

1997 Chevrolet S10 Pickup

D - ADJUSTMENTS - 2.2L 1997 ENGINE PERFORMANCE General Motors - On-Vehicle Adjustments - 2.2L

D - ADJUSTMENTS - 2.2L

1997 ENGINE PERFORMANCE General Motors - On-Vehicle Adjustments - 2.2L

ENGINE MECHANICAL

Before performing any on-vehicle adjustments to fuel or ignition systems, ensure engine mechanical condition is okay.

VALVE CLEARANCE

NOTE: All models are equipped with hydraulic lifters. Adjustments are not required.

IGNITION TIMING

NOTE: Ignition timing is controlled by control module and is not adjustable.

IDLE SPEED & MIXTURE

IDLE SPEED & MIXTURE

NOTE: DO NOT attempt to adjust idle mixture and idle speed. Both are controlled by Powertrain Control Module (PCM). Incorrect idle speeds are normally caused by dirty throttle plate or vacuum leaks. Ensure all vacuum components are functioning properly.

NOTE: Controlled idle speed and IAC count can be checked using scan tool. See CONTROLLED IDLE SPEED & IAC COUNT table.

Controlled Idle Speed Check

1. Ensure no trouble code(s) are present, IAC system is okay, and ignition timing is correct. Block drive wheels. Apply parking brake. Connect Tech 1 scan tool to Data Link Connector (DLC). Put scan tool into OPEN mode.
2. Start engine and bring to normal operating temperature. Check for correct state of transmission range switch on scan tool. Check if idle speed and IAC valve pintle position (counts) are as specified. See CONTROLLED IDLE SPEED & IAC COUNT table.
3. If idle speed is not within specification, refer to the TESTS W/O CODES - 2.2L article.

CONTROLLED IDLE SPEED & IAC COUNT

Application	Idle RPM	(1) IAC Counts
Auto. Trans. (2)	(4)	5-50
Man. Trans. (3)	(4)	5-50

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

1997 Chevrolet S10 Pickup

F - BASIC TESTING - 2.2L 1997 ENGINE PERFORMANCE General Motors Corp. - Basic Diagnostic Procedures - 2.2L

pump circuit is faulty, go to step 24). If fuel pump circuit is okay, go to next step.

18. Inspect fuel filter for obstruction, fuel supply line for restriction, fuel pump strainer for obstructions or fuel pump flex pipe for leaks. Repair or replace as necessary. After repairs, go to step 24). If problem was not found, go to step 21).
19. Locate and repair vacuum leak to fuel pressure regulator. After repairs, system is okay.
20. Replace fuel pressure regulator. After repairs, system is okay.
21. Replace fuel sending unit. After repairs, system is okay.
22. Locate and replace any leaking fuel injector(s). After repairs, system is okay.
23. Locate and correct restriction in fuel return line. After repairs, system is okay.
24. Repair problem as necessary. After repairs, system is okay.

BASIC IGNITION SYSTEM CHECKS

NOTE: To diagnose ignition system, see appropriate **IGNITION SYSTEM** test in **NO-START DIAGNOSIS** .

IDLE SPEED & IGNITION TIMING

Ensure idle speed and ignition timing are set to specifications. For specifications, see SPECIFICATIONS article. For adjustment procedures, see ADJUSTMENTS article.

ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK

NOTE: Use of Tech 1 scan tool is required to perform **ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK** .

The OBD System Check determines:

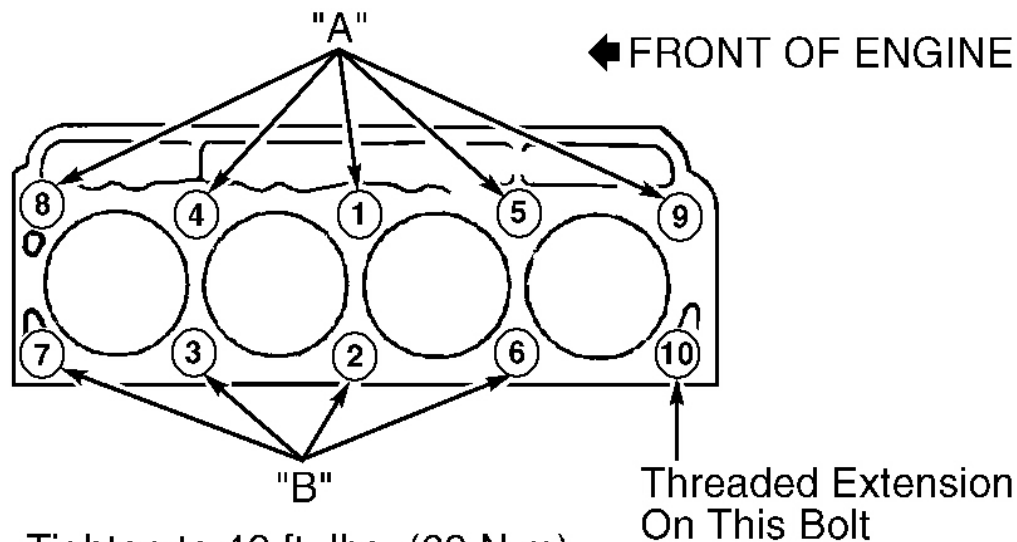
- If Malfunction Indicator Light (MIL) works.
- If PCM/VCM is operating and can recognize a fault.
- If any Diagnostic Trouble Codes (DTCs) are stored.

After performing procedures in PRELIMINARY INSPECTION & ADJUSTMENTS, **BASIC FUEL SYSTEM CHECKS** and BASIC IGNITION SYSTEM CHECKS, this is the starting point for utilizing the self-diagnostic system for determining computer-related problems. After performing necessary tests as described in the OBD system circuit check, if no codes are indicated and driveability problems still exist, see the TESTS W/O CODES article and SCAN TOOL usage in the TESTS W/CODES article.

1. Turn ignition on with engine off. If Malfunction Indicator Light (MIL) illuminates, go to next step. If MIL does not illuminate, go to MIL INOPERATIVE.
2. Turn ignition off. Install Tech 1 scan tool and follow scan tool manufacturer's instructions to proceed with test. Turn ignition on. If scan tool displays PCM data, go to next step. If scan tool does not display PCM data, go to **DLC DIAGNOSIS OR NO SCAN TOOL DATA** .

1997 Chevrolet S10 Pickup

2.2L 4-CYL - VIN [4] 1996-97 ENGINES General Motors Corp. 2.2L 4-Cylinder VIN [4]



A. Tighten to 46 ft. lbs. (62 N.m)

B. Tighten to 43 ft. lbs. (58 N.m)

NOTE: Tighten each bolt an additional 90 degrees.

G91G08216

Fig. 5: Cylinder Head Bolt Tightening Sequence

Courtesy of GENERAL MOTORS CORP.

FRONT COVER

Removal

1. Disconnect negative battery cable. Remove oil pan. See **OIL PAN** . Remove serpentine drive belt. Remove power steering pump (leave hoses connected). Remove generator (leave wiring connected). Remove drive belt tensioner. Raise and support vehicle.
2. Remove right front wheel. Remove engine splash shield. Remove bolt from center of crankshaft pulley. Remove 3 crankshaft pulley bolts. Using a puller, remove crankshaft pulley hub. If replacing seal, pry seal from front cover with a large screwdriver (DO NOT distort front cover). Remove bolts and front cover.

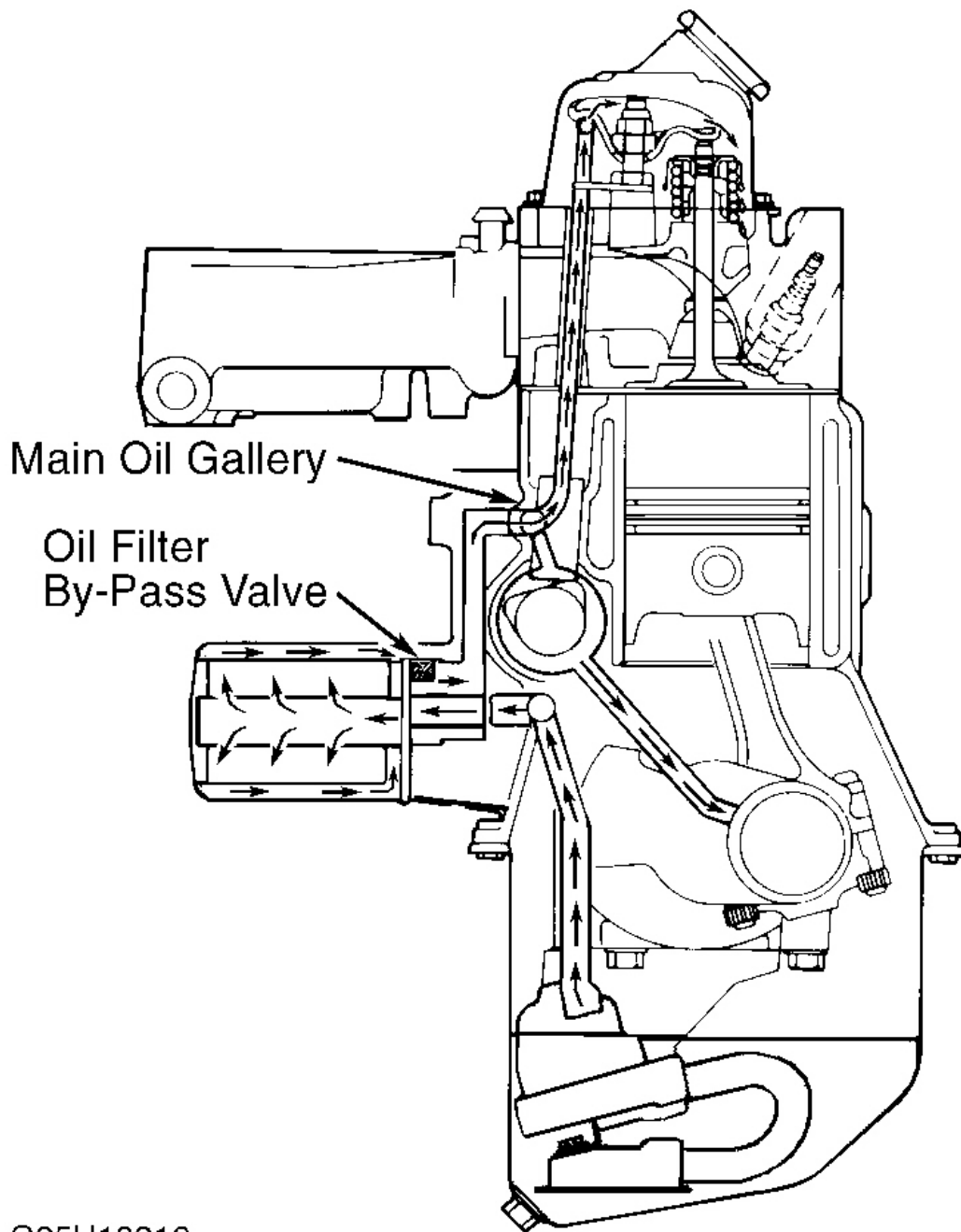
CAUTION: To prevent oil leakage, apply RTV sealant to keyway of crankshaft pulley hub before installing hub.

Installation

1. Install front cover and NEW gasket. Tighten front cover bolts to specification. See **TORQUE**

1997 Chevrolet S10 Pickup

2.2L 4-CYL - VIN [4] 1996-97 ENGINES General Motors Corp. 2.2L 4-Cylinder VIN [4]



G95H13216

Fig. 10: Cross-Sectional View Of Engine Oil Circuit (Typical)
Courtesy of GENERAL MOTORS CORP.

OIL PUMP

retainer into the PCM bracket slots. If NEW PCM has been installed, PCM MUST BE programmed and the crankshaft position system variation procedure must be performed.. For PCM programming, See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION. For crankshaft position system variation learn, see **Crankshaft Position System Variation Learn**.

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY (EEPROM)

EEPROM is a permanent memory that is part of PCM. EEPROM cannot be replaced. EEPROM contains program and calibration information that PCM uses to control powertrain. If PCM is replaced, ensure that NEW PCM software/calibration is correct and most recent version for vehicle. EEPROM must be programmed when NEW PCM is installed. Program EEPROM using latest software for that specific vehicle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION.

IGNITION SYSTEM

KNOCK SENSOR (KS) MODULE

NOTE: Knock sensor module is an integral part of PCM.

CAMSHAFT POSITION (CMP) SENSOR

Removal & Installation

On engines with distributorless ignition, CMP sensor is located in the engine block adjacent to cam. See **Fig. 2**.

CAUTION: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

1. Raise the vehicle.
2. Remove the RH tire assembly.
3. Remove the Camshaft Position (CMP) sensor electrical connector.
4. Remove the CMP sensor
5. Install the Camshaft Position (CMP) sensor. Tighten the CMP sensor bolt to 10 Nm (7.5 lb in).
6. To complete installation, reverse removal procedure.

1997 Chevrolet S10 Pickup

1997-98 ENGINE PERFORMANCE Removal, Overhaul & Installation 2.2L

Disconnect wiring harness connector from knock sensor. Remove knock sensor. To install, reverse removal procedure. Install sealant to sensor threads prior to installation. Tighten knock sensor to 14 ft. lbs. (19 N.m). Install harness connector. Lower vehicle. reconnect negative battery cable.

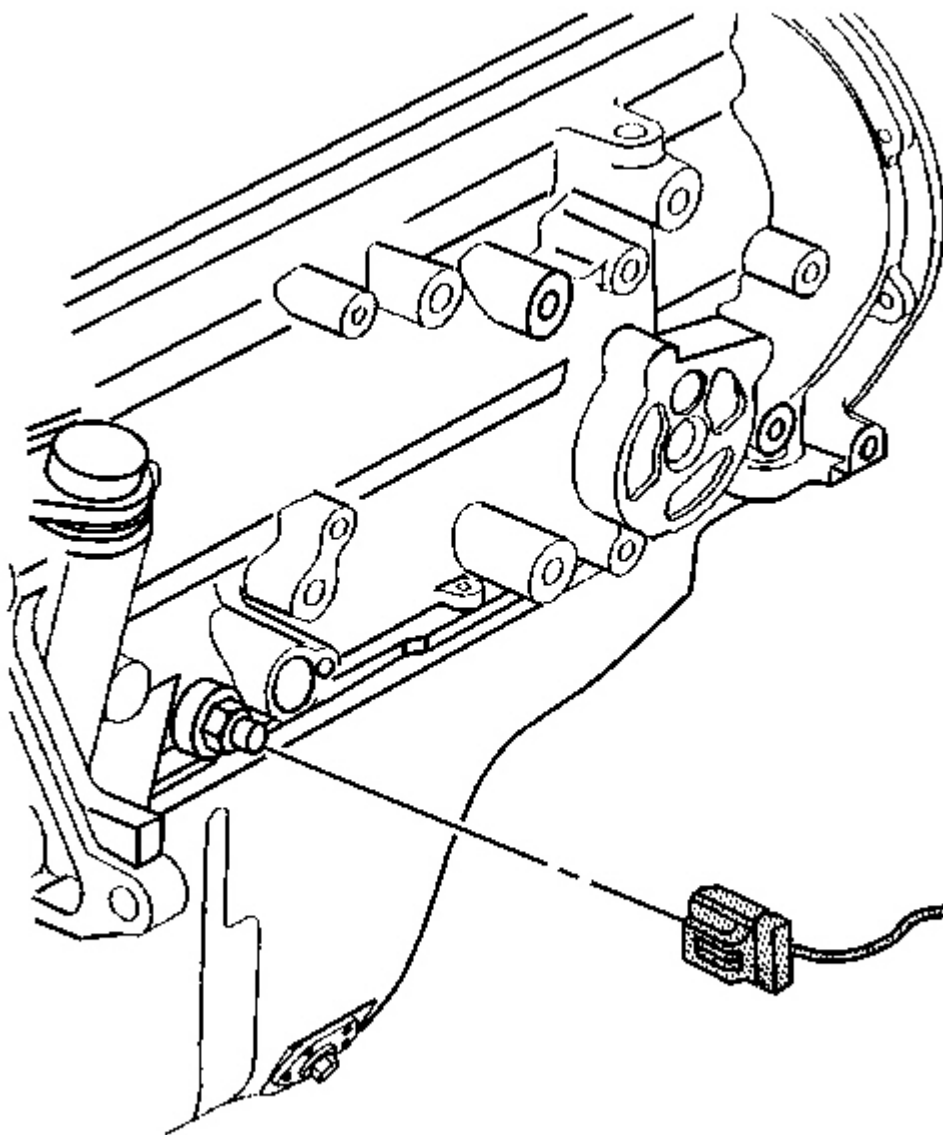


Fig. 10: Locating Knock Sensor
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1996-97 ENGINES 4.3L V6 - Trucks

5. Connect power steering pump. Connect hydraulic lines at gear-box, pump, hydro boost and reservoir. Install serpentine belt. Install/connect A/C accumulator and hoses. Install radiator. Install upper radiator hoses and cooler lines. Connect heater hoses. Install all vacuum hoses.
6. Install fan and fan clutch assembly. Install fan shroud and radiator filler panels. Install grille and headlamp bezels.
7. Install master cylinder and connect all fittings disconnected previously. Install hood latch and radiator braces. Install transmission and engine filler tubes. Install cruise control stepper motor cable, wiring and accelerator cable. Install plug wires.
8. Install air cleaner and ducts. Connect fuel lines at intake manifold. Install fuel line bracket and connect fuel lines at frame. Raise and support vehicle with safety stands.
9. Connect lower engine oil cooler line to radiator. Install power steering cooler and lines. Install lower transmission oil cooler line and lower radiator hose to radiator. Install front bumper. Connect drive shaft and transmission linkage. Torque all fasteners to specification. See **TORQUE SPECIFICATIONS** . Connect all fuel hoses. Install air bag sensor wiring. Install starter. Connect remaining wiring at engine and sub-frame.
10. Install torque converter bolts and cover. See **TORQUE SPECIFICATIONS** . Connect exhaust pipes and lower vehicle. Install oil filter and oil. Ensure oil level is correct. See **Crankcase Capacity** . Ensure transmission fluid level is correct. Fill and bleed power steering system. See **POWER STEERING BLEEDING** . Install air filter assembly. Install battery and negative battery cable. Install engine cover. Install right kick panel.
11. Install battery. Fill and bleed brake system. Install coolant as needed. See **COOLING SYSTEM BLEEDING** . Evacuate and charge A/C system. See appropriate article in REFRIGERANT RECOVERY/RECYCLING in A/C GENERAL SERVICING.
12. Check all components for leaks, proper fluid levels and proper operation.

1997 Chevrolet S10 Pickup

1996-97 ENGINES 4.3L V6 - Trucks

NOTE: Tighten upper intake manifold bolts to specification in a criss-cross pattern. Manufacturer does not provide a specific torque sequence.

2. Install the 2 corner studs first in order to help align the two halves. Install upper intake manifold bolts. Tighten first to 44 INCH lbs. (5 N.m) and then tighten to 89 INCH lbs. (10 N.m).
3. Install the purge solenoid and bracket. Install the ignition coil and bracket. Install the PCV hose at the upper intake manifold. Install the fuel lines and bracket at the rear of the lower intake manifold.
4. Install the throttle linkage and cruise control cable (if equipped). Install the wiring harness connectors and brackets.
5. Install the air filter assembly and intake duct. Connect the negative battery cable.

1997 Chevrolet S10 Pickup

1996-97 ENGINES 4.3L V6 - Trucks

NOTE: **DO NOT** reinstall original composite front cover. Always install a **NEW** front cover. Reinstalling original front cover can lead to oil leaks.

3. Install and align CKP sensor reluctor ring. See **Fig. 10** . Install NEW front cover and gasket. Tighten front cover bolts to specification.

CAUTION: Ensure CKP sensor is fully seated and held stationary in bore of front cover upon installation. A CKP sensor that is not fully seated may result in erratic engine operation.

4. Install CKP sensor. Tighten CKP sensor holddown bolt to specification. See **TORQUE SPECIFICATIONS** .
5. Apply RTV sealant to Woodruff keyway in crankshaft damper. Using Damper Puller/Installer (J-23523-F), install crankshaft balancer. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** . To complete installation, reverse removal procedure.

ROCKER ARM STUDS

Removal & Installation

CAUTION: On models equipped with press in rocker arm studs, ream stud bore before installing oversize rocker arm stud, or cylinder head may be damaged.

Unscrew rocker arm stud from cylinder head. To install, insert NEW rocker arm stud. Tighten to 35 ft. lbs. (47 N.m).

VALVE LIFTERS

Removal

Remove upper and lower intake manifold. See **INTAKE MANIFOLD (UPPER)** and **INTAKE MANIFOLD (LOWER)** . Remove valve covers. Remove push rods. See **ROCKER ARMS & PUSH RODS** . Remove stuck valve lifter using Valve Lifter Remover (J-9290-01).

Installation

Coat lifter base or roller (if equipped) and body with High Viscosity Oil/Zinc (12345501) or equivalent. Install lifters in original location. To complete installation, reverse removal procedure. Replace oil and filter, and add High Viscosity Oil/Zinc (GM P/N 12345501) or equivalent.

CAMSHAFT

Removal

Remove front cover. See **FRONT COVER** . Remove timing chain and sprockets. See **TIMING CHAIN &**

1997 Chevrolet S10 Pickup

1996-97 ENGINES 4.3L V6 - Trucks

CAUTION: On some 4.3L engines, the distance between rear main bearing thrust faces is .008" (.20 mm) wider than standard (identified by .008" stamped on crankshaft rear counterweight). When replacing rear main bearings on these engines, use only .008" (.20 mm) wider bearings.

1. Install main bearing caps (except rear), and tighten cap bolts to specification. See **TORQUE SPECIFICATIONS** table. Install rear main bearing cap and tighten cap bolts to 10 ft. lbs. (14 N.m).
2. Tap crankshaft rearward then forward to align thrust surfaces. Tighten rear main bearing cap bolts to specification. Measure crankshaft end play at forward thrust surface of rear main bearing cap. See **CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS** table under **ENGINE SPECIFICATIONS** .

Cylinder Block

Measure cylinder bore out-of-round and taper. If measurement is not within specification, machine cylinder bore and/or replace piston. See **CYLINDER BLOCK** table under ENGINE SPECIFICATIONS. Finish bore with a 45-65 degree cross-hatch pattern.

ENGINE OILING

ENGINE LUBRICATION SYSTEM

Gear-type oil pump delivers full pressure lubrication through full-flow oil filter to main oil gallery. Main oil gallery feeds crankshaft and camshaft bearings through drilled passages in block.

Valve lifter oil gallery feeds valve lifters. From lifters, oil is routed through hollow push rods to upper valve train components. Timing chain and sprockets are lubricated by oil drainage from No. 1 camshaft bearing. Pistons and piston pins are lubricated by oil splash. Non-adjustable oil pressure regulator is located in oil pump body.

Crankcase Capacity

Crankcase capacity is 4.5 qts (4.26L), including oil filter.

Oil Pressure

Measure oil pressure with engine at operating temperature and specified RPM. See **OIL PRESSURE SPECIFICATIONS** table.

OIL PRESSURE SPECIFICATIONS ⁽¹⁾

Application	psi (kg/cm ²)
1000 RPM	6 (0.4)
2000 RPM	18 (1.3)
4000 RPM	24 (1.7)

1997 Chevrolet S10 Pickup

N - REMOVE/INSTALL/OVERHAUL - 4.3L 1997 ENGINE PERFORMANCE General Motors - Removal, Overhaul & Installation - 4.3L

PCM. New PCM does not come equipped with knock sensor module. Install knock sensor module into new PCM.

Removal

Ensure ignition switch is in OFF position. Disconnect negative battery cable. Unplug electrical connectors from PCM. Remove PCM from vehicle. Remove access cover and remove knock sensor module from PCM.

Installation

Install knock sensor module in NEW PCM. Install access cover. Install PCM into vehicle. Connect electrical connectors to PCM. Reconnect negative battery cable.

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY

Electrically Erasable Programmable Read-Only Memory (EEPROM) is a permanent memory that is part of PCM. EEPROM cannot be replaced. EEPROM contains program and calibration information that PCM uses to control powertrain. If PCM is replaced, ensure that NEW PCM software/calibration is correct and most recent version for vehicle. EEPROM must be programmed when new PCM is installed. Program EEPROM using latest software for that specific vehicle.

KNOCK SENSOR MODULE

Removal & Installation

1. Knock Sensor (KS) module is located in PCM. Disconnect negative battery cable. Remove PCM from vehicle. See **POWERTRAIN CONTROL MODULE (PCM)** . Position PCM with access cover up. Remove access cover from PCM.
2. Using thumb and forefinger, squeeze both ends of knock sensor module inward and pull module up from access hole. To install, reverse removal procedure. Ensure module latches into holder in PCM.

NOTE: If PCM is replaced, KS module must be transferred from original to replacement PCM.

SENSORS & SWITCHES

CAMSHAFT POSITION SENSOR

Removal & Installation

1. Disconnect negative battery cable. Reference mark spark plug wires at distributor cap. Disconnect spark plug wires and ignition coil wire at distributor cap.
2. Disconnect Camshaft Position (CMP) sensor electrical connector at distributor. Remove distributor cap retaining screws and distributor cap.
3. Remove rotor retaining screws and rotor. Align the square slot in the reluctor wheel with the CMP sensor. Remove CMP sensor retaining screws. Remove CMP sensor. See **Fig. 2** .

1997 Chevrolet S10 Pickup

N - REMOVE/INSTALL/OVERHAUL - 4.3L 1997 ENGINE PERFORMANCE General Motors - Removal, Overhaul & Installation - 4.3L

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Distributor Clamp Bolt	20 (27)
Fuel Line Nut	17 (23)
Fuel Tank Strap Nuts	33 (45)
Idle Air Control Valve (Threaded)	13 (18)
Oxygen Sensor	30 (41)
Throttle Body-To-Upper Intake Manifold Fasteners	18 (24)
	INCH Lbs. (N.m)
Camshaft Position Sensor Retaining Screws	14-25 (1.6-2.8)
Crankshaft Position Sensor Bolt	71 (8)
Distributor Cap Retaining Screws	21 (2.5)
Distributor Rotor Retaining Screws	17 (2)
Fuel Meter Body Fasteners	88 (10)
Idle Air Control Valve Screws (Flange Mounted)	27 (3)
Ignition Coil Studs	106 (12)
Upper Intake Manifold Fasteners ⁽¹⁾	
Step 1	44 (5)
Step 2	89 (10)

(1) Tighten fasteners to specification in a criss-cross pattern.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

Vehicle Control Module Connector C1 (W/ A/T)



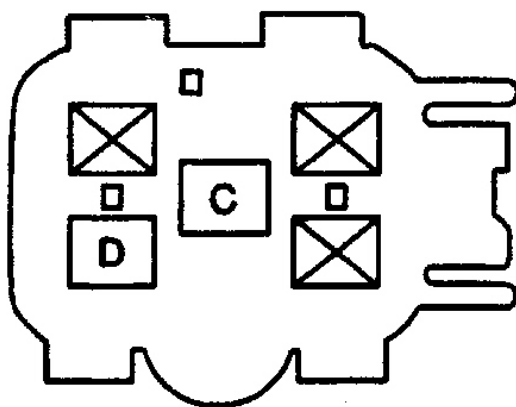
Connector Part Information			
<ul style="list-style-type: none"> • 12129025 • 32 - Way F Micro-Pack 100 W Series (Natural) W/ Blue Color Sleeve 			
Pin	Wire Color	Circuit No.	Function
1	—	—	Not used
2	—	—	Not used
3	BRN/WHT	633	Camshaft Position Sensor signal
4	PNK	539	Ignition Feed - Fused
5	YEL/BLK	846	Fuel Injector #6 driver
6	—	—	Not used
7	TAN	1667	Right Front Heated Oxygen Sensor low
8	PNK/BLK	632	Camshaft Position Sensor ground
9	—	—	Not used
10	TAN/BLK	422	Torque Converter Clutch Solenoid Valve control
11	—	—	Not used
12	DK GRN/WHT	428	Canister Purge Solenoid Output
13	WHT	687	3-2 Shift Solenoid Valve Assembly control
14	—	—	Not used
15	YEL/BLK	1827	Vehicle Speed Signal To Electronic Brake Control Module
16	—	—	Not used
17	—	—	Not used

Connector Part Information			
<ul style="list-style-type: none"> • 12129025 • 32 - Way F Micro-Pack 100 W Series (Natural) W/ Blue Color Sleeve 			
Pin	Wire Color	Circuit No.	Function
18	GRY	435	Exhaust Gas Recirculation Valve control
19	PPL/WHT	1665	LH Front Heated Oxygen Sensor signal
20	PPL	1670	Pre-Converter Heated Oxygen Sensor signal
21	PPL	1666	RH Front Heated Oxygen Sensor signal
22	PPL/WHT	1668	Post-Converter Heated Oxygen Sensor signal
23	BLK/WHT	451	Ground
24	TAN	1671	Pre-Converter Heated Oxygen Sensor low
25	TAN/WHT	1653	LH Front Heated Oxygen Sensor low
26	TAN/WHT	1669	Post-Converter Heated Oxygen Sensor low
27	—	—	Not used
28	PPL	574	Crankshaft Position Sensor signal
29	LT GRN/BLK	822	Vehicle Speed Sensor low
30	PPL/WHT	821	Vehicle Speed Sensor high
31	YEL	573	Crankshaft Position Sensor ground
32	—	—	Not used

G00164931

Fig. 2: VCM 32-Pin Connector C1 (Blue) - With A/T
Courtesy of GENERAL MOTORS CORP.

