

Front Suspension

Specifications

Fastener Tightening Specifications

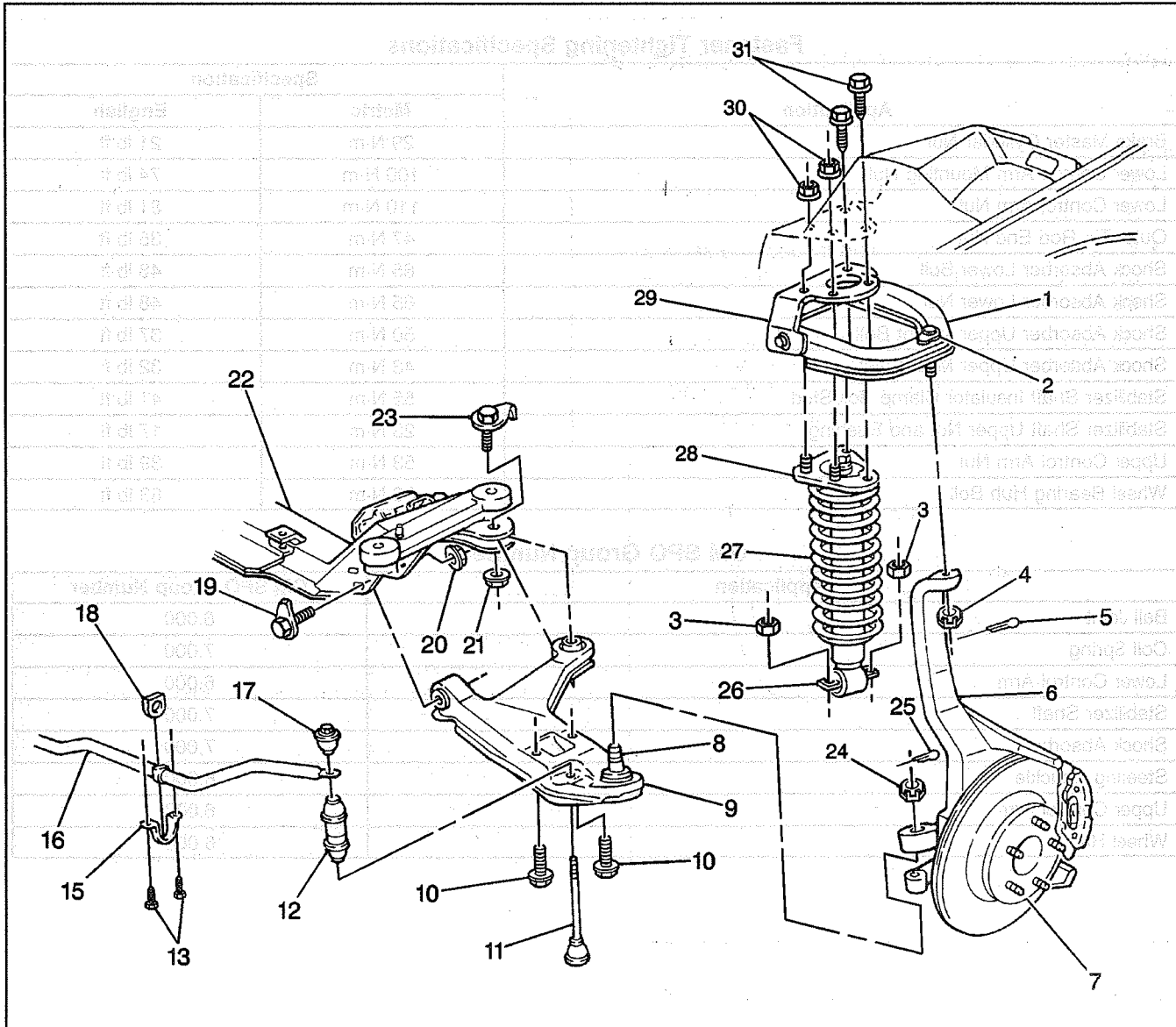
Application	Specification	
	Metric	English
Brake Master Cylinder Nut	29 N·m	21 lb ft
Lower Control Arm Mounting Nut	100 N·m	74 lb ft
Lower Control Arm Nut	110 N·m	81 lb ft
Outer Tie Rod End Nut	47 N·m	35 lb ft
Shock Absorber Lower Bolt	65 N·m	48 lb ft
Shock Absorber Lower Nut	65 N·m	48 lb ft
Shock Absorber Upper Mount Bolt	50 N·m	37 lb ft
Shock Absorber Upper Mount Nut	43 N·m	32 lb ft
Stabilizer Shaft Insulator Clamp Bolt/Stud	55 N·m	41 lb ft
Stabilizer Shaft Upper Nut and Bushing	23 N·m	17 lb ft
Upper Control Arm Nut	53 N·m	39 lb ft
Wheel Bearing Hub Bolt	86 N·m	63 lb ft

GM SPO Group Numbers

Application	GM SPO Group Number
Ball Joint	6.000
Coil Spring	7.000
Lower Control Arm	6.000
Stabilizer Shaft	7.000
Shock Absorber	7.000
Steering Knuckle	6.000
Upper Control Arm	6.000
Wheel Hub	6.000

Component Locator

Front Suspension Components



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Legend

- | | |
|---|---|
| (1) Arm, Front Upper Control | (13) Bolt/Screw, Front Stabilizer Shaft Insulator Clamp |
| (2) Stud, Front Upper Control Arm Ball | (15) Clamp, Front Stabilizer Shaft Insulator |
| (3) Nut, Front Shock Absorber Lower Bracket | (16) Stabilizer Shaft, Front |
| (4) Nut, Front Upper Control Arm | (17) Nut, Front Stabilizer Shaft Link |
| (5) Pin, Front Upper Control Arm Cotter | (18) Insulator, Front Stabilizer Shaft |
| (6) Knuckle and Hub, Steering | (19) Bolt/Screw, Front Lower Control Arm |
| (7) Hub, Front Wheel | (20) Nut, Front Lower Control Arm |
| (8) Stud, Front Lower Control Arm Ball | (21) Nut, Front Lower Control Arm |
| (9) Arm, Front Lower Control | (22) Crossmember, Front |
| (10) Bolt/Screw, Front Shock Absorber | (23) Bolt/Screw, Front Lower Control Arm |
| (11) Link, Front Stabilizer Shaft | (24) Nut, Front Lower Control Arm |
| (12) Sleeve, Front Stabilizer Shaft Link | (25) Pin, Front Lower Control Arm Cotter |

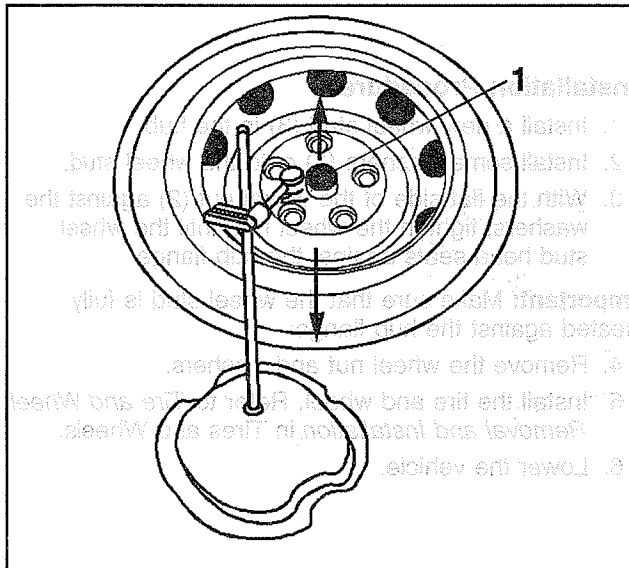
- | | |
|--|---|
| (26) Absorber, Front Shock | (30) Nut, Front Shock Absorber Upper |
| (27) Spring, Front | (31) Bolt/Screw, Front Shock Absorber Upper Mount |
| (28) Mount, Front Upper Shock Absorber | |
| (29) Support, Front Upper Control Arm | |

Diagnostic Information and Procedures

Ball Stud Check

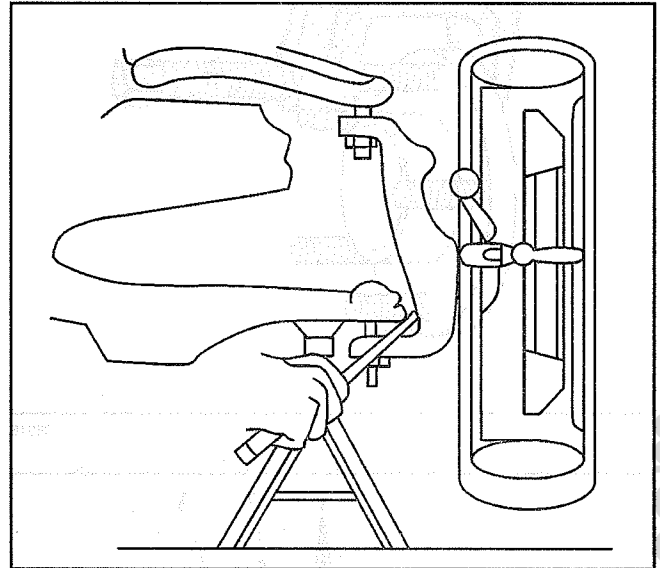
Important:

- The vehicle must be stable and should not rock on the floor stands.
 - Wipe the ball joints clean and inspect the seals for cuts or for tears. If the seal is cut or torn, replace the ball joint.
1. Raise the vehicle and position the floor stands under both lower control arms as nearly as possible to each ball stud. Refer to *Lifting and Jacking the Vehicle* in General Information.



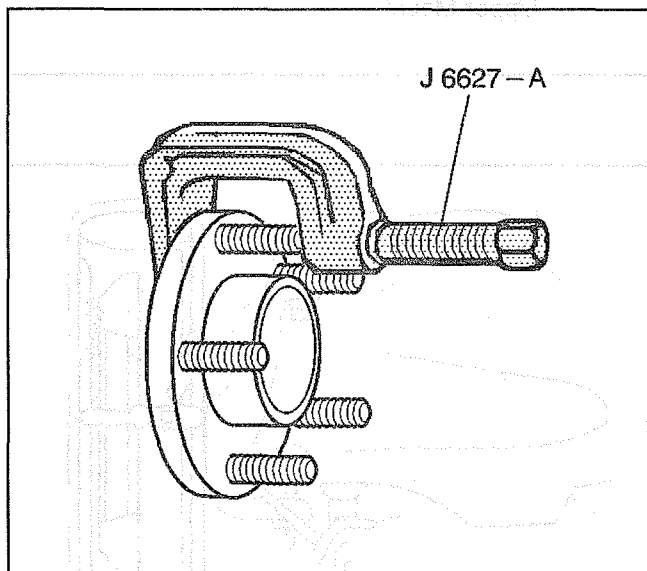
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2. Position the dial indicator against the wheel rim.

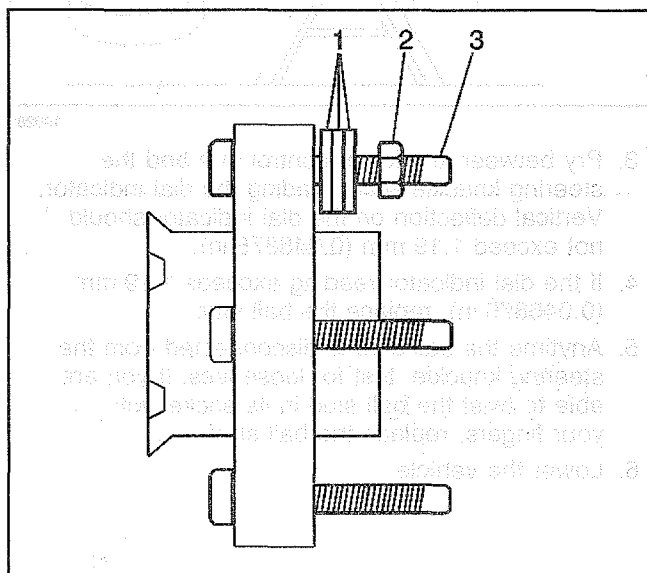


3. Pry between the lower control arm and the steering knuckle while reading the dial indicator. Vertical deflection on the dial indicator should not exceed 1.19 mm (0.046875 in).
4. If the dial indicator reading exceeds 1.19 mm (0.046875 in), replace the ball stud.
5. Anytime the ball stud is disconnected from the steering knuckle, test for looseness. If you are able to twist the ball stud in its socket with your fingers, replace the ball stud.
6. Lower the vehicle.

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Repair Instructions

Wheel Hub Bolt Replacement

Removal Procedure

Tool Required

J 6627-A Wheel Stud Remover

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
3. Install J 6627-A onto the hub and over the wheel stud.
4. Turn the forcing screw in until the wheel stud is pushed out of the hub.

