



(Does not apply to Mack Trucks Australia)

Date

9/14/12

Number

SC0362

Page

1(34)

Axle Beam Replacement

FXL

SC0362, Axle Beam Replacement

(September 2012)

Mack Trucks, Inc. has decided that a defect, which relates to motor vehicle safety, exists in certain LEU and MRU model vehicles. The issue is related to a manufacturing defect, which may affect the performance of the axle beam when used in certain applications. This may result in a fatigue crack, which over time may result in the complete fracture of the axle beam.

The recall will involve replacement of the axle beam for those vehicles used in the applications at risk.

NOTE

At time of scheduling the vehicle, contact 1-877-800-4945, Option 2, to place order for required parts. Calling is required to initiate recall. Certain parts are VIN specific.

Required Tools: 633-J45996, 633-J45944, 633-J45845, 633-J45945, 633-J45943A or equivalent tools. The tools must be ordered via VDSP from OTC Tools on Blanket PO SMO 063311.

Required Parts:

Part Number	Part	Quantity
21881776	Axle Beam	1
TBA (U-bolt part number to be determined when placing order)	U-bolts	4
*994341	Bolt - Brake Spider	24
301SQ53	King Pin Set	1
*25088023	Washer, U-bolt	8
*25098611	Nut, U-bolt	8
*20531577	VOY Wheel Seal	2
25154203	Clip U-bolt	4
25159327	Clip U-bolt	2
914476	Retaining Ring	2
25168999	Lock Washer	2
1075870	Hex Nut	2
21806624	Safety Washer	2
6000-1161247	Grease	1

* Included in Kit 85135385

NOTE

All additional parts are subject to normal warranty guidelines. Worn parts are the responsibility of the customer. Parts damaged during removal, e.g. drag links, tie-rod ends, etc. may be put on claims but are subject to review. Should additional parts be required that are not available in dealer inventory, please contact 1-877-800-4945 and select "Option 2" for ordering, or place order using model and last six digits of VIN as P.O. Number. Receiving additional parts does not constitute approval for warranty purposes.

NOTE

Axle must be stored in a clean dry location. Avoid damage to packaging and use care in moving and lifting the axle. Damage to the axle and machined surfaces can occur. Damaged axles cannot be used.

NOTE

Verify that the vehicle does not have bolt on tie-rod arms. You must contact 1-877-800-4945 for instructions. Failure to do so will result in steering component interference.

Repair Procedure:

Disassembly

HUB REMOVAL

NOTE

FXL axles are also available with spoke wheels. Procedures for removing the spoke wheel/hub assembly are basically the same as those used for removing a disc wheel hub assembly.

1. Apply the parking brakes and place blocks at the rear wheels to prevent the vehicle from moving.
2. Place a jack under the center of the front axle beam and raise the vehicle. Position heavy-duty jackstands under the frame and lower the jack to take the weight of the chassis off the front axle springs.

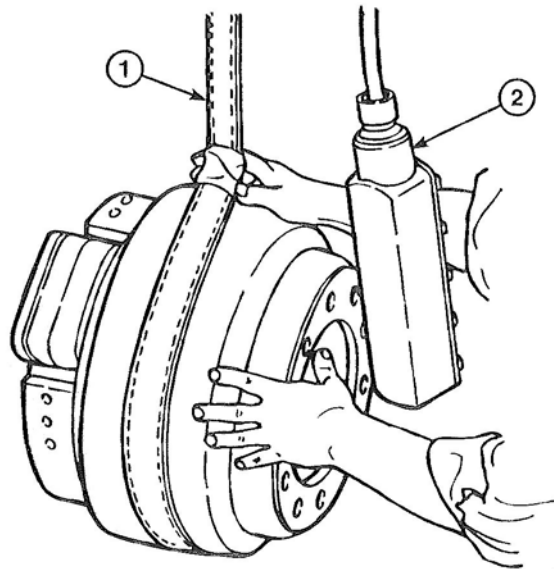
DANGER

Do not work on or around a vehicle that is supported only by a hydraulic jack, as the jack could fall suddenly and unexpectedly resulting in serious personal injury or death. Use jackstands of adequate capacity to support the vehicle.

3. Back off the slack adjuster to provide clearance between the brake shoes and brake drum to facilitate removal of the drum. Refer to the Air Brake System Service Manual, 16-104, for information on backing off the slack adjuster.
4. Position a wheel dolly under the front wheel.
5. Using a alternating criss-cross pattern, remove the wheel nuts and then remove the wheel assembly from the vehicle.
6. Use a dolly, hoist or other suitable lifting device to remove the brake drum.

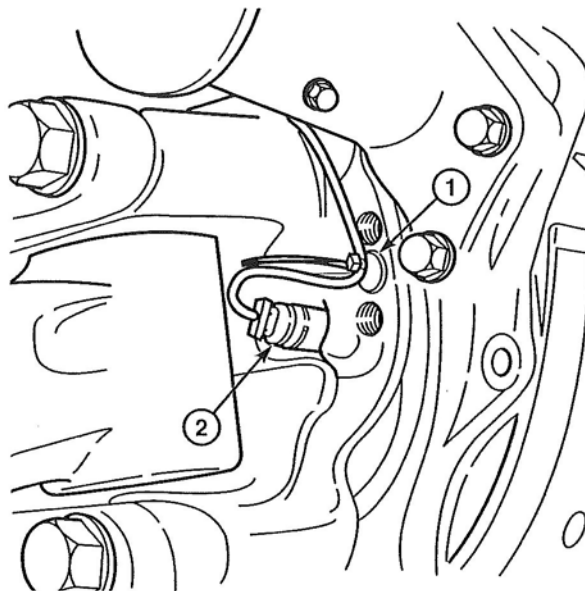
NOTE

If difficulty in removing the brake drum is encountered, lightly tap around the circumference of the drum with a brass hammer/mallet to free the drum from the hub and studs.



1. Suitable lifting strap
2. Hoist control

7. Remove the Anti-Lock Brake System (ABS) sensor from the steering knuckle assembly by first pulling the sensor wire retainer from the mounting hole in the knuckle, and then pulling the sensor from the sensor mounting hole and clip. After removing the sensor retaining spring clip. Mark the sensor hole location. The marked sensor location can be used to differentiate the difference between RH and LH knuckles at reassembly.

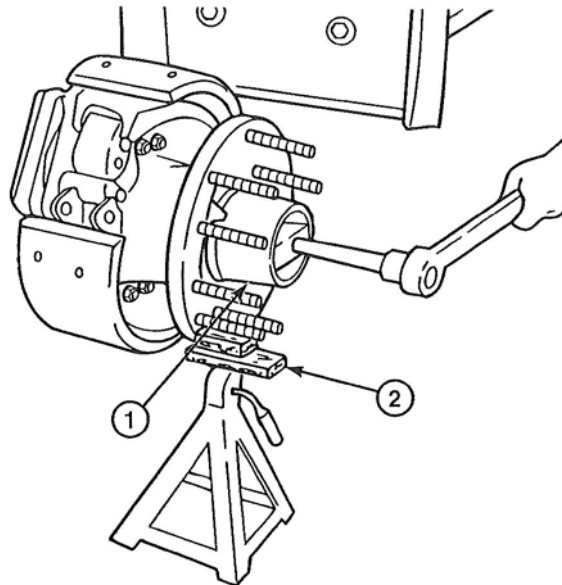


1. Sensor wire retainer
2. ABS sensor

8. Remove the hubcap from the hub assembly. Hubcap removal/installation Tool J45996 (or equivalent tool) is required to remove the hubcap. Prevent the hub from turning during hubcap removal by placing a jackstand against one of the hub wheel studs. Place a block of wood on top of the jackstand to protect the threads of the stud.

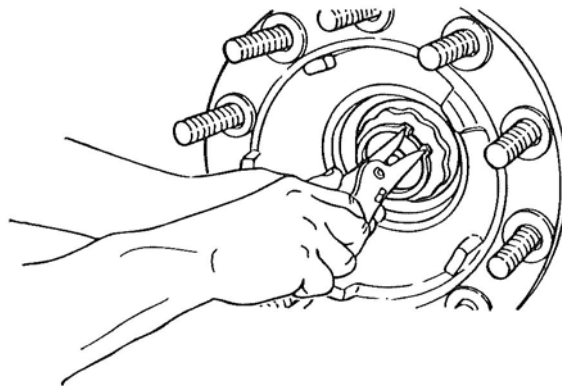
! DANGER

The weight of the vehicle should be supported on a jackstand or framestand. Never support on hub. The purpose of the illustration is to show that the hub should be prevented from rotating.

