

[2009 Chevrolet Express - AWD](#) | [Express, Savana \(VIN G/H\) Service Manual](#) | [Steering](#) | [Steering Linkage](#) | [Specifications](#)
| Document ID: 798215

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Idler Arm to Frame Mounting Bolts	150 N·m	111 lb ft
Idler Arm to Relay Rod Retaining Nut	63 N·m	47 lb ft
InnerTie Rod to Relay Rod Retaining Nut	112 N·m	83 lb ft
Pitman Arm to Relay Rod Retaining Nut	63 N·m	47 lb ft
Pitman Arm to Steering Gear Retaining Nut	250 N·m	184 lb ft
Tie Rod to Steering Knuckle Retaining Nut	63 N·m	47 lb ft

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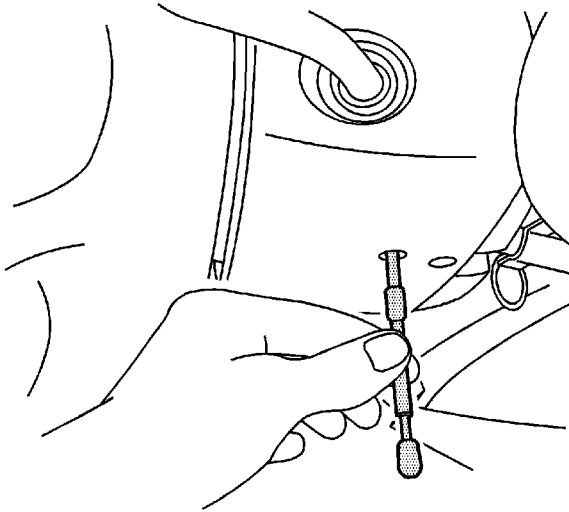
Steering Linkage Inspection

Tools Required

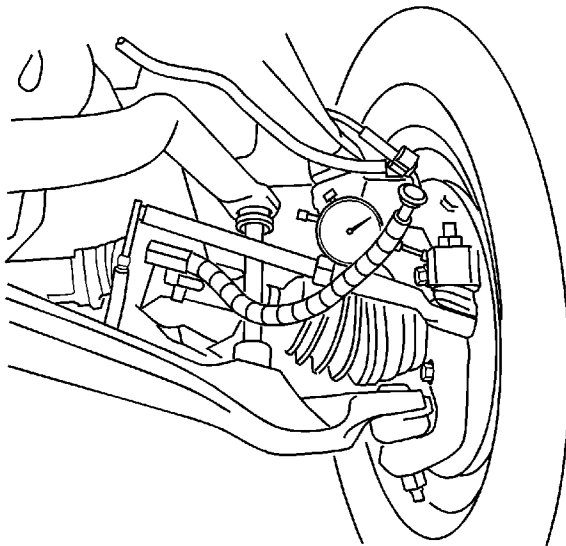
- [J 45101](#) Hub and Wheel Runout Gage
- [J 42640](#) Steering Column Anti-Rotation Pin

Left Side Steering Linkage

1. Elevate the left front of the vehicle and install suitable vehicle support maintaining contact between the right front wheel and the shop floor.

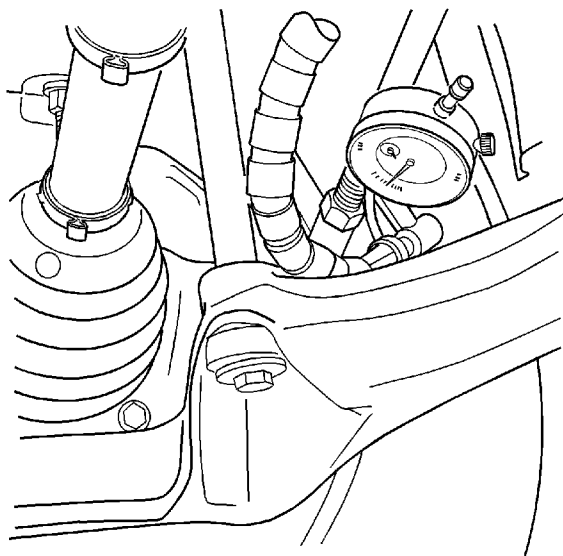


2. Position the wheels in a straight-ahead position and install the [J 42640](#).



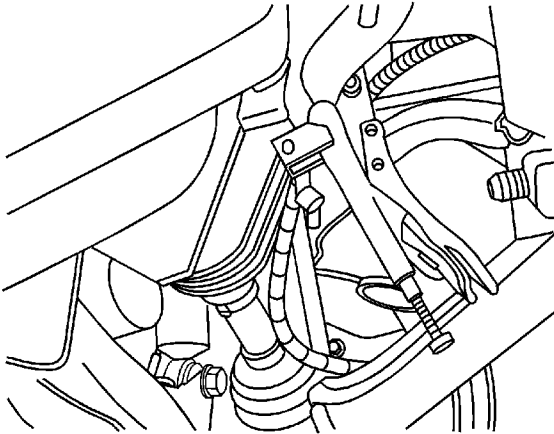
3. Install a dial indicator between the outer tie rod and the steering knuckle as shown and push inward to remove the lash slowly with one hand.
4. Place the dial indicator at zero, pull outward on the tire, and note the amount of movement in the joint.

The movement should not exceed 1.0 mm (0.039 in).

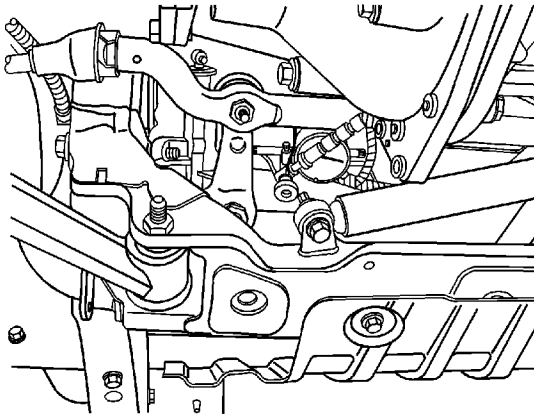


5. Install the dial indicator between the outer tie rod end and the jam nut and attach the other end to the relay rod as shown and push inward on the tire to remove the lash slowly with one hand.
6. Place the dial indicator at zero, pull outward, and note the amount of movement in the joint.

The movement should not exceed 1.0 mm (0.039 in).