Vehicle Control Module Connector C5



Connector Part Information		<ul style="list-style-type: none"> • 12176428 • 5 - Way F Metri - Pack 280 Series (Black) 	
Pin	Wire Color	Circuit No.	Function
A	—	—	Blocked
B	—	—	Blocked
C	WHT	1510	Antilock Brake System jumper
D	WHT	1510	Antilock Brake System jumper
E	—	—	Blocked

G00164941

Fig. 12: VCM 32-Pin Connector C5 (Black)

Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC TROUBLE CODES

NOTE: Before clearing DTCs, perform On-Board Diagnostic (OBD) System Check. See the BASIC TESTING - 4.3L article. Record FREEZE FRAME and FAILURE

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

5. Using a DVOM connected to ground, probe 5-volt reference circuit at MAP sensor harness connector. If voltage reading is greater than 5.2 volts, go to step 10). If voltage reading is not greater than 5.2 volts, go to next step.
6. Using a test light connected battery voltage, probe MAP sensor ground circuit at MAP sensor harness connector. If test light illuminates, go to next step. If test light does not illuminate, go to step 14).
7. Check MAP sensor vacuum source for restriction. If restriction is found, go to step 15). If no restriction is found, go to next step.
8. Replace MAP sensor. After replacing sensor, go to step 19).
9. Check for short to voltage in MAP sensor signal circuit. Repair as necessary. After repairs, go to step 15). If circuit is okay, go to step 18).
10. Turn ignition off. Disconnect VCM White harness connector. Turn ignition on. Using DVOM connected to ground, check voltage on 5-volt reference circuit at VCM harness connector. If voltage reading is greater than 5.2 volts, go to next step. If voltage reading is not greater than 5.2 volts, go to step 13).
11. Disconnect EGR harness connector. Check voltage on 5-volt reference circuit at VCM harness connector. If voltage reading is greater than 5.2 volts, go to next step. If voltage reading not greater than 5.2 volts, go to step 16).
12. Repair short to voltage on 5-volt reference circuit. After repairs, go to step 19).
13. Using DVOM connected to ground, check voltage on VCM harness connector terminal GR12. If voltage reading is greater than 5.2 volts, go to step 17). If voltage reading is not greater than 5.2 volts, go to step 18).
14. Repair sensor ground circuit. After repairs, go to step 19).
15. Repair as necessary. After repairs, go to step 19).
16. Replace EGR valve. After replacing EGR valve, go to step 19).
17. Repair short to ground on 5-volt reference circuit. After repairs, go to step 19).
18. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
19. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P0108. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
20. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

Check MAP sensor signal and 5-volt reference circuits for intermittent open condition. With ignition on and engine off, MAP signal is equal to atmospheric pressure with signal voltage high. This information is used by VCM as an indication of altitude. Comparison of this reading with a known-good vehicle with same sensor is a way to check accuracy of suspect sensor. Readings should be within 0.4 volt of each other.

Disconnect sensor from bracket and twist sensor by hand to check for intermittents. Output changes greater than 0.1 volt indicate a faulty sensor connection.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

15. Replace EGR valve. After replacing EGR, go to step 18).
16. Repair short to voltage on 5-volt reference circuit. After repairs, go to step 18).
17. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
18. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P0123. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
19. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

Check for and repair the following condition(s):

- Throttle plate sticking or excessive deposits on throttle plate or throttle bore.
- Check TP sensor harness connector ground circuit for open, and signal circuit for short to ground.
- TP sensor signal voltage should be less than 1.25 volt with throttle closed, and greater than 4.5 volts at wide open throttle.

DTC P0125 - ECT EXCESSIVE TIME TO REACH CLOSED LOOP

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

While engine is warming, VCM reads Engine Coolant Temperature (ECT) sensor to determine how long it takes coolant to reach temperature required for closed loop operation. VCM compares actual time required to a predetermined time.

Conditions required to set DTC are:

- Engine running.
- No ECT or IAT DTCs are set.
- Vehicle speed greater than one MPH.
- ECT and IAT greater than 15.8°F (-9°C).
- Start-up ECT is greater than 15.8°F (-9°C).

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. Allow engine to cool completely. Turn ignition on. Using scan tool, compare ECT and IAT values. If values are close, go to next step. If values are not close, go to **DTC P0117** .

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

- Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

Check for proper fuel pressure. Check for proper fuel injector operation. Check EVAP canister for fuel saturation. Check for leaking fuel pressure regulator diaphragm. Check for proper TP sensor operation. Check HO2S for silicone contamination (powdery white deposit). Using scan tool, check HO2S voltage. Voltage should be greater than one volt. Check HO2S voltage with connector disconnected. If voltage goes from greater than one volt to about 0.45 volt, replace HO2S. Never solder HO2S wires.

DTC P0140 - HO2S INSUFFICIENT ACTIVITY BANK 1, SENSOR 2

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

Circuit Description

VCM provides about 0.45 volt reference to Heated Oxygen Sensor (HO2S). HO2S sensor signal voltage varies from about one volt when exhaust is rich to about 0.1 volt when exhaust is lean. VCM reads and stores sensor voltage information and evaluates the voltage samples to determine amount of time sensor voltage is out of range. If HO2S voltage is out of predetermined range, DTC will set.

Conditions required to test for DTC are:

- No ECT, IAT, MAF, MAP or TP sensor DTCs set.
- No EVAP system DTC set.
- No other DTC tests in progress.
- No device controls active.
- System voltage measures at least 9 volts.
- Engine run time at least 2 minutes.
- HO2S voltage is greater than .299 volt, but less than .598 volt.

Diagnostic Procedures

- Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
- Start engine and allow it to reach operating temperature. Place gear selector in Park or Neutral, and apply parking brake. Increase engine speed to greater than 1200 RPM for 2 minutes. Using scan tool, read LOOP MODE. If scan tool displays CLOSED LOOP, go to step 5). If scan tool does not display CLOSED LOOP, go to next step.
- Turn ignition off. Disconnect HO2S connector. Connect a jumper wire between HO2S harness connector signal and ground circuits, and chassis ground. Turn ignition on, engine off. Read HO2S BANK 1 SENSOR GROUND voltage. If voltage is less than 0.2 volt, go to step 7). If voltage is 0.2 volt or greater,

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

6. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
7. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P0152. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
8. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

Check for proper fuel pressure. Check for proper fuel injector operation. Check EVAP canister for fuel saturation. Check for leaking fuel pressure regulator diaphragm. Check for proper TP sensor operation. Check HO2S for silicone contamination (powdery white deposit). Using scan tool, check HO2S voltage. Voltage should be more than one volt. Check HO2S voltage with connector disconnected. If voltage goes from more than one volt to about 0.45 volt, replace HO2S. Never solder HO2S wires.

DTC P0153 - HO2S SLOW RESPONSE BANK 2, SENSOR 1

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

Circuit Description

VCM provides about 0.45 volt reference to Heated Oxygen Sensor (HO2S). HO2S sensor signal voltage varies from about one volt when exhaust is rich to about 0.1 volt when exhaust is lean. VCM reads and stores sensor voltage information and evaluates the voltage samples to determine amount of time sensor voltage is out of range. If HO2S voltage is out of predetermined range, DTC will set.

Conditions required to test for DTC are:

- No ECT, IAT, MAF, MAP or TP sensor DTCs set.
- No EVAP system DTC set.
- No other DTC tests in progress.
- No device controls active.
- HO2S average transition time from lean-to-rich or rich-to-lean is greater than 100 milliseconds.

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. If any other HO2S DTCs are set, diagnose affected DTCs. If no other HO2S DTCs are set, go to next step.
3. Using scan tool, read MAP sensor voltage, with engine idling. If voltage is greater than 4 volts, see **DTC**

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

- Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

If problem cannot be isolated, attempt driving vehicle under various load conditions while using scan tool to read LT and ST fuel trim values. This may help isolate condition which set DTC P0174. If condition to set DTC cannot be duplicated, problem could have been caused by a cylinder misfire. See **DTC P0300** .

DTC P0175 - FUEL TRIM SYSTEM RICH BANK 2

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

Circuit Description

VCM reads HO2S signal voltage and adjusts fuel delivery based on this voltage. A change made to fuel delivery is indicated by Long Term (LT) and Short Term (ST) fuel trim values.

ST fuel trim values change rapidly in response to HO2S signal voltages. These changes fine tune engine fueling. LT fuel trim values changes in response to trends in ST fuel trim. LT fuel trim makes coarse adjustments to fueling in order to re-center and restore control to ST fuel trim. LT and ST fuel trim can be read by using a scan tool.

Ideal fuel trim value is about 128. Fuel trim value more than 128 indicates that VCM is adding fuel to compensate for a lean condition. Fuel trim less than 128 indicates that VCM is reducing amount of fuel to compensate for rich condition. DTC will set if VCM detects an excessively rich or lean condition.

Conditions required to test for DTC are:

- No IAC DTCs set at idle.
- No ECT, EGR, HO2S, IAT, MAF, MAP, TP or VSS sensor DTCs set.
- No EVAP or voltage system DTCs set.
- No misfire DTCs set.
- Engine speed 575-4500 RPM.
- ECT at normal operating temperature.
- Airflow 3-150 gm/s.
- Vehicle speed less than 85 MPH.
- BARO greater than 70 kPa.
- ECT greater than 140°F (60°C) but less than 212°F (100°C).
- MAP greater than 20 kPa but less than 99 kPa.
- IAT greater than -4°F (-20°C) but less than 158°F (70°C).
- MAF greater than 3 gm/s. but less than 150 gm/sec.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

Circuit Description

Misfire is detected using Camshaft Position (CMP) and Crankshaft Position (CKP) sensors. When VCM senses CKP deceleration not associated with normal engine speed reduction, CMP is used to determine misfiring cylinder. VCM determines misfires on each cylinder and evaluates a random misfire and set DTC.

Conditions for setting DTC are:

- No IAC DTCs set.
- No CKP, CMP, MAF, TP or VSS sensor DTCs set.
- ECT at least 19°F (-7°C).
- Fuel tank level is greater than 10 percent.
- Engine speed at least 600 RPM and less than 5600 RPM.
- System voltage at least 9 volts, but less than 14 volts.
- Positive throttle position change less than 4.9 percent for 100 msec.
- Negative throttle position change less than 2.9 percent for 100 msec.
- A misfire is detected.

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. If any other DTCs are set, diagnose affected DTCs. If no other DTCs are set, go to step 4).
3. Start engine and allow it to idle. Using scan tool, read MAP sensor voltage. If voltage is greater than 4 volts, go to **DTC P0108** . If voltage is not greater than 4 volts, go to next step.
4. Turn ignition off, then on. Duplicate conditions required to set DTC. Using scan tool, read DTC PRESENT THIS IGNITION CYCLE. If DTC P0305 sets, go to next step. If DTC does not set, go to step 9).
5. Install a spark tester on No. 5 spark plug wire. Disconnect fuel injector harness at intake manifold. Crank engine and check for spark at tester. Repeat procedure for each spark plug wire. If spark was okay on all wires, go to next step. If spark was not okay, go to step 10).
6. Remove and check spark plugs for wear, excessive air gap, cracks or fouling. If spark plugs are okay, go to next step. If spark plugs are not okay, go to step 11).
7. Perform cylinder compression test. See the **BASIC TESTING - 4.3L** article. If problem is found, repair as necessary. After repairs, go to step 13). If compression is okay, go to next step.
8. Perform INJECTOR CIRCUIT TEST under FUEL SYSTEM DIAGNOSIS in the **BASIC TESTING - 4.3L** article. If fuel system is okay, go to next step. If fuel system is not okay, go to step 12).
9. Misfire is currently not active. See DIAGNOSTIC AIDS.
10. See IGNITION SYSTEM in the **BASIC TESTING - 4.3L** article.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. Turn engine on and allow it to idle. Retrieve and record FREEZE FRAME and FAILED RECORDS data for DTC P0340. Continue to idle engine for one minute. Observe FREEZE FRAME, LAST TEST FAILED DTC. If DTC P0340 FAILED is not displayed, go to step 8). If DTC P0340 FAILED is displayed, turn engine off. Restart engine. If MIL remains on, go to next step. If MIL does not remain on, go to step 8).
3. Turn ignition on, with engine off. Disconnect CMP sensor harness connector. Connect a test light between engine ground and CKP sensor harness connector ignition feed circuit. If test light illuminates, go to next step. If test light does not illuminate, go to step 9).
4. Connect test light between CMP sensor harness connector ground and ignition feed circuits. If test light illuminates, go to next step. If test light does not illuminate, go to step 11).
5. Ignition off. Install Gray jumpers from Connector Test Kit (J35616-A) between CMP sensor and CMP sensor harness connector. Using a DVOM, check voltage between on CMP sensor signal circuit. If voltage is 5-7 volts, go to step 15). If voltage is not 5-7 volts, go to next step.
6. Check CMP sensor harness connector signal circuit for open. If open is found, go to step 13). If open is not found, go to next step.
7. Check CMP sensor harness connector signal circuit for short to voltage. If short is found, go to step 13). If short is not found, go to step 12).
8. DTC P0340 is intermittent. If any additional DTCs are set, diagnose affected DTCs. If no additional DTCs are set, see DIAGNOSTIC AIDS.
9. Check for open in CMP sensor harness connector ignition feed circuit. If open is found, go to step 13). If open is not found, go to next step.
10. Repair short to ground in CMP sensor harness connector ignition feed circuit. After repairs, go to step 17).
11. Repair open in CMP sensor harness connector ground circuit. After repairs, go to step 17).
12. Check for faulty connection at CMP sensor. If faulty connection is found, go to next step. If connection is okay, go to step 14).
13. Repair circuit as necessary. After repairs, go to step 17).
14. Replace CMP sensor. After replacing sensor, go to step 17).
15. Check for faulty connection at VCM. If faulty connection is found, go to step 13). If connection is okay, go to next step.
16. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
17. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P0340. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
18. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

- For missing or damaged "O" rings at EVAP canister fuel vapor and purge line fittings.
- For faulty connections at VCM. Inspect harness connectors for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal to wire connection.
- For damaged harness. Inspect wiring harness to EVAP vent solenoid, EVAP purge solenoid, and fuel tank pressure sensor for intermittent open or short.

DTC P0461 - FUEL LEVEL SENSOR CIRCUIT MALFUNCTION

NOTE: For circuit reference, see the appropriate **WIRING DIAGRAMS** article. For connector and terminal identification, see **CONNECTOR IDENTIFICATION** .

Circuit Description

Fuel level sensor information is used by VCM to determine volume of fuel in fuel tank. Fuel level affects rate or change in air pressure in EVAP system.

Conditions required to set DTC are:

- Fuel tank level slosh test is completed
- Fuel tank main test is completed.
- Fuel tank level data valid.
- Fuel level signal has not changed for distance of 200 miles.

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. Turn ignition off. Turn ignition on, with engine off. Using scan tool, compare fuel level on scan tool and vehicle fuel gauge. If fuel level are about the same, go to next step. If not, go to step 5).
3. Record vehicle fuel gauge reading. Turn ignition off. Disconnect Black VCM harness connector. Turn ignition on. If fuel gauge reading changed, go to next step. If fuel gauge reading did not change, go to step 5).
4. Turn ignition off. Locate fuel level sending unit harness connector forward of fuel tank. Disconnect fuel sending unit harness connector. Using jumper wire, jumper fuel level input to fuel level sensor ground. Turn ignition on. Check fuel gauge and scan tool reading. If both reads Empty (zero percent), go to next step. If not, go to step 6).
5. Check and repair circuit to fuel gauge sending unit.
6. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
7. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P0461. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

Conditions required to set DTC are:

- Engine speed is 800 RPM or less with throttle closed, or more than 800 RPM with throttle slightly above idle.
- MAP sensor voltage less than 0.2 volt.
- No TP sensor DTCs are set.

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. Turn engine on and allow it to idle. Using scan tool, read MAP sensor voltage. If voltage is less than 0.5 volt, go to next step. If voltage is not less than 0.5 volt, go to step 5).
3. Turn ignition off. Disconnect MAP sensor harness connector. Connect a jumper wire between MAP sensor harness connector 5-volt reference and signal circuits. Turn ignition on. If voltage is greater than 4.7 volts, go to step 6). If voltage is not greater than 4.7 volts, go to next step.
4. Turn ignition off. Disconnect jumper wire. Connect a test light between battery voltage and MAP sensor harness connector signal circuit. Turn ignition on. If voltage is greater than 4.7 volts, go to step 9). If voltage is not greater than 4.7 volts, go to step 7).
5. DTC P1107 is intermittent. If any additional DTCs are set, diagnose affected DTCs. If no additional DTCs are set, go to DIAGNOSTIC AIDS.
6. Check for faulty connection at MAP sensor. If faulty connection is found, go to step 12). If connection is okay, go to step 11).
7. Check for open MAP sensor signal circuit. If circuit is open, go to step 12). If circuit is okay, go to next step.
8. Check MAP sensor signal circuit for short to ground. If short is found, go to step 12). If circuit is okay, go to step 13).
9. Check for open in MAP sensor 5-volt reference circuit. If open is found, go to step 12). If circuit is okay, go to next step.
10. Check MAP sensor 5-volt reference circuit for short to ground. If short is found, go to step 12). If circuit is okay, go to step 13).
11. Replace faulty MAP sensor. After replacing sensor, go to step 14).
12. Repair circuit as necessary. After repairs, go to step 14).
13. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
14. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P1107. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
15. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

L/R rich average to obtain a ratio. If HO2S ratio is not within range, DTC will set.

Conditions required to set DTC are:

- No fuel trim DTCs set.
- L/R and R/L switches less than 30 counts.
- No ECT, IAT, MAP, or TP sensor DTCs set.
- No EGR or EVAP DTCs set.
- DTC P0131, P0132, P0134 or P0135 not set.
- Vehicle operating in closed loop mode.
- HO2S voltage 0.3-0.6 volt.
- TP ANGLE value 10-20 percent.
- Average response time calculated for this ignition cycle.
- Ratio of HO2S (bank 1, sensor 1) L/R to R/L switches greater than 64 counts.
- Ratio of HO2S (bank 1, sensor 1) L/R to R/L switches greater than 48 counts.

Diagnostic Procedures

1. Perform ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK. See the **BASIC TESTING - 4.3L** article. Retrieve and record FREEZE FRAME and/or FAIL RECORDS data for each DTC set. Go to next step.
2. If any other DTCs are set, diagnose affected DTCs. If no other DTCs are set, go to next step.
3. Turn engine on and allow it to reach normal operating temperature. Set engine speed at 1200-2000 RPM for 2 minutes. Using scan tool, read HO2S BANK 1 SENSOR 1 voltage. If voltage rapidly switches from less than 0.3 volt to greater than 0.6 volt, go to next step. If voltage does not switch as specified, go to step 5).
4. With engine speed still at 1200-2000 RPM, read LOOP MODE. If scan tool displays CLOSED LOOP, see DIAGNOSTIC AIDS. If scan tool does not display CLOSED LOOP, go to step 8).
5. If voltage stays within 0.3-0.6 volt longer than it stays out of range, go to step 10). If voltage stays outside 0.3-0.6 volt longer than it stays within range, go to next step.
6. Check for faulty connection at VCM HO2S (bank 1, sensor 1) terminals. If faulty connection is found, go to step 10). If connection is okay, go to next step.
7. Check for faulty connection at HO2S (bank 1, sensor 2). If faulty connection is found, go to step 10). If connection is okay, go to next step.
8. Replace HO2S (bank 1, sensor 1) and go to step 11).
9. Check for HO2S contamination caused by leaded fuel, incorrect gasket sealer or over-rich operation. If problem is found, go to next step. If no problem is found, go to step 11).
10. Repair or replace as necessary. After repairs, go to next step.
11. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P1134. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).

1997 Chevrolet S10 Pickup

1997 ENGINE PERFORMANCE Self-Diagnostics - 4.3L S/T Series

21. Check for short to ground in EGR valve control low circuit. If short is found, go to next step. If no short is found, go to step 23).
22. Repair short to ground in EGR valve control low circuit. After repairs, go to step 40).
23. Check for faulty connection at EGR valve. If faulty connection is found, go to next step. If connection is okay, go to step 25).
24. Repair faulty connection at EGR harness connector. After repairs, go to step 40).
25. Replace EGR valve. After replacing EGR valve, go to step 40).
26. Using DVOM, check voltage between EGR valve harness connector ground and 5-volt reference circuits. If voltage reading is about 5 volts, go to step 31). If voltage reading is not about 5 volts, go to next step.
27. Using DVOM, check voltage between engine ground and VCM harness connector 5-volt reference circuit. If voltage is 5 volts, go to next step. If voltage is not 5 volts, go to step 29).
28. Check for faulty connection at VCM harness connector 5-volt reference circuit. If faulty connection is found, go to next step. If connection is okay, go to step 30).
29. Repair faulty connection at VCM harness connector 5-volt reference circuit. After repairs, go to step 40).
30. Repair open 5-volt reference circuit. After repairs, go to step 40).
31. Connect test light between battery voltage and EGR valve harness connector pintle position signal circuit. If test light illuminates, go to step 34). If test light does not illuminate, go to next step.
32. Check for short to ground in EGR pintle position signal circuit. If short is found, go to next step. If short is not found, go to step 34).
33. Repair short to ground in EGR pintle position signal circuit. After repairs, go to step 40).
34. Connect appropriate adapters from Connector Test Kit (J-35616) between EGR valve and EGR valve harness connector. Using DVOM, check voltage between engine ground and EGR valve pintle position signal circuit at EGR valve. Using scan tool, command EGR position to 100 percent. If voltage is 3.5-5.0 volts, go to next step. If voltage is not as specified, go to step 36).
35. Check for open in EGR pintle position circuit. Check for poor connection at EGR valve connector. If a problem is found, go to step 37). If no problem is found, go to next step.
36. Check for faulty connection at VCM harness connector pintle position signal circuit. If faulty connection is found, go to step 38). If connection is okay, go to step 39).
37. Repair open EGR pintle position signal circuit. After repairs, go to step 40).
38. Repair faulty connection. After repairs, go to step 40).
39. Replace VCM. Program replacement VCM using required equipment. After replacing VCM, go to next step.
40. Using scan tool, select DTC, CLEAR INFO function. Start engine and allow it to reach operating temperature. Using scan tool, select DTC, SPECIFIC function and enter DTC P1406. Operate vehicle within conditions required to set DTC. If scan tool displays RAN AND PASSED, go to next step. If scan tool does not display RAN AND PASSED, return to step 2).
41. Using scan tool, select Read and Record INFO, REVIEW INFO function. If any undiagnosed DTCs are displayed, diagnose affected DTCs. If no DTCs are displayed, system is okay.

Diagnostic Aids

Check for faulty connections or damaged harness. If connections and harness appear okay, observe scan tool

1997 Chevrolet S10 Pickup

A/C COMPRESSOR CLUTCH CONTROLS 1997 A/C GENERAL SERVICING General Motors Corp. - A/C Compressor Clutch Controls

- problem is found, go to step 7).
6. Repair A/C compressor clutch harness connector. Go to step 27).
 7. Replace A/C compressor clutch. Go to step 27).
 8. Turn ignition off. Disconnect VCM connector C3. Turn ignition on. Using a test light connected to ground, probe A/C request signal circuit (Dark Green/White wire) at VCM harness connector C3. If test light comes on, go to next step. If test light does not come on, go to step 11).
 9. Check for poor connection at VCM harness connector C3. If a problem is found, go to next step. If no problem is found, go to step 26).
 10. Repair VCM harness connector C3. Go to step 27).
 11. Repair open or short to ground in Dark Green/White wire to A/C pressure switch and/or A/C control switch. Go to step 27).
 12. Using a test light connected to ground, probe A/C compressor clutch signal circuit (Dark Green wire) at A/C compressor clutch harness connector. If test light comes on, go to next step. If test light does not come on, go to step 14).
 13. Repair open in A/C compressor clutch ground circuit (Black wire). Go to step 27).
 14. Install scan tool. Turn ignition on, engine off. Using scan tool, command A/C relay on. If A/C relay clicks, go to step 23). If A/C relay does not click, go to next step.
 15. Disconnect A/C relay. Using a test light connected to ground, probe A/C relay harness connector cavity No. 85 (Pink wire). If test light comes on, go to step 17). If test light does not come on, go to next step.
 16. Repair open or short to ground in A/C relay ignition feed circuit (Pink wire). Go to step 27).
 17. Connect a test light between A/C relay harness connector cavities No. 85 (Pink wire) and No. 86 (Dark Green/White wire). Using scan tool, command A/C relay on. If test light comes on, go to next step. If test light does not come on, go to step 19).
 18. Replace A/C relay. Go to step 27).
 19. Check for a faulty connection at VCM harness connector C3. If a problem is found, go to next step. If no problem is found, go to step 21).
 20. Repair faulty connection at VCM connector C3. Go to step 27).
 21. Check for an open Dark Green/White wire between A/C relay harness connector cavity No. 86 and VCM harness connector C3, terminal No. 9. If a problem is found, go to next step. If no problem is found, go to step 26).
 22. Repair open in Dark Green/White wire between A/C relay harness connector cavity No. 86 and VCM connector C3, terminal No. 9. Go to step 27).
 23. Remove A/C relay. Using a fused jumper wire, jumper A/C relay harness connector cavities No. 30 (Orange wire) and No. 87 (Dark Green wire) together. If A/C compressor clutch engages, go to next step. If A/C compressor clutch does not engage, go to step 25).
 24. Replace A/C relay. Go to step 27).
 25. Repair open or short to ground in A/C compressor clutch control circuit (Dark Green wire). Go to step 27).
 26. Replace VCM. Go to next step.
 27. Using scan tool, select DTC CLEAR INFO. Start engine and allow it to reach normal operating temperature. Select DTC SPECIFIC, then enter DTC number that was set. Operate vehicle within conditions that may have set this DTC. If DTC does not reset, go to next step. If DTC resets, go to step

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

Fig. 5: Table B - Air Bag Indicator Comes On Steady (2 Of 3)
Courtesy of GENERAL MOTORS CORP.

TABLE B - AIR BAG WARNING LIGHT COMES ON STEADY (3 OF 3)

WHEN MEASUREMENTS ARE REQUESTED IN THIS TABLE, USE J 39200 DVM WITH CORRECT TERMINAL ADAPTER FROM J 35616-A. WHEN A CHECK FOR PROPER CONNECTION IS REQUESTED REFER TO "INTERMITTENTS AND POOR CONNECTIONS" IN SECTION 8A-4. WHEN A WIRE, CONNECTOR OR TERMINAL REPAIR IS REQUESTED USE J 38125-A AND REFER TO "WIRING REPAIR" IN THIS SECTION.

Step	Action	Yes	No
19	1. Ignition switch "OFF." 2. Repair the short B+ in circuit 806/1035 between terminal A8 and B10. 3. Has the short CKT been repaired?	Go to Step 30	—
20	1. Replace the "AIR BAG" fuse. 2. Ignition switch "ON." 3. Wait 10 seconds. 4. Ignition switch "OFF." 5. Remove and inspect the "AIR BAG" fuse. 6. Is the fuse good?	Go to Step 30	Go to Step 21
21	1. Disconnect the arming sensor. 2. Replace the "AIR BAG" fuse. 3. Ignition switch "ON." 4. Wait 10 seconds. 5. Ignition switch "OFF." 6. Remove and inspect the "AIR BAG" fuse. 7. Is the fuse good?	Go to Step 22	Go to Step 23
22	1. Replace the Arming Sensor. 2. Has the sensor been replaced?	Go to Step 30	—
23	1. Repair the short to ground in CKT 1139. 2. Has the short CKT been repaired?	Go to Step 30	—
24	1. Properly connect the DERM electrical harness connector to the DERM. 2. Has the connector been properly connected to the DERM?	Go to Step 30	—
25	1. Disconnect electrical connector (C200) terminal "S." 2. Check for proper connection at terminal "S." 3. Is the connector damaged or corroded?	Go to Step 26	Go to Step 27
26	1. Repair electrical connector (C200) terminal "S." 2. Has the connector been repaired?	Go to Step 30	—
27	1. Ignition switch "ON." 2. Measure the voltage on the fuse side of connector (C200) at terminal "S." 3. Does J 39200 display battery voltage?	Go to Step 28	Go to Step 29
28	1. Repair the open in CKT 1139 between terminal "S", "A9" and "A10". 2. Has the open CKT been repaired?	Go to Step 30	—
29	1. Repair the open in CKT 1139 between terminal "S" and AIR BAG fuse. 2. Has the open CKT been repaired?	Go to Step 30	—
30	1. Reconnect all the SIR system components. 2. Ensure the components are properly mounted. 3. Have all the SIR components been reconnected and properly mounted?	Go to Step 31	—
31	1. Clear the SIR Diagnostic Trouble Codes. 2. Have the SIR Diagnostic Trouble Codes been cleared?	Go to "SIR Diagnostic System Check"	—

97B05611

Courtesy of General Motors Corp.

Fig. 6: Table B - Air Bag Indicator Comes On Steady (3 Of 3)

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

only use test equipment specified in diagnostic tables. Under no circumstances should battery powered test equipment or test light be used. Carefully follow all instructions.

Description

During INITIATOR ASSEMBLY RESISTANCE test, DERM grounds DRIVER-SIDE LOW terminal No. B8 and turns on driver current source at DRIVER-SIDE HIGH terminal No. B9. This causes a known amount of current flow through driver initiator circuit. By monitoring difference between voltage at DRIVER-SIDE HIGH terminal No. B9 and DRIVER-SIDE LOW terminal No. B8, DERM calculates combined resistance of driver-side air bag module, SIR coil assembly, harness wiring CKTs 347 and 348 and connector terminal contact.

DTC Will Set

When the combined resistance of the driver-side air bag module, SIR coil assembly, harness wiring CKTs 347 and 348 and connector terminal contact is above a specified value. This test is run once each ignition cycle during INITIATOR ASSEMBLY RESISTANCE test when:

- 1) No higher priority faults are detected during Turn ON.
- 2) No higher priority faults are detected during CONTINUOUS MONITORING for 1 second.
- 3) No CRANK signal present.
- 4) IGNITION 1 voltage is above a specified value.

Action Taken

DERM turns on AIR BAG indicator and sets a diagnostic trouble code.

DTC Will Clear

When ignition switch is turned OFF.

Diagnostic Aids

An intermittent condition is likely to be caused by poor connection at **Yellow** 2-way connector at base of steering column, DERM terminal Nos. B8 or B9, or connection at top of steering column to driver-side air bag module. The test for this diagnostic trouble code is only run while AIR BAG indicator is performing BULB TEST. When scan tool CLEAR CODES command is issued and malfunction is still present, DTC will not reappear until next ignition cycle.

NOTE: Test numbers refer to test numbers on diagnostic table. For circuit number identification, see WIRING DIAGRAM .

- 1) The SIR DIAGNOSTIC SYSTEM CHECK must be starting point for all diagnostics.
- 7) This test checks for terminal deformation or contamination.
- 8) This test checks whether malfunction is in driver-side air bag module circuit or in DERM wiring harness circuit

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

DTC B1023 - DRIVER INITIATOR CIRCUIT VOLTAGE HIGH (3 OF 5)

WHEN MEASUREMENTS ARE REQUESTED IN THIS TABLE, USE J 39200 DVM WITH CORRECT TERMINAL ADAPTER FROM J 35616-A. WHEN A CHECK FOR PROPER CONNECTION IS REQUESTED REFER TO "INTERMITTENTS AND POOR CONNECTIONS" IN SECTION 8A-4. WHEN A WIRE, CONNECTOR OR TERMINAL REPAIR IS REQUESTED USE J 38125-A AND REFER TO "WIRING REPAIR" IN THIS SECTION.

