



Wheel Hub


[Printable View \(478 KB\)](#)

Special Tool(s)

 ST1137-A	73III Automotive Meter 105-R0057 or equivalent
 ST1176-A	Vacuum Pump Kit 416-D002 (D95L-7559-A) or equivalent

Material

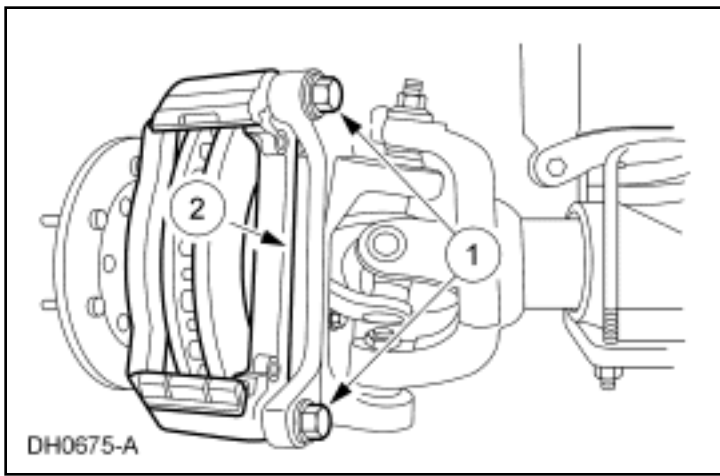
Item	Specification
Brake Parts Cleaner PM-4	—

Removal

1. Remove the wheel and tire assembly. For additional information, refer to [Section 204-04](#).
2. **NOTE:** Caliper is removed for clarity.

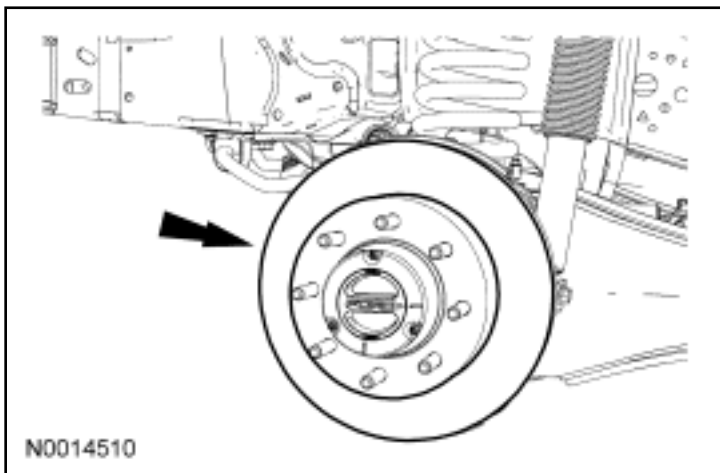
Position aside the front disc brake caliper and anchor plate.

1. Remove the two front disc brake caliper anchor plate bolts.
2. Remove the front disc brake caliper anchor plate and position aside.



3. **NOTE:** Carry out this step for F-250 and F-350 4x4 SRW vehicles.

Remove the rotor.

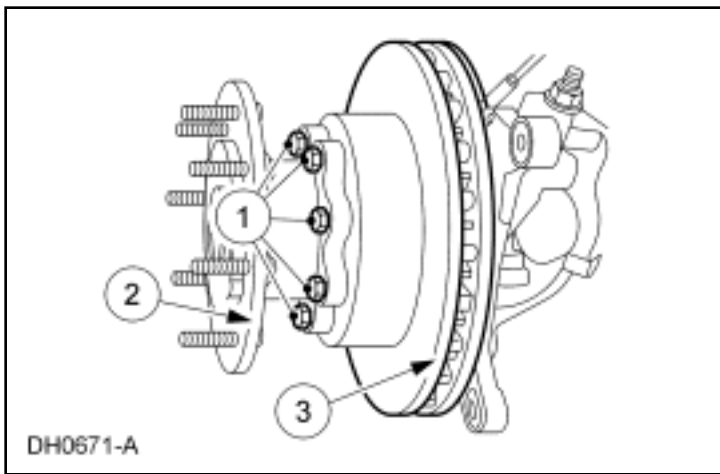



4. **NOTE:** Carry out this step for DRW vehicles.

NOTE: If excessive force must be used during brake rotor removal, the brake rotors should be checked for lateral runout prior to installation. For additional information, refer to [Section 206-00](#).


Remove the eight hub extender nuts, the hub plate and the rotor.

1. Remove the eight hub plate nuts.
2. Remove the hub plate.
3. Remove the rotor.



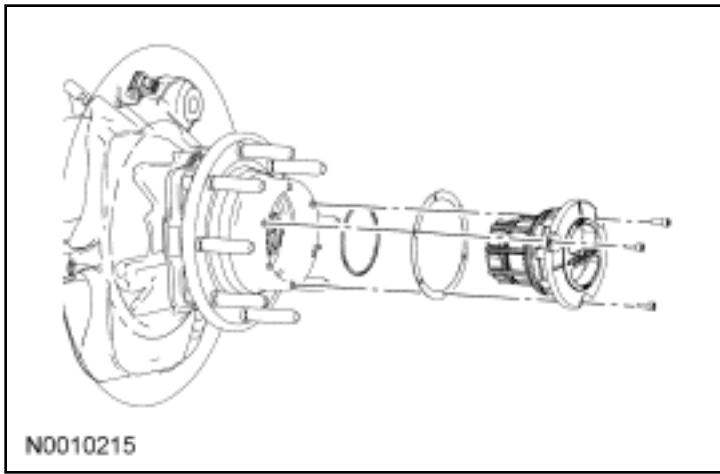
5.  **CAUTION:** Due to the fit of the splines, the hub lock will be difficult to remove. Lifting or lightly prying (with a small bar) on the axle U-joint will ease removal. When prying on the cap/hub flange, work around the flange to uniformly withdraw the hub lock.

 **CAUTION:** The service replacement kit includes two O-ring seals. One for testing the hub lock assembly and one for reassembly into the wheel hub. **DO NOT REUSE O-RING SEALS.**

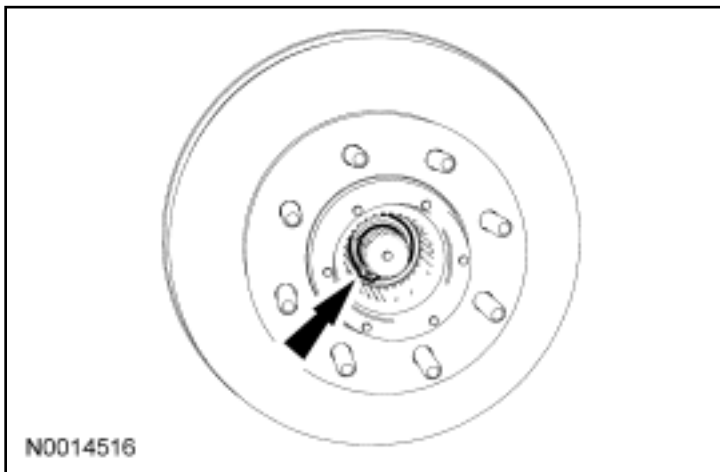
 **CAUTION:** Always check the vacuum leak rate of the wheel end assembly when repairing or diagnosing the axle, wheel end or hub lock performance.

Loosen each retainer screw one to two turns.

