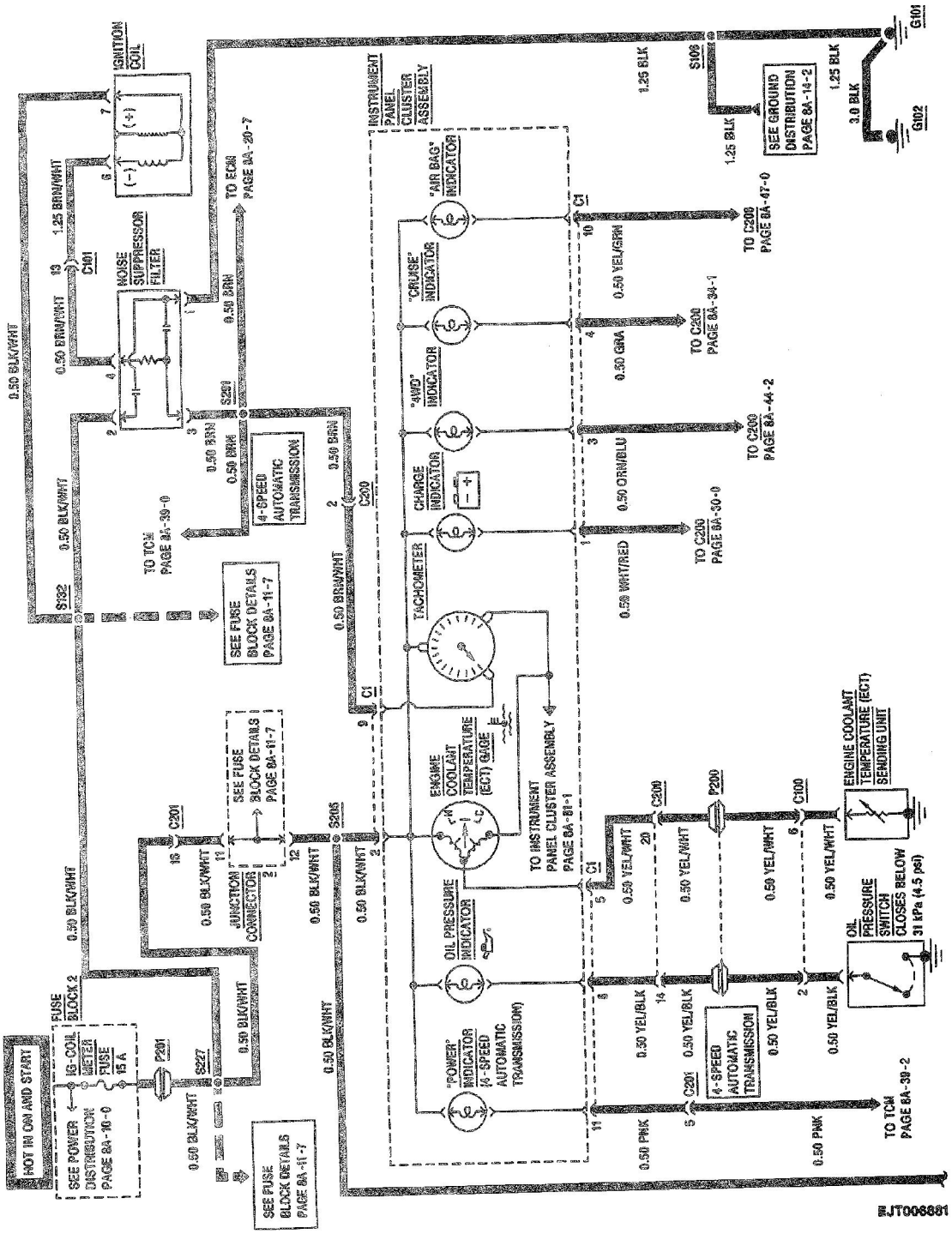
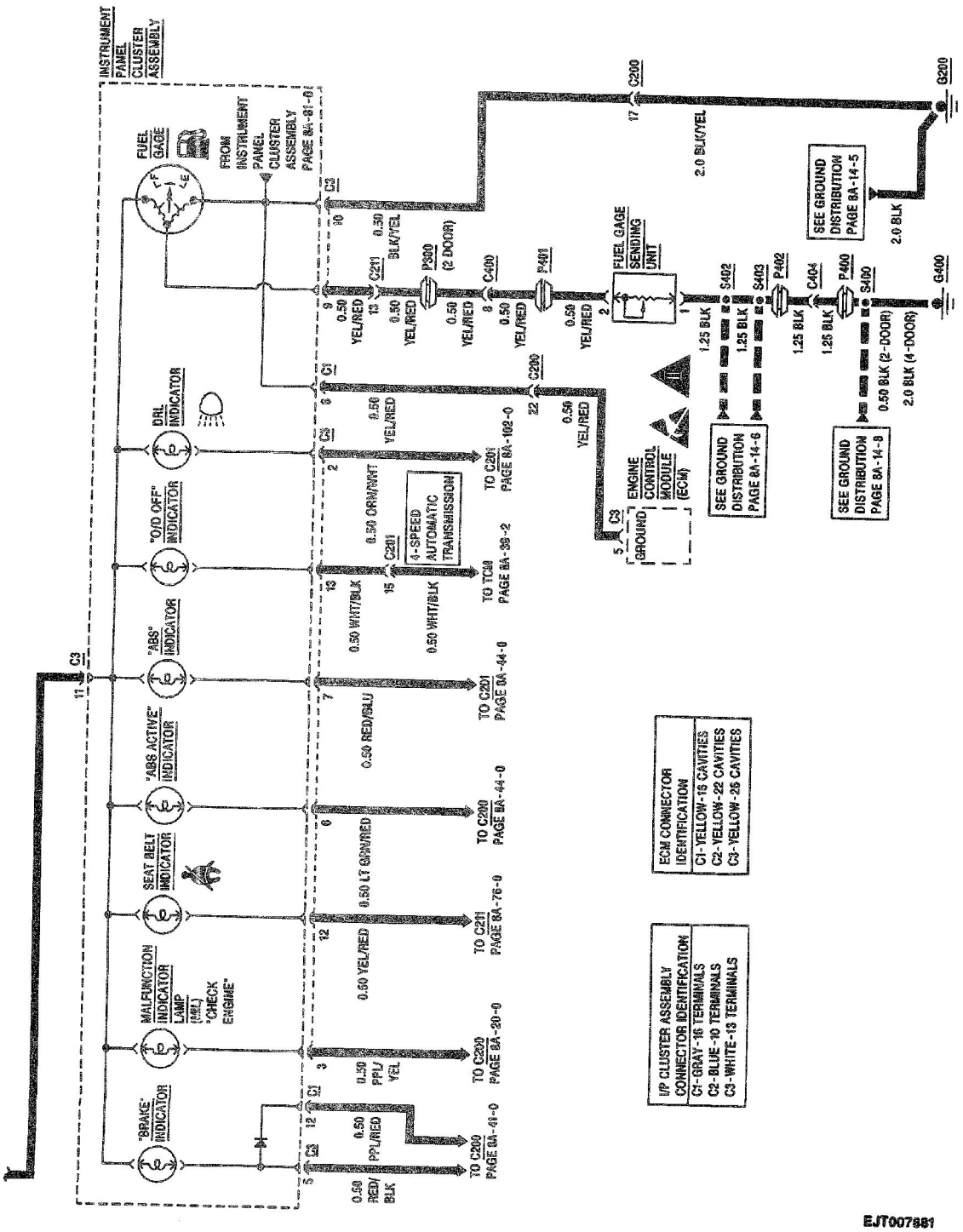
INSTRUMENT CLUSTER: WITH GAGES