Step	Action	Yes	No
19	1. Measure the resistance on the LH Forward Discriminating Sensor from terminal "A" to terminal "B." 2. Is the resistance 5.0 ohms or less?	Go to Step 20	Go to Step 44
20	1. Measure the resistance on the Arming Sensor from terminal "C" to terminal "D." 2. Is the resistance 7.5k ohms or less?	Go to Step 46	Go to Table A
21	1. Ignition switch "OFF." 2. Disconnect the yellow 2-way electrical connector at the base of the steering column. 3. Disconnect the Arming Sensor. 4. Disconnect the DERM. 5. Inspect the Arming Sensor electrical harness connector for backed out and/or shorted terminals. 6. Is the Arming Sensor electrical harness connector damaged or shorted?	Go to Step 22	Go to Step 23
22	1. Repair the Arming Sensor electrical harness connector. 2. Has the connector been repaired?	Go to Step 47	—
23	1. Measure the resistance on the Arming Sensor electrical harness connector from terminal "C" to terminal "D." 2. Does J 39200 display "OL" (infinite)?	Go to Step 29	Go to Step 24
24	1. Disconnect the Arming Sensor jumper harness electrical connector C110. 2. Inspect the Arming Sensor jumper harness electrical connector C110 for backed out and/or shorted terminals. 3. Is the connector damaged or shorted?	Go to Step 25	Go to Step 26
25	1. Repair the Arming Sensor jumper harness connector C110. 2. Has the connector been repaired?	Go to Step 47	—
26	1. Measure the resistance on the Arming Sensor jumper harness electrical connector (bulkhead side) from terminal "C" to terminal "D." 2. Does J 39200 display "OL" (infinite)?	Go to Step 28	Go to Step 27
27	1. Repair the short from CKT 347 to CKT 1400. 2. Has the short CKT been repaired?	Go to Step 47	—
28	1. Repair the short from CKT 347 to CKT 1400. 2. Has the short from CKT 347 to CKT 1400 been repaired?	Go to Step 47	—
29	1. Measure the resistance on the Arming Sensor from terminal "C" to terminal "D." 2. Is the resistance 7.5k ohms or less?	Go to Step 46	Go to Step 30
30	1. Disconnect the Discriminating Sensor jumper harness electrical connector C109. 2. Inspect the Discriminating Sensor jumper harness electrical connector C109. 3. Are the connector terminals damaged or corroded?	Go to Step 31	Go to Step 32
31	1. Repair the Discriminating Sensor jumper harness electrical connector C109. 2. Has the connector been repaired?	Go to Step 47	—

97E05617

Courtesy of General Motors Corp.

Fig. 21: DTC B1023 - Driver Initiator Circuit Voltage High (3 Of 5)
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

DTC B1025 - DRIVER INITIATOR CIRCUIT SHORT TO IGNITION (1 OF 2)

WHEN MEASUREMENTS ARE REQUESTED IN THIS TABLE, USE J 39200 DVM WITH CORRECT TERMINAL ADAPTER FROM J 35616-A. WHEN A CHECK FOR PROPER CONNECTION IS REQUESTED REFER TO "INTERMITTENTS AND POOR CONNECTIONS" IN SECTION 8A-4. WHEN A WIRE, CONNECTOR OR TERMINAL REPAIR IS REQUESTED USE J 38125-A AND REFER TO "WIRING REPAIR" IN THIS SECTION.

Step	Action	Yes	No
1	Was the "SIR Diagnostic System Check" performed?	Go to Step 2	Go to "SIR Diagnostic System Check"
2	<ol style="list-style-type: none"> 1. Ignition switch "OFF." 2. Disconnect the yellow 2-way electrical connector at the base of the steering column. 3. Connect J 38715-A SIR Driver/Passenger Load Tool to harness side of the yellow 2-way electrical connector at the base of the steering column. 4. Ignition switch "ON." 5. Is DTC B1025 current? 	Go to Step 4	Go to Step 3
3	<ol style="list-style-type: none"> 1. Ignition switch "OFF." 2. Disconnect J 38715-A. 3. Remove the Inflator Module from the steering wheel. 4. Remove the SIR coil assembly. 5. Inspect the SIR coil assembly for damage. 6. Determine the cause of the damage and repair. 7. Replace the SIR coil assembly. 8. Has the SIR coil assembly been replaced? 	Go to Step 10	—
4	<ol style="list-style-type: none"> 1. Ignition switch "OFF." 2. Disconnect the DERM. 3. Disconnect the Arming Sensor. 4. Disconnect the LH Forward Discriminating Sensor. 5. Disconnect J 38715-A. 6. Ignition switch "ON." 7. Measure the voltage on the DERM electrical harness connector from terminal "B9" to terminal "A1" (ground). 8. Is the voltage 1.0 volt or less? 	Go to Step 6	Go to Step 5
5	<ol style="list-style-type: none"> 1. Ignition switch "OFF." 2. Repair the short from CKT 347 to B+. 3. Has the short CKT been repaired? 	Go to Step 10	—
6	<ol style="list-style-type: none"> 1. Measure the voltage on the DERM electrical harness connector from terminal "B8" to terminal "A1" (ground). 2. Is the voltage 1.0 volt or less? 	Go to Step 8	Go to Step 7

96J14364

Fig. 28: DTC B1025 - Driver Initiator Circuit Short to Ignition (1 Of 2)
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

DERM turns on AIR BAG indicator and sets a diagnostic trouble code.

DTC Will Clear

When DRIVER 36 VLR power supply is in a discharged state, voltage measured at DRIVER SOURCE SENSE terminal No. A5 is within specified range of IGNITION 1 voltage. When neither the set nor clear conditions are met, the state of the diagnostic trouble code from the previous ignition cycle is used.

Diagnostic Aids

An intermittent condition is likely to be caused by a poor connection at arming sensor terminal Nos. A or C, poor connection at DERM terminal No. A5, open ignition feed to arming sensor, open DRIVER SOURCE SENSE circuit or a malfunctioning arming sensor diode. The test for this diagnostic trouble code is only run while AIR BAG indicator is performing BULB TEST. When a scan tool clear codes command is issued and malfunction is still present, DTC will not reappear until ignition switch is turned off for at least 2 minutes with entire SIR system connected, and then the ignition switch is turned ON.

NOTE: Test numbers refer to test numbers on diagnostic table. For circuit number identification, see WIRING DIAGRAM .

- 1) The SIR DIAGNOSTIC SYSTEM CHECK must be starting point for all diagnostics.
- 7) This test checks whether a malfunction is occurring.
- 13) This test checks for an open in arming sensor ignition feed circuit.
- 16) This test locates the open in arming sensor ignition feed circuit.
- 19) This test determines whether malfunction is an open in DRIVER SOURCE SENSE circuit or an open in arming sensor.
- 22) This test locates open in DRIVER SOURCE SENSE circuit.

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

DTC B1042 - LOOP ENERGY RESERVE VOLTAGE LOW (2 OF2)

WHEN MEASUREMENTS ARE REQUESTED IN THIS TABLE, USE J 39200 DVM WITH CORRECT TERMINAL ADAPTER FROM J 35616-A. WHEN A CHECK FOR PROPER CONNECTION IS REQUESTED REFER TO "INTERMITTENTS AND POOR CONNECTIONS" IN SECTION 8A-4. WHEN A WIRE, CONNECTOR OR TERMINAL REPAIR IS REQUESTED USE J 38125-A AND REFER TO "WIRING REPAIR" IN THIS SECTION.

Step	Action	Yes	No
9	1. Ignition switch "OFF." 2. Is the recorded voltage on the repair order 1.0 volt or less?	Go to Step 10	Go to Table A
10	1. Disconnect the Arming Sensor jumper harness electrical connector C109. 2. Ignition switch "ON." 3. Using the TECH 1 SIR Data List Function select "Driver 36 VLR." 4. Does the scan tool display 1.0 volt or less?	Go to Step 11	Go to Step 12
11	1. Repair the short from CKT 236 to ground. 2. Has the short CKT been repaired?	Go to Step 13	—
12	1. Repair the short from CKT 236 to ground. 2. Has the short CKT been repaired?	Go to Step 13	—
13	1. Reconnect all the SIR components. 2. Ensure the components are properly mounted. 3. Have all the SIR components been reconnected and properly mounted?	Go to Step 14	—
14	1. Clear the SIR Diagnostic Trouble Codes. 2. Have the SIR Diagnostic Trouble Codes been cleared?	Go to "SIR Diagnostic System Check"	—

97B05625

Courtesy of General Motors Corp.

Fig. 42: DTC B1042 - Loop Energy Reserve Voltage Low (2 Of 2)

Courtesy of GENERAL MOTORS CORP.

DTC B1043 - DRIVER SOURCE FEED LOW

WARNING: To avoid air bag deployment and injury when trouble shooting system, only use test equipment specified in diagnostic tables. Under no circumstances should battery powered test equipment or test light be used. Carefully follow all instructions.

Description

During normal non-deployment operation of SIR system, DERM monitors voltage supplied through arming sensor to high side of driver deployment loop at DRIVER SOURCE SENSE terminal No. A5. This measured voltage will have a value approximately equal; to DRIVER 36 VLR. When voltage measured at DRIVER-SIDE LOW terminal No. B8 is in its normal operating range, indicating driver deployment loop integrity has been maintained, while simultaneously the voltage measured at DRIVER SOURCE SENSE terminal No. A5 is a specified amount below DRIVER 36 VLR for 500 milliseconds, DTC B1043 will set.

DTC Will Set

When voltage measured at DRIVER-SIDE LOW terminal No. B8 is within a specified percentage of DRIVER

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

Action Taken

DERM turns on AIR BAG indicator and sets a diagnostic trouble code.

DTC Will Clear

When ignition switch is turned OFF.

DTC B1055 - DERM INCOMPATIBILITY

WHEN MEASUREMENTS ARE REQUESTED IN THIS TABLE, USE J 39200 DVM WITH CORRECT TERMINAL ADAPTER FROM J 35616-A. WHEN A CHECK FOR PROPER CONNECTION IS REQUESTED REFER TO "INTERMITTENTS AND POOR CONNECTIONS" IN SECTION 8A-4. WHEN A WIRE, CONNECTOR OR TERMINAL REPAIR IS REQUESTED USE J 38125-A AND REFER TO "WIRING REPAIR" IN THIS SECTION.

Step	Action	Yes	No
1	1. Was the "SIR Diagnostic System Check" performed?	Go to Step 2	Go to "SIR Diagnostic System Check"
2	1. Replace the DERM. 2. Has the DERM been replaced?	Go to "SIR Diagnostic System Check"	—

96E14385

Courtesy of General Motors Corp.

Fig. 49: DTC B1055 - DERM Incompatibility
Courtesy of GENERAL MOTORS CORP.

DTC B1061 - SIR INDICATOR CIRCUIT FAILURE

WARNING: To avoid air bag deployment and injury when trouble shooting system, only use test equipment specified in diagnostic tables. Under no circumstances should battery powered test equipment or test light be used. Carefully follow all instructions.

Description

When ignition switch is first turned ON, battery voltage is applied to AIR BAG indicator and to IGNITION 1 input terminal Nos. A9 and A10. DERM responds by flashing AIR BAG indicator 7 times alternating between primary and redundant lamp drivers. DERM monitors primary lamp driver output by comparing output state at AIR BAG indicator terminal No. B1 to microprocessor commanded state. When IGNITION 1 is above a specified value and output state does not match commanded state of primary lamp driver for 400 milliseconds, DTC B1061 is set.

DTC Will Set

When IGNITION 1 voltage is above a specified value and output state at AIR BAG indicator terminal No. B1 does not match commanded state of primary lamp driver for 400 milliseconds during CONTINUOUS MONITORING.

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System

greater.

- When placing a live air bag module on a bench or other surface, always make certain that the trim cover (finished side) is up and away from surface. This will reduce motion of module if accidentally deployed.
- After deployment, air bag surface may contain deposits of sodium hydroxide, which can irritate skin. Always wear safety glasses, rubber gloves and long-sleeved shirt during clean-up, and wash hands using mild soap and water. Follow correct disposal procedures. See **DISPOSAL PROCEDURES** .
- At no time should any electrical source be allowed near inflator on back of air bag module.
- **DO NOT** apply power to SIR system unless all components are connected or a diagnostic chart requests it, as this will set a diagnostic trouble code.
- When carrying a live air bag module, trim cover should be pointed away from your body to minimize injury in case of accidental deployment.
- **DO NOT** attempt to service DERM, front end discriminating sensor, SIR coil assembly, or air bag modules. If defective, these parts must be replaced.
- **DO NOT** probe a wire through insulator; this will damage it and eventually cause failure due to corrosion.
- When performing electrical tests, prevent accidental shorting of terminals. Such mistakes can damage fuses or components and may cause a second fault code to set, making diagnosis of original problem more difficult.
- When using diagnostic charts to diagnose SIR system, under no circumstances should a volt/ohmmeter, test light or any type of electrical equipment not specified by manufacturer be used. See **SPECIAL TOOLS** .
- If SIR system is not fully functional for any reason, vehicle should not be driven until system is repaired. **DO NOT** remove bulbs, modules, sensors or other components or in any way disable system from operating normally. If SIR system is not functional, park vehicle until repairs can be made.

SPECIAL TOOLS

To avoid deployment when working on SIR system, DO NOT use electrical test equipment such as test lights, battery or A/C-powered volt/ohmmeter, or any type of electrical equipment other than those specified by manufacturer. See SIR RECOMMENDED TOOLS table.

SIR RECOMMENDED TOOLS

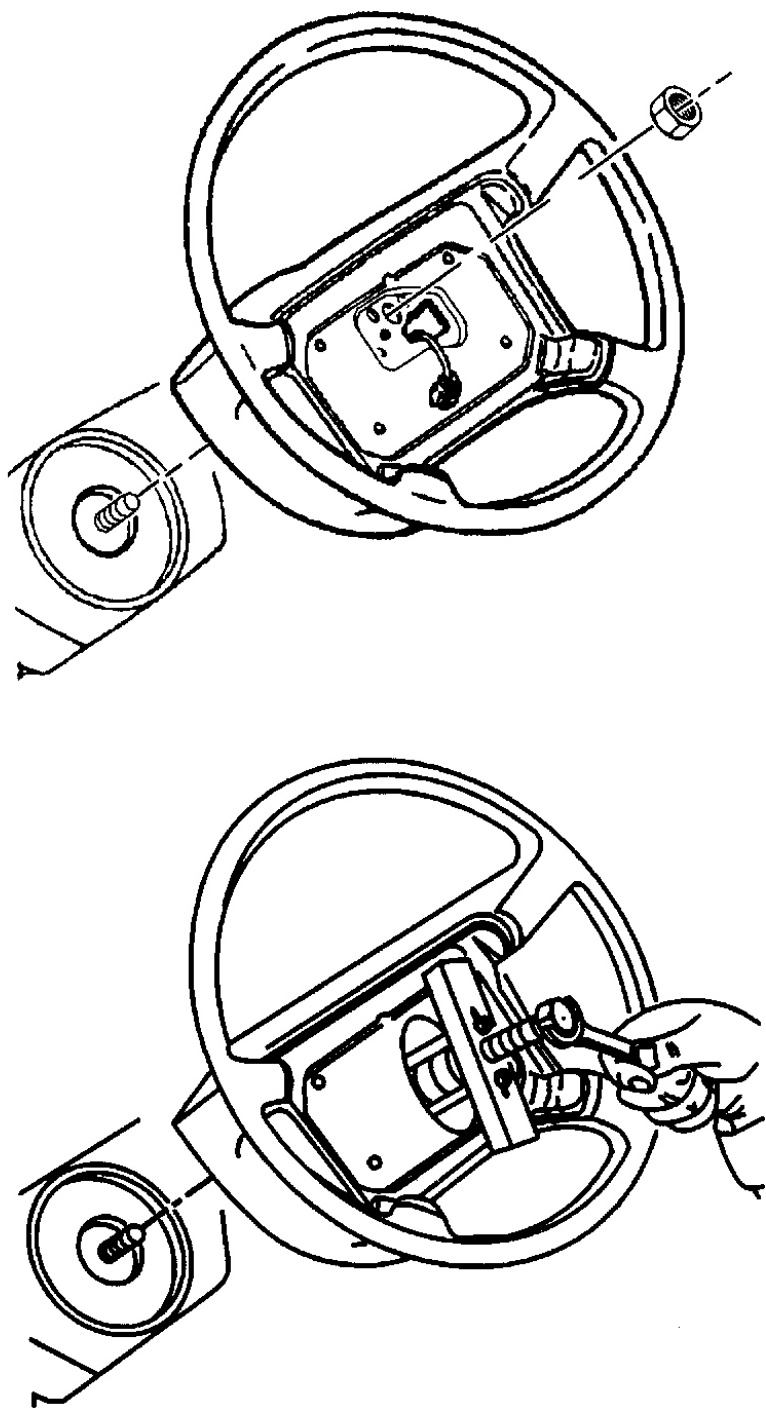
Tool Name	Tool Number
Connector Test Adapter Kit	J-35616
Digital Volt/Ohmmeter	J-39200
Air Bag Module & Steering Column Replacement Load	J-38715-A
Wire Repair Kit	J-38125-A
Scan Tool	Tech 2

DISABLING & ACTIVATING SIR SYSTEM

WARNING: Wait about 2 minutes after disabling air bag system. The SDM maintains system voltage for about 2 minutes after battery is disconnected.

1997 Chevrolet S10 Pickup

AIR BAG RESTRAINT SYSTEM 1997 ACCESSORIES/SAFETY EQUIPMENT General Motors - Air Bag Restraint System



96F05948

Courtesy of General Motors Corp.

Fig. 59: Removing Steering Wheel

1997 Chevrolet S10 Pickup

ANTI-LOCK BRAKE SYSTEM 1997 BRAKES General Motors Corp. - Anti-Lock - 4WAL

Diagnostic Procedures

1. Verify all EBCM connectors are connected properly. Install scan tool with proper cartridge. Turn ignition switch to RUN position. Using scan tool, select FO: DATA LIST. If data is being received from EBCM, go to step 7). If data is not received from EBCM, go to next step.
2. Observe scan tool. If scan tool displays WAITING FOR DATA, go to next step.
3. Ensure scan tool is properly connected to DLC. If connection is okay, go to next step. If not, go to step 5).
4. Turn ignition off. Remove and inspect 10A brake fuse. If fuse is open, go to step 11). If fuse is okay, go to step 6).
5. Reconnect scan tool to DLC connector and repeat step 1).
6. Turn ignition off. Install brake fuse. Disconnect negative battery terminal. Disconnect 10-pin EBCM harness connector C1. Check resistance between negative battery terminal and 10-pin EBCM harness connector C1 terminal "J". If resistance is 0-2 ohms, go to step 14). If resistance is not 0-2 ohms, go to step 17).
7. Using scan tool, select DTC(s). If DTC(s) are present, go to appropriate DTC test. If DTC(s) are not present, go to next step.
8. Turn ignition off for 10 seconds. Turn ignition switch to RUN position. If ABS warning light illuminates for 3 seconds, and then goes off, go to next step. If not, go to step 10).
9. Select DTC HISTORY. If DTC(s) are present, diagnose affected DTC(s). Go to DIAGNOSTIC TROUBLE CODES (DTC). If DTC(s) are not present, system is okay.
10. Observe ABS warning light. If warning light stays on, go to TEST "B" under **SYMPTOM TESTS** . If warning light does not stay on, go to TEST "A" under **SYMPTOM TESTS** .
11. Replace brake fuse. Turn ignition switch to RUN position for 10 seconds. Turn ignition off. Remove and inspect fuse. If fuse is blown, go to next step. If fuse is okay, go to step 19).
12. Disconnect 10-pin EBCM harness connector C1. Replace brake fuse. Turn ignition switch to RUN position for 10 seconds. Turn ignition off. Remove and inspect fuse. If fuse is blown, go to step 20). If fuse is okay, go to next step.
13. Inspect ignition and brake switch input circuits and 10-pin EBCM harness connector C1 for physical damage which could cause a short to ground with EBCM harness connector connected to EBCM. Repair as necessary. After repairs, reconnect all connectors. Turn ignition switch to RUN position for 10 seconds. Turn ignition off. Remove and inspect fuse. If fuse is blown, go to step 21). If fuse is okay, check for intermittent or poor connections.
14. Reconnect negative battery terminal. Turn ignition switch to RUN position. Check voltage between 10-pin EBCM harness connector C1 terminal "A" and ground. If voltage reading is 10-15 volts, go to next step. If not, go to step 22).
15. Turn ignition off. Disconnect positive battery terminal. Turn ignition switch to RUN position. Check resistance between positive battery cable and 10-pin EBCM connector C1, terminal "A". If resistance is 0-2 ohms, go to next step. If resistance is not 0-2 ohms, go to step 22).
16. Inspect EBCM and EBCM harness connector terminals for poor contact. Inspect battery terminals and battery cable terminals for poor connection. Repair as necessary. After repairs, go to step 24). If connections or terminals are okay, go to step 25).
17. Repair open or high resistance in EBCM ground circuit. See **WIRING DIAGRAMS** . After repairs, repeat step 1).

1997 Chevrolet S10 Pickup

ANTI-LOCK BRAKE SYSTEM 1997 BRAKES General Motors Corp. - Anti-Lock - 4WAL

This DTC can be set by a faulty VSS or a fault in VSS signal circuit.

DTC C0036: REAR SPEED SENSOR SIGNAL MISSING

NOTE: For circuit reference, see WIRING DIAGRAMS .

Circuit Description

The rear wheel speed sensor signal originates from the VSS which is connected to the PCM/VCM. The EBCM receives the rear wheel speed sensor signal from the PCM/VCM.

Conditions for setting DTC:

- EBCM losing rear wheel speed signal for at least 5 seconds at speeds greater than 8 MPH with brake pedal released. If DTC C0035 is also present, diagnose that DTC first.

Diagnostic Procedures

1. Perform diagnostic system check. See DIAGNOSTIC SYSTEM CHECK . After performing diagnostic system check, go to next step.
2. Turn ignition off. Disconnect 10-pin EBCM harness connector. Turn ignition switch to RUN position. Check voltage between 10-pin EBCM harness connector terminal "E" and ground. If voltage is greater than 10 volts, go to step 4). If not, go to next step.
3. Turn ignition off. Disconnect PCM/VCM harness connector C1. Check resistance between 10-pin EBCM harness connector terminal "E" and PCM/VCM harness connector terminal No. 15 (terminal No. 70 on 2.2L engines). If resistance is 0-2 ohms, go to step 5). If not, go to step 8).
4. Turn ignition off. Reconnect PCM/VCM harness connector. Turn ignition switch to RUN position. Using scan tool, clear DTCs. Test drive vehicle at speed greater than 15 MPH. Check for DTCs. If DTC C0036 resets, go to step 6). If DTC does not reset, go to step 7).
5. Check resistance between 10-pin EBCM harness connector terminal "E" and ground. If resistance is infinite, check VSS. If resistance is not infinite, go to step 9).
6. Replace EBCM. After replacing EBCM, perform DIAGNOSTIC SYSTEM CHECK .
7. Malfunction is intermittent. Inspect all connectors and harnesses for damage which may result in high resistance when all components are connected. See DIAGNOSTIC AIDS. After repairs, perform DIAGNOSTIC SYSTEM CHECK .
8. Repair open in VSS signal circuit between VCM and EBCM. See WIRING DIAGRAMS . After repairs, perform DIAGNOSTIC SYSTEM CHECK.
9. Repair short to ground in VSS signal circuit. After repairs, perform DIAGNOSTIC SYSTEM CHECK .

Diagnostic Aids

This DTC can be set by a faulty VSS or a fault in VSS signal circuit between EBCM and VCM.

DTC C0037: REAR SPEED SENSOR SIGNAL ERRATIC

1997 Chevrolet S10 Pickup

ANTI-LOCK BRAKE SYSTEM 1997 BRAKES General Motors Corp. - Anti-Lock - 4WAL

8. Replace EBCM. After replacing EBCM, perform **DIAGNOSTIC SYSTEM CHECK** .
9. Repair short to ground in battery circuit between underhood fuse/relay block and EBCM. See **WIRING DIAGRAMS** . After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .
10. Repair open or high resistance in battery circuit to EBCM. After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .

DTC C0052: REAR DUMP SOLENOID CIRCUIT OPEN

NOTE: For circuit reference, see **WIRING DIAGRAMS** .

Circuit Description

When rear dump solenoid is needed, EBCM will ground solenoid circuit to energize coil within solenoid. This will open dump valve by magnetic force created by solenoid coil.

Conditions for setting DTC:

- ANTI-LOCK indicator light check complete.
- Low voltage on EBCM solenoid driver circuit when expected to be high (solenoid not energized).

Diagnostic Procedures

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** . After performing diagnostic system check, go to next step.
2. Turn ignition off. Disconnect 2-pin EBCM harness connector. Inspect connector for damage or corrosion which could result in loss of power to EBCM. If connector is okay, go to next step. If connector is not okay, go to step 6).
3. Check resistance between ground and 2-pin EBCM harness connector terminal "B". If resistance is 0-2 ohms, go to next step. If not, go to step 7).
4. Check voltage between ground and 2-pin EBCM harness connector terminal "A". If voltage reading is greater than 10 volts, go to step 8). If not, go to next step.
5. Inspect ABS fuse or fusible link. If fuse or fusible link is open, go to step 9). If fuse or fusible link is okay, go to step 10).
6. Repair 2-pin EBCM harness connector as necessary. After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .
7. Repair open or high resistance in ground circuit to EBCM. See **WIRING DIAGRAMS** . After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .
8. Replace EBCM. After replacing EBCM, perform **DIAGNOSTIC SYSTEM CHECK** .
9. Repair short to ground in battery circuit between underhood fuse/relay block and EBCM. See **WIRING DIAGRAMS** . After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .
10. Repair open or high resistance in battery circuit to EBCM. After repairs, perform **DIAGNOSTIC SYSTEM CHECK** .

1997 Chevrolet S10 Pickup

ANTI-LOCK BRAKE SYSTEM 1997 BRAKES General Motors Corp. - Anti-Lock - 4WAL

NOTE: For circuit reference, see WIRING DIAGRAMS .

Circuit Description

The EBCM controls the ANTI-LOCK indicator light by supplying ground to turn on or battery voltage to turn off the indicator light.

If indicator light is off constantly, check for an open or short to voltage in the light circuit between indicator light and EBCM. Also check for open in GAUGES fuse or faulty light bulb.

Diagnostic Procedures

1. Perform Diagnostic System Check. If diagnostic system check has been performed, go to next step. If not, go to DIAGNOSTIC SYSTEM CHECK .
2. Turn ignition off. Disconnect 10-pin EBCM harness connector. Using a fused jumper wire, jumper terminal "B" of 10-pin harness connector to ground. Turn ignition switch to RUN position. If ANTI-LOCK indicator light illuminates, go to next step. If not, go to step 4).
3. Inspect 10-pin EBCM harness connector for damage or corrosion. If connector is okay, go to step 9). If connector is not okay, go to step 8).
4. Inspect jumper wire fuse. If fuse is blown, go to step 10). If fuse is okay, go to next step.
5. Inspect 10-amp GAUGE fuse. If fuse is blown, go to next step. If fuse is okay, go to step 7).
6. Turn ignition off. Replace fuse. Turn ignition switch to RUN position. Remove and inspect GAUGE fuse. If fuse is blown, go to step 13). If fuse is okay, go to step 14).
7. Remove and inspect ANTI-LOCK indicator light bulb. If bulb is okay, go to step 12). If bulb is faulty, go to step 11).
8. Repair 10-pin EBCM harness connector. After repairs, perform DIAGNOSTIC SYSTEM CHECK .
9. Replace EBCM. After replacing EBCM, perform DIAGNOSTIC SYSTEM CHECK .
10. Repair short to voltage in ANTI-LOCK indicator light circuit between EBCM and instrument cluster. See WIRING DIAGRAMS . After repairs, perform DIAGNOSTIC SYSTEM CHECK .
11. Replace ANTI-LOCK indicator light bulb. After replacing light bulb, perform DIAGNOSTIC SYSTEM CHECK .
12. Repair open in circuit between fuse block and instrument cluster, or ANTI-LOCK indicator light control circuit between instrument cluster and EBCM. See WIRING DIAGRAMS . After repairs, perform DIAGNOSTIC SYSTEM CHECK .
13. Repair short to ground in brake warning light control circuit between instrument cluster and EBCM. See WIRING DIAGRAMS . After repairs, perform DIAGNOSTIC SYSTEM CHECK .
14. Problem is an intermittent short to ground in brake warning light control circuit between instrument cluster and EBCM. See WIRING DIAGRAMS . Repair as necessary. After repairs, perform DIAGNOSTIC SYSTEM CHECK .

TEST B: ANTI-LOCK LIGHT IS ON AT ALL TIMES - NO DTCS

NOTE: For circuit reference, see WIRING DIAGRAMS .

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series

The 4L60-E is a fully automatic transmission consisting of a 3-element hydraulic torque converter with a Torque Converter Clutch (TCC). The 4-speed transmission is equipped with 2 planetary gear sets, 5 multiple-disc clutches, one sprag clutch, one roller clutch and a 2-4 band. See **Fig. 2** .

A hydraulic system, pressurized by a variable capacity vane type oil pump, provides pressure required to operate friction elements and automatic controls. The 4L60-E also contains electronic solenoids to control hydraulic operations. A Powertrain Control Module (PCM) receives signals from Vehicle Speed Sensor (VSS), Throttle Position (TP) Sensor, fluid pressure switch assembly, and temperature sensor. These signals help PCM determine when to switch 2 shift solenoids, 3-2 downshift solenoid, and/or TCC solenoid on or off. PCM can also control line pressure via pressure control solenoid (force motor).

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series

not assembled properly.

Valve body pad porous or damaged. 2-4 accumulator has porosity. Servo piston seals damaged. Apply pin damaged or has improper length. 2-4 band burned or anchor pin not engaged. Throttle Position (TP) sensor, VSS and/or 4WD low switch (if equipped) disconnected or damaged.

No Converter Clutch Apply

Transmission not supplied 12 volts. Outside electrical connector damaged. Inside electrical connector wiring harness or solenoid damaged. Solenoid wire pinched. Solenoid not grounded. Pressure switches incorrect or damaged. Temperature sensor damaged. Damaged engine speed sensor or pressure switch assembly. Converter internal damage.

Converter clutch valve stuck or assembled backward, or retaining ring not positioned properly. Pump-to-case gasket not positioned properly. Orifice cup plug restricted or damaged. Solenoid "O" ring seal cut or damaged. Pump-to-body cover high or uneven bolt torque. Turbine shaft "O" ring seal cut or damaged. Turbine shaft retainer and ball assembly restricted or damaged. TCC shift valve or apply valve stuck. Solenoid "O" ring leaking. Solenoid screen is blocked.