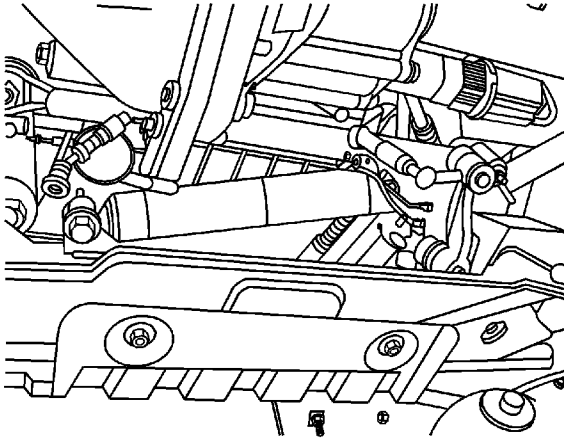
7. Install the dial indicator between the pitman arm and the relay rod as shown and push inward on the tire to remove the lash slowly with one hand.



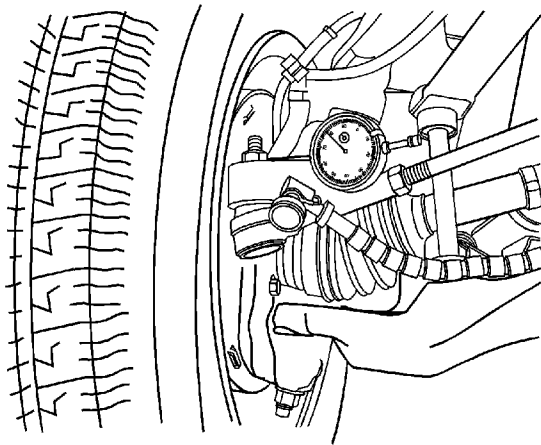
8. Place the dial indicator at zero, pull outward, and note the amount of movement in the joint.

The movement should not exceed 1.0 mm (0.039 in).

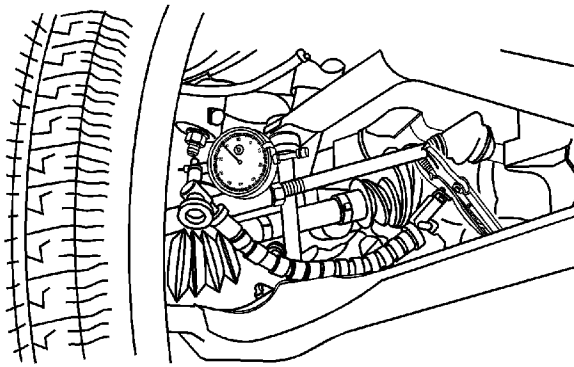
Right Side Steering Linkage



1. Elevate the right front of vehicle and install a suitable vehicle support maintaining contact between the left front wheel and the shop floor.

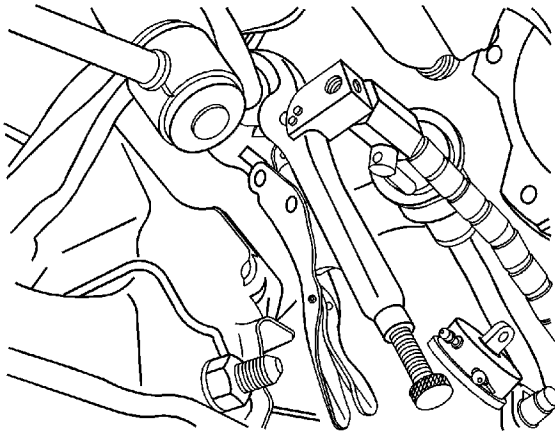


2. Install a dial indicator between the outer tie rod and the steering knuckle as shown and push inward to remove the lash slowly with one hand.

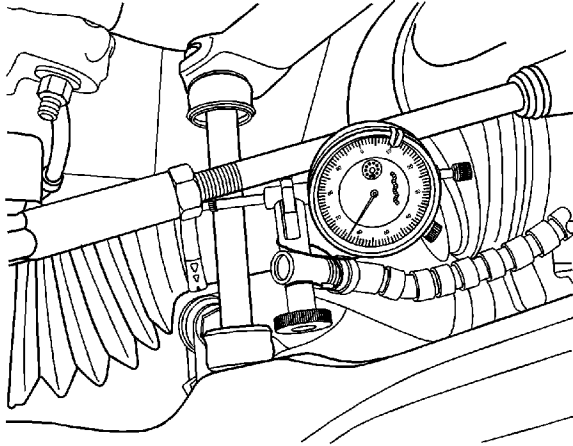


3. Place the dial indicator at zero, pull outward, and note the amount of movement in the joint.

The movement should not exceed 1.0 mm (0.039 in).



4. Install the dial indicator between the outer tie rod end and the relay rod as shown and push inward to remove the lash slowly with one hand.



5. Place the dial indicator at zero, pull outward, and note the amount of movement in the joint.

The movement should not exceed 1.0 mm (0.039 in).

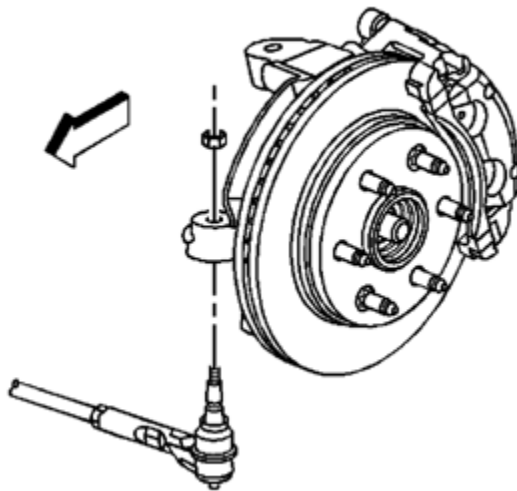
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Steering Linkage Outer Tie Rod Replacement