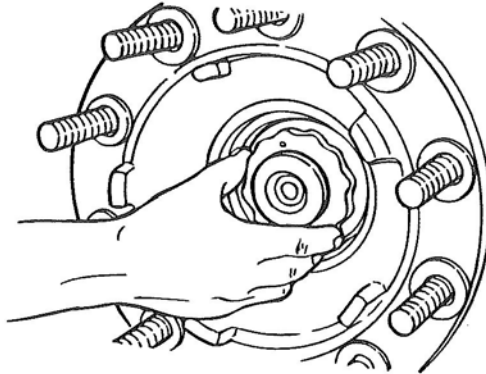


1. Tool J45996 or equivalent tool
2. Jackstand with wood block

9. Remove the snap ring from the axle spindle using suitable snap ring pliers.

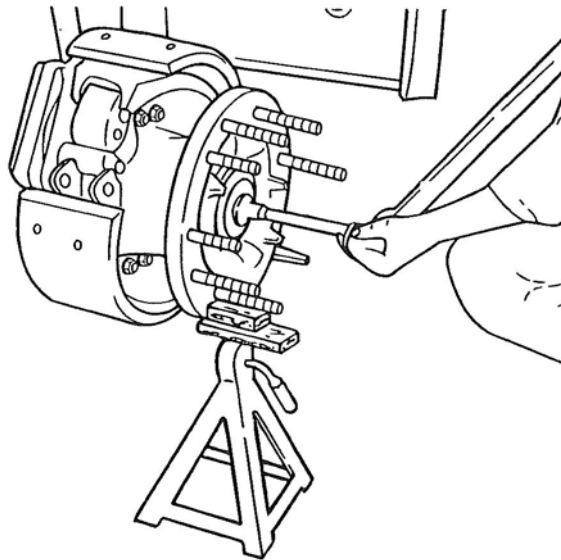


10. Remove the locking plate from the spindle.



11. Using the correct socket as listed below, along with an extension and handle, remove the hub nut.

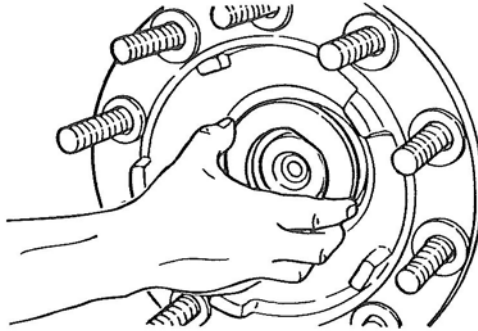
- FXL 12 and 14.6 – 70 mm socket
- FXL 18, 20 and 23 – Hub nut removal Tool J45944 or equivalent tool



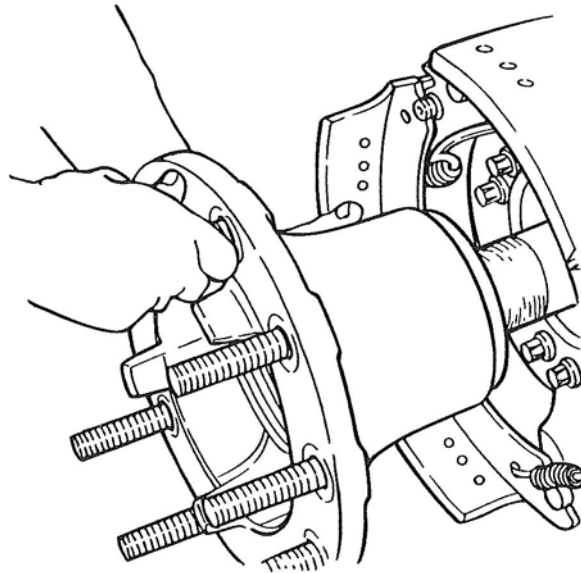
NOTE

The weight of the vehicle should be supported on a jackstand or framestand. Never support on hub. The purpose of the illustration is to show that the hub should be prevented from rotating.

12. Using hand pressure, remove the "D" shaped washer.



13. Slide the hub assembly off the axle spindle.

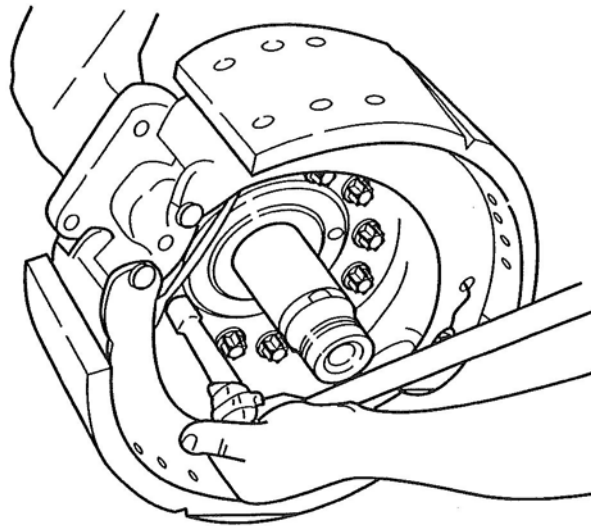


BRAKE ASSEMBLY REMOVAL

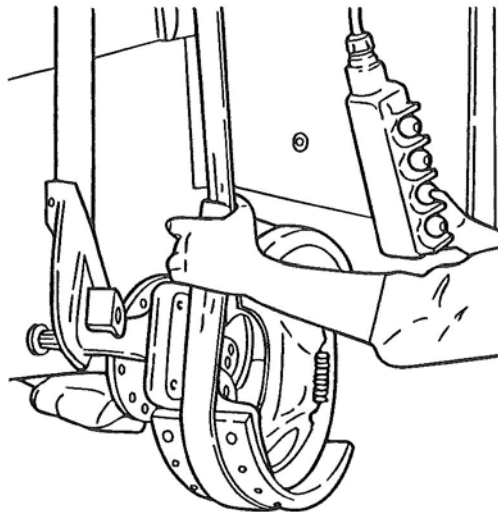
NOTE

Before removing the brake assembly, make sure that the ABS sensor has been removed from the steering knuckle.

1. Disconnect the air line from the brake chamber.
2. Secure the brake assembly to a hoist, dolly or other suitable lifting device.
3. Using a 20 mm external Torx socket, remove the twelve capscrews that secure the brake assembly to the steering knuckle.

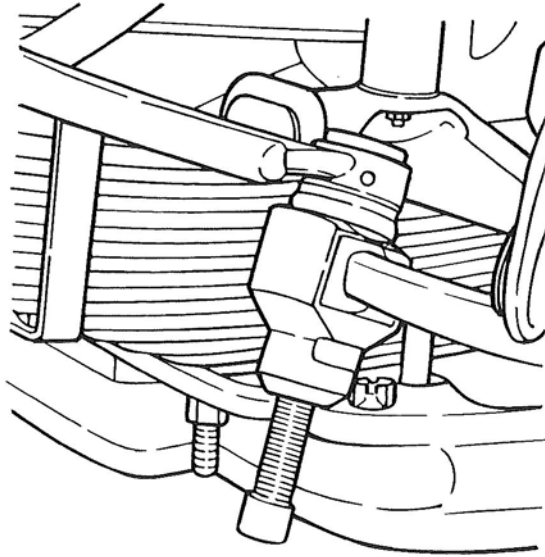


4. While supporting the brake with a suitable lifting device, carefully remove the brake mechanism assembly complete with the anchor plate or spider assembly.

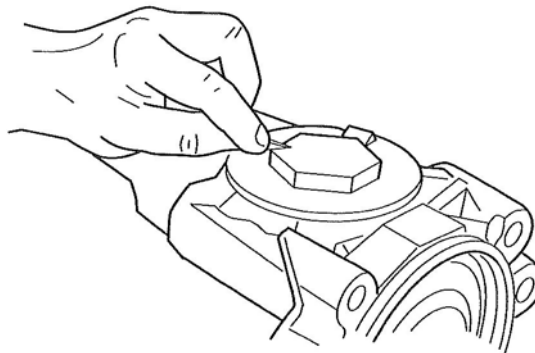


STEERING KNUCKLE REMOVAL

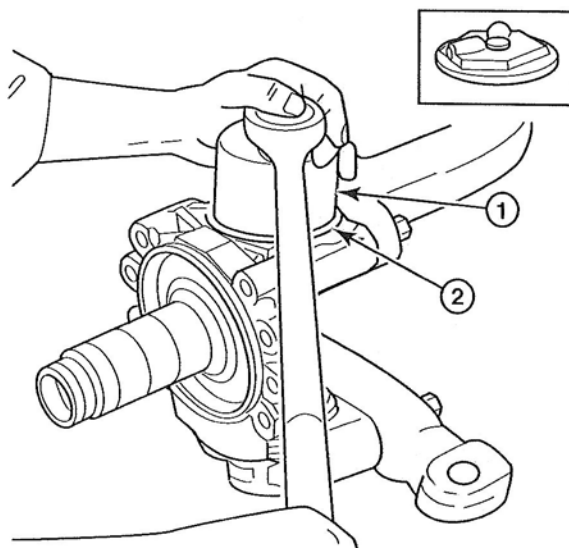
1. Disconnect the drag link from the steering lever and the cross steering tube from the cross steering lever. To prevent damaging the ball sockets, use a suitable ball socket remover tool to disconnect the ball sockets from the levers.