Converter Shudder

Torque converter has internal damage. Converter clutch valve stuck. Restricted oil passages. Crack in filter body. Restriction in filter neck. "O" ring seal cut or damaged. Turbine shaft "O" ring cut or damaged. Turbine shaft retainer and ball assembly restricted or damaged. Low oil pressure. Engine not tuned properly.

No Converter Clutch Release

Solenoid external ground. Converter internal damage. Converter clutch valve stuck. Converter clutch apply valve stuck in apply position. PCM external ground faulty.

Converter Clutch Applies When Cold

Check engine coolant temperature sensor and trouble codes.

Ratcheting Noise

Parking pawl return spring weak, damaged or not assembled properly.

Oil Leaking Out Vent

Chamber in pump body rotor pocket too large. Fluid level overfilled. Cross leak out of pump body and cover.

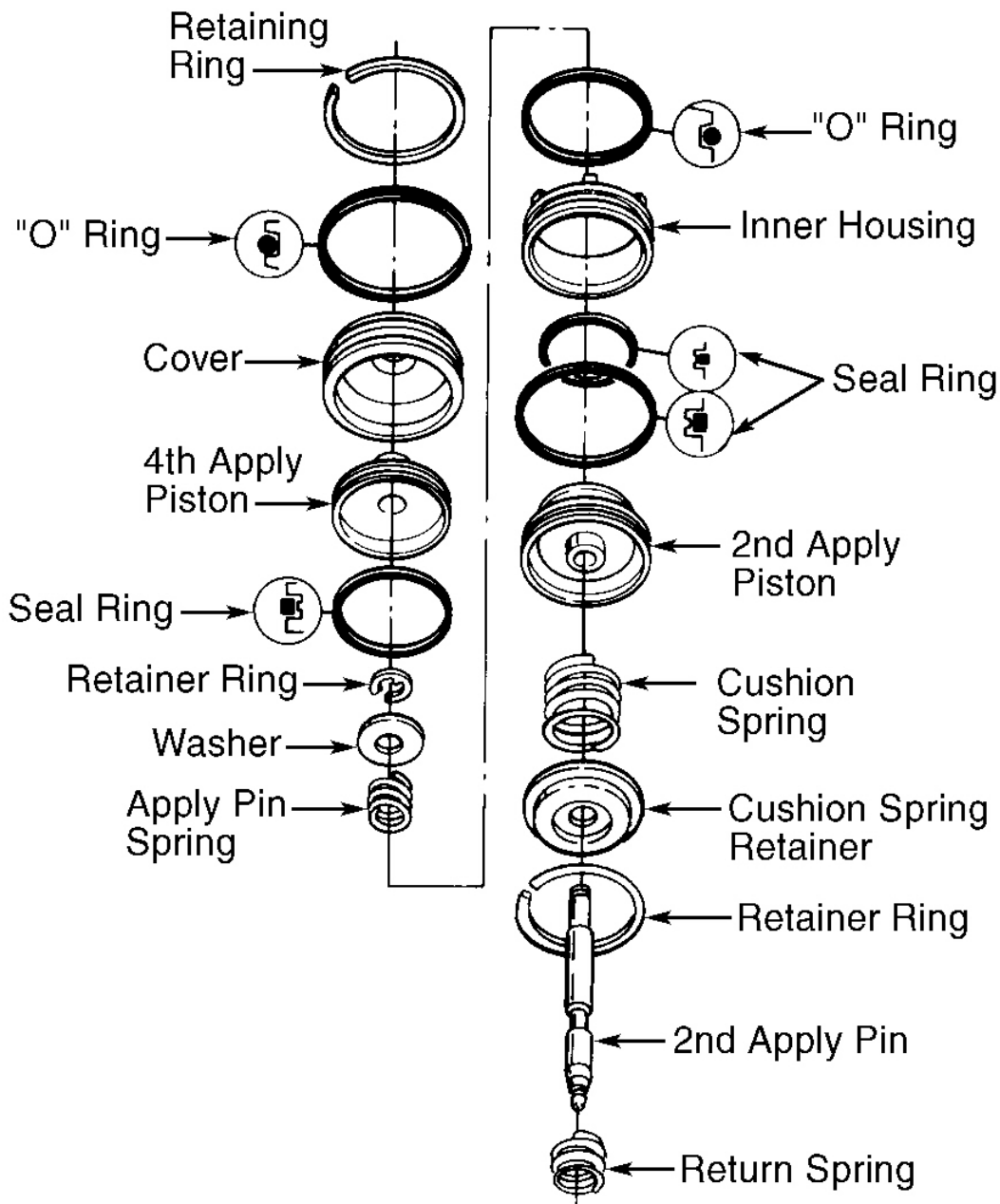
Vibration In Reverse & Whining Noise In Park

Broken oil pump vane rings.

Front Oil Leak

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series



G96E04444

Fig. 11: Exploded View Of 2-4 Servo Assembly
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series

restrictions and blockage. Inspect case internal clutch plate lugs for damage and wear. Inspect servo and accumulator bores for damage. Inspect all snap ring grooves for damage.

CASE ATTACHMENTS

Cleaning & Inspection

Clean all parts and dry with compressed air. Inspect 1-2 and 3-4 accumulator parts for damage to pistons or housing. Inspect for flatness and condition of accumulator, oil passage plate and gasket. Inspect wiring harness leads and connectors for damage. Inspect speed sensor rotor teeth for damage and distortion.

REACTION & INPUT GEAR SETS, LOW-REVERSE CLUTCH & SUPPORT

Cleaning & Inspection

1. Clean all parts and dry with compressed air. Inspect reaction and input carriers for pinion gear damage, excessive wear and improper staking of pinion pins. Inspect carrier bearings for heat damage, flatness and roller condition. Place output shaft sleeve inside reaction carrier and input carrier.
2. Rotate sleeve and note smoothness of bearing operation. Replace carrier assembly if roughness is felt. Check pinion gear end play on reaction and input carriers.
3. Pinion gear end play should be .008-.024" (.20-.61 mm). Inspect internal reaction gear and support for cracks and damaged splines. Inspect low-reverse clutch plates for wear and signs of excessive heat.
4. Inspect low-reverse clutch piston for roughness or damage in seal ring area. Inspect retainer ring and spring assembly for damage. Inspect sun and internal gears and supports for spline and bushing wear and damage. Replace damaged parts as necessary.

COMPONENT DISASSEMBLY & REASSEMBLY

REVERSE INPUT CLUTCH

Disassembly

1. Remove snap ring from reverse input clutch housing. Remove selective backing plate, steel plates, composition plates and Belleville plate. See **Fig. 17**. Note number of clutch plates for reassembly reference. Compress reverse input clutch spring assembly.
2. Remove retainer ring and spring assembly. Remove piston and seals. Thickness of composition plates should be .068-.074" (1.73-1.88 mm). Thickness of steel plates should be .075-.081" (1.90-2.05 mm). Thickness of Belleville plate should be .087-.091" (2.21-2.31 mm).

Inspection

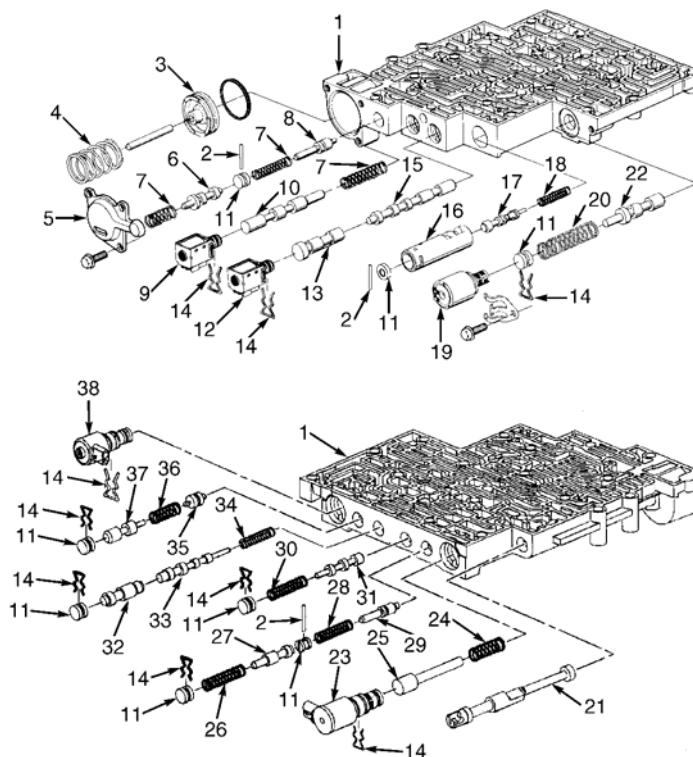
Inspect all plates for damage, distortion, flatness and burred edges. Inspect spring retainer for distortion. Check piston for deformation or damage. Inspect clutch housing bushings for wear. Inspect clutch housing for dishing. Replace worn or damaged parts as necessary.

NOTE: Soak clutch plates in ATF before installation.

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series

1. Valve Body
2. Pin
3. Forward Accumulator Piston
4. Forward Accumulator Spring
5. Forward Accumulator Cover
6. Low Overrun Valve
7. Spring
8. Forward Abuse Valve
9. 1-2 Shift Solenoid
10. 1-2 Shift Valve
11. Bore Plug
12. 2-3 Shift Solenoid
13. 2-3 Shuttle Valve
14. Retainer
15. 2-3 Shift Valve
16. 1-2 Accumulator Valve Sleeve
17. 1-2 Accumulator Valve
18. 1-2 Accumulator Valve Spring
19. Pressure Control Solenoid
20. Actuator Feed Limit Valve Spring
21. Manual Valve
22. Actuator Feed Limit Valve
23. 3-2 Control Solenoid
24. 3-2 Control Valve Spring
25. 3-2 Control Valve
26. 3-2 Downshift Valve Spring
27. 3-2 Downshift Valve
28. Reverse Abuse Valve Spring
29. Reverse Abuse Valve
30. 3-4 Shift Valve Spring
31. 3-4 Shift Valve
32. 3-4 Relay Valve
33. 4-3 Sequence Valve
34. 4-3 Sequence Valve Spring
35. Isolator Valve
36. Regulator Apply Spring
37. Regulator Apply Valve
38. TCC PWM Solenoid



98D01181

Fig. 24: Exploded View Of Valve Body
Courtesy of GENERAL MOTORS CORP.

TRANSMISSION REASSEMBLY

NOTE: To identify bushing, seal, thrust bearing and thrust washer locations and direction, see **BUSHINGS, SEALS, BEARINGS & THRUST WASHERS** . See **Fig. 26** and **Fig. 27** .

LOW-REVERSE CLUTCH

1. Place transmission in a vertical position. Install seals on low-reverse clutch piston. Apply petroleum jelly to seals. Align and install piston with notch in bottom of transmission case. Ensure piston is fully seated and parking pawl aligns with opening in piston wall. Install spring assembly with flat side of retainer upward. Compress springs and install retainer ring.
2. Coat bearing assembly with petroleum jelly. Install bearing assembly on case hub with outside bearing race toward case hub. Install internal reaction gear and support. Install bearing assembly onto support with outside bearing race toward support. Install oil deflector (if equipped) and reaction carrier assembly in case. See **Fig. 17** . Ensure clutch plates are proper thickness.
3. Install clutch plates. See **LOW-REVERSE CLUTCH PLATE USAGE** table. Ensure clutch plates align with splines of reaction carrier and case and that steel plates are aligned. Place waved plate on work

1997 Chevrolet S10 Pickup

1997-98 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L60-E Overhaul - Isuzu Hombre & S/T Series

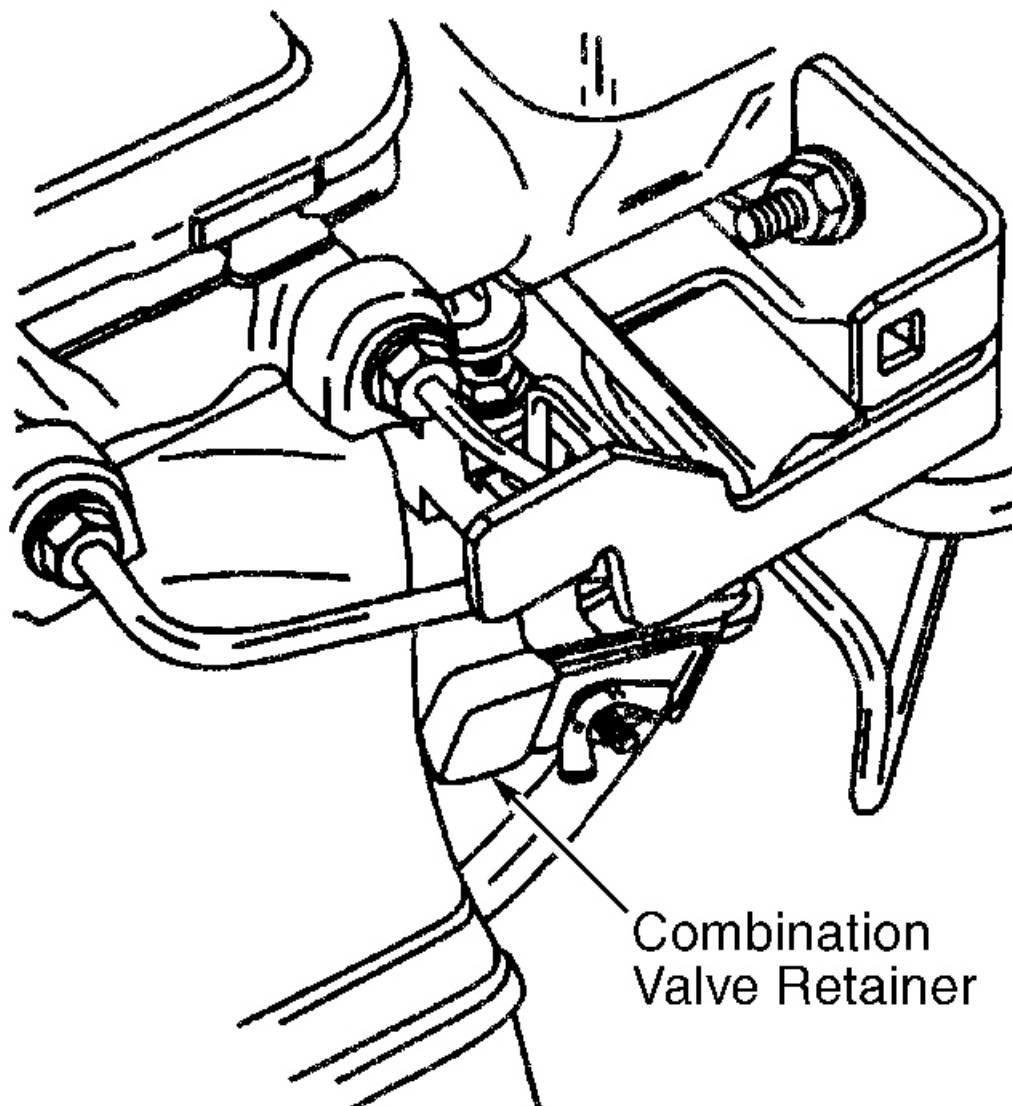
Transmission	.005-.036 (.13-.91)
Height	
Low-Reverse Clutch	1.15-1.18 (29.2-29.9)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS**

Application	Ft. Lbs. (N.m)
Converter Housing Bolt	55 (75)
Cooler Pipe Connector	28 (38)
Detent Spring-To-Valve Body Bolt	18 (24)
Extension Housing Bolt	26 (35)
Fill Tube Bolt	35 (47)
Manual Shaft-To-Detent Lever Nut	23 (31)
Oil Pump Cover-To-Body Bolt	18 (24)
Oil Pump-To-Case Bolt	18 (24)
Park Bracket-To-Case Bolt	23 (31)
Torque Converter-To-Flexplate Bolt	46 (62)
Transmission-To-Engine Bolt	35 (47)
	INCH Lbs. (N.m)
Accumulator Cover-To-Case Bolt	96 (11)
Line Pressure Plug	96 (11)
Oil Pan-To-Case Bolt	96 (11)
Oil Passage Cover Bolt	96 (11)
Pressure Switch Assembly	96 (11)
Solenoid Bolt	96 (11)
Speed Sensor Bolt	96 (11)
Valve Body-To-Case Bolt ⁽¹⁾	96 (11)
(1) Tighten valve body bolts in a spiral pattern starting in center of valve body.	

1997 Chevrolet S10 Pickup

BRAKE SYSTEM 1997 BRAKES Disc & Drum - General Motors



95B27103

Fig. 1: Positioning Hold-Off Valve On Combination Valve (Typical)
Courtesy of GENERAL MOTORS CORP.

ADJUSTMENTS

PARKING BRAKE

1997 Chevrolet S10 Pickup

BRAKE SYSTEM 1997 BRAKES Disc & Drum - General Motors

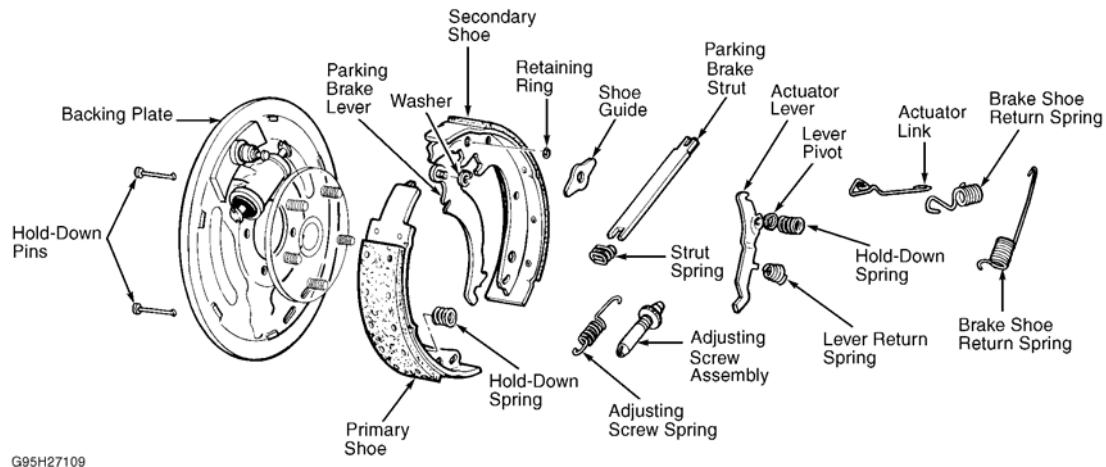


Fig. 6: Exploded View Of Rear Brake Assembly
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

GENERATOR & REGULATOR 1997 ELECTRICAL General Motors Corp. - Generators & Regulators

Generator	RPO Code	Rated Output
CS130D	K60	100

ADJUSTMENTS

NOTE: No adjustment or maintenance is required on generator assembly. Regulator voltage is preset and no adjustment is possible. On all models drive belt tension is controlled by a belt tensioner.

TROUBLE SHOOTING

NOTE: For information not covered in this article, see the TROUBLE SHOOTING - BASIC PROCEDURES article in the GENERAL INFORMATION section.

ON-VEHICLE TESTING

NOTE: All generators are serviced by replacement only.

NOTE: Before making electrical checks, visually inspect all terminals for clean, tight connections. Check generator mounting bolts and drive belt tension. Ensure battery is in good condition prior to testing charging system.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in the GENERAL INFORMATION section before disconnecting battery.

CHARGE INDICATOR LIGHT

NOTE: Perform this test only if charge indicator light does not illuminate when ignition is turned on, or does not go out after engine is started.

CAUTION: DO NOT run engine with generator output terminal disconnected from battery.

1. Ensure battery is fully charged. Visually check generator belt and wiring. Turn ignition switch to ON position (engine not running). Charge indicator light should illuminate. If charge indicator light does not illuminate, go to next step. If charge indicator light illuminates, go to step 4).
2. Turn ignition off. Disconnect generator harness connector. Using a fused (5-amp) jumper wire, connect terminal "L" of generator harness connector to ground. Turn ignition on (engine not running). If charge indicator light illuminates, replace or repair generator.

1997 Chevrolet S10 Pickup

1996-97 CLUTCHES General Motors Corp. Trucks

Remove nut and washer from center of brake drum. Remove drum yoke assembly, bolts, washers and drum yoke. Remove cotter pin, clevis pin, clevis, and nut from brake cable. Remove parking brake cable grommet, and cable from bracket.

4. On all vehicles, disconnect exhaust pipes from exhaust manifold, and catalytic converter from muffler assembly (if necessary). Disconnect electrical connectors from speed sensor and back-up light switch. Using Quick Connect Disconnect Tool (J-36221), remove clutch line from concentric slave cylinder quick connect coupling. See **Fig. 4**. Remove starter and clutch housing cover. Remove transmission vent hose.
5. Support transmission and engine. Remove crossmember. Remove clutch plate and clutch cover from flywheel. Remove transmission-to-engine bolts and studs. Pull transmission straight back on clutch hub splines. Remove clutch and clutch cover plates during transmission-to-engine separation. Remove transmission.

Installation

1. To install, reverse removal procedure. If equipped with drive shaft parking brake, adjust parking brake. See **DRIVE SHAFT PARKING BRAKE (C/K SERIES)** or **DRIVE SHAFT PARKING BRAKE (P SERIES)** under ADJUSTMENTS. On 4WD, install NEW transmission adapter gasket. Adjust transfer case shift linkage. See **TRANSFER CASE LINKAGE (C/K SERIES)** under ADJUSTMENTS.
2. Lightly coat input shaft splines with high-temperature grease. Tighten bolts to specifications. See **TORQUE SPECIFICATIONS (C/K SERIES)** table or **TORQUE SPECIFICATIONS (P SERIES)** table. Fill transmission and transfer case with fluid. See **TRANSMISSION/TRANSFER CASE LUBRICATION FLUID** table under LUBRICATION.

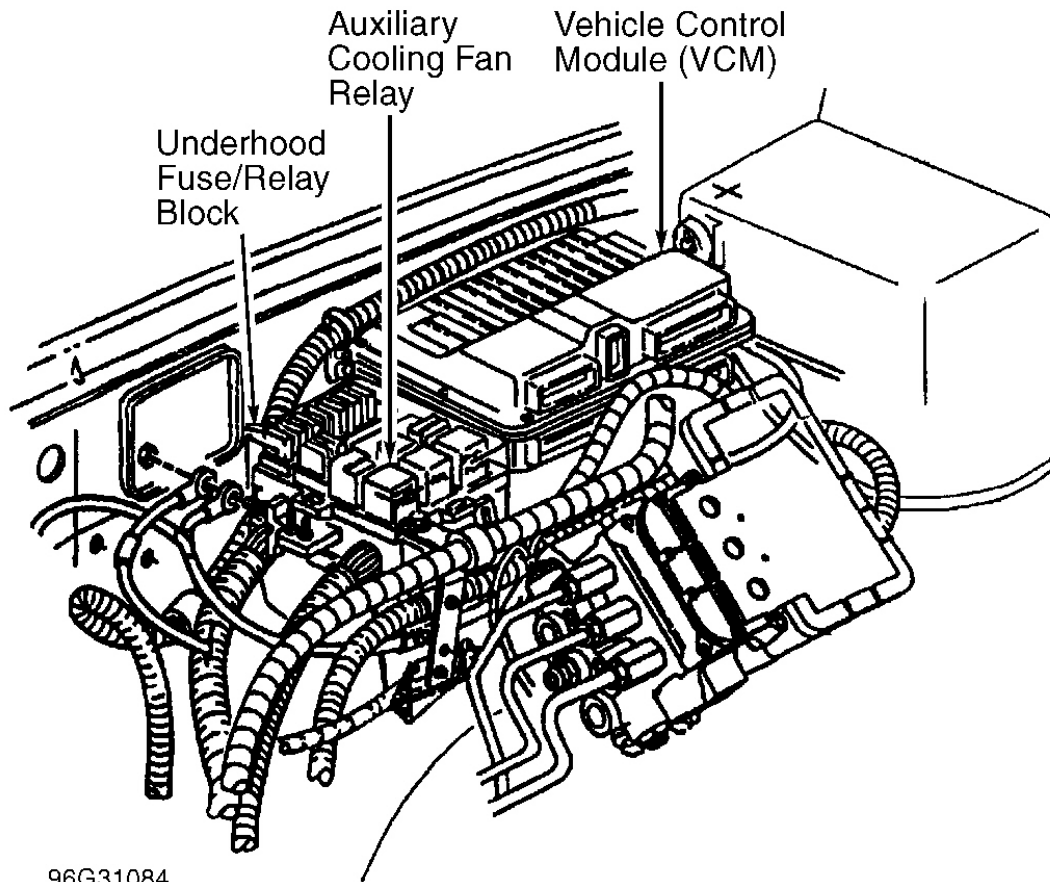
Removal (S/T Series)

1. Disconnect negative battery cable. Shift transmission into 3rd or 4th gear. Remove shift lever knob and nut. Remove shift lever retainer screws and retainer (if equipped). Remove shift lever boot mounting screws and boot. Remove shift lever and nut.
2. Remove exposed bolts on base of housing. DO NOT remove bolts under rubber boot at top of housing. Remove shift lever housing. Raise and support vehicle. Drain transmission fluid. Remove parking brake cable for clearance. Mark drive shaft(s) for reassembly reference. Remove drive shaft(s).
3. Disconnect electrical connectors from speed sensor and back-up switch. On all models, disconnect exhaust pipe from exhaust manifold. Remove catalytic converter and hanger. If equipped, remove right and left side transfer case-to-transmission braces. On 4WD, place transfer case in 4H position. Remove skid plate. Drain fluid from transfer case. Disconnect vacuum lines and electrical connectors from transfer case (if equipped).
4. Disconnect shift cable from transfer case. Support transfer case with jack. Remove transfer case-to-transmission mounting bolts. Slide transfer case rearward until free of transmission output shaft. Lower and remove transfer case. Remove and discard gasket. Using Quick Connect Disconnect Tool (J-36221), remove clutch line from concentric slave cylinder quick connect coupling. See **Fig. 4**.
5. Remove clutch housing cover. Remove clutch plate and clutch cover from flywheel. Support transmission. Using a fuel pressure gauge, purge fuel system, and disconnect fuel lines. Remove fuel lines and retainers from rear crossmember. Remove rear crossmember. Move wiring harness away from transmission oil pan.
6. Lower transmission enough to gain access to top of transmission. Remove wiring harness from front

1997 Chevrolet S10 Pickup

ENGINE COOLING FAN 1997 ENGINE COOLING General Motors Corp. - Electric Cooling Fan

Erasable Programmable Read Only Memory (EEPROM). When replacing PCM/VCM, the new PCM/VCM must be programmed.



96G31084

Fig. 1: Auxiliary Cooling Fan Relay Location ("C" & "K" Series)
Courtesy of GENERAL MOTORS CORP.

SCAN TOOL

A variety of information is transmitted through Data Link Connector (DLC). This data is transmitted at a high frequency which requires the use of Tech 1 Scan Tool (94-00101A), appropriate cartridge kit and vehicle interface module kit. Other types of scan tools are available and may function and provide adequate information for diagnostic work. Always refer to scan tool manufacturer's instructions.

ELECTRIC COOLING FAN CIRCUIT DIAGNOSIS

3.4L ("U" SERIES)

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

1997 Chevrolet S10 Pickup

ENGINE COOLING FAN 1997 ENGINE COOLING General Motors Corp. - Electric Cooling Fan

4. Using a fused jumper wire, jumper fan control relay harness connector terminals No. 30 and 87 together. If cooling fan motor runs, go to next step. If cooling fan motor does not run, go to step 6).
5. Disconnect jumper wire. Using a test light connected to ground, probe fan control relay harness connector terminal No. 85. If test light illuminates, go to step 8). If test light does not illuminate, locate and repair open in Pink wire between ENG 1 fuse and fan control relay.
6. With jumper wire still in place, disconnect cooling fan motor harness connector. Using a test light connected to ground, probe cooling fan motor harness connector terminal "B". If test light illuminates, go to next step. If test light does not illuminate, locate and repair open in Red wire between fan control relay and cooling fan motor.
7. Using a test light connected to battery positive, probe cooling fan motor harness connector terminal "A". If test light illuminates, replace cooling fan motor. If test light does not illuminate, locate and repair open in Black wire between cooling fan motor and ground.
8. Reconnect fan control relay. Using a voltmeter, check voltage (backprobe) between fan control relay harness connector terminal No. 86 and ground. If reading is less than 10 volts, replace fan control relay. If reading is 10 volts or greater, locate and repair open in Dark Green wire between fan control relay and splice.
9. Disconnect auxiliary fan control switch harness connector. Turn ignition on. Using a voltmeter, check voltage between auxiliary fan control switch harness connector terminal "A" and ground. If reading is less than 10 volts, locate and repair open in Dark Green wire between auxiliary fan control switch and splice. If reading is 10 volts or greater, replace auxiliary fan control switch.
10. Disconnect A/C high pressure switch harness connector. Using a voltmeter, check voltage between auxiliary fan control switch harness connector terminal "B" and ground. If reading is 10 volts or greater, go to next step. If reading is less than 10 volts, locate and repair open in Dark Green wire between A/C high pressure fan switch and splice.
11. Using a test light connected to battery positive, probe A/C high pressure switch harness connector terminal "A". If test light illuminates, replace A/C high pressure fan switch. If test light does not illuminate, locate and repair open in Black wire between A/C high pressure switch harness connector terminal "A" and splice.
12. With ignition on, disconnect fan control relay harness connector. If cooling fan motor stops, replace fan control relay. If cooling fan motor continues to run, locate and repair short to power in Red wire between fan control relay and cooling fan motor.
13. Turn ignition off. Disconnect fan control relay harness connector. Using a test light connected to battery positive, probe cooling fan relay harness connector terminal No. 86. If test light illuminates, go to next step. If test light does not illuminate, replace fan control relay.
14. With test light still connected, disconnect auxiliary fan control switch harness connector. If test light remains on, go to next step. If test light does not remain on, replace auxiliary fan control switch.
15. With test light still connected, disconnect A/C high pressure fan switch harness connector. If test light remains on, locate and repair short to ground in Dark Green wire between fan control relay and either A/C high pressure fan switch or auxiliary fan control switch.