Installation Procedure

1. Install a new wheel stud (3) in the hub.
2. Install some washers (1) onto the wheel stud.
3. With the flat side of the wheel nut (2) against the washers, tighten the wheel nut until the wheel stud head seats against the hub flange.

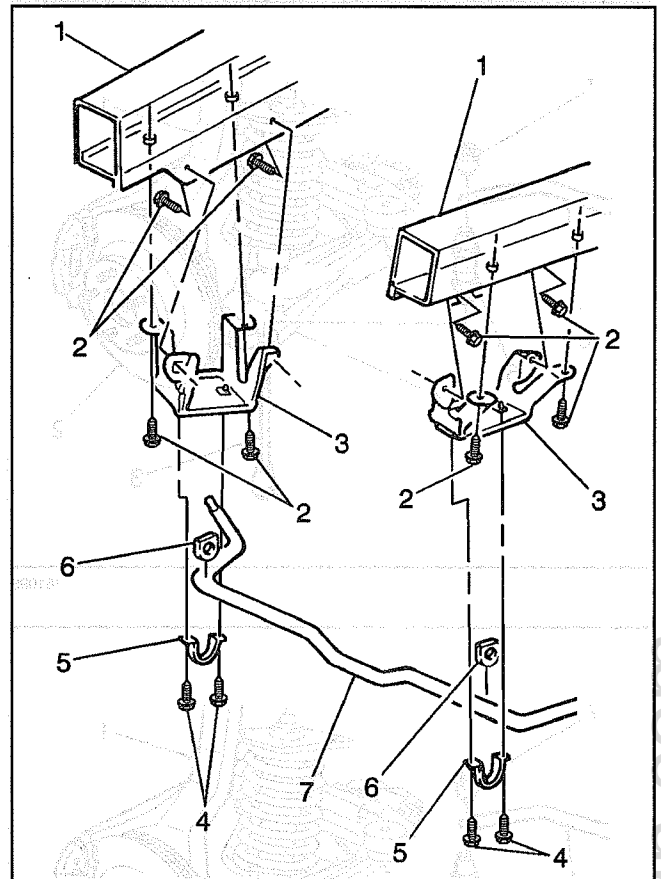
Important: Make sure that the wheel stud is fully seated against the hub flange.

4. Remove the wheel nut and washers.
5. Install the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
6. Lower the vehicle.

Stabilizer Shaft Replacement

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
3. Remove the stabilizer shaft insulator clamp bolts (4) and stud.
4. Remove the stabilizer shaft insulator clamps (5).
5. Remove the stabilizer shaft (7) from the vehicle.
6. Remove the insulators (6) from the stabilizer shaft (7), if necessary.



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Installation Procedure

Important: The slit in the insulator (6) must face toward the front of the vehicle.

1. Install the stabilizer shaft insulators (6) over the stabilizer shaft (7), if necessary.
2. Place the stabilizer shaft (7) into position on the vehicle.
3. Install the stabilizer shaft insulator clamps (5) over the insulators.

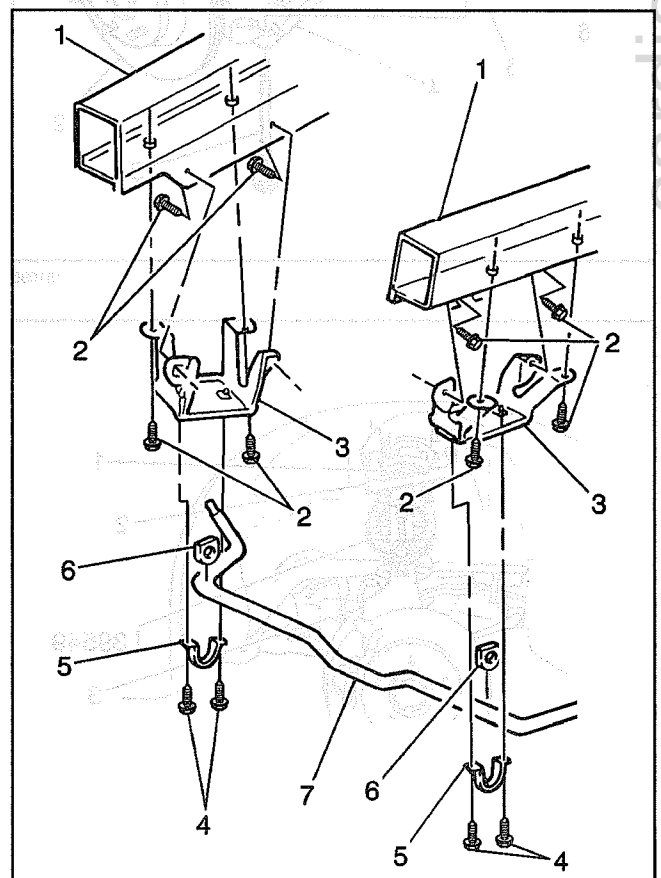
Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the stabilizer shaft insulator clamp bolts (4) and stud.

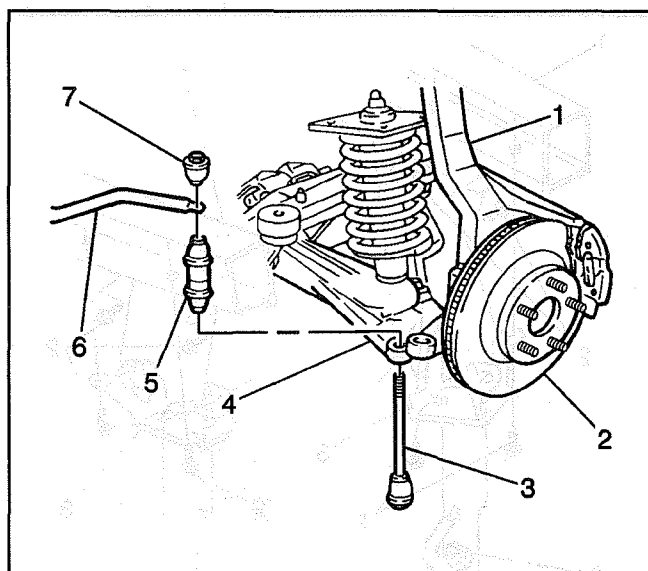
Tighten

Tighten the stabilizer shaft insulator clamp bolts (4) and stud to 55 N·m (41 lb ft).

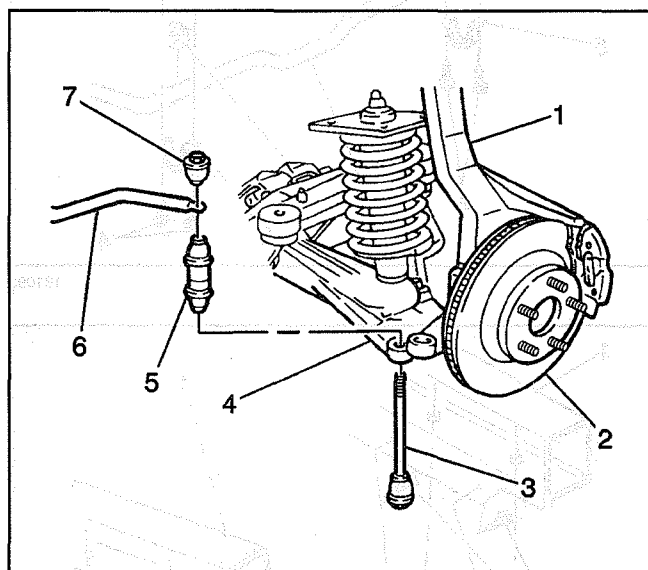
5. Install the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
6. Lower the vehicle.



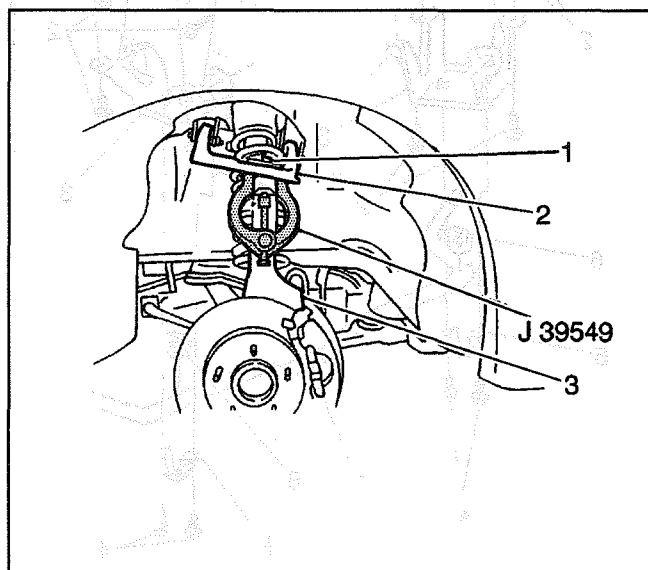
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Stabilizer Shaft Link Replacement

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the stabilizer shaft upper nut and bushing (7).
3. Remove the stabilizer shaft bolt (3).
4. Remove the stabilizer shaft spacer (5) between the lower control arm (4) and stabilizer shaft (6).

Installation Procedure

1. Install the stabilizer shaft spacer (5) between the lower control arm (4) and the stabilizer shaft (6).
2. Install the stabilizer shaft bolt (3).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the stabilizer shaft upper nut and bushing (7).

Tighten

Tighten the stabilizer shaft upper nut and bushing (7) to 23 N·m (17 lb ft).

4. Lower the vehicle.

Upper Ball Joint Replacement

Removal Procedure

Tools Required

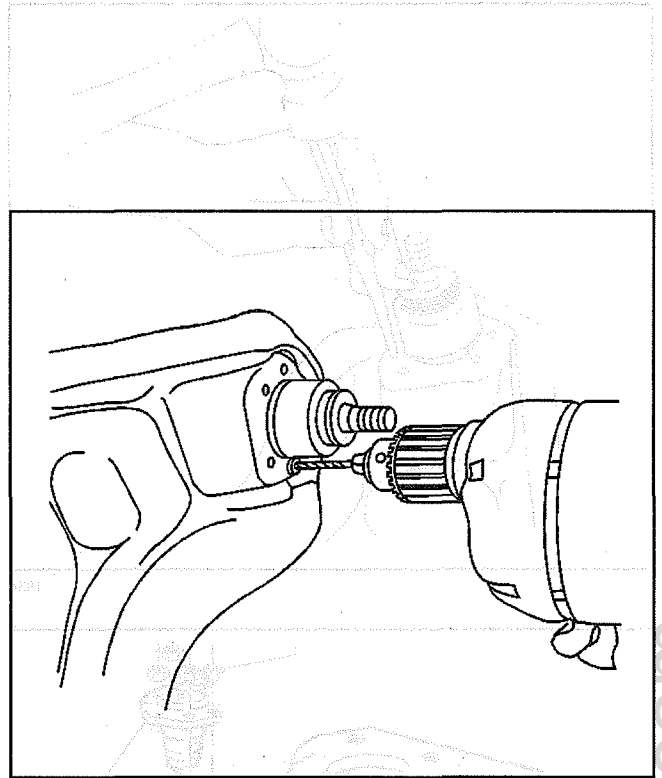
J 39549 Ball Joint/Tie Rod Separator

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.

Important: During removal and installation, the floor jack must remain under the shock absorber mounting location on the lower control arm in order to hold the spring and the lower control arm in position.

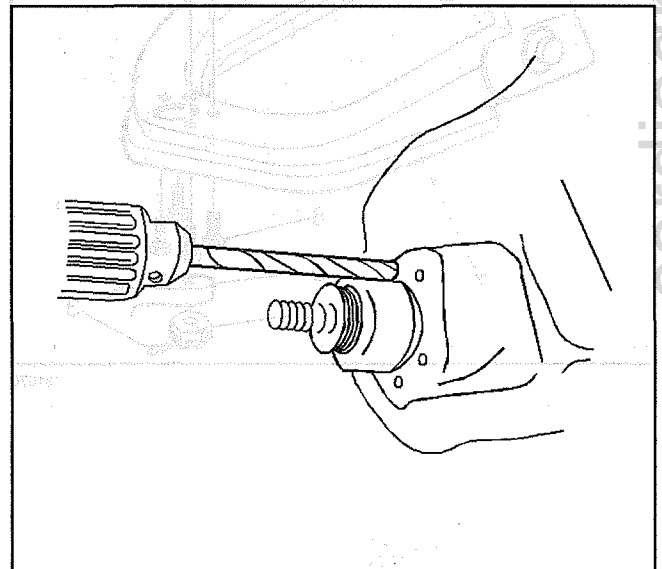
3. Place a floor jack under the shock absorber mounting location on the lower control arm.

