

2002 SUSPENSION

Front - Sedona

DESCRIPTION

An independent MacPherson strut type front suspension is used on these vehicles. Vertical shock absorbing MacPherson struts attach to the top of the steering knuckle and to the front strut tower.

This interconnection between the steering knuckle and the body of the vehicle provides for the correct steering knuckle position. This steering knuckle position provides for the correct front caster and camber settings for the vehicle, at the time the vehicle is designed. Lower arms are attached inboard to the front suspension subframe and outboard to the bottom of the steering knuckle. Attachment of the lower arm to the steering knuckle is done through a ball joint in the lower arm. During steering maneuvers, the strut and the steering knuckle (through the ball joint and a pivot bearing in the strut's upper retainer) turn as an assembly.

This vehicle uses one piece subframe for the front suspension. The subframe is used as the attaching points for the lower arm, stabilizer bar, tension rod and steering gear. The subframe is mounted to the body of the vehicle at four points.

The front suspension knuckle is not a repairable component of the vehicle front suspension. It must be replaced, if bent, broken or damaged in any way, do not attempt to straighten or repair the steering knuckle. Service replacement of the front hub/bearing assembly can be done with the front steering knuckle remaining on the vehicle.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See FRONT WHEEL ALIGNMENT PROCEDURE article in WHEEL ALIGNMENT.

TROUBLESHOOTING

Abnormal Noise From Suspension

Poor lubrication or wear of lower arm ball joint, shock absorber malfunction, worn or deteriorated stabilizer bar bushing.

Body Rolls

Deteriorated stabilizer bar and stabilizer control links, worn or deteriorated stabilizer bar bushing, shock absorber malfunction.

Heavy Steering Wheel Operation

Poor lubrication or wear of lower arm ball joint, improperly adjusted wheel alignment, steering system

malfunction, deformed or unbalanced wheel.

Instable Riding

Weak coil spring, shock absorber malfunction, worn or deteriorated lower arm bushing, worn or deteriorated stabilizer bar bushing, improperly adjusted wheel alignment, damaged lower arm ball joint, steering system malfunction, deformed or unbalanced wheel.

Poor Riding Comfort

Weak coil spring, shock absorber malfunction.

Steering Pulls To One Side

Weak coil spring, worn or deteriorated stabilizer bar bushing, worn or deteriorated lower control arm bushing, damaged lower arm ball joint, improperly adjusted wheel alignment, steering system malfunction, brake system malfunction, deformed or unbalanced wheel.

Steering Wheel Does Not Return

Lower control arm ball joint stuck or damaged, improperly adjusted wheel alignment, steering system malfunction, deformed or unbalanced wheel.

Steering Wheel Vibrates

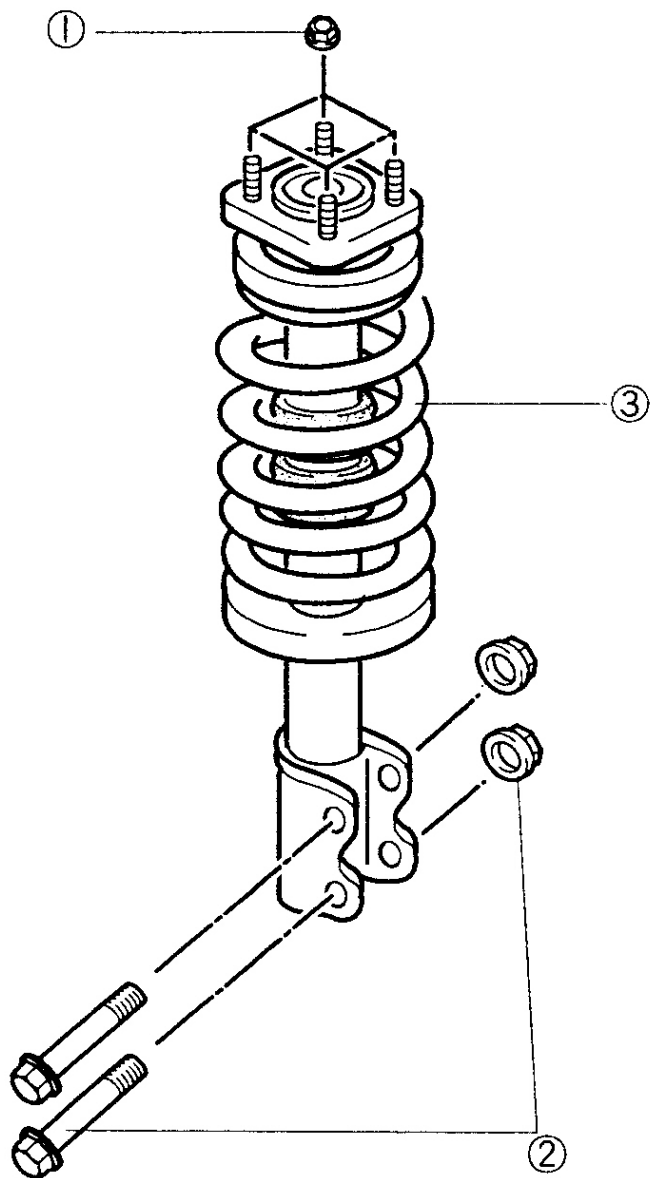
Damaged lower control arm ball joint, shock absorber malfunction, loose shock absorber installation, worn or deteriorated lower arm bushing, worn or deteriorated stabilizer bar bushing, improperly adjusted wheel alignment, worn or damaged wheel bearing, steering system malfunction, deformed or unbalanced wheel.