WIRING DIAGRAMS

1997 Chevrolet S10 Pickup

ENGINE COOLING FAN 1997 ENGINE COOLING General Motors Corp. - Electric Cooling Fan

Fig. 6: Cooling Fan System Wiring Diagram ("U" Series)

1997 Chevrolet S10 Pickup

CRUISE CONTROL SYSTEM 1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Cruise Control System

Fig. 3: Cruise Control System Wiring Diagram (2.2L)

1997 Chevrolet S10 Pickup

1998-99 DRIVE AXLES Differentials - Eaton Locking - Trucks

Disassembly (Cam Unit)

Remove retaining ring with snap ring pliers. Remove clutch plates, guide clips and wave washer. Remove cam plate and left side gear.

Inspection

NOTE: If side gears or thrust block are replaced, adjust differential. Check side gear backlash and thrust block clearance. See 1-PIECE CASE under ADJUSTMENTS.

Clean all parts in solvent. Inspect all gears for cracks and scoring. Inspect all clutch components and thrust washers for damage. Check fit of side gears on axle shafts. Inspect thrust sleeve for wear. Replace components as necessary.

Reassembly (Cam Unit)

Install cam plate on side gear. Install wave washer. Install clutch plates in alternating sequence (8 on 7 5/8" ring gear and 10 on 8 1/2" ring gear). See Fig. 1 . Install retaining ring. Use grease to hold guide clips in place. Install guide clips on clutch plates.

Reassembly (Differential)

1. Install thrust washer and left side gear (cam unit) in to case. Install thrust washer for right side gear into case. Install clutch pack for right side gear. Install clutch plates in alternating sequence. See Fig. 1 .
2. Use grease to hold guide clips in place. Install guide clips onto clutch plates. Install right side gear, thrust block, thrust washers and pinion gears. Install pinion gears into case, 180 degrees apart.
3. Rotate pinion gears and thrust block into case. Ensure open side of thrust block faces small window opening. Install pinion shaft and NEW lock screw. DO NOT tighten lock screw to specification at this time.

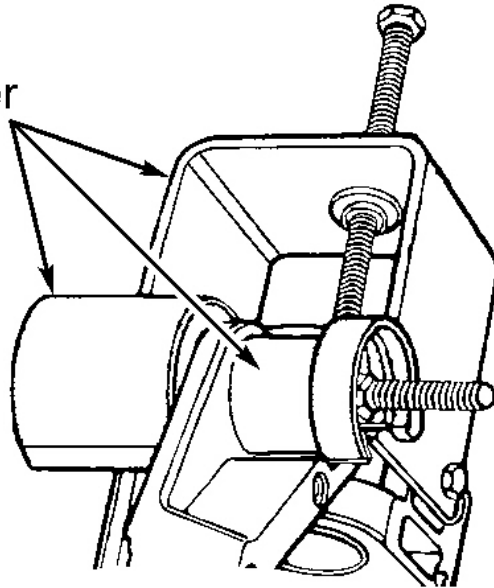
NOTE: Once unit is installed into differential housing, tighten lock screw to specification.

4. Place governor assembly and latching bracket into case. Place straight end of latching bracket spring over and outside governor assembly shaft. See Fig. 2 .
5. Install governor assembly and latching bracket bushing. Latching bracket bushing has a tapered hole; governor bushing has a straight hole. Press governor bushing into case to set shaft end play at .004-.020" (.10-.51 mm). Press latching bracket bushing into case so no shaft end play exists. Once unit is installed, tighten lock screw to 37 ft. lbs. (51 N.m) on 9 1/2" ring gear, or 27 ft. lbs. (37 N.m) on all others.

1997 Chevrolet S10 Pickup

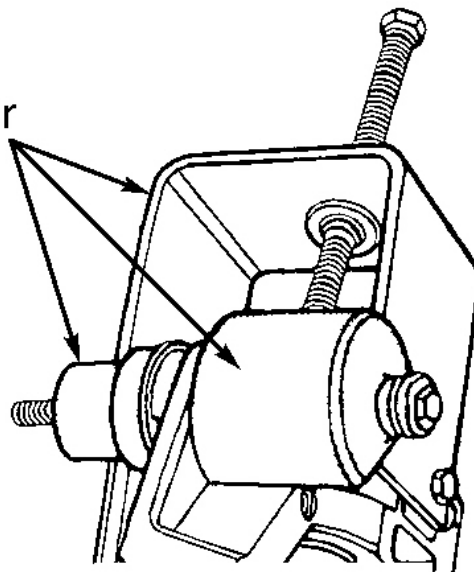
1996-97 DRIVE AXLES "T" Series Front Axle

Carrier Bushing
Remover/Installer



REMOVAL

Carrier Bushing
Remover/Installer



INSTALLATION

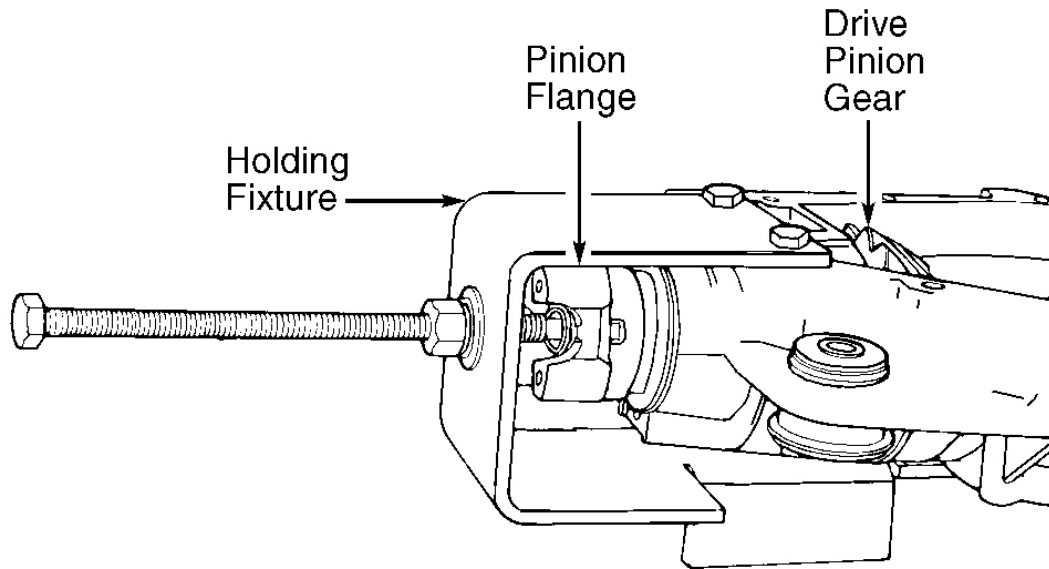
G92C22279

Fig. 2: Removing/Installing Carrier Case Bushing
Courtesy of GENERAL MOTORS CORP.

FRONT AXLE ASSEMBLY

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES "T" Series Front Axle



G95H27083

Fig. 7: Installing Pinion Holding Fixture Tool
Courtesy of GENERAL MOTORS CORP.

7. Remove pinion with attached shim, inner bearing and spacer as an assembly. Remove collapsible spacer from pinion. Using Differential Side/Pinion Bearing Remover (J-22912-01), press inner bearing from pinion. Remove shim(s) from pinion, keeping shims in order.
8. Install Bearing Race Remover (J-33837-6) on Holding Fixture (J-33837-1) and remove outer pinion bearing, race and pinion seal. Remove inner pinion bearing race by pushing it out of carrier with bearing race remover installed on Pinion Bearing Remover/Installer Set (J-33837). See **Fig. 8** .

1997 Chevrolet S10 Pickup

1998-99 DRIVE AXLES 7 5/8", 8 1/2", 8 5/8" & 9 1/2" Ring Gears

1998-99 DRIVE AXLES

7 5/8", 8 1/2", 8 5/8" & 9 1/2" Ring Gears

MODEL IDENTIFICATION

Vehicle model can be identified by fifth character of Vehicle Identification Number (VIN), stamped on metal pad on top of left end of instrument panel, near windshield. See **MODEL IDENTIFICATION** table.

MODEL IDENTIFICATION

Series ⁽¹⁾	Model
"C"	2WD Pickup, Sierra, Silverado, Suburban, Tahoe & Yukon
"G"	Express, G-Van & Savana
"K"	4WD Pickup, Sierra, Silverado, Suburban, Tahoe & Yukon
"L"	AWD Astro & Safari
"M"	2WD Astro & Safari
"S"	2WD Blazer, Jimmy, Pickup & Sonoma
"T"	AWD Bravada, 4WD Blazer, Envoy, Jimmy, Pickup & Sonoma

(1) Fifth character of VIN.

DESCRIPTION

NOTE: 8 1/2" ring gear differential is also used as front drive axle on K2 models. K2 models may also be equipped with a Dana front drive axle. Some models are equipped with a locking differential. For testing and overhaul procedures, see **DIFFERENTIALS - EATON LOCKING** article.

Drive axle assembly is hypoid gear type with integral carrier housing. This type assembly is used on light-duty emission vehicles with semi-floating axles. Differential side bearing preload adjustment and drive pinion depth adjustment are made by using shims. Pinion bearing preload is made with a collapsible spacer. A removable differential cover permits inspection and minor servicing of differential without removing axle assembly from vehicle.

AXLE RATIO & IDENTIFICATION

Rear axle identification is stamped on forward side of axle tube. The first 3 digits indicate rear axle ratio, the next digit indicates axle assembly build source code and the next 3 digits indicate the day built.

LUBRICATION

Fill differential with appropriate amount of 80W or 80W-90 GL-5 gear lubricant. See **LUBRICATION SPECIFICATIONS** table. On models with limited-slip or locking differential, add 4 ozs (.12 L) of limited slip additive.

1997 Chevrolet S10 Pickup

1998-99 DRIVE AXLES 7 5/8", 8 1/2", 8 5/8" & 9 1/2" Ring Gears

1. Side bearing preload and backlash adjustment are adjusted by varying thickness of both left and right side bearing shims. Side bearings must be previously installed to differential case. Lubricate side bearings and install races.
2. Place differential case assembly into position in housing. Position ring gear tightly against pinion so backlash is .000-.001" (0-.025 mm). Hold assembly in place by hand temporarily. Install Bearing Strap (J-22799-6) to left side bearing race.
3. Install Side Bearing Backlash Gauge (J-22779) between left side bearing race and carrier housing. See **Fig. 6** . While moving gauge up and down, tighten gauge adjusting nut until a slight drag is felt. Tighten lock bolt on side of gauge, and leave gauge in position.

1997 Chevrolet S10 Pickup

ENGINE COOLING Drive Belt Routing - Trucks

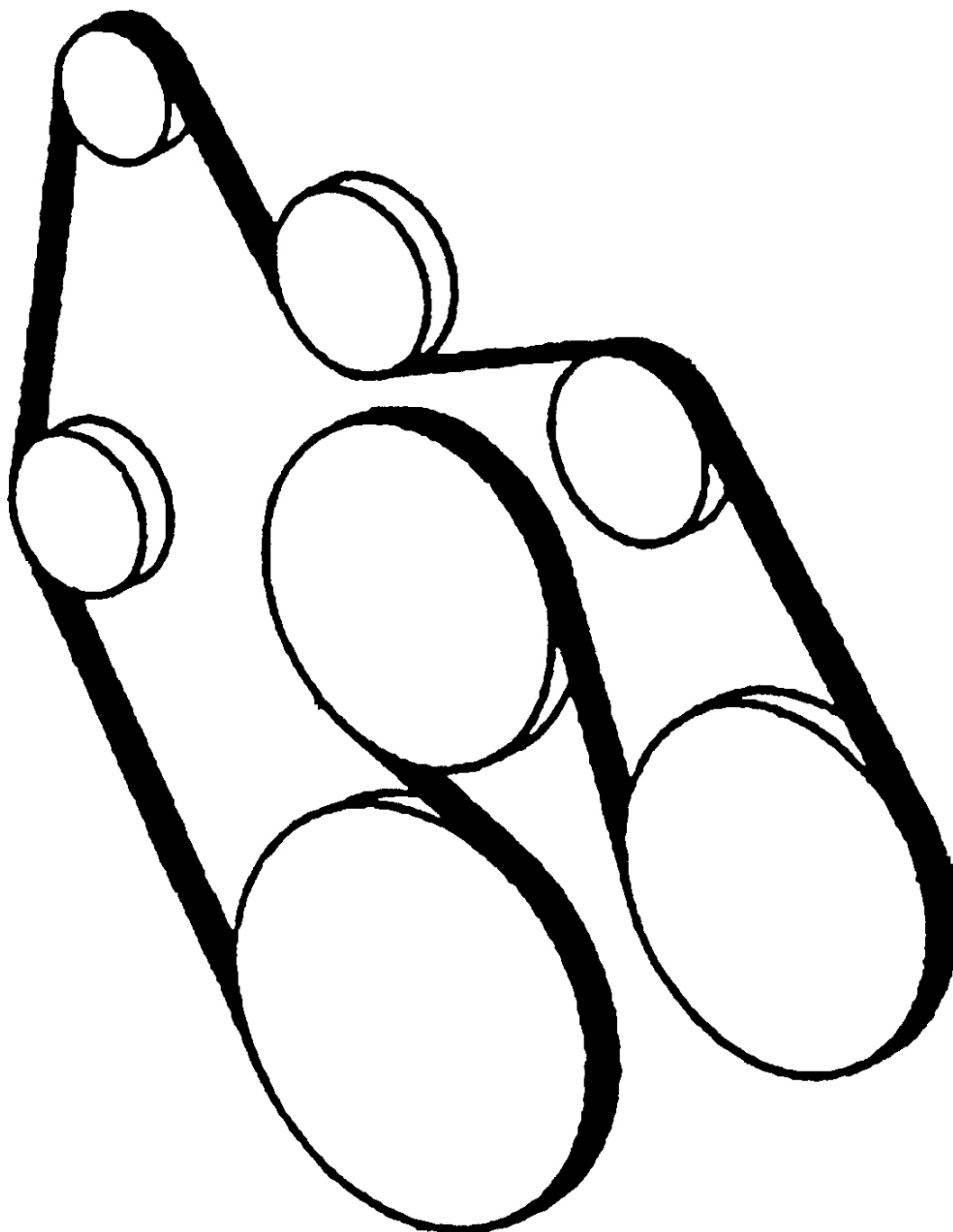


Fig. 4: Drive Belt Routing - 2.2L (Without A/C, With Manual Steering)
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES Drive Shafts & Universal Joints - Trucks

1996-97 DRIVE AXLES

Drive Shafts & Universal Joints - Trucks

MODEL IDENTIFICATION

Vehicle model can be identified by fifth character of Vehicle Identification Number (VIN), stamped on metal pad on top of left end of instrument panel, near windshield. See **MODEL IDENTIFICATION** table.

MODEL IDENTIFICATION

Series ⁽¹⁾	Model
"C"	2WD Pickup, Sierra, Suburban, Tahoe & Yukon
"G"	⁽²⁾ RWD Van
"K"	4WD Pickup, Sierra, Suburban, Tahoe & Yukon
"L"	AWD Astro & Safari
"M"	2WD Astro & Safari
"P"	Commercial Van & Motorhome
"S"	2WD Blazer, Jimmy, Pickup & Sonoma
"T"	4WD Blazer, Jimmy, Pickup & Sonoma
"T"	AWD Bravada

(1) Fifth character of VIN.

(2) Includes Express, G-Van and Savana.

DESCRIPTION

CONSTANT VELOCITY JOINTS

Constant Velocity (CV) joints are used on AWD "L" and "T" series and 4WD Tracker, "K" and "T" series vehicles. These joints are located at axle end of drive shaft. A cage contains 6 balls inside CV joint. See appropriate FRONT AXLE article.

DRIVE SHAFTS

Drive shafts may have one shaft, 2 shafts with a center bearing, or 3 shafts with slip joints. Three shafts are used on 4WD vehicles. Location of slip joints vary with model application. See **Fig. 1**.

1997 Chevrolet S10 Pickup

1996-97 DRIVE AXLES Drive Shafts & Universal Joints - Trucks

Suburban	.015	.010	.015
"P" Series	.015	.010	.015

- (1) Measured on ground surface near spine, with drive shaft removed.
- (2) Measured with rear shaft connected to front shaft. Runout of front drive shaft must be within specification.
- (3) Measured at tapered hole in end of splined shaft, with rear drive shaft removed.
- (4) Measured with front drive shaft disconnected. Runout of front drive shaft must be within specification.

UNIVERSAL JOINT MAINTENANCE

Lubrication

1. Whenever drive shaft is removed or slip yoke sticks in extension housing seal, clean yoke with solvent. Lubricate inside diameter of seal with synthetic oil seal lubricant and outside diameter of seal with transmission fluid.
2. Ball socket on double cardan joint requires periodic lubrication through provided fitting. Special Lubricant (1050679) is recommended by manufacturer. If lubrication fitting cannot be seen from beneath vehicle, double cardan joint may be lubricated from above using Adapter (J-25512-2) attached to end of a flex hose. See **Fig. 9**.

1997 Chevrolet S10 Pickup

1997 GENERAL MOTORS Blazer, Bravada, Jimmy, S10 Pickup & Sonoma

	sun roof module.
C317 (Black, 2 Pin)	Body harness to left front seat belt switch & power seats, under left front seat.
C401 (Black, 4 Pin)	Chassis to taillight harness, near G402.
C402 (Black, 4 Pin)	Body harness to taillight harness, at left rear of vehicle.
C403 (Black, 4 pin)	Body harness to taillight harness, to right rear of vehicle.
C410 (Black, 4 Pin)	Body harness to tailgate harness, center rear of body, at tailgate.
C415 (Black, 6 Pin)	Body harness to tailgate harness, center rear of body, at tailgate.
C425 (Black, 3 Pin)	Body harness to tailgate harness, center rear of body, at tailgate.
C426 (Black, 8 Pin)	Body harness to left liftgate harness.
C427 (Black, 1 Pin)	Body harness to left liftgate harness.
C428 (Black, 8 Pin)	Body harness to right liftgate harness.
C429 (Black, 1 Pin)	Body harness to right liftgate harness.
C430 (Black, 2 Pin)	Chassis harness to license light harness, inside rear crossmember, in front of license plate.
C432 (Black, 1 Pin)	Body harness to rear defogger grid.
C433 (Gray, 1 Pin)	Body harness to rear defogger grid.
C500 (Black, 13 Pin)	Crossbody harness to left front door harness, in left front door.
C501 (Black, 16 Pin)	Crossbody harness to left front door harness, in left front door.
C601 (Black, 16 Pin)	Crossbody harness to right front door harness, in right front door.

GROUNDS

GROUNDS

Component	Component Location
G100	Lower right front of engine block.
G101 (2.2L VIN 4)	Lower right radiator support.
G101 (4.3L VIN W)	Left rear of engine compartment, left side of A/C compressor relay.
G101 (4.3L VIN X)	Left rear of engine compartment, left side of A/C compressor relay.
G102 (2.2L VIN 4)	Left side of engine, below exhaust manifold.
G102 (4.3L VIN W)	Rear of right cylinder head.
G102 (4.3L VIN X)	Rear of right cylinder head.

1997 Chevrolet S10 Pickup

1996-97 SUSPENSION Front - 2WD Coil Spring - "S" Series Trucks

SPECIFICATIONS table.

STABILIZER BAR

Removal

Raise and support vehicle. Remove wheel and tire assembly. Remove stabilizer bar-to-frame retaining bolts and clamps. See **Fig. 1** . Disconnect stabilizer bar from frame. Remove stabilizer bar-to-lower control arm retaining bolt, nut and washers. Disconnect stabilizer bar from lower control arm, and remove rubber grommets and bushing assembly. Remove stabilizer bar and bushings from vehicle. Check all rubber bushings for excessive wear, deterioration or damage. Replace as necessary.

Installation

To install, reverse removal procedure. Bushings should be installed with slit area toward front of vehicle. Apply rubber lubricant to bushings to aid in installation. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** table.

COIL SPRINGS

Removal

1. Raise and support vehicle with jackstand under frame, with control arms hanging free. Remove wheel and tire assembly. Remove shock absorber. See **SHOCK ABSORBERS** .

WARNING: Securely bolt Spring Remover (J-23028-01) to floor jack, and install safety chain through lower control arm and coil spring to prevent personal injury.

2. Install Spring Remover (J-23028-01) on floor jack. Position assembly under lower control arm so bushings seat in grooves of spring remover.
3. Remove stabilizer bar-to-lower control arm retaining bolt, nut and washers. Disconnect stabilizer bar from lower control arm, and remove rubber grommets and bushing assembly. Raise floor jack to release spring tension on lower control arm pivot bolts. Install safety chain around coil spring and through lower control arm.

CAUTION: DO NOT apply force on lower control arm and ball joint to remove coil spring. Coil spring can easily be removed by maneuvering spring.

4. Remove lower control arm pivot bolts and nuts (rear bolt and nut first). Carefully lower floor jack until all tension is released from coil spring. Remove safety chain and coil spring from vehicle.

Installation

NOTE: Coil spring must be positioned with tape at lowest position. Bottom of

1997 Chevrolet S10 Pickup

1996-97 SUSPENSION Front 4WD - "T" Series Trucks

1996-97 SUSPENSION

Front 4WD - "T" Series Trucks

DESCRIPTION

Independent front suspension consists of upper and lower control arms with steering knuckle mounted between ball joints. See **Fig. 1**. Shock absorbers fit between lower control arm and frame. A stabilizer bar is mounted to frame side rails and connected to lower control arms.

Torsion bars are used in place of coil springs. Front of torsion bar attaches to lower control arm. Rear of torsion bar attaches to adjustable arm at torsion bar support crossmember. Adjustments to trim height are made here.

1997 Chevrolet S10 Pickup

1996-97 SUSPENSION Front 4WD - "T" Series Trucks

Control Arm Bushing Service Set (J-33793). See **Fig. 5**.

3. Install NEW bushings into upper control arm using Nut (J-21474-18), Bolt (J-21474-19), washer, bearing and Control Arm Bushing Service Set (J-33793). See **Fig. 5**.
4. Ensure bushings are properly seated in upper control arm. Install upper control arm. See **UPPER CONTROL ARM**.

1997 Chevrolet S10 Pickup

HEATER SYSTEM 1997 A/C-HEATER SYSTEMS General Motors Corp. - Heater System

BI-LEV Mode

Air is directed to instrument panel and floor outlets. A slight amount of air is directed to defroster and side window defogger outlets.

HEAT Mode

Air is diverted to floor outlets to heat passenger compartment. A slight amount of air is directed to windshield and side window defogger outlets.

BLEND Mode

Air is divided between instrument panel and floor outlets, with a slight amount of air going to defroster outlets.

DEF Mode

Air is directed to windshield defroster outlets. A slight amount of air is diverted to floor outlets and side window defogger outlets.

ADJUSTMENTS

NOTE: Information on temperature control cable adjustment not available at time of publication

TROUBLE SHOOTING

NOTE: For Heater System trouble shooting information, see the HEATER SYSTEM TROUBLE SHOOTING article. For front (and rear) blower motor trouble shooting information, see the A/C-HEATER SYSTEM - MANUAL article.

TEMPERATURE DOOR MALFUNCTIONING

1. Turn ignition on. Using DVOM, backprobe terminal "B" (Light Blue wire) of heater control module connector C2 to ground. Move temperature control knob from HOT setting to COLD setting, and then from COLD setting to HOT setting. If voltage varies between approximately 1-12 volts, go to step 3).
2. If voltage does not vary as indicated, check for poor connection at heater control module connector C2 (terminal "B") or short to ground/voltage in Light Blue wire. Also check for open Brown wire between heater control module connector C2 and fuse block. If connection and wires are okay, replace heater control module.
3. Using DVOM, backprobe temperature door motor terminal No. 10 (Brown wire) to ground. If battery voltage exists, go to next step. If voltage does not exist, repair open Brown wire between temperature door motor and fuse block.
4. Using DVOM, backprobe between temperature door motor terminal No. 7 (Black/White wire) and terminal No. 10 (Brown wire). If battery voltage exists, go to next step. If voltage does not exist, repair open Black/White wire.

1997 Chevrolet S10 Pickup

1997 AIR CONDITIONING & HEAT Manual A/C

1. Turn ignition switch to RUN position. Place mode selector in VENT position. Place blower switch in LO position. Connect test light from Purple wire at blower motor relay connector to ground. If test light does not glow, go to next step. If test light glows, check for poor connection at blower motor and relay connectors. If connections are okay, check for open Purple wire or Black wire between blower motor relay connector and blower motor connector. If wires are okay, replace blower motor.
2. Disconnect blower motor relay connector. Connect test light from Dark Blue wire at blower motor relay connector to ground. If test light does not glow, go to next step. If test light glows, check for poor connection at blower motor relay connector. If connection is okay, replace blower motor relay.
3. Connect test light from Brown wire (mode selector control to fuse block wire) at mode selector control to ground. If test light does not glow, repair open Brown wire between mode selector control and fuse block. If test light glows, check for poor connections at blower motor relay connector and mode selector control connector. If connections are okay, replace control panel.

BLOWER MOTOR DOES NOT OPERATE IN HIGH SPEED

1. Turn ignition switch to RUN position. Place mode selector in VENT position. Place blower switch in HIGH position. Connect test light from Orange wire at blower motor relay connector to ground. If test light glows, go to next step. If test light does not glow, check for poor connection at blower switch connector of control panel. If connection is okay, replace control panel.
2. Connect test light from Red wire at blower motor relay connector to ground. If test light does not glow, repair open Red wire between blower motor relay connector and battery junction block. If test light glows, check for poor connection at blower motor relay connector or open Black wire between blower motor relay connector and ground. If connection and wire are okay, replace blower motor relay.

BLOWER MOTOR DOES NOT OPERATE IN MEDIUM SPEEDS

1. Turn ignition switch to RUN position. Place mode selector in VENT position. Place blower switch in medium-low (M1) position. Connect test light from Tan wire at blower motor resistor connector to ground. If test light glows, go to next step. If test light does not glow, check for poor connection at blower switch connector of control panel or open Tan wire. If connection and wire are okay, replace control panel.
2. Place blower switch in medium-high (M2) position. Connect test light from Light Blue wire at blower motor resistor connector to ground. If test light does not glow, check for poor connection at blower switch connector or open Light Blue wire. If connection and wire are okay, replace blower switch. If test light glows, check for poor connection at blower motor resistor connector. If connection is okay, replace blower motor resistor.

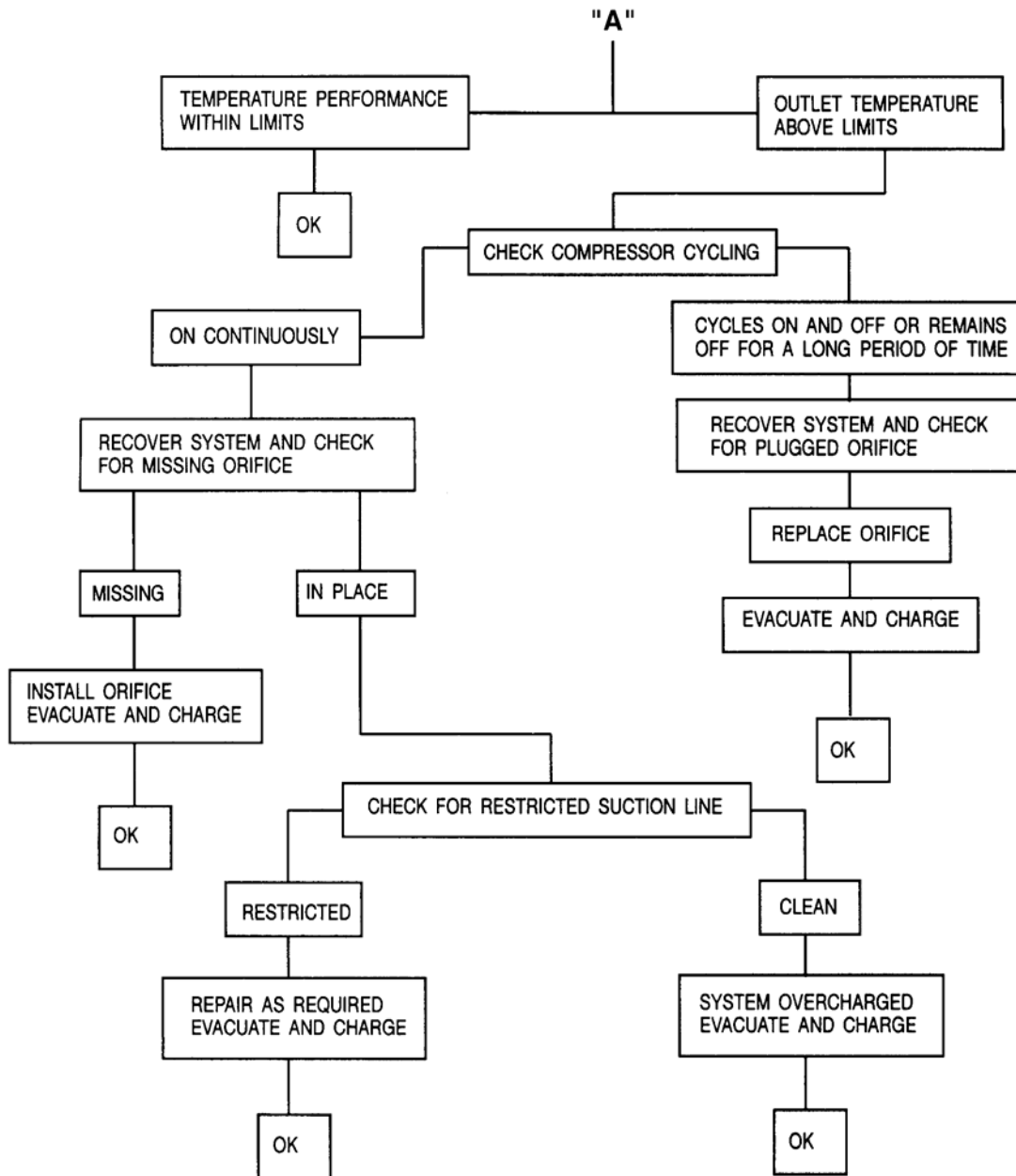
BLOWER MOTOR DOES NOT OPERATE IN LOW SPEED

Turn ignition switch to RUN position. Place mode selector in VENT position. Place blower switch in LO position. Disconnect blower motor resistor. Connect test light from Brown wire at blower motor resistor connector to ground. If test light does not glow, check Brown wire for high resistance or open. If wire is okay, replace control panel. If test light glows, check for poor connections at blower motor resistor. If connections are okay, replace blower motor resistor.

