

SECTION : 6C

POWER STEERING GEAR

CAUTION : *Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.*

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SPECIFICATIONS

GENERAL SPECIFICATIONS

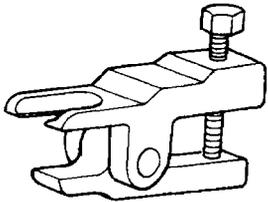
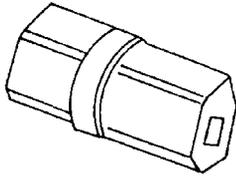
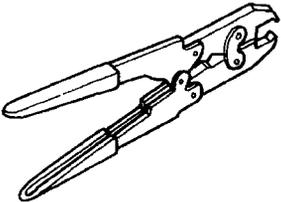
Application	Description
Capacity	1.0 Liter (1.06 qt)
Lubricant	Power Steering Fluid DEXRON®-II or III

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb–Ft	Lb–In
Adjuster Plug	7 (minus 30°– 40°)	–	62 (minus 30°– 40°)
Adjuster Plug Locknut	75	56	–
Control Module Bracket Bolts	7	–	62
Dash Seal Retaining Ring Nuts	7	–	62
Hydraulic Cylinder Line Fittings – Cylinder End	27	20	–
Hydraulic Cylinder Line Fittings – Valve End	18	13	–
Inner Tie Rods	100	74	–
Intermediate Shaft Pinch Bolts – Upper and Lower	25	18	–
Maximum Pinion Preload	1	–	9
Outer Tie Rod Adjusting Nut	64	47	–
Outer Tie Rod Nuts	50	37	–
Pinion Locknut	30	22	–
Steering Gear Inlet and Outlet Pipe Fittings	28	21	–
Steering Gear Mounting Bracket Nuts and Bolts	60	44	–
Transaxle Center Bracket–to–Engine Bolt	90	66	–
Transaxle Center Bracket–to–Transaxle Bolts	90	66	–

SPECIAL TOOLS

SPECIAL TOOLS TABLE

 <p style="text-align: center;">A106C034</p>	<p style="text-align: center;">KM-507-B Ball Joint Remover</p>	 <p style="text-align: center;">C105C001</p>	<p style="text-align: center;">J-42459 Rack Guide Spring Cap Wrench</p>
 <p style="text-align: center;">A104A008</p>	<p style="text-align: center;">KM-J-22610 Installer</p>		

DIAGNOSIS

POWER RACK AND PINION STEERING GEAR

Hissing Noise

Checks	Action
Check the intermediate shaft joints for looseness.	Tighten the intermediate shaft joints.
Check the power steering hose for contact with other components.	Be sure the power steering hose is correctly fitted into the hose clips.

Rattling Noise in Steering Gear

Checks	Action
Check the power steering hose for contact with the body.	Be sure the power steering hose is correctly fitted into the hose clips.
Check the steering gear for insufficient lubrication.	Lubricate the steering gear.
Check the steering gear mounting for improper installation.	Tighten the steering gear mounting bracket nuts and bolts.
Check the outer tie rods for improper installation.	Tighten the outer tie rod joints. Replace the outer tie rods.

Poor Return of Steering Wheel to Center

Checks	Action
Check the steering wheel for contact with the turn signal housing.	Adjust the turn signal housing.
Check the intermediate shaft joints for binding or looseness.	Replace the intermediate shaft.
Check the power steering pump flow control valve for sticking and improper alignment.	Replace the power steering pump.
Check the wheel alignment.	Align the wheels.
Check the wheel bearings for wear or damage.	Replace the wheel bearings.
Check the intermediate shaft joints for improper installation.	Adjust the intermediate shaft between the steering gear and the steering column. Replace the intermediate shaft.
Check the outer tie rods and the ball joints for binding or looseness.	Tighten the tie rods and the ball joints. Replace the tie rods and the ball joints.
Check the steering gear adjustments.	Perform a straight-ahead check.
Check the steering column shaft seal for rubbing on the shaft.	Replace the dash seal.
Check the steering shaft bearings for binding.	Replace the stub shaft bearings.

Momentary Increase in Effort When Turning the Wheel Quickly

Checks	Action
Check the power steering pump for internal leaks.	Replace the power steering pump.
Check the hoses for damage or restricted flow.	Replace the power steering hoses and/or pipes.
Check the power steering fluid level.	Fill the power steering fluid reservoir.
Check the power steering pump flow control valve for sticking and improper operation.	Replace the power steering pump.

