1990
DEALER
SERVICE MANUAL
UPDATE BULLETIN
SUPPLEMENT

FOR THE 1990 CHEVROLET
LIGHT DUTY TRUCK UNIT REPAIR,
ASTRO VAN, C-K PICKUP TRUCKS, R-V-G-P MODELS,
AND S-10 MODELS SERVICE MANUALS

ST-502-90SB

1990

SERVICE MANUAL SUPPLEMENT

CAUTION

To reduce the chance of personal injury and/or property damage the following instructions must be carefully observed:

Proper service and repair are important to the safety of the service technician and the safe, reliable operation of all motor vehicles. If part replacement is necessary, the part must be replaced with one of the same part number or with an equivalent part. Do not use a replacement part of lesser quality.

The service procedures recommended and described in this service manual are effective methods of performing service and repair. Some of these procedures require the use of tools specially designed for the purpose.

Accordingly, anyone who intends to use a replacement part, service procedure or tool, which is not recommended by the vehicle manufacturer, must first determine that neither his safety nor the safe operation of the vehicle will be jeopardized by the replacement part, service procedure or tool selected.

It is important to note that this manual contains various "Cautions" and "Notices" that must be carefully observed in order to reduce the risk of personal injury during service or repair, or the possibility that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these "Cautions" and "Notices" are not exhaustive, because it is impossible to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

This manual contains Dealer Service Update Bulletins covering service manual updates which were issued September 1989 through August 1990. Some pages may apply to prior or later model years. It will also be necessary to check bulletins issued after August 1990.

Any reference to brand names in this manual is intended merely as an example of the types of lubricants, tools, and materials recommended for use. In all cases, an equivalent may be used.

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CHEVROLET MOTOR DIVISION
General Motors Corporation
WARREN, MICHIGAN

Table of Contents

CHEVROLET MOTOR DIVISION
General Motors Corporation
Service Department

CHEVROLET SERVICE

Chevrolet Dealer Service Update Bulletin

90-106-3E
Number:
3E
Section:
December 1989
Date:
993101
Corporate Bulletin No.:

Subject: **WHEEL ALIGNMENT SPECIFICATIONS**

Model and Year: **1990 PASSENGER CARS AND LIGHT DUTY TRUCKS**

TO: ALL CHEVROLET DEALERS

ATTACHED FOR YOUR INFORMATION ARE THE 1990 MODEL WHEEL ALIGNMENT SPECIFICATIONS FOR ALL GM PASSENGER CARS AND LIGHT TRUCKS.

SERVICE UPDATE

1990 GM PASSENGER CAR ALIGNMENT SPECIFICATIONS (DEGREES)

CAR LINE	FRONT WHEELS					STEERING WHEEL ANGLE	REAR WHEELS		
	CAMBER	CROSS	CASTER	CROSS	TOTAL TOE		CAMBER	TOTAL TOE	THRUST ANGLE
A	0.00 +/- .50	0.70	▲ 1.70 +/- 0.70	0.70	0.00 +/- .20	+/- 3.5	▲ 0.00 +/- .30 ▲ 0.00 +/- .50	▲ 0.00 +/- .30 ▲ +0.20 +/- .20	▲ 0.00 +/- .15 ▲ 0.00 +/- .15
B	+0.80 +/- .80	1.00	2.80 +/- 1.00	1.00	+0.10 +/- .20	+/- 2.5	▲	▲	▲
F	+0.30 +/- .50	0.70	4.80 +/- 0.50	0.70	0.00 +/- .20	+/- 3.5	▲	▲ 0.00 +/- .30 (ref. only)	▲ 0.00 +/- .15 (ref. only)
L	+0.60 +/- .60 -0.20 +/- .60	1.00 1.00	▲ 1.15 +/- 0.75	0.70	0.00 +/- .20	+/- 3.5 TO COLUMN	▲ -0.25 +/- .50	▲ +0.30 +/- .25	▲ 0.00 +/- .35
J/N	0.00 +/- .70	1.00	▲ 1.70 +/- 1.00	0.70	0.00 +/- .20	+/- 5.0	▲ -0.25 +/- .50	▲ +0.25 +/- .16	▲
W	+0.70 +/- .50	0.75	▲ 2.00 +/- 0.50 ▲ 1.90 +/- 0.50	0.75 0.75	0.00 +/- .20	+/- 3.5 TO COLUMN	▲ +0.10 +/- .50 ▲ -0.15 +/- .50	▲ -0.10 +/- .30	▲ 0.00 +/- .15
Y	+0.50 +/- .50	1.00	5.80 +/- 0.80	1.00	0.00 +/- .20	+/- 2.0	+0.20 +/- .50	+0.20 +/- .20	0.00 +/- .15 RECOMMENDED
S	-0.25 +/- .75	1.50	0.90 +/- 0.75	1.50	+0.08 +/- .31	+/- 5.0	-0.50 +/- .75	+0.90 +/- .31	0.00 +/- .15 RECOMMENDED
M/R	+0.31 +/- 1.00	1.00	2.25 +/- 0.50	1.00	0.00 +/- .34	+/- 5.0	0.00 +/- .75	+0.43 +/- .43	0.00 +/- .15 RECOMMENDED

NOTE: ▲ NOT ADJUSTABLE

Tire-Wheel Systems General Motors Proving Ground Milford, Michigan 48042-2001 November 17, 1989

1990 GENERAL MOTORS TRUCK WHEEL ALIGNMENT SPECIFICATIONS (DEGREES)

TRUCK LINE	CAMBER	CROSS	CASTER	CROSS	TOTAL TOE	STEERING WHEEL ANGLE
C-K	+.50 ± .50	1.00	3.75 ± 1.00	1.00	+.24 ± .20	± 5.0
G-10/20	+.50 ± .75	1.00	* ± 1.00	1.00	0 ± .20	±5.0
G-30	+.25 ± .75					
M	+ 80 ± .80	1.00	2.60 ± 1.00	1.00	0 ± .20	± 5.0
L ALL WD	+.91 ± .80	1.00	3.52 ± 1.00	1.00	-.10 ± .20	± 5.0
U	00 ± .50	1.00	1.70 ± 1.00	1.80	.00 ± .20	± 5.0
P	+.25 ± .75	1.00	* ± 1.00	1.00	+.34 ± 23	± 5.0
S-T	+ 60 ± .80	1.00	1.80 ± 1.00	1.00	+.30 ± .20	± 5.0
R-10	+.70 ± .75	1.00	* ± 1.00	1.00	+ 15 ± 23	± 5.0
R-20/30	+ 25 ± .75					
V ALL	1.50 ± .75	1.00	8.00 ± 1.00	1.00	0. ± .23	± 5.0

NOTES * ACTUAL "CORRECTED" CASTER ANGLE = ALIGNER ANGLE + FRAME RAIL ANGLE
(FRAME ANGLE IS NEGATIVE WHEN LOWER IN REAR, AND POSITIVE WHEN LOWER IN FRONT.)

V VEHICLE CASTER AND CAMBER ARE NOT ADJUSTABLE

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CHEVROLET MOTOR DIVISION
General Motors Corporation
Technical Service Department

Dealer Service Update Bulletin

90-213-5
Number:
5
Section:
April 1990
Date:
065001
Corporate Bulletin No.:

Subject: **4WAL BRAKE BLEEDING PROCEDURE**

Model and Year: **1990 M/L TRUCK**

SERVICE UPDATE

TO: ALL CHEVROLET DEALERS

This bleed procedure revises the bleed procedure published in the 1990 Light Duty Truck Service Manual Section 5 (reference Dealer Service Bulletin No. 90-65-5). This procedure is correctly listed in the 1991 S/T service manual as it applies to that model. Please place a copy of this bulletin in the 1990 Light Duty Truck Service Manual.

The following brake bleeding procedure is to be used on ALL 1990 M/L Vans equipped with 4 wheel anti-lock brake systems.

IMPORTANT: The ignition switch must be off through-out bleeding or false trouble codes could be set to memory.

4WAL Brake System Bleeding Procedure:

1. Assure ignition is in off position.
2. Deplete brake booster by pumping the brake pedal several times.
3. Assure the master cylinder is full.
4. Install two J 35856 bleed valve tools on the 4WAL EHCU at the high pressure accumulators (HPA) (see Figure 2).
5. Install one J 35856 bleed valve tool on the combination valve.
6. There are internal bleed screws on each side of the EHCU module (Figure 2). The bleed screws are used to open the internal passages within the EHCU module. Back off the two internal bleed screws 1/4 to 1/2 turn.
7. Use conventional bleeding process; Pressure, Vacuum or Pedal Bleeding.

IMPORTANT: The EHCU module should be bled after replacement or if trapped air is thought to be in the unit. It should not be necessary to bleed the EHCU module if the fluid has not become contaminated or if no air is thought to be in the module. In the event the EHCU module needs to be bled the module should be thoroughly bled BEFORE the wheel cylinders and calipers.

There are two bleeders on the front of the unit that look like normal brake bleeders (Figure 2). These are the modulator bleeders for bleeding the EHCU module and they must remain closed when the unit is not pressurized.

8. EHCU Module Bleed Procedure (if required). Pedal bleeding method described below:

   - Slowly depress the brake pedal one time and hold.
   - Open one of the modulator bleeders on the front of the unit until fluid flows clearly or pedal is depressed.
   - Close the modulator bleeder and tighten to 7 Nm. (60 in.lbs). DO NOT OVER TIGHTEN!
   - Slowly release the pedal.
   - Wait 15 seconds, then repeat the above sequence, including the 15 second wait until all air is purged from the EHCU module.

   Repeat the above process on the remaining modulator bleeder on the front of the EHCU module until all air is purged from the unit.