BLOWER MOTOR OPERATES IN HIGH SPEED ONLY

1997 Chevrolet S10 Pickup

A/C-HEATER SYSTEM TROUBLE SHOOTING - MANUAL 1997 A/C-HEATER SYSTEMS General Motors - Manual
A/C-Heater System Trouble Shooting



95A60285

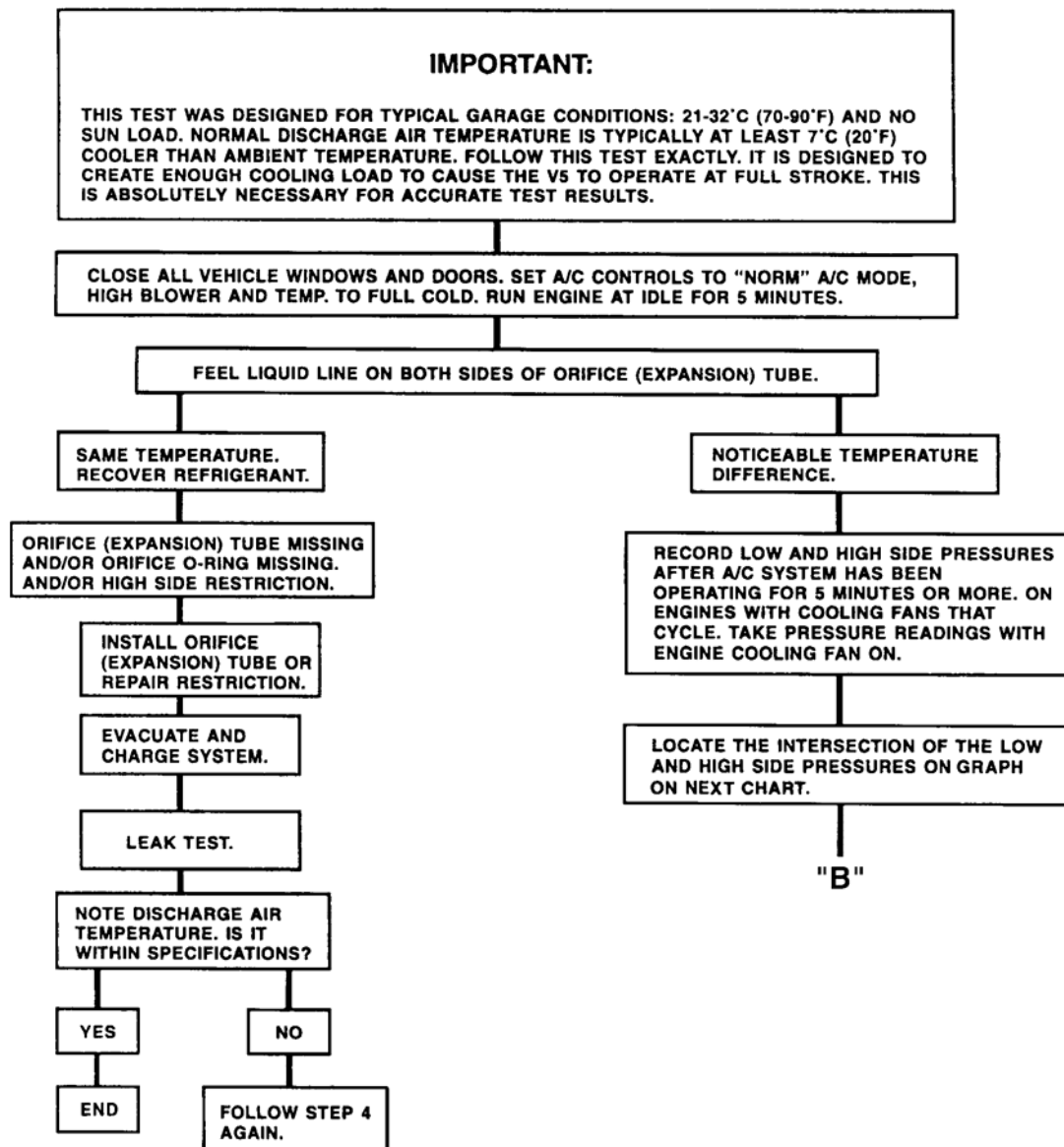
Fig. 5: Insufficient Cooling Chart "E" (CCOT)

Courtesy of GENERAL MOTORS CORP.

CHECKING REFRIGERANT CHARGE - STEP 2 - (V5/TXV)

1997 Chevrolet S10 Pickup

A/C-HEATER SYSTEM TROUBLE SHOOTING - MANUAL 1997 A/C-HEATER SYSTEMS General Motors - Manual
A/C-Heater System Trouble Shooting



95160077

Fig. 15: Checking Performance - Step 4 (V5/VDOT - 1 Of 2)
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1997 ACCESSORIES/SAFETY EQUIP Analog Instrument Panels - General Motors Corp.

Inspect CHECK GAUGES bulb and replace if faulty. If bulb is okay, replace instrument cluster.

OIL PRESSURE GAUGE

NOTE: If procedure specifies replacing oil pressure sending unit, replace with revised sending unit. Some older version sending units may cause gauge to indicate oil pressure higher than actual pressure, or may cause gauge fluctuations. Check with manufacturer for latest part number.

Gauge Is Inaccurate

1. Disconnect oil pressure sending unit connector. Connect one Red wire lead of Instrument Panel Tester (J-33431) to Tan wire terminal of temperature sending unit connector, and connect other Red lead to ground. Turn ignition on.
2. Adjust tester dial to zero ohms, then 90 ohms. If gauge indicates LOW at zero ohms and HIGH at 90 ohms, replace sending unit. If gauge does not indicate as specified, check for open in Tan wire between sending unit and instrument cluster. If wire is okay, replace instrument cluster.

SPEEDOMETER & ODOMETER

NOTE: Speedometer and odometer testing for is not available from manufacturer.

TACHOMETER

Tachometer Inoperative

Connect Tech 1 scan tool to data link connector. Start engine. Read engine RPM from Tech 1 scan tool. If Tech 1 scan tool displays engine RPM, repair open or short to ground in White wire between ignition coil and instrument cluster terminal No. 8. See **Fig. 2**. If wire is okay, replace instrument cluster. If Tech 1 displays zero for engine RPM, repair open or short to ground in White wire. If wire is okay, replace ignition coil or Powertrain Control Module (PCM).

1997 Chevrolet S10 Pickup

MAINTENANCE INFORMATION 1994-99 MAINTENANCE General Motors Corp. Maintenance Information

SHORT TRIP/CITY & LONG TRIP/HIGHWAY SERVICE DEFINITIONS

NOTE: Starting in the 1996 model year, General Motors has renamed their maintenance schedules; One is referred to as the Short-Trip/City and the other is the Long Trip/Highway schedule. These schedule requirements are similar to the familiar Severe Service and Normal schedules and can be used in place of one another.

SEVERE & NORMAL SERVICE DEFINITIONS

NOTE: Use the Severe Service schedule if the vehicle to be serviced is operated under ANY (one or more) of these conditions:

Service is recommended at mileage intervals based on vehicle operation, emission classification, and Gross Vehicle Weight Rating (GVWR, VIN Position 4). Emission classification is identified by engine VIN code (except diesel-powered vehicles). Manufacturer's Schedules identify items to be serviced based on type of operation. Service schedules are based on the following primary operating conditions:

Severe Service

- Short Trips (4 Miles Or Less)
- Freezing Temperatures
- Towing Or Heavily Loaded
- Severe Dust Conditions
- Hot Weather, Stop-And-Go Driving
- Extensive Idling Conditions (Taxi Or Delivery Type Service)

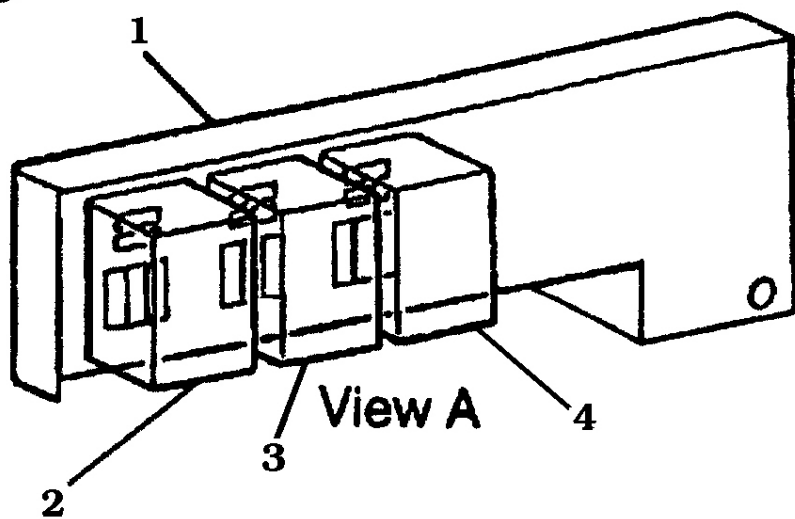
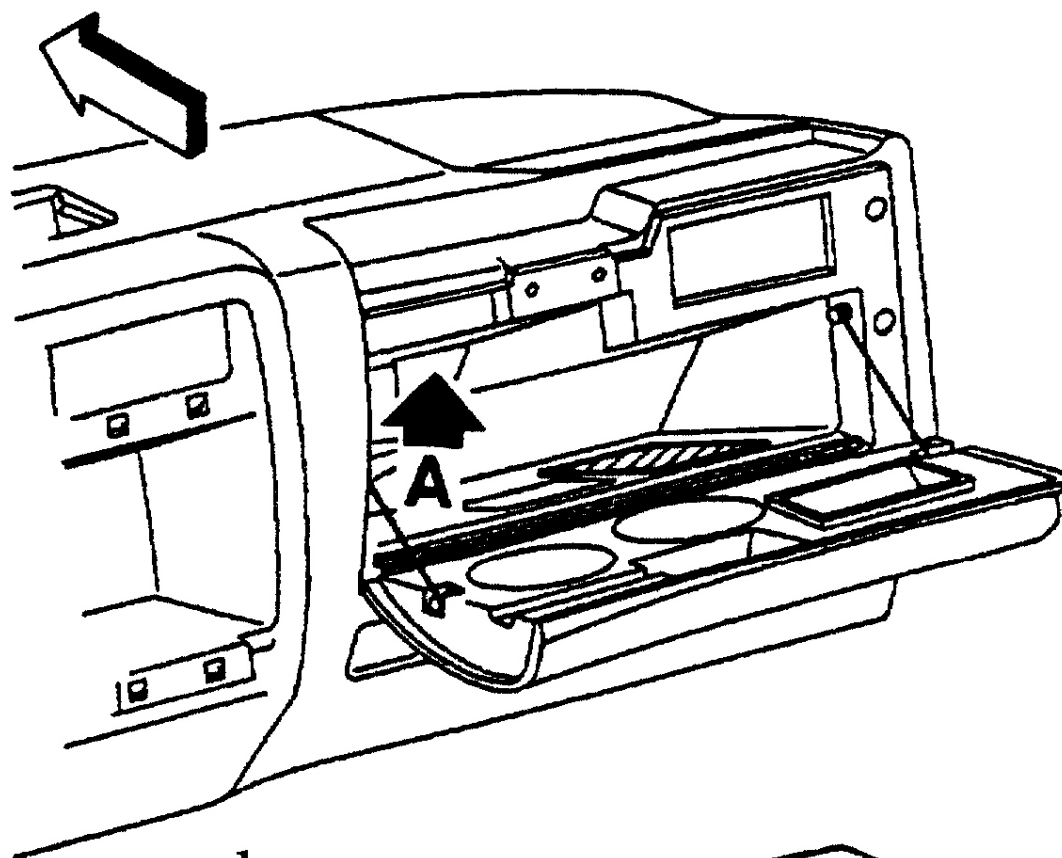
Normal Service

- No Severe Service Operating Conditions

SERVICE POINT LOCATIONS

1997 Chevrolet S10 Pickup

MAINTENANCE INFORMATION 1994-99 MAINTENANCE General Motors Corp. Maintenance Information



1 RELAY CENTER

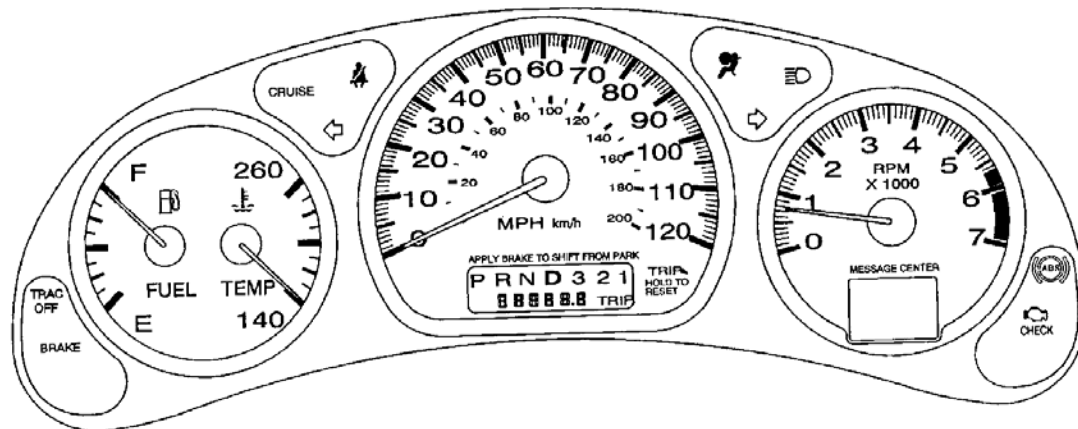
2. Fuel Pump Relay

3. Horn Relay

4. Fuel Injector Relay

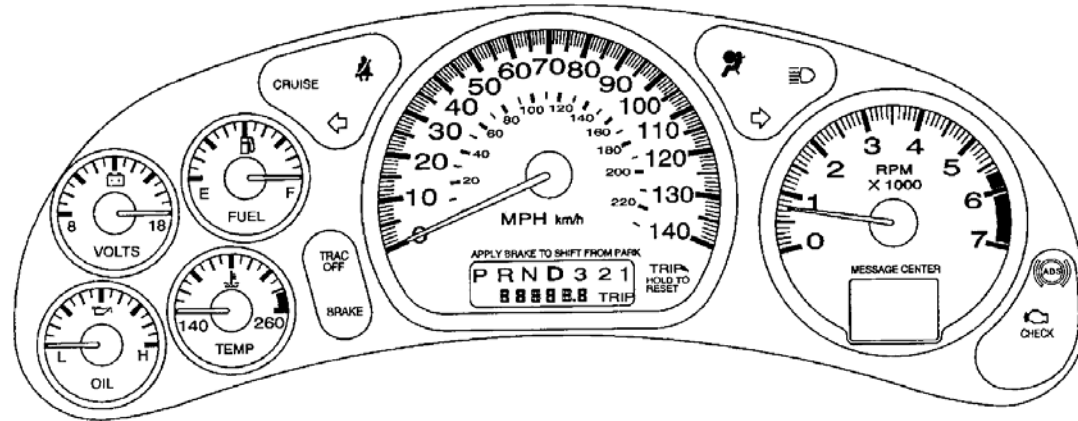
1997 Chevrolet S10 Pickup

GENERAL INFORMATION Service Reminder Indicators - Chevrolet



G00275764

Fig. 3: Identifying Instrument Cluster (Impala V6)
Courtesy of GENERAL MOTORS CORP.



G00275766

Fig. 4: Identifying Instrument Cluster (Monte Carlo V6)
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

GENERAL INFORMATION Service Reminder Indicators - Chevrolet

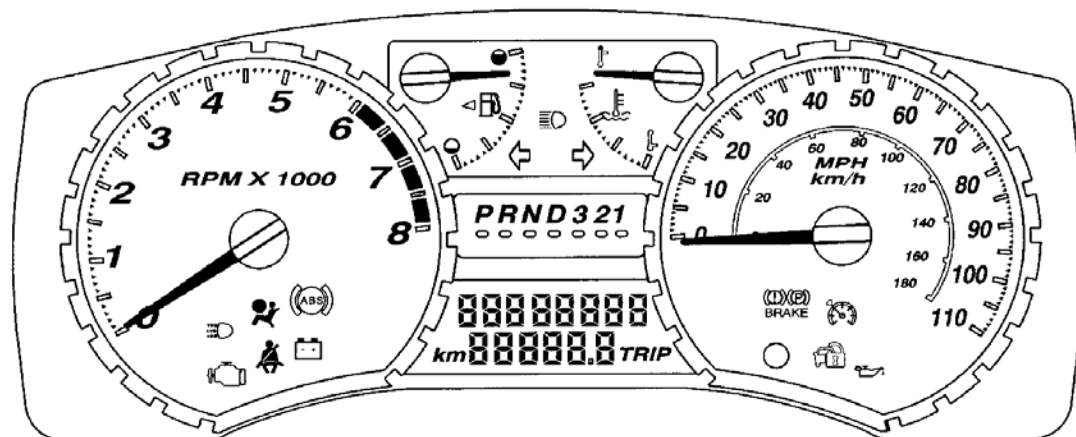


Fig. 12: Identifying Instrument Cluster (2004 Colorado)
Courtesy of GENERAL MOTORS CORP.

2004 SSR

This vehicle has an engine oil life monitor. See **Fig. 13**. The GM Oil Life System™ will show when to change engine oil and oil filter. This will usually occur between 3000 miles and 7500 miles since the last oil change. Under severe conditions, the indicator may come on before 3000 miles.

Vehicle should not be driven more than 7500 miles or 12 months without an oil and oil filter change. The system will not detect dust in the oil. So if the vehicle is driven in a dusty area, be sure to change the oil and oil filter every 3000 miles or sooner if the CHANGE OIL SOON indicator comes on. Reset the system when the oil has been changed.

1. Turn ignition to ON without starting the engine.
2. Fully push and release accelerator pedal slowly 3 times within 5 seconds.
3. If CHANGE ENG OIL light flashes for 5 seconds, the system is reset. If light does not flash, repeat the procedure.

1997 Chevrolet S10 Pickup

GENERAL INFORMATION Service Reminder Indicators - Chevrolet

7. After horn chirp sounds, proceed as in step 6 for the next 3 sensors in the following order of right front, right rear and left rear.
8. Turn ignition OFF to exit learn mode.

2004 AVALANCHE, SUBURBAN & TAHOE

NOTE: If the wheels have been rotated, or tire pressure sensor or RCDLR is replaced, the TPM system needs to relearn tire pressure sensor IDs. See TIRE PRESSURE SENSOR RELEARN in appropriate manufacturer service information.

2005-08 AVALANCHE, SILVERADO, SUBURBAN & TAHOE

NOTE: When the wheels have been rotated or a tire pressure sensor has been replaced, retrain tire pressure sensor.

1. Turn ignition switch to ON position, with engine off. Apply parking brake.

NOTE: If learn mode cannot be enabled, TPM system is not enabled in PDM/RCDLR. See appropriate manufacturer service information.

2. Turn headlight switch from OFF to parking lamps 4 times within 4 seconds. A double horn chirp will sound and the low tire pressure indicator will begin to flash to indicate the learn mode has been enabled (the low tire pressure indicator should continue flashing throughout the matching procedure, and "SERVICE TIRE MONITOR" message will be displayed on the DIC).

WARNING: Overinflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure, do not exceed the maximum inflation pressure as noted on the tire sidewall.

NOTE: If a horn chirp does not sound after 35 seconds for any of the 4 sensors, turn ignition switch to OFF position to exit the learn mode. Repeat procedure from step 1.

3. Starting with left front tire, increase or decrease the pressure for 8-10 seconds, or until a horn chirp sounds. Horn chirp may occur before the 8-10 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached.
4. After horn chirp has sounded, proceed as in step 3 for the next 3 sensors in the following order: right front, right rear and left rear.
5. After left rear sensor has been learned, check to see if the low tire pressure indicator is still flashing. If it is, turn ignition switch to OFF position to exit relearn procedure. Adjust all tire pressures to specification. If the low tire pressure indicator is not flashing, repeat procedure from step 1.
6. On some models, the DIC may list all 4 of the tire pressures at 0 psi after tire pressure sensor relearn procedure has been performed (although PDM/RCDLR reads correct learn value of the tires). To

1997 Chevrolet S10 Pickup

MANUAL TRANS OVERHAUL - NEW VENTURE 1500 (MW2) 1997 MANUAL TRANSMISSIONS New Venture 1500 (MW2) 5-Speed

Removal & Installation

Shift transmission into 3rd or 4th gear. Remove shift lever. When removing shift lever housing, remove 4 bolts at base of housing. See **Fig. 3** . DO NOT remove bolts under boot located at top of shift lever housing. DO NOT disassemble shift lever housing. If housing requires repair, replace complete assembly. Internal components are not available from manufacturer. When installing shift lever housing, ensure transmission is in 3rd or 4th gear.

REMOVAL & INSTALLATION

See **TRANSMISSION REMOVAL & INSTALLATION - M/T** article in MANUAL TRANS SERVICE section.

TRANSMISSION DISASSEMBLY

1. Remove 2 bolts securing idler shaft support and collar to rear housing. Remove back-up light switch and vehicle speed sensor. Remove shift rail block-out bushing bolt, located on top of front housing near breather assembly.
2. Using Detent Plug Remover (J-36509) and slide hammer, remove detent plug, spring and plunger from front housing. See **Fig. 2** . Remove output shaft oil seal. With transmission in vertical position, remove input shaft bearing retainer. Remove snap ring. Position transmission horizontally and remove 9 front housing-to-rear housing bolts. See **Fig. 3** .
3. Remove countershaft roller bearing from countershaft or bearing shell. Remove roll pin from shift lever. DO NOT lose plunger and spring. Support shift rail end while driving out shift lever roll pin. Using 3/16" (5 mm) punch and air gun, remove shift rail socket roll pin. DO NOT apply excessive force, or pin willpeen shift rail and damage rear housing shift rail bushing.
4. Remove shift rail, shift rail socket, shift lever and shift rail block-out bushing. See **Fig. 3** . Rotate 3rd-4th shift fork counterclockwise and remove shift fork.
5. Remove 5 bolts from center of rear housing securing output shaft bearing retainer. Remove rear housing from gear assemblies. Remove reverse idler gear and output shaft bearing retainer. Remove shift forks. Remove countershaft, countershaft bearing snap ring, and bearing. Press countershaft bearing off countershaft, if necessary. Remove output shaft assembly, input shaft and pilot bearing. See **Fig. 4** .

1997 Chevrolet S10 Pickup

1996-97 MANUAL TRANSMISSION SERVICING General Motors

TRANSMISSION RECOMMENDED FLUID

Application	Fluid Type
T5 5-Speed (77-mm)	Dexron-III ATF
NV 1500 5-Speed (85-mm)	(1) GM Synchronesh Fluid (9985648)
NV 3500 5-Speed (85-mm)	GM Synchronesh Fluid (12345349)
NV 4500 5-Speed (109-mm)	GM GL-4 Transmission Fluid (12345871)
(1) With 5 percent Friction Modifier (12380672)	

TRANSFER CASE RECOMMENDED FLUID

Application	Fluid Type
Transfer Cases	Dexron-III ATF

FLUID CAPACITY

NOTE: Capacities listed in the following chart are approximations only. Correct fluid level should be determined by level at filler plug hole rather than by amount added.

TRANSMISSION REFILL CAPACITIES

Application	Pts. (L)
T5 5-Speed (77-mm)	4.8 (2.4)
NV 1500 5-Speed (85-mm)	5.7 (2.7)
NV 3500 5-Speed (85-mm)	4.2 (2.0)
NV 4500 5-Speed (109-mm)	8.4 (4.0)

TRANSFER CASE REFILL CAPACITIES

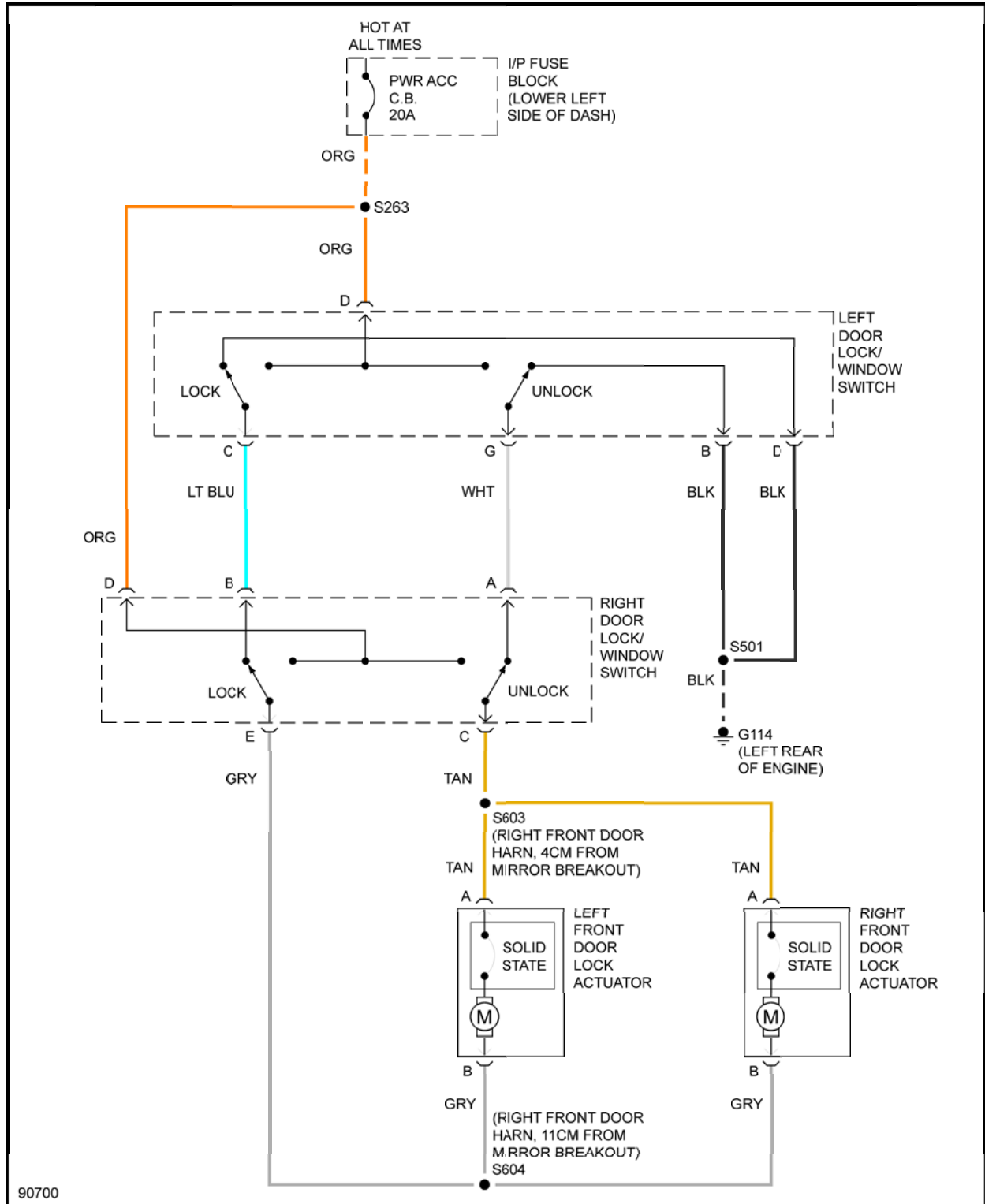
Application	Pts. (L)
Model 231 & 233	2.5 (1.2)
Model 241 & 243	4.6 (2.2)
Model 4401	2.9 (1.4)
Model 4470	6.6 (3.1)

ADJUSTMENTS

NOTE: Manual transmissions have no shift rods. Shift lever mounts directly to top of transmission and is not adjustable.

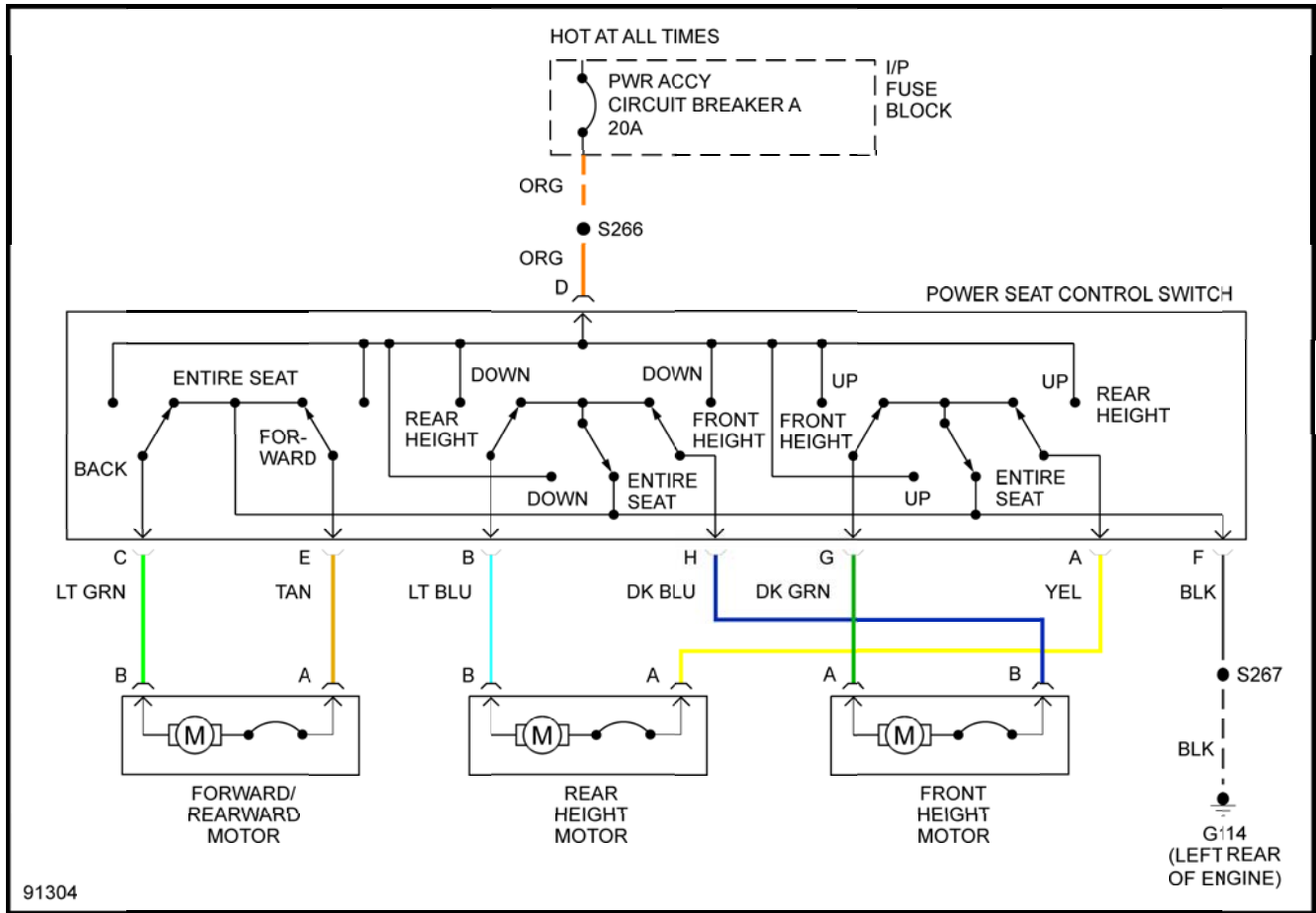
1997 Chevrolet S10 Pickup

DOOR LOCKS - POWER 1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Power Door Locks



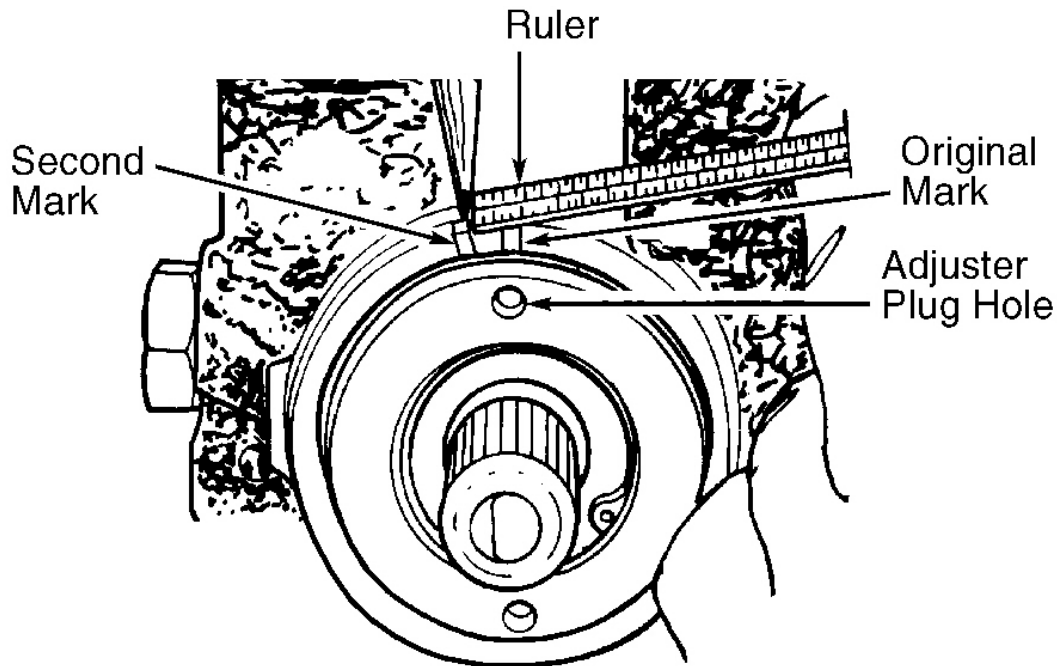
1997 Chevrolet S10 Pickup

SEATS - POWER 1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Power Seats



1997 Chevrolet S10 Pickup

STEERING SYSTEM - POWER RECIRCULATING BALL 1997 STEERING Power Recirculating Ball - General Motors Corp.