2. Remove the grease fittings from the knuckle top cover. The grease fittings must be removed before the top cover is removed.

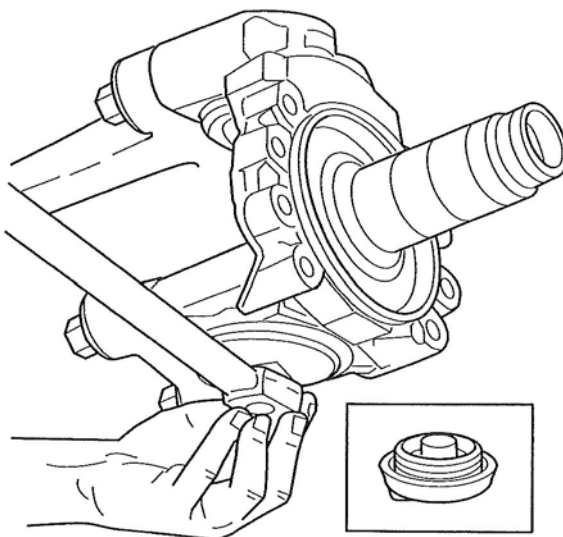


3. Remove the knuckle top cover from the steering knuckle. Use top cover removal/installation Tool J45944 or equivalent tool, to remove the cover.

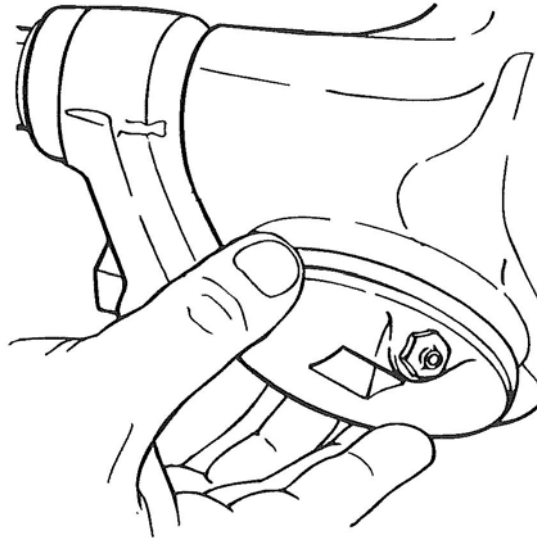


1. Tool J45944 or equivalent tool
2. Knuckle top cover

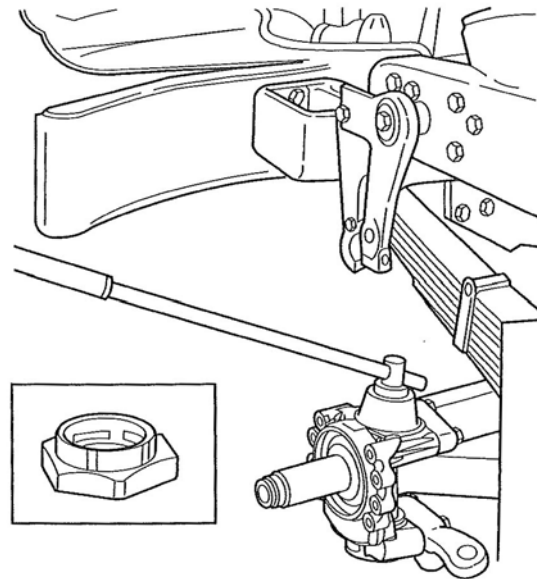
4. Loosen the bottom cover from the steering knuckle. A 3/4 in. square drive can be used to loosen the bottom cover.



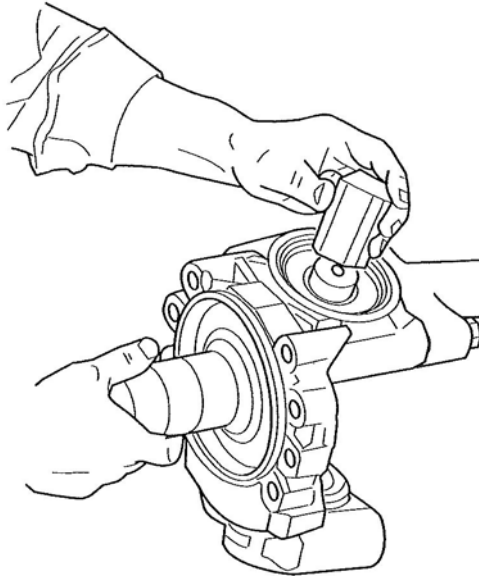
5. Remove the bottom cover.



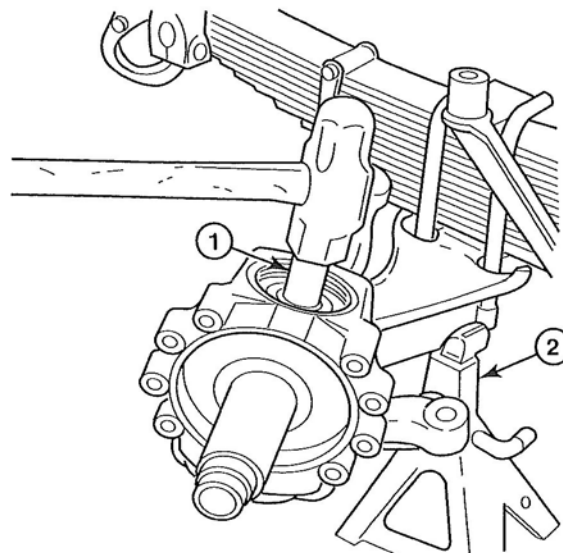
6. Use a 1-inch drive breaker bar, socket and long handle to loosen and remove the kingpin nut.



7. Install the kingpin removal tool, J45945 (or equivalent tool), on the kingpin. Tighten the tool until it bottoms. When the tool is sufficiently tightened, there will be clearance between the bottom of the tool and the inner race of the upper bearing. If J45845 is unavailable, install kingpin nut until flush with top of kingpin. Then, using a suitable drift on top of the kingpin and nut, perform Step 8.



8. Place a heavy-duty jackstand under the axle where it connects at the suspension spring. This will support the axle during kingpin removal. Strike the tool with a hammer to loosen the kingpin inside the tapered axle eye.



1. Tool J45945 or equivalent tool
2. Jackstand

9. After loosening the kingpin, remove the tool.
10. Use a hammer and a suitable drift to drive the kingpin out through the bottom of the knuckle. Tap on the brass drift until the tapered kingpin falls free of the knuckle.
11. Remove the knuckle from the front axle.

12. Remove and discard the lower seal.
13. Perform same procedure of removal to the other knuckle from the steer axle.

AXLE BEAM REMOVAL

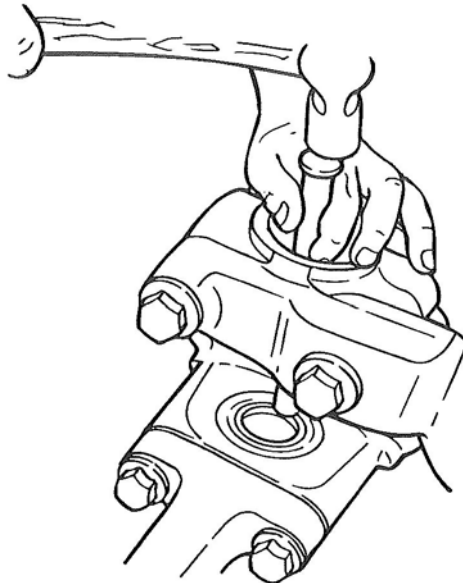
1. Remove axle assembly and install new one.
2. Install new U-bolts and torque to specifications, 542-610 Nm (400-450 ft-lb).