9. Always maintain a full master cylinder.

10. Bleed wheel cylinders and calipers as described in HYDRAULIC BRAKES (Sec. 5A of the service manual).

11. Remove the three J 35856 bleed valve tools.

12. Close the left internal bleed screw and tighten to 7 Nm (60 in.lbs.). DO NOT OVER TIGHTEN!

13. Close the right internal bleed screws and tighten to 7 Nm (60 in.lbs). DO NOT OVER TIGHTEN!

14. Start vehicle and evaluate the brake pedal feel. If firm, continue with this procedure. If the pedal is soft or spongy, reinstall tools and re-bleed the system starting with step 1. Any RE-BLEED due to soft or spongy pedal should always include bleeding the EHCU module (step 8).

15. Perform 3 function tests using the Tech-1 Function test procedure.

16. Road test vehicle.

IMPORTANT: Failure to follow this procedure accurately may result in an immediate soft pedal after the first anti-lock stop and technician induced stored codes.

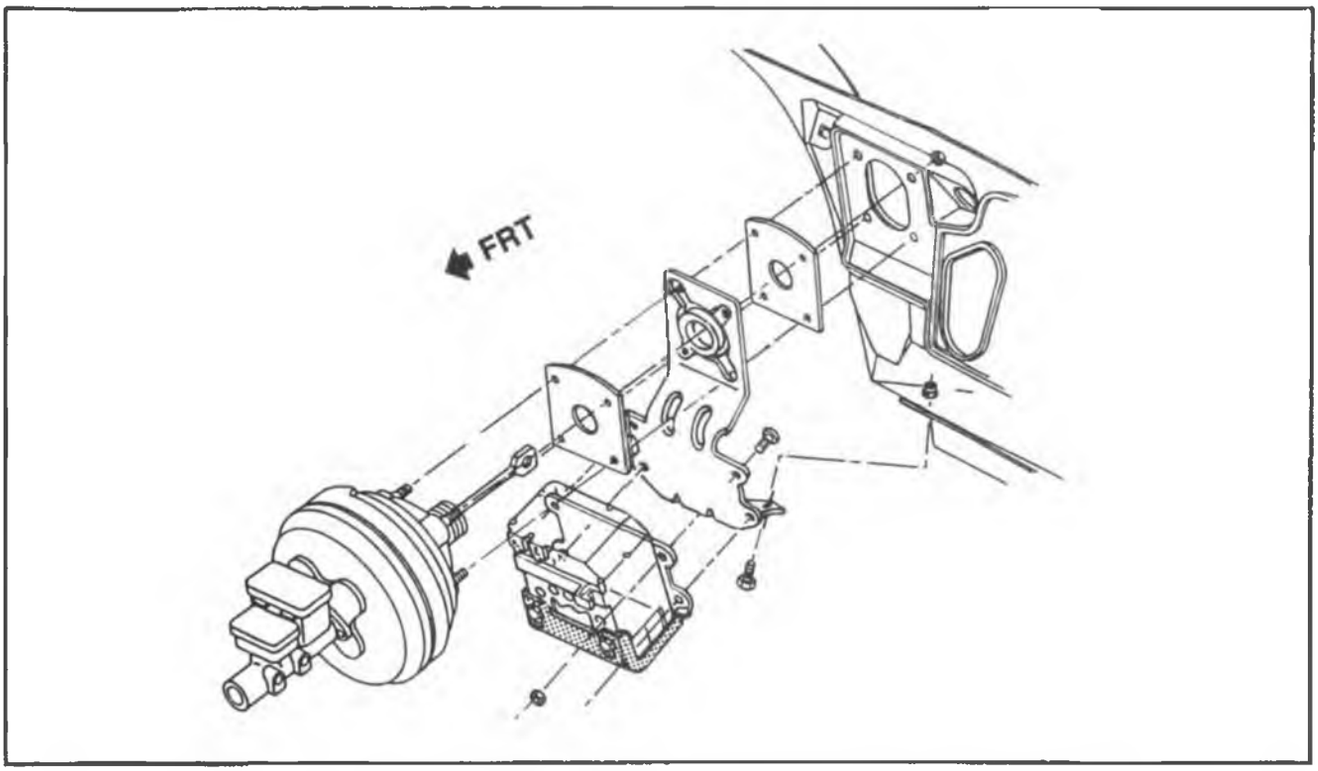

Figure 1 4WAL EHCU Assembly Mounting—M/L Series

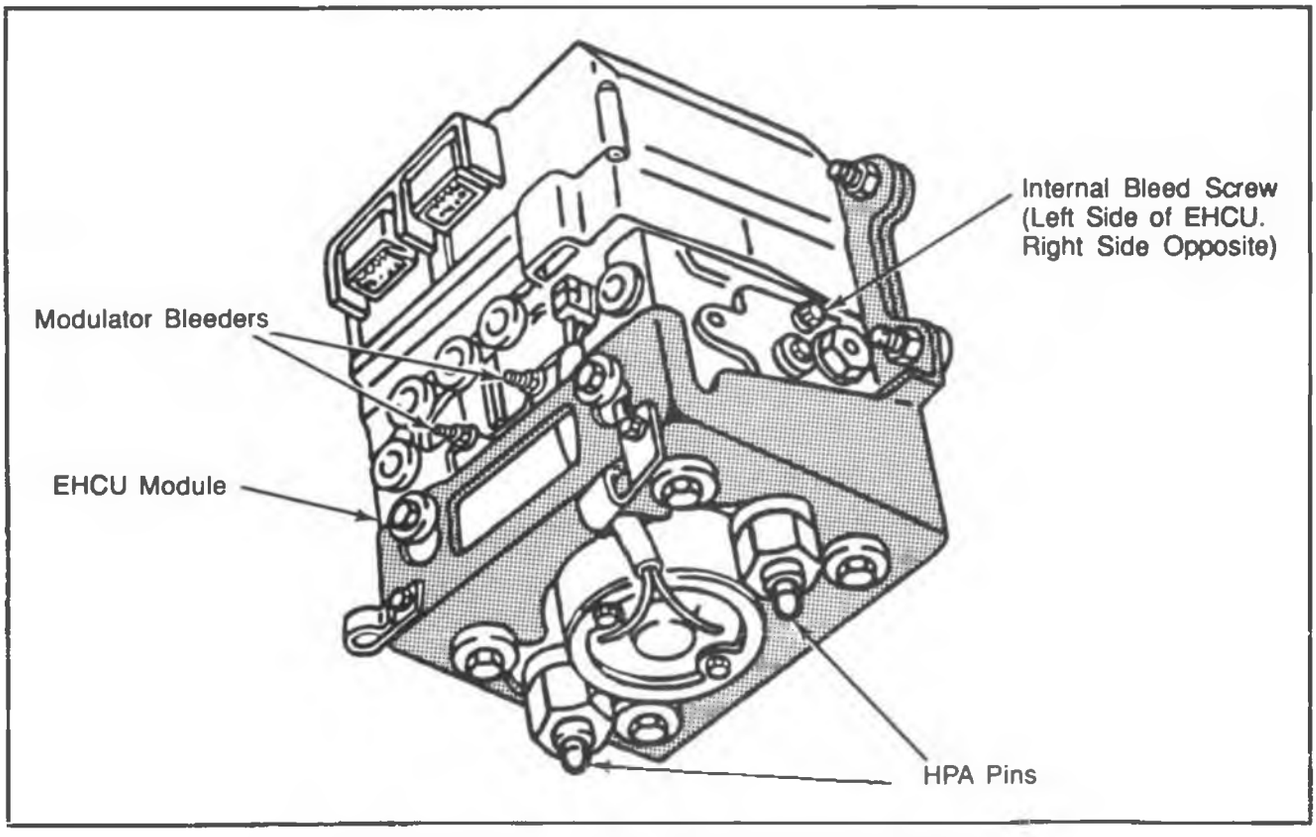

Figure 2 4WAL EHCU Service Bleed Valves

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CHEVROLET MOTOR DIVISION
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Technical Service Department

Dealer Service Update Bulletin

90-269-5
Number:
5
Section:
July 1990
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065008
Corporate Bulletin No.:

Subject: **RWAL BRAKES**

Model and Year: **1988-90 C/K AND 1989-90 S/T/M AND 1990 R/V AND G TRUCKS**

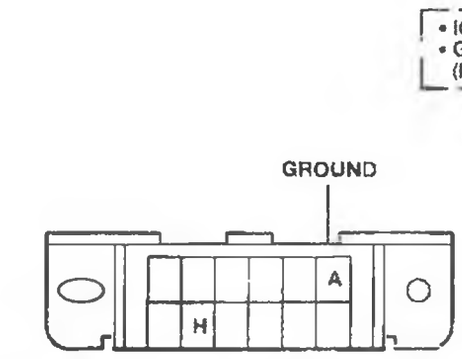
SERVICE UPDATE

TO: ALL CHEVROLET DEALERS

The attached chart (see Figure 1) is a revised code 5 diagnostic chart. The revised chart requires a check of wiring and the transfer case switch operation before the control valve is replaced on 4-wheel drive vehicles. The chart also revises code 5 diagnostic information in the following service manuals:

1988 C/K
1989 C/K
1990 C/K
1990 R/V AND G
1989 S/T
1990 S/T
1989 M VAN
1990 M VAN

CODE 5
EXCESSIVE ACTUATIONS OF THE DUMP VALVE DURING AN ANTILOCK STOP



- IGNITION "ON"
- GROUND THE DIAGNOSTIC TERMINAL (FROM DIAGNOSTIC CIRCUIT CHECK)

BRAKE LIGHT FLASHES CODE 5

IGNITION "OFF"

IS THE VEHICLE EQUIPPED WITH 4WD?