REMOVAL & INSTALLATION

FRONT SHOCK ABSORBER & COIL SPRING

Removal

For an exploded view of the shock absorber and the coil spring, see **Fig. 1** .



- (1) Nut
- (2) Bolt and nut
- (3) Shock absorber and coil spring

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Fig. 1: Exploded View Of Shock Absorber & Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

1. Lift vehicle and support with safety stands.

2. Remove wheel and tire assembly.
3. Remove the brake hose and the speed sensor cable from routing bracket on the shock absorber strut assembly.
4. Remove the 2 shock absorber strut mounting nuts and bolts securing the spring and shock assembly to front wheel knuckle.
5. Remove the 4 front shock absorber upper mounting nuts.
6. Remove the shock absorber assembly from vehicle.

Installation

1. Position the shock absorber assembly into the wheel housing. Be sure of the direction indicator on the front shock absorber upper mounting bracket.
2. Secure the front shock absorber upper mounting bracket to the shock tower with nuts. Tighten the front shock absorber upper mounting bracket nuts. See **TORQUE SPECIFICATIONS** .
3. Install the front shock absorber assembly to the front wheel knuckle. Tighten the shock absorber knuckle attaching nuts. See **TORQUE SPECIFICATIONS** .
4. Position the hydraulic brake hose and speed sensor cable to the shock absorber assembly.
5. Install the wheel and tire assembly and tighten nuts. See **TORQUE SPECIFICATIONS** .
6. Lower the vehicle.
7. Check the front wheel alignment. See **FRONT WHEEL ALIGNMENT PROCEDURE**

FRONT SUSPENSION

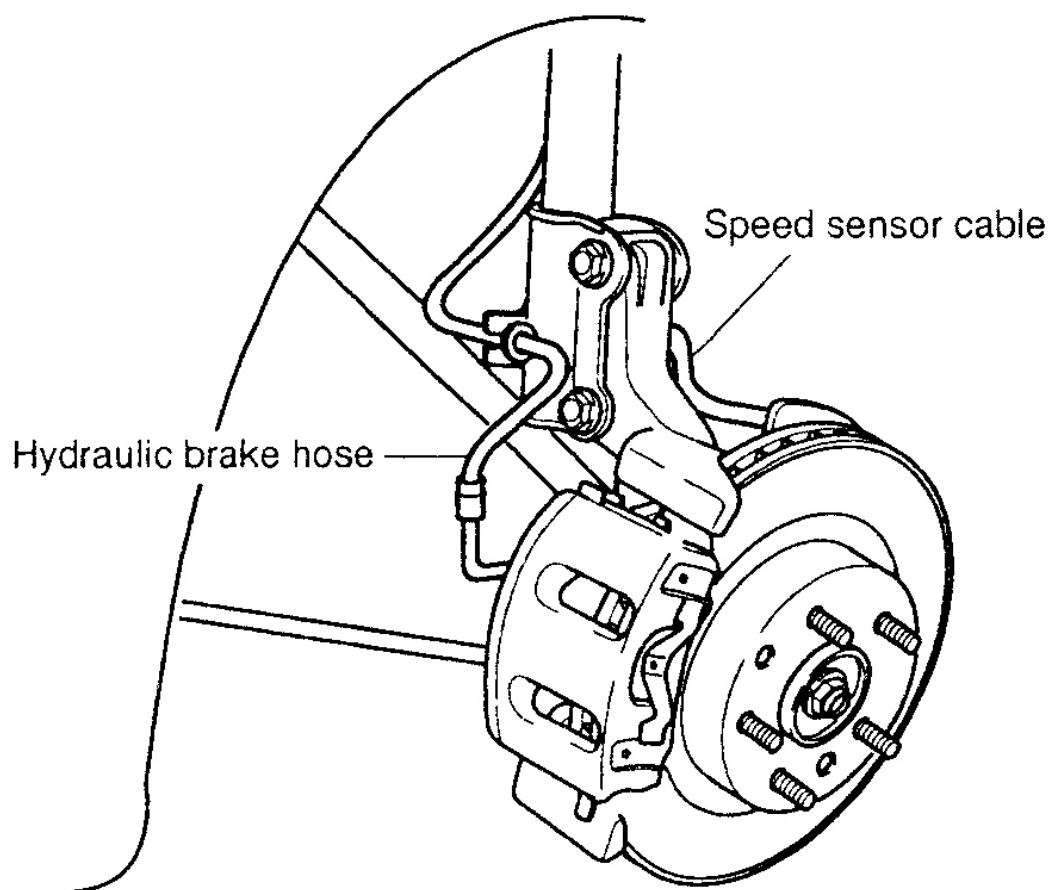
Removal

For an exploded view of the front suspension and sub frame, see **Fig. 2** .

NOTE: Care must be taken not to separate the inner C/V joint during this operation.