STEERING KNUCKLE OVERHAUL PROCEDURES

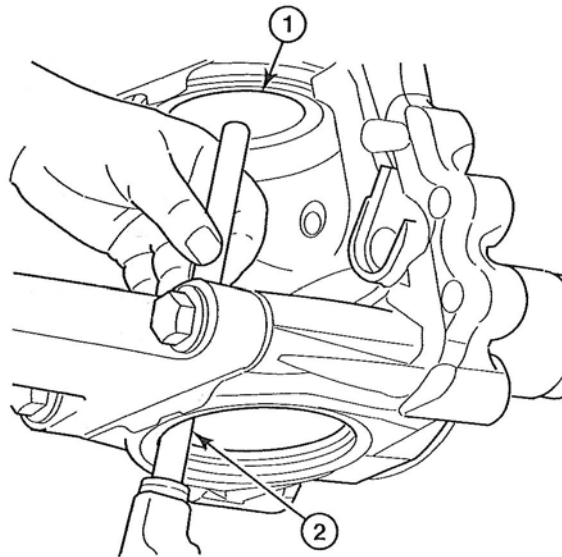
1. Clean the knuckle thoroughly. Be sure that the lubrication passageways are clean and free of any dirt.
2. Remove the bearing cone from the knuckle. Using a hammer and a suitable drift, remove the bearing cup.

 CAUTION

Be careful not to damage the bearing seat on the knuckle.

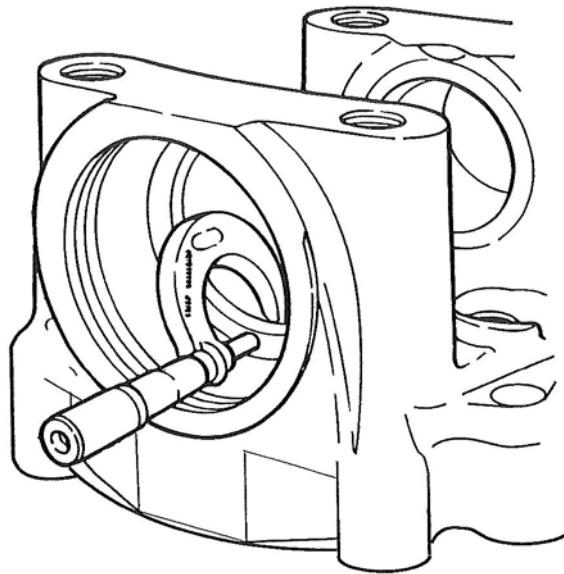


3. Remove the nylon bushing (lower) from the bottom of the knuckle with a hammer and suitable drift.



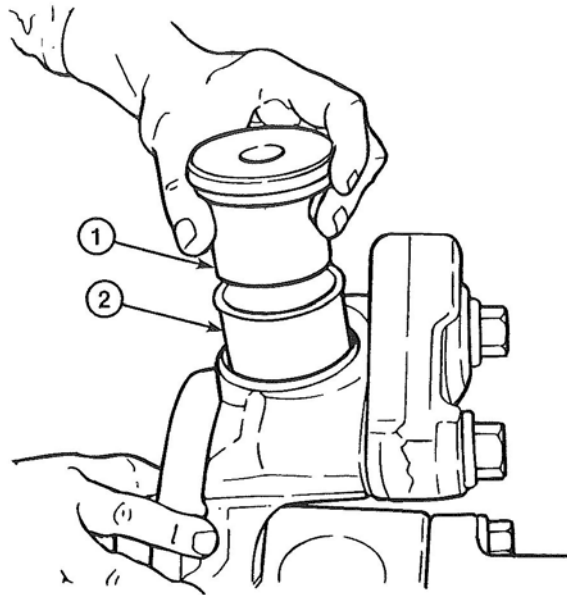
1. Lower nylon bushing
2. Brass drift

4. Measure the thickness of the bearing seat area with a micrometer. Measure in four places. Thickness should be 9.96-10.0 mm (0.392-0.394 in.). If thickness is not within specification, replace the knuckle.



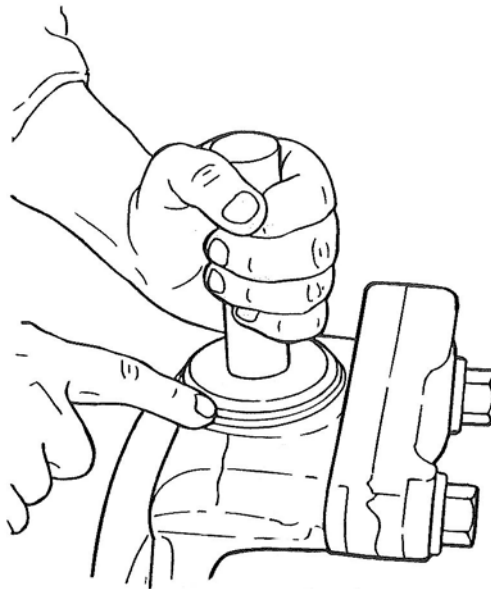
5. Inspect the knuckle for damage, and check the axle spindle for wear that might have been caused by worn or faulty wheel bearings. Replace as necessary.

6. Insert a new nylon bushing into the bottom of the knuckle and position Tool J45943A or equivalent tool over the bushing to drive it in place into the bottom of the knuckle.

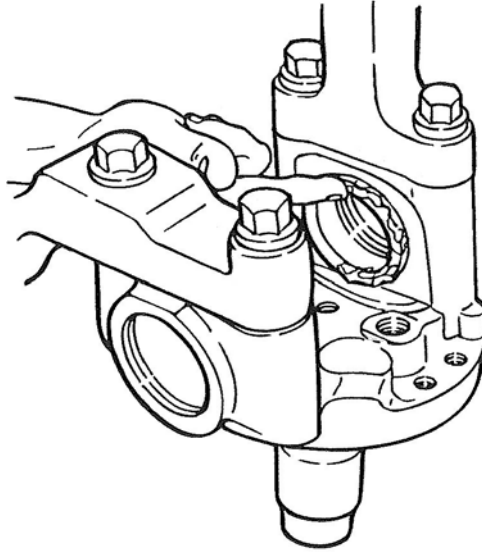


1. Tool J45943A or equivalent tool
2. Lower bushing

7. Using Tool J45943A or equivalent tool, and standard driver and hammer, carefully install the bushing into the bottom of the knuckle. Drive the bushing into the knuckle until the shoulder of the tool seats against the surface of the knuckle.



8. Coat the underneath ledge surface in the area of the steering knuckle upper bearing bore with grease. This allows the knuckle to slide into the axle eye during knuckle-to-axle beam assembly in a later step.



Reassembly

STEERING KNUCKLE INSTALLATION

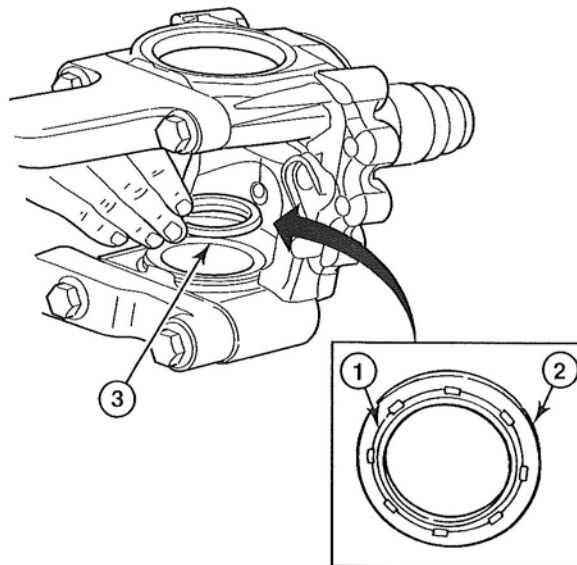
1. Position a new lower seal on the knuckle.

NOTE

The white nylon insert inside the seal faces down against the steering knuckle.

NOTE

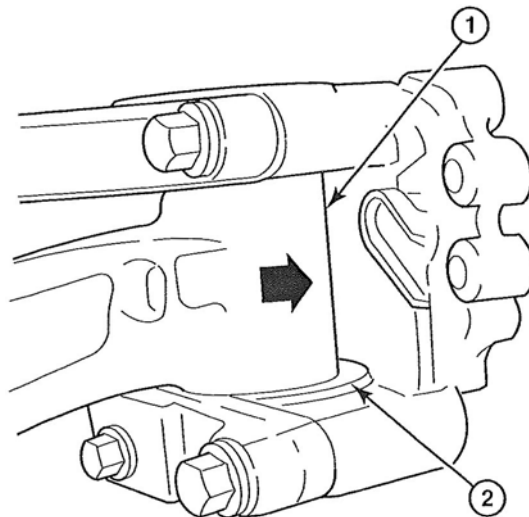
Do not coat the lower seal with grease.



1. Seal nylon insert (must face down)
 2. Lower seal
 3. Positioning lower seal
2. Slide the steering knuckle assembly into position on the front axle eye while pressing the lower seal down at the same time. Make sure that the lower seal is properly aligned once the knuckle is installed.

