

## BALL JOINT CHECKING

### FACTORY RECOMMENDED METHOD

#### AMERICAN MOTORS

**Upper Ball Joint (Exc. Pacer)** — Lift front of car until front wheels are off ground and place safety stands under body side sills. Remove upper ball joint grease fitting and install gauge tool (J-21240). Place pry bar under tire and lift several times. Subtract minimum reading from maximum reading obtained. If difference is more than .080", replace ball joint.

**Lower Ball Joint (Exc. Pacer)** — Move lower portion of wheel and tire inward and outward. If lower ball joint has any lateral shake, ball joint should be replaced.

**Upper Ball Joint (Pacer)** — Raise front of vehicle until wheels are off the ground. Move upper portion of wheel inward and outward. Then move upper control arm up and down. If ball joint exhibits any looseness, replace ball joint.

**Lower Ball Joint (Pacer)** — Remove grease fitting from ball joint and insert a stiff wire or thin rod into hole until it contacts ball stud. Scribe mark on wire where it aligns with outer edge of hole. Measure distance from end of wire to scribe mark. If distance is greater than  $\frac{7}{16}$ ", ball joint should be replaced.

#### BUICK

**Upper Ball Joint** — If ball joint stud has any perceptible lateral shake, or if it can be twisted with no torque, replace ball joint.

**Lower Ball Joint** — Wear is indicated visually. A new ball joint will show a  $\frac{1}{16}$ " protrusion of round nipple into which grease fitting is installed. Replace ball joint if round nipple is flush or below surface of cover.

#### CADILLAC

**Upper Ball Joint (Exc. Seville)** — With car on stands, remove wheel and tire. Scribe an alignment mark between steering knuckle and camber eccentric. Loosen ball joint stud lock nut two turns. Use hammer to separate joint and knuckle and remove lock nut and washer from stud. Using joint stud nut and a second nut as a lock nut, turn joint in socket using an INCH lb. torque wrench. Reading should be between 24-48 INCH lbs. Replace ball joint if too tight or loose.

**Upper Ball Joint (Seville)** — If upper ball joint has any lateral shake or can be twisted by hand, ball joint should be replaced.

**Lower Ball Joint (Exc. Eldorado)** — Wear is inspected visually. A new ball joint will show a .050" protrusion of round nipple (at service plug). Replace ball joint if round nipple is flush or below surface of cover (see illustration).

**Lower Ball Joint (Eldorado)** — Raise vehicle and position stands under lower control arms. Clamp self-locking pliers on hub to drive axle nut so pliers are in horizontal position. Using a suitable stand, mount a dial indicator so indicator is horizontal and contacting pliers. Place pry bar between lower control arm and drive axle outer race, then pry down on bar.

**CAUTION** — Do not contact drive axle seal with pry bar or seal may become damaged internally. If reading on dial indicator exceeds .125", replace ball joint.

#### CHEVROLET

**Upper Ball Joint (All Models)** — Raise vehicle and support with jacks under each lower control arm between ball joint and spring pocket. Grasping wheel at top and bottom, move top of wheel with an in-and-out motion. Any looseness observed, without movement of steering knuckle, indicates worn ball joint and replacement is necessary.

**Lower Ball Joint (Exc. Corvette)** — Support vehicle on wheels or frame so lower ball joint is in a loaded condition. Ball joint features a visual wear indicator and is checked as follows: Wear is indicated by protrusion of  $\frac{1}{2}$ " diameter nipple into which the grease fitting is threaded. On a new, unworn joint, round nipple projects .050" beyond surface of ball joint cover. Normal wear will result in nipple retreating inward. If round nipple is flush with outside cover surface (see Fig. 1), ball joint must be replaced.

**Lower Ball Joint (Corvette)** — With vehicle weight supported under lower control arm, measure distance from grease fitting to end of threaded stud. Record dimension. Raise tire and knuckle assembly by levering under the tire. This will seat ball stud internally. Remeasure. If difference in measurements exceeds  $\frac{1}{16}$ ", the joint is worn and must be replaced.

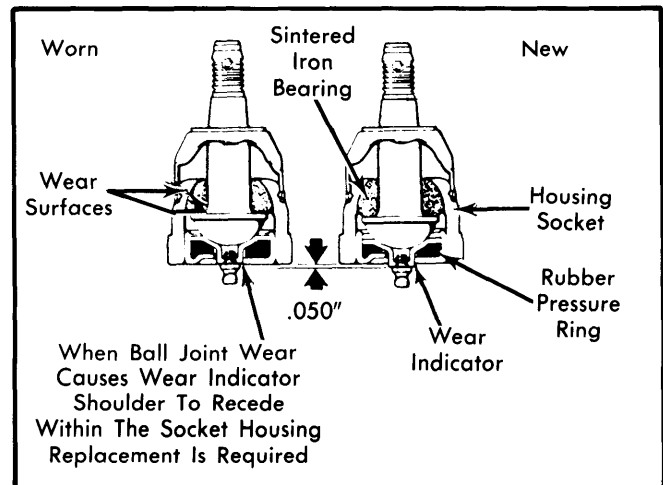


Fig. 1 General Motors Lower Ball Joint Wear Indicator (Ford Fairmont & Zephyr Similar)

#### CHRYSLER CORPORATION

**Lower Ball Joint (All Models)** — Raise vehicle and place on safety stands so weight of vehicle rests on control arms. Install dial indicator and clamp assembly to lower control arm. Zero indicator with plunger tip against knuckle arm. Raise and lower wheel using levering action under tire and measure axial travel of knuckle arm. If movement of knuckle arm relative to lower control arm exceeds .030", replace lower ball joint.