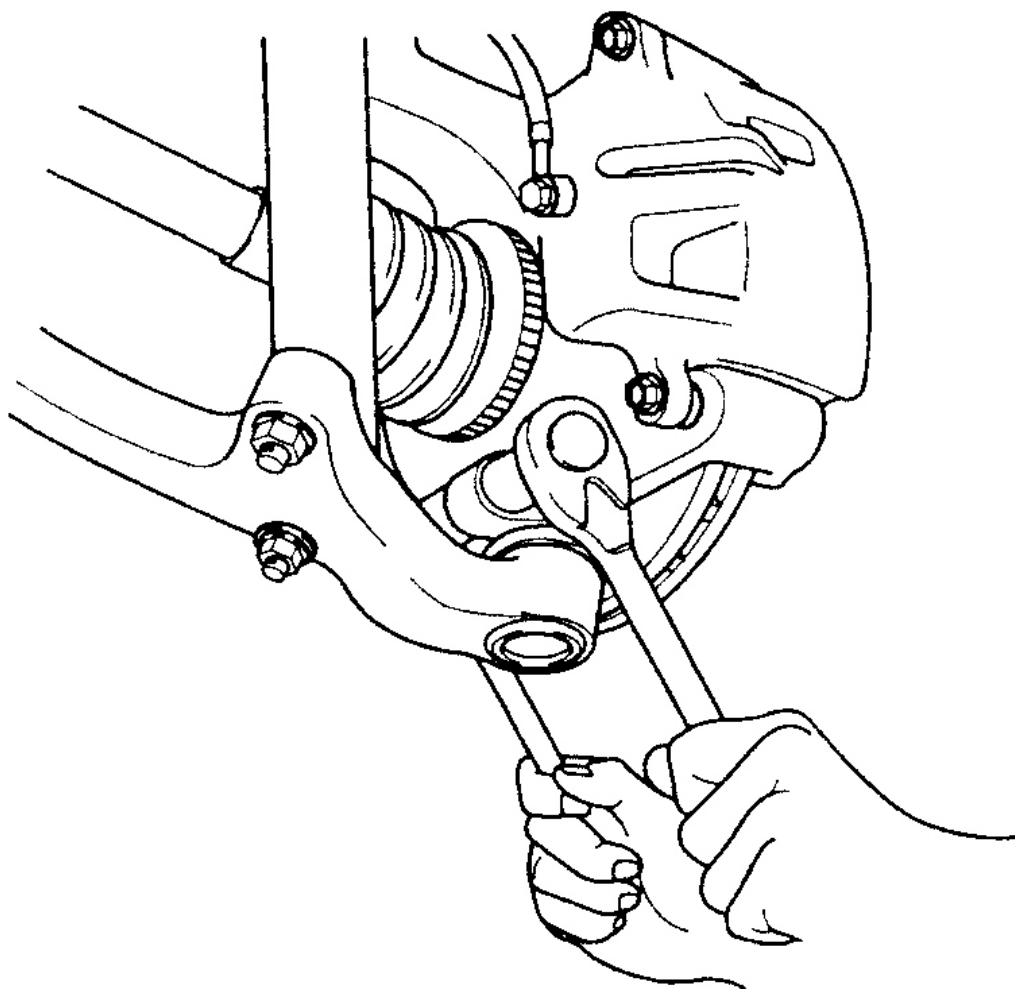
NOTE: DO NOT allow driveshaft to hang by inner C/V joint after removing outer C/V joint from the hub/bearing assembly in steering knuckle.

9. Pull steering knuckle out and away from the outer C/V joint of the driveshaft. See **Fig. 7**.
10. Remove the steering knuckle from the front shock absorber assembly after loosening bolts and nuts.
11. Remove four nuts attaching the front shock absorber assembly upper mount.
12. Remove the lower control arm from the subframe after loosening bolt and nut.
13. Mark alignment of tension rod nuts and spacer washers before loosening tension rod nuts. See **Fig. 8**.
14. Remove the tension rod from the subframe.
15. Remove the stabilizer bar from the subframe after loosening bolts installed to subframe.
16. Remove the exhaust pipe.
17. Remove the fixed bracket after removing the power steering rack and pinion.
18. Support engine with engine support bar SST (0K201 170 AA0).
19. Remove the engine mounting No.1 and 2 from the subframe.
20. Remove mounting bolt and nuts of the impact bar.
21. Remove the subframe.