INSTRUMENT PANEL CLUSTER ASSEMBLY
FUEL GAGE
FROM INSTRUMENT PANEL CLUSTER ASSEMBLY PAGE 8A-81-0
"BRAKE" INDICATOR
MALFUNCTION INDICATOR LAMP (MIL) "CHECK ENGINE"
SEAT BELT INDICATOR
"ABS ACTIVE" INDICATOR
"ABS" INDICATOR
"O/D OFF" INDICATOR
DRL INDICATOR
C3
C1
C2
C200
C201
C211
P300 (2 DOOR)
C400
P401
FUEL GAGE SENDING UNIT
S402
P402
C404
P400
S403
S400
G200
G400
4-SPEED AUTOMATIC TRANSMISSION
TO TCM PAGE 8A-39-2
ENGINE CONTROL MODULE (ECM)
GROUND
SEE GROUND DISTRIBUTION PAGE 8A-14-6
SEE GROUND DISTRIBUTION PAGE 8A-14-8
SEE GROUND DISTRIBUTION PAGE 8A-14-5
0.50 BLK (2-DOOR)
2.0 BLK (4-DOOR)
2.0 BLK
2.0 BLK/YEL
1.25 BLK
0.50 YEL/RED
0.50 BLK/YEL
0.50 ORN/WHT
0.50 WHT/BLK
0.50 RED/BLU
0.50 LT GRN/RED
0.50 YEL/RED
0.50 PPL/YEL
0.50 PPL/RED
0.50 RED/BLK
TO C200 PAGE 8A-44-0
TO C201 PAGE 8A-44-0
TO C201 PAGE 8A-76-0
TO C200 PAGE 8A-80-0
TO C200 PAGE 8A-81-0
TO C201 PAGE 8A-102-0
I/P CLUSTER ASSEMBLY CONNECTOR IDENTIFICATION
C1-GRAY-16 TERMINALS
C2-BLUE-10 TERMINALS
C3-WHITE-13 TERMINALS
ECM CONNECTOR IDENTIFICATION
C1-YELLOW-16 CAVITIES
C2-YELLOW-22 CAVITIES
C3-YELLOW-26 CAVITIES

