




**Wheel Knuckle - F-450, F-550**

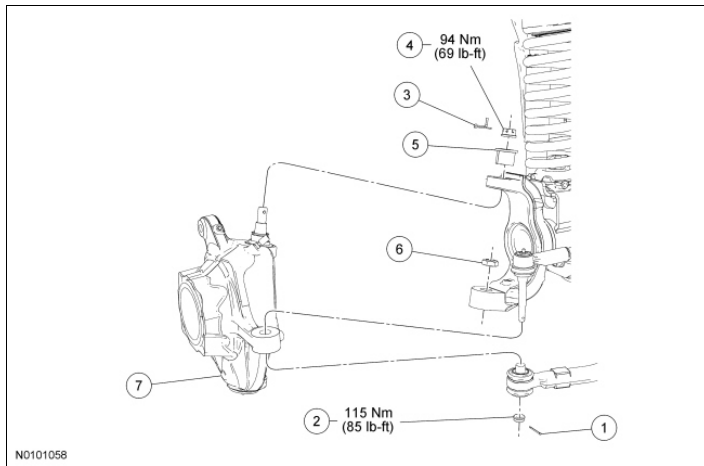
Special Tool(s)

 <small>ST1494-A</small>	C-Frame and Screw Assembly 211-023 (T74P-3044-A1)
 <small>ST1283-A</small>	Pitman Arm Puller 211-003 (T64P-3590-F) or Equivalent
 <small>ST2945-A</small>	Separator, Ball Joint 204-592

Material

Item	Specification
Threadlock and Sealer TA-25	WSK-M2G351-A5

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

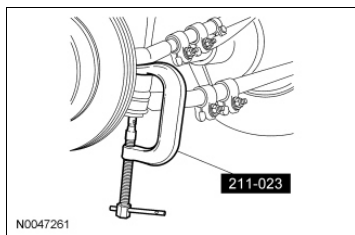


Item	Part Number	Description
1	W525287	Cotter pin
2	W711373	Tie-rod end nut
3	W525287	Cotter pin
4	3A049	Upper ball joint nut
5	3B404	Camber adjustment sleeve
6	3A050	Lower ball joint nut
7	3131 LH/ 3130 RH	Wheel knuckle

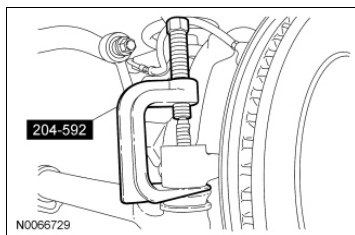
## Removal

**NOTICE:** Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. They must be replaced with the same part number or an equivalent part if replacement is necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Remove the wheel bearing and hub assembly. For additional information, refer to Wheel Bearing and Wheel Hub - F-450, F-550 in this section.
2. Remove the cotter pin and tie-rod end nut.
  - Discard the cotter pin.
3. If removing the RH wheel spindle, using the C-Frame and Screw Assembly, disconnect the RH outer tie-rod end and drag link from the wheel spindle.

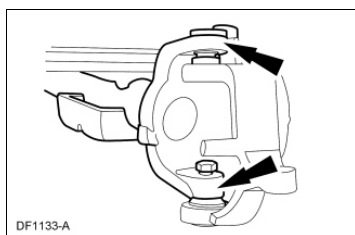


4. If removing the LH wheel spindle, using the Ball Joint Separator, disconnect the LH outer tie-rod end from the wheel spindle.

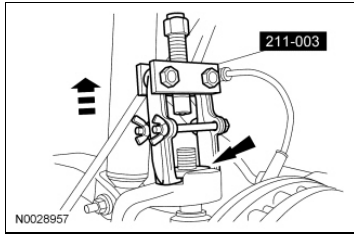


5. Remove the cotter pin and upper ball joint nut.
  - Discard the cotter pin.
6. Loosen, but do not remove, the lower ball joint nut.
7. **NOTICE:** To prevent damage to the ball joint seal and the ball joint socket, do not use a pickle fork-type remover to loosen the ball joints.

Strike the lower and upper end of the axle to loosen the ball joints and the camber adjustment sleeve.



8. Using the Pitman Arm Puller, remove the camber adjustment sleeve.



9. Remove the lower ball joint nut and the front wheel spindle.
  - Discard the nut.

### Installation

1. **NOTICE:** The caster/camber adjustment sleeve must be removed and the axle bores and adjustment sleeve contact areas cleaned to ensure proper torque sequence. If not clean, damage to the ball joint, adjustment sleeve and/or axle bores can occur.

**NOTICE:** Failure to remove the caster/camber adjustment sleeve can result in a hard to steer condition.

Thoroughly clean the axle bore and adjustment sleeve contact areas.

