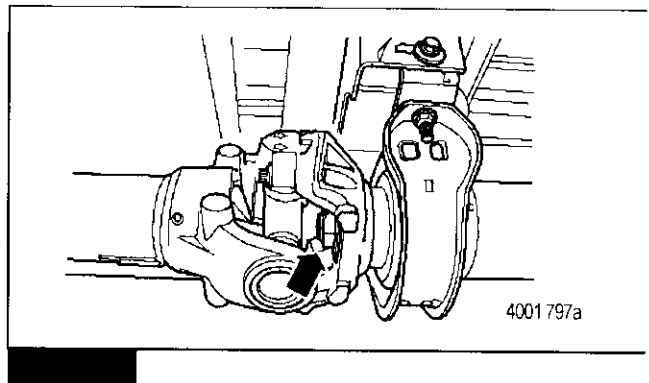
Disconnect the driveline. Tighten the coupling yoke retaining nut to 450-600 lb-ft (612-816 nm). ○ Inspect the center bearing bracket bolts for looseness.

If the bolts are loose: Verify that the bracket is aligned correctly before tightening the bolts. Tighten the center bearing bracket bolts. Refer to the vehicle manufacturer's procedures for the correct torque specification.

Inspect the center bearing rubber cushion for damage.

If equipped, check that the deflectors are not rubbing against the rubber cushion. Verify that the rubber cushion is correctly seated in the metal bracket.

If any of these conditions are evident: Replace the center bearing assembly.



Self-Aligning Center Bearings

A self-aligning center bearing accepts ± 5 degrees of angular misalignment. This helps to ensure that the hanger bearing is correctly aligned to the driveline under all operating conditions.

Use the same service procedures for a self-aligning center bearing as for a standard center bearing. You can identify a self-aligning center bearing by the bright gold color of the integral deflector.

Deflectors are integral to a self-aligning center bearing, so separate deflectors are not required.

Some vehicles manufactured after January 18, 2002, are equipped with self-aligning center bearings.

- If you replace a self-aligning center bearing on a vehicle manufactured after January 18, 2002: You must install a new self-aligning center bearing.

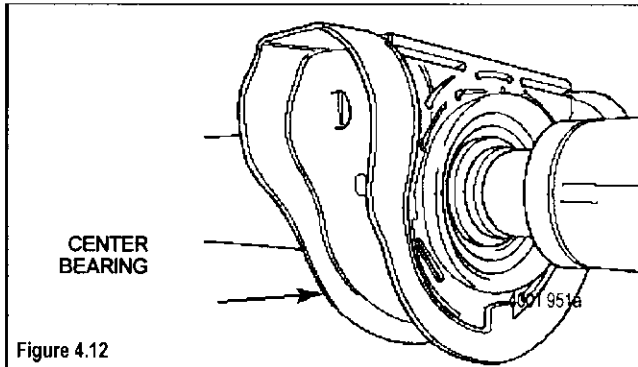


Figure 4.12