4. Remove and discard the upper control arm cotter pin.
5. Remove the upper control arm nut.
6. Support the steering knuckle (3) with a floor jack.
7. Use *J 39549* in order to separate the upper ball joint (1) from the steering knuckle (3).
8. With the upper control arm in a raised position, drill out the four rivets approximately 6 mm (0.25 in) deep using a 1/8 inch drill bit.

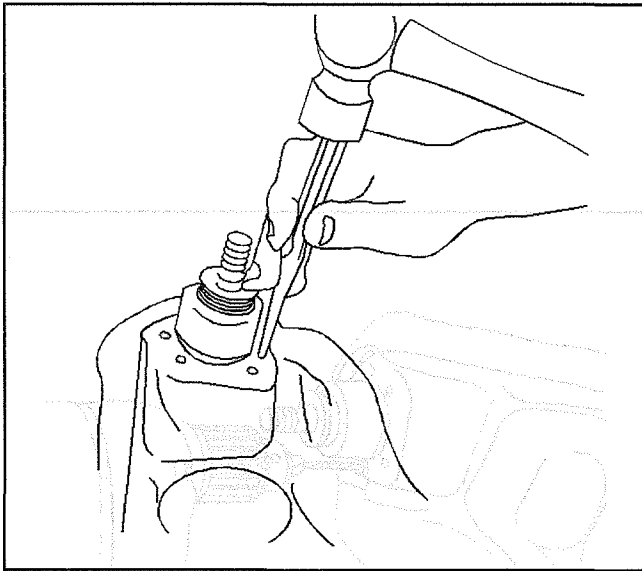


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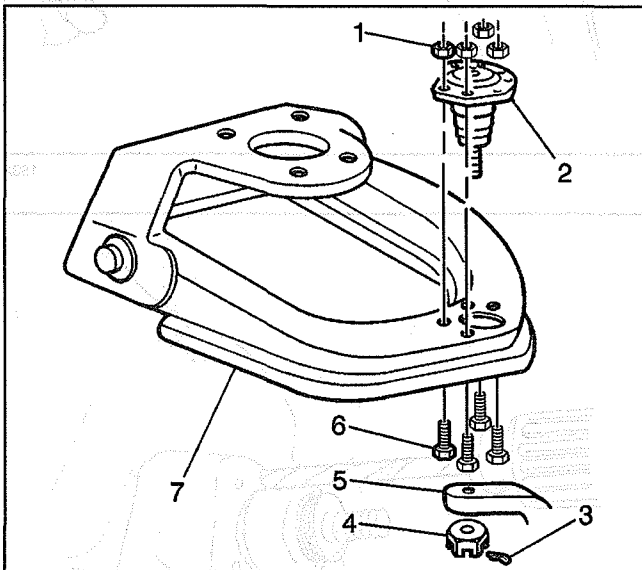
9. Drill out the rivet heads using a 1/2 inch drill bit.



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10. Punch out the rivets using a small punch.
11. Remove the upper ball joint.

Installation Procedure

1. Loosely install the new upper ball joint (2) into the upper control arm (7).
2. Remove the temporary support from the steering knuckle (5).
3. Align and install the upper ball joint (2) to the steering knuckle (3).
4. Install the upper control arm nut (4) finger tight.
5. Install the upper ball joint service kit bolts (6) and nuts (4). Refer to the ball joint kit for torque specifications.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

6. Torque the upper control arm nut (4) to specifications.

Tighten

Tighten the upper control arm nut (4) to 53 N·m (39 lb ft).

Important: Never loosen the control arm nut in order to align the cotter pin slot, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

7. Install a new upper control arm cotter pin (3).
8. Remove the floor jack from under the shock absorber seat.
9. Install the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
10. Lower the vehicle.

Lower Ball Joint Replacement

Removal Procedure

Tools Required

- J 39549 Ball Joint/Tie Rod Separator
- J 9519-7 Ball Joint Remover
- J 9519-18 Ball Joint Pressing Screw
- J 9519-23 Ball Joint C-Clamp

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
3. Place a floor jack under the lower control arm (1).
4. Remove and discard the lower control arm cotter pin.
5. Remove the lower control arm nut.

Important: During removal and installation, the floor jack must remain under the shock absorber mounting location on the lower control arm in order to hold the spring and the lower control arm in position.

6. Use J 39549 in order to separate the lower ball joint from the steering knuckle.
7. Use J 9519-7, J 9519-18, and J 9519-23 in order to press the lower ball joint out of the lower control arm (1).

Installation Procedure

Tools Required

- J 9519-9 Ball Joint Installer
- J 9519-18 Ball Joint Pressing Screw
- J 9519-23 Ball Joint C-Clamp

1. Position the lower ball joint into the opening in lower control arm (1).
2. Using J 9519-9, J 9519-18, and J 9519-23 press in the ball joint until it extends all the way through the lower control arm (1).

The ball joint must fit firmly into the lower control arm. If the ball joint does not fit firmly into the lower control arm, replace the lower control arm.

3. Align and install the ball joint to the steering knuckle.

Notice: Refer to *Fastener Notice* in Cautions and Notices.

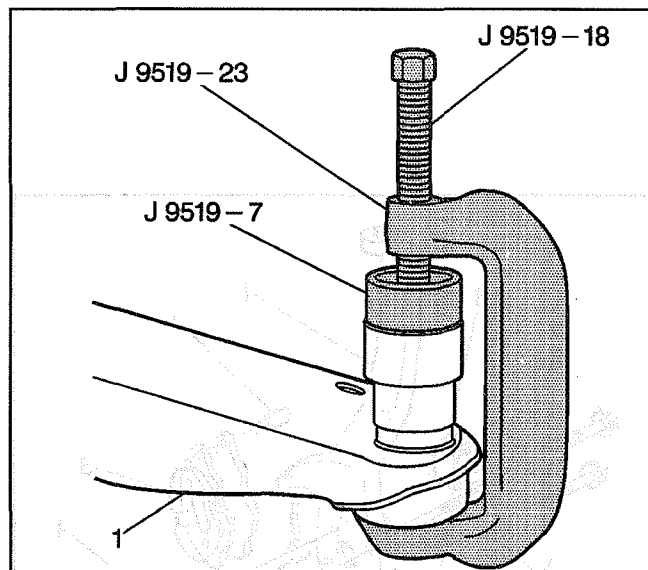
4. Install the lower control arm nut.

Tighten

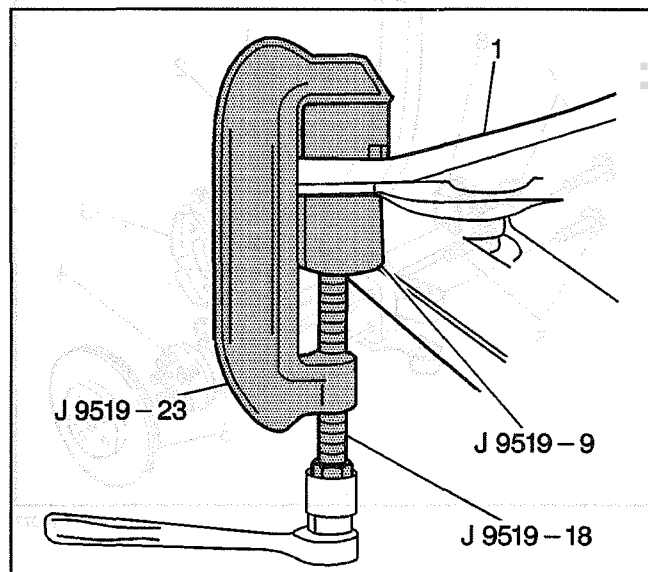
Tighten the lower control arm nut to 110 N·m (81 lb ft).

Important: Never loosen the control arm nut in order to align the cotter pin slot, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

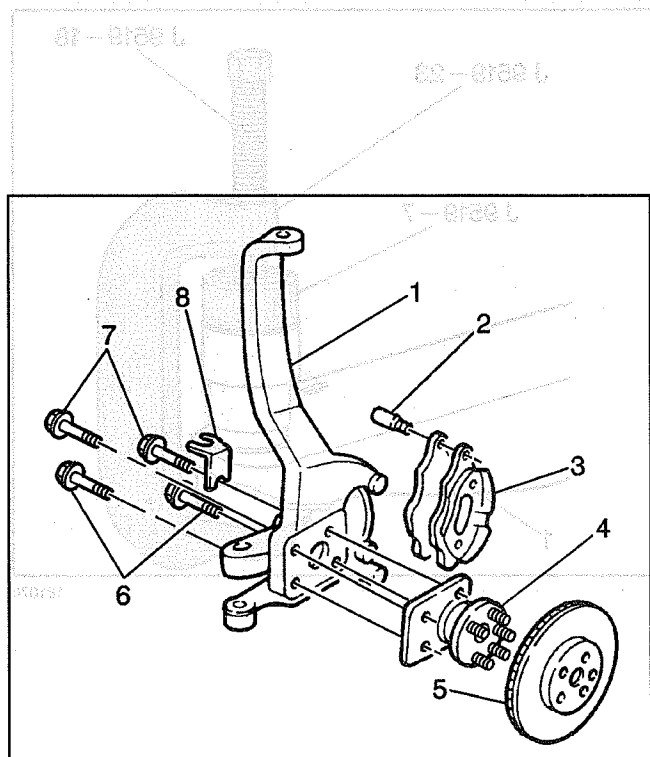
5. Install a new lower control arm cotter pin.
6. Remove the floor jack from under the lower control arm (1).



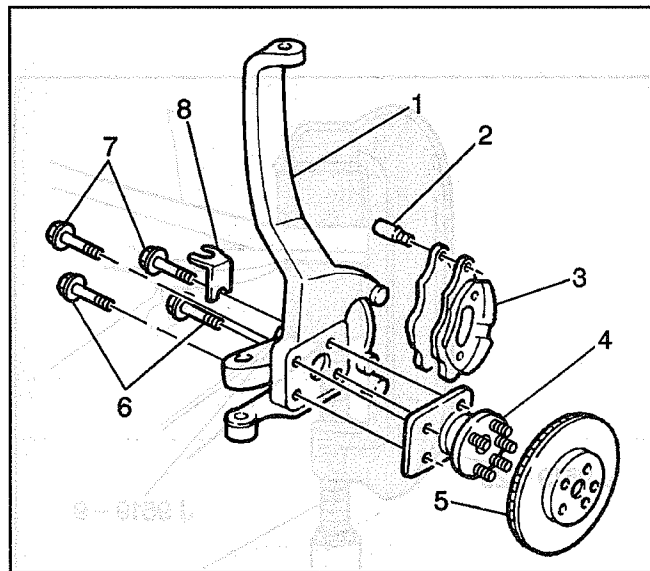
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7. Install the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
8. Lower the vehicle.
9. Check the wheel alignment. Refer to *Measuring Wheel Alignment* in Wheel Alignment.

Wheel Bearing/Hub Replacement - Front

Removal Procedure

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
3. Remove the brake caliper (3) from its mounting.
4. Support the brake caliper (3) on the steering knuckle using mechanics wire.
5. Remove the brake rotor (5) from the wheel bearing hub (4).
6. Disconnect the wheel speed sensor electrical connector.
7. Remove the wheel bearing hub bolts (6 and 7) and wheel speed sensor wire bracket (8).
8. Pull the wheel bearing hub (4) from the steering knuckle (1).

Installation Procedure

1. Align the wheel bearing hub (4) to the steering knuckle (1).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the wheel bearing hub bolts (6 and 7) and wheel speed sensor wire bracket (8).

Tighten

Tighten the wheel bearing hub bolts (6 and 7) to 86 N·m (63 lb ft).

3. Connect the wheel speed sensor electrical connector. Attach the wheel speed sensor wire to the bracket (8).
4. Install the brake rotor (5) to the wheel bearing hub (4).
5. Remove the brake caliper (3) from the mechanics wire support.
6. Install the brake caliper (3) to its mounting.
7. Install the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
8. Lower the vehicle.