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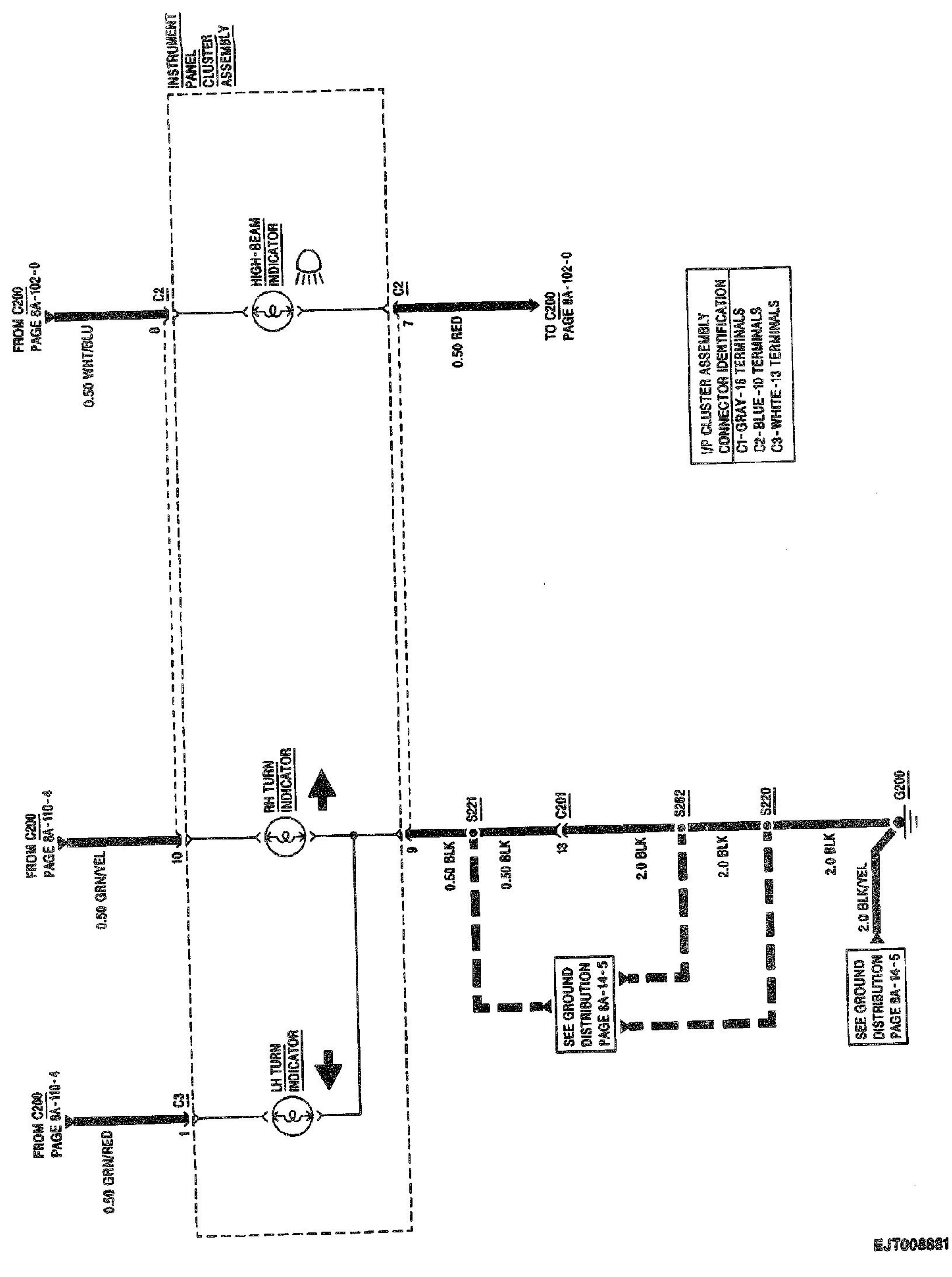
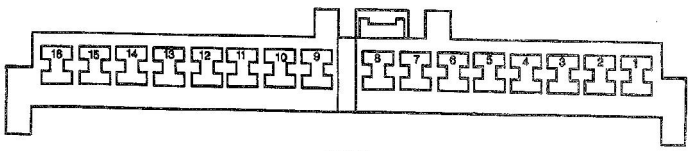
INSTRUMENT CLUSTER: WITH GAGES