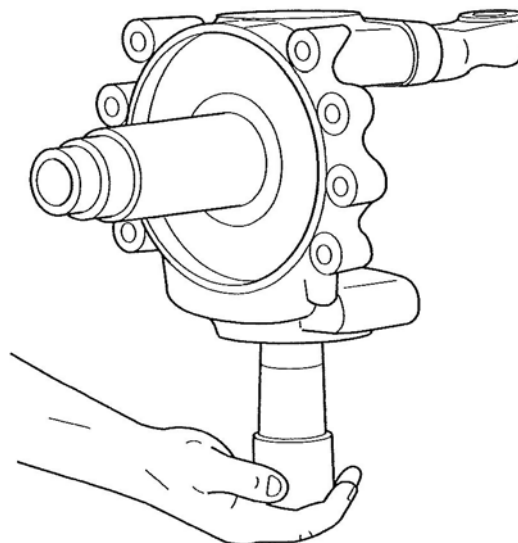
NOTE

The right and left knuckle assemblies are different. The difference between a left and right knuckle is ABS sensor location. Properly installed, the sensor hole will be in the front. To ensure the correct knuckle is being installed, check to see if the ABS sensor hole is located toward the front.



- 1. Axle center
- 2. Lower seal

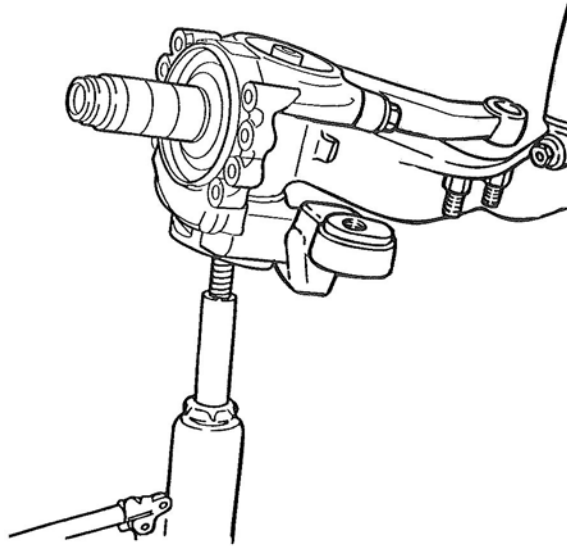
- 3. Clean all grease from the kingpin using a suitable solvent and rag.
- 4. Begin installation by inserting the kingpin through the bottom of the knuckle assembly, and once the kingpin is in place and alignment of the lower seal is verified, the kingpin is installed and pushed up into the knuckle firmly by hand. The kingpin should begin to seat into the taper of the axle eye.



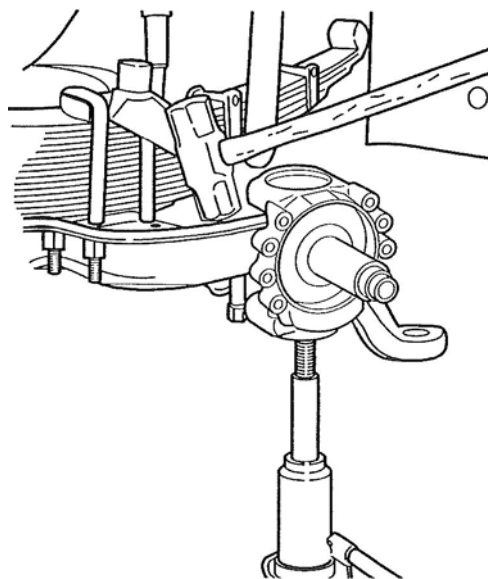
5. Use a bottle jack positioned against the bottom of the kingpin to push the kingpin into the tapered eye of the axle. Raise the jack so that the weight of the vehicle is supported by the jack.

NOTE

Make sure the weight of the vehicle is supported by the jack, not just the suspension.

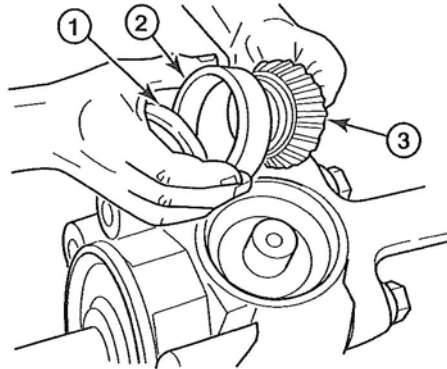


6. Strike the axle beam directly behind the steering knuckle assembly with a heavy hammer to drive and tightly seat the kingpin into the axle eye taper. A heavy blow with a hammer will be necessary to wedge the kingpin into the taper.



7. Using a bearing pressurized grease packer, pack the upper bearing cone with grease.

8. Assemble the bearing cup and cone together, and then install the new seal on the flange of the bearing cup.

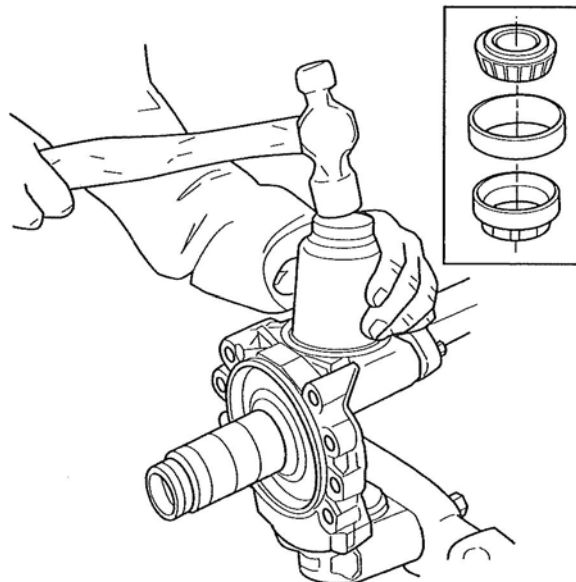


1. Upper bearing seal
2. Upper bearing cup
3. Upper bearing cone

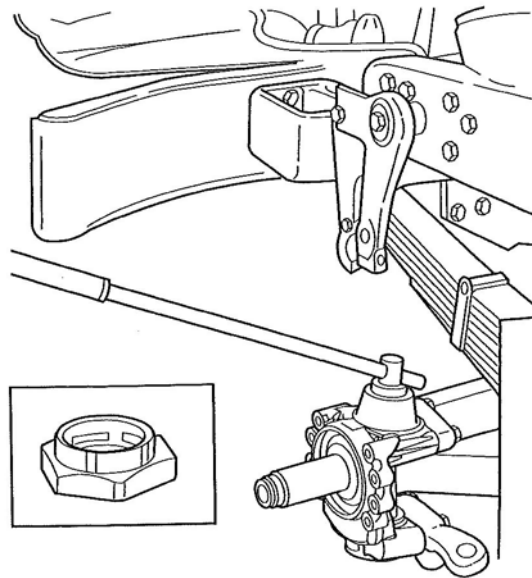
NOTE

Bearing race may turn in housing. This is not an indication of a problem.

9. Install the bearing assembly in the knuckle. Use a suitable bearing driver to tap the bearing into the knuckle far enough so that enough threads of the kingpin are exposed to allow installation of the kingpin nut.



10. Install a new kingpin nut and tighten to 200-300 Nm (148-221 ft-lb).

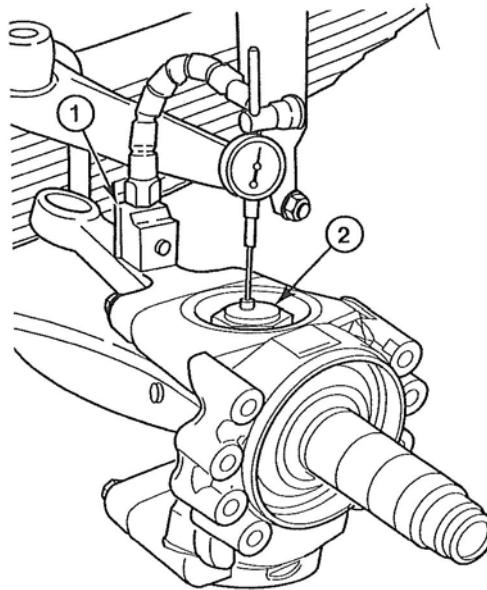


11. After tightening the kingpin nut, remove the bottle jack.
12. Move the steering knuckle back and forth several times (from steering lock to steering lock) to make sure the knuckle turns freely without binding.
13. Tighten the kingpin nut to 763-934 Nm (563-689 ft-lb).