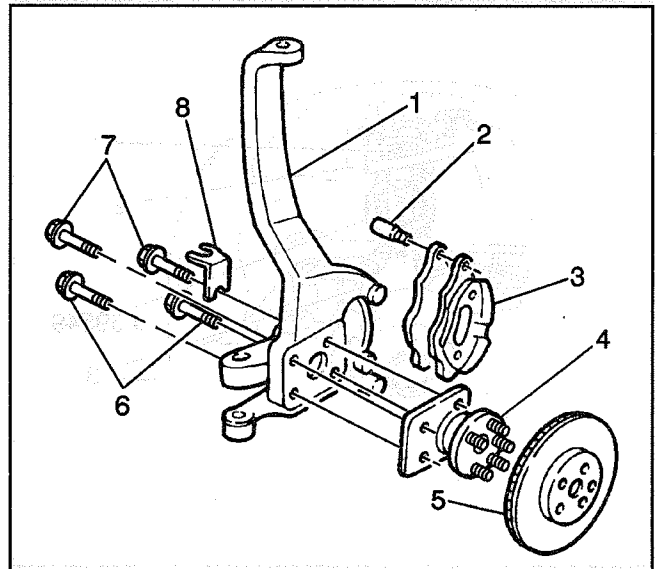
Steering Knuckle Replacement

Removal Procedure

Tools Required

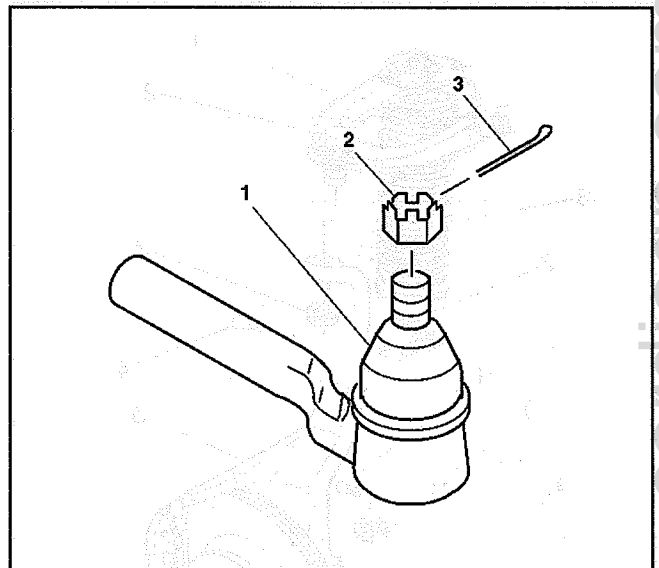
- J 24319-01 Universal Steering Linkage Puller
- J 39549 Ball Joint/Tie Rod Separator

1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
3. Remove the wheel hub (4) from the steering knuckle (1). Refer to *Wheel Bearing/Hub Replacement - Front*.



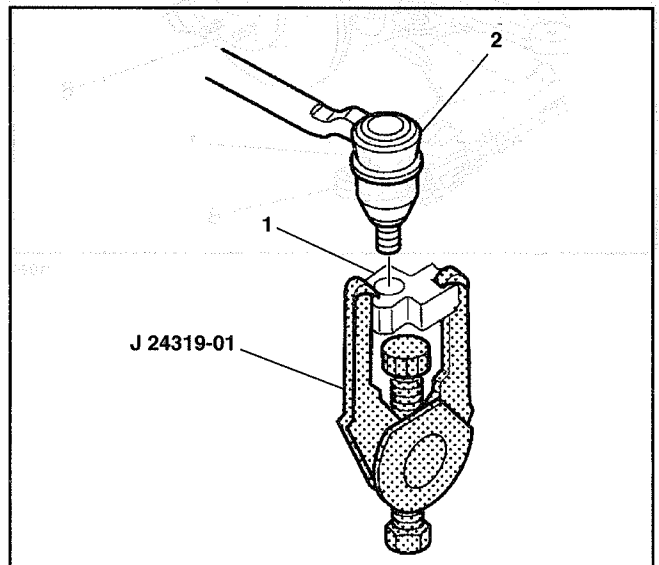
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4. Remove and discard the cotter pin (3) from the outer tie rod end (1).
5. Remove the outer tie rod end nut (2).

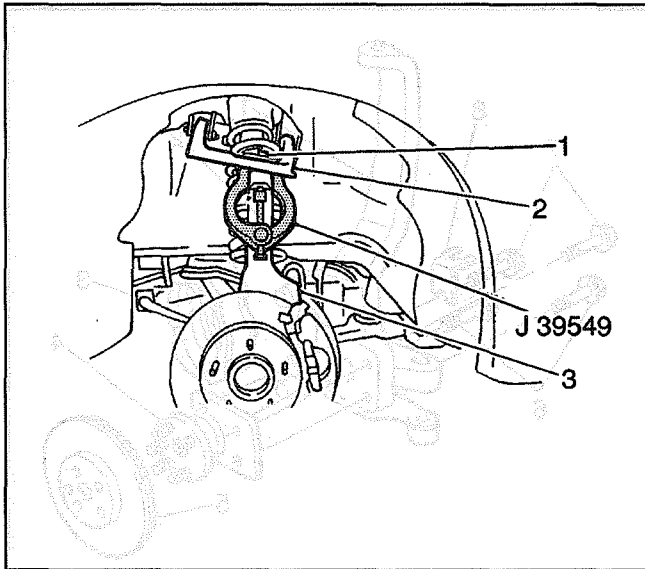


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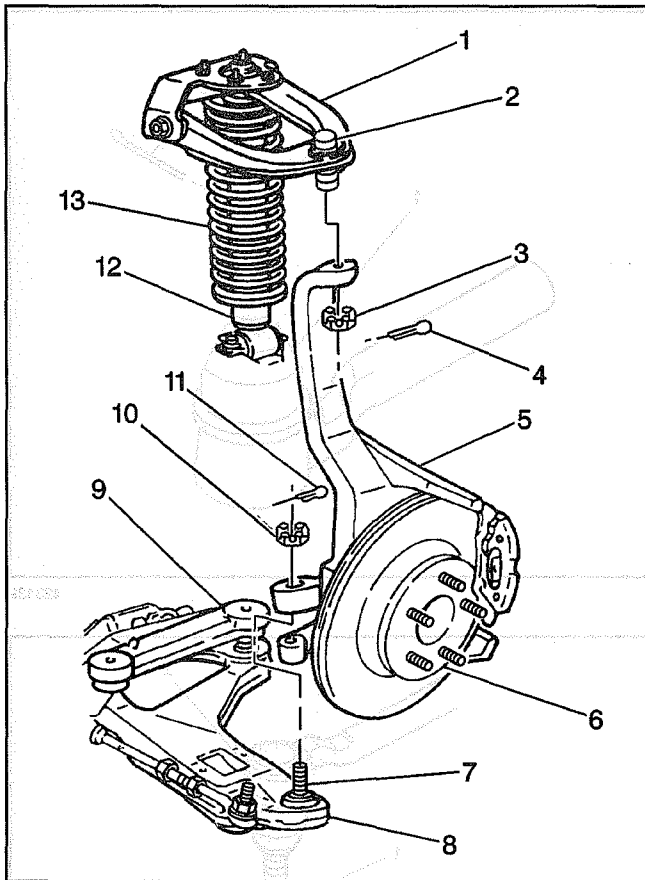
6. Using J 24319-01 separate the outer tie rod end (2) from the steering knuckle (1).
7. Use a jack stand to support the lower control arm.
8. Remove the shock absorber lower bolts and nuts.
9. Remove and discard the upper control arm cotter pin.
10. Remove the upper control arm nut.



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11. Using J 39549 separate the upper ball joint (1) from the steering knuckle (3).
12. Remove the upper control arm (2) and upper ball joint (1) from the steering knuckle (3).
13. Remove and discard the lower control arm cotter pin.
14. Remove the lower control arm nut.
15. Using J 39549 separate the lower ball joint (7) from the steering knuckle (5).
16. Remove the lower control arm (8) and lower ball joint (7) from the steering knuckle (5).
17. Remove the steering knuckle (5) from the vehicle.

Installation Procedure

1. Install the steering knuckle (5) to the vehicle.
2. Align and Install the lower ball joint (7) and control arm (8) to the steering knuckle (5).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

3. Install the lower control arm nut.

Tighten

Tighten the lower control arm nut to 110 N·m (81 lb ft).

Important: Never loosen the control arm nut in order to align the cotter pin solt, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

4. Install a new lower control arm cotter pin.
5. Align and install the upper control arm and upper ball joint to the steering knuckle.
6. Install the upper control arm nut.

Tighten

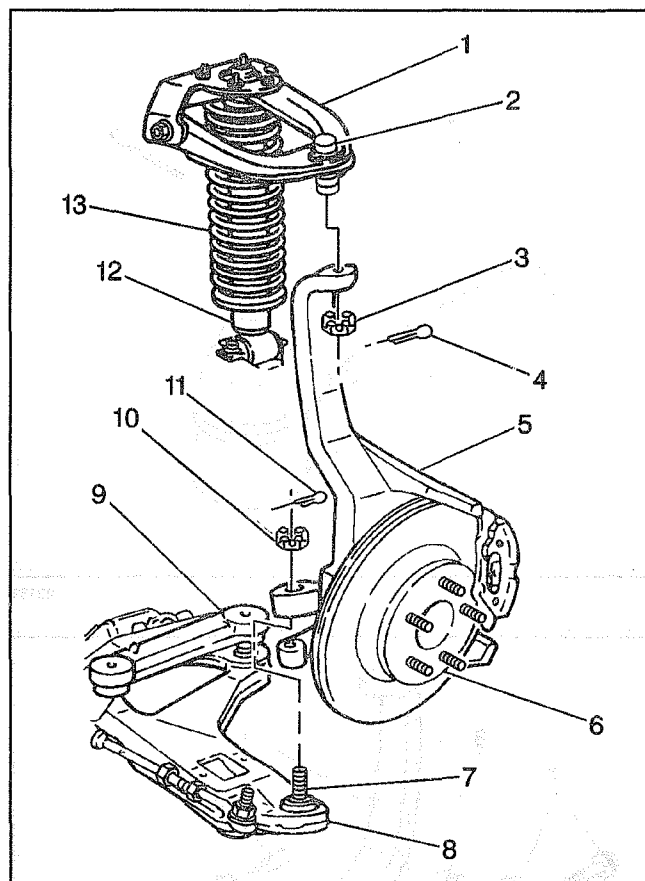
Tighten the upper control arm nut to 53 N·m (39 lb ft).

7. Install a new upper control arm cotter pin.
8. Install the shock absorber lower bolts and nuts.

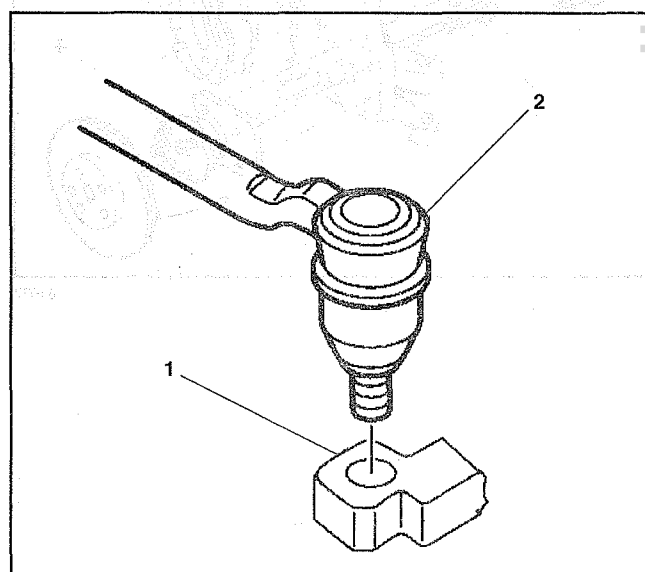
Tighten

Tighten the shock absorber lower bolts or nuts to 65 N·m (48 lb ft).

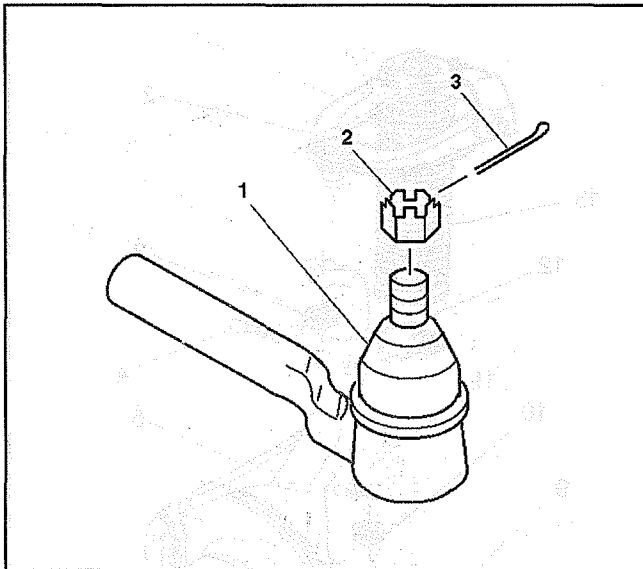
9. Remove the jack stand supporting the lower control arm.
10. Connect the outer tie rod end (2) to the steering knuckle (1).