INSTRUMENT PANEL CLUSTER CONNECTOR: C1



GRAY

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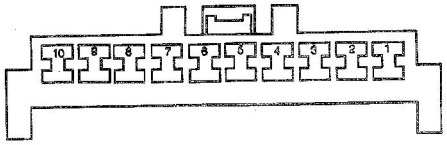
WIRING DETAIL LEGEND

CAVITY	WIRE COLOR	CIRCUIT
1	WHT/RED	Charge Indicator
2	BLK/WHT	Engine Coolant Temperature (ECT) Gage
3	ORN/BLU	"4WD" Indicator
4	GRA	Cruise Indicator
5	YEL/WHT	Engine Coolant Temperature (ECT) Sending Unit
6	YEL/RED	ECM Ground
7	—	NOT USED
8	YEL/BLK	Oil Pressure Switch

CAVITY	WIRE COLOR	CIRCUIT
9	BRN/WHT	Tachometer
10	YEL/GRN	Air Bag Indicator
11	PNK	Power Indicator (4-Speed Automatic Transmission)
12	PPL/RED	Brake Indicator
13	—	NOT USED
14	—	NOT USED
15	RED/GRN	Illumination Lamps
16	RED/YEL	Illumination Lamps

INSTRUMENT CLUSTER: WITH GAGES

INSTRUMENT PANEL CLUSTER CONNECTOR: C2



BLUE

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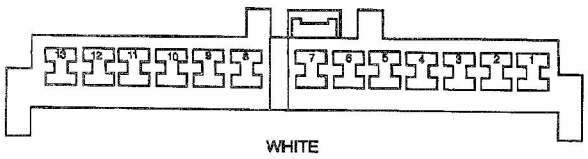
WIRING DETAIL LEGEND

