

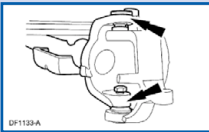


# DID YOU KNOW?

## ADVICE FOR THE PROFESSIONAL

### Overview

After installing MOOG ball joints on Ford Super Duty and Dodge Ram HD straight axle 4x4 and twin I-beam trucks, some customers may encounter poor steering wheel return (referred to as “memory steer”), a tight feel on center on the highway and difficulty when turning the knuckle. This may be the result of ball joint binding due to improper installation. All straight axle and twin I-beam designs have manufacturing variations horizontally between upper and lower taper holes in the knuckle/ axle and also variation between mounting locations of the upper and lower ball joint.



MOOG ball joints have precision metal tolerances (similar to a crankshaft bearing.) When installed properly, they will provide superior service life. Using improper procedures can effect product operation and shorten service life due to the excessive load that these variations can place on ball joints.

We recommend installing MOOG Problem Solver ball joints:

#### K80026 Upper, K8607T Lower

(See MOOG Problem Solver Bulletin 212002 to learn more about these specific ball joints.)

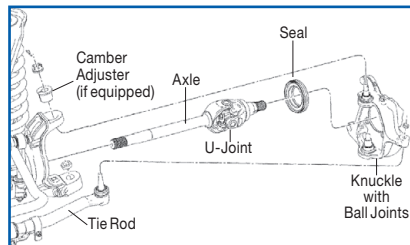
Proper installation procedures with MOOG Problem Solver ball joints will ensure a more profitable job, with less comebacks and more satisfied customers.

In addition, close attention should be paid to the steering gear box, steering damper, and front axle u-joints during the repair procedure. These components, if faulty, can cause symptoms similar to failed ball joints and will result in comebacks and time-consuming diagnostics.

#### Vehicles affected

Vehicles affected		
DODGE	RAM 2500	1998-1994
	RAM 2500 PICKUP	1999
	RAM 3500	1998-1994
	RAM 3500 PICKUP	1999
FORD	EXCURSION	2005-2000
	F-250 SUPER DUTY	2010-1999
	F-350	1997-1992
	F-350 SUPER DUTY	2010-1999
	F-450 SUPER DUTY	2004-1999
	F-550 SUPER DUTY	2004-1999

### Removal Procedure



Remove the wheel hub, bearing and axle.

Refer to the factory service manual for proper safety and repair procedures.

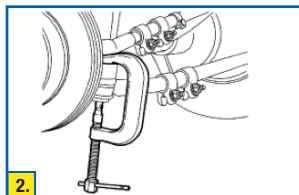
With the axle out, inspect the u-joint. If the u-joint is in poor shape it should be replaced. Failed u-joints can cause noise and binding, and are easily replaced at this point. We recommend replacing with MOOG premium u-joint 374.



Remove the tie rod cotter pin and the tie rod end nut. (FIG 1)



Using an appropriate tool, disconnect the tie rod end from the wheel knuckle. (FIG 2)

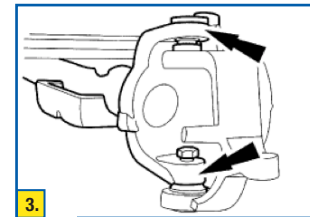


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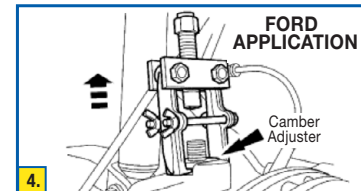
### Removal Procedure (con't)

Remove the **upper** ball joint cotter pin and nut. Loosen, but do not remove, the **lower** ball joint nut.

Strike the lower and upper end of the axle to loosen the ball joints. (FIG 3)



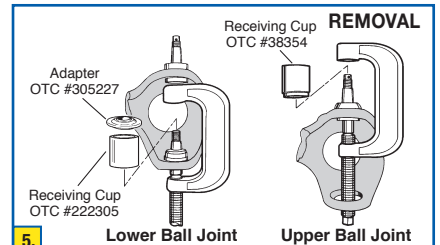
On Ford applications - Use the Ford service tool to remove the camber adjuster. Note its position. (FIG 4). **IT IS IMPERATIVE THAT YOU REMOVE THE BUSHING AND CLEAN THE MATING SURFACES BEFORE PROCEEDING.**



Remove the lower ball joint nut and the wheel knuckle.

Now remove the ball joints from the knuckle. It is easier to remove the **lower** ball joint first. First, remove the snap ring, then use a ball joint press and appropriate receiving cups and adapters.