G95E27841

Fig. 4: Measuring Worm Bearing Preload
Courtesy of GENERAL MOTORS CORP.

OVER-CENTER PRELOAD

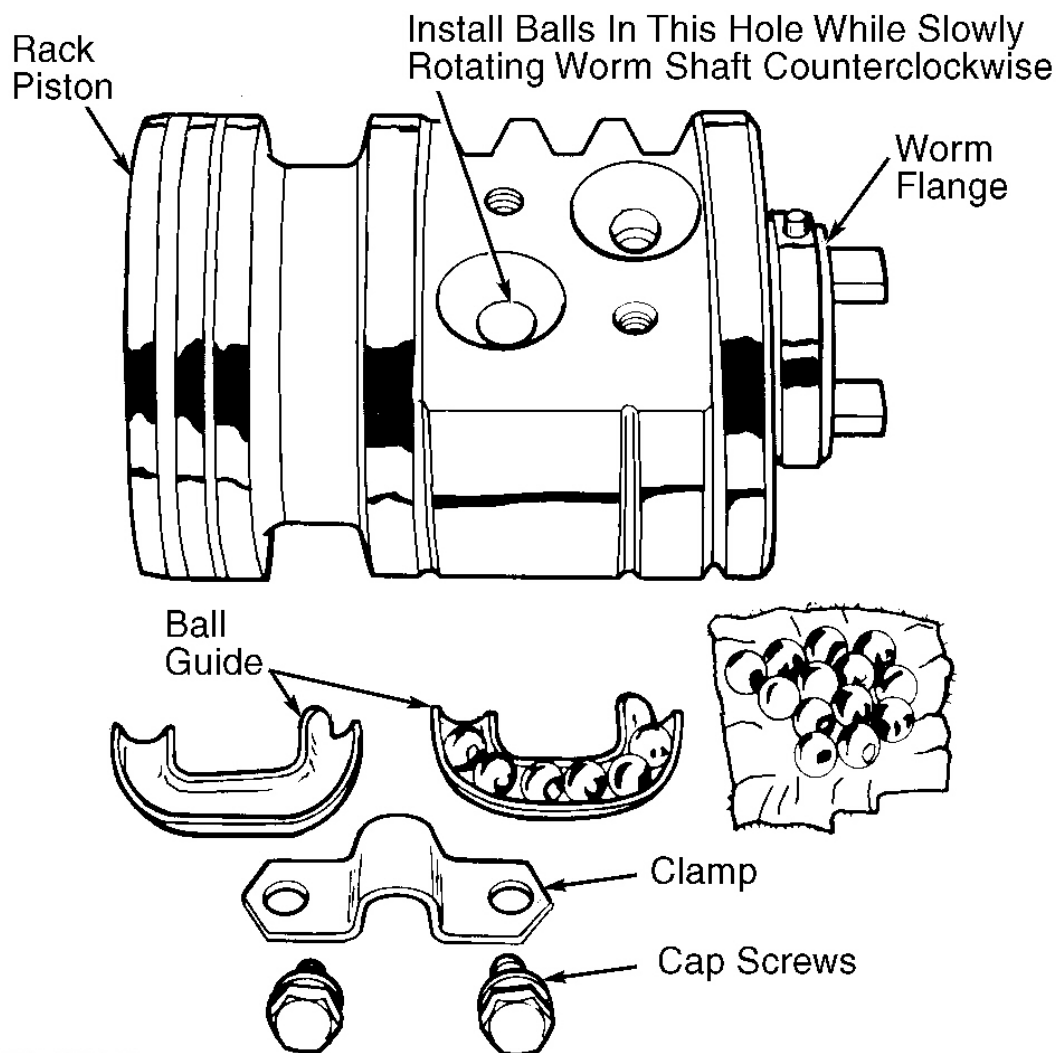
1. With worm bearing preload adjusted, rotate stub shaft slowly from stop to stop while counting total number of turns. With stub shaft positioned at either stop, rotate stub shaft back $\frac{2}{3}$ total number of turns counted. Stub shaft should be back to exact center position. Flat on stub shaft should be facing upward and parallel to side cover and master spline on pitman shaft should be aligned with adjuster screw.
2. Turn pitman shaft adjuster screw counterclockwise until extended, then back off one full turn. Place INCH-lb. torque wrench in vertical position on end of stub shaft. Measure gear over-center torque by rotating torque wrench attached to stub shaft in a 90 degree arc, 45 degrees on each side of center. See **Fig. 5**. Record highest degree of arc on each side of center. Record highest reading.
3. Turn adjuster screw in until torque required to rotate stub shaft is 6-10 INCH lbs. (.6-1.1 N.m) greater than reading in step 2). Continue adjustment until over-center reading is within specification. See **LASH ADJUSTMENT PRELOAD** table. Tighten adjuster screw lock nut when reading is obtained.

LASH ADJUSTMENT PRELOAD

Application	Over-Center INCH Lbs. (N.m)	⁽¹⁾ Total INCH Lbs. (N.m)
New Gears	6-10 (0.7-1.1)	18 (2.0)
Used Gears ⁽²⁾	4-5 (.5-.6)	14 (1.6)

1997 Chevrolet S10 Pickup

STEERING SYSTEM - POWER RECIRCULATING BALL 1997 STEERING Power Recirculating Ball - General Motors Corp.



G95127845

Fig. 8: Installing Ball Bearing Into Rack Piston
Courtesy of GENERAL MOTORS CORP.

POWER STEERING PUMP

Disassembly (Model "P")

1. Using Puller (J-29785-A), remove pulley from shaft if not previously removed. Remove union fitting and "O" ring. Remove reservoir retaining bolts. Remove reservoir and "O" rings from housing.
2. Using punch and screwdriver, remove end plate retaining ring. Remove end plate and pressure plate spring. See **Fig. 9**. Remove "O" ring, flow control valve, and spring. Using soft-faced hammer, tap end of drive shaft to loosen pressure plate.

POWER WINDOWS**1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Power Windows****DESCRIPTION & OPERATION**

A permanent-magnet motor operates each power window. Each motor raises and lowers window when voltage is supplied. Motor direction depends on polarity of supply voltage. Switches control supply voltage polarity.

Master door lock/power window switch assembly controls all motors. Individual window switches are located on each door panel. Each motor is protected by a built-in circuit breaker. If a window switch is held too long with window obstructed or after window is fully up or down, circuit breaker opens circuit. Circuit breaker resets automatically as it cools.

TROUBLE SHOOTING

Before proceeding to **TESTING**, perform the following visual inspections:

- Check POWER WINDOW CIRCUIT BREAKER for damage. Replace if damaged.
- Check power window voltage supply fuse. If fuse is blown, service and repair source of overload. Replace fuse.
- Check for mechanical failures or binding linkage.
- If express down feature does not work, but window moves down with each switch depression, replace left window switch.
- Check for broken or partially broken wire inside insulation, which could cause system malfunction but prove good in a continuity/voltage check with system disconnected. These circuits may be intermittent or resistive when loaded. Check by monitoring voltage drop with system under load.
- Check for proper installation of aftermarket electronic equipment.

TESTING

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

NOTE: Before any testing is attempted, battery should be fully charged and all connections and pins cleaned and tightened to ensure proper continuity and ground.

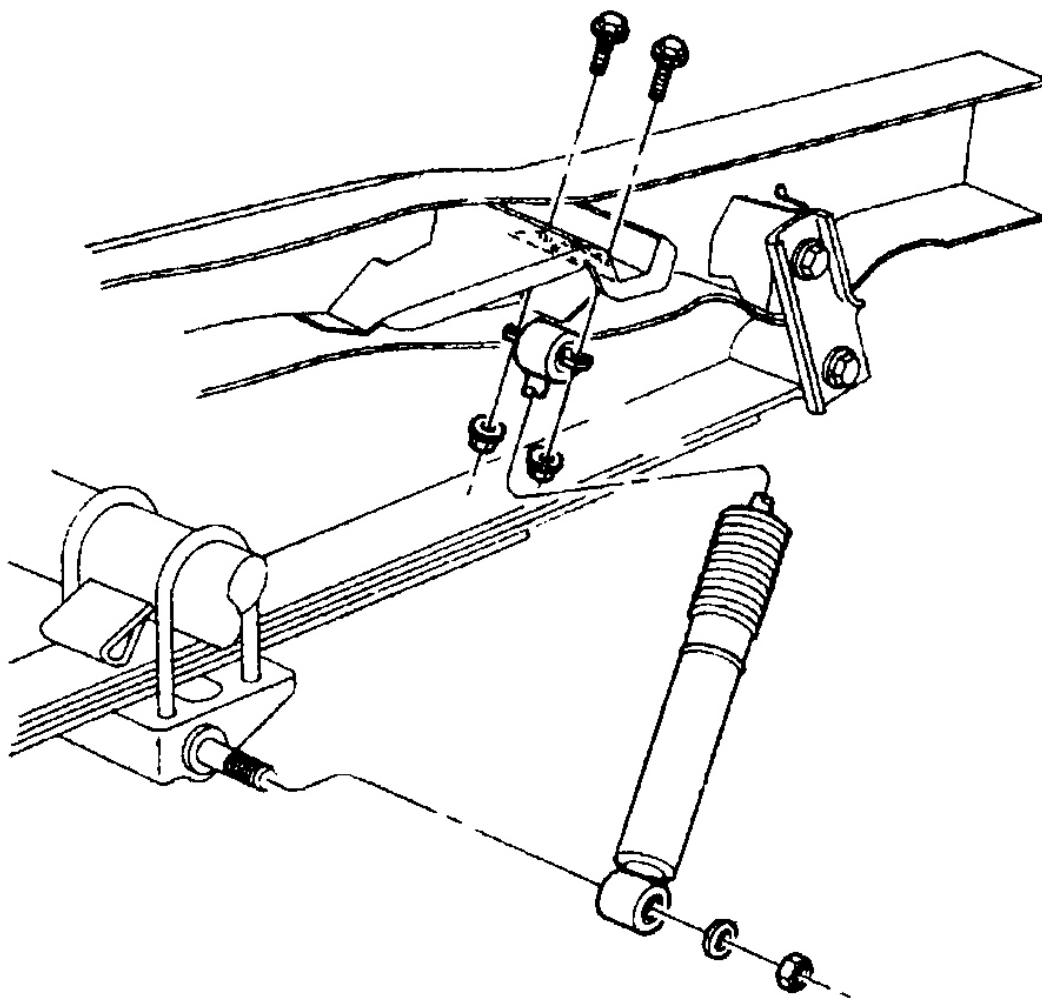
NOTE: See appropriate wiring diagram under **WIRING DIAGRAMS** to assist in testing procedures.

1997 Chevrolet S10 Pickup

1995-97 SUSPENSION Rear - Blazer, Bravada, S10 Pickup, Jimmy & Sonoma

Removal

1. Raise vehicle on a hoist.
2. Remove shock absorber to frame bracket nuts and bolts. See **Fig. 2**, **Fig. 3** or **Fig. 4**.
3. Remove shock absorber to anchor plate nut and washer.
4. Remove shock absorber from the vehicle.

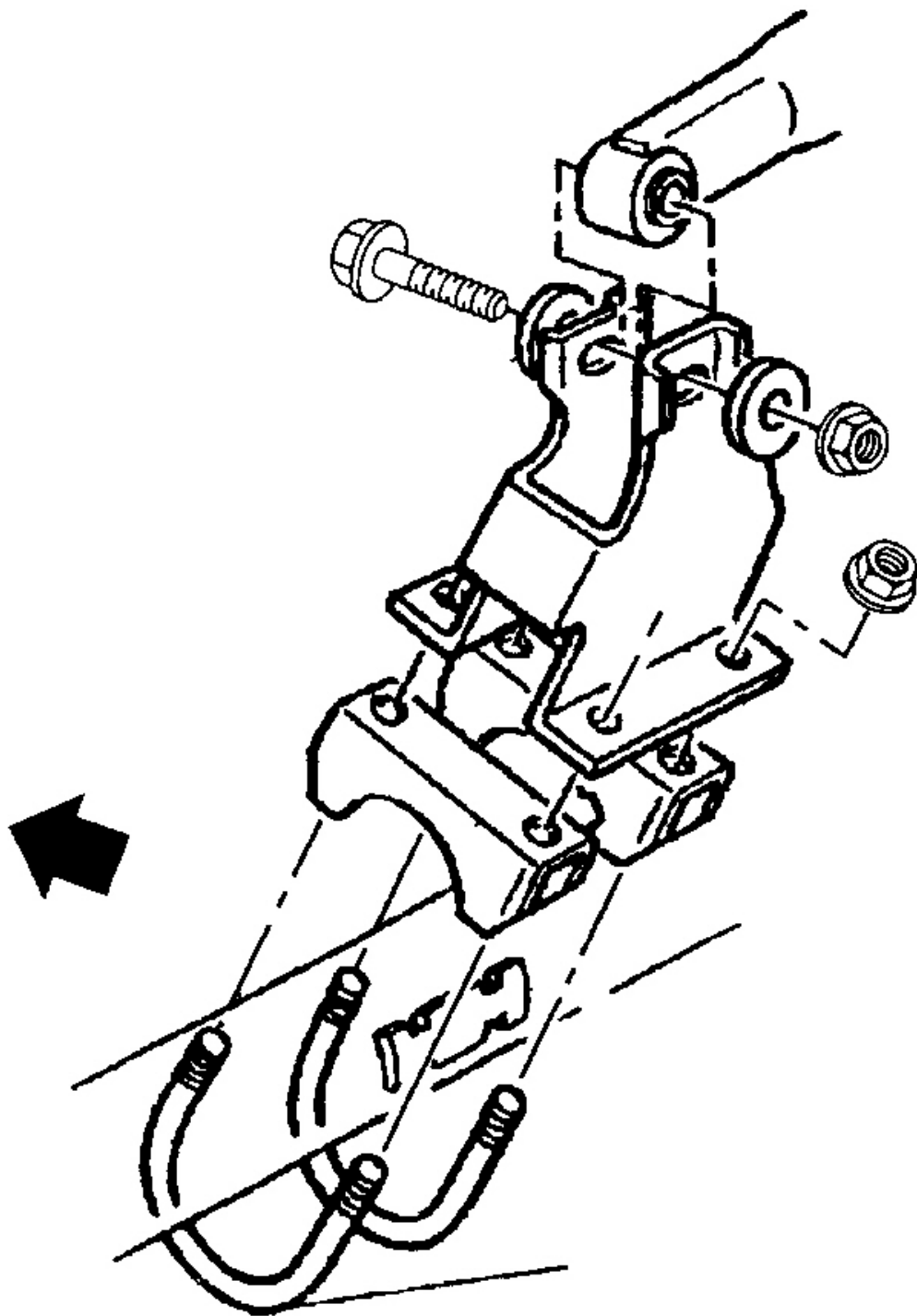


G00137962

Fig. 2: Removing Shock Absorber
Courtesy of GENERAL MOTORS CORP.

1997 Chevrolet S10 Pickup

1995-97 SUSPENSION Rear - Blazer, Bravada, S10 Pickup, Jimmy & Sonoma



G00137969

1997 Chevrolet S10 Pickup

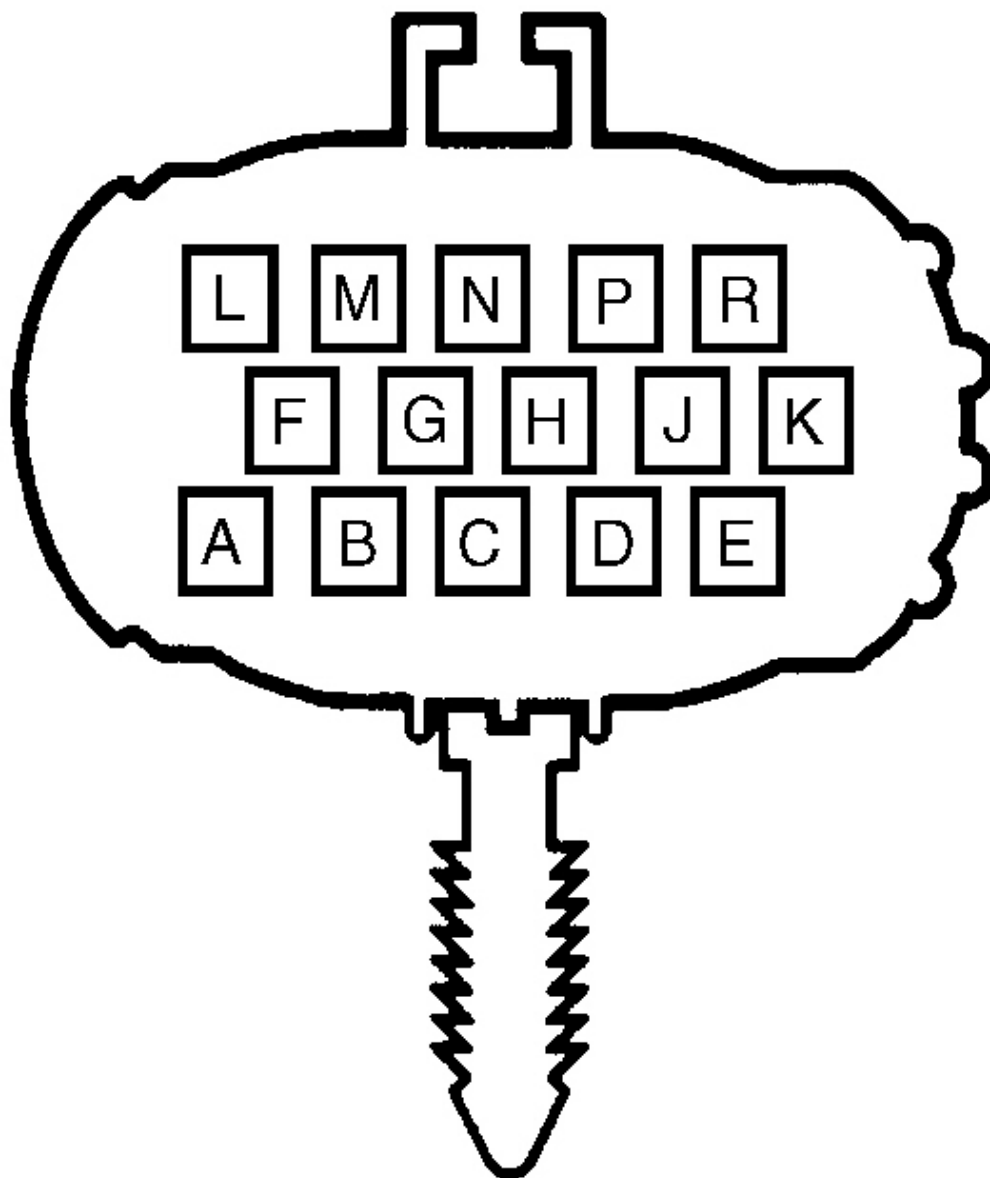
1995-97 SUSPENSION Rear - Blazer, Bravada, S10 Pickup, Jimmy & Sonoma

Application	Ft. Lbs. (N.m)
Lug (Wheel) Nuts	95 (130 N.m)
Shackle to Frame Nuts	92 (125 N.m)
Shackle to Spring Nuts	92 (125 N.m)
Shock Absorber Lower Nuts	47 (64 N.m)
Shock Absorber Upper Nuts	17 (23 N.m)
Spring to Front Bracket Nuts	92 (125 N.m)
Spring U-Bolt Nuts	85 (115 N.m)
Stabilizer Clamp U-Bolts Nuts	44 (60 N.m)
Stabilizer Bar to Link Nut (2 Door Utility)	15 (20 N.m)
Stabilizer Bar to Link Nut (4 Door Utility)	50 (68 N.m)
Track Bar Axle Mount Nut	44 (60 N.m)
Track Bar Frame Mount Bolt	44 (60 N.m)

TORQUE SPECIFICATIONS (1996-97)

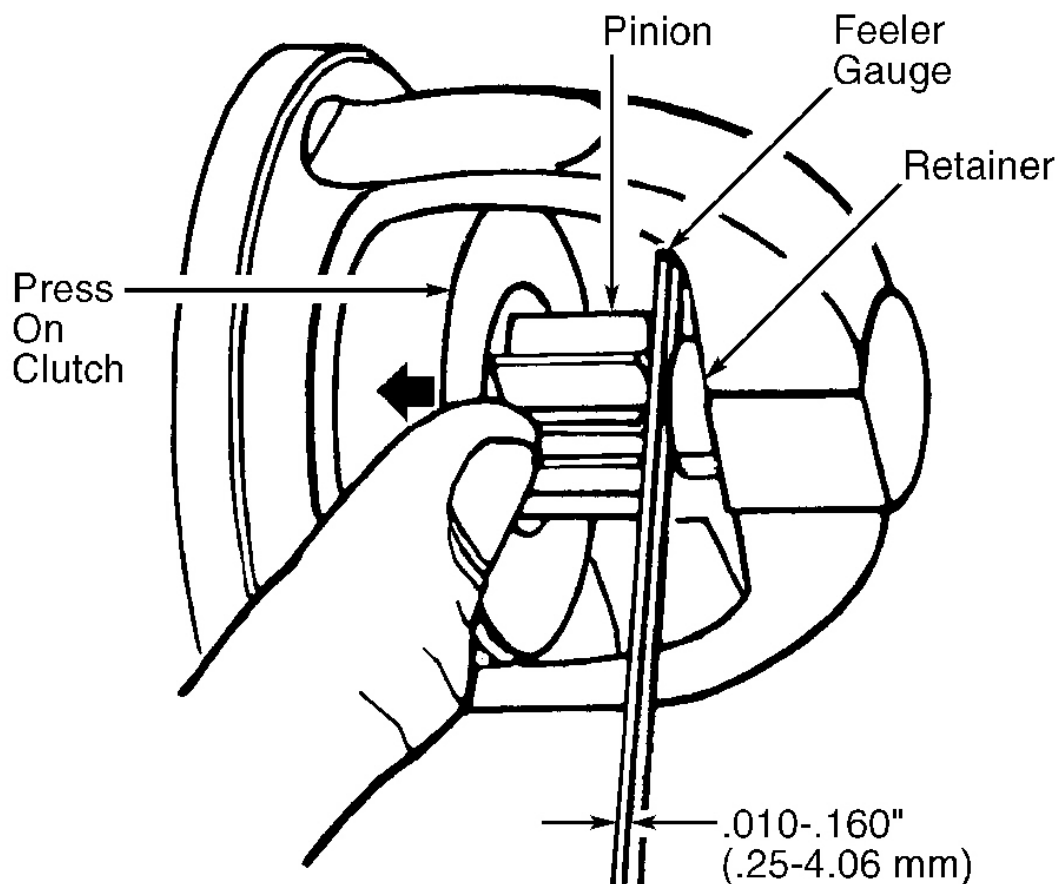
Application	Ft. Lbs. (N.m)
Lug (Wheel) Nuts	95 (130 N.m)
Shackle to Frame Nuts	89 (122 N.m)
Shackle to Spring Nuts	89 (122 N.m)
Shock Absorber Lower Nuts	62 (84 N.m)
Shock Absorber Upper	
Nuts (1996)	22 (22 N.m)
Bolts (1997)	18 (25 N.m)
Shock Absorber Lower Nut (4 Door Utility - 1997)	73 (100 N.m)
Spring to Front Bracket Nuts	89 (122 N.m)
Spring U-Bolt Nuts	73 (100 N.m)
Stabilizer Clamp U-Bolts Nuts	44 (60 N.m)
Stabilizer Bar Upper Link Nut (2 Door Utility)	25 (35 N.m)
Stabilizer Bar Lower Link Nut (2 Door Utility)	50 (68 N.m)
Stabilizer Bar Upper Link Nut (4 Door Utility and Pickup)	25 (35 N.m)
Stabilizer Bar Lower Link Nut (4 Door Utility and Pickup)	50 (68 N.m)
Track Bar Axle Mount Nuts	39 (53 N.m)
Track Bar Bolt to Axle Mount Nut	45 (61 N.m)
Track Bar Tie to Frame Mount Nut	45 (61 N.m)

SPECIAL TOOLS



97128462

Fig. 4: Black 15-pin Connector C102 ("S" & "T" Series - M/T Only)
Courtesy of GENERAL MOTORS CORP.



G92H05218

Fig. 10: Checking Pinion Clearance
Courtesy of GENERAL MOTORS CORP.

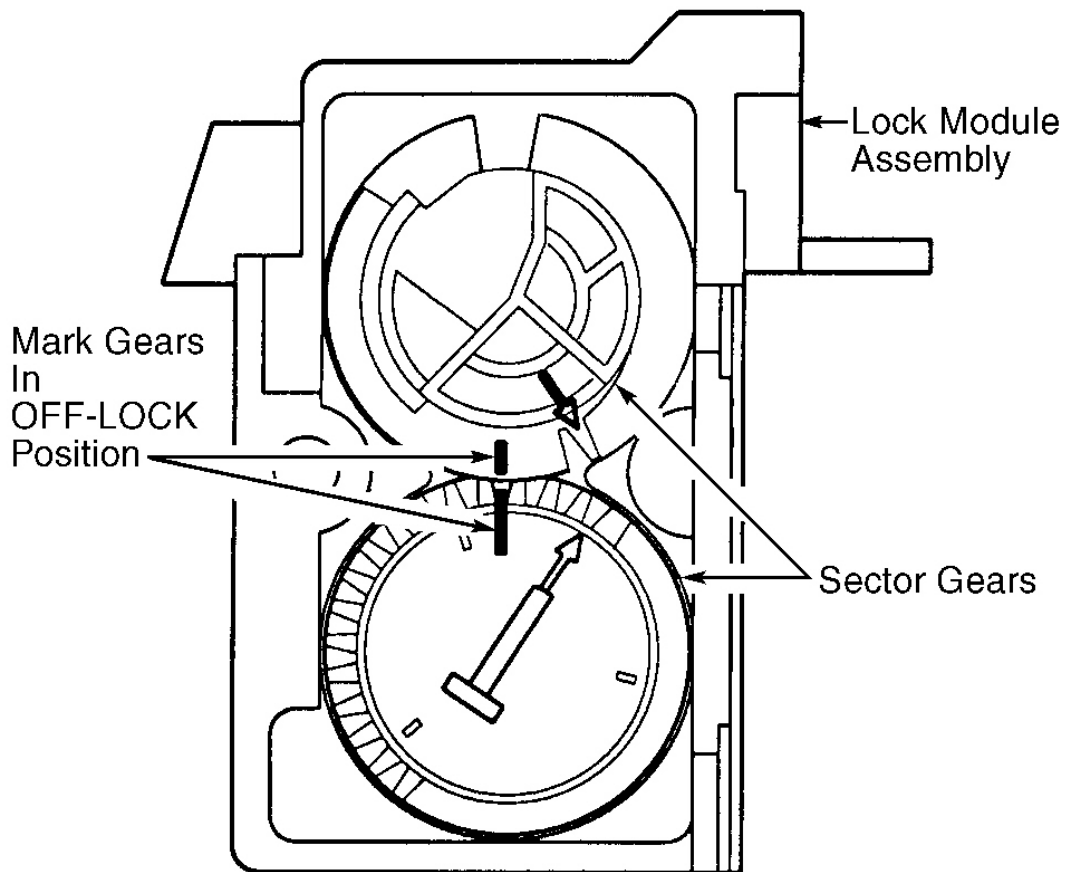
REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in the GENERAL INFORMATION section before disconnecting battery.

NOTE: Vehicles are designed for starter mounting without shims. A short shim or long shims may have been added to correct a noise or engagement condition. When installing starter any previously installed shims should be replaced in original location to ensure proper pinion to flywheel clearance.