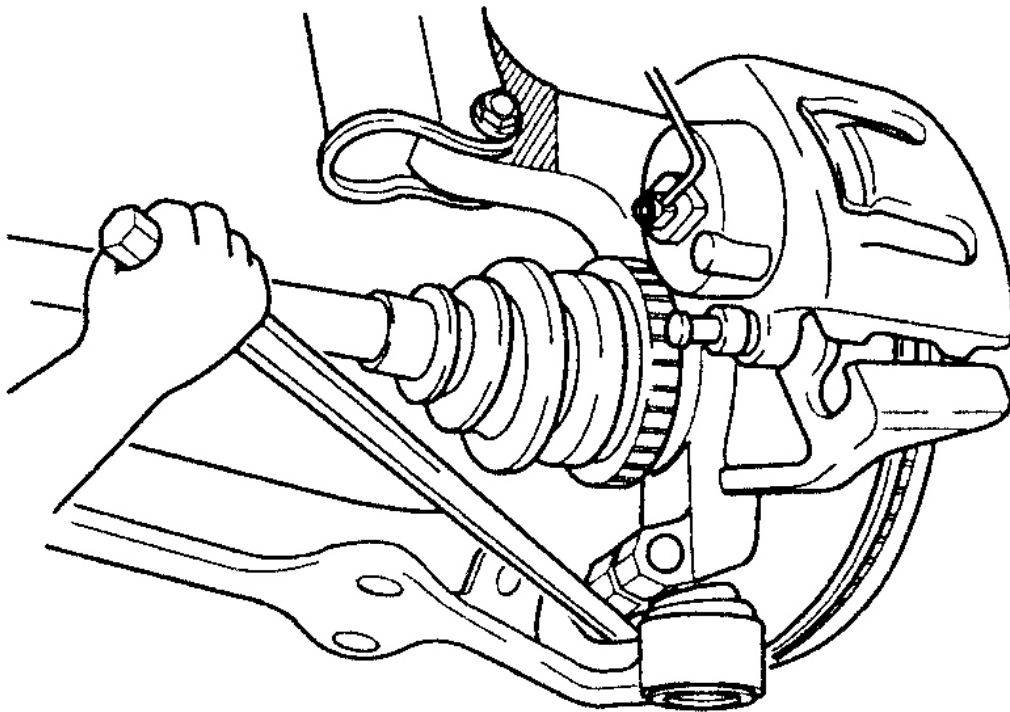
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Fig. 3: Disconnecting Brake Hose & Speed Sensor Cable From Routing Bracket
Courtesy of KIA MOTORS AMERICA, INC.



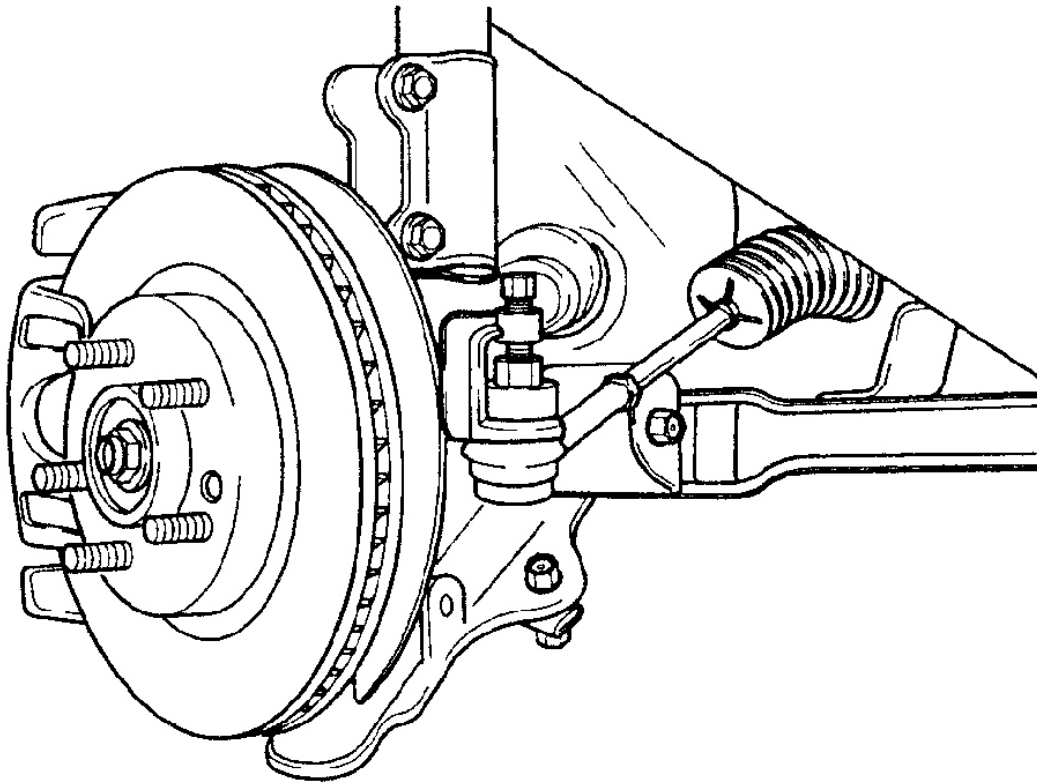
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Fig. 4: Removing Lower Arm Ball Joint Bolt & Nut
Courtesy of KIA MOTORS AMERICA, INC.