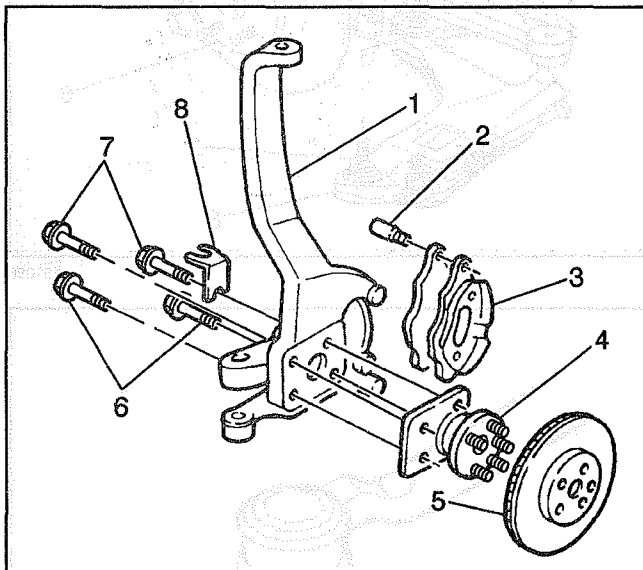
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11. Install the outer tie rod end nut (2).
- Tighten**
- Tighten the outer tie rod end nut (2) to 47 N·m (35 lb·ft).
12. Install a new cotter pin (3) to the outer tie rod end (1).

13. Install the wheel hub (4) from the steering knuckle (1). Refer to *Wheel Bearing/Hub Replacement - Front*.
14. Install the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
15. Lower the vehicle.
16. Check the wheel toe-in. Refer to *Front Toe Adjustment* in *Wheel Alignment*.

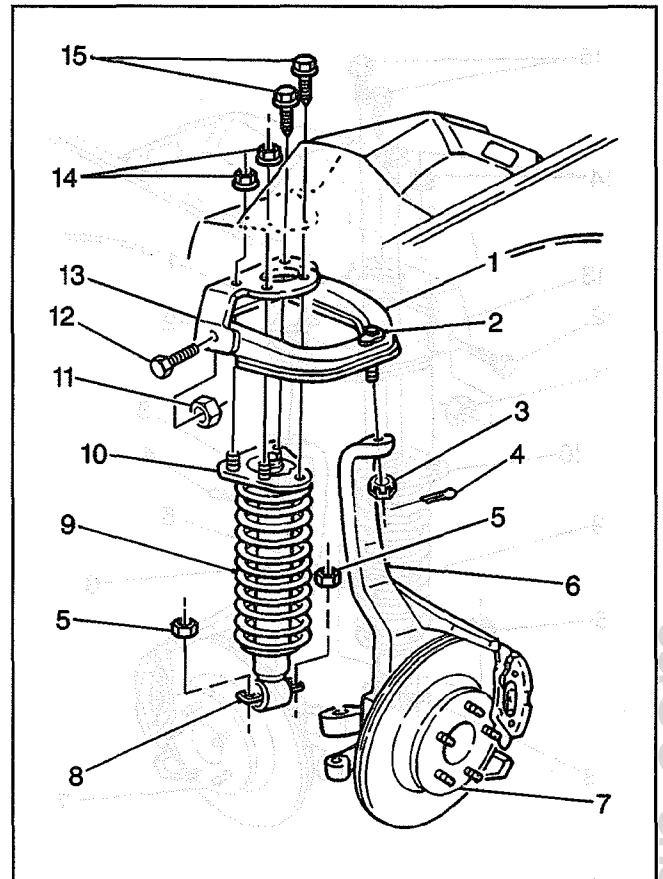
Upper Control Arm Replacement

Removal Procedure

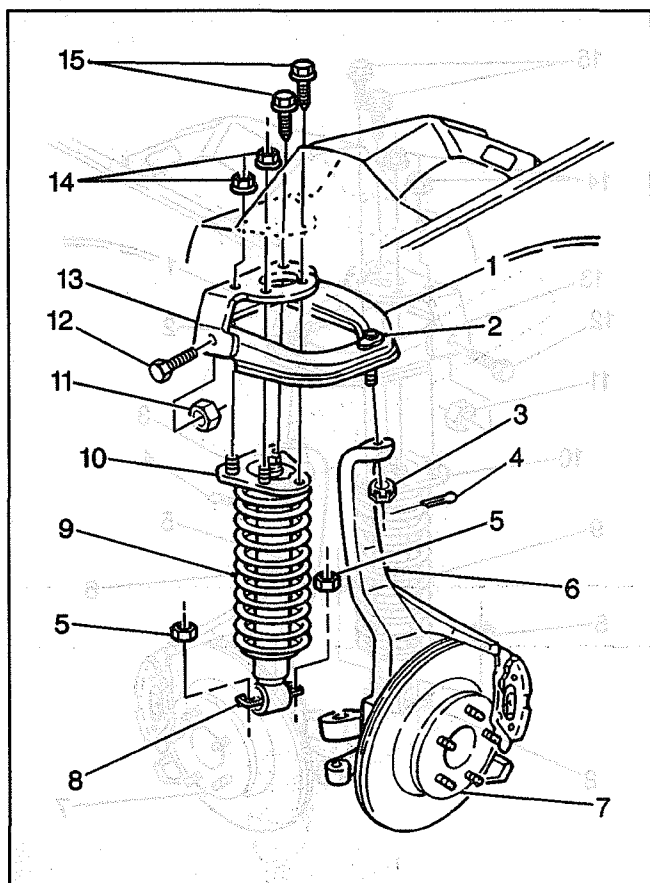
Tools Required

J 39549 Ball Joint/Tie Rod Separator

1. If servicing the driver side upper control arm, perform the following:
 - 1.1. Remove the brake master cylinder nuts.
 - 1.2. Gently, reposition the brake master cylinder to the side.
2. Remove the shock absorber upper mounting bolts (15) and nuts (14).
3. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
4. Remove the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
5. Remove the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
6. Remove the shock absorber lower bolts and nuts (5).
7. Remove and discard the upper control arm cotter pin (4).
8. Remove the upper control arm nut (3).
9. Support the steering knuckle (6) with a jack stand.
10. Use J 39549 in order to separate the upper ball joint (2) from the steering knuckle (6).
11. Remove the steering knuckle (6) and ball joint (2) from the upper control arm (1).
12. Remove the upper control arm (1) and shock absorber (8) from the vehicle.
13. Separate the shock absorber (8) from the upper control arm (1).



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Installation Procedure

1. Place the shock absorber (8) through the upper control arm (1).
2. Install the upper control arm (1) and shock absorber (8) to the vehicle.
3. Align and install the upper control arm (1) and upper ball joint (2) to the steering knuckle (6).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the upper control arm nut (3).

Tighten

Tighten the upper control arm nut (3) to 53 N·m (39 lb ft).

Important: Never loosen the control arm nut in order to align the cotter pin slot, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

5. Install a new upper control arm cotter pin (4).
6. Remove the jack stand supporting the lower control arm.
7. Install the shock absorber lower bolts and nuts (5).

Tighten

Tighten the shock absorber lower bolts or nuts (5) to 65 N·m (48 lb ft).

8. Install the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
9. Install the tire and wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
10. Lower the vehicle.
11. Install the shock absorber upper mounting bolts (15) and nuts (14).

Tighten

- Tighten the shock absorber upper mounting nuts (14) to 41 N·m (30 lb ft).
- Tighten the shock absorber upper mounting bolts to 50 N·m (37 lb ft).

12. If servicing the driver side upper control arm, perform the following:

- 12.1. Gently, reposition the brake master cylinder into position.
- 12.2. Install the brake master cylinder nuts.

Tighten

Tighten the brake master cylinder nuts to 29 N·m (21 lb ft).

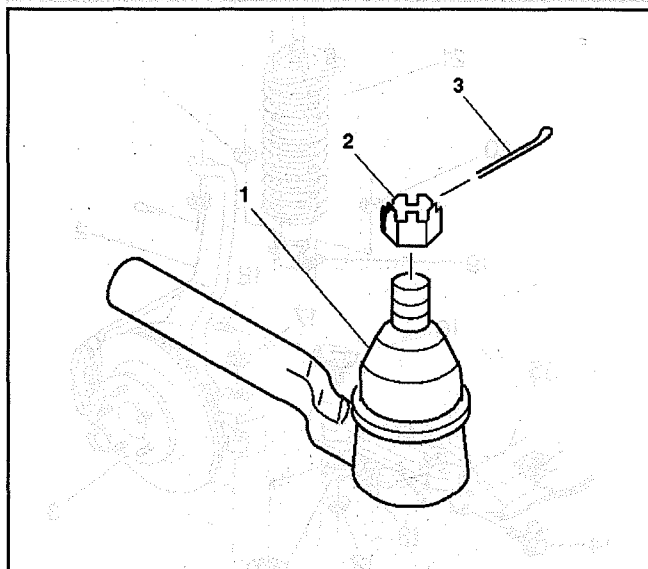
Lower Control Arm Replacement

Removal Procedure

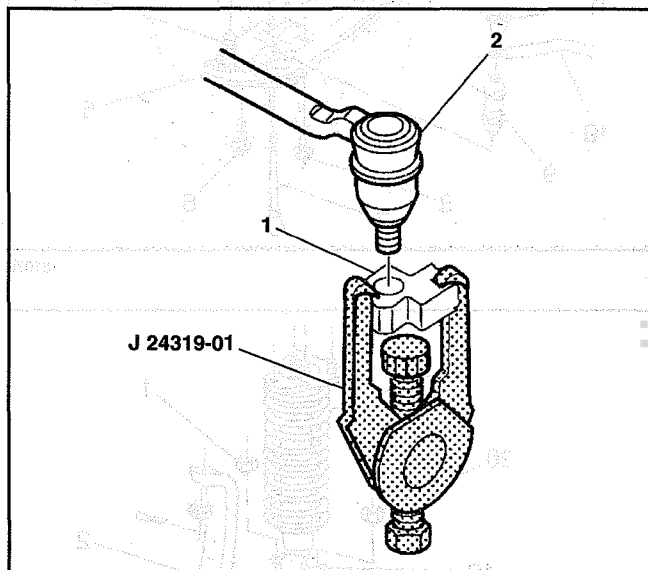
Tools Required

- J 24319-01 Universal Steering Linkage Puller
- J 39549 Ball Joint/Tie Rod Separator

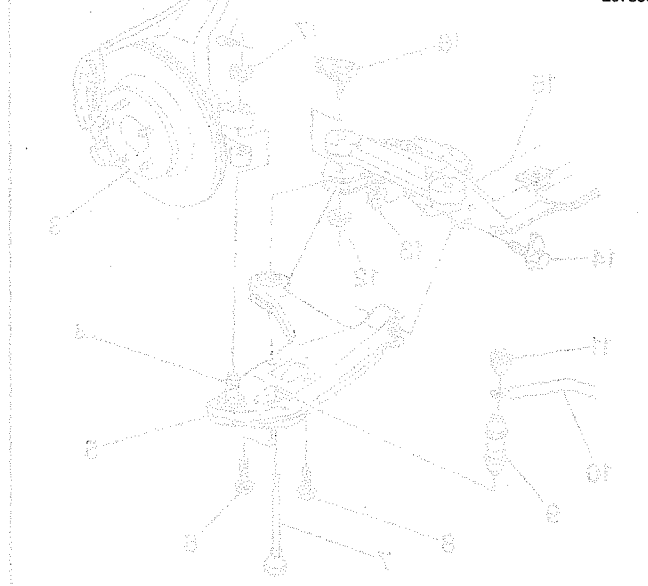
1. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
2. Remove the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
3. Remove the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
4. Remove and discard the cotter pin (3) from the outer tie rod end (1).
5. Remove the outer tie rod end nut (2).
6. Using J 24319-01 separate the outer tie rod end (2) from the steering knuckle (1).