- Gently pry on the hub lock cap edge to release gasket adhesion.
- Remove and discard the retainer screws.
- While lifting/jiggling the axle U-joint, pull or uniformly pry the hub lock from the wheel hub.



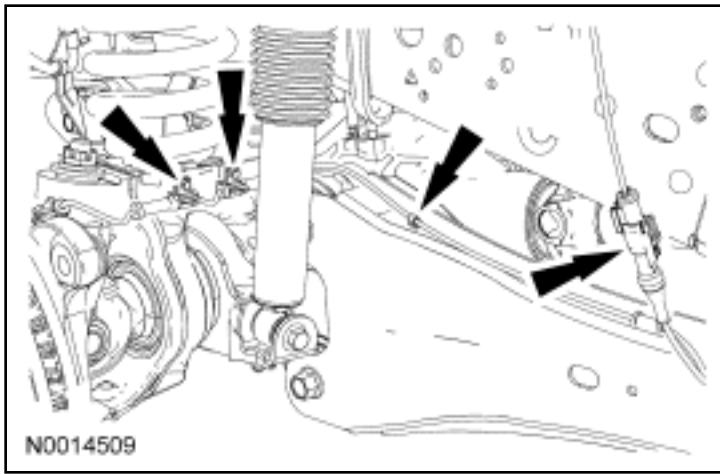
6. Remove the axle shaft snap ring.



7.  **CAUTION: Do not remove the ABS sensor from the bearing.**

Disconnect the ABS wheel sensor harness.

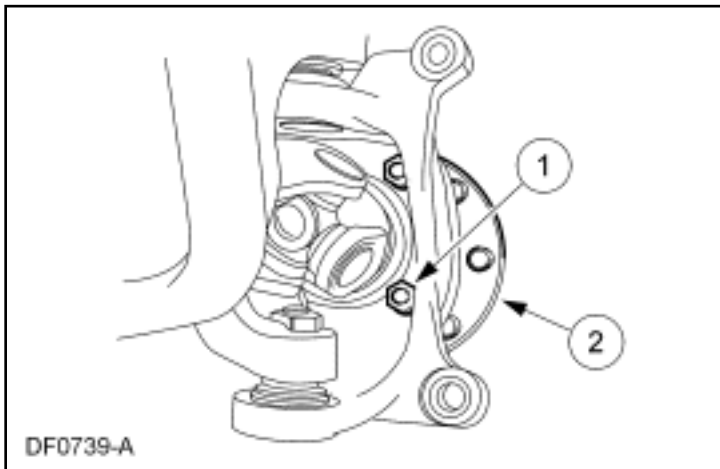
- Disconnect the connector.
- Disconnect the harness routing clip.
- Remove the two bolts.



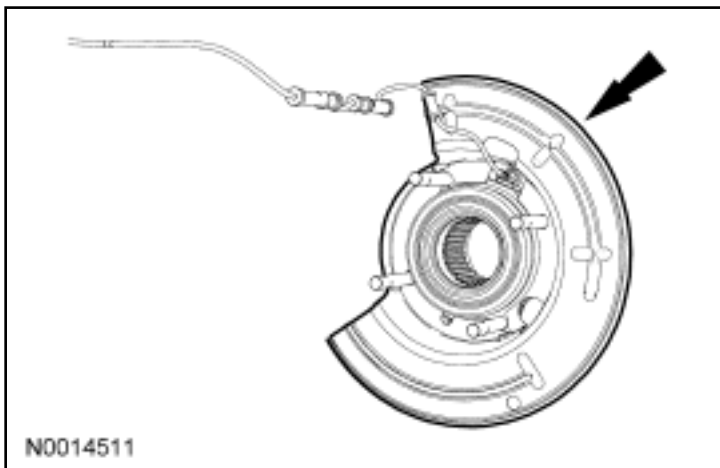
8. **NOTE:** The wheel hub and bearing is a slip fit design and should not require a puller to remove it.

Remove the wheel hub and bearing.

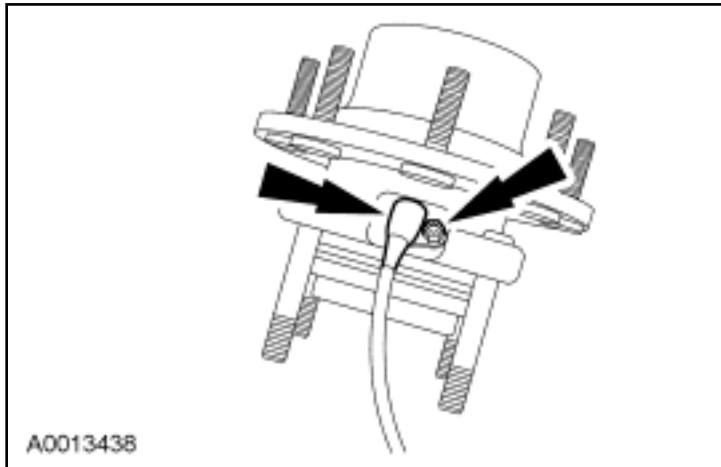
1. Remove the four lock nuts.
2. Remove the wheel hub and bearing.



9. If necessary, remove the brake disc shield.

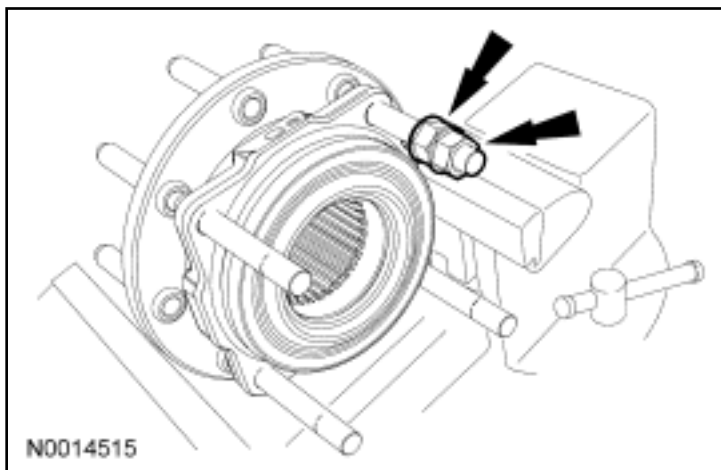


10. If necessary, remove the bolt and the ABS sensor.

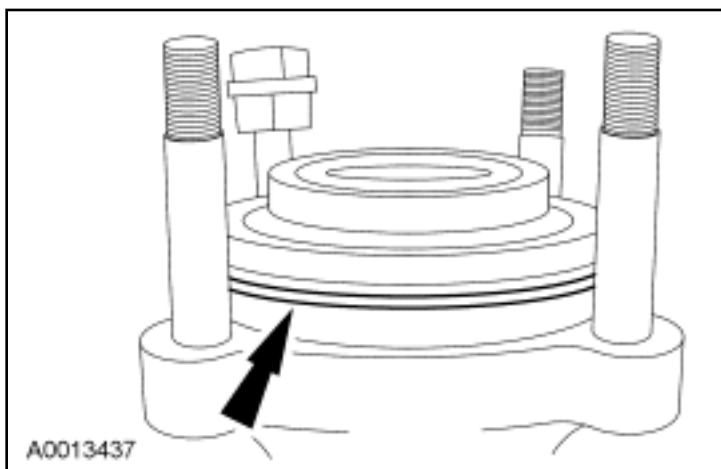


11. **NOTE:** If necessary, position the hub in a soft-jawed vise.