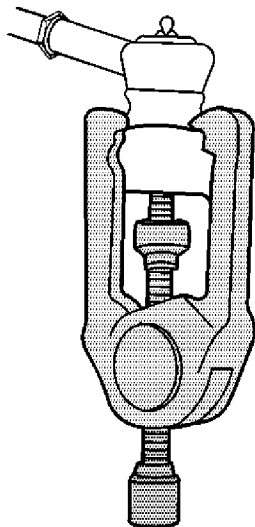
Special Tools

[J 24319-B](#) Steering Linkage and Tie Rod Puller

Removal Procedure

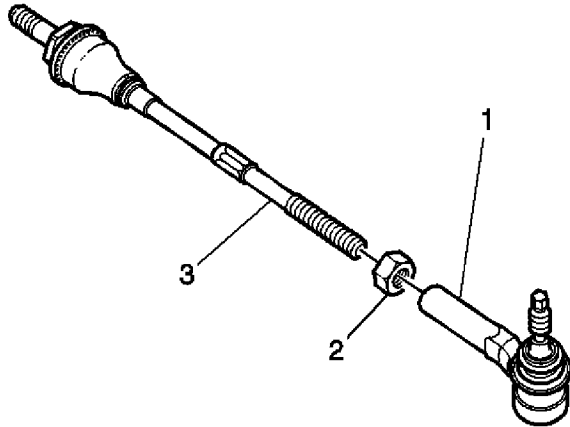


1. Raise and suitable support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#).
3. Remove the outer tie rod to steering knuckle retaining nut.



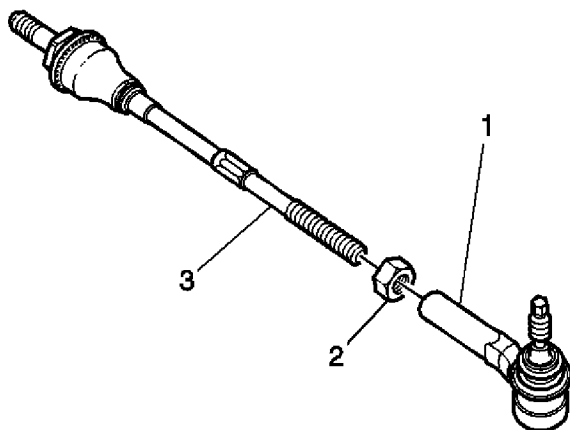


4. Disconnect the outer tie rod from the steering knuckle using the [J 24319-B](#).



5. Loosen the jam nut (2) and remove the outer tie rod (1) from the inner tie rod (3).
6. Inspect the shaft for bent or damaged threads.
7. Clean the tapered surface of the steering knuckle.

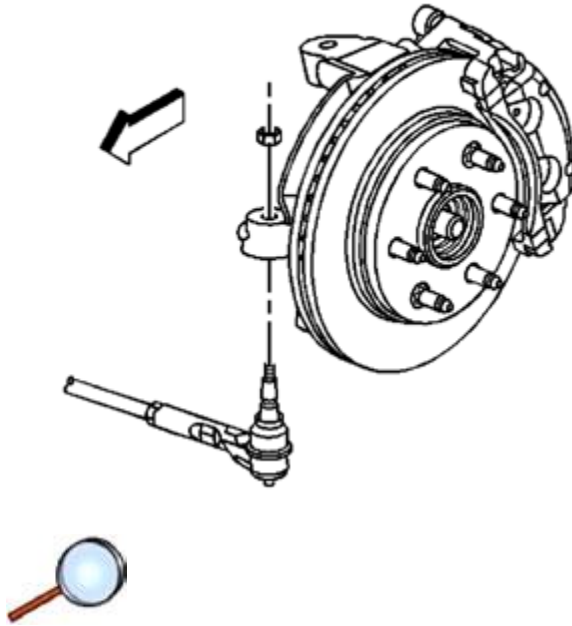
Installation Procedure



1. Lubricate the inner tie rod (3) threads with a suitable chassis lubricant before installing the outer tie rod (1).

2. Install the outer tie rod (1) to the inner tie rod (3). Do not tighten jam nut at this time.

Caution: Refer to [Fastener Caution](#) in the Preface section.



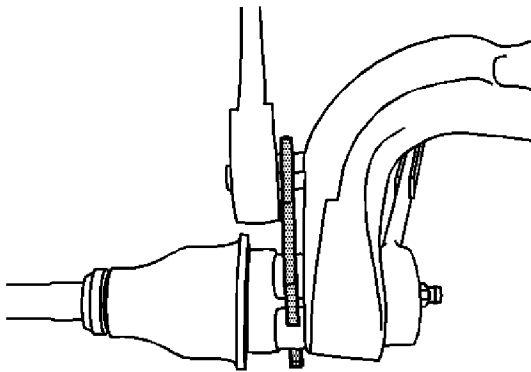
3. Install the outer tie rod to steering knuckle retaining nut and tighten to **63 N·m (47 lb ft)**.
4. Install the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#).
5. Lower the vehicle.
6. Adjust the front toe. Refer to [Wheel Alignment Measurement](#).

Steering Linkage Inner Tie Rod Replacement

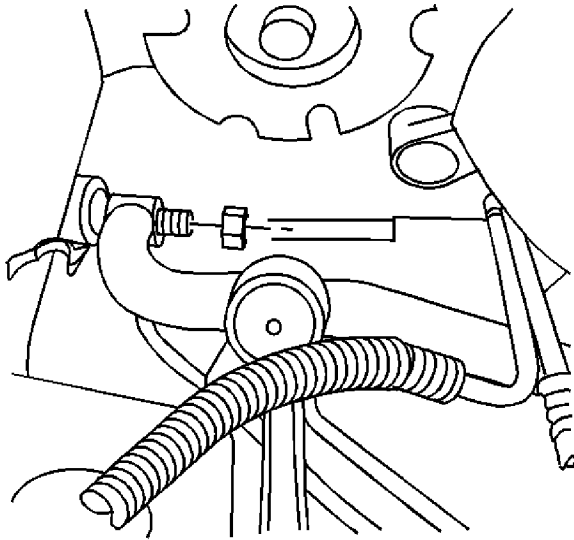
Special Tools

[J 34028](#) Inner Tie Rod Wrench

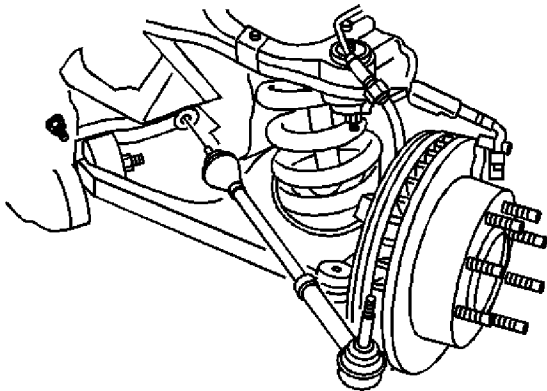
Removal Procedure



1. Raise and suitable support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#).
3. Remove the outer tie rod. Refer to [Steering Linkage Outer Tie Rod Replacement](#).
4. Loosen the inner tie rod to relay rod retaining nut using [J 34028](#) .