YES

ENGAGE 4WD

4WD INDICATOR "ON"

YES

CHECK VOLTAGE AT BRAKE LAMP SWITCH TERMINAL A WITH THE BRAKES APPLIED (CKT 420)

12 VOLTS

CHECK VOLTAGE AT PIN F OF THE MODULE CONNECTOR (CKT 420)

12 VOLTS

0 VOLTS

REPAIR WIRING

NO

REPAIR. REFER TO TRANSFER CASE

0 VOLTS

CHECK VOLTAGE AT SINGLE CAVITY CONNECTOR FROM TRANSFER CASE SWITCH

0 VOLTS

REPLACE TRANSFER CASE SWITCH

12 VOLTS

REPAIR WIRING

NO

REPLACE THE VALVE ASSEMBLY. REFER TO ISOLATION/DUMP VALVE IN THIS SECTION.

VERIFY OPERATION OF THE REAR BRAKES. REPAIR IF NECESSARY

IGNITION "OFF"

- REMOVE THE STOP/HAZARD FUSE*
- INSTALL THE FUSE AFTER 5 SECONDS

PERFORM THE DIAGNOSTIC CIRCUIT CHECK

* ECM B fuse on S/T-Series truck.
Stop/hazard fuse on C/K- and R/V-Series truck.
Horn/dome fuse on M-Series truck.
Tail LPS fuse on G-Series truck.

Figure 1

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CHEVROLET MOTOR DIVISION
General Motors Corporation
Technical Service Department

Dealer Service Update Bulletin

90-206-6C
Number:
6C
Section:
April 1990
Date:
036504
Corporate Bulletin No.:

Subject: **CONTROLLED IDLE SPEED UPDATED CHART**

Model and Year: **1990 ALL TRUCKS (EXCEPT TRACKER)**

SERVICE UPDATE

TO: ALL CHEVROLET DEALERS

This bulletin updates the chart shown on Page 4-43 in the Fuel Control Section of the 1990 Shop Manual. This information is for all 1990 Light-duty trucks (except Tracker) with gas engines.

1990 CONTROLLED IDLE SPEED

ENGINE	TRANS	GEAR (D/N)	IDLE SPEED (RPM)	IAC COUNTS*	OPEN/CLOSED LOOP**
2.5L	MAN.	N	950(S)	5-20	CLOSED
	AUTO.	D	800(S) 750(M)	15-40	CLOSED
2.8L	MAN.	N	800	5-20	OPEN
3.1L	AUTO.	D	650	5-15	CLOSED
4.3L (under 8500 GVW)	MAN.	N	550	2-20	CLOSED
	AUTO.	D	537	10-25	CLOSED
	AUTO.(1)	D	500	5-30	CLOSED
	MAN.(1)	N	600	5-30	CLOSED
	AUTO.(2)	D	588	10-25	CLOSED
4.3L (over 8500 GVW)	MAN.	N	650	12-30	CLOSED
	AUTO.	D	650	20-35	CLOSED
5.0L	MAN.	N	600	5-30	OPEN
	AUTO.	D	500	5-30	CLOSED
	AUTO.(3)	D	500	5-30	CLOSED

ENGINE	TRANS	GEAR (D/N)	IDLE SPEED (RPM)	IAC COUNTS*	OPEN/CLOSED LOOP**
5.7L (under 8500 GVW)	MAN.	N	600	5-30	OPEN
	AUTO.	D	525	5-30	CLOSED
5.7L (over 8500 GVW)	MAN.		650	5-30	OPEN
	MAN.(4)	N	650	5-30	CLOSED***
	AUTO.	D	550	5-30	CLOSED
7.4L (under 8500 GVW)	MAN.	N	800	5-30	OPEN
	AUTO.	D	750	5-30	OPEN
7.4L (above 8500 GVW)	MAN.	N	750	5-30	OPEN
	AUTO.	D	750	5-30	OPEN

---

* Add 2 counts for engines with less than 500 miles.
Add 2 counts for every 1000 ft. above sea level (4.3L & V8).
Add 1 count for every 1000 ft. above sea level (2.5L & 2.8L).

** Let engine idle until proper fuel control status (open/closed loop) is reached.

*** Switches to open loop after 3 min.

(1) 4.3L S/T-series.

(2) 4.3L High-Output M/L-van series.

(3) 3-Speed Automatic in a C10 pickup with Federal emissions and no A.I.R. system.

(4) G-van or Suburban with a single catalytic converter.

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CHEVROLET MOTOR DIVISION
General Motors Corporation
Technical Service Department

Dealer Service Update Bulletin

90-199-6E
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6E
Section:
March 1990
Date:
016510
Corporate Bulletin No.:

Subject: **REVISED CHART C-1D, CODE 33, 34, 63, 64**

Model and Year: **1980-90 PASSENGER CARS AND TRUCKS**

SERVICE UPDATE

TO: ALL CHEVROLET DEALERS

This bulletin revises the Manifold Absolute Pressure (MAP) Output Check Chart C-1D and updates Code 33, Code 34, Code 63, and Code 64 in the Service Manual section on "Driveability And Emissions" (Section 6E1, 6E2, and 6E3). This information applies to all MAP Sensors on 1980-1990 vehicles with gasoline engines (except turbocharged) with green (standard) MAP sensor electrical connector insert or the solid black MAP sensor electrical connector insert.

The revised chart and facing page information is as follows:
- Diagnostic Chart C-1D and facing page.

The updated chart and facing page information is as follows:
- Diagnostic Chart Code 33 and facing page.
- Diagnostic Chart Code 34 and facing page.
- Diagnostic Chart Code 63 and facing page.
- Diagnostic Chart Code 64 and facing page.

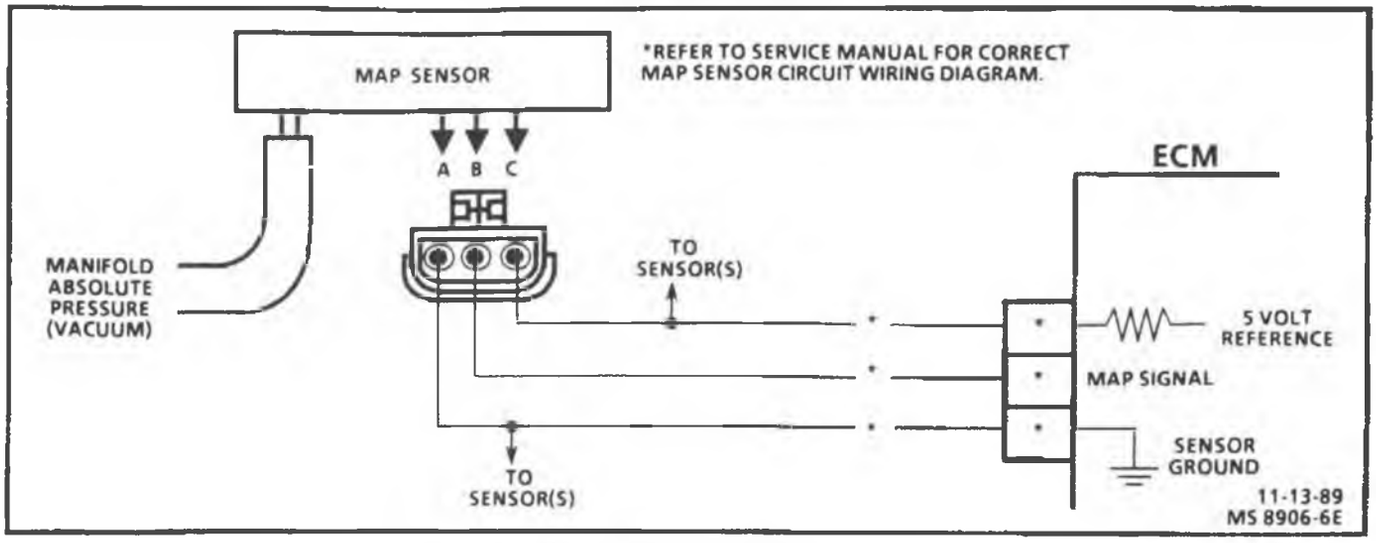


CHART C-1D

MANIFOLD ABSOLUTE PRESSURE (MAP) VOLTAGE OUTPUT CHECK

Circuit Description:

The Manifold Absolute Pressure (MAP) sensor measures the changes in the intake manifold pressure which result from engine load (intake manifold vacuum) and rpm changes; and converts these into a voltage output. The ECM sends a 5 volt reference voltage to the MAP sensor. As the manifold pressure changed, the output voltage of the sensor also changes. By monitoring the sensor output voltage, the ECM knows the manifold pressure. A lower pressure (low voltage) output voltage will be about 1 - 2 volts at idle. While higher pressure (high voltage) output voltage will be about 4 - 4.8 at Wide Open Throttle (WOT). The MAP sensor is also used, under certain conditions, to measure barometric pressure, allowing the ECM to make adjustments for different altitudes. The ECM uses the MAP sensor to control fuel delivery and ignition timing.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

Important

- Be sure to use the same Diagnostic Test Equipment for all measurements.

1. When comparing "Scan" readings to a known good vehicle, it is important to compare vehicles that use a MAP sensor having the same color insert or having the same "Hot Stamped" number. See figures on facing page.
2. Applying 34 kPa (10" Hg) vacuum to the MAP sensor should cause the voltage to change. Subtract second reading from the first. Voltage value should be greater than 1.5 volts. Upon applying vacuum to the sensor, the change in voltage should be instantaneous. A slow voltage change indicates a faulty sensor.
3. Check vacuum hose to sensor for leaking or restriction. Be sure that no other vacuum devices are connected to the MAP hose.

NOTE: Make sure electrical connector remains securely fastened.

4. Disconnect sensor from bracket and twist sensor by hand (only) to check for intermittent connection. Output changes greater than .1 volt indicate a bad connector or connection If OK, replace sensor.