1997 Chevrolet S10 Pickup

STEERING COLUMN 1997 STEERING Steering Columns - General Motors Corp.



G97H28214

Fig. 1: Aligning Sector Gears
Courtesy of GENERAL MOTORS

1997 Chevrolet S10 Pickup

I - SYSTEM/COMPONENT TESTS - 2.2L 1997 ENGINE PERFORMANCE General Motors Corp. - System & Component Testing - 2.2L 2WD

I - SYSTEM/COMPONENT TESTS - 2.2L

1997 ENGINE PERFORMANCE General Motors Corp. - System & Component Testing - 2.2L 2WD

INTRODUCTION

Before testing separate components or systems, perform procedures in the **BASIC TESTING - 2.2L** article. Since many computer-controlled and monitored components set a trouble code if they malfunction, also perform procedures in the **TESTS W/CODES - 2.2L** article.

NOTE: Testing individual components does not isolate shorts or opens. Perform all voltage tests with a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance, unless stated otherwise in test procedure. Use ohmmeter and refer to the **WIRING DIAGRAMS** article to isolate wiring harness shorts or opens.

The following table provides the location of commonly used diagnostic information.

GENERAL MOTORS REFERENCE

System Or Component	Diagnostic Information Location
Malfunction Indicator Light (MIL)	See ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in <u>BASIC TESTING - 2.2L</u> article
DLC & MIL On Steady	See ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in <u>BASIC TESTING - 2.2L</u> article
No Scan Tool Data	See ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in <u>BASIC TESTING - 2.2L</u> article
No-Start Diagnosis	See appropriate NO-START - ENGINE CRANKS OKAY in <u>BASIC TESTING - 2.2L</u> article
Injector Circuit Diagnosis	See BASIC FUEL SYSTEM CHECKS in <u>BASIC TESTING - 2.2L</u> article
Fuel Pump Relay	See <u>MODULES, MOTORS, RELAYS & SOLENOIDS</u>
Fuel System Diagnosis	See appropriate BASIC FUEL SYSTEM CHECKS in <u>BASIC TESTING - 2.2L</u> article
Injector Balance Test	See <u>FUEL SYSTEM</u>
MAP Sensor	See <u>ENGINE SENSORS & SWITCHES</u>
Transmission Range Switch	See <u>ENGINE SENSORS & SWITCHES</u>
IAC Valve	See <u>IDLE CONTROL SYSTEM</u> under FUEL SYSTEM
Fuel Evaporation Control	See <u>EMISSION SYSTEMS & SUB-SYSTEMS</u>
Ignition Control Circuit	See <u>IGNITION SYSTEM</u>
Knock Sensor Check	See <u>IGNITION SYSTEM</u>
EGR System	See <u>EMISSION SYSTEMS & SUB-SYSTEMS</u>

1997 Chevrolet S10 Pickup

I - SYSTEM/COMPONENT TESTS - 2.2L 1997 ENGINE PERFORMANCE General Motors Corp. - System & Component Testing - 2.2L 2WD

after 2 seconds, go to next step. If actual EGR pintle position is not as specified, go to step 5).

- MAP reading should have increased when EGR pintle responded. If MAP did not respond, check EGR passages and EGR valve for blockage. If MAP responded, set desired EGR pintle position to 100 percent. If EGR pintle position sets to 100 percent, EGR is okay. If not, replace EGR valve.
- Turn engine off. Check EGR electrical circuit and connecting components. Turn ignition on, check for 5-volt reference voltage on harness connector terminal "D" (Gray wire). If 5-volt reference voltage is not present, check PCM/VCM. See **CONTROL UNIT** under COMPUTERIZED ENGINE CONTROLS. If circuits are okay, replace EGR valve.

FUEL EVAPORATION CONTROL

EVAP Control System

A problem in the EVAP control system will set a Diagnostic Trouble Code (DTC). See the **TESTS W/CODES - 2.2L** article.

POSITIVE CRANKCASE VENTILATION

Required Service

The PCV system may require service for obstructions if any of the following conditions exist:

- Rough Idle
- Stalling or Low Idle Speed
- Oil Leaks
- Oil in Air Cleaner
- Sludge in Engine

A leaking PCV valve or hose could cause:

- Rough Idle
- Stalling
- High Idle Speed

If engine idles roughly, check for clogged PCV valve and for plugged or broken PCV hoses BEFORE adjusting idle. Check for correct PCV valve application to ensure the correct valve is fitted. Replace PCV valve if required.

Checking PCV Valve Function

- Remove PCV valve from rocker cover. Run engine at idle. Place thumb over open end of valve to check for vacuum. If there is no vacuum at valve, check for obstruction in manifold port, hoses or PCV valve. Repair or replace as necessary.
- Turn engine off. Remove PCV valve. Shake valve and listen for rattle of check valve inside PCV valve. If a clear rattle is not heard, replace PCV valve.

1997 Chevrolet S10 Pickup

1997 TRANSFER CASES General Motors Corp. New Venture 231 Overhaul

lever in Neutral. Pry control cable end from shift lever. Loosen control cable lock nut. Check transfer case to ensure it is in Neutral. Ensure shift lever is in Neutral. Turn shift lever end of cable in or out as needed until it is aligned with shift lever. Install control cable on shift lever. Tighten control cable lock nut.

TROUBLE SHOOTING

SYMPTOM DIAGNOSIS

Will Not Shift Or Difficult To Shift Into Gear

Vehicle speed too high; slow vehicle to 2-3 MPH to shift. Vehicle operated too long on dry paved surface; stop vehicle and place in Reverse or Neutral to relieve driveline torque. Ensure transfer case external linkage is not binding. Ensure correct fluid is used. Internal parts may be worn or damaged.

Noisy In All Gears

Check fluid level. Ensure correct fluid is used. If fluid is okay, locate possible internal mechanical problem.

Jumps Out Of Gear Or Noisy In 4WD

Transfer case not completely in gear; check shift linkage. Range fork damaged. Shift fork pads are worn or shift fork binding. Low range gear worn.

Fluid Leaking From Vent Or Seals

Transfer case overfilled. Vent plugged. Output shaft seals are damaged or not installed properly.

TESTING

VACUUM SWITCH

Shift to 2WD position. Locate vacuum switch on front of transfer case. Apply 15 in. Hg vacuum to "L". See **Fig. 1**. Vacuum should be present at "M". Connect a vacuum gauge to "N". Shift to 4WD position. Apply vacuum to "L". Vacuum should be present at "N". If switch fails any test, replace switch.

1997 Chevrolet S10 Pickup

1997 TRANSFER CASES General Motors Corp. New Venture 233 Overhaul

Vehicle operated too long on dry paved surface. Stop vehicle. Place transmission in Reverse or Neutral to relieve drive line torque. Ensure correct fluid is used. Internal parts may be worn or damaged.

Noisy In All Gears

Check fluid level. Ensure correct fluid is used. If fluid is okay, locate possible internal mechanical problem.

Jumps Out Of Gear Or Noisy In 4WD

Transfer case internal shift mechanism faulty. Range fork damaged. Fork pads are worn. Shift fork binding. Low range gear worn.

Fluid Leaking From Vent Or Seals

Transfer case overfilled. Vent plugged. Output shaft seals are damaged or not installed properly.

REMOVAL & INSTALLATION

TRANSFER CASE

WARNING: When battery is disconnected, vehicles equipped with computers may lose memory data. When battery power is restored, driveability problems may exist on some vehicles. These vehicles may require a relearn procedure. See COMPUTER RELEARN PROCEDURES article in **GENERAL INFORMATION**.

Removal

1. Shift transfer case into 4H and disconnect battery negative cable. Raise vehicle, remove skid plate and drain fluid.
2. Mark front and rear output shaft yokes to drive shafts for reassembly reference. Support transfer case and remove rear crossmember. Remove drive shafts.
3. Disconnect speedometer cable, electrical connections and vacuum (hoses) harness at transfer case. Remove transfer case attaching bolts. Remove transfer case from vehicle.

Installation

1. Clean all old gasket material from transmission and transfer case mating surfaces. Position NEW gasket on transfer case with orientation tab at upper left bolt hole.
2. Install transfer case, aligning splines of input shaft with transmission. Slide transfer case forward until seated against transmission. Install transfer case attaching bolts and tighten to specification. See **TORQUE SPECIFICATIONS** . Install rear crossmember.
3. Attach speedometer cable, electrical connections and vacuum harness at transfer case. Using reference marks made during removal, reinstall front and rear drive shafts. Refill transfer case. Install skid plate and lower vehicle. Connect negative battery cable. Road test vehicle.

1997 Chevrolet S10 Pickup

1997 ACCESSORIES & EQUIPMENT Wiper/Washer Systems - Blazer, Bravada, Jimmy, Sonoma & S10 Pickup

1. Turn ignition ON and wiper switch to LO position. Using test light, backprobe between ground and wiper motor connector terminal "A" (Pink wire). See **Fig. 1**.
2. Observe test light while momentarily pushing WASH button. If test light stays on after WASH button is released, go to next step. If test light goes out after WASH button is released, replace wiper motor cover. See **WIPER MOTOR CIRCUIT BOARD (FRONT)**. Check washer switch. Repair/replace as necessary.

Wipers Inoperative In All Modes

CAUTION: If front wiper/washer system works intermittently, or is completely inoperative, refer to SPECIAL POLICY ADJUSTMENT - WINDSHIELD WIPER MOTOR FAILURES Service Campaign Bulletin 02054A dated May 9, 2003 prior to making repairs.

1. Turn ignition ON and wiper switch to HIGH position. Using test light, backprobe between ground and wiper motor connector Purple wire terminal. If test light is on, go to next step. If test light is not on, go to step 3.
2. Turn wiper switch to LO position. Connect jumper wire between wiper motor case and chassis ground. If wiper motor operates, repair ground circuit as necessary. If wiper motor does not operate, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.
3. Using test light, backprobe between ground and wiper motor connector Yellow wire terminal. If test light is on, go to next step. If test light is not on, check WIPER fuse (No. 17). If fuse is okay, repair open circuit in Yellow wire between instrument panel fuse block and wiper motor. If fuse is blown, replace as necessary and check for short to ground in Yellow wire circuit.
4. Check for open in Purple wire between wiper motor connector and wiper switch. Check for faulty wiper switch. Check for open in Yellow wire between WIPER fuse and wiper switch. Repair as necessary.

Wipers Run In Low Speed Only

Disconnect wiper motor harness connector. Using jumper wire, connect battery voltage to wiper motor terminal "A". See **Fig. 1**. Connect a second jumper wire between ground and wiper motor terminal "B". If wiper motor does not operate, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION. If wiper motor operates, check for open in Purple wire between wiper motor connector and wiper switch. Check for faulty wiper switch. Repair as necessary.

Wipers Run In High Speed Only

Disconnect wiper motor harness connector. Using jumper wire, connect battery voltage to wiper motor terminal "C". See **Fig. 1**. Connect a second jumper wire between ground and wiper motor terminal "B". If wiper motor does not operate, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION. If wiper motor operates, check for open in Brown wire between wiper motor connector and wiper switch. Check for faulty wiper switch. Repair as necessary.

Wipers Run At One Speed Only

1. Disconnect wiper motor harness connector. Using jumper wire, connect battery voltage to wiper motor

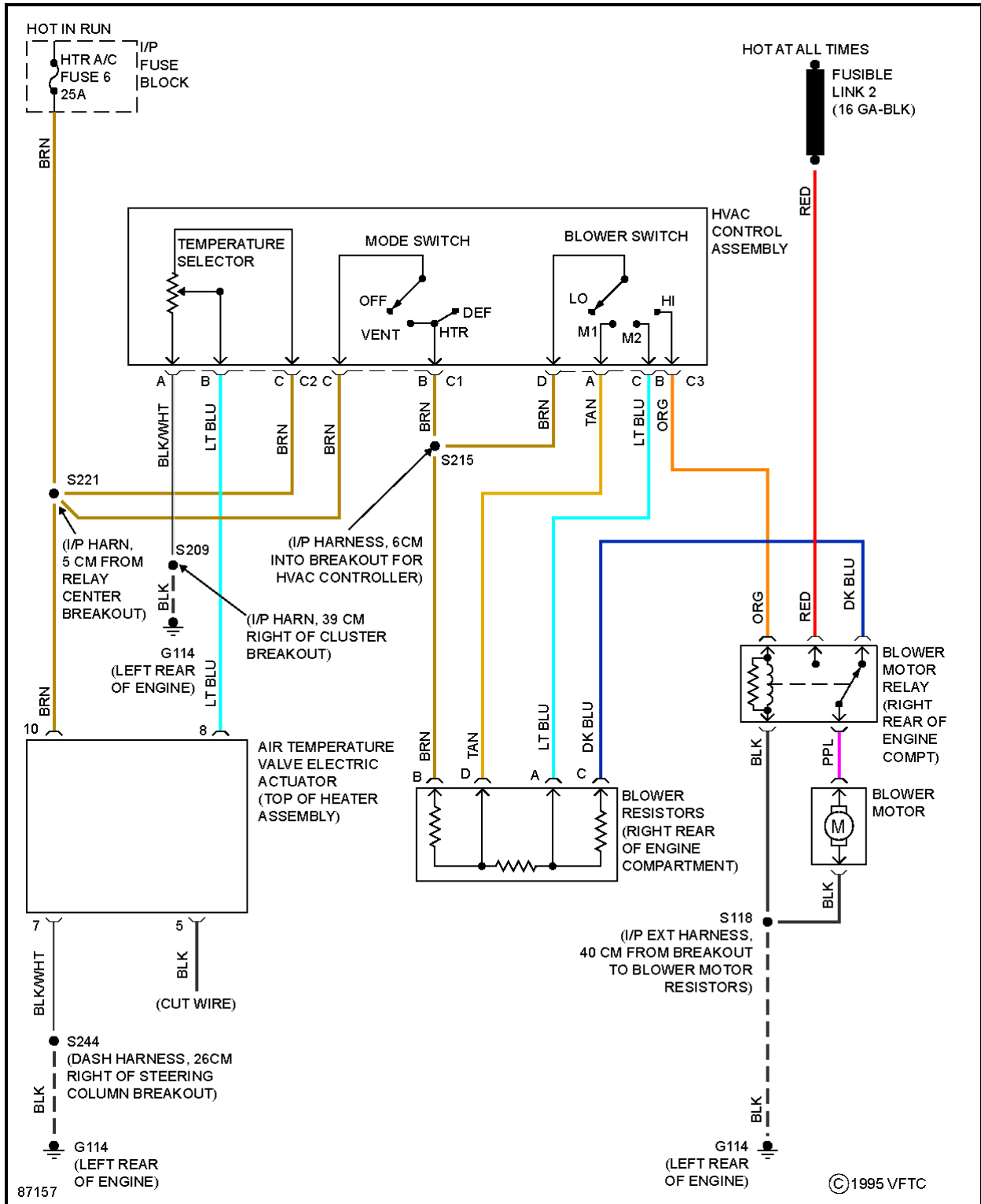
1997 Chevrolet S10 Pickup

1997 ACCESSORIES & EQUIPMENT Wiper/Washer Systems - Blazer, Bravada, Jimmy, Sonoma & S10 Pickup

Fig. 5: Rear Wiper/Washer System Wiring Diagram (Blazer, Bravada & Jimmy)

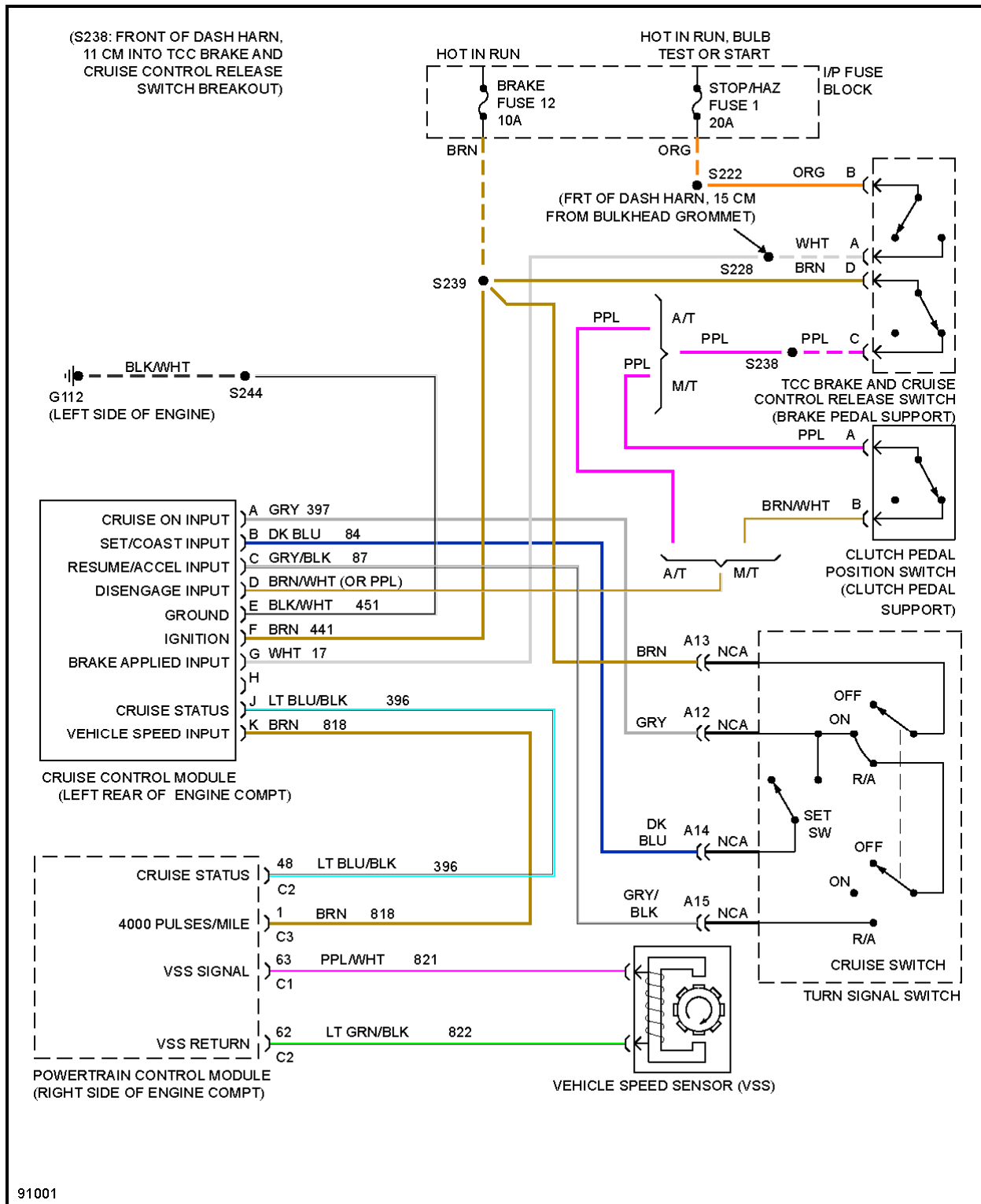
1997 Chevrolet S10 Pickup

1997 System Wiring Diagrams Chevrolet - S10



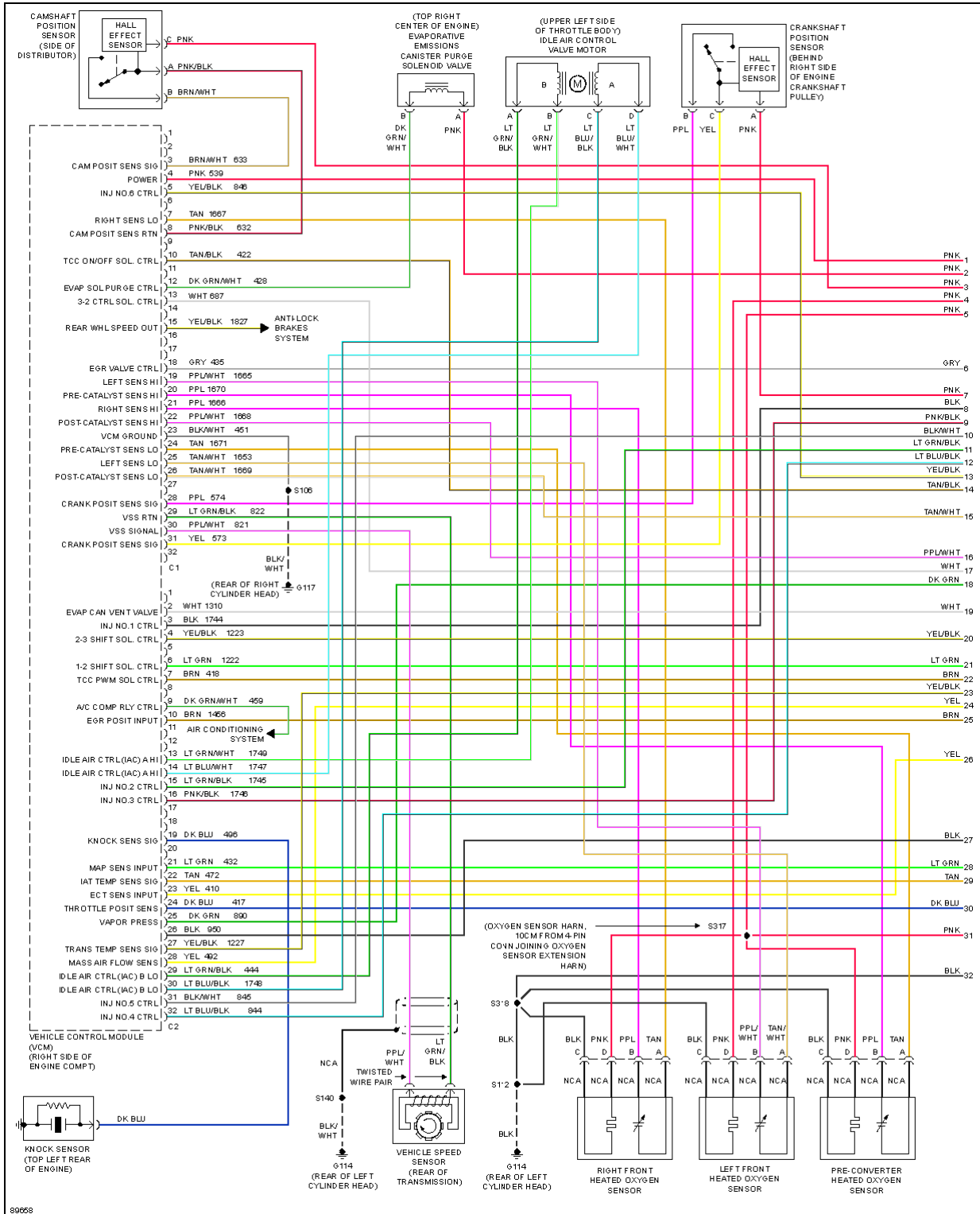
1997 Chevrolet S10 Pickup

1997 System Wiring Diagrams Chevrolet - S10



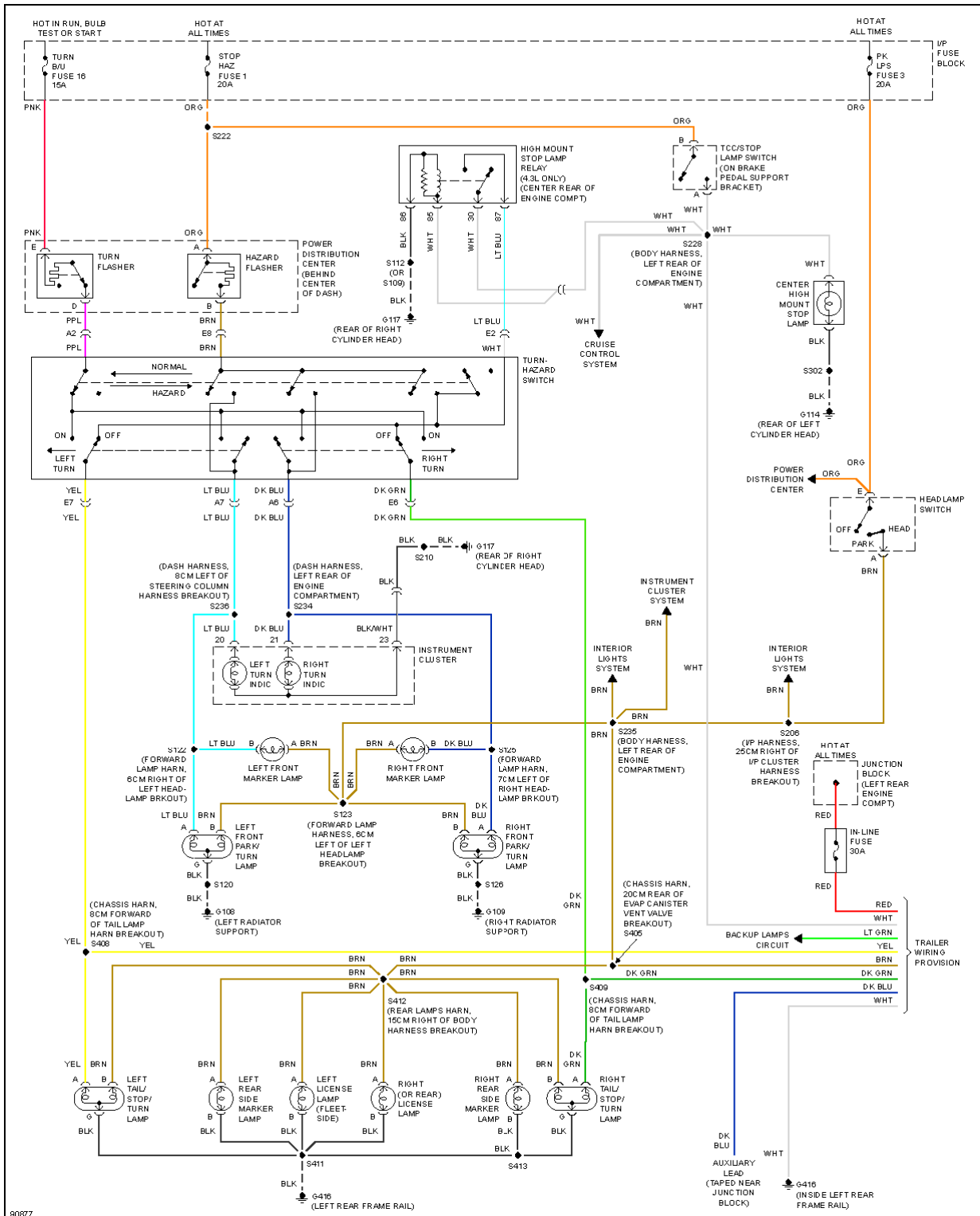
1997 Chevrolet S10 Pickup

1997 System Wiring Diagrams Chevrolet - S10



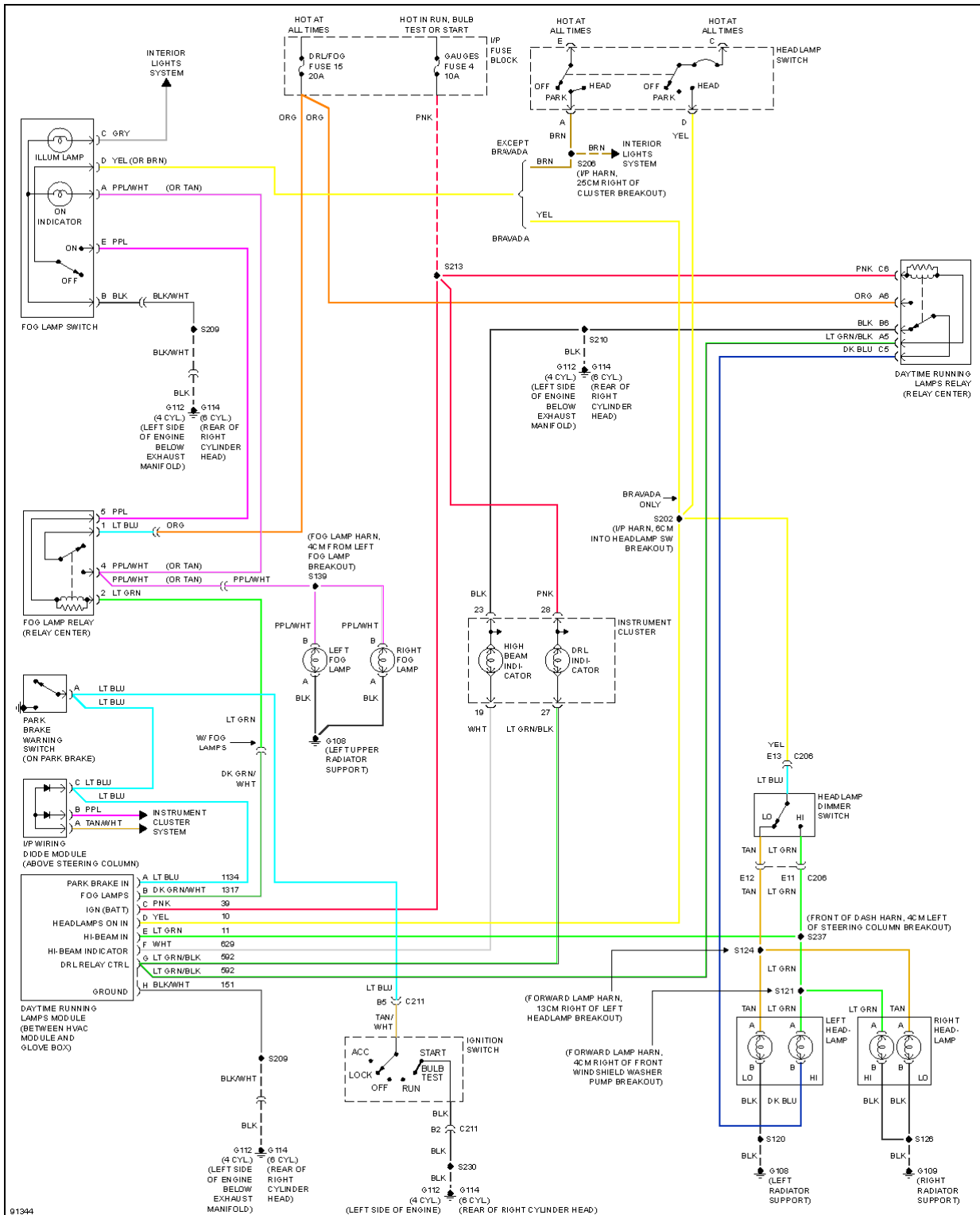
1997 Chevrolet S10 Pickup

1997 System Wiring Diagrams Chevrolet - S10



1997 Chevrolet S10 Pickup

1997 System Wiring Diagrams Chevrolet - S10



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL