INSTRUMENT CLUSTERS, CONTROL AND WARNING SYSTEMS

GROUP 33
(10000 & 19000)

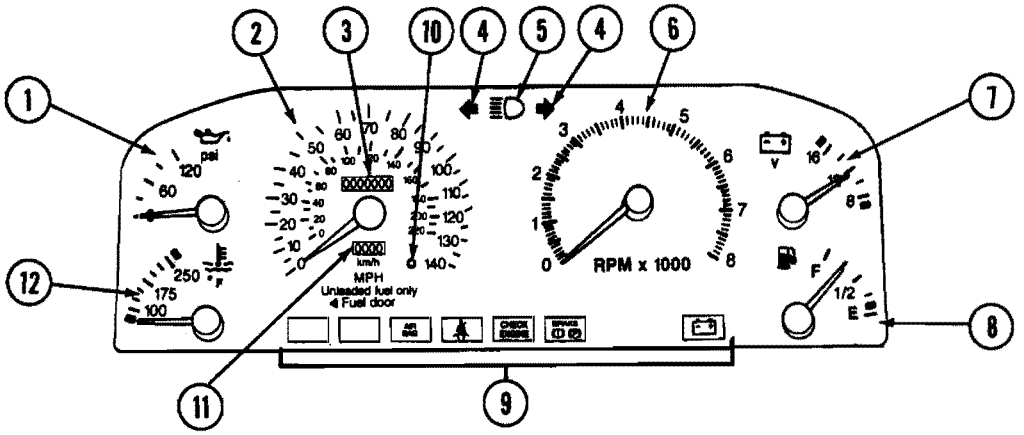
SECTION 33-01 Instrument Cluster

VEHICLE APPLICATION

Capri.

DESCRIPTION

The instrument cluster contains a speedometer, tachometer, fuel gauge, voltmeter, oil pressure gauge and engine coolant temperature gauge. It also contains warning indicator lamps. A boost gauge is included on turbocharged vehicles. All panel / cluster lamps are controlled by the panel dimmer switch located on the instrument panel.



STANDARD INSTRUMENTATION

1. ENGINE OIL PRESSURE GAUGE
2. SPEEDOMETER
3. ODOMETER
4. TURN SIGNAL/HAZARD INDICATOR LAMP
5. HIGH BEAM INDICATOR LAMP
6. TACHOMETER
7. BATTERY VOLTAGE GAUGE
8. FUEL GAUGE
9. WARNING INDICATOR LAMPS
10. TRIP ODOMETER RESET BUTTON
11. TRIP ODOMETER
12. ENGINE COOLANT TEMPERATURE GAUGE

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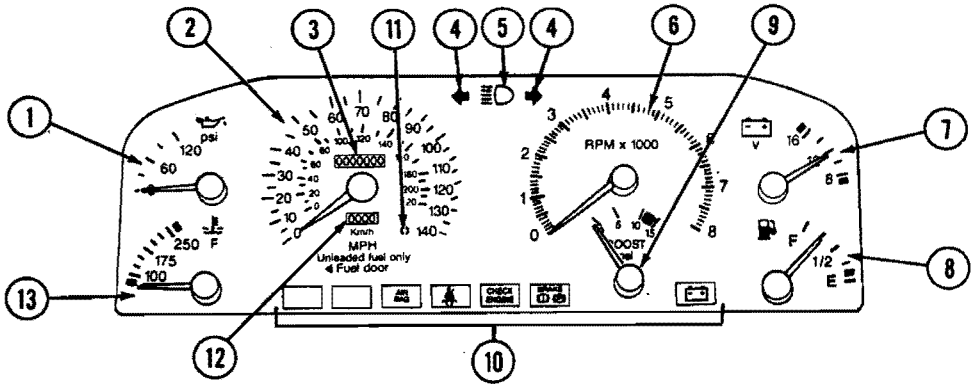

TURBO INSTRUMENTATION

1. ENGINE OIL PRESSURE GAUGE
2. SPEEDOMETER
3. ODOMETER
4. TURN SIGNAL/HAZARD INDICATOR LAMP
5. HIGH BEAM INDICATOR LAMP
6. TACHOMETER
7. BATTERY VOLTAGE GAUGE
8. FUEL GAUGE
9. TURBO BOOST GAUGE
10. WARNING INDICATOR LAMPS
11. TRIP ODOMETER RESET BUTTON
12. TRIP ODOMETER
13. ENGINE COOLANT TEMPERATURE GAUGE

