

2002-04 SUSPENSION

Front - RAV4

DESCRIPTION

Vehicles are equipped with front wheel drive and independent MacPherson strut (shock absorber) front suspension. RAV4 can also be equipped with all wheel drive. Suspension consists of vertically mounted strut assemblies, control arms, and stabilizer bar. Shock absorbers are mounted between inner fender and steering knuckle. Tie rod ends connect rack and pinion steering to steering knuckle. Ball joint connects steering knuckle to lower control arm. A suspension crossmember is used. A stabilizer bar attaches to lower control arms.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See:

- 2002 Models - SPECIFICATIONS article in WHEEL ALIGNMENT.
- 2003 Models - SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.
- 2004 Models - SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT.

BALL JOINT INSPECTION

NOTE: Ball joint must be removed for the following inspection procedure. See LOWER CONTROL ARM and BALL JOINTS under REMOVAL & INSTALLATION.

Remove ball joint and place in vise, with ball joint stud pointing upward. Flip stud back and forth about 5 times. Reinstall ball joint nut. Place torque wrench on ball joint nut and turn nut continuously 1 turn every 3-5 seconds. Read torque measurement on 5th turn. See BALL JOINT TURNING TORQUE SPECIFICATIONS table. If torque is not within specification, replace ball joint.

BALL JOINT TURNING TORQUE SPECIFICATIONS

Application	INCH Lbs. (N.m)
RAV4	8.7-43 (1-4.8)

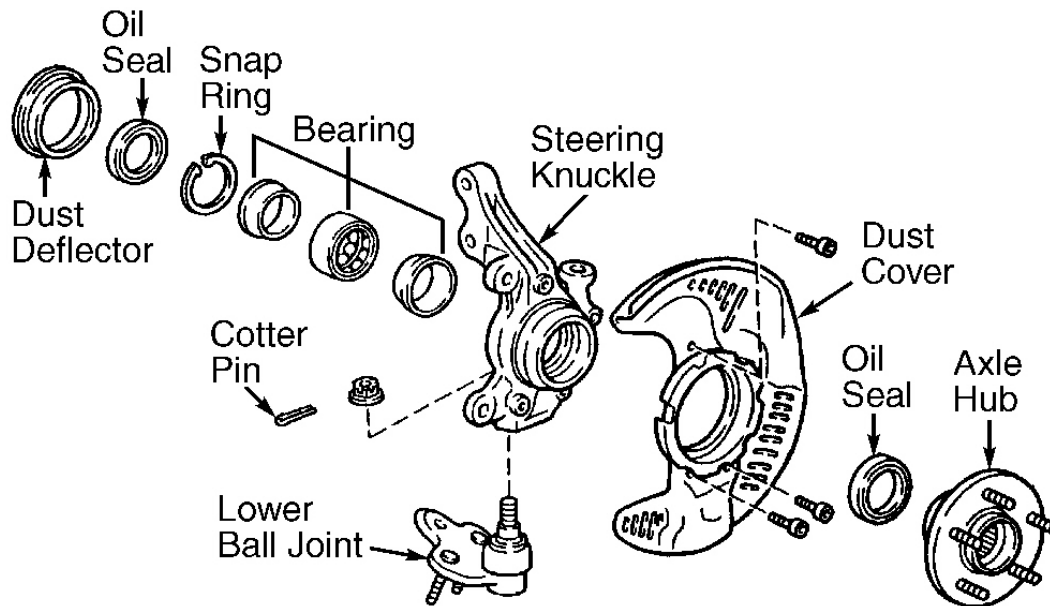
WHEEL BEARING INSPECTION

NOTE: Wheel bearings are not adjustable. Whenever bearings are removed, replace with NEW bearings, races and oil seals.

1. Remove front wheel. Remove brake caliper and disc. Support caliper out of way. Using dial indicator

placed near center of axle hub, check backlash by moving hub in bearing shaft direction. If backlash exceeds .002 in. (.05 mm), replace bearing.

2. Check deviation at axle hub surface, outside of hub bolt by moving hub with twisting motion. If deviation is more than .0028 in. (.05 mm.), replace bearing. Reinstall disc, brake caliper and front wheel. See **Fig. 1**.