Install two nuts on the studs and use the inner nut to remove the studs.



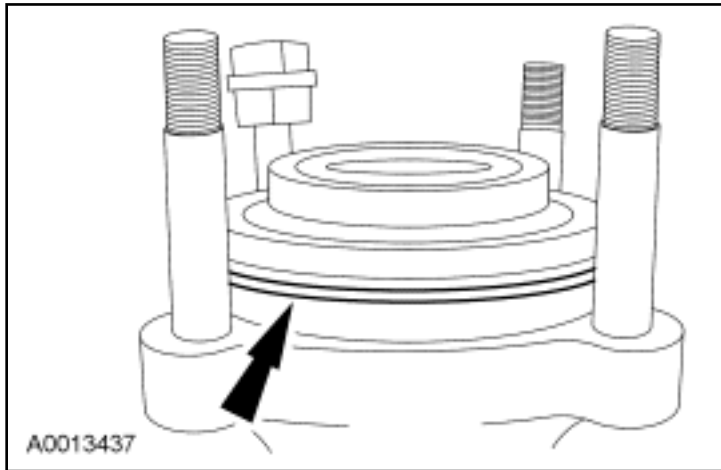
12. Remove and discard the O-ring.



Installation

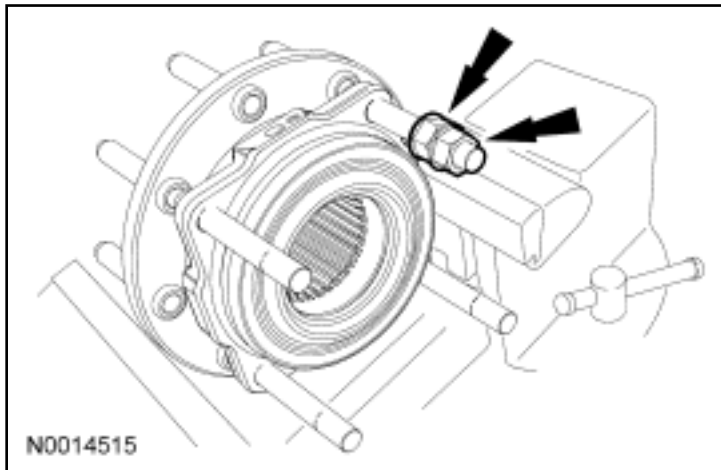
1. **NOTE:** Any time the wheel hub is removed for any reason, a new O-ring seal must be installed. Failure to do so can cause a vacuum leak and loss of four wheel drive operations.

Install a new O-ring.

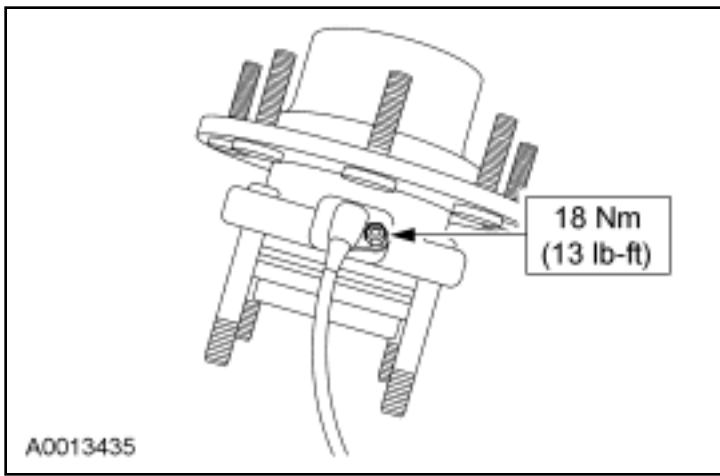


2. **NOTE:** Position the hub in a soft-jawed vise.

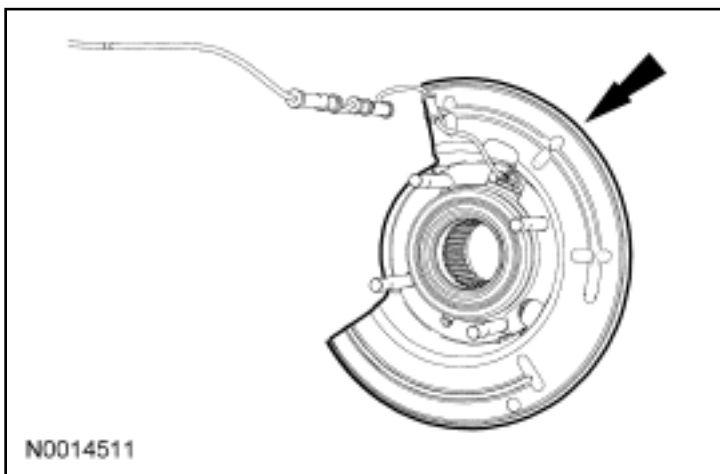
Install two nuts on the studs and use the outer nut to install the studs.



3. Position the ABS sensor and install the bolt.



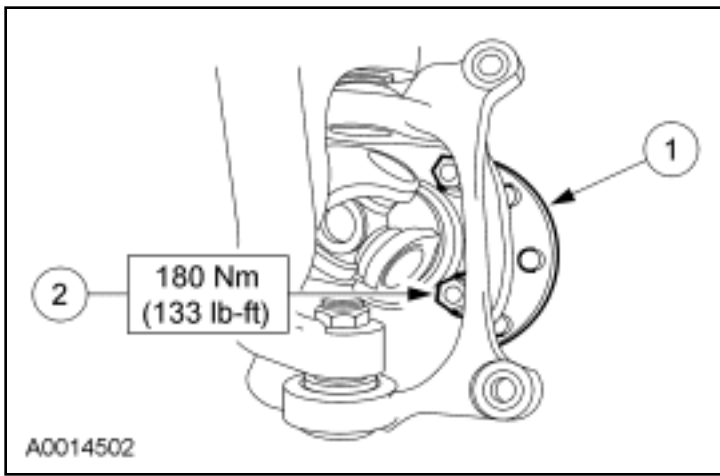
4. Position the brake disc shield.



5. **NOTE:** Apply a coat of Ford High Temperature 4x4 Front Axle and Wheel Bearing Grease E8TZ-19590-A meeting Ford specification ESA-M1C198-A to the O-ring area of the wheel hub and bearing before installing the hub and bearing.

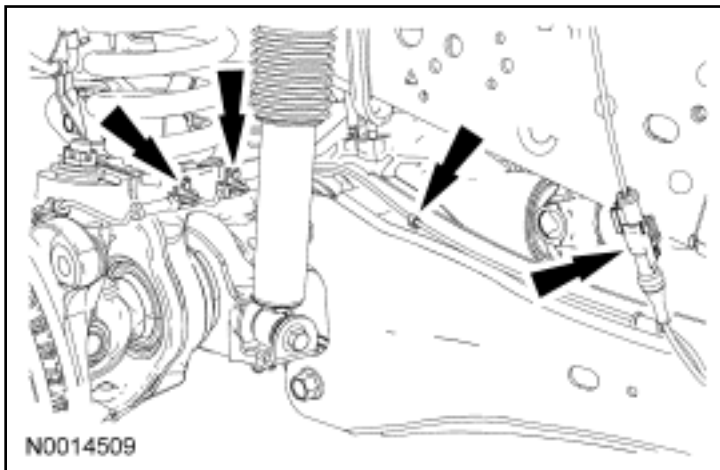
Install the wheel hub and bearing.