CHART C-1D

MANIFOLD ABSOLUTE PRESSURE (MAP) VOLTAGE OUTPUT CHECK

NOTE: THIS CHART ONLY APPLIES TO MAP SENSORS HAVING GREEN OR BLACK COLOR KEY INSERT (SEE BELOW).

1. • IGNITION "ON," ENGINE "OFF."
   • "SCAN" TOOL SHOULD INDICATE A MAP SENSOR VOLTAGE.
   • COMPARE THIS READING WITH THE READING OF A KNOWN GOOD VEHICLE. SEE FACING PAGE TEST DESCRIPTION, STEP 1.
   • VOLTAGE READING SHOULD BE WITHIN, ± .4 VOLT.
   IS IT?

- YES → 2
- NO → REPLACE SENSOR.

2. • DISCONNECT AND PLUG VACUUM SOURCE TO MAP SENSOR.
   • CONNECT A HAND VACUUM PUMP TO MAP SENSOR.
   • START ENGINE.
   • NOTE MAP SENSOR VOLTAGE.
   • APPLY 34 kPa (10" Hg) OF VACUUM AND NOTE VOLTAGE CHANGE. SUBTRACT SECOND READING FROM THE FIRST. VOLTAGE VALUE SHOULD BE GREATER THAN 1.5 VOLTS.
   IS IT?

- YES → 3
- NO → 4

3. NO TROUBLE FOUND. CHECK SENSOR VACUUM SOURCE FOR LEAKAGE OR RESTRICTION. BE SURE THIS SOURCE SUPPLIES VACUUM TO MAP SENSOR ONLY.

4. CHECK SENSOR CONNECTION. IF OK, REPLACE SENSOR.

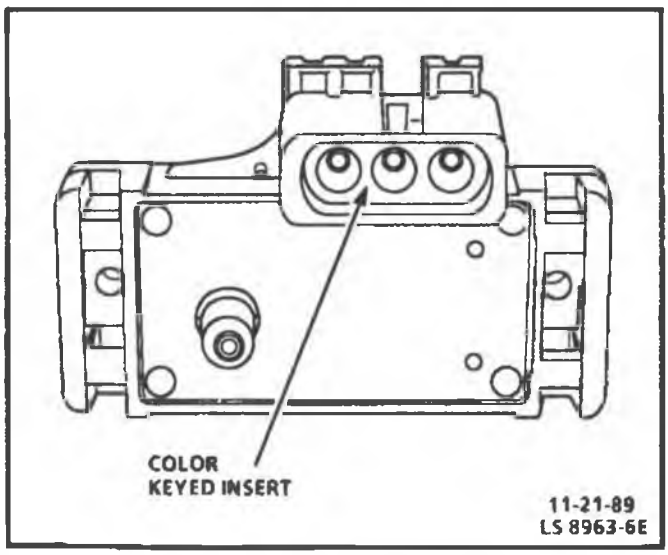


Figure 1 - Color Key Insert

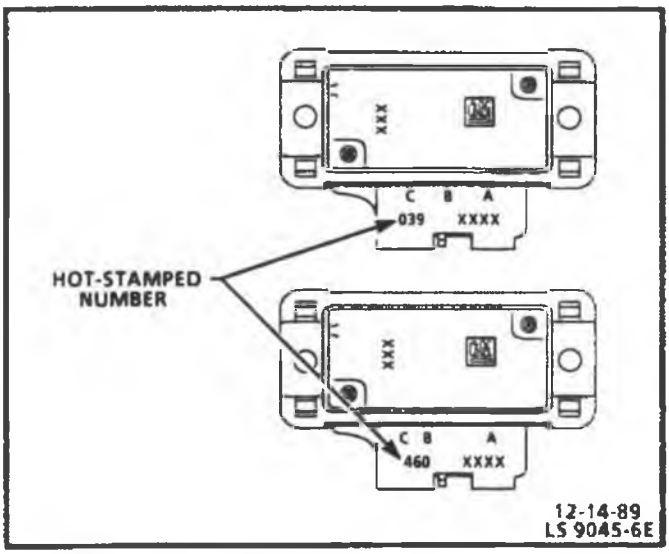
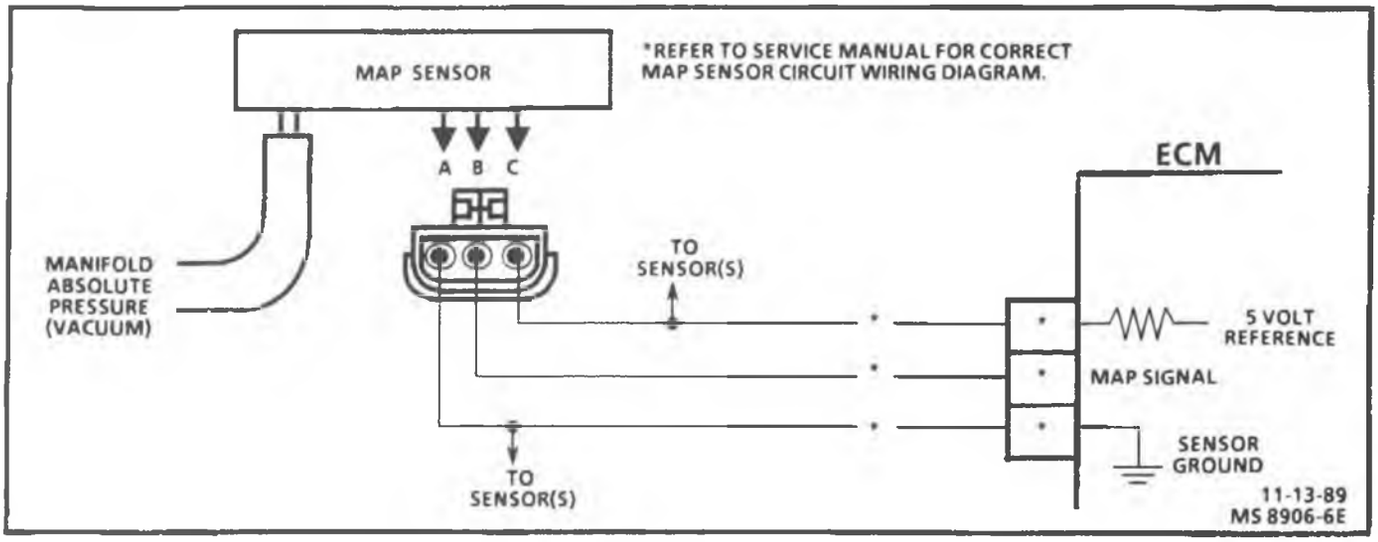


Figure 2 - Hot-Stamped Number

CLEAR CODES AND CONFIRM "CLOSED LOOP" OPERATION AND NO "SERVICE ENGINE SOON" LIGHT.

2-28-90
• 7S 3162-6E



CODE 33

MANIFOLD ABSOLUTE PRESSURE (MAP) OUTPUT CHECK
(SIGNAL VOLTAGE HIGH - LOW VACUUM)

Circuit Description:

The Manifold Absolute Pressure (MAP) sensor responds to changes in manifold pressure (vacuum). The ECM receives this information as a signal voltage that will vary from about 1 to 1.5 volts at closed throttle (idle) to 4.5 - 4.8 volts at wide open throttle (low vacuum).

If the MAP sensor fails, the ECM will substitute a fixed MAP value and use the Throttle Position Sensor (TPS) to control fuel delivery.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. This step will determine if Code 33 is the result of a hard failure or an intermittent condition.
   A Code 33 will set under the following conditions:
   - MAP signal voltage is too high (low vacuum).
   - TPS less than 2%.
   - These conditions exist longer than 5 seconds.
2. This step simulates conditions for a Code 34. If the ECM recognizes the change, the ECM and CKT 416 and CKT 432 are OK. If CKT 469 is open, there may also be a stored Code 23.

Diagnostic Aids:

With the ignition "ON" and the engine stopped, the manifold pressure is equal to atmospheric pressure and the signal voltage will be high. This information is used by the ECM as an indication of vehicle altitude. Comparison of this reading with a known good vehicle with the same sensor is a good way to check accuracy of a "suspect" sensor. Readings should be the same ± .4 volt.

A Code 33 will result if CKT 469 is open or if CKT 432 is shorted to voltage or to CKT 416.

If Code 33 is intermittent, refer to Section "B".

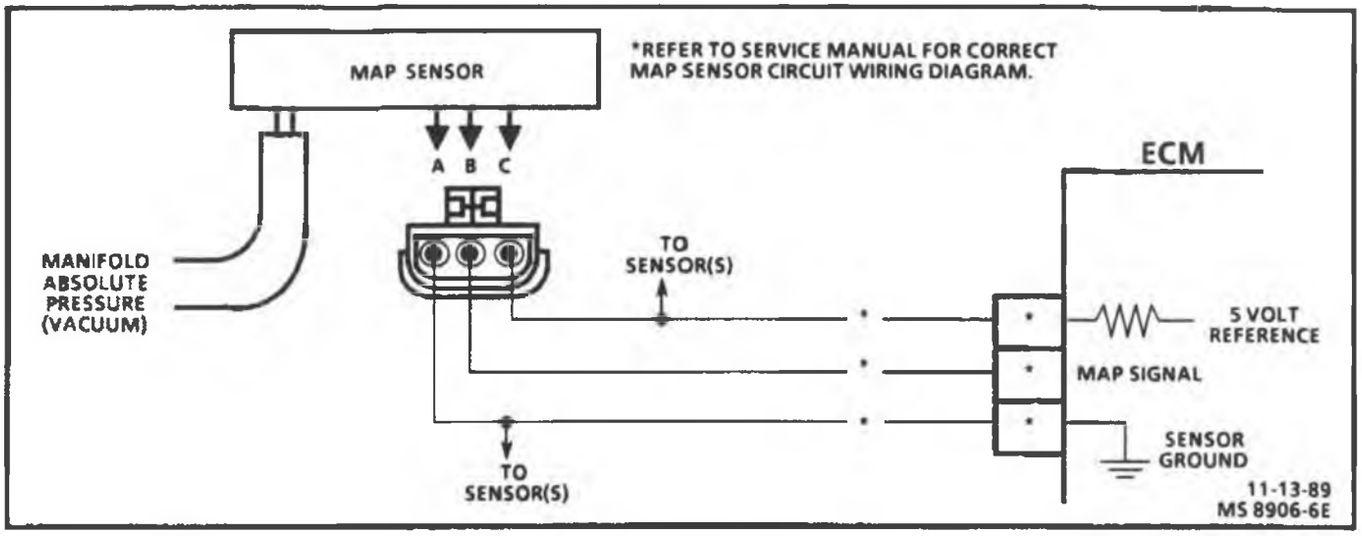
NOTE: Make sure electrical connector remains securely fastened.