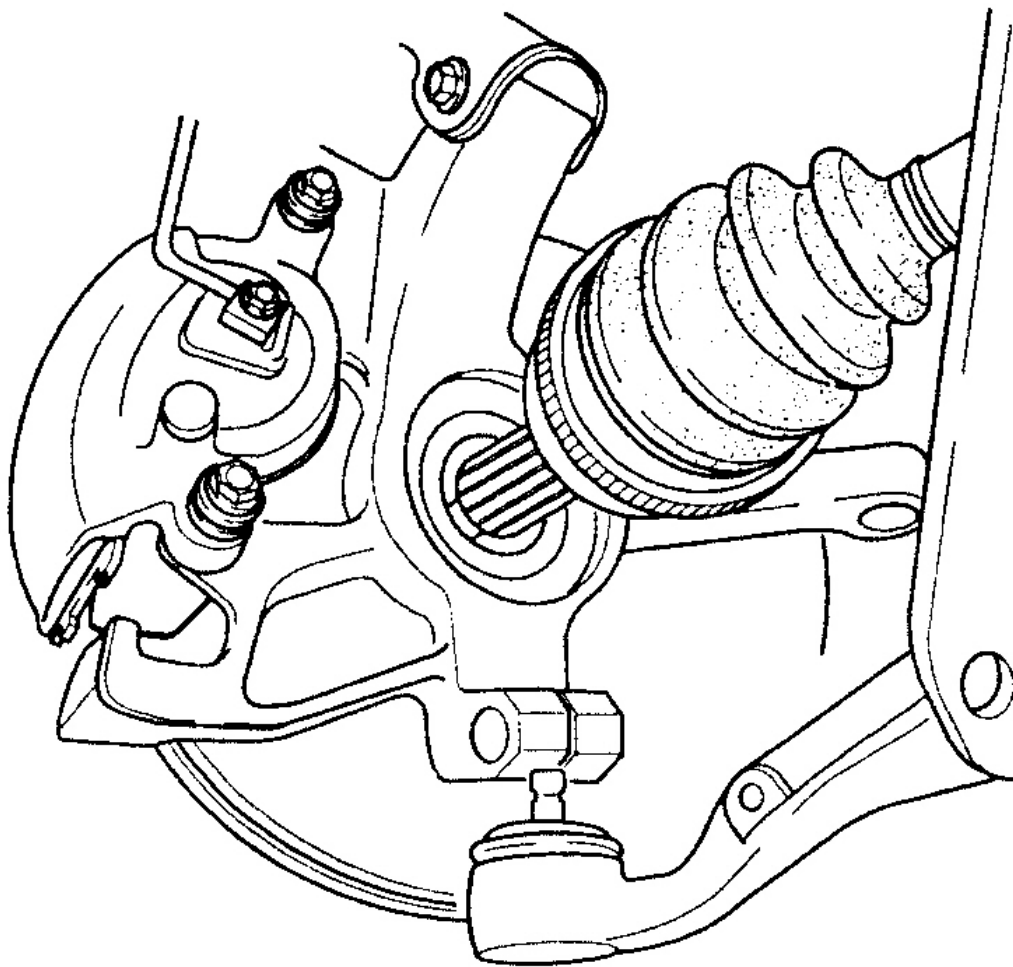
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Fig. 5: Using Pry Bar To Separate Steering Knuckle From Lower Control Arm
Courtesy of KIA MOTORS AMERICA, INC.



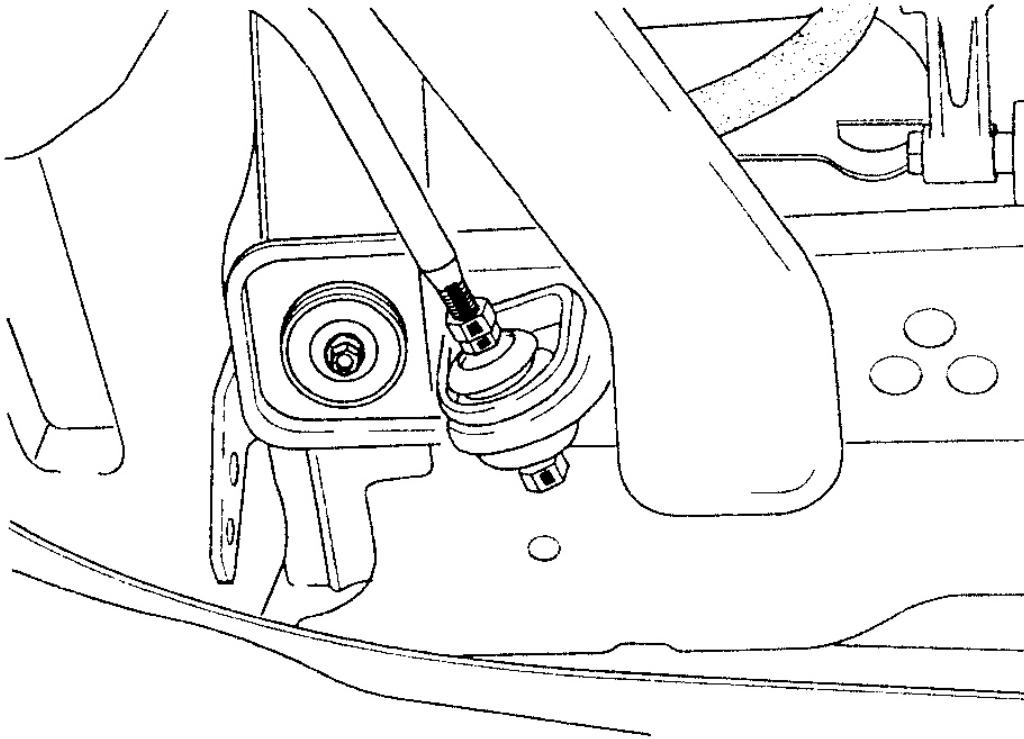
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Fig. 6: Disconnecting Tie Rod End
Courtesy of KIA MOTORS AMERICA, INC.



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Fig. 7: Pulling Steering Knuckle Away From C/V Joint
Courtesy of KIA MOTORS AMERICA, INC.