1. Position the wheel hub and bearing.
2. Install the four lock nuts.



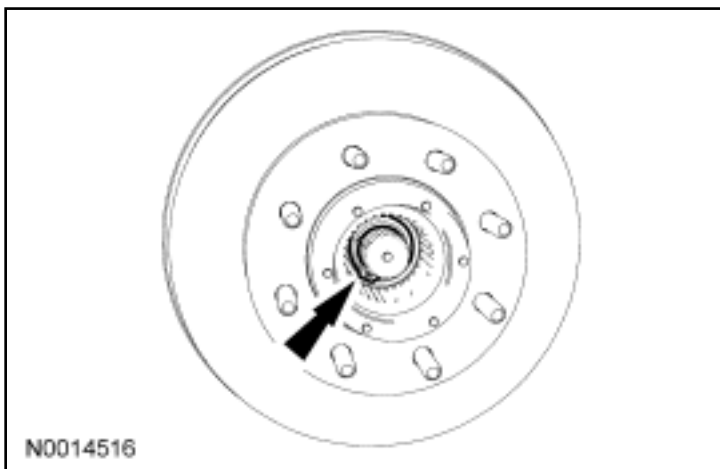
6. Connect the ABS sensor harness.

- Position the ABS sensor harness and install the two bolts.
- Install the routing clips.
- Connect the harness connector.



7. Install the snap ring.


- Position the three thrust washers onto the axle shaft.
- Install the snap ring.



8. **NOTE:** Any time the hub lock is removed, a new O-ring seal must be installed. Failure to do so can cause a vacuum leak and loss of four wheel drive functions.

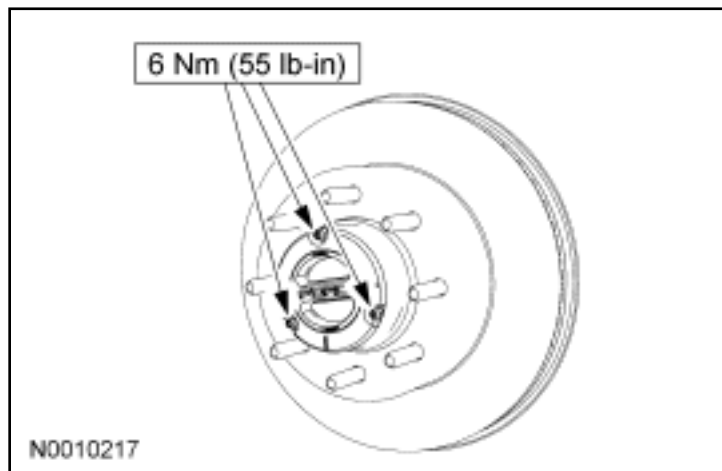
Install a new O-ring.

9.  **CAUTION:** The service replacement kit includes two O-ring seals. One for testing the hub lock assembly and one for reassembly into the wheel hub. **DO NOT REUSE O-RING SEALS.**

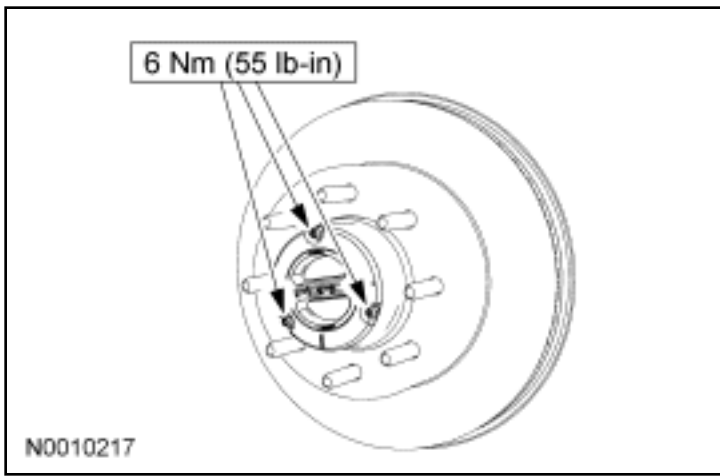
 **CAUTION:** Always check the vacuum leak rate of the wheel end assembly when repairing or diagnosing the axle, wheel end or hub lock performance.

Install a new gasket and O-ring.

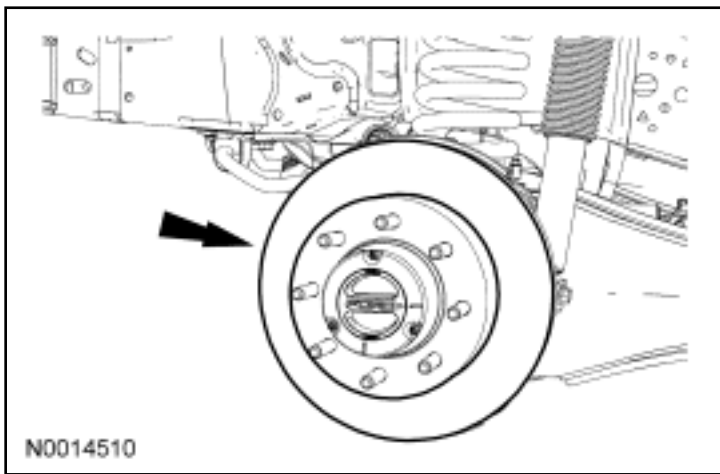
- Rotate the hub lock dial to clockwise position (LOCK). Apply lubricant to the inner and outer splines.
- Insert the hub lock into the wheel hub while slowly turning the wheel hub to align the splines. Lift/jiggle the axle U-joint while pushing the hub lock into the wheel hub.



10. Install the hub lock fasteners. Rotate the dial to counter clockwise position (FREE/AUTO) position.
- Confirm the wheel hub turns free of the axle shaft.

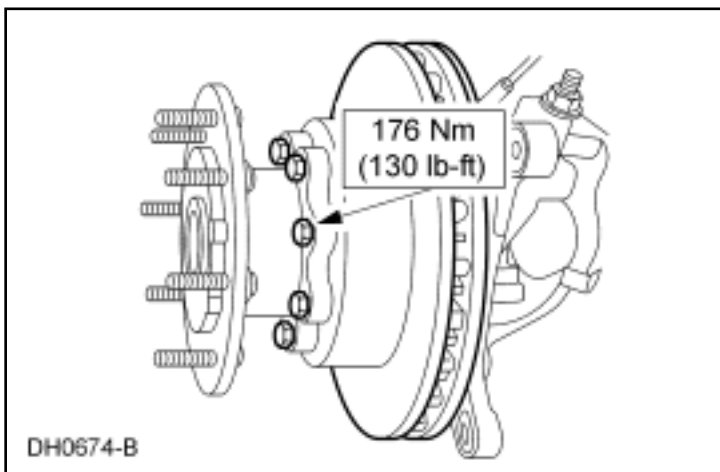


11. Position the front disc brake rotor to the wheel hub. Make sure the wheel hub and the front disc brake rotor braking and mounting surfaces are clean.
 - Use brake parts cleaner to clean the front disc brake rotor.



12. **NOTE:** Carry out this step for DRW vehicles only.