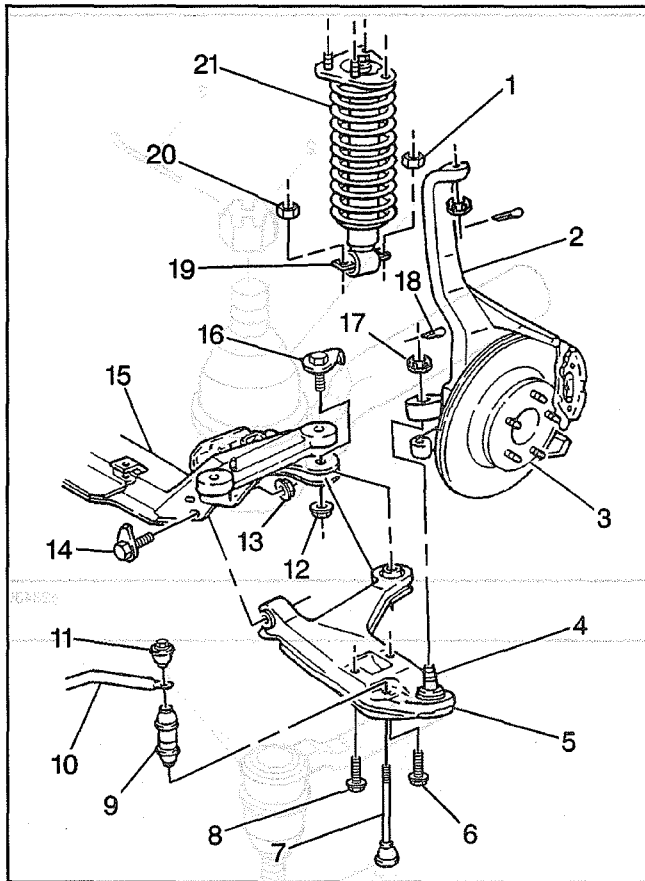
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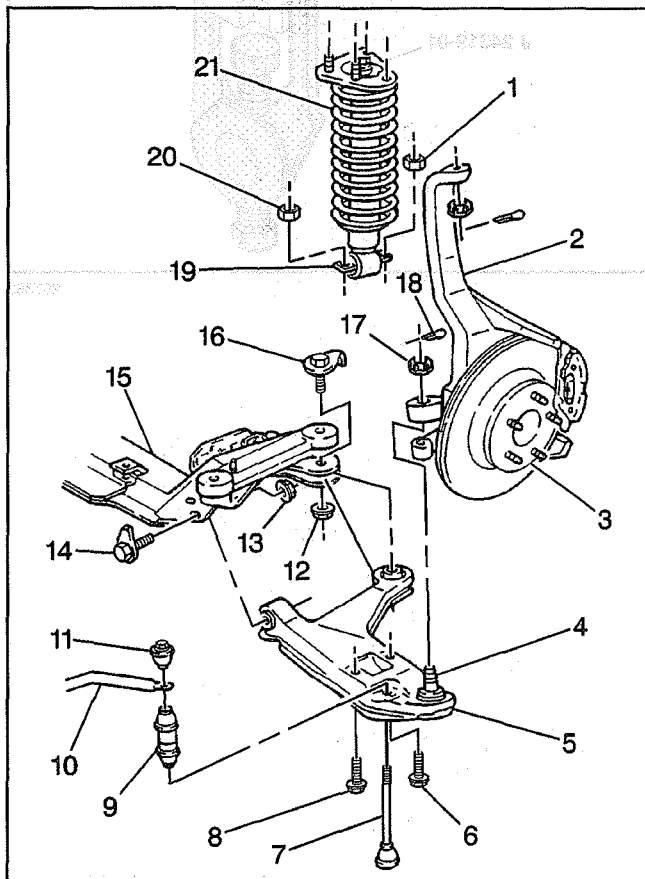
7. Remove the shock absorber lower bolts (6 and 8) and nuts (1 and 20).
8. Remove and discard the lower control arm cotter pin (18).
9. Remove the lower control arm nut (17).
10. Using *J 39549* separate the lower ball joint (4) from the steering knuckle (2).
11. Remove the lower control arm (5) and lower ball joint (4) from the steering knuckle (2).
12. Remove the lower control arm mounting bolts (14 and 16) and nuts (12 and 13).
13. Remove the lower control arm (5).

Remove the stabilizer shaft link. Refer to Stabilizer Shaft Link Replacement.

Remove and discard the cotter pin (18) from the lower control arm (5).

Remove the outer tie rod end nut (2) and (5).

Using *J 39549* separate the outer tie rod end (2) from the steering knuckle (1).



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Installation Procedure

1. Align and install the lower control arm (5).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the lower control arm mounting bolts (14 and 16) and nuts (12 and 13).

Tighten

Tighten the lower control arm mounting nuts (12 and 13) to 100 N·m (74 lb ft).

3. Align and Install the lower ball joint (4) and control arm (5) to the steering knuckle (2).
4. Install the lower control arm nut (17).

Tighten

Tighten the lower control arm nut (17) to 110 N·m (81 lb ft).

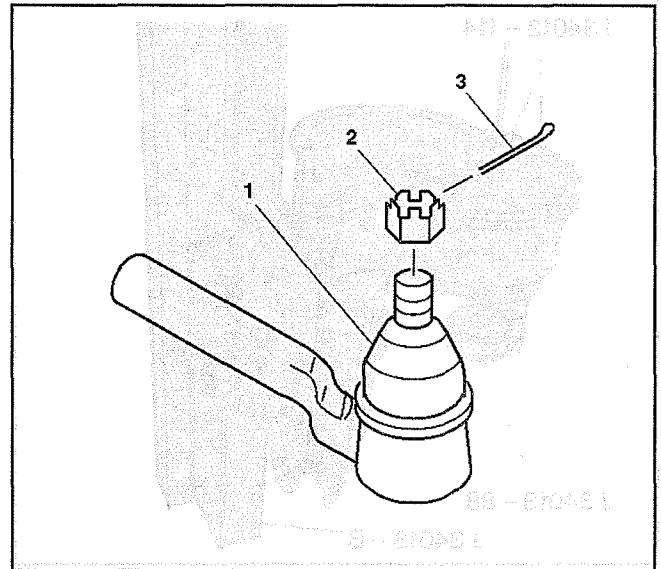
Important: Never loosen the control arm nut in order to align the cotter pin slot, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

5. Install a new lower control arm cotter pin (18).
6. Install the shock absorber lower bolts (6 and 8) and nuts (1 and 20).

Tighten

Tighten the shock absorber lower bolts (6 and 8) or nuts (1 and 20) to 65 N·m (48 lb ft).

7. Install the outer tie rod end nut (2).
8. Install a new cotter pin (3) to the outer tie rod end (1).
9. Install the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
10. Install the tire and the wheel. Refer to *Tire and Wheel Removal and Installation in Tires and Wheels*.
11. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
12. Lower the vehicle.
13. Perform a front end alignment. Refer to *Measuring Wheel Alignment* in Wheel Alignment.



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Shock Absorber Replacement

Removal Procedure

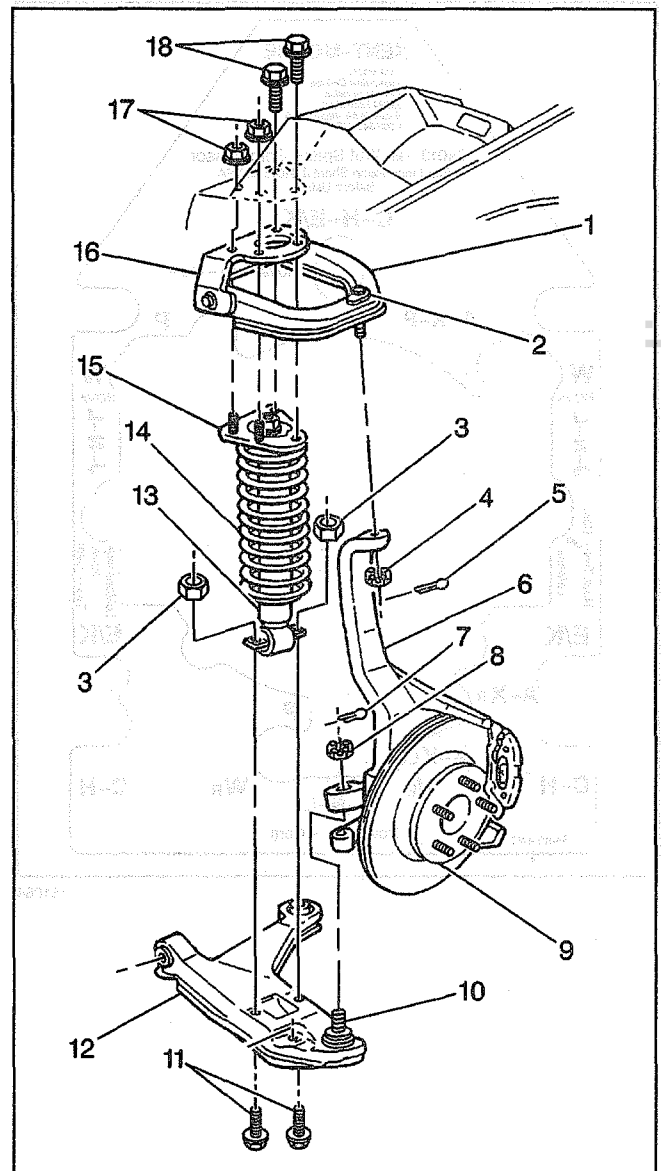
Tools Required

J 39549 Ball Joint/Tie Rod Separator

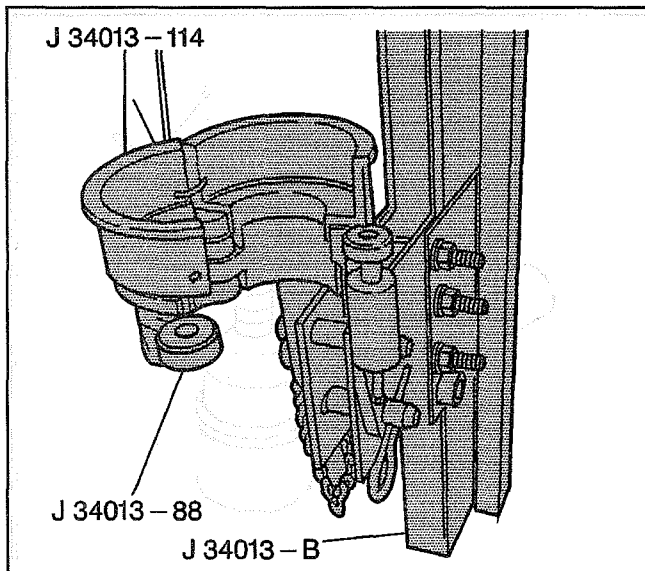
1. If servicing the driver side shock absorber, perform the following:
 - 1.1. Remove the brake master cylinder nuts.
 - 1.2. Gently move the brake master cylinder to one side.
2. Remove the shock absorber upper mounting bolts (18) and nuts (17).
3. Raise and suitably support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
4. Remove the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
5. Remove the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
6. Remove the shock absorber lower bolts (11) and nuts (3).
7. Remove and discard the lower control arm cotter pin (7).
8. Remove the lower control arm nut (8).
9. Using J 39549 separate the lower ball joint (10) from the steering knuckle (6).
10. Remove the lower control arm (12) and lower ball joint (10) from the steering knuckle (6).

Important: Use chalk or paint in order to mark (do not scribe) the lower mount location relative to the upper mount location before removing the shock absorber.

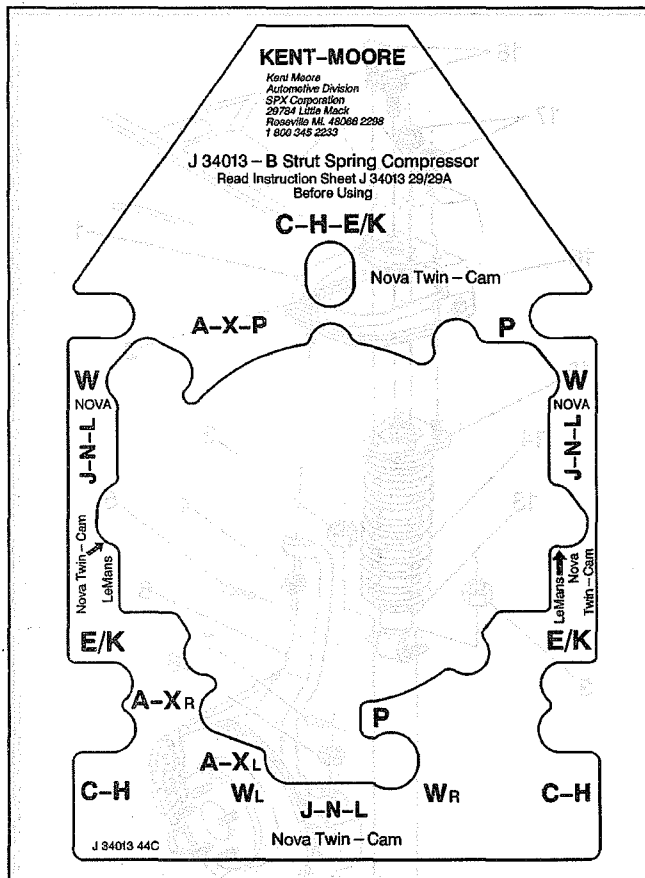
11. Remove the shock absorber (13) and the spring (14) from the vehicle.