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Fig. 8: Marking Alignment Of Tension Rod Nuts & Spacer Washers
Courtesy of KIA MOTORS AMERICA, INC.

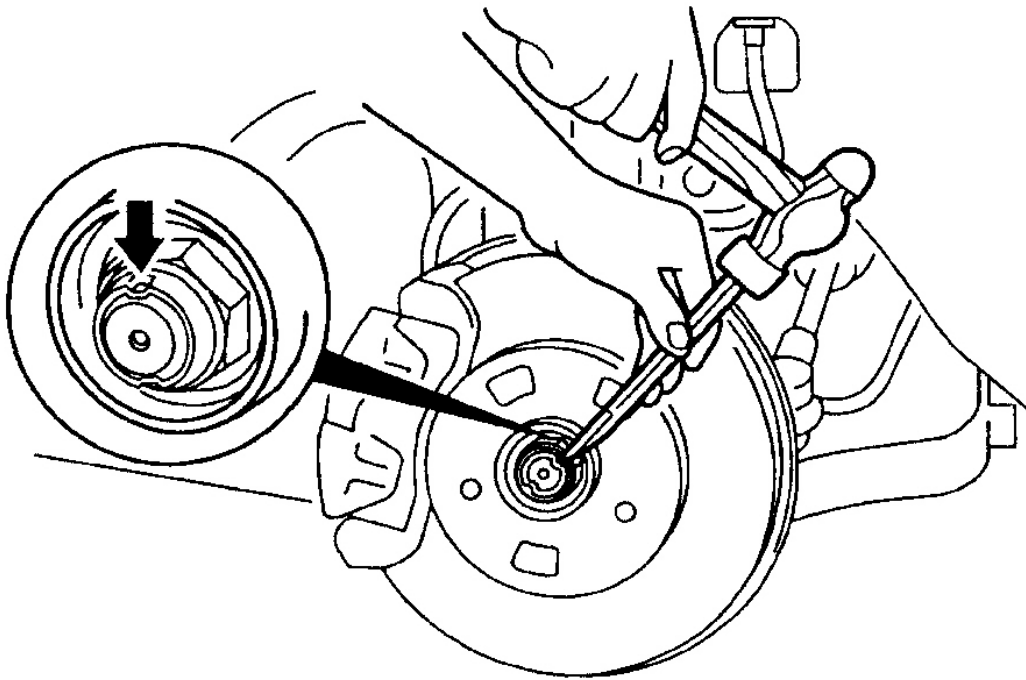
Installation

1. Tighten the subframe bolts. See **TORQUE SPECIFICATIONS** .
2. Install the impact bar to the subframe and tighten bolts and nuts. See **TORQUE SPECIFICATIONS** .
3. Install the engine mounting No. 1 and No. 2 to the subframe and tighten bolts and nuts.
4. Install the power steering rack and pinion to the subframe. See **TORQUE SPECIFICATIONS** .

NOTE: **Be careful not to damage oil seal when installing.**

5. Install the exhaust pipe.
6. Remove the engine support bar SST (0K201 170 AA0) from engine.
7. Install the stabilizer bar and stabilizer bar plate to the subframe and tighten bolts. See **TORQUE SPECIFICATIONS** .
8. Pull lower arm into the side of the subframe and then tighten lower arm and subframe with bolts and nuts. See **TORQUE SPECIFICATIONS** .

9. Tighten tension rod nuts after aligning with mark made. See **TORQUE SPECIFICATIONS** .
10. Install the front shock absorber assembly upper mount and tighten nuts to specified torque. See **TORQUE SPECIFICATIONS** .
11. Install the steering knuckle to shock absorber strut bracket and tighten nuts and bolts. See **TORQUE SPECIFICATIONS** .
12. Slide driveshaft back into the front hub and bearing assembly.
13. Install tension rod to the lower arm and tighten bolts and nuts. See **TORQUE SPECIFICATIONS** .
14. Attach the lower arm ball joint to the front wheel knuckle and tighten the lower arm ball joint nut and bolt. See **TORQUE SPECIFICATIONS** .
15. Install the stabilizer to the lower arm and tighten the stabilizer bolts. See **TORQUE SPECIFICATIONS** .
16. Attach the tie rod end to the front wheel knuckle. Tighten the tie rod nut and then install a new tie rod end cotter pin.
17. Install the hydraulic brake hose and the speed sensor cable to routing bracket on the strut assembly.
18. Install a new driveshaft lock nut and stake it. See **Fig. 9** .
19. Install front wheel and tire assembly and tighten nuts. See **TORQUE SPECIFICATIONS** .
20. Lower vehicle.
21. Set front wheel alignment on vehicle to required specification. See **FRONT WHEEL ALIGNMENT PROCEDURE** article in WHEEL ALIGNMENT.