G00006667

Fig. 1: Identifying Hub Components

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL & INSTALLATION

FRONT AXLE HUB & WHEEL BEARING

Removal

1. Remove front wheel. Check wheel bearing backlash and deviation (rotational free play). See **WHEEL BEARING INSPECTION** under ADJUSTMENTS & INSPECTION.
2. Remove cotter pin and lock nut cap. Hold drive shaft from turning by applying brakes and remove drive shaft lock nut. Remove brake caliper and disc and support caliper out of way.
3. On RAV4 with ABS, remove ABS speed sensor and wire harness clamp. Loosen 2 nuts on lower end of shock absorber (DO NOT remove).
4. Remove cotter pin and nut from tie rod end. Use separator tool to disconnect tie rod end from steering knuckle.

5. Remove 2 nuts and 1 bolt and disconnect lower ball joint from lower control arm. Remove 2 nuts and bolts from lower end of shock absorber. Remove steering knuckle and axle hub from vehicle. See **Fig. 1** .
6. Mount assembly in vise. Carefully pry dust deflector from hub. Remove cotter pin and nut, and use separator tool to remove lower ball joint from hub assembly.
7. Use slide hammer and attaching plate to remove axle hub. Place axle hub on press and use appropriate support plates to press inner bearing race from axle hub. Remove Torx bolts and remove dust cover.
8. Remove wheel bearing snap ring, if equipped. Place inner race against outside of bearing and press wheel bearing from axle hub. See **Fig. 1** .

Installation

To install, reverse removal procedure. Use NEW snap ring after pressing in NEW wheel bearing. Use NEW cotter pins. Tighten bolts to specifications. See **TORQUE SPECIFICATIONS** .