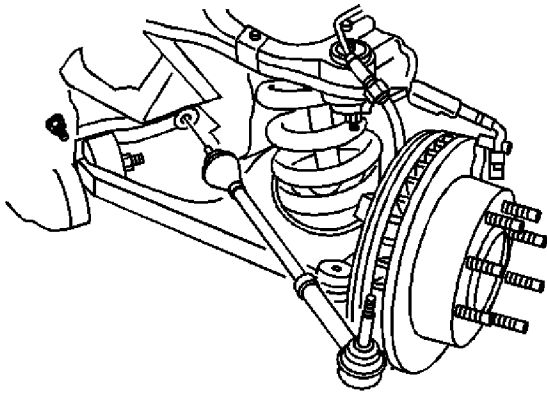


5. Remove the inner tie rod to the relay rod retaining nut. Discard old nut.

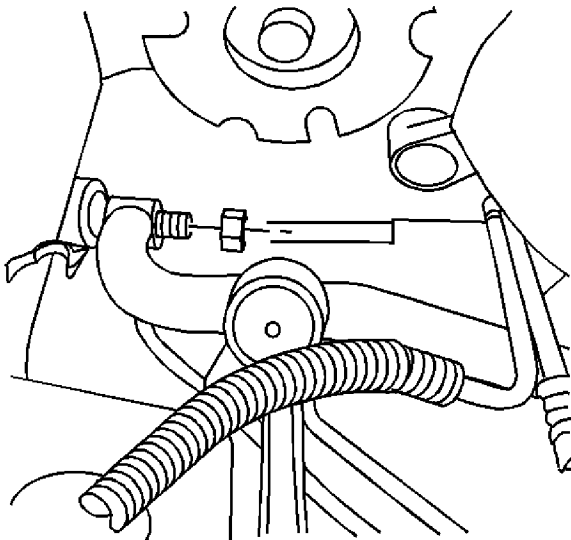


6. Remove the inner tie rod from the vehicle
7. Inspect the shaft for bent or damaged threads.
8. Clean the tapered surface of the steering knuckle.

Installation Procedure

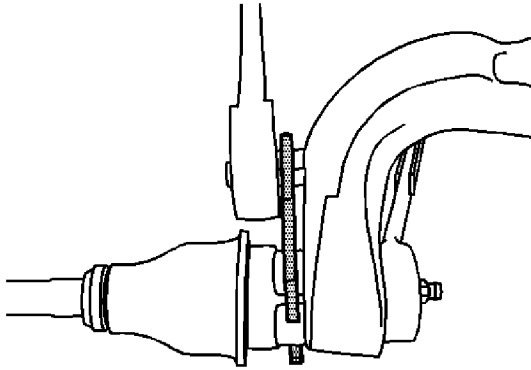


1. Lubricate the inner tie rod threads with a suitable chassis lubricant before installing the outer tie rod.
2. Install the inner tie rod to the vehicle.



3. Install the inner tie rod to relay rod retaining nut.

Caution: Refer to [Fastener Caution](#) in the Preface section.

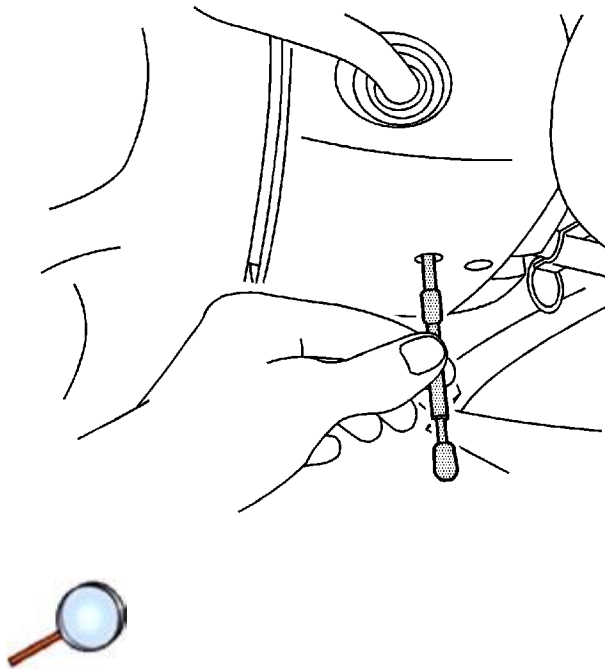


4. Tighten the inner tie rod to relay rod retaining nut using [J 34028](#) and tighten to **112 N·m (83 lb ft)**.
5. Install the outer tie rod. Refer to [Steering Linkage Outer Tie Rod Replacement](#).
6. Install the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#).
7. Lower the vehicle.
8. Adjust the front toe. Refer to [Wheel Alignment Measurement](#).

Idler Arm Inspection

Special Tools

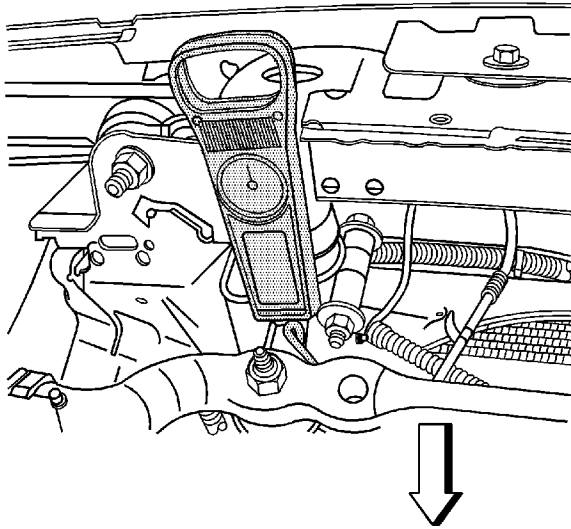
- [J 35999](#) Spring Scale
 - [J 42640](#) Steering Column Anti-Rotation Pin
 - [J 45101](#) Hub and Wheel Runout Gage
1. Raise the vehicle on a hoist. Support the vehicle with jackstands. Refer to [Lifting and Jacking the Vehicle](#).