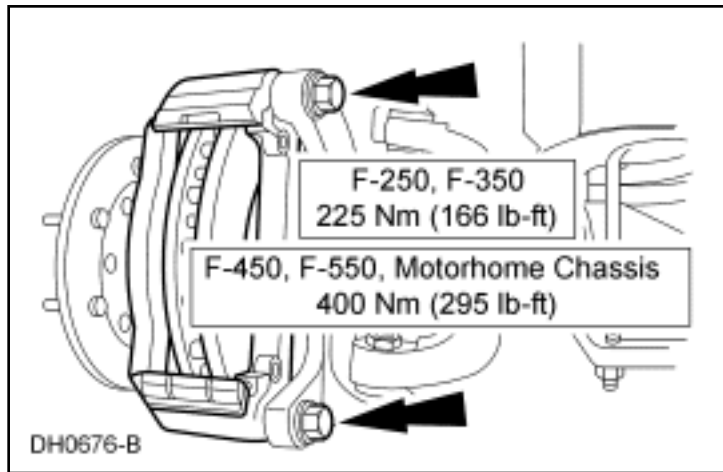
Install the front wheel hub extender and nuts.



13. **NOTE:** Caliper is removed for clarity.

Position back the front disc brake caliper and anchor plate.

- Position back the front disc brake caliper and anchor plate bolts.
- Install the front disc brake caliper anchor plate bolts.



14. Install the wheel and tire assembly. For additional information, refer to [Section 204-](#)

REMOVAL AND INSTALLATION

[Procedure revision date: 02/16/2006](#)

Wheel Knuckle

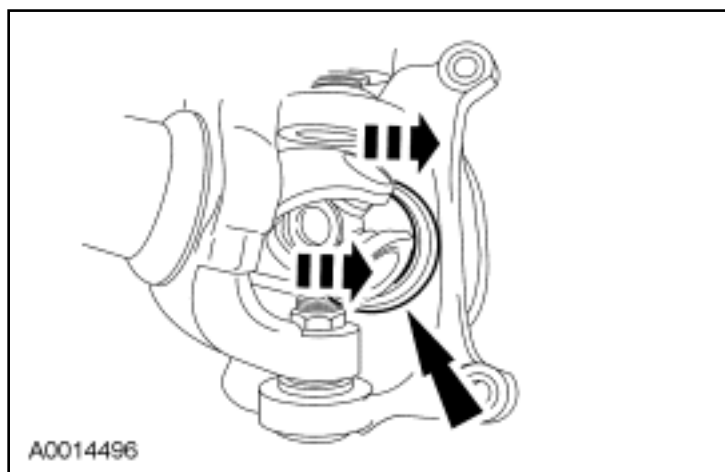
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Special Tool(s)

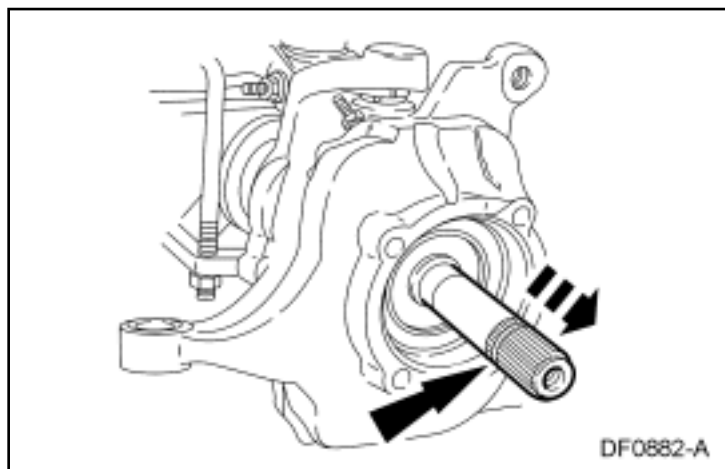
 <p>ST1263-A</p>	<p>Steering Arm Remover 211-003 (T64P-3590-F)</p>
 <p>ST1494-A</p>	<p>C-Frame and Screw 211-023 (T74P-3044-A1)</p>
 <p>ST2371-A</p>	<p>Installer/Remover, Drive Pinion Oil Seal 205-440</p>
 <p>ST2927-A</p>	<p>Installer, Wheel Knuckle Seal (F250/350) 205-830</p>
 <p>ST2928-A</p>	<p>Installer, Wheel Knuckle Seal (F450/550) 205-831</p>

Removal

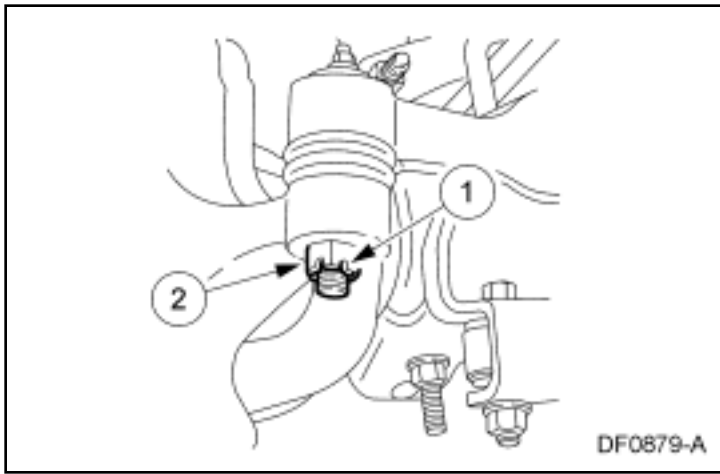
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. Remove the front brake disc. For additional information, refer to [Section 206-03](#).
3. Remove the wheel hub and bearing. For additional information, refer to [Wheel Hub](#) in this section.
4. If equipped, disconnect the pulse vacuum hub (PVH) hose.
5. Using a drift, drive the axle shaft main seal out of the wheel knuckle.



6. Remove the axle shaft and main seal.

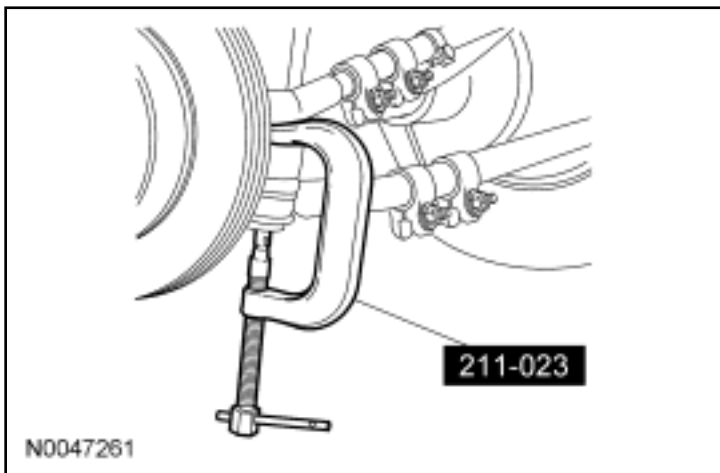


7. Remove the tie-rod end castellated nut.
 1. Remove the cotter pin.
 2. Remove the castellated nut.



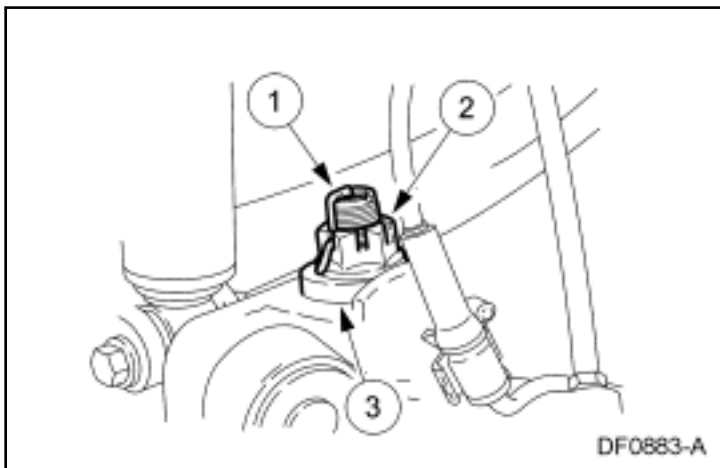
8. **NOTE:** RH shown, LH similar.