2. Install the camber adjustment sleeve.
3. Position the knuckle onto the axle and install the nut onto the upper ball joint. Do not tighten the nut at this time.
4. Apply threadlock and sealer to the threads of the lower ball joint and install the nut onto the lower ball joint. Do not tighten the nut at this time.
5. Tighten the new lower ball joint nut to 59 Nm (44 lb-ft).
6. **NOTE:** Do not loosen the nut to install the cotter pin.

Tighten the new upper ball joint nut to 94 Nm (69 lb-ft) and install the cotter pin.

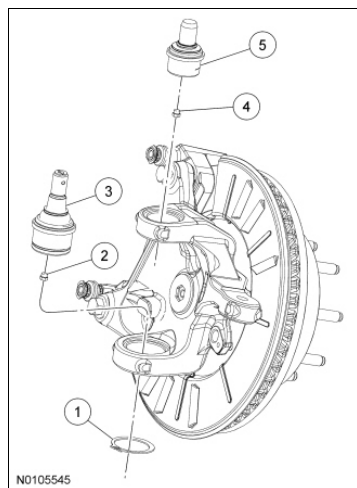
- If necessary, tighten the nut until the cotter pin can be installed.
7. Tighten the new lower ball joint nut to 204 Nm (150 lb-ft).
  8. Connect the tie-rod end to the wheel spindle and install the nut and a new cotter pin.
    - Tighten to 115 Nm (85 lb-ft).
    - If necessary, tighten the nut until the cotter pin can be installed.
  9. Install the wheel bearing and hub assembly. For additional information, refer to Wheel Bearing and Wheel Hub - F-450, F-550 in this section.
  10. Check and, if necessary, align the front end. For additional information, refer to Section 204-00.



**Ball Joint**

Special Tool(s)

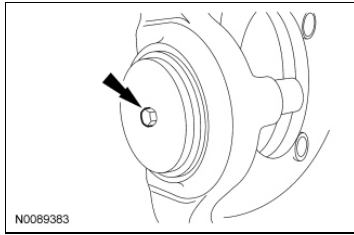
 <p>ST2930-A</p>	<p>Installer/Remover, Ball Joint 204-355</p>
 <p>ST2929-A</p>	<p>Installer/Remover, Ball Joint 204-358</p>
 <p>ST1172-A</p>	<p>Installer/Remover, C-Frame and Screw 205-086 (T74P-4635-C)</p>



Item	Part Number	Description
1	97541	Snap ring
2	-	Grease fitting (part of 3050)
3	3050	Lower ball joint
4	-	Grease plug (part of 3049)
5	3049	Upper ball joint

**Removal**

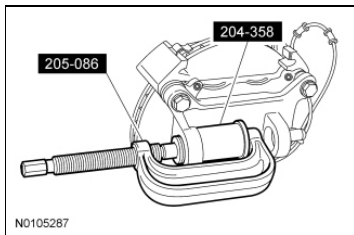
1. Remove the wheel spindle or wheel knuckle assembly. For additional information, refer to Wheel Spindle - F-250, F-350 or Wheel Knuckle - F-450, F-550 in this section.
2. Remove the lower ball joint grease plug.



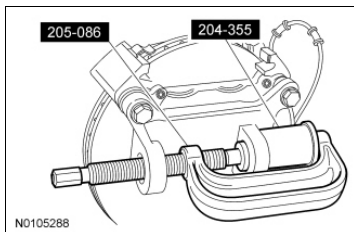
3. Position the wheel spindle in a vise and remove the snap ring from the lower ball joint.

4. **NOTICE:** To avoid damage to the components, do not use heat to aid ball joint removal.

Using the C-Frame and Screw Installer/Remover and Ball Joint Installer/Remover, remove the lower ball joint.



5. Using the C-Frame and Screw Installer/Remover and Ball Joint Installer/Remover, remove the upper ball joint.



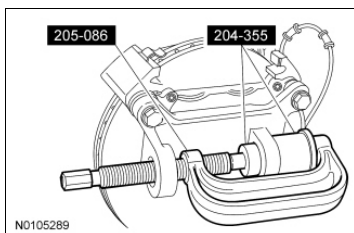
## Installation

1. **NOTICE:** To avoid damage to components, do not use heat to aid installation.

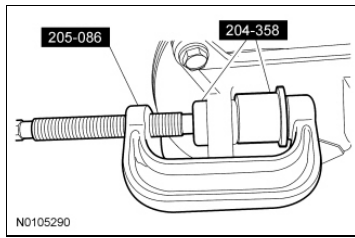
**NOTE:** Clean the wheel knuckle ball joint bores.