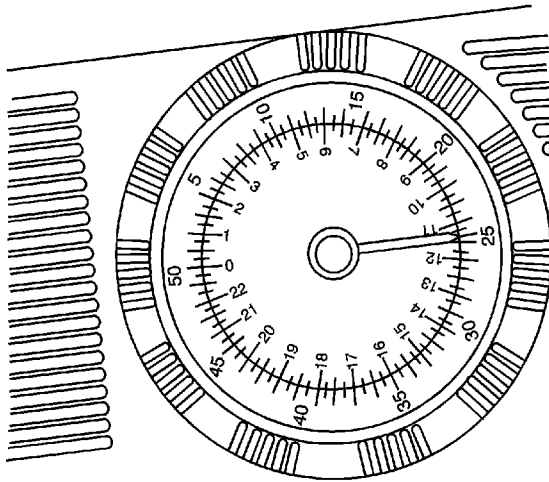
Caution: The wheels of the vehicle must be straight ahead and the steering column in the LOCK position before disconnecting the steering column or intermediate shaft from the steering gear. Failure to do so will cause the SIR coil assembly to become uncentered, which may cause damage to the coil assembly.

2. Position the wheels in a straight-ahead position and install the [J 42640](#).
3. Install the dial indicator [J 45101](#) between the idler arm and vehicle frame.

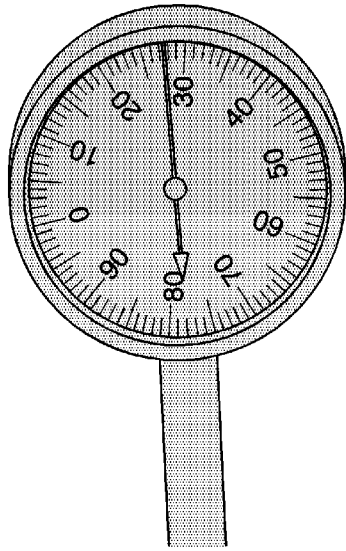
Ensure the gage is at zero before taking a measurement.



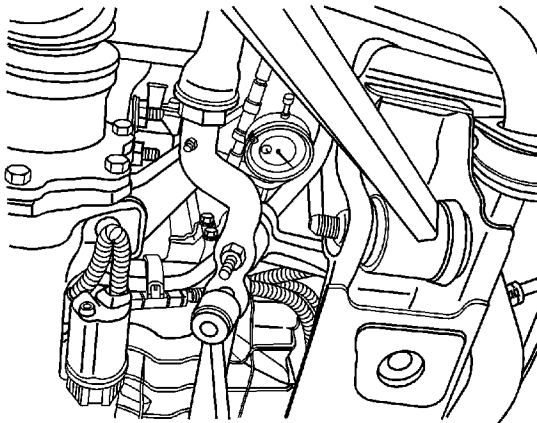
4. Place a [J 35999](#) near the relay rod end of the idler arm.



5. Exert a 110 N·m (25 lb) force upward, and then downward while measuring the total distance the arm moves.

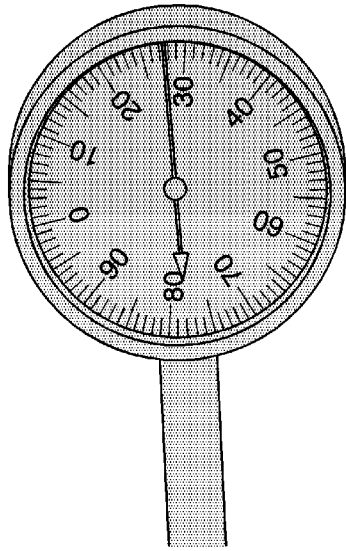


6. If movement exceeds 2 mm (0.078 in) replace the idler arm.



7. Install the dial indicator at the idler arm.
8. Push the tire inward slowly with one hand to remove any lash.

Zero out the dial indicator and pull outward in order to take a reading.



9. Allow only 1 mm (0.039 in) of movement at the idler arm ball stud.

If more than 1 mm exists, replace the idler arm.

10. Lower the vehicle.

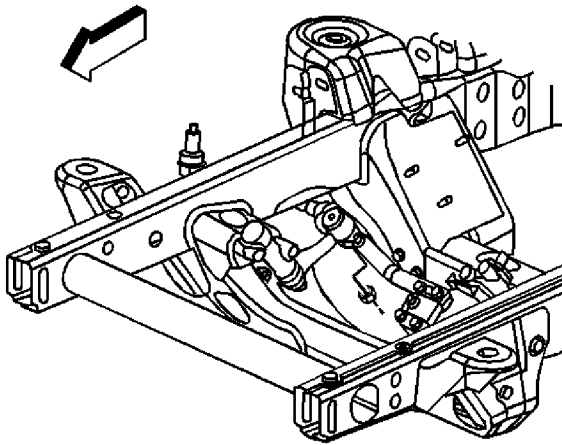
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Idler Arm Replacement

Special Tools

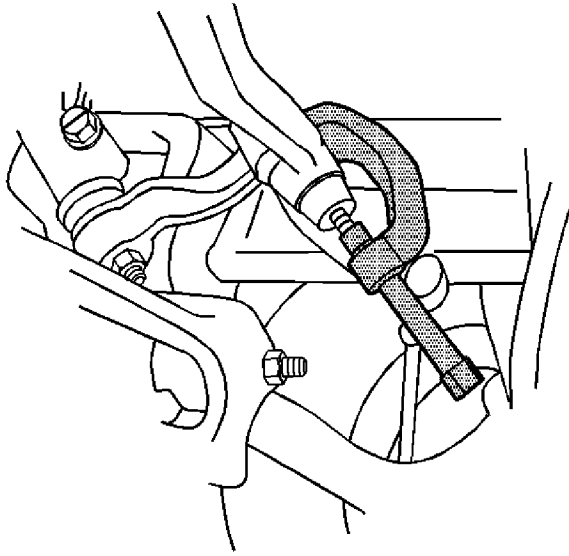
[J 43631](#) Ball Joint Remover

Removal Procedure

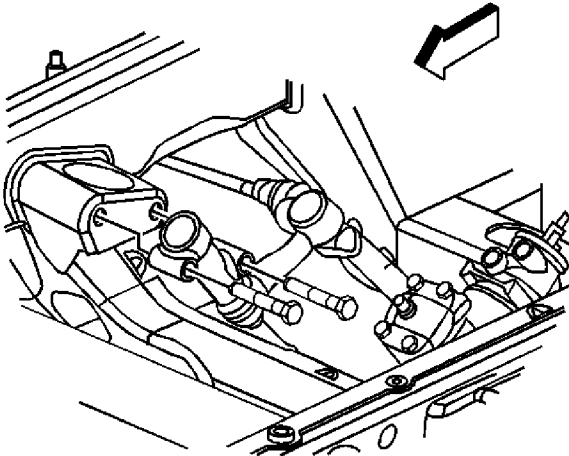


1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the idler arm to relay rod retaining nut.