Steering Surges or Jerks When Turning with Engine Running

Checks	Action
Check the power steering pump for insufficient pressure.	Replace the power steering pump.
Check the power steering pump flow control valve for sticking and improper operation.	Replace the power steering pump.
Check the power steering pump serpentine belt for slippage.	Tighten the power steering serpentine belt.
Check for air contamination in the power steering system.	Bleed the power steering system.

Steering Vibrates During Low Speed or Static Steering

Checks	Action
Check for air contamination in the power steering system.	Bleed the power steering system.
Check the power steering pump serpentine belt for looseness.	Tighten the power steering serpentine belt.

Excessive Wheel Kickback or Loose Steering

Checks	Action
Check for air contamination in the power steering system.	Bleed the power steering system.
Check the wheel bearings for wear or damage.	Replace the wheel bearings.
Check the steering gear mounting for improper installation.	Tighten the steering gear mounting bracket nuts and bolts.
Check the intermediate shaft joints for improper installation.	Adjust the intermediate shaft between the steering gear and the steering column. Replace the intermediate shaft.
Check the outer tie rods and the ball joints for looseness.	Tighten the tie rods and the ball joints. Replace the tie rods and the ball joints.

Hard Steering or Lack of Assist (Especially During Parking)

Checks	Action
Check the intermediate shaft joints for improper installation.	Adjust the intermediate shaft between the steering gear and the steering column. Replace the coupling flange.
Check the power steering pump flow control valve for sticking and improper installation.	Replace the power steering pump.
Check the power steering pump for insufficient pressure.	Replace the power steering pump.
Check the power steering pump for internal leaks.	Replace the power steering pump.
Check for a loose or a worn intermediate shaft.	Tighten the intermediate shaft. Replace the intermediate shaft, as needed.
Check the power steering pump serpentine belt tension.	Tighten the power steering serpentine belt.

POWER RACK AND PINION STEERING GEAR BENCH TESTING

Removal, Setup and Testing Procedure

Notice : Pressure checks or pressure and flow checks may also be conducted using this setup.