- Check all connections.
- Disconnect sensor from bracket and twist sensor by hand (only) to check for intermittent connections. Output changes greater than .1 volt indicates a bad connector or connection. If OK, replace sensor.
- Refer to CHART C-1D, MAP sensor voltage output check for further diagnosis.

CODE 33

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT
(SIGNAL VOLTAGE HIGH - LOW VACUUM)

10-26-89
• 7S 3210-6E



CODE 34

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT (SIGNAL VOLTAGE LOW - HIGH VACUUM)

Circuit Description:

The Manifold Absolute Pressure (MAP) sensor responds to changes in manifold pressure (vacuum). The ECM receives this information as a signal voltage that will vary from about 1 to 1.5 volts at closed throttle (idle) to 4.5 - 4.8 volts at wide open throttle (low vacuum).

If the MAP sensor fails, the ECM will substitute a fixed MAP value and use the Throttle Position Sensor (TPS) to control fuel delivery.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. This step determines if Code 34 is the result of a hard failure or an intermittent condition. A Code 34 will set when MAP signal voltage is too low and the ignition is "ON."
2. Jumpering harness terminals "B" to "C" (5 volts to signal circuit) will determine if the sensor is at fault, or if there is a problem with the ECM or wiring.
3. The "Scan" tool may not display 5 volts. The important thing is that the ECM recognizes the voltage as more than 4 volts, indicating that the ECM and CKT 432 are OK.

Diagnostic Aids:

An intermittent open in CKT 432 or CKT 416 will result in a Code 34. With the ignition "ON" and the engine "OFF," the manifold pressure is equal to atmospheric pressure and the signal voltage will be high. This information is used by the ECM as an indication of vehicle altitude.

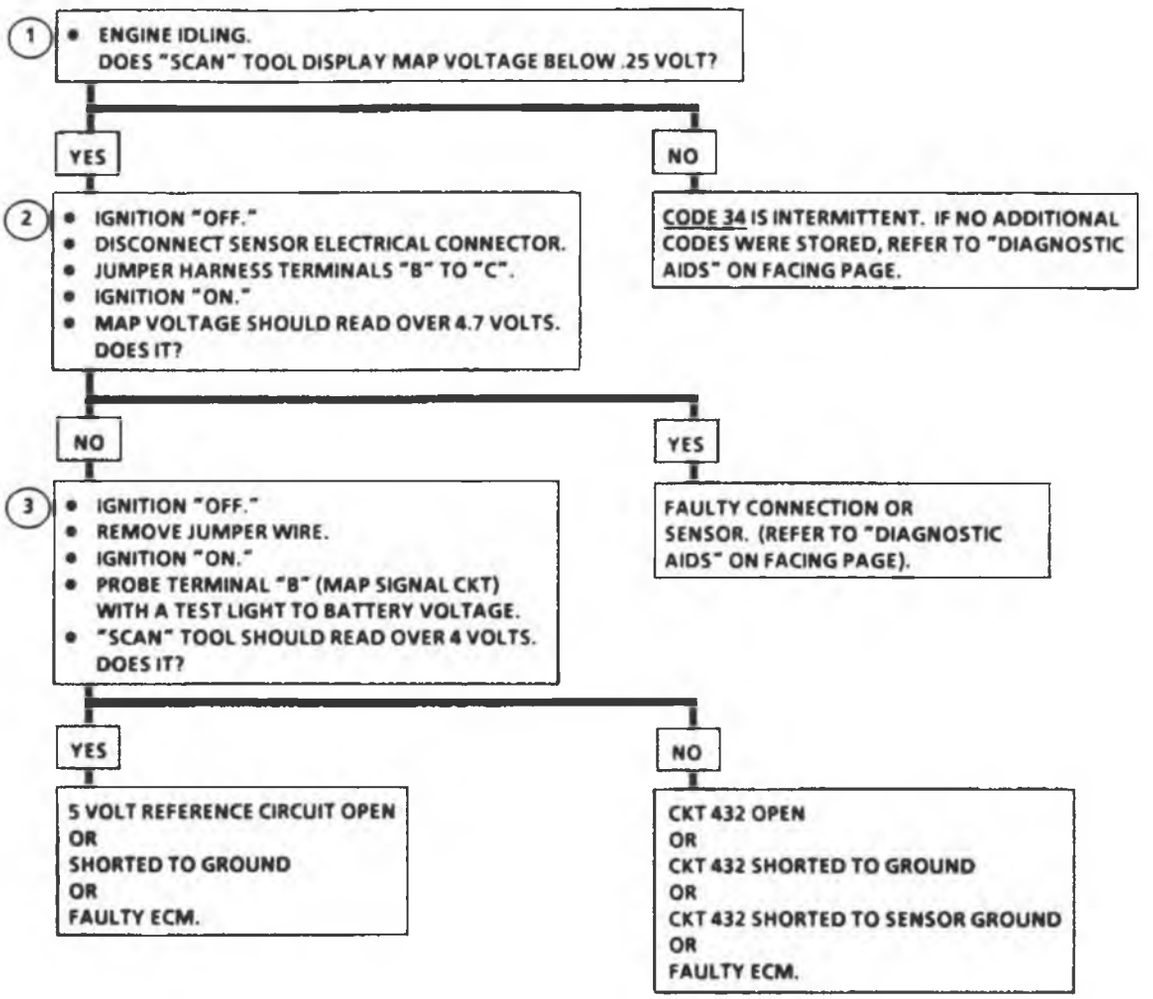
Comparison of this reading with a known good vehicle with the same sensor is a good way to check accuracy of a "suspect" sensor. Readings should be the same ± .4 volts. Also CHART C-1D can be used to test the MAP sensor. Refer to "Intermittents" in Section "B".

NOTE: Make sure electrical connector remains securely fastened.

- Check all connections.
- Disconnect sensor from bracket and twist sensor By hand (only) to check for intermittent connections. Output changes greater than .1 volt indicates a bad connector or connection. If OK, replace sensor.
- Refer to CHART C-1D, MAP sensor voltage output check for further diagnosis.

CODE 34

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT
(SIGNAL VOLTAGE LOW - HIGH VACUUM)



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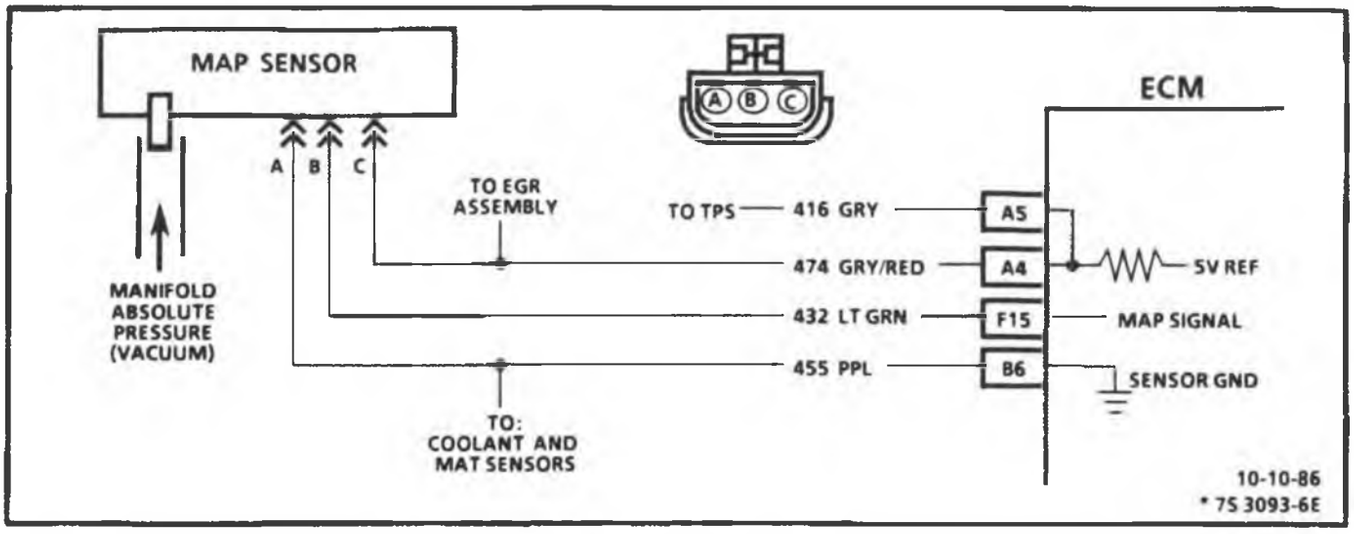


CODE 63

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT
(SIGNAL VOLTAGE HIGH - LOW VACUUM)

Circuit Description:

The Manifold Absolute Pressure (MAP) sensor responds to changes in manifold pressure (vacuum). The ECM receives this information as a signal voltage that will vary from about 1 to 1.5 volts at closed throttle (idle) to 4.5 - 4.8 volts at wide open throttle (low vacuum).

If the MAP sensor fails, the ECM will substitute a fixed MAP value and use the Throttle Position Sensor (TPS) to control fuel delivery.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. Code 63 will set when:
   - Engine running.
   - Manifold pressure greater than 75.3 kPa (A/C "OFF") 81.2 kPa (A/C "ON").
   - Throttle angle less than 2%.
   - Conditions met for 2 seconds.

   Engine misfire or a low unstable idle may set Code 63.
2. With the MAP sensor disconnected, the ECM should see a low voltage if the ECM and wiring are OK.

Diagnostic Aids:

With the ignition "ON" and the engine stopped, the manifold pressure is equal to atmospheric pressure and the signal voltage will be high. This information is used by the ECM as an indication of vehicle altitude. Comparison of this reading with a known good vehicle with the same sensor is a good way to check accuracy of a "suspect" sensor. Readings should be the same ± .4 volt.

If idle is rough or unstable, refer to symptoms in Section "B" for items which can cause an unstable idle.

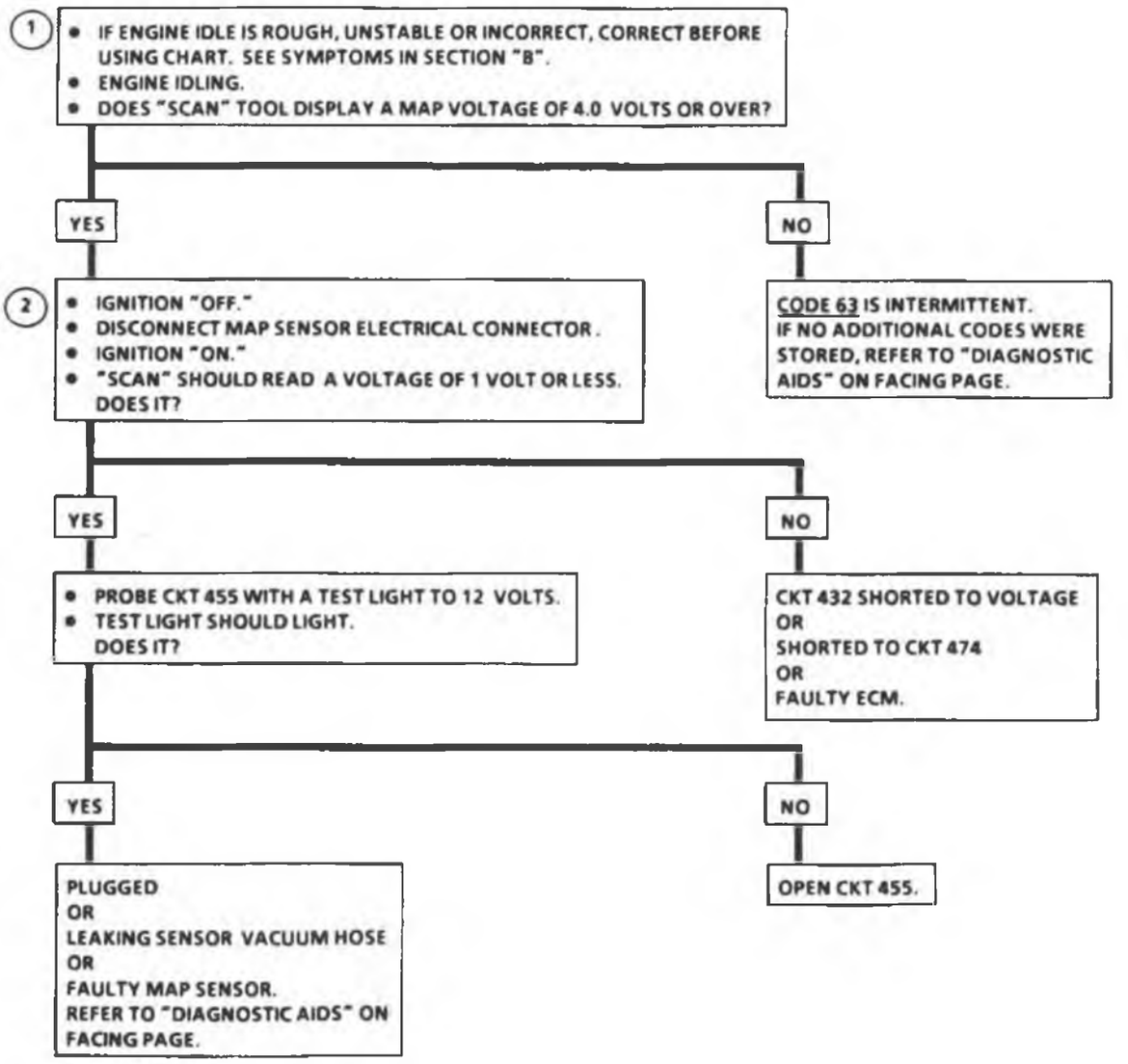
An open in CKT 455 or the connection will result in a Code 63.

NOTE: Make sure electrical connector remains securely fastened.

- Check all connections.
- Disconnect sensor from bracket and twist sensor by hand (only) to check for intermittent connections. Output changes greater than .1 volt indicates a bad connector or connection. If OK, replace sensor.
- Refer to CHART C-1D, MAP sensor voltage output check for further diagnosis.

CODE 63

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT (SIGNAL VOLTAGE HIGH - LOW VACUUM)



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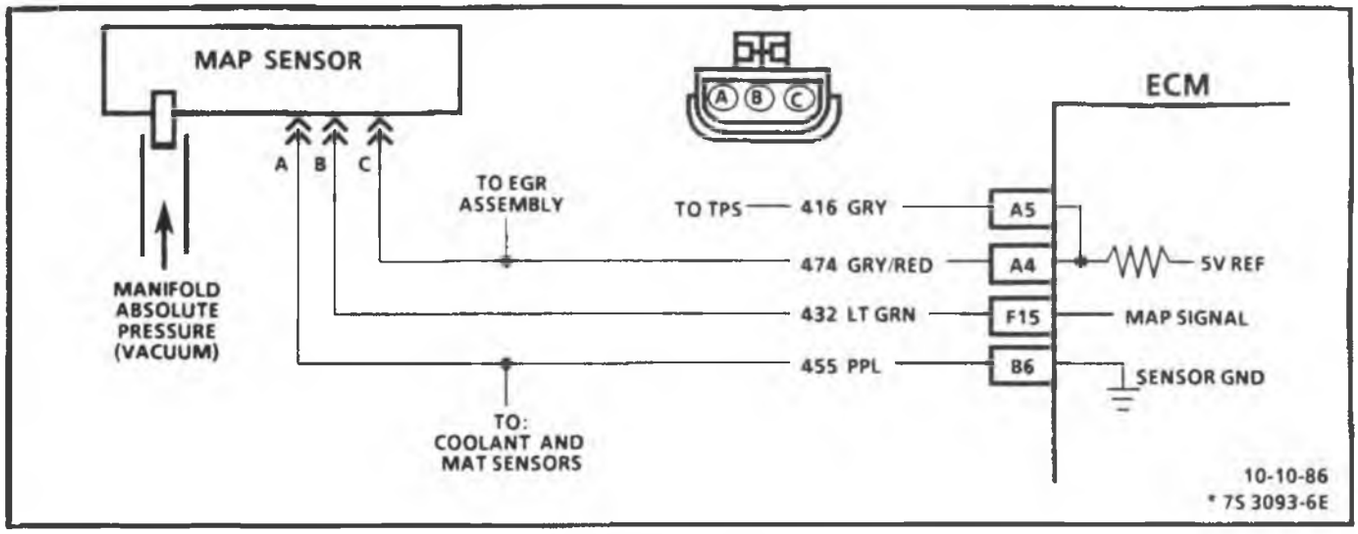


CODE 64

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT
(SIGNAL VOLTAGE LOW - HIGH VACUUM)

Circuit Description:

The Manifold Absolute Pressure (MAP) sensor responds to changes in manifold pressure (vacuum). The ECM receives this information as a signal voltage that will vary from about 1 to 1.5 volts at closed throttle (idle) to 4.5 - 4.8 volts at wide open throttle (low vacuum).

If the MAP sensor fails, the ECM will substitute a fixed MAP value and use the Throttle Position Sensor (TPS) to control fuel delivery.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. Code 64 will set if:
   - Engine rpm less than 600.
   - Manifold pressure reading less than 13 kPa.
   - Conditions met for 1 second.

   or
   - Engine rpm greater than 600.
   - Throttle angle over 20%.
   - Manifold pressure less than 13 kPa.
   - Conditions met for 1 second.
2. This test to see if the sensor is at fault for the low voltage, or if there is an ECM or wiring problem.
3. This simulates a high signal voltage to check for an open in CKT 432. If the test light is bright during this test, CKT 432 is probably shorted to ground. If "Scan" reads over 4 volts at this test, CKT 474 can be checked by measuring the voltage at terminal "C" (should be 5 volts).

Diagnostic Aids:

An intermittent open in CKTs 432 or 474 will result in a Code 64.

With the ignition "ON" and the engine "OFF," the manifold pressure is equal to atmospheric pressure and the signal voltage will be high. This information is used by the ECM as an indication of vehicle altitude.