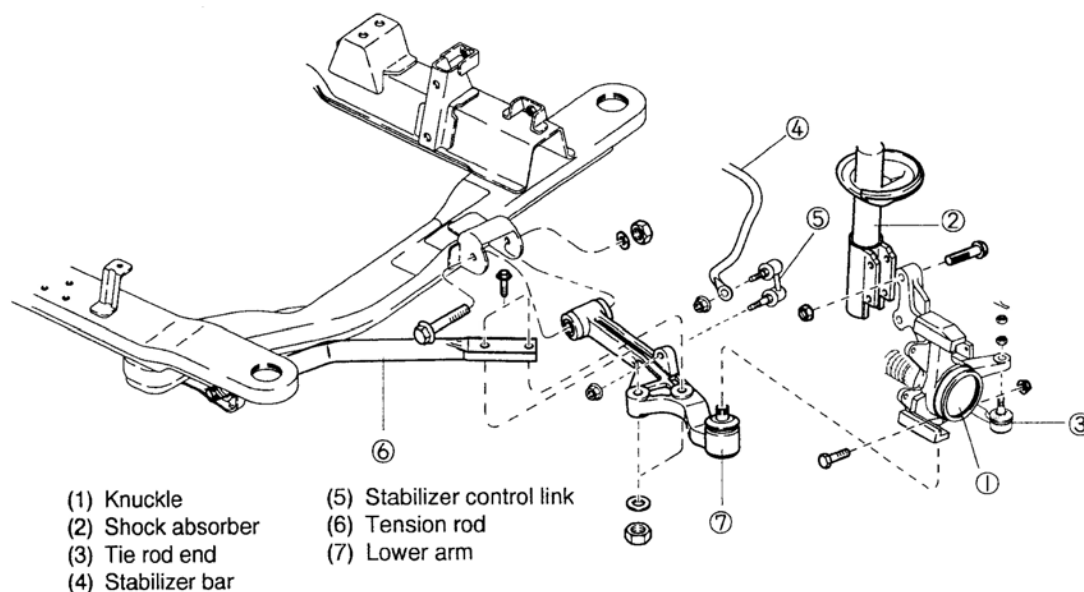
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Fig. 9: Staking Driveshaft Lock Nut
Courtesy of KIA MOTORS AMERICA, INC.

LOWER CONTROL ARM

Removal

For an exploded view of the lower control arm, see **Fig. 10** .



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Fig. 10: Exploded View Of Lower Arm
 Courtesy of KIA MOTORS AMERICA, INC.

1. Lift vehicle and support with safety stands.
2. Remove wheel and tire assembly.
3. Remove stabilizer control link nut on the lower control arm.
4. Remove the tension rod from the lower control arm after loosening 2 bolts and nuts.

NOTE: Use caution when separating lower control arm from steering knuckle, so ball joint seal does not get cut.

5. Remove the lower arm ball joint bolt and nut from steering knuckle.
6. Using prybar, separate the steering knuckle from the lower control arm.
7. Remove the lower control arm from the subframe after loosening bolt and nut.

Installation

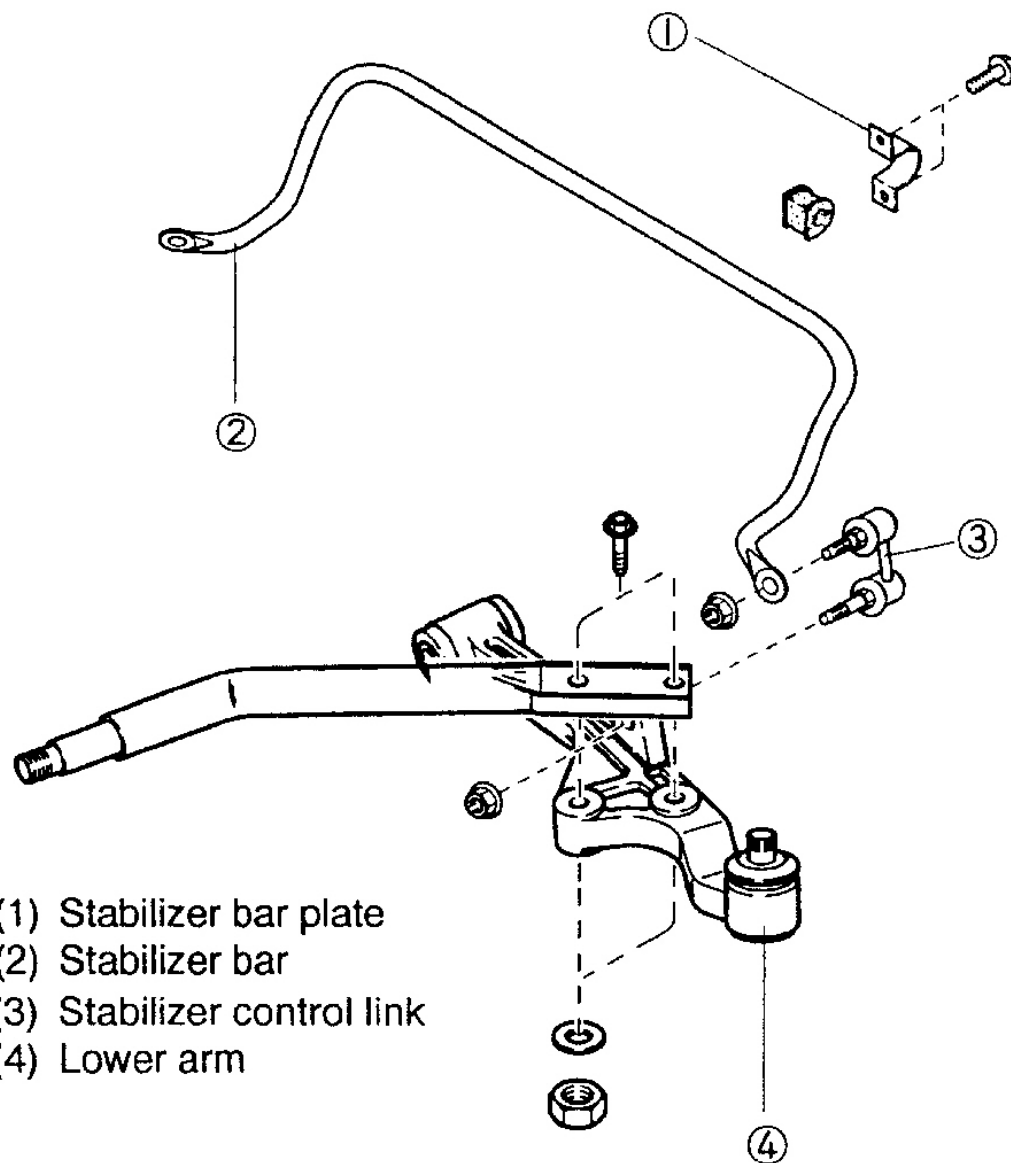
1. Position the front lower control arm to the subframe and secure it with bolt. Tighten the lower arm nut. See **TORQUE SPECIFICATIONS**.
2. Position the front lower arm ball joint into the steering knuckle.
3. Tighten the lower arm ball joint bolt and nut to steering knuckle. See **TORQUE SPECIFICATIONS**.
4. Install the tension rod to the lower arm. Tighten bolts and nuts. See **TORQUE SPECIFICATIONS**.
5. Tighten the stabilizer control link nut to the stabilizer bar. See **TORQUE SPECIFICATIONS**.
6. Tighten the stabilizer control link nut on the lower control arm.