Using the special tool, disconnect the tie-rod end from the wheel knuckle.

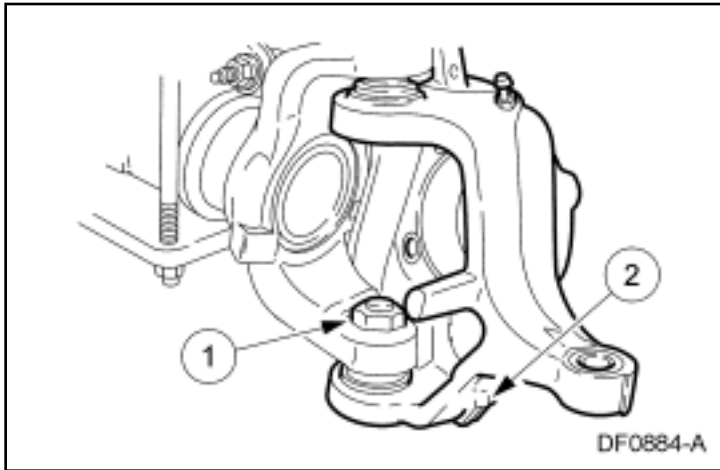


9. Remove the upper ball joint castellated nut and the insert.

1. Remove the cotter pin.
2. Remove the nut.
3. Remove the insert.



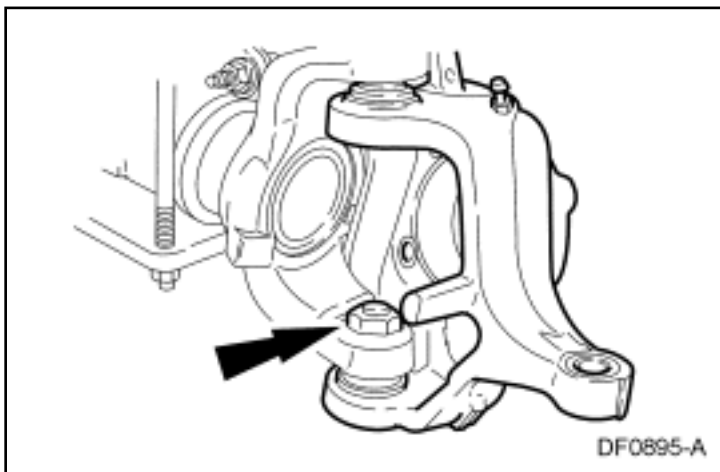
10. Remove the wheel knuckle.
 1. Remove the lower ball joint nut.
 2. Remove the knuckle.



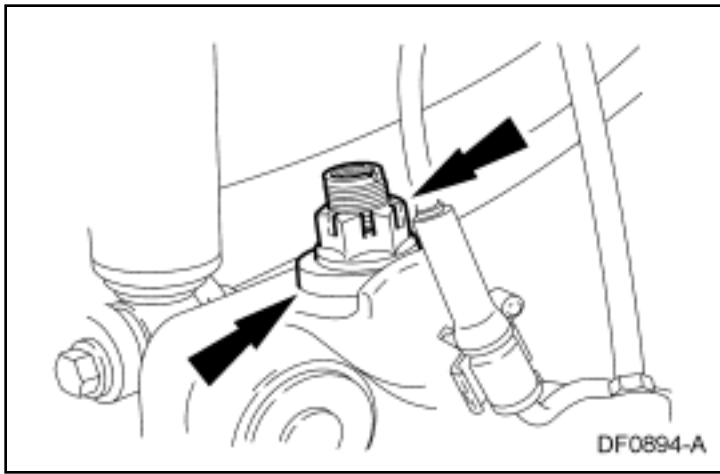
11. Clean and inspect the wheel knuckle ball joint bores.

Installation

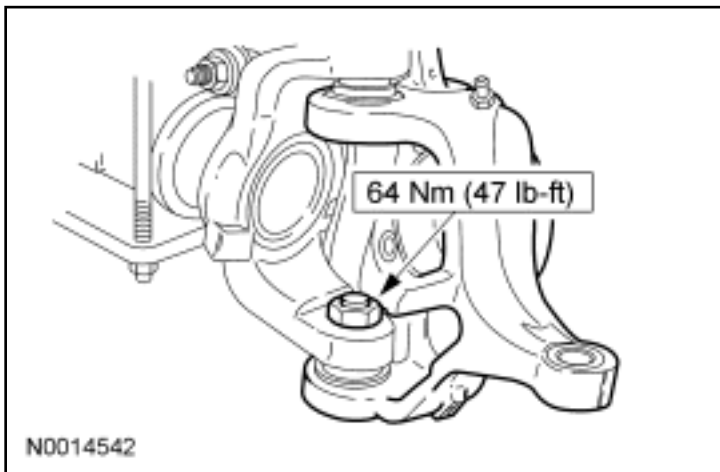
1. Position the wheel knuckle onto the axle housing.
2. Install the nut onto the lower ball joint. Do not tighten the nut at this time.



3. Install the insert and the castellated nut onto the upper ball joint. Do not tighten the nut at this time.



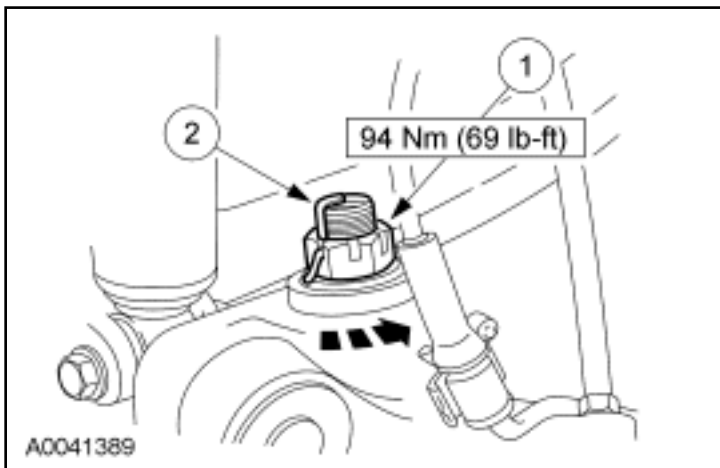
4. Tighten the lower ball joint retaining nut. Pre-tighten the nut to 64 Nm (47 lb-ft).



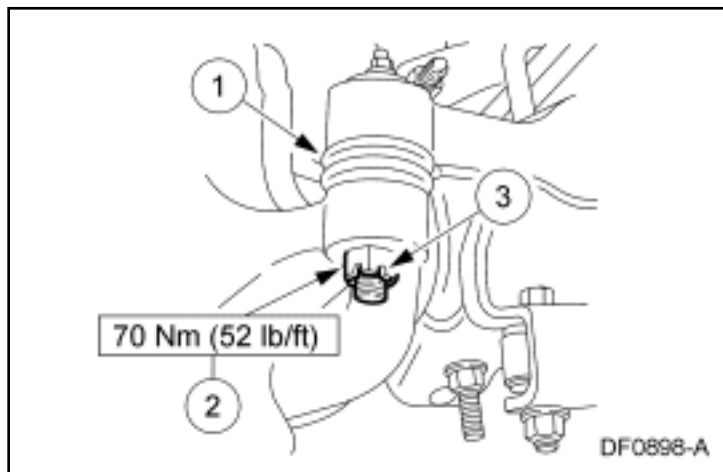
5. **NOTE:** Do not loosen the castellated nut to install the cotter pin.