Discard the nut.

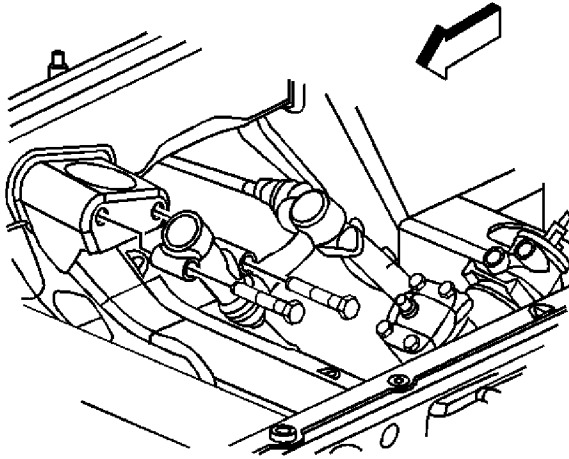


3. Disconnect the idler arm from the relay rod using the [J 43631](#).



4. Remove the idler arm to frame mounting bolts.
5. Remove the idler arm from the vehicle.

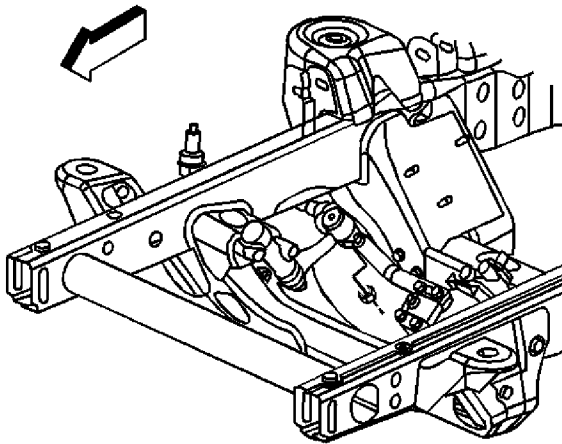
Installation Procedure



1. Install the idler arm to the frame.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the idler arm to frame mounting bolts and tighten to **150 N·m (111 lb ft)**.



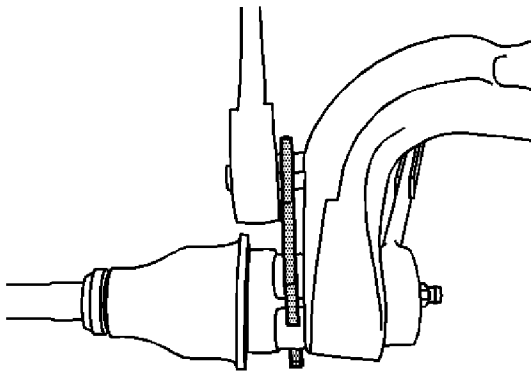
3. Install the idler arm to the relay rod.
4. Install the new idler arm to relay rod retaining nut and tighten to **63 N·m (47 lb ft)**.
5. Lower the vehicle.
6. Check the wheel alignment. Refer to [Wheel Alignment Measurement](#).

Relay Rod Replacement

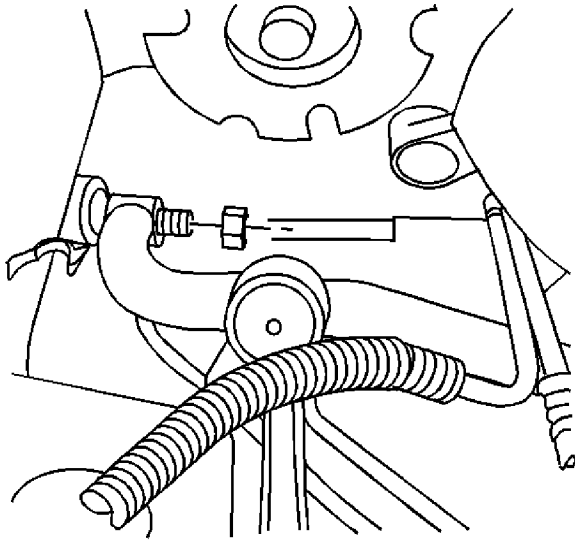
Special Tools

- [J 24319-B](#) Steering Linkage and Tie Rod Puller
- [J 43631](#) Ball Joint Remover
- [J 34028](#) Inner Tie Rod Wrench

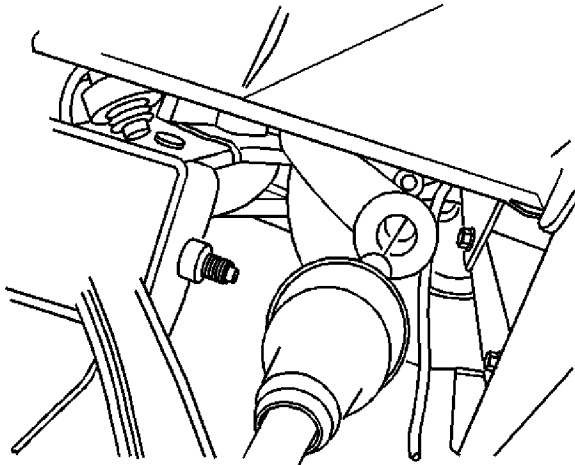
Removal Procedure



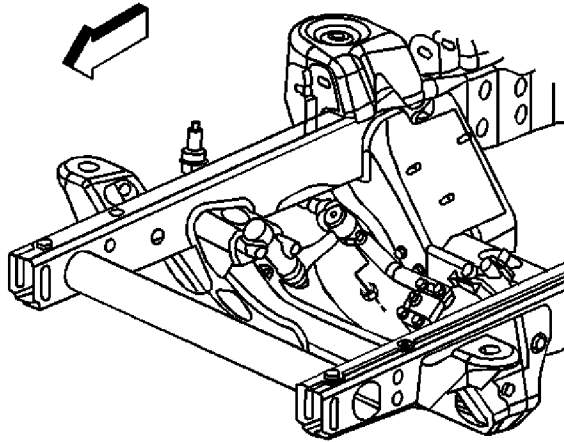
1. Raise and suitable support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Loosen the inner tie rods to relay rod retaining nuts using [J 34028](#).