CAVITY	WIRE COLOR	CIRCUIT
1	—	NOT USED
2	—	NOT USED
3	—	NOT USED
4	—	NOT USED
5	—	NOT USED

CAVITY	WIRE COLOR	CIRCUIT
6	—	NOT USED
7	RED	High Beam Indicator
8	WHT/BLU	Battery
9	BLK	Turn Indicator
10	GRN/YEL	RH Turn Indicator

INSTRUMENT PANEL CLUSTER CONNECTOR: C3



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WIRING DETAIL LEGEND

CAVITY	WIRE COLOR	CIRCUIT
1	GRN/RED	LH Turn Indicator
2	ORN/WHT	DRL Indicator
3	PPL/YEL	MIL Indicator
4	YEL	Speedometer
5	RED/BLK	Brake Indicator
6	LT GRN/RED	ABS Active Indicator
7	RED/BLU	ABS Indicator

CAVITY	WIRE COLOR	CIRCUIT
8	BLK/RED	NOT USED
9	YEL/RED	Fuel Gage
10	BLK/YEL	Ground
11	BLK/WHT	Ignition
12	YEL/RED	Seat Belt Indicator
13	WHT/BLU	O/D OFF Indicator

INSTRUMENT CLUSTER: WITH GAGES

COMPONENT	LOCATION	201-PG	FIG.	CONN
Engine Control Module (ECM)	Under LH I/P, left of Steering Column			
Fuel Gage Sending Unit	In Fuel Tank			
Fuse Block 2	Under LH I/P	06	A	
Ignition Coil	In Distributor			
Instrument Panel Cluster Assembly	LH I/P	07	A	
C1 (16 Terminals)	I/P Harness to I/P Cluster Assembly, behind I/P Cluster Assembly	07	A	81-03
C2 (10 Terminals)	I/P Harness to I/P Cluster Assembly, behind I/P Cluster Assembly	07	A	81-04
C3 (13 Terminals)	I/P Harness to I/P Cluster Assembly, behind I/P Cluster Assembly	07	A	81-05
Noise Suppressor Filter	LH Rear Engine Compartment, below Front Wiper Motor	04	A	
Oil Pressure Switch	LH Engine, above Oil Filter			
C100 (16 Cavities)	Main Harness to Engine Harness, on Bulkhead mounted to Bracket, left of Front Wiper Motor	04	A	202-01A1
C200 (22 Cavities)	Main Harness to I/P Harness, LH I/P near Fuse Block 2	06	A	202-06A1
C201 (16 Cavities)	Main Harness to I/P Harness, LH I/P near Fuse Block 2	06	A	202-07A1
C211 (16 Cavities)	I/P Harness to Floor Harness, LH I/P, near "A" Pillar	07	A	202-09A1
C400 (12 Cavities) (2-Door)	Floor Harness to Rear Lamp Harness, behind LH Rear Wheelhousing	10	A	202-11A2
C400 (10 Cavities) (4-Door)	Floor Harness to Rear Lamp Harness, behind LH Rear Wheelhousing	10	A	202-11A1
C404 (1 Cavity)	Rear Lamp Harness to Rear Door Harness, behind RH Rear Wheelhousing			
G101	On Bulkhead behind Distributor	04	A	
G102	RH Rear of Engine near Distributor			
G200	Behind LH I/P, above Fuse Block 2	06	A	
G400	Inside Rear Door near License Plate Lamps			
P200	LH Engine Compartment on Bulkhead, near Brake Master Cylinder	04	A	
P201	RH Rear Engine Compartment on Bulkhead, near Battery	01	A	
P300 (2-Door)	LH "A" Pillar, under I/P, behind LH Kick Panel	08	A	
P400	Rear Door			
	(2-Door)	14	A	
	(4-Door)	13	A	
P401	Rear of Vehicle, right of LH Frame Rail	10	A	
P402	Rear of Vehicle, left of RH Frame Rail	10	A	