Install the cotter pin into the upper ball joint.

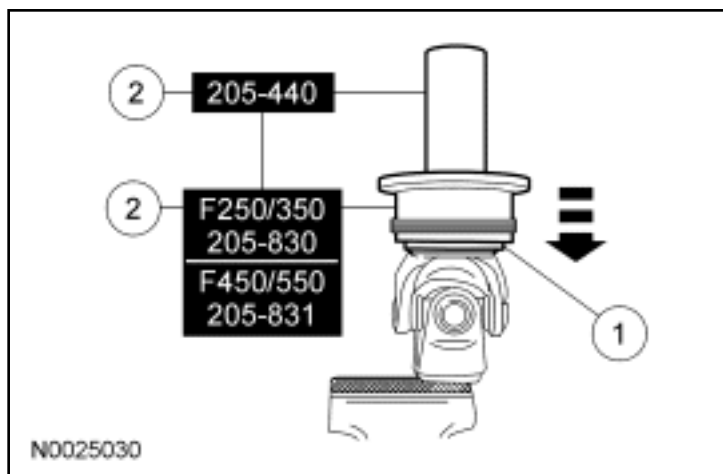
1. Tighten the upper ball joint castellated nut.
2. Install the cotter pin. If necessary, tighten the castellated nut until the cotter pin can be installed.




6. Tighten the lower ball joint nut to 204 Nm (150 lb-ft).
7. Install the tie-rod end onto the wheel knuckle.
 1. Position the tie-rod end into the wheel knuckle.
 2. Install and tighten the castellated nut.
 3. Install the cotter pin.



8. Install the new main seal onto the axle shaft.
 1. Position the main seal onto the axle shaft.
 2. Using the special tools and a hammer, seat the main seal onto the axle shaft.

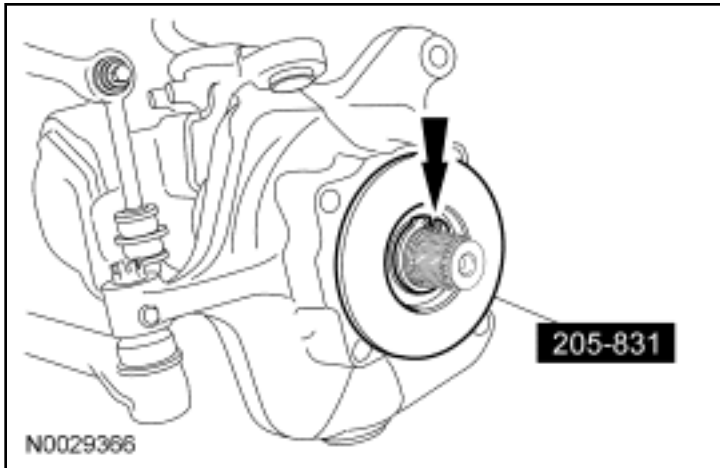


9. Position the axle shaft into the axle housing.
10.  **CAUTION: The knuckle bore must be clean enough to allow the special tool to seat completely by hand. Do not press or draw the wheel knuckle seal and axle shaft into place.**

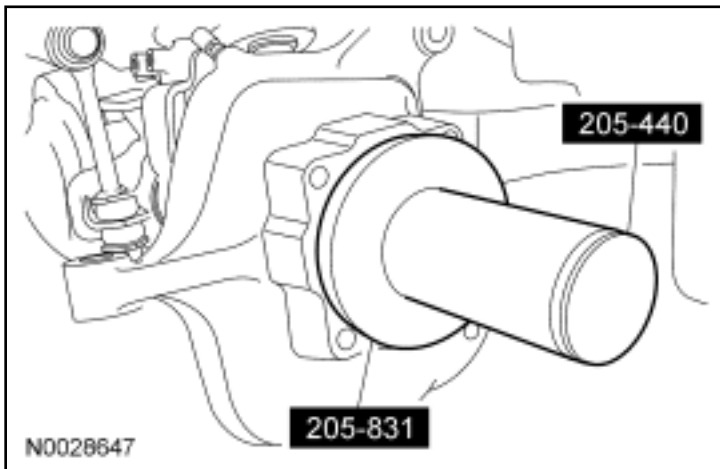
 **CAUTION: Do not apply any lubricant to the surface of the wheel knuckle bore.**

Clean and inspect the wheel knuckle bore. If the wheel knuckle is cracked, a new one must be installed.

11. Position the special tool onto the axle shaft and install the snap ring.



12. Using the special tools, install the wheel knuckle seal and axle shaft.





13. Install the wheel hub and bearing. For additional information, refer to [Wheel Hub](#) in this section.

14. Install the front brake disc. For additional information, refer to [Section 206-03](#).

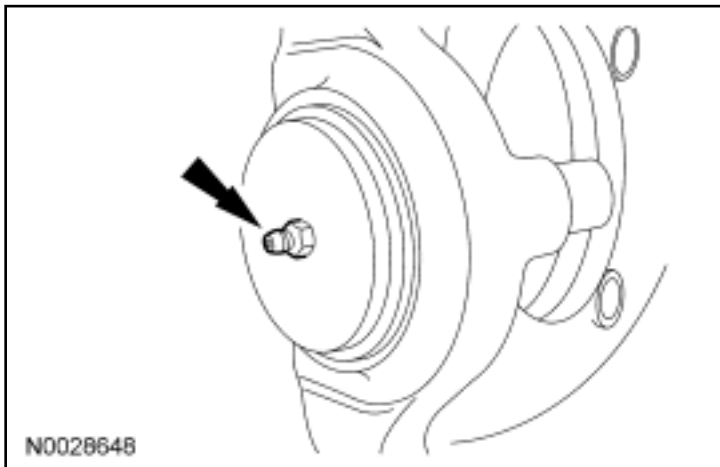
15. If equipped, connect the pulse vacuum hub (PVH) hose.