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Disassembly Procedure

Tools Required

- J 34013-B Strut Spring Compressor
- J 34013-114 Modular Shock Compressor Adapter
- J 34013-88 Strut Compressor Adapter
- J 39642 Modular Shock Nut Removal Set, 15 mm (0.60 in)
- J 34013-115 Modular Alignment Rod

1. Install J 34013-114 and J 34013-B.

2. Use wing nuts in order to secure the tool to the following mounting holes:

- For the driver-side shock absorber
 - C-H (lower left corner)
 - P (upper right corner)
- For the passenger-side shock absorber
 - A-X-P (upper left corner)
 - C-H (lower right corner)

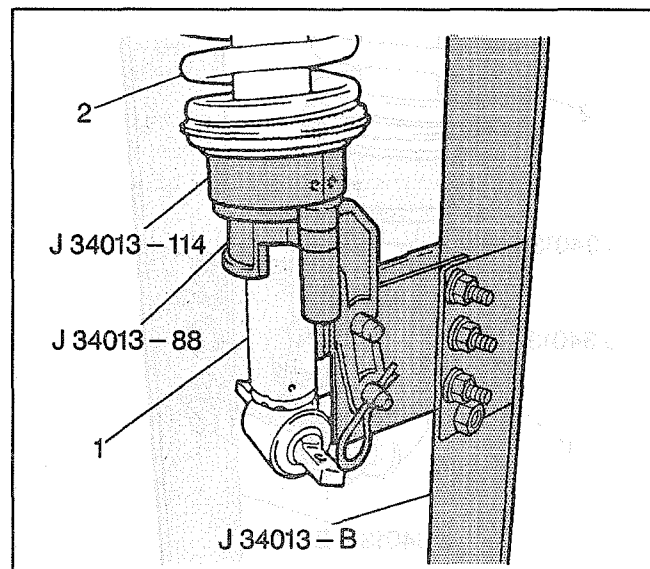
Important: Align J 34013-114 and J 34013-88 so that these tools may open and close together. If J 34013-114 and J 34013-88 do not align properly, the tools will not open.

3. Install J 34013-114 and J 34013-88

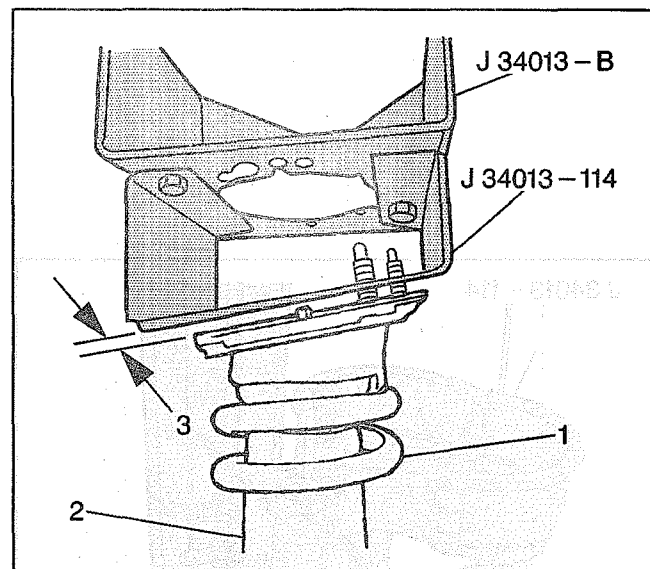
Important: Align the top of the shock absorber flat against J 34013-114.

4. Install the driver side shock absorber to the top of J 34013-114.

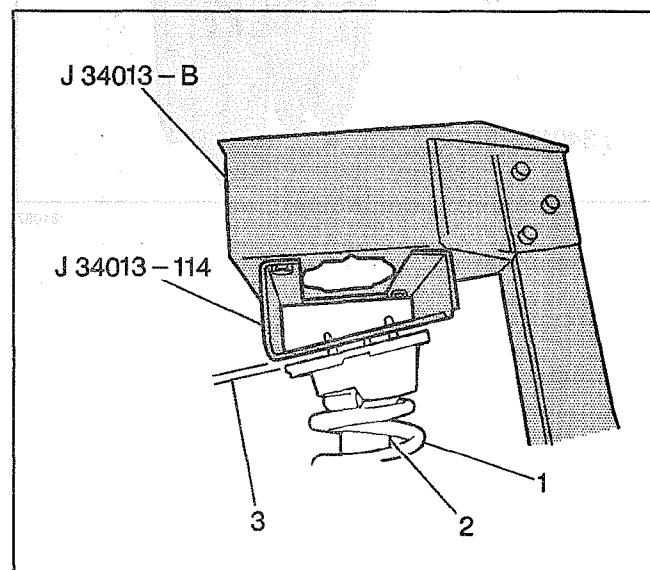
5. Install the passenger side shock absorber to the top of J 34013-114.



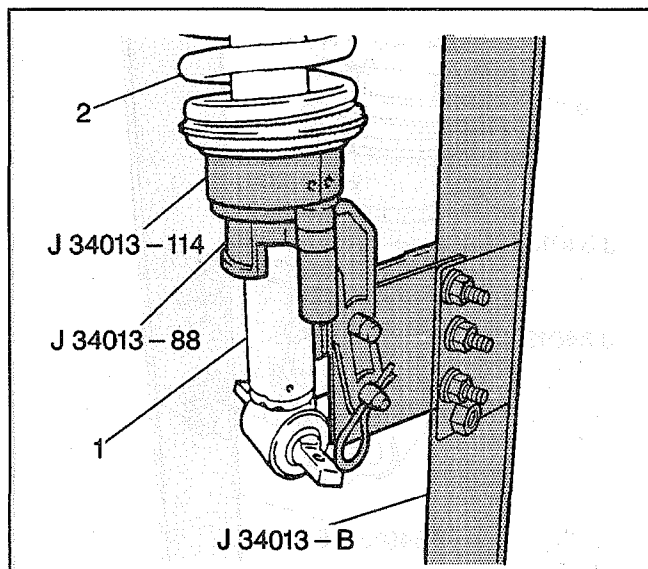
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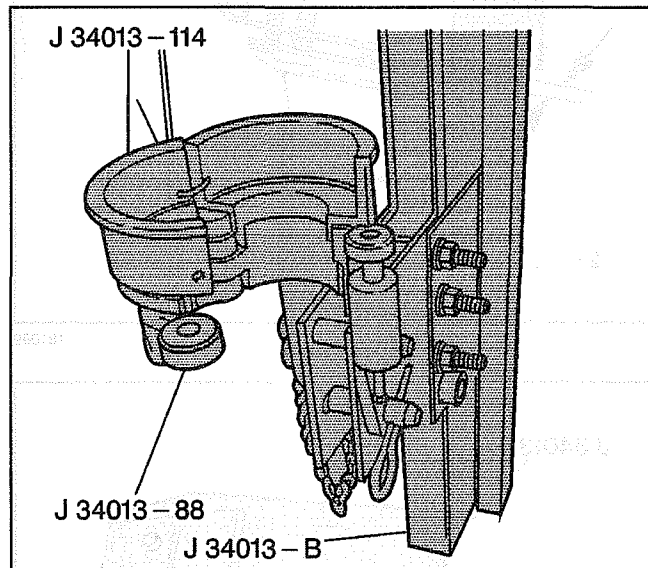
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6. Install the shock absorber (1) into J 34013-114 and J 34013-88.
7. Close J 34013-114 and J 34013-88 and install the locking pin.

Important: If the mounting ears of the shock absorber are not facing downward, toward the rear of J 34013-B, the shock absorber will not align properly.

8. Turn the screw on J 34013-B counterclockwise in order to raise the shock absorber up to J 34013-114. Align the top of the shock absorber flat against the tool with the studs going through the guide holes in J 34013-114.

Caution: Do not over compress the spring. Severe overloading may cause tool failure which could result in bodily injury.

9. Compress the front spring approximately 13 mm (0.50 in), or 3-4 complete turns of the screw on J 34013-114.
10. Insert J 39642 -1 on the shock absorber nut, then insert J 39642 -2 through J 39642 -1 in order to hold the shock absorber rod in place.
11. Remove the shock absorber nut with J 39642 -1 while holding the shock absorber rod from rotating with J 39642 -2.
12. Discard the shock absorber nut.
13. Turn J 34013-B clockwise in order to fully relieve spring pressure.

Assembly Procedure

Tools Required

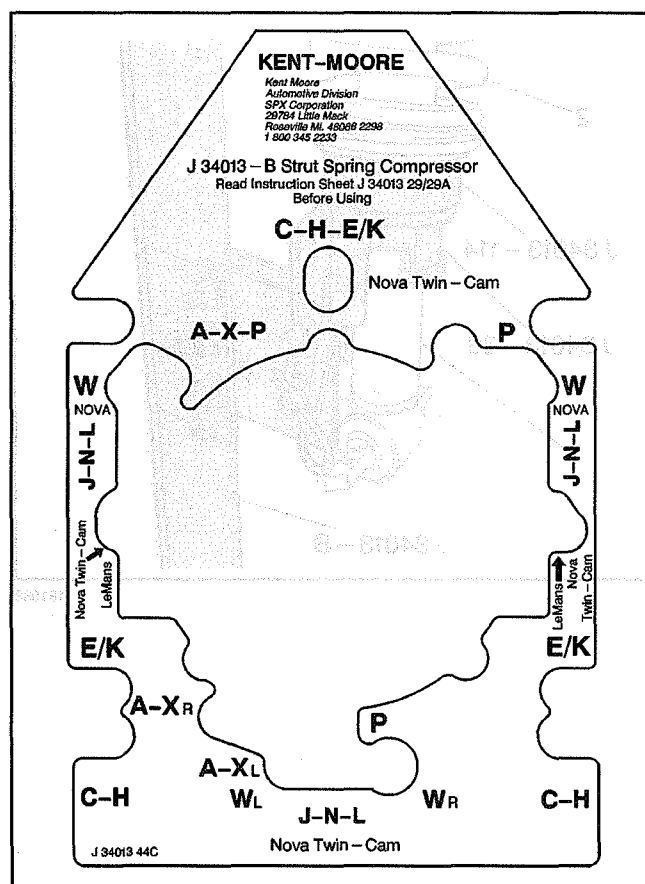
- J 34013-B Strut Spring Compressor
- J 34013-114 Modular Shock Compressor Adapter
- J 34013-88 Strut Compressor Adapter
- J 39642 Modular Shock Nut Removal Set, 15 mm (0.60 in)
- J 34013-115 Modular Alignment Rod

1. Install J 34013-114 to J 34013-B.

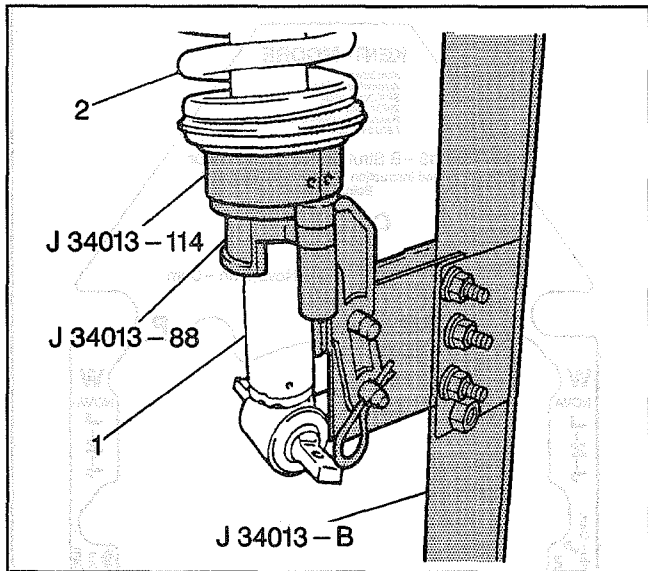
2. Use wing nuts in order to secure the tool to the following mounting holes:

- For the driver-side shock absorber
 - C-H (lower left corner)
 - P (upper right corner)
- For the passenger-side shock absorber
 - A-X-P (upper left corner)
 - C-H (lower right corner)

3. Install J 34013-114 and J 34013-88.



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4. Install the shock absorber (1) to J 34013-114 and J 34013-88.

Important:

- Face the mounting ears of the shock absorber downward, toward the rear of J 34013-B or the shock absorber will not align properly.
- Before removing the shock absorber, use chalk or paint in order to mark the lower mount location relative to the upper mount location, or you will not be able to properly reinstall the shock absorber. Do NOT scribe.

5. Close J 34013-114 and J 34013-88 and engage the locking pin.
6. Position the upper and lower spring seats correctly.

Important: Align the top of the shock absorber flat against J 34013-114.

7. Install the shock absorber to the top of J 34013-114.

Important: Only turn the screw until the shock absorber secures itself in J 34013-B. Do not load the spring.

8. Turn the screw on J 34013-B counterclockwise in order to raise the shock absorber up to J 34013-114 without compressing the spring.

Important: Ensure that J 34013-115 is straight with the shock absorber. If J 34013-115 is angled, repeat steps 1 through 5 until the tool is straight.

9. Place J 34013-115 down through the top of J 34013-B through the top of the shock absorber and onto the top of the shock absorber rod.

Caution: Do not over compress the spring. Severe overloading may cause tool failure which could result in bodily injury.

10. Turn the operating screw clockwise in order to compress the spring until the threaded portion of the shock absorber rod is through the top of the shock absorber.
11. Remove J 34013-115.

Important: Always use a new shock absorber nut. Never reinstall the original nut.

12. Insert the new shock absorber nut on the shock absorber rod.

13. Place J 39642 -1 on the shock absorber nut.

Notice: Turning the shock absorber while tightening the nut may damage the shock absorber. In order to prevent damage, keep the shock absorber in a stationary position while tightening the nut.