**NOTE:** The upper ball joint must be installed first.

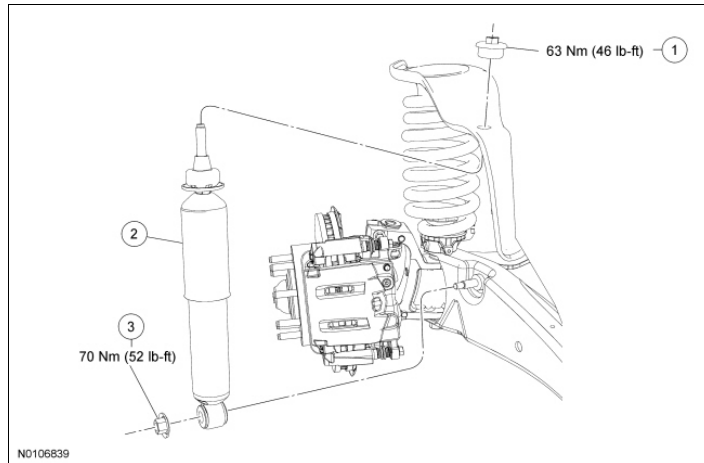
Using the C-Frame and Screw Installer/Remover and Ball Joint Installer/Remover, install the upper ball joint.



2. Using the C-Frame and Screw Installer/Remover and Ball Joint Installer/Remover, install the lower ball joint.



3. Install the snap ring in the groove at the bottom of the lower ball joint.
  4. Install the lower ball joint grease plug.
  5. Install the front wheel spindle or wheel knuckle assembly. For additional information, refer to Wheel Spindle - F-250, F-350 or Wheel Knuckle - F-450, F-550 in this section.
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**Shock Absorber - F-250, F-350****NOTE:** LH shown, RH similar.

Item	Part Number	Description
1	18A192	Shock absorber upper nut, washer and bushing assembly
2	18045	Shock absorber
3	N806085	Shock absorber lower nut and washer

**Removal and Installation**

**⚠ WARNING:** Do not apply heat or flame to the shock absorber or strut tube. The shock absorber and strut tube are gas pressurized and could explode if heated. Failure to follow this instruction may result in serious personal injury.

**NOTICE:** Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. They must be replaced with the same part number or an equivalent part if replacement is necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

- NOTE:** The shock absorber upper nut and washer are accessed through the engine compartment.

Remove and discard the shock absorber upper nut, washer and bushing assembly.

- To install, tighten to 63 Nm (46 lb-ft).

- With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).

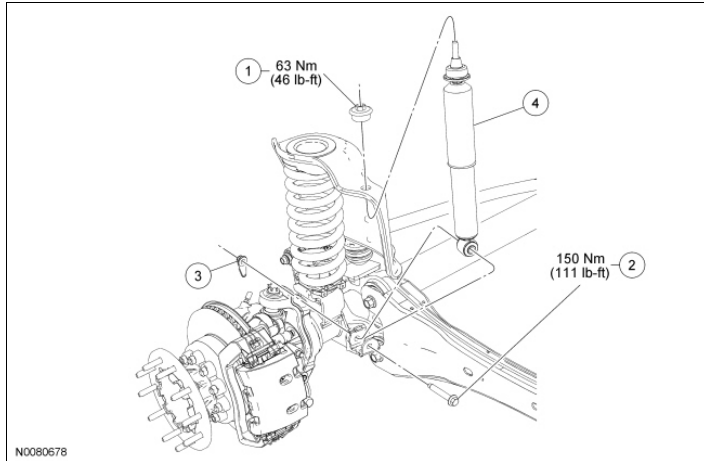
- Remove and discard the shock absorber lower nut and washer.
  - To install, tighten the new nut to 70 Nm (52 lb-ft).

- Remove the shock absorber.



5. To install, reverse the removal procedure.

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**Shock Absorber - F-450, F-550****NOTE:** LH shown, RH similar.

Item	Part Number	Description
1	18A192	Upper nut, washer and bushing assembly (upper half)
2	W500765	Shock absorber lower bolt
3	W711430	Shock absorber lower flagnut
4	18045	Shock absorber

**Removal and Installation**

**⚠ WARNING:** Do not apply heat or flame to the shock absorber or strut tube. The shock absorber and strut tube are gas pressurized and could explode if heated. Failure to follow this instruction may result in serious personal injury.

**NOTICE:** Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. They must be replaced with the same part number or an equivalent part if replacement is necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. Remove and discard the shock absorber upper nut, washer and bushing assembly (upper half).
  - To install, tighten the new nut to 63 Nm (46 lb-ft).
3. Remove and discard the shock absorber lower bolt and flagnut.
  - To install, tighten the new bolt to 150 Nm (111 lb-ft).
4. Remove the shock absorber.
5. To install, reverse the removal procedure.