COMPONENT	LOCATION	201-PG FIG. CONN
S106	Main Harness, at Bulkhead near Ignition Coil	
S132	Main Harness, at Bulkhead near Front Wiper Motor	
S205	I/P Harness, behind center of I/P	
S220	Main Harness, near I/P left of Steering Column	
S221	I/P Harness near, C201 breakout	
S227	Main Harness, near Fuse Block 2	
S262	Main Harness, left of Steering Column	
S291	Main Harness, near Engine Control Module (ECM)	
S400	Rear Door Harness, near License Plate Lamps	
S402	Rear Lamp Harness, near RH Rear Combination Lamp	
S403	Rear Lamp Harness, near RH Rear Combination Lamp	

TROUBLESHOOTING HINTS

1. Check IG-COIL METER Fuse by starting vehicle.
2. Check that grounds G101, G102, G200 and G400 are clean and tight.
3. Check that the engine coolant level is adequate for Engine Coolant Temperature (ECT) Gage operation.
4. Check that engine oil level is adequate for Oil Pressure Indicator operation.
5. If the Oil Pressure Indicator remains lit with the engine running, refer to SECTION 6 to check for proper oil pressure.
6. If the INSTRUMENT PANEL CLUSTER ASSEMBLY appears completely inoperative, check for an open in the BLK/WHT wire between FUSE BLOCK 2 and the INSTRUMENT PANEL CLUSTER ASSEMBLY.
7. If the INSTRUMENT PANEL CLUSTER ASSEMBLY appears partially inoperative:
   - Check for an open in the BLK/YEL wire between the INSTRUMENT PANEL CLUSTER ASSEMBLY and G200.
   - Check the INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT for cracks and bad connections. If printed circuit is damaged, refer to SECTION 8C for proper replacement procedure.

INSTRUMENT CLUSTER: WITH GAGES

SYSTEM DIAGNOSIS

TEST	RESULT	ACTION
1. Turn IGNITION SWITCH to "ON."	Oil Pressure Indicator Lights.	GO to step 2.
	Oil Pressure Indicator does not light.	GO to step 6.
2. Start engine.	Oil Pressure Indicator goes out.	GO to step 3.
	Oil Pressure Indicator remains lit.	GO to step 8.
3. Check Fuel Gage operation.	Fuel Gage indicates correct fuel tank level.	GO to step 4.
	Fuel Gage indicates "E" at all times.	GO to step 9.
	Fuel Gage indicates "F" at all times	GO to step 12.
4. Run engine until normal operating temperature is attained. Check Engine Coolant Temperature (ECT) Gage.	ECT Gage indicates correct engine coolant temperature.	GO to step 5.
	ECT Gage indicates "C" at all times.	GO to step 14.
	ECT Gage indicates "H" at all times.	GO to step 16.
5. With engine running, check Tachometer operation.	Tachometer indicates engine rpm.	All systems in this cell are functioning normally.
	Tachometer does not indicate engine rpm.	GO to step 18.
6. Disconnect OIL PRESSURE SWITCH connector. Connect a fused jumper from OIL PRESSURE SWITCH connector to chassis ground.	Oil Pressure Indicator lights.	Replace OIL PRESSURE SWITCH.
	Oil Pressure Indicator does not light.	GO to step 7.
7. Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C1. Connect a digital multimeter from connector C1 cavity 1 to chassis ground. Measure resistance.	More than 0.5 ohms.	Repair open in YEL/BLK wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and OIL PRESSURE SWITCH.
	Less than 0.5 ohms.	Repair/replace INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT.
8. Disconnect OIL PRESSURE SWITCH connector.	Oil Pressure Indicator remains lit.	Repair short to ground in YEL/BLK wire or INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT.
	Oil Pressure Indicator goes out.	Check oil pressure with a mechanical gage. If OK, replace OIL PRESSURE SWITCH.
9. Disconnect FUEL GAGE SENDING UNIT connector. Connect a digital multimeter from connector cavity 1 to chassis ground. Measure resistance.	More than 3.0 ohms.	Repair open in BLK wire between FUEL GAGE SENDING UNIT and G400.
	Less than 3.0 ohms.	GO to step 10.
10. Connect a fused jumper from FUEL GAGE SENDING UNIT connector cavity 2 to chassis ground.	Fuel Gage indicates "F."	Replace FUEL GAGE SENDING UNIT.
	Fuel Gage continues to indicate "E."	GO to step 11.
11. Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C2. Connect a digital multimeter from connector C2 cavity 9 to chassis ground. Measure resistance.	More than 3.0 ohms.	Repair open in YEL/RED wire between Fuel Gage and FUEL GAGE SENDING UNIT.
	Less than 3.0 ohms	Check INSTRUMENT PANEL CLUSTER for cracks and bad connections. If OK, replace Fuel Gage.