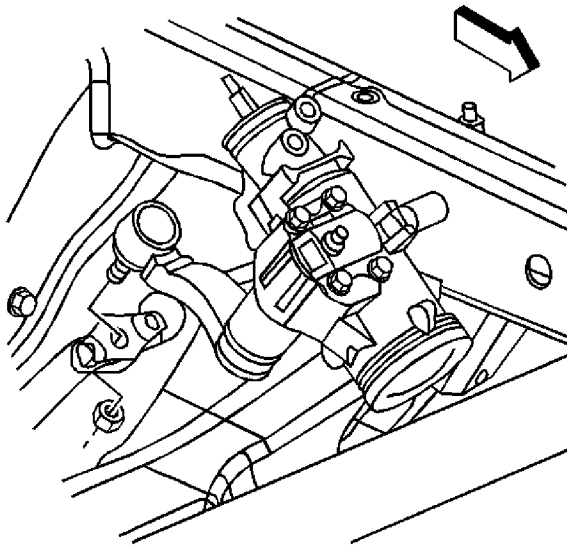
3. Remove the inner tie rods to the relay rod retaining nuts.



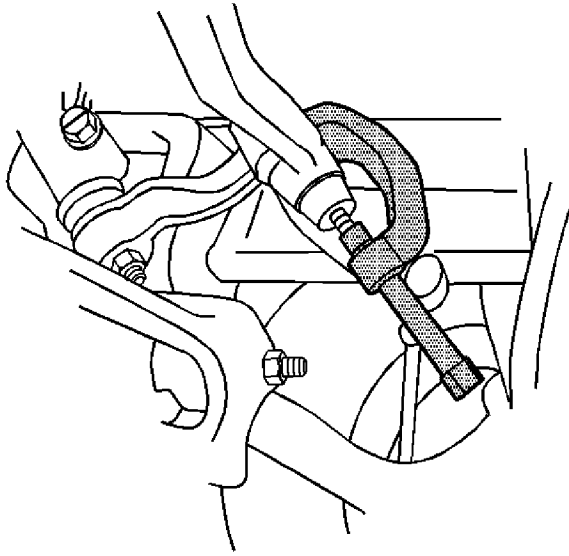
4. Rotate the steering linkage to remove the inner tie rods from the relay rod.



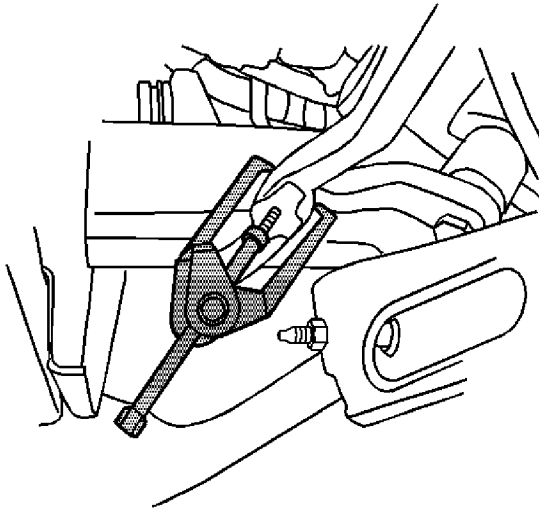
-  5. Remove the idler arm to relay rod retaining nut. Discard the nut.



-  6. Remove the pitman arm retaining nut. Discard the nut.

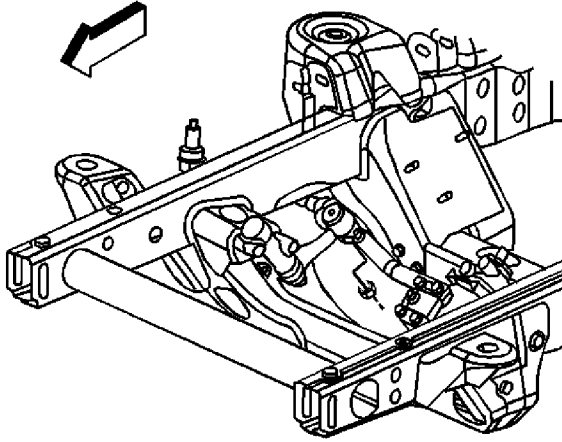


7. Disconnect the relay rod from the idler arm using the [J 43631](#) .



8. Disconnect the relay rod from the pitman arm using the [J 24319-B](#) .
9. Remove the relay rod from the vehicle.

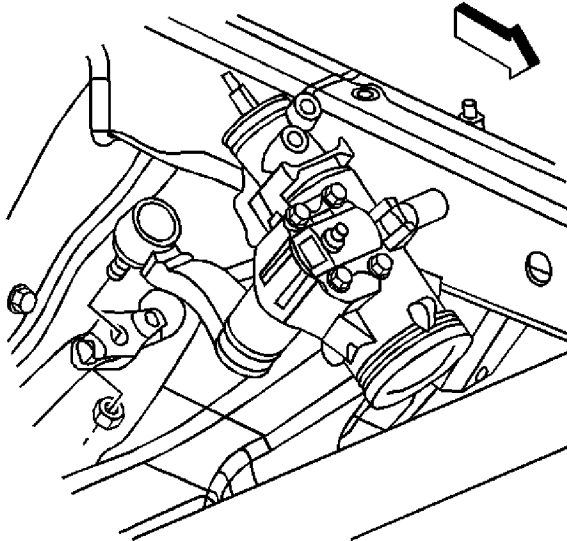
Installation Procedure



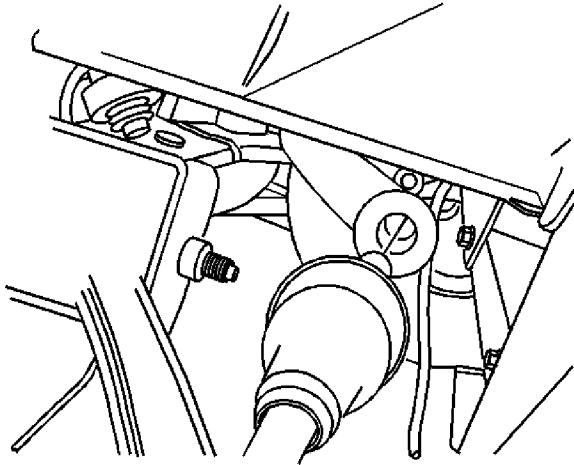
1. Install the relay rod to the vehicle.
2. Install the relay rod to the pitman arm and idler arm.