SHOCK ABSORBER

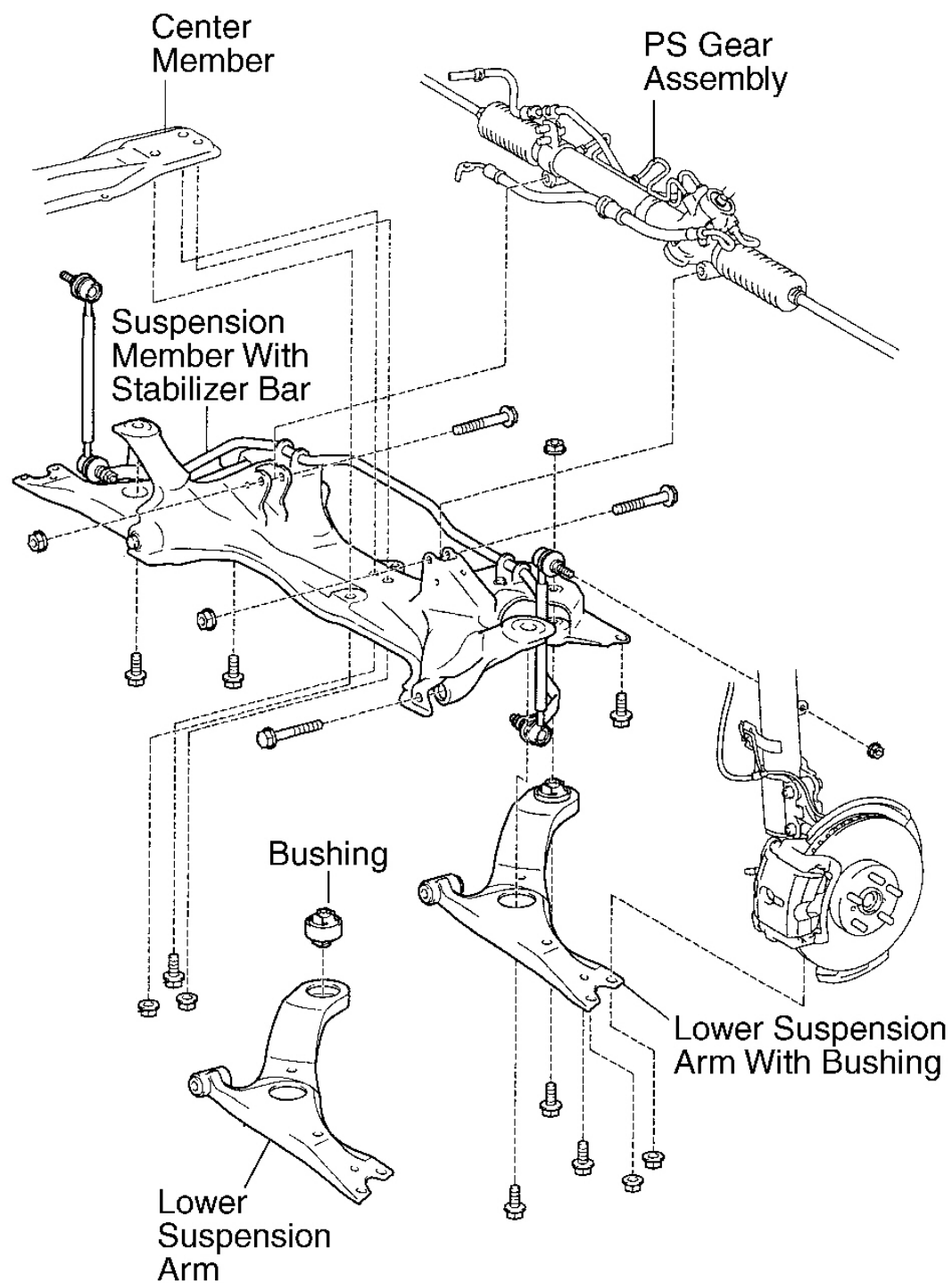
Removal & Installation

1. Remove front wheel. Disconnect brake hose and ABS speed sensor clamp from shock absorber.
2. Remove 2 lower shock absorber nuts and bolts and disconnect shock absorber from steering knuckle. Remove 3 upper shock absorber mounting nuts from inside engine compartment and remove shock absorber with coil spring.
3. To install, reverse removal procedure. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .

LOWER CONTROL ARM

Removal & Installation

1. Remove front wheel. Remove stabilizer bar. See **STABILIZER BAR** .
2. Disconnect lower control arm from lower ball joint by removing bolt and 2 nuts. Remove nut and 2 bolts and disconnect lower control arm bracket. See **Fig. 2** .
3. Remove 2 power steering gear assembly mounting bolts and nuts. Remove 5 bolts and 2 center member set nuts and disconnect center member from front suspension member. Support front suspension crossmember with a jack. Lower suspension crossmember from vehicle, with control arms attached.
4. Remove bolt and remove lower control arm.
5. To install, reverse removal procedure. Tighten bolts and nuts to specification. See **Fig. 3** . See **TORQUE SPECIFICATIONS** .