14. Secure the magnetic base of a dial indicator to the steering lever and position the dial indicator so that the stylus is on the top of the kingpin or kingpin nut. Lift the steering knuckle upward and note the end play indicated on the dial indicator. End play should be 0.0-0.15 mm (0.0-0.01 in.). If end play is not within specification, replace the upper bearing.

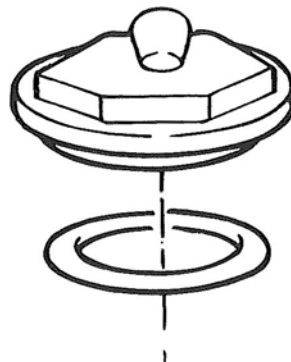
NOTE

Following a steering knuckle overhaul, kingpin vertical play must be checked at the next service.

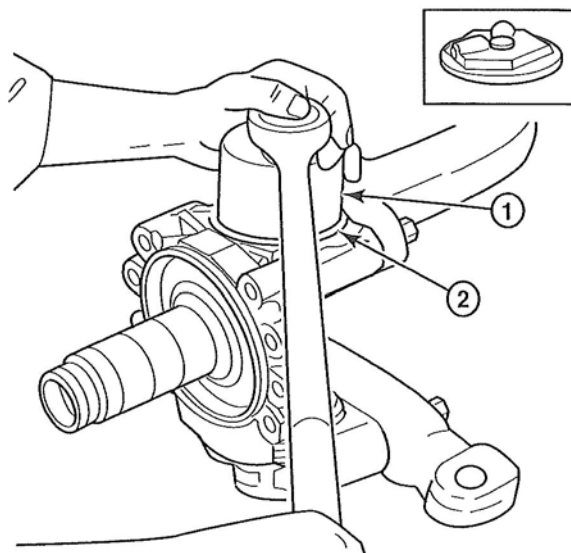


1. Magnetic base dial indicator
2. Kingpin nut top surface

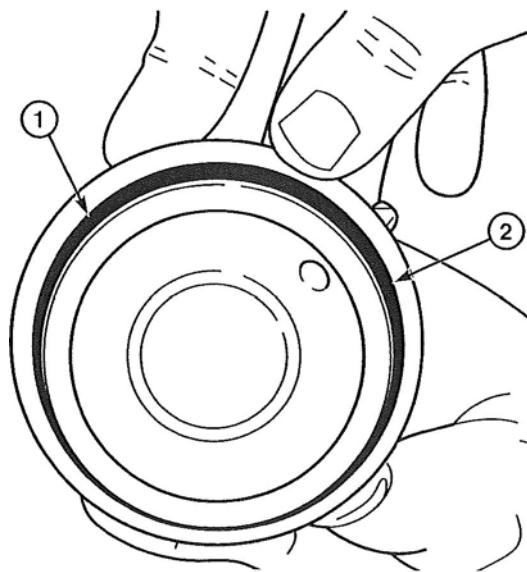
15. Install a new o-ring in the knuckle top cover and coat with grease.



16. Install the top cover and tighten to 130-170 Nm (111-125 ft-lb). Use the knuckle top cover installation/removal tool, J45944 or equivalent tool to tighten the cover.

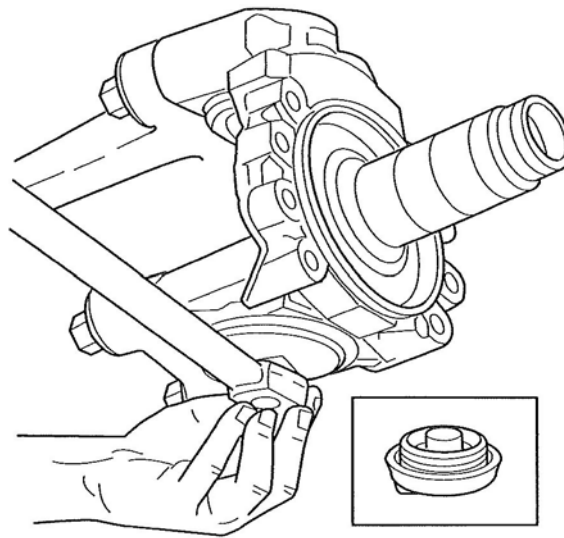


17. Install the grease fittings in the top cover.
18. Install the new o-ring in the knuckle bottom cover and coat with grease.

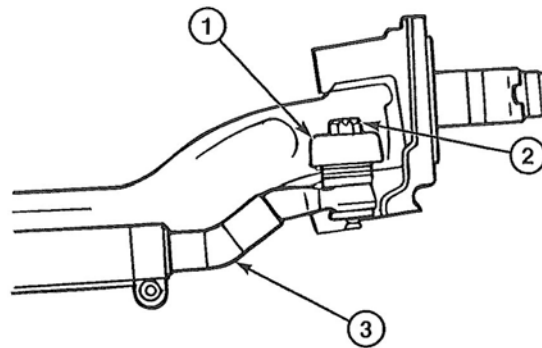


1. O-ring
2. Bottom cover groove

19. Using a 3/4 in. square drive, install the lower cover and tighten to 130-170 Nm (111-125 ft-lb).



20. Apply grease to the knuckle top and bottom grease fittings while moving the knuckle back and forth from steering lock to steering lock. Make sure grease purges past the upper and lower seals.
21. Reinstall the cross steering tube and tighten the ball socket nut to 200 Nm (148 ft-lb). If the cotter pin hole in the ball socket stud does not align with one of the slots in the castellated nut, continue tightening the nut until aligned. Install a new cotter pin.

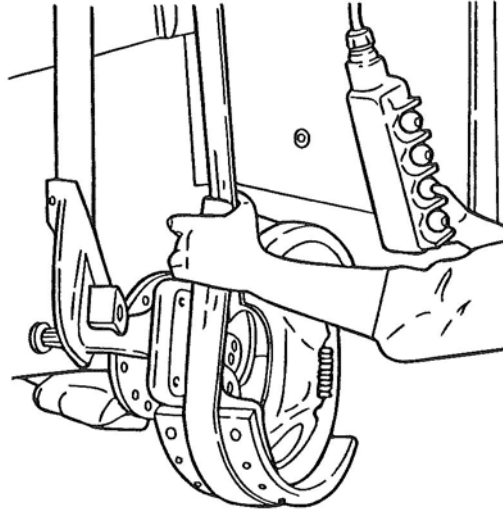


1. Steering knuckle
2. Ball socket castellated nut
3. Cross steering tube

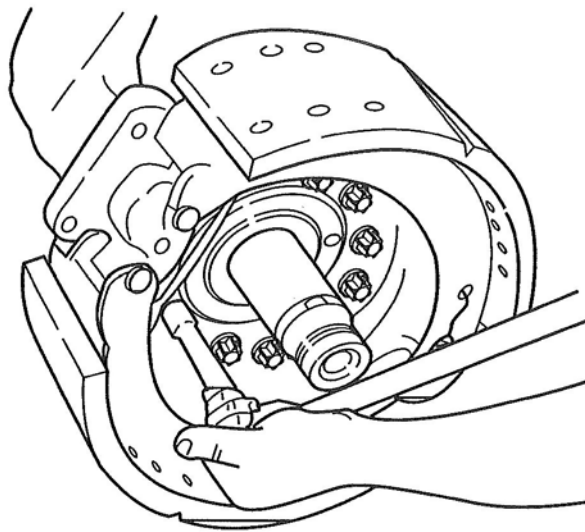
22. Install the drag link and tighten the ball socket nut to 200 Nm (148 ft-lb). If the cotter pin hole in the ball socket stud does not align with one of the slots in the castellated nut, continue tightening until aligned. Install a new cotter pin.

BRAKE ASSEMBLY INSTALLATION

1. Secure the brake assembly to a wheel dolly, hoist or other lifting device.



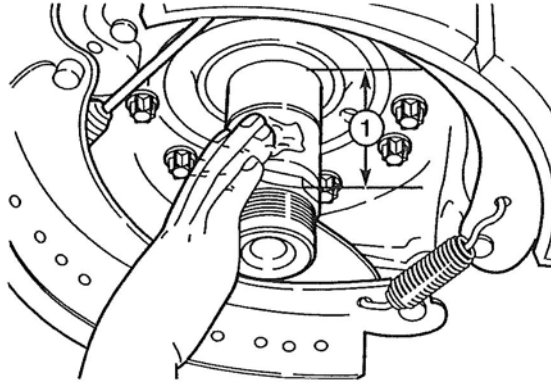
2. Position the brake assembly on the steering knuckle and align the mounting holes in the anchor plate or brake spider with the mounting holes in the steering knuckle.
3. Install the capscrews securing the brake assembly to the steering knuckle. Tighten the brake assembly capscrews in an alternating criss-cross pattern to 230 ± 23 Nm (170 ± 17 ft-lb). Use red Loctite.