TEST	RESULT	ACTION
12. Disconnect FUEL GAGE SENDING UNIT connector.	Fuel Gage indicates "E."	Replace FUEL GAGE SENDING UNIT.
	Fuel Gage continues to indicate "F."	GO to step 13.
13. Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C2. Connect a digital multimeter from connector C2 cavity 9 to chassis ground.	Less than infinite.	Repair short to ground in YEL/RED wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and FUEL GAGE SENDING UNIT.
	Infinite.	Check INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT for cracks and bad connections. If OK, replace Fuel Gage.
14. Disconnect ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT connector. Connect a fused jumper from connector cavity to chassis ground.	ECT Gage indicates "H."	Replace ECT SENDING UNIT.
	ECT Gage still indicates "C."	GO to step 15.
15. Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C1. Connect a digital multimeter from connector C1 cavity 5 to chassis ground. Measure resistance.	More than 3.0 ohms.	Repair open in YEL/WHT wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and ECT SENDING UNIT.
	Less than 3.0 ohms.	Check INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT for cracks and bad connections. If OK, replace ECT Gage.
16. Disconnect ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT connector.	ECT Gage indicates "C."	Replace ECT SENDING UNIT.
	ECT Gage still indicates "H."	GO to step 17.
17. Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C1. Connect a digital multimeter from connector cavity 5 to chassis ground. Measure resistance.	Infinite.	Check INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT for cracks and bad connections. If OK, replace ECT Gage.
	Less than infinite.	Repair short to ground in YEL/WHT wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and ECT SENDING UNIT.
18. Turn IGNITION SWITCH to "OFF." Disconnect INSTRUMENT PANEL CLUSTER ASSEMBLY connector C3. Connect a digital multimeter from connector C3 cavity 10 to chassis ground. Measure resistance.	More than 0.3 ohms.	Repair open in BLK wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and G200.
	Less than 0.3 ohms.	GO to step 19.
19. Disconnect ENGINE CONTROL MODULE connector C3 and NOISE SUPPRESSOR FILTER connector. Connect a digital multimeter from NOISE SUPPRESSOR FILTER connector cavity 3 to INSTRUMENT PANEL CLUSTER ASSEMBLY connector C1 cavity 9. Measure resistance.	More than 0.5 ohms.	Repair open in BRN wire between NOISE SUPPRESSOR FILTER and INSTRUMENT PANEL CLUSTER ASSEMBLY.
	Less than 0.5 ohms.	GO to step 20.