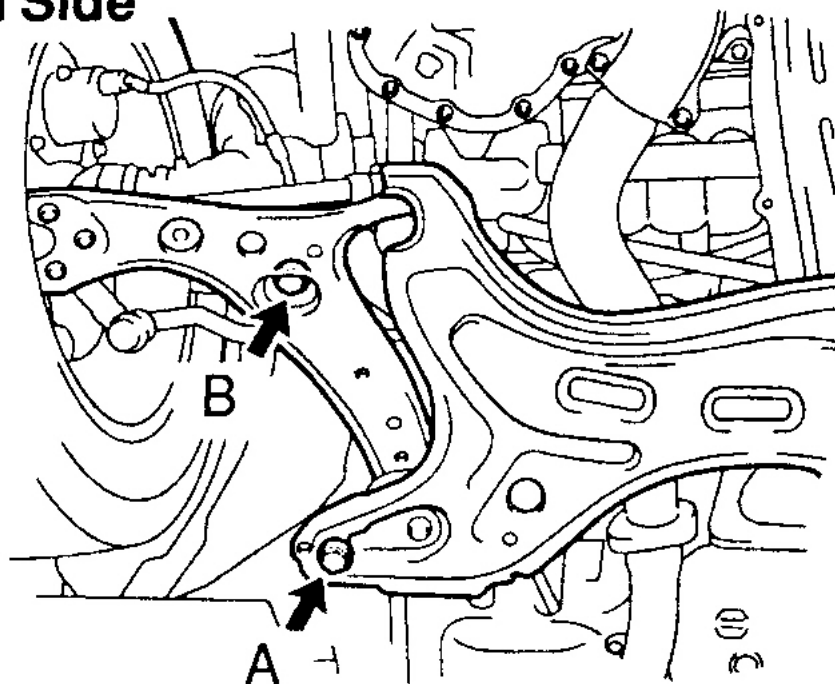


G00029047

Fig. 2: Exploded View Of Lower Control Arm & Related Components

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

RH Side



LH Side

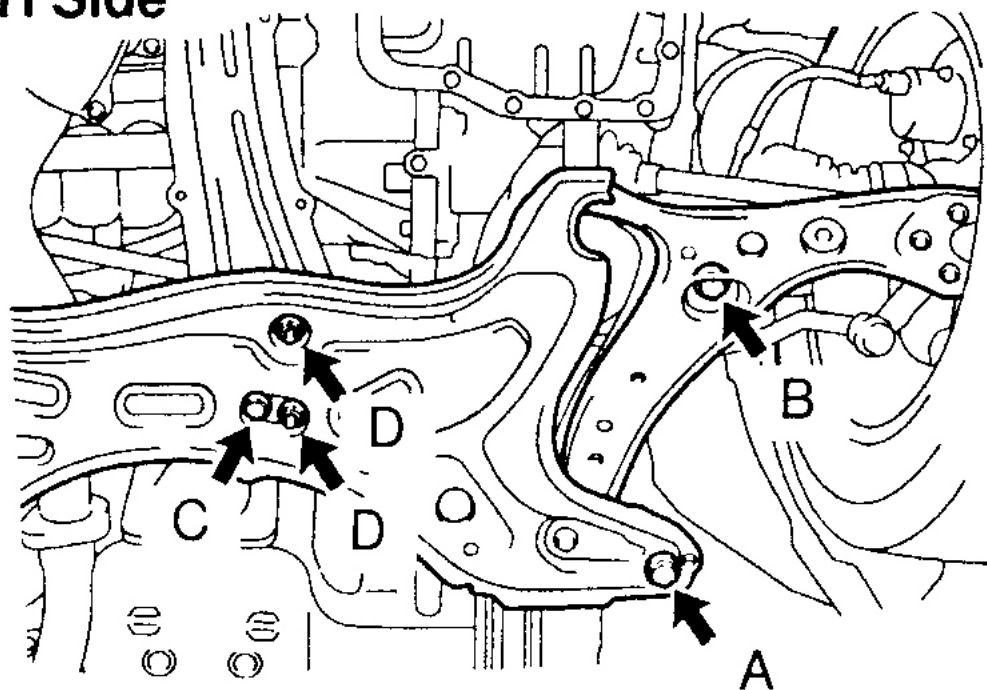


Fig. 3: Locating Suspension Crossmember Bolts & Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

BALL JOINTS

Removal & Installation

- 1. Remove steering knuckle with axle hub. See **FRONT AXLE HUB & WHEEL BEARING** . Using screwdriver, pry off dust cover. Remove cotter pin and nut. Use ball joint removal tool to remove lower ball joint from axle hub assembly.
- 2. To install, reverse removal procedure. Check ball joint turning torque. See **BALL JOINT CHECKING** under ADJUSTMENTS & INSPECTION. Install NEW cotter pin and NEW dust cover.

STABILIZER BAR

Removal & Installation

- 1. Remove both front wheels. Remove 4 nuts and remove both stabilizer bar links (2 nuts at each end). See **LOWER CONTROL ARM** .
- 2. Remove 2 bolts, bracket and bushing. Remove stabilizer bar.
- 3. To install, reverse removal procedure. Install bushing, with cut out facing toward rear, on outside of paint line on stabilizer bar. Tighten all bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Brake Caliper Mounting Bolts-To-Steering Knuckle	79 (107)
Brake Hose Clamp Bolt	14 (19)
Drive Axle Nut	159 (216)
Lower Ball Joint-To-Steering Knuckle	98 (133)
Lower Control Arm-To-Ball Joint Nuts & Bolt	94 (128)
Lower Control Arm Bushing-To-Suspension Crossmember Bolts	101 (137)
Lower Control Arm Bracket Bolts & Nuts	101 (137)
Power Steering Gear Mounting Bolts	97 (131)
Shock Absorber Center Nut	35 (47)
Shock Absorber Lower Nuts	106 (143)
Shock Absorber Upper Nuts	59 (80)
Stabilizer Bar Bracket Bolts	21 (29)
Stabilizer Bar Link Nuts	54 (73)
Suspension Crossmember Bolts & Nuts ⁽¹⁾	
Outer Rear Bolts ("A")	116 (157)
Front Bolts ("B")	82 (113)

Center Bolts ("C")	53 (72)
Center Nuts ("D")	53 (72)
Tie Rod End Nut	36 (49)
INCH Lbs. (N.m)	
ABS Speed Sensor Wire Harness Clamp Bolt	44 (5.0)
ABS Speed Sensor Bolt	71 (8.0)
Axle Hub Dust Cover Bolts	74 (8.3)
Font Suspension Clamp (A/T Only)	74 (8.3)
(1) See Fig. 3 .	