Then remove the **upper** ball joint from the knuckle, utilizing a ball joint press and appropriate receiving cups and adapters. (FIG 5)



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[moogproblemsolver.com](http://moogproblemsolver.com)



**DID YOU KNOW?****ADVICE FOR THE PROFESSIONAL****Installation Procedures****OTC COMPONENTS REQUIRED:**

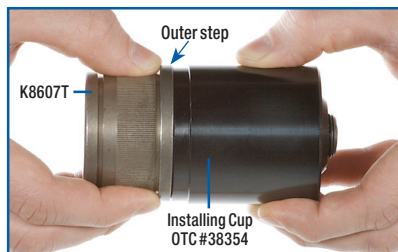
- Installing Adapter #204508A
- Installing Cup #38355A
- Installing Cup #38354

**IMPORTANT:** THOROUGHLY clean the surface where the new ball joints will seat. DIRTY MATING SURFACES WILL AFFECT BALL JOINT ALIGNMENT AND TORQUING.

Using a ball joint press, press in the new ball joints. It is **IMPORTANT** that the ball joints are installed properly to prevent misalignment and binding! Be sure to use the correct size adapter. Refer to the following diagrams.

**UPPER BALL JOINT - CORRECT**

Correct fit, against outer step

**LOWER BALL JOINT - CORRECT**

Correct fit, against outer step

These ball joints press in and apply force on the stud end of these applications. It is important that the installation cup be placed on the outer step of the ball joint housing. Pressing in the ball joint with force against the inside lip may push the lip and lower bearing into the stud, causing binding and premature failure. Always press in these ball joints using the outer step.

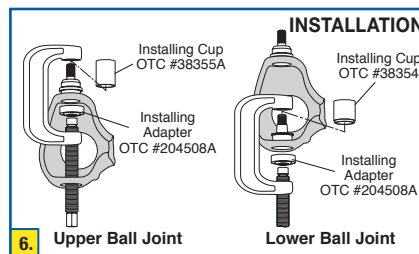
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**Installation Procedure (con't)****INCORRECT**

Incorrect fit, not against outer step

The upper ball joint must be installed before the lower ball joint.

1. Clean the knuckle ball joint mating surfaces thoroughly.
2. Apply a suitable lubricant to the ball joint mating surface and assemble the ball joint into the knuckle.
3. Assemble the ball joint press components as shown in Fig 6. Check the alignment of all components. Tighten the forcing screw until the ball joint is firmly seated.
4. Install the snap ring on the upper ball joint.
5. Repeat Steps 1-3 to install the lower ball joint. Install the snap ring.
6. Install the knuckle assembly to the vehicle according to the vehicle service manual procedures.



6. Upper Ball Joint

Lower Ball Joint

Install the camber adjuster sleeve (if equipped).

Position the wheel knuckle onto the axle and install the nut onto the upper ball joint. Do not tighten the nut at this time.

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.

**It is important that the following torque procedures be followed:**

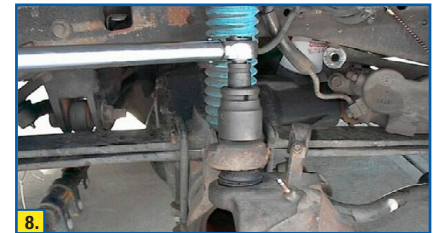
Tighten the LOWER ball joint nut to **59 Nm (44 ft. lbs.)** DO NOT USE AN IMPACT WRENCH. An impact wrench can spin the stud at high speed and cause premature failure. (FIG 7)

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**Installation Procedure (con't)**

7.

Tighten the UPPER ball joint nut to **94 Nm (69 ft. lbs.)** DO NOT USE AN IMPACT WRENCH. An impact wrench can spin the stud at high speed and cause premature failure. (FIG 8)



8.

If necessary, tighten the nut until the cotter pin can be installed. Install the cotter pin.

Tighten the LOWER ball joint nut to **204 Nm (150 ft. lbs.)**. DO NOT USE AN IMPACT WRENCH. An impact wrench can spin the stud at high speed and cause premature failure. (FIG 7)

**NOTE:** Do not loosen the nut to install the cotter pin. Always tighten to install the cotter pin.

Connect the tie-rod end to the wheel knuckle and install the tie.

Tighten to **115 Nm (85 ft. lbs.)** DO NOT USE AN IMPACT WRENCH. An impact wrench can spin the stud at high speed and cause premature failure. If necessary, tighten the nut until the cotter pin can be installed.

Complete the repair per the vehicle service manual. Also, a wheel alignment should be performed anytime ball joints are replaced.

Other factors to consider:

Inspect the steering damper if equipped. Binding from internal rust can cause stiff steering and poor steering wheel return-to-center.

It is important that the steering gear box is properly adjusted. A steering gear box that is worn or out of adjustment can cause steering looseness, wandering, poor return-to-center, and/or tight and stiff turning.



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