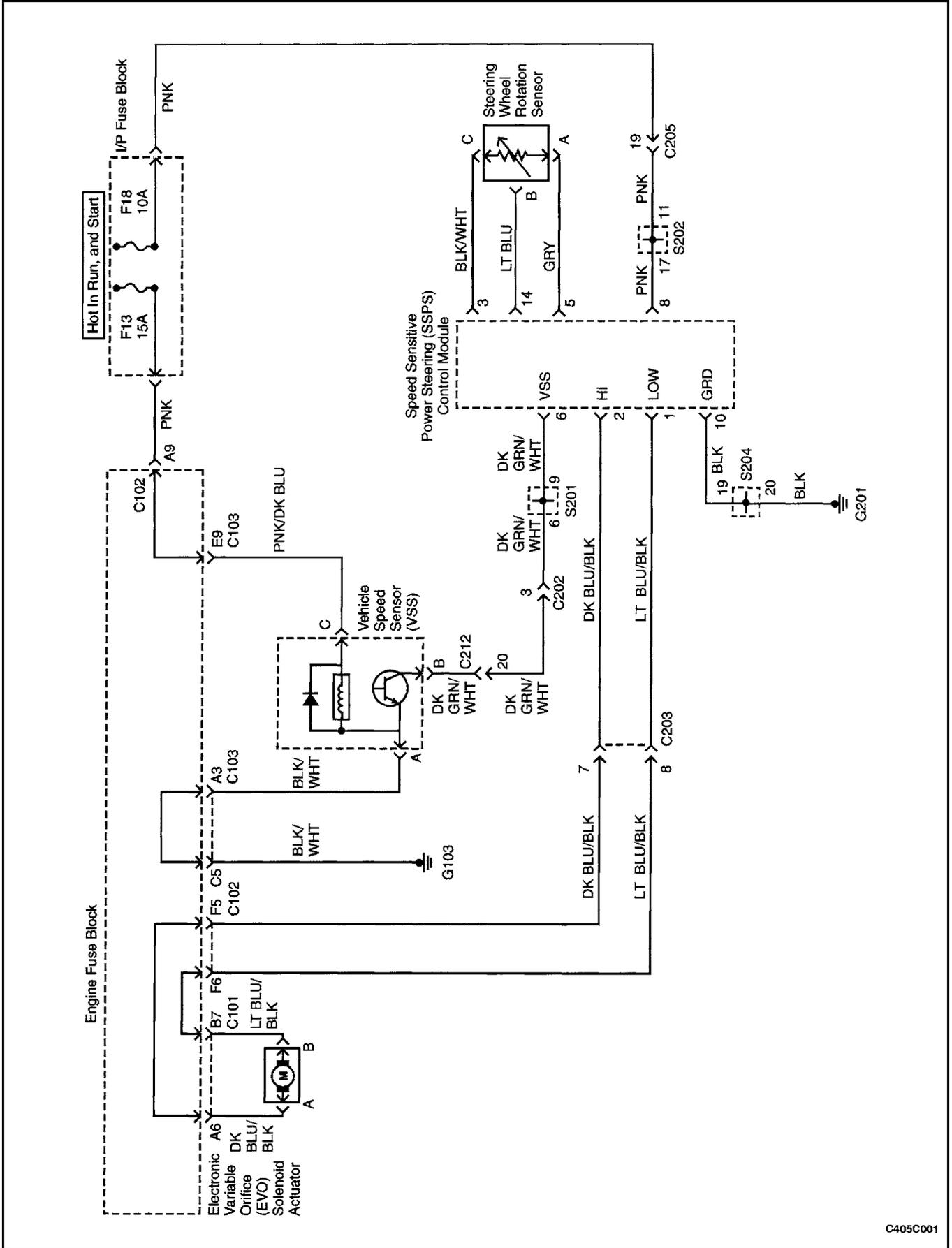
1. Disconnect and remove the power steering gear. Refer to "Rack and Pinion Assembly" in this section.
2. Place the power steering gear on a bench next to the vehicle.
3. Disconnect the pressure line at the point where the hose connects to the pipe. Extend this line to reach the power steering gear on the bench.
4. Disconnect the return line from the the power steering fluid reservoir. Extend this line to reach the power steering gear on the bench.
5. Connect the power steering pipes to the power steering gear.

6. Start the engine and allow it to idle for 10 seconds.
7. Check the power steering fluid level. Refer to *Section 6A, Power Steering System*.
8. Start the engine and turn the rack and pinion stub shaft a full turn in each direction. Hold the shaft against each stop for 5 seconds.
9. Inspect for possible leak points. Refer to *Section 6A, Power Steering System*.

Installation Procedure

1. Stop the engine.
2. Disconnect the power steering pipes from the power steering gear.
3. Remove the extensions and reconnect the pressure and return lines.
4. Install and connect the power steering gear. Refer to "Rack and Pinion Assembly" in this section.
5. Start the engine and allow it to idle for 10 seconds.
6. Check the power steering fluid level. Refer to *Section 6A, Power Steering System*.

SPEED SENSITIVE POWER STEERING SYSTEM



SPEED SENSITIVE POWER STEERING SYSTEM OPERATING WITH FULL ASSIST AT ALL TIMES

Step	Action	Value(s)	Yes	No
1	Perform an initial inspection of the power steering system. Is the system operational?		Go to Step 2	Go to Section 6A, Power Steering System
2	Check the speedometer. Is the speedometer inoperative?		Go to Section 5A, ZF4HP14 Automatic Transaxle	Go to Step 3
3	Check the diagnostic trouble codes (DTCs) at the engine control module (ECM). Is ECM Code 24 set?		Go to Section 1F, Engine Controls	Go to Step 4
4	1. Turn the ignition ON. 2. Disconnect the electronic variable orifice (EVO) solenoid actuator electrical connector at the power steering pump. 3. Probe terminal A of the EVO actuator connector with a voltmeter. Is the voltage equal to the specified value?	≈ 3 v	Go to Step 6	Go to Step 5
5	Repair the open or short in the circuit between terminal A of the EVO solenoid actuator electrical connector and terminal 2 on the speed sensitive power steering (SSPS) control module connector. Is the repair complete?		System OK	
6	1. Remove the EVO solenoid actuator from the power steering pump. 2. Turn the actuator upside down to position the pintle. 3. Stimulate the actuator by connecting it to the battery. Does the actuator click?		Go to Step 8	Go to Step 7
7	Replace the EVO solenoid actuator. Is the repair complete?		System OK	
8	1. Turn the ignition OFF. 2. Remove the SSPS control module from the control module bracket. 3. Disconnect the SSPS control module connector. 4. Connect a test light from terminal 8 on the SSPS control module connector to ground. 5. Turn the ignition ON. Is the test light on?		Go to Step 14	Go to Step 9
9	Check the ignition fuse. Is the ignition fuse open?		Go to Step 10	Go to Step 11
10	Replace the ignition fuse. Is the repair complete?		System OK	
11	Check for an open or short in the circuit between terminal 8 of the control module connector and the I/P fuse block. Is the connection faulty?		Go to Step 12	Go to Step 13