14. Insert J 39642 -2 through J 39642 -1 and tighten the shock absorber nut.

15. Tighten the shock absorber nut while holding onto J 39642 -2.

16. Remove the shock absorber from J 34013-B.

Installation Procedure

1. Align and install the shock absorber (13) and spring (14) to the lower control arm (12).

Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install the shock absorber lower bolts (11) and nuts (3).

Tighten

Tighten the shock absorber lower bolts (11) or nuts (3) to 65 N·m (48 lb ft).

3. Align and install the lower ball joint (10) and control arm (12) to the steering knuckle (6).
4. Install the lower control arm nut (8).

Tighten

Tighten the lower control arm nut (8) to 110 N·m (81 lb ft).

Important: Never loosen the control arm nut in order to align the cotter pin slot, it is permissible to over torque the control arm nut 1/6 of a turn MAX.

5. Install a new lower control arm cotter pin (7).
6. Install the stabilizer shaft link. Refer to *Stabilizer Shaft Link Replacement*.
7. Install the tire and the wheel. Refer to *Tire and Wheel Removal and Installation* in Tires and Wheels.
8. Lower the vehicle.
9. Install the shock absorber upper mounting bolts (18) and nuts (17).

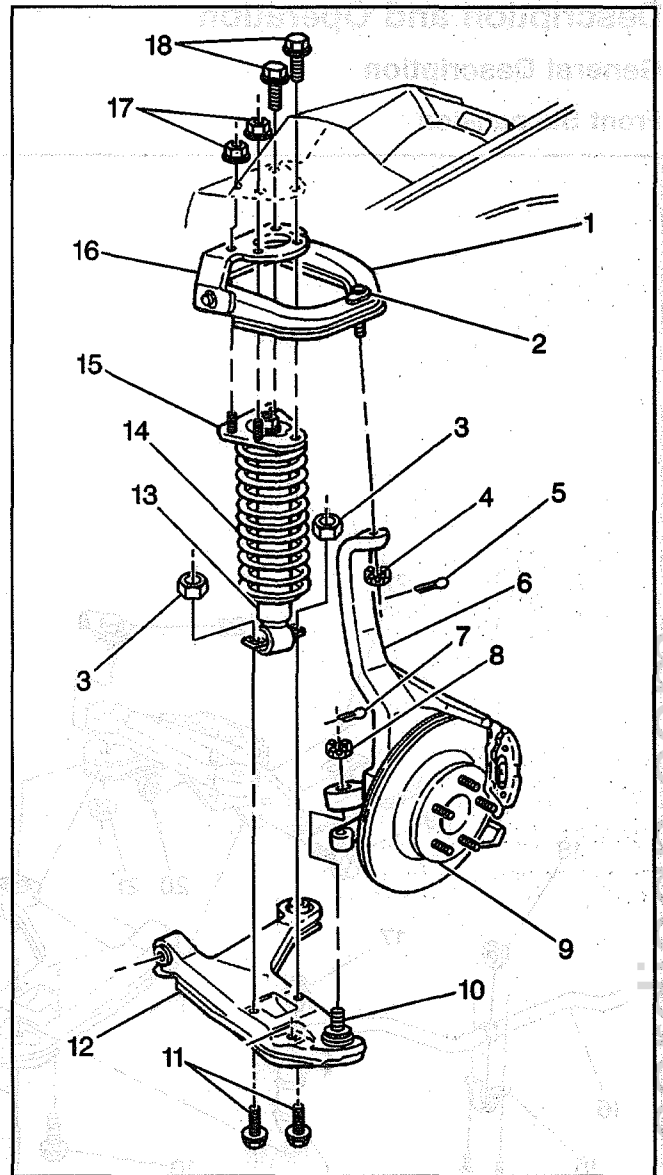
Tighten

- Tighten the shock absorber upper mounting nuts (17) to 41 N·m (30 lb ft).
- Tighten the shock absorber upper mounting bolts (18) to 50 N·m (37 lb ft).

10. If servicing the driver side shock absorber, perform the following:
 - 10.1. Gently, reposition the brake master cylinder into position.
 - 10.2. Install the brake master cylinder nuts.

Tighten

Tighten the brake master cylinder nuts to 29 N·m (21 lb ft).

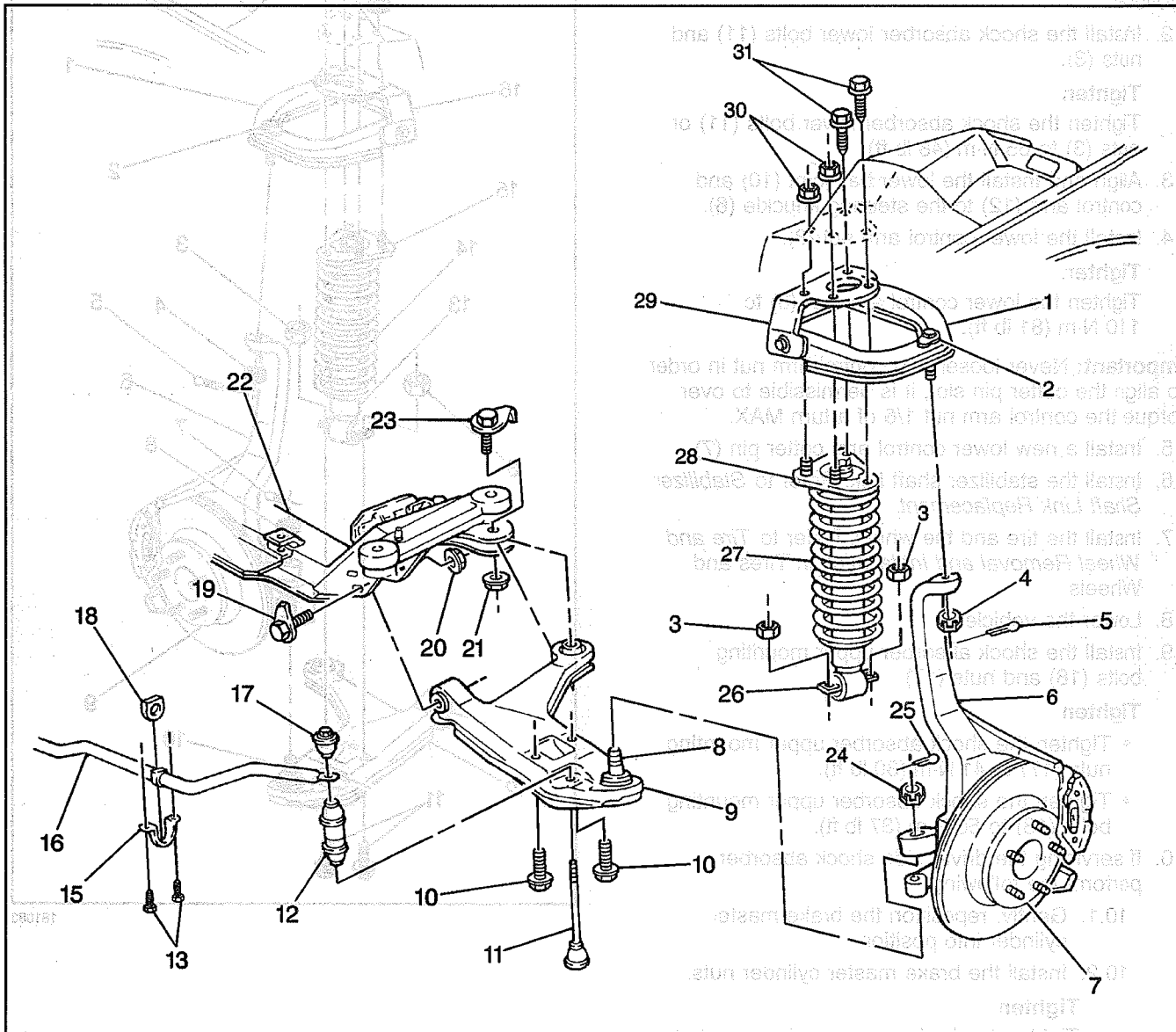


181083

Description and Operation

General Description

Front Suspension



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The short/long arm front suspension design allows each wheel to compensate for changes in the road surface level without appreciably affecting the opposite wheel. Each wheel independently connects to the frame by the following:

- A steering knuckle (6)
- A wheel hub (7)
- A shock absorber (26) and spring (27)

- Upper and lower ball studs (2,8)
- Upper and lower control arms (1,9)

The steering knuckle and the hubs (6,7) move in a prescribed three-dimensional arc. The front wheels are held in proper relationship to each other by the two front tie rods. The front tie rods connect to the steering arms on the knuckles and connect to the steering gear.

Springs (27) mount to the lower control arms (9). Direct-acting shock absorbers (26) provide ride control. The upper portion of the shock absorber connects to the front upper shock absorber mount (28). The upper mount (28) extends through the upper control arm support (29) and through the center wheelhouse. The upper mount attaches with two bolts/screws (31) and two nuts (30).

The stabilizer shaft (16) controls idle roll of the front suspension. The stabilizer shaft mounts to the stabilizer shaft insulators (18). These insulators attach to the frame side rails by the stabilizer shaft brackets. The ends of the stabilizer shaft (16) connect to the lower control arms (9) by the stabilizer shaft links (11). These ends are isolated by bushings.

The inner ends of the lower control arm (9) have pressed-in bushings. Bolts (19) pass through the bushings and attach the lower control arm (9) to the crossmember (22).

The upper ball stud (2) is riveted to the upper control arm (1). This stud attaches to the steering knuckle (6) with a nut (4) and a cotter pin (5). The control arm bolts to the shock absorber (26) through an upper control arm support (29) which attaches to the body.

The lower ball stud (8) is press fit into the lower control arm (9). This ball stud attaches to the steering knuckle (6) with a nut (24) and a cotter pin (25).

Rubber seals are provided at the ball sockets in order to keep dirt and moisture from entering the stud and damaging the bearing surfaces.

Special Tools and Equipment

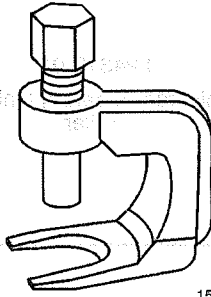
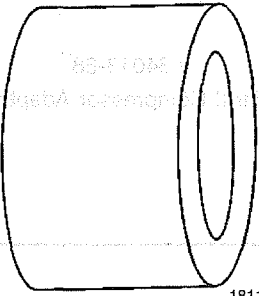
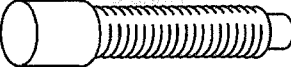
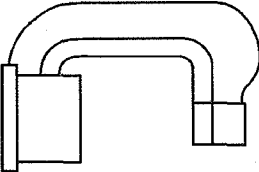
Illustration	Tool Number/ Description
 153085	J 6627-A Wheel Stud Remover
 153086	J 9519-7 Ball Joint Remover
 181128	J 9519-9 Ball Joint Installer
 153089	J 9519-18 Ball Joint Pressing Screw
 153090	J 9519-23 Ball Joint C-Clamp

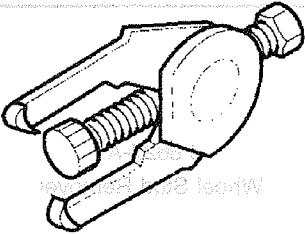
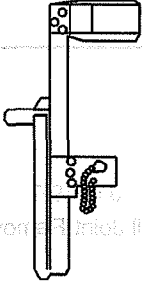
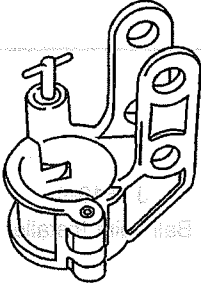
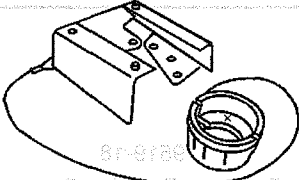
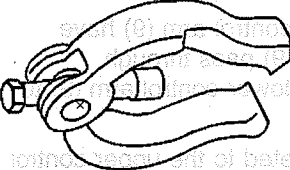
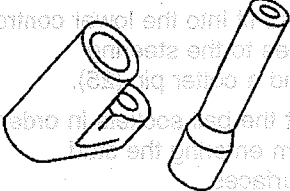
Illustration	Tool Number/ Description
 297656	J 24319-01 Universal Steering Linkage Puller
 144083	J 34013-B Strut Spring Compressor
 176280	J 34013-88 Strut Compressor Adapter
 181112	J 34013-114 Modular Shock Compressor Adapter

Illustration	Tool Number/ Description
 181114	J 34013-115 Modular Shock Alignment Rod
 181116	J 39549 Ball Joint/Tie Rod Separator
 181126	J 39642 Modular Shock Nut Removal Set, 15 mm (0.60 in)