**Upper Ball Joint (All Models)** — Raise vehicle clear of floor with jack under lower control arm. Remove hubcap, grease cup and cotter pin. Tighten spindle nut to remove all bearing play. Lower vehicle until tire lightly contacts floor. Grasping top of tire, apply firm in-and-out motion and check for any movement at the ball joints between knuckle and upper control arm. If any looseness is observed, replace upper ball joint.

## BALL JOINT CHECKING (Cont.)

### FORD MOTOR CO.

**NOTE** — Three different types of front suspensions are used. Types are similar in design with the basic difference being in the location of the coil springs and shock absorbers. One type (enclosed coil) has the coil spring and shock absorber mounted between the lower and upper control arms. The second type (spring tower) has the coil spring and shock absorber mounted between the upper control arm and body. The third type has a single control arm. For further information and description, see appropriate article in SUSPENSION Section.

#### Suspension Systems

##### Application

##### Models

Enclosed Coil .....	Ford, Mercury, LTD II, Cougar, Thunderbird, Continental Mark V, Lincoln Continental, Pinto, Bobcat & Mustang II
Spring Tower .....	Granada, Monarch & Versailles
Single Control Arm .....	Fairmont & Zephyr

**CAUTION** — Suspension control arms must be replaced as complete units. Do not attempt to replace only ball joints or other subcomponent parts. Ball joint seals MAY be replaced, except in Mustang II, Pinto and Bobcat lower control arm.

**NOTE** — Before inspecting ball joints, adjust front wheel bearings.

**Upper Ball Joint (Enclosed Coil)** — Place floor jacks beneath lower control arms. Have assistant hold lower edge of tire, moving wheel in and out. Check for movement between upper end of spindle and upper control arm. Install new upper control arm if movement exists.

**Lower Ball Joint (Enclosed Coil)** — Place floor jacks under lower control arms. Attach a dial indicator to lower control arm so that plunger rests against inner side of wheel, next to lower ball joint. Holding tire at top and bottom, slowly move the tire in and out. If reading exceeds .250", replace lower control arm.

**Upper Ball Joint (Spring Tower)** — Place jacks under front crossmember, permitting wheel to drop to full-down position. Have assistant hold tire at top and bottom and slowly move tire in and out. Check for movement between upper end of spindle and upper control arm. Install new upper control arm if movement exists.

**Lower Ball Joint (Spring Tower)** — Place jacks under front crossmember, until wheel falls into the full-down position. Have assistant move lower edge of tire in and out, as you check for movement between the lower end of spindle and lower control arm. Install new lower control arm if movement exists.

**Lower Ball Joint (Single Arm)** — With vehicle resting on normal driving surface, wipe ball joint grease fitting and checking

surface free of all grease or dirt. The round boss into which the grease fitting is threaded (checking surface) should extend outside the ball joint cover. If round boss is inside cover, replace lower control arm assembly. Similar to Fig. 1. Ball joints and lower control arm bushings are not serviced separately. Replace entire control arm, bushing and ball joint assembly. Ball joint seals may be replaced, however.

### OLDSMOBILE (EXC. TORONADO)

**Upper Ball Joint** — Place dial indicator against wheel rim with vehicle raised on jack stands. Push in on bottom of tire while pulling out at top, reverse procedure. Difference on dial indicator should not exceed .125".

**Lower Ball Joint** — Raise vehicle and support under lower control arms. Visually inspect ball joint. Wear is indicated by protrusion of 1/2" diameter nipple in to which grease fitting is threaded. On a new or unworn ball joint, round nipple projects .050" beyond surface of ball joint cover. Normal wear will result in nipple retreating inward. If nipple has become recessed, ball joint must be replaced.

### OLDSMOBILE TORONADO

**Vertical Check** — Place car on floor stands positioned under lower control arms. Place dial indicator on stand. Clamp self-locking pliers on hub to drive axle nut so that pliers are in horizontal position. Make sure that indicator button contacts pliers. Place pry bar between lower control arm and drive axle outer race and pry down on bar. If reading on dial indicator exceeds .125", replace ball joint.

### PONTIAC

**Upper Ball Joint (Except Sunbird)** — Raise the vehicle and support with stands beneath lower control arms. Stands should be placed between ball joint and spring pocket. Grasping wheel at top and bottom, move top of wheel with firm in-and-out motion. Any looseness observed, without movement of steering knuckle, indicates worn ball joint and replacement is necessary.

**Upper Ball Joint (Sunbird)** — If ball joint stud has any measureable lateral play, ball joint must be replaced.

**Lower Ball Joint (All Models)** — Wear is inspected visually. A new ball joint will show a .050" protrusion of round nipple into which grease fitting is installed. Replace ball joint if round nipple is flush or below surface of cover.