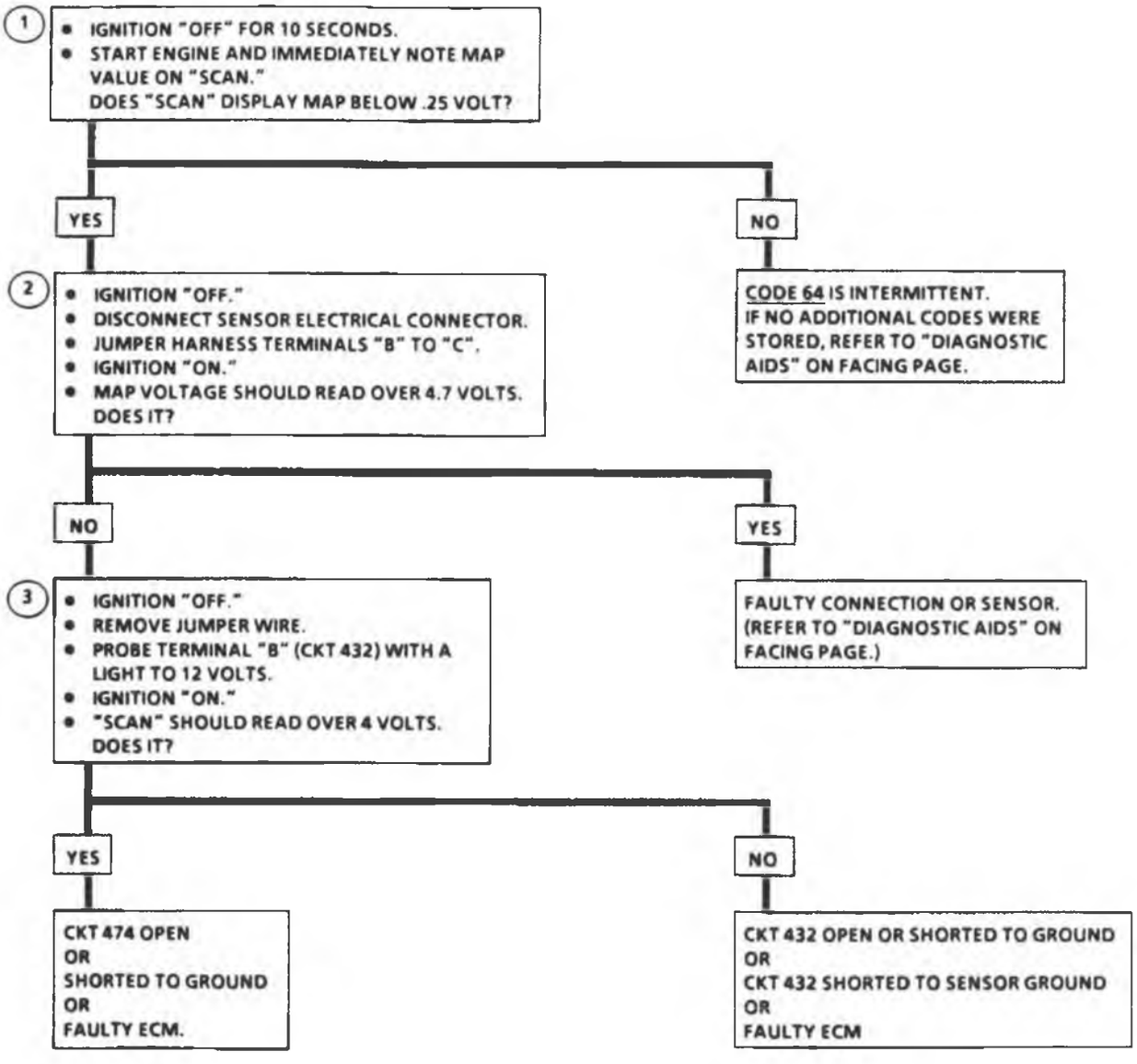
Comparison of this reading with a known good vehicle with the same sensor is a good way to check accuracy of a "suspect" sensor. Readings should be the same ± .4 volts. Also CHART C-1D can be used to test the MAP sensor. Refer to "Intermittents" in Section "B"

NOTE: Make sure electrical connector remains securely fastened.

- Check all connections.
- Disconnect sensor from bracket and twist sensor By hand (only) to check for intermittent connections. Output changes greater than 1 volt indicates a bad connector or connection. If OK, replace sensor.
- Refer to CHART C-1D, MAP sensor voltage output check for further diagnosis.

CODE 64

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT (SIGNAL VOLTAGE LOW - HIGH VACUUM)



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CHEVROLET MOTOR DIVISION
General Motors Corporation
Service Department

CHEVROLET SERVICE

Chevrolet Dealer Service Update Bulletin

90-77-7A
Number: 7A
Section: October 1989
Date: 977145
Corporate Bulletin No.:

Subject: **REVISED PRELIMINARY CHECK PROCEDURE AND SHIFT SPEED CHART FOR 1990 4L60/700-R4 TRANSMISSIONS**

Model and Year: **1990 PASSENGER CARS WITH 4L60 TRANSMISSION**
1990 LIGHT DUTY TRUCKS WITH 4L60 TRANSMISSION

TO: ALL CHEVROLET DEALERS

This bulletin provides a revised Preliminary Check Procedure and Shift Speed Chart for 1990 HM4L60/700-R4 transmissions. These charts have been updated since publication of the 1990 Service Manuals. Please make reference to these changes in your service manuals.

SERVICE UPDATE

1990 HYDRA-MATIC 4L60 SHIFT SPEED CHART

MODEL	1 2 MIN THROTTLE	2 3 MIN THROTTLE	3-4 MIN THROTTLE	1 2 W.O.T.	4-3 COAST DOWN	3 2 COAS DOWN	2 1 COAST DOWN
BAM	13-16	22-27	50 +	29-43	36-48	13-20	9-11
BPM	14-18	26-31	40-52	31-48	29-33	17-24	10-12
CAM, CBM, KAM, MJM, MNM, WAM	14-18	24-42	49 +	31-43	37-48	15-24	11-14
CCM, CFM, KBM, WBM	16-19	25-31	50 +	33-46	37-47	14-24	12-14
CHM, CJM, KCM, RAM, WCM	14-17	22-28	46-53	29-41	34-45	15-21	10-13
DBM	14-18	27-31	38-51	31-43	28-33	16-24	9-12
FBM	14-18	26-33	42-53	37-51	28-35	16-24	10-12
FTM	12-15	22-25	40-49	28-41	31-39	13-22	10-12
FUM	12-15	22-25	39-47	25-41	25-31	14-21	9-11
FZM	12-16	24-31	44-52	36-46	34-39	10-19	10-12
HBM, HHM	12-16	21-25	40-48	27-44	26-35	15-22	9-12
HCM, HDM	15-18	25-28	40-48	31-45	28-34	19-29	12-15
HJM	14-17	27-31	51 +	30-44	31-47	16-27	11-13
LAM, LBM, LCM, LDM, LFM	12-14	21-26	45-51	24-33	28-38	14-21	7-9
MBM, SAM	12-14	20-25	47-53	24-37	37-47	10-18	9-12
MSM	10-13	20-23	40-46	22-36	26-37	11-19	7-9
SHM, TLM	13-18	24-31	50 +	30-42	37-48	19-26	11 13
YDM	13-16	21-25	39-51	39-53	22-28	13-19	9-11

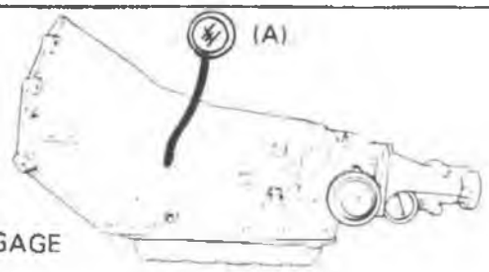
NOTES:
1. ALL SPEEDS INDICATED ARE IN MILES PER HOUR. CONVERSION TO km/h = MPH x 1.609.
2 SHIFT POINTS WILL VARY SLIGHTLY DUE TO ENGINE LOADS AND VEHICLE OPTIONS.
3. SPEEDS LISTED WITH + EXCEED 65 MPH.

LH0002 4L60 R2

Figure 1

PRELIMINARY CHECK PROCEDURE

- CHECK TRANSMISSION FLUID LEVEL
- CHECK AND ADJUST T.V. CABLE
- CHECK OUTSIDE MANUAL LINKAGE AND CORRECT
- CHECK ENGINE TUNE
- INSTALL PRESSURE GAGE
- CONNECT TACHOMETER TO ENGINE
- CHECK PRESSURE AS FOLLOWS:



(A) ATTACH PRESSURE GAGE

Minimum T.V. Line Pressure Check
Set the T.V. cable to specification; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m. indicated in the chart below.

Full T.V. Line Pressure Check
Full T.V. line pressure readings are obtained by tying or holding the T.V. cable to the full extent of its travel; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m. indicated in the chart below.

***NOTICE** Total running time for this combination not to exceed 2 minutes.

CAUTION Brakes must be applied at all times.