4. Connect the air line to the brake chamber.

WHEEL HUB INSTALLATION

1. Lightly coat axle spindle with special spindle grease (PN 6000-1161247).

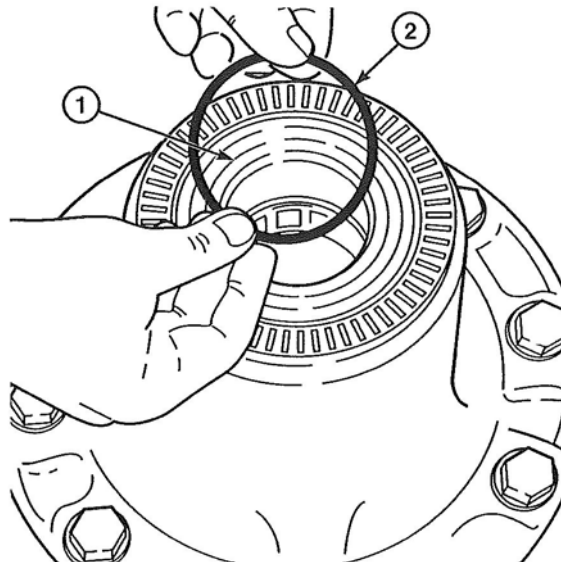


1. Apply grease to spindle.

CAUTION

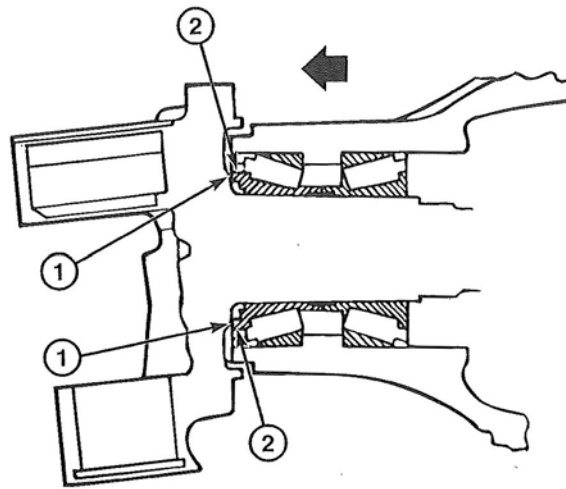
The spindle must be lightly coated with special spindle grease (PN 6000-1161247) prior to installation of the hub assembly. DO NOT use regular chassis grease.

2. Install a new o-ring in the groove at the back of the wheel hub.



1. Hub o-ring groove
2. Hub o-ring

3. Slide the wheel hub on the axle spindle as far as it will go (until the inner bearing contacts knuckle flange).

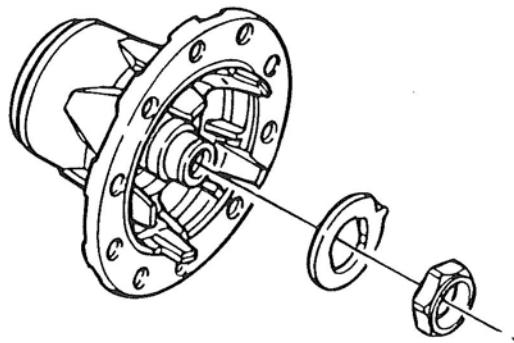


1. Knuckle flange
2. Hub inner bearing

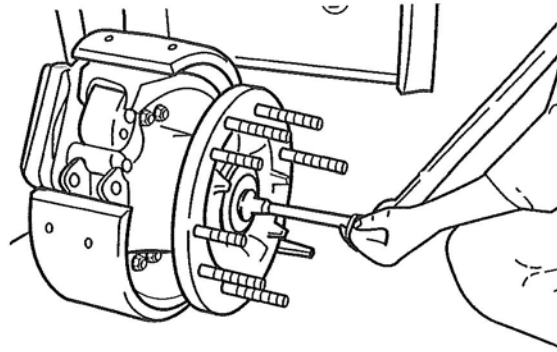
4. Install new "D" washer and a new hub nut. Tighten the hub nut by hand.

⚠ CAUTION

Always use a new hub nut during hub assembly.



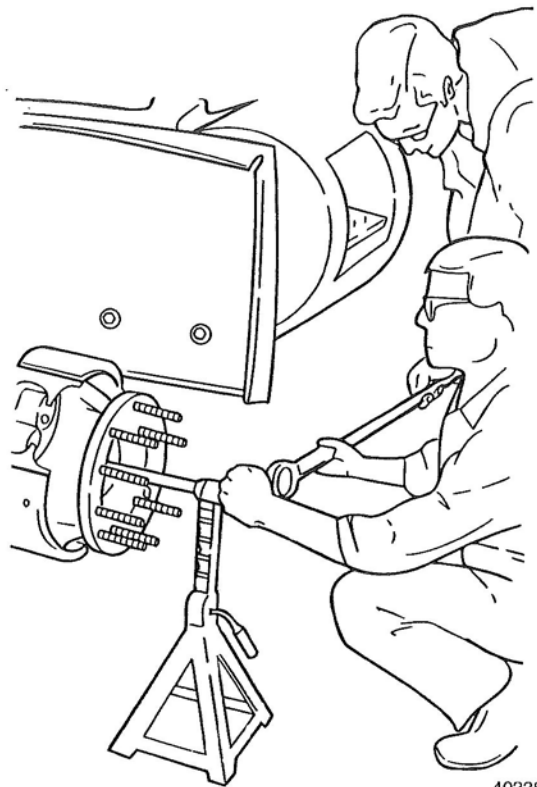
5. Tighten the hub nut to 120-180 Nm (89-133 ft-lb) using a 70 mm socket or equivalent tool for FXL12 and 14.6 axles, or tool No. J45944 for FCL18, 20, and 23 axles.



6. Rotate the hub 20 revolutions in either direction.
7. After rotating the hub 20 revolutions, tighten the hub nut to 900-1100 Nm (664-811 ft-lb). It is important to support the torque wrench with a jackstand to stabilize the wrench while applying this relatively high torque. It is also helpful to have an assistant press on the long handle of the wrench while the technician observes the reading on the dial of the torque wrench.

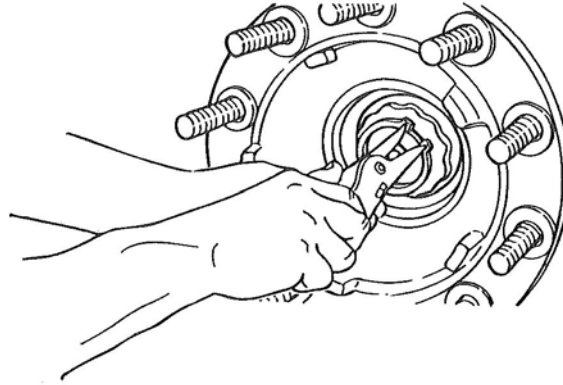
NOTE

With unitized hub assemblies, bearing end play adjustment is not necessary.
Tightening the hub nut to the proper torque value ensures proper end play.



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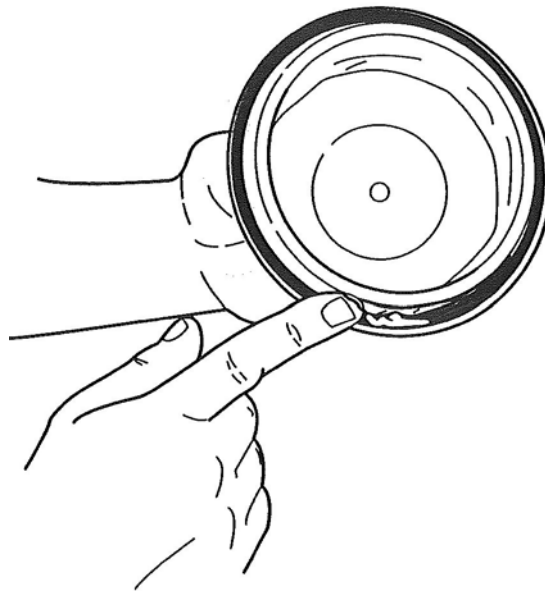
8. Install the new lock plate by indexing the plate around the hub nut until the plate aligns with the flats of the nut. The lock plate must not be forced over the nut. Install the new snap ring. The lock plate and snap ring are properly installed when the snap ring rotates freely in the snap ring groove.