7. Install wheel and tire assembly.
8. Lower the vehicle.
9. Check the front wheel alignment. See **FRONT WHEEL ALIGNMENT PROCEDURE** article in WHEEL ALIGNMENT.

STABILIZER

Removal

For an exploded view of the stabilizer assembly, see **Fig. 11** .



- (1) Stabilizer bar plate
- (2) Stabilizer bar
- (3) Stabilizer control link
- (4) Lower arm

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Fig. 11: Identifying Stabilizer Assembly
Courtesy of KIA MOTORS AMERICA, INC.

1. Lift front of vehicle and support it with safety stands.
2. Remove wheel and tire.
3. Remove stabilizer from control link.
4. Remove control link from the lower control arm.

- 5. Remove the exhaust pipe.
- 6. Position a suitable transaxle jack under the transaxle and secure it to the transaxle.
- 7. Remove the engine mounting No. 1 and No. 2 from the subframe.
- 8. Remove stabilizer mounting bolts from the subframe.
- 9. Remove the stabilizer bar.

Installation

NOTE: **DO NOT change replacement direction of the stabilizer control link when installing.**

- 1. Align the stabilizer bushing with the steel clamp on the stabilizer bar. Locate the bushing adjacent to the position line on stabilizer bar.
- 2. Position stabilizer behind the subframe.
- 3. Raise the subframe into place and tighten engine mounting No. 1 and No. 2 bolts and nuts to specified torque. See **TORQUE SPECIFICATIONS** .
- 4. Tighten the stabilizer mounting bolts to the subframe. See **TORQUE SPECIFICATIONS** .
- 5. Install the exhaust pipe.

NOTE: **Tighten the 2 control link nuts to specified torque before lowering vehicle.**

- 6. Install the stabilizer control link to the lower arm and stabilizer bar and then tighten 2 control link nuts. See **TORQUE SPECIFICATIONS** .
- 7. Remove the jack stand from under transaxle.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Impact Bar-To-Subframe Bolt	65-85 (88-115)
Impact Bar-To-Subframe Nut	88-101 (119-137)
Lower Control Arm-To-Subframe Bolts	88-101 (119-137)
Control Link Nuts	69-85 (93-115)
Driveshaft Lock Nut	177-199 (240-270)
Lower Control Arm Ball Joint-To-Steering Knuckle Bolt	69-85 (93-115)
Lower Control Arm-To-Front Wheel Knuckle Bolt & Nut	69-85 (93-115)
Lower Control Arm-To-Subframe Bolt	88-101 (119-137)
Power Steering Rack & Pinion-To-Subframe Bolts & Nuts	55-69 (74-93)
Shock Absorber Assembly Upper Mounting Nuts	34-46 (46-62)
Shock Absorber Knuckle Attaching Nuts	88-101 (119-137)
Shock Absorber Mounting Bracket Nuts	33-46 (46-62)

Stabilizer Bar & Plate-To-Subframe Bolts	16-20 (21-26)
Stabilizer Control Link Nut-To-Stabilizer Bar Nut	69-85 (93-115)
Stabilizer-To-Lower Control Arm Bolts	69-85 (93-115)
Steering Knuckle-To-Shock Absorber Strut Bracket	88-101 (119-137)
Subframe Bolts	88-101 (119-137)
Tension Rod Nuts	115-130 (157-177)
Tension Rod-To-Lower Control Arm Bolts & Nuts	88-101 (119-137)
Wheel & Tire Assembly Nuts	65-79 (88-108)