1990 HYDRA-MATIC 4L60 TRANSMISSION PRESSURES

RANGE	MODEL	NORMAL PRESSURE AT MINIMUM T.V.		NORMAL PRESSURE AT FULL T.V.	
		kPa	PSI	kPa	PSI
PARK, NEUTRAL, OVERDRIVE & MANUAL 3RD @ 1000 RPM	BAM, FTM	451-515	65-75	816-1016	118-147
	BPM	451-515	65-75	1025-1306	149-189
	CAM, CBM, HCM, HDM, KAM, MJM, MNM, WAM	451-515	65-75	851-1063	123-154
	CCM, CFM, TNM, WBM	451-515	65-75	947-1185	137 172
	CHM, CJM, RAM, TMM, WCM	451-515	65-75	914 1149	133 167
	DBM	483-622	70-90	883 1170	128 170
	FBM	451-515	65-75	918 1146	133 166
	FUM, FZM	451 515	65-75	1073 1354	155 196
	HBM, HHM	483-622	70-90	1019-1347	148-195
	HJM, YDM	451-515	65-75	1116 1430	162 207
	LAM, LBM, LCM, LDM, LFM	451-515	65-75	899-1134	130 164
	MBM, SAM	451-515	65 75	845-1068	123 155
	MSM	483-622	70-90	797-1079	116 157
	SHM, TLM	451-515	65-75	969-1231	141 179
REVERSE @ 1000 RPM	BAM, FTM	742-847	108 123	1342-1670	195 242
	BPM	742-847	108-123	1686-2146	245 311
	CAM, CBM, HCM, HDM, KAM, MJM, MNM, WAM	742-847	108-123	1400-1747	203 253
	CCM, CFM, TNM, WBM	742-847	108-123	1556-1948	226-283
	CHM, CJM, RAM, TMM, WCM	742-847	108-123	1503-1869	218 274
	DBM	793-1023	115-148	1451-1924	210-279
	FBM	580-662	84-96	1180-1472	171 214
	FUM, FZM	742-847	108-123	1763-2225	256 323
	HBM, HHM	793-1023	115-148	1676 2214	243 320
	HJM, YDM	742 847	108-123	1834-2351	265 340
	LAM, LBM, LCM, LDM, LFM	741 845	107-123	1474 1860	214 270
	MBM, SAM	580-662	84-96	1085-1372	157 199
	MSM	793-1023	115-148	1311 1773	190 257
	SHM, TLM	742-847	108-123	1593-2023	231 293
MANUAL 2ND & MANUAL LO @ 1000 RPM	BAM, BPM, CAM, CBM, CCM, CFM, CHM, CJM, FBM, FTM, FUM, FZM, HCM, HDM, HJM, KAM, MBM, MJM, MNM, RAM, SAM, SHM, TLM, TMM, TNM, WAM, WBM, WCM, YDM	1127 1286	163-186	1127 1286	163 186
	DBM, HBM, HHM, MSM	1205-1554	175-226	1205-1554	175 226
	LAM, LBM, LCM, LDM, LFM	1191 1359	173-197	1191-1359	173 197

Line pressure is basically controlled by pump output and the pressure regulator valve. In addition, line pressure is boosted in Reverse, Second and Lo by the reverse boost valve.

Also, in the Neutral, Drive, Intermediate and Reverse positions of the selector lever, the line pressure should increase with throttle opening because of the T.V. system. The pressure is controlled by the T.V. cable, the throttle lever and bracket assembly and the T.V. link, as well as the control valve assembly.

The main line pressure tap plug is located on the left side of the transmission above the outside manual lever.

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Figure 2

CHEVROLET MOTOR DIVISION
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Service Department

CHEVROLET SERVICE

Chevrolet Dealer Service Update Bulletin

90-89-7A
Number:
7A
Section:
November 1989
Date:
977159
Corporate Bulletin No

Subject: **REVISED ACCUMULATOR SPRING CHART**

Model and Year: **1990 B, Y CARS AND C, K, G, L, M, R, S, T, V TRUCKS WITH 4L60/700R4 AUTOMATIC TRANSMISSION**

TO: ALL CHEVROLET DEALERS

This bulletin covers revised 1-2 and 3-4 Accumulator Spring Chart. The new chart is applicable to all 1990 THM 700-R4/HYDRA-MATIC 4L60 transmissions. See Figure 1.

Use the following chart to update your 1990 HYDRA-MATIC 4L60 Unit Repair Service Manual Section, page 4L60-50, Figure 110.

SERVICE UPDATE

1990 MODELS	1-2 ACCUMULATOR SPRING COLOR	3-4 ACCUMULATOR SPRING COLOR
CHM, CJM, KCM, RAM, WCM	ORANGE, LT. GREEN, WHITE OR PLAIN	VIOLET
CAM, CBM, KAM, MJM, MNM, WAM	ORANGE, LT. GREEN, WHITE OR PLAIN	DK. GREEN
CCM, CFM, FTM, KBM, LAM, LBM, LCM, LDM, LFM, WBM	ORANGE, LT. GREEN, WHITE OR PLAIN	RED
FUM	YELLOW	YELLOW
HCM, MBM, SAM	YELLOW	RED
SHM, TLM	DK. GREEN	LT. BLUE
BAM, FZM	YELLOW	VIOLET
HBM, HHM	DK. GREEN	YELLOW
FBM, HDM	DK. GREEN	RED
DBM	ORANGE, LT. GREEN, WHITE OR PLAIN	ORANGE, LT. GREEN, WHITE OR PLAIN
HJM	VIOLET	YELLOW
YDM	YELLOW	ORANGE, LT. GREEN, WHITE OR PLAIN
MSM	ORANGE, LT. GREEN, WHITE OR PLAIN	YELLOW
BPM, 188M	DK. GREEN	ORANGE, LT. GREEN, WHITE OR PLAIN

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Figure 1

CHEVROLET MOTOR DIVISION
General Motors Corporation
Service Department

CHEVROLET SERVICE

Chevrolet Dealer Service Update Bulletin

90-56-8
Number:
8
Section:
September 1989
Date:
916521R
Corporate Bulletin No.:

Subject: **PACKARD 32 WAY CONNECTOR IDENTIFICATION**

Model and Year: **1980-90 A, B, F, G, J, L, W, Y CARS AND ALL TRUCKS WITH GMP4 ECM APPLICATIONS**

TO: ALL CHEVROLET DEALERS

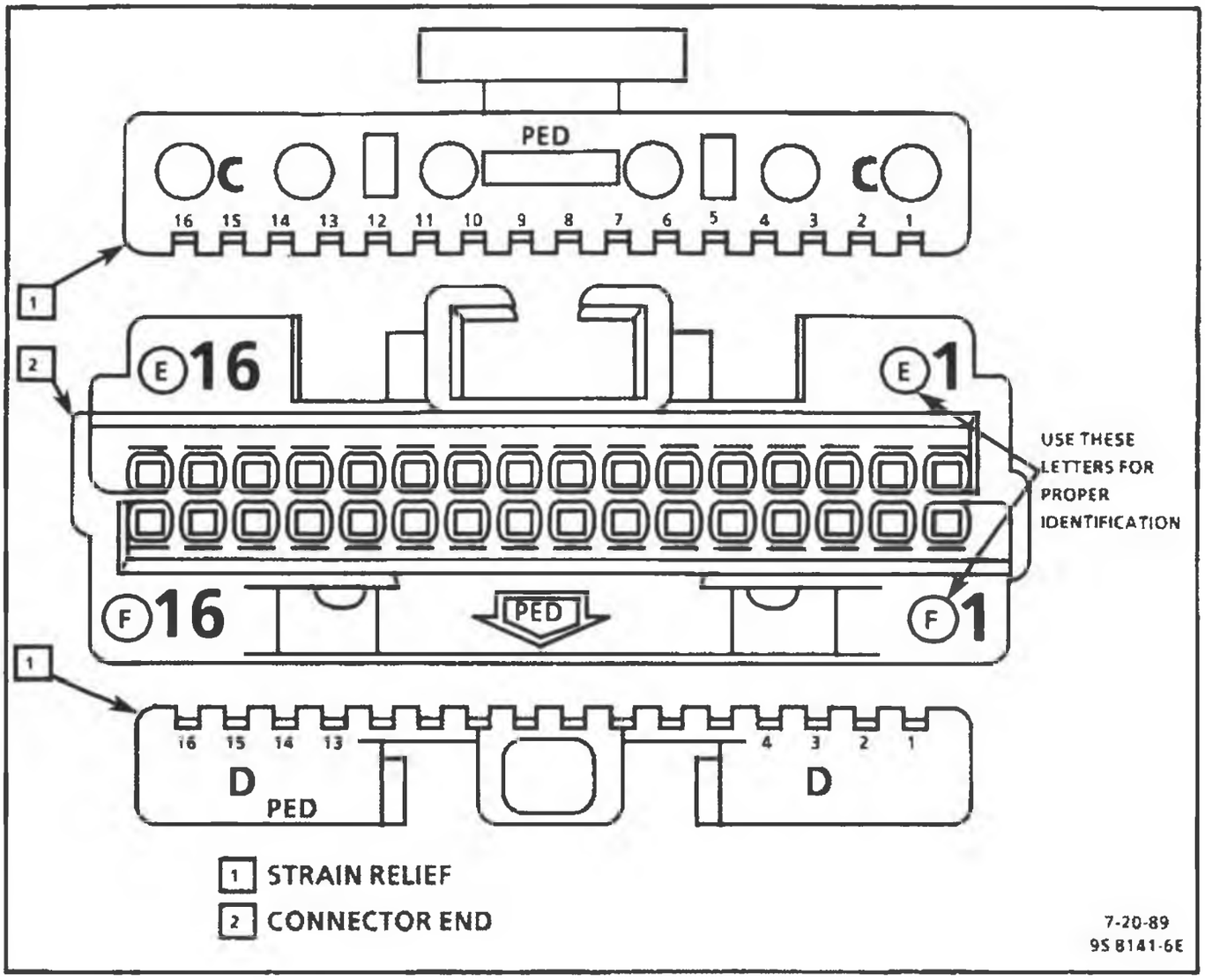
This bulletin serves to clarify the labeling of the Packard 32 way connectors used on the GMP4 under dash ECMs.

Currently a common strain relief is used in both the C-D 32 pin and the E-F 32 pin connectors. To properly identify these connectors, the strain reliefs must be removed. Use the lettering on the connector as shown on the attached document.

The colors used at this time for the 32 pin E-F connector are yellow, mint green or orange.

This updates any previous information released concerning identification that indicates any of these colors as being C & D connectors, found in the 6E and 8D Sections of the affected Service Manuals.

SERVICE UPDATE


PED
C
C
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
1
2
E 16
E 1
USE THESE LETTERS FOR PROPER IDENTIFICATION
F 16
PED
F 1
1
16 15 14 13
D
PED
4 3 2 1
D
1 STRAIN RELIEF
2 CONNECTOR END
7-20-89
9S 8141-6E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