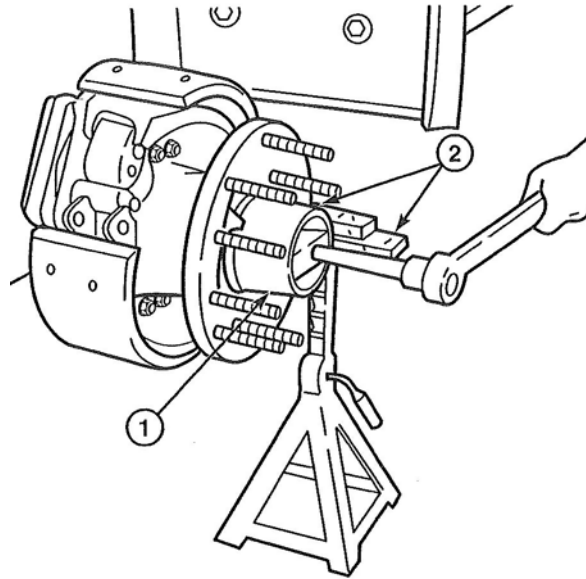
⚠ CAUTION

Do not hammer on the lock plate. Rotate snap ring to ensure engagement.

9. Install a new o-ring in the hubcap and coat with grease.



10. Install the hubcap onto the hub assembly. Hubcap removal/installation Tool J45996 (or equivalent tool) is required to install the hubcap. Prevent the hub from turning during hubcap installation by placing a jackstand against one of the hub wheel studs. Place a block of wood on the top of the jackstand to protect the threads of the stud. Install the hubcap and tighten to 215-285 Nm (159-210 ft-lb).

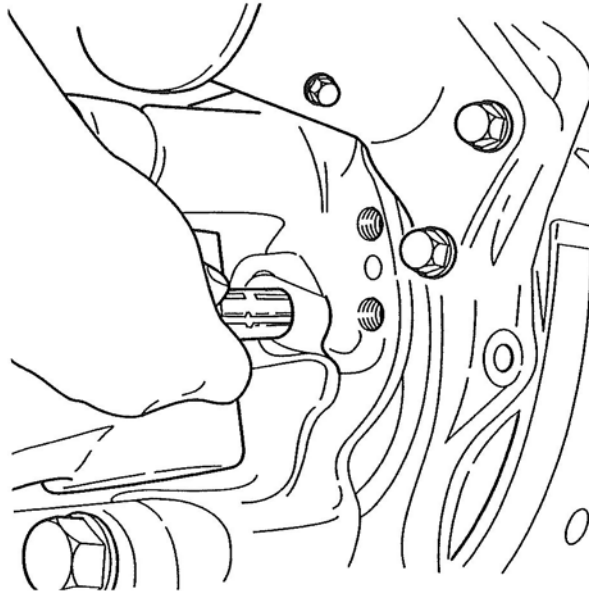


1. Tool J45996 or equivalent tool
2. Jackstand with wood block

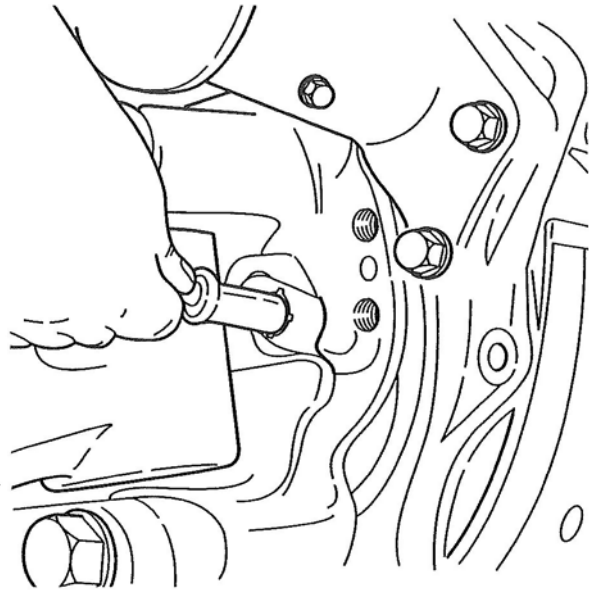
NOTE

The weight of the vehicle should be supported on a jackstand or framestand. Never support on hub. The purpose of the illustration is to show that the hub should be prevented from rotating.

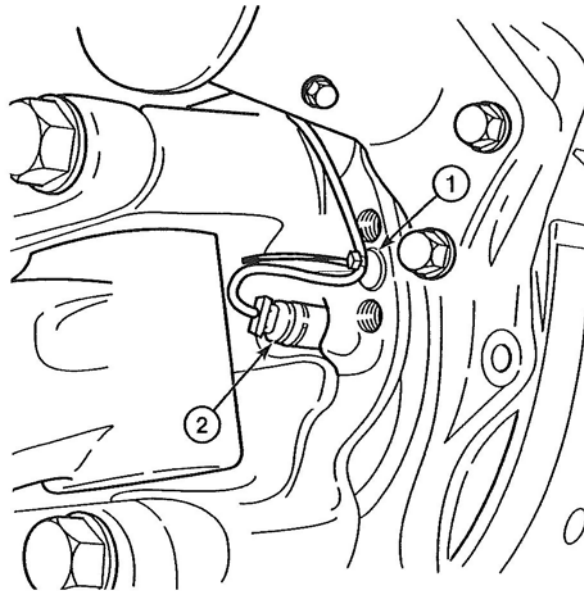
11. Apply *Never-Seize*, or equivalent, to the ABS sensor retaining spring and install the retaining spring clip into the ABS sensor hole located on the forward edge of the steering knuckle.



12. Install the ABS sensor until it fully engages the spring clip.

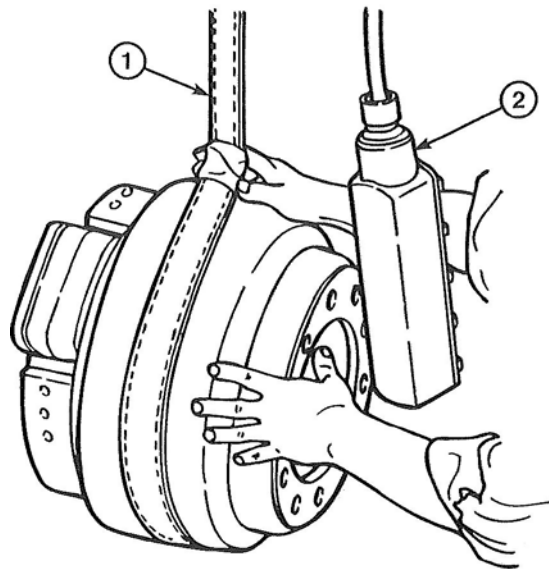


13. Insert the ABS sensor wire retainer into the hole located above and forward of the ABS sensor hole.



1. ABS sensor wire retainer
2. ABS sensor

14. Use a dolly, hoist or other suitable type of lifting device to install the brake drum.



1. Suitable lifting strap
2. Hoist control

15. Use a use wheel dolly to reinstall the wheel and tire assembly. Tighten the wheel nuts to specification 644 ± 34 Nm (475 ± 25 ft-lb).
16. If not previously done, lubricate the kingpin bushings and bearings with the recommended grease through the grease fittings.

17. Check and adjust toe in.
18. Adjust brakes on steer axle.
19. Raise up the steer axle and remove jack stands. Lower the axle.
20. Lower cab.

NOTE

Ensure that poppets are correctly set.

NOTE

On all vehicles, the front axle wheel stops must be adjusted to provide a minimum of one inch clearance between the tires and chassis components, and a minimum of 1/2 inch between any moving steering component (pitman arm, drag link, steering lever, etc.) and any other steering component.

21. Check and adjust wheel cut as needed.
22. Remove wheel chocks and test drive vehicle.

Reimbursement

This repair is covered by an authorized Safety Recall campaign. Reimbursement is obtained through the normal claim handling process.	
Claim Type (used only when uploading from the Dealer Bus. Says.)	R
Recall Status	
Vehicle inspected, no repair required	
Vehicle repaired per instructions	2-Modified per instructions
Labor Code	
Primary Labor Code (includes steam clean)	4211B-01-95 - 9.5 hr.
Time to take charge of vehicle and determine campaign status	101AA 0A 00 - 0.3 hr.
Causal Part	25195264
Authorization No.	SC0362

Take-charge time is not included in the labor code for this operation. Take charge may be eligible, but can only be used once per vehicle repair visit. If the vehicle is having other warranty repairs performed, take-charge should be charged to the warranty repair, otherwise take-charge can be charged to this Safety Recall.

NOTE

Dealers are to perform Safety Recall Campaigns on all subject vehicles at no charge to the vehicle owner regardless of mileage, age of vehicle or ownership (original purchaser or subsequent purchasers). Whenever vehicles are subject to a safety recall are brought to your dealership for service, or taken into your dealership vehicle inventory, it is strongly recommended that every effort be made to perform the recall correction before the vehicle is sold or released to the owner.