Caution: Refer to [Fastener Caution](#) in the Preface section.

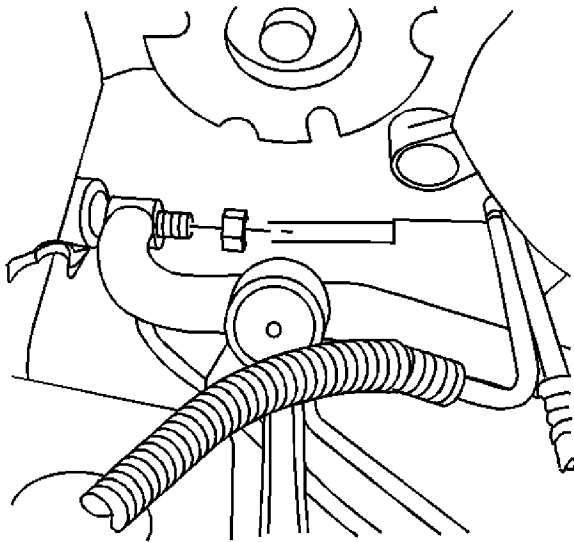
3. Install the new relay rod to the idler arm retaining nut and tighten to **63 N·m (47 lb ft)**.



4. Install the new relay rod to the pitman arm retaining nut and tighten to **63 N·m (47 lb ft)**.

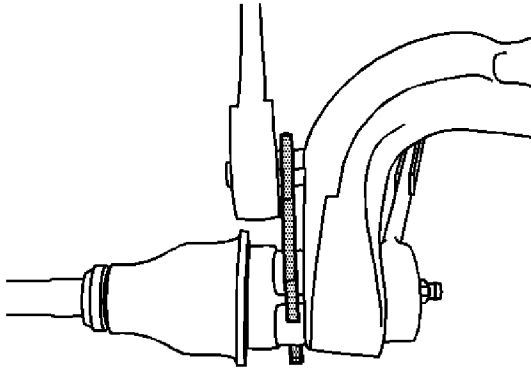


5. Install the inner tie rods to the relay rod.



6. Install the inner tie rods to relay rod retaining nuts.

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7. Tighten the inner tie rods to relay rod retaining nuts using [J 34028](#) to **112 N·m (83 lb ft)**.
8. Lower the vehicle.
9. Verify the wheel alignment. Refer to [Wheel Alignment Measurement](#).

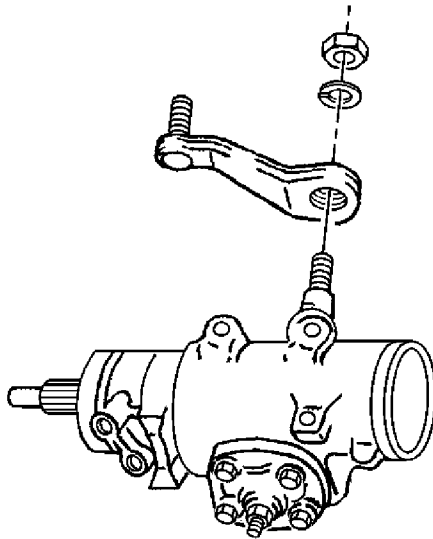
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Pitman Arm Replacement

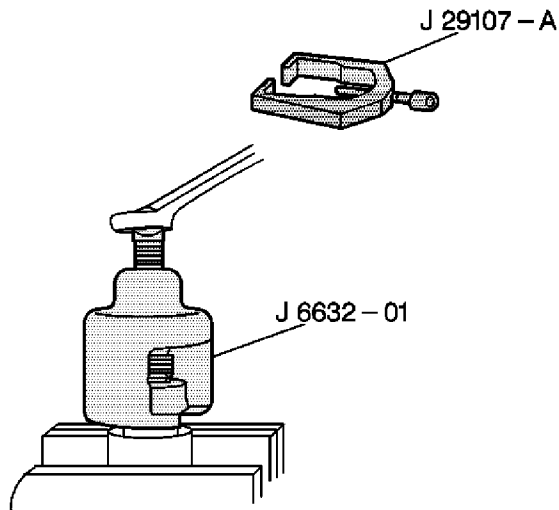
Special Tools

- [J 6632-01](#) Pitman Arm Puller
- [J 29107-A](#) Universal Pitman Arm Puller

Removal Procedure

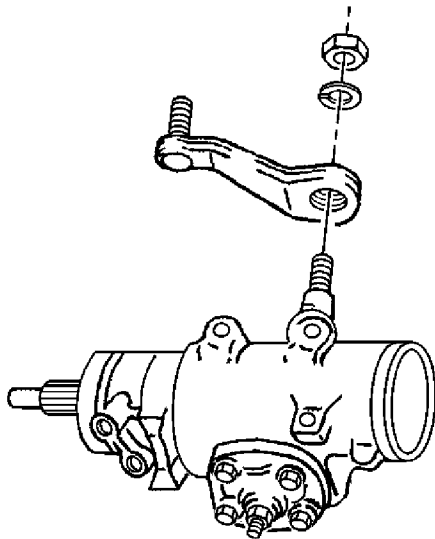


1. Raise and suitable support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the power steering gear. Refer to [Steering Gear Replacement](#).
3. Install the power steering gear into a vise.
4. Remove the pitman arm nut and washer.



5. Remove the pitman arm from the pitman shaft using [J 6632-01](#) or [J 29107-A](#).

Installation Procedure



1. Install the pitman arm to the power steering gear.

Caution: Refer to [Fastener Caution](#) in the Preface section.

- Align the marks made at the removal on the pitman arm and the pitman arm shaft.
- Install a new pitman arm washer and nut and tighten to **250 N·m (184 lb ft)**.
- Remove the power steering gear from the vise.

5. Install the power steering gear. Refer to [Steering Gear Replacement](#).
6. Lower the vehicle.
7. Check the wheel alignment. Refer to [Wheel Alignment Measurement](#).

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