INSTRUMENT CLUSTER: WITH GAGES

TEST	RESULT	ACTION
20. Disconnect IGNITION COIL connector. Connect a digital multimeter from IGNITION COIL connector cavity 2 to NOISE SUPPRESSOR FILTER cavity 4. Measure resistance.	More than 0.3 ohms.	Repair open in BRN/WHT wire between IGNITION COIL and NOISE SUPPRESSOR FILTER.
	Less than 0.3 ohms.	GO to step 21.
21. Turn IGNITION SWITCH "ON". Disconnect NOISE SUPPRESSOR FILTER connector. Backprobe NOISE SUPPRESSOR FILTER connector with a test lamp from cavity 2 to Ground.	Test lamp does not light.	Repair open in BLK/WHT wire between NOISE SUPPRESSOR FILTER and IG-COIL METER FUSE.
	Test lamp lights.	GO to step 22.
22. Turn IGNITION SWITCH to "OFF." Disconnect NOISE SUPPRESSOR FILTER connector. Backprobe NOISE SUPPRESSOR FILTER connector with a test lamp from cavity 1 to B+.	Test lamp does not light.	Repair open in BLK wire between NOISE SUPPRESSOR FILTER and G101.
	Test lamp lights.	Replace NOISE SUPPRESSOR FILTER.

COMPONENT REPLACEMENT INFORMATION

For component replacement procedures, refer to the section listed below.

CIRCUIT OPERATION

FUEL GAGE

The pointer of the Fuel Gage is moved by the magnetic fields of two coils. The coils are at right angles to each other. Voltage is applied to coil F from the IG-COIL METER Fuse. The circuit divides at the opposite (ground) side of the coil. One path seeks a ground through coil E to G200 and the other path seeks a ground through the variable resistor in the FUEL GAGE SENDING UNIT.

When fuel level is low, resistance in the FUEL GAGE SENDING UNIT is high. Since current will always seek the path of least resistance, current will flow through coil F and coil E to ground at G200. Because the length of the E coil winding is twice the length of the F coil winding, the magnetic field generated by the E coil is twice as strong as the magnetic field generated by the F coil. Therefore, the pointer will be pulled to the "E" position.

As fuel level increases, resistance in the FUEL GAGE SENDING UNIT decreases. Since current will always seek the path of least resistance, more current will begin to bypass the E coil and travel directly to ground through the FUEL GAGE SENDING UNIT. Under these conditions, the coil F magnetic field becomes stronger than the coil E magnetic field and the pointer moves toward the "F" position.

ENGINE COOLANT TEMPERATURE (ECT) GAGE

The pointer of the Engine Coolant Temperature (ECT) Gage is moved by the magnetic fields of two coils. The coils are at right angles to each other. Voltage is applied to coil H from the IG-COIL METER Fuse. The circuit divides at the opposite (ground) side of the coil. One path seeks a ground through coil C and the other path seeks a ground through the variable resistor in the ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT.

When engine coolant temperature is low, resistance in the ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT is high. Since current will always seek the path of least resistance, current will flow through the H coil and the C coil to ground at G200. Because the length of the C coil winding is twice the length of the coil H winding, the magnetic field generated by coil C is twice as strong as the magnetic field generated by coil H. Therefore, the pointer will be pulled to the "C" position.

As engine coolant temperature increases, resistance in the ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT decreases. Since current will always seek the path of least resistance, more current will begin to bypass the C coil and travel directly to ground through the ENGINE COOLANT TEMPERATURE (ECT) SENDING UNIT. Under these conditions, the coil H magnetic field becomes stronger than the coil C magnetic field and the pointer moves toward the "H" position.

OIL PRESSURE INDICATOR

With the IGNITION SWITCH in the "ON" or "START" position, Battery voltage is applied through the IG-COIL METER Fuse to the Oil Pressure Indicator in the INSTRUMENT PANEL CLUSTER ASSEMBLY. If engine oil pressure should fall below 32 kPa (4.5 psi), the OIL PRESSURE SWITCH located on the engine block closes. With this switch closed, a ground path is provided to the Oil Pressure Indicator and the bulb lights.

TACHOMETER

The Tachometer displays engine speed in rpm. Ground pulses are taken from the ignition system and sent to the Tachometer. The Tachometer responds to the frequency of the ground pulses, which increase with engine speed. The purpose of the NOISE SUPPRESSOR FILTER within the circuit is to round off pulses and remove voltage spikes caused by noise in the circuit.