Ball Joint — Lower[Printable View \(166 KB\)](#)**Special Tool(s)**

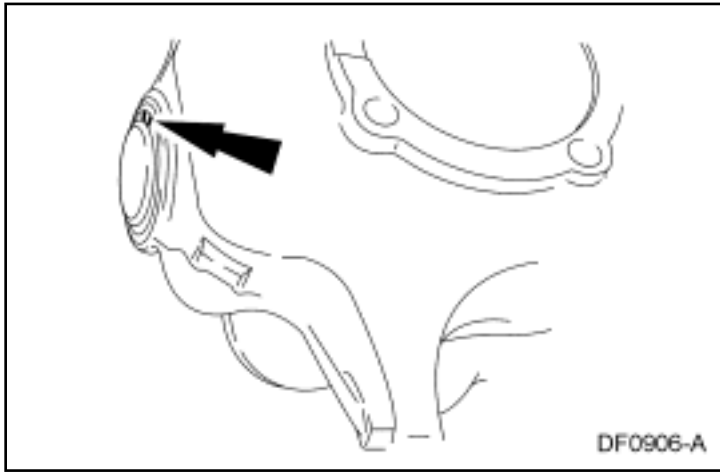
 ST1172-A	Installer/Remover, C-Frame and Screw 205-086 (T74P-4635-C)
 ST2929-A	Remover/Installer, Ball Joint 204-358

Removal

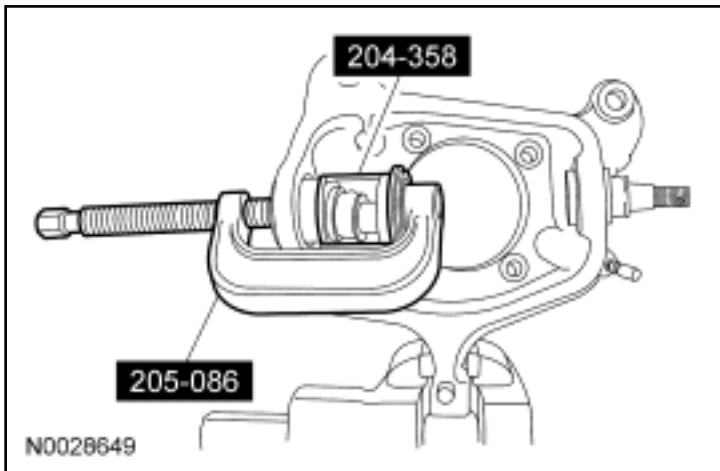
1. Remove the wheel knuckle. For additional information, refer to [Wheel Knuckle](#) in this section.
2. Place the wheel knuckle into a suitable vise.
3. If equipped, remove the ball joint grease fitting.



4. Remove the snap ring.

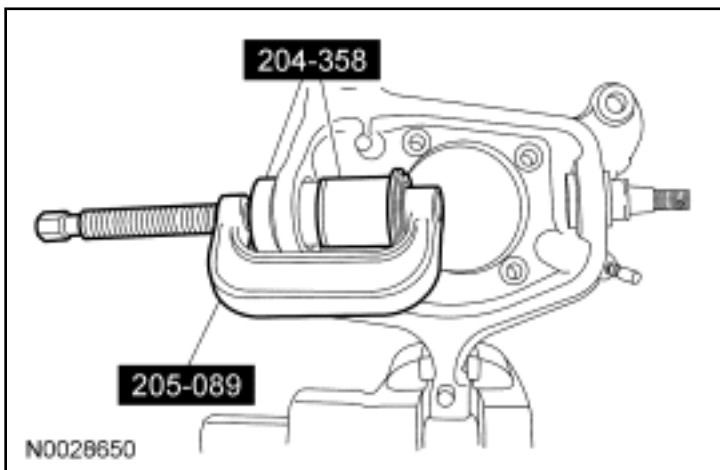


5. Using the special tools, remove the ball joint.

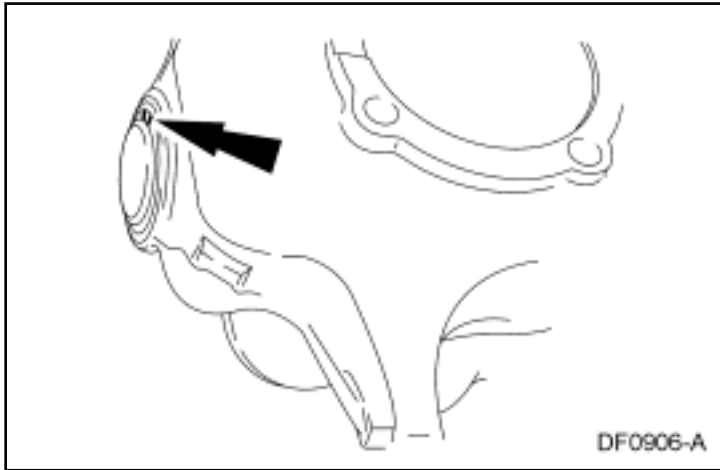


Installation

1. Clean the wheel knuckle ball joint bore.
2. Using the special tools, install the ball joint.



3. Install the snap ring.



4.  **CAUTION: Do not overtighten the ball joint grease fitting.**



If removed, install the ball joint grease fitting.

5. Install the wheel knuckle. For additional information, refer to [Wheel Knuckle](#) in this section

Ball Joint — Upper

[Printable View \(133 KB\)](#)

Special Tool(s)

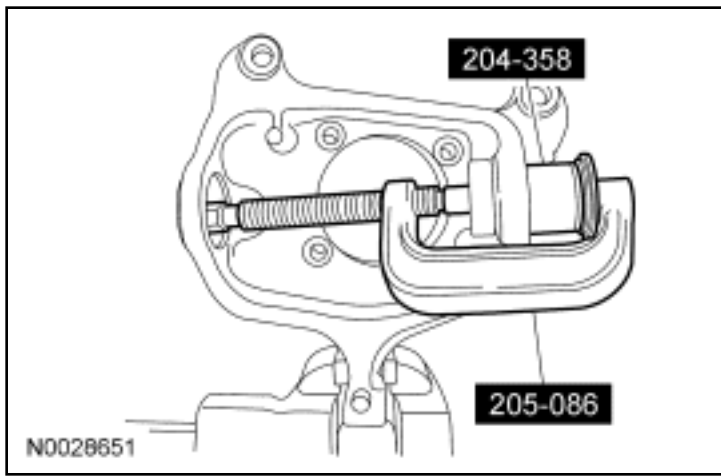
 ST1172-A	Installer/Remover, C-Frame and Screw 205-086 (T74P-4635-C)
 ST2929-A	Remover/Installer, Ball Joint 204-358

Removal

1. Remove the wheel knuckle. For additional information, refer to [Wheel Knuckle](#) in this section.
2. Place the wheel knuckle into a suitable vise.
3. **NOTE:** Always remove the lower ball joint first.

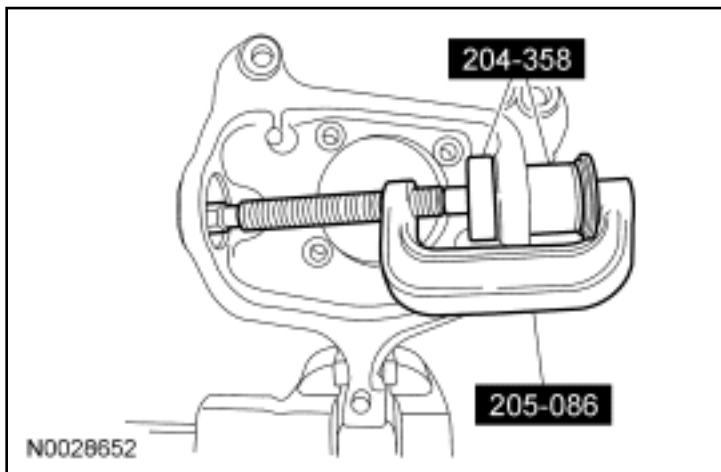
Remove the lower ball joint. For additional information, refer to [Ball Joint — Lower](#) in this section.

4. Using the special tools, remove the ball joint.



Installation

1. Clean the wheel knuckle ball joint bores.
2. Using the special tools, install the ball joint.



3. Install the lower ball joint. For additional information, refer to [Ball Joint — Lower](#) in this section.
4. Install the wheel knuckle. For additional information, refer to [Wheel Knuckle](#) in this section.