6C – 8 POWER STEERING GEAR

Step	Action	Value(s)	Yes	No
12	Repair the open or short in the circuit between terminal 8 of the SSPS control module connector and the I/P fuse block. Is the repair complete?		System OK	
13	Repair the power feed to ignition fuse F18. Is the repair complete?		System OK	
14	1. Turn the ignition OFF. 2. Connect a test light from terminal 10 of the SSPS control module connector to B+. Is the test light on?		Go toStep 16	Go toStep 15
15	Repair the open in the ground circuit between terminal 10 of the SSPS control module connector and G201. Is the repair complete?		System OK	
16	Check for a short to B+ or an open in the circuit between terminal 1 of the SSPS control module connector and terminal B of the EVO solenoid actuator connector. Is the connection faulty?		Go toStep 17	Go toStep 18
17	Repair the short to B+ or an open in the circuit between terminal 1 of the SSPS control module connector and terminal B of the EVO solenoid actuator connector. Is the repair complete?		System OK	
18	1. Disconnect the steering wheel rotation sensor. 2. Turn the ignition ON. 3. Check for an open, short to ground, short to B+, or poor terminal contact between terminal 5 of the SSPS control module connector and terminal A of the steering wheel rotation sensor connector. Is the connection faulty?		Go toStep 19	Go toStep 20
19	Repair the open, short to ground, short to B+, or poor terminal contact between terminal 14 of the SSPS control module connector and terminal A of the steering wheel rotation sensor connector. Is the repair complete?		System OK	
20	Check for an open between terminal 3 of the SSPS control module connector and terminal C of the steering wheel rotation sensor connector. Is the connection faulty?		Go toStep 21	Go toStep 22
21	Repair the open between terminal 3 of the SSPS control module connector and terminal C of the steering wheel rotation sensor connector. Is the repair complete?		System OK	
22	Check for an open, short to ground, short to B+, or poor terminal contact between terminal 14 of the SSPS control module connector and terminal B of the steering wheel rotation sensor connector. Is the connection faulty?		Go toStep 23	Go toStep 24

Step	Action	Value(s)	Yes	No
23	Repair the open, short to ground, short to B+, or poor terminal contact between terminal 14 of the SSPS control module connector and terminal B of the steering wheel rotation sensor connector. Is the repair complete?		System OK	
24	1. Turn the ignition OFF. 2. Connect the SSPS control module. 3. Connect the steering wheel rotation sensor. 4. Turn the ignition ON. 5. Backprobe with a voltmeter from terminal 5 on the control module connector to ground. 6. Rotate the steering wheel quickly in both directions. Does the voltage show an increase and decrease from the specified value?	$\approx 3\text{ v}$	Go to <i>Step 25</i>	Go to <i>Step 26</i>
25	Replace the SSPS control module. Is the repair complete?		System OK	
26	Replace the steering wheel rotation sensor. Is the repair complete?		System OK	

SPEED SENSITIVE POWER STEERING SYSTEM OPERATING WITH DECREASED ASSIST AT ALL TIMES

Step	Action	Value(s)	Yes	No
1	Check the speedometer. Is speedometer inoperative?		Go to <i>Section 5A, ZF4HP14 Automatic Transaxle</i>	Go to <i>Step 2</i>
2	Disconnect the EVO solenoid actuator at the power steering pump. Is the symptom still present?		Go to <i>Section 6A, Power Steering System</i>	Go to <i>Step 3</i>
3	Replace the speed sensitive power steering (SSPS) control module. Is repair complete?		System OK	