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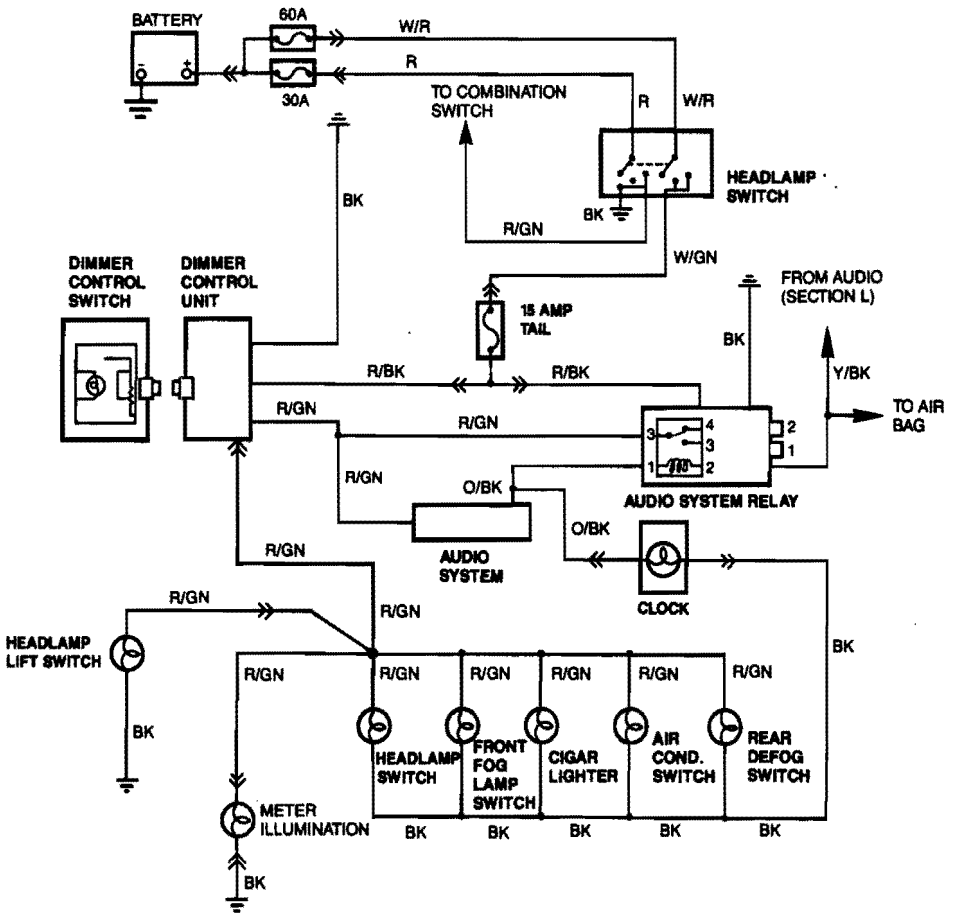
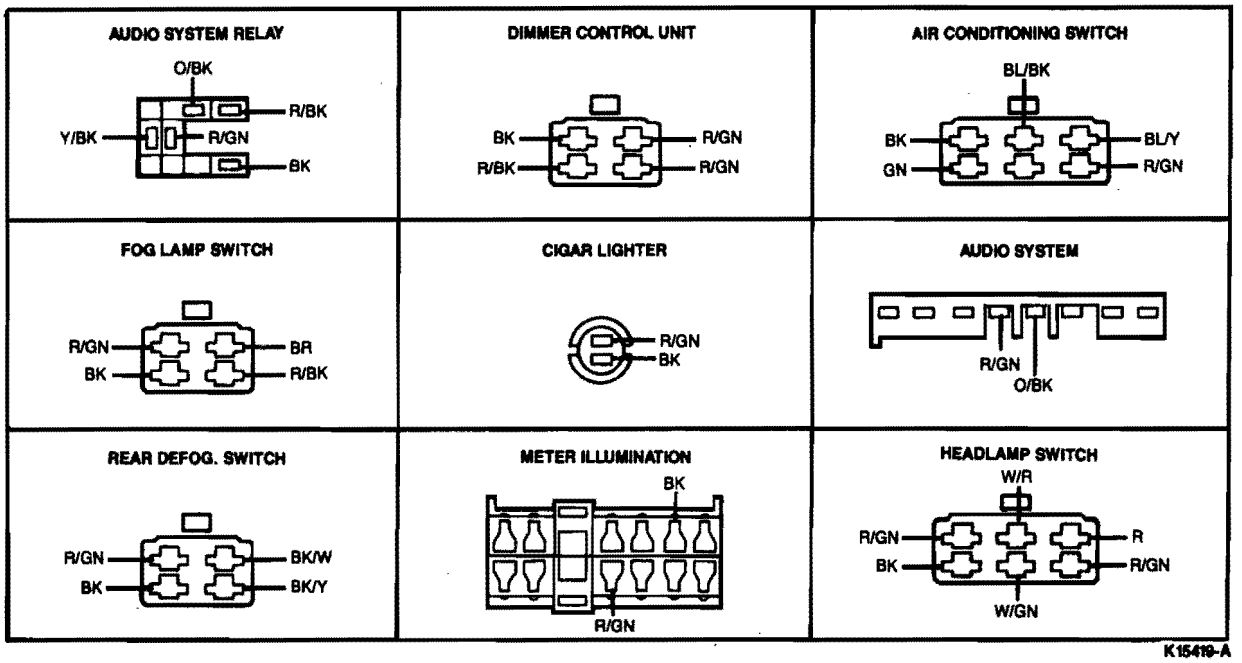
DESCRIPTION (Continued)





DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:
   a. Main fuse(s) 60 amp BTN, 30 amp HEAD.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged audio system relay.
   e. Damaged illumination lamp(s).
   f. Damaged dimmer control unit.
   g. Damaged headlamp switch.
2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. If fault is not visually evident, determine condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• All Lamps Not Operating Correctly	• 60 or 30 amp main fuses. • Headlamp switch. • 15 amp tail fuse. • Dimmer control switch. • Loose or corroded connections. • Damaged circuit. • Audio system relay. • Illumination lamps.	• Go to **IL1.**
• Illumination Lamps Not Working Using the Headlamp Switch	• Headlamp switch. • 15 amp tail fuse. • Loose or corroded connections. • Power to the headlamp switch.	• Go to **IL7.**
• Some Illumination Lamps Not Operating Correctly	• Dimmer control unit. • Audio system relay. • Wires to the illumination lamps. • Blown bulb(s). • Loose or corroded connections. • Damaged circuit.	• Go to **IL12.**
• Audio Illumination and Clock Not Operating Correctly	• Blown bulb(s). • Damaged circuit. • Audio system relay. • Loose or corroded connections.	• Go to **IL16.**
• Some Lamp(s) Not Operating Correctly	• Loose or corroded connections. • Blown bulb(s). • Damaged circuit.	• Go to **IL22.**

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT	ACTION TO TAKE
IL1	ILLUMINATION FUSES CHECK		
	• Locate main fuse panel. • Check the 30 amp head fuse and the 60 amp BTN fuse. • Are the fuse(s) OK?	Yes ▶ No ▶	GO to **IL4.** GO to **IL2.**
IL2	SYSTEM CHECK		
	• Replace fuse(s). • Does fuse(s) blow again?	Yes 30 amp head ▶ 60 amp BTN ▶ No ▶	GO to **IL3.** GO to **IL4.** GO to **IL5.**
IL3	CHECK FOR SHORTS TO GROUND		
	• Disconnect the positive battery cable. • Disconnect the R wire from the 30 amp head fuse. • Measure the resistance of the R wire to ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **IL5.** SERVICE R wire from 30 amp head fuse to headlamp switch.
IL4	CHECK FOR SHORTS TO GROUND		
	• Disconnect the positive battery cable. • Disconnect the W/R wire from the 60 amp BTN fuse. • Measure resistance of the W/R wire to ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **IL5.** SERVICE W/R wire from 60 amp BTN fuse to headlamp switch.
IL5	CHECK POWER AT HEADLAMP SWITCH		
	• Disconnect headlamp switch. • Measure the voltage on the R and the W/R wires at the headlamp switch. • Is the voltage(s) greater than 10 volts?	Yes ▶ No ▶	GO to **IL6.** SERVICE wire in question.
IL6	CHECK SWITCH GROUND		
	• Key OFF. • Measure the resistance of the BK wire and ground at the headlamp switch. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **IL7.** SERVICE BK wire.

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DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
IL7	CHECK HEADLAMP SWITCH OPERATION		
• Disconnect headlamp switch. • Measure the resistance between the terminals listed in the following switch positions. **Switch Position / Wire Colors / Resistance** OFF — R, R/GN — Greater than 10,000 ohms W/R, W/GN — Greater than 10,000 ohms Parking Lamps — R, R/GN — Greater than 10,000 ohms W/R, W/GN — Less than 5 ohms Headlamps — R, R/GN — Less than 5 ohms W/R, W/GN — Less than 5 ohms • Are the resistance(s) OK?		Yes ▶ No ▶	GO to **IL8**. REPLACE switch.
IL8	CHECK WIRE TO 15 AMP TAIL FUSE		
• Locate fuse panel. • Measure the resistance from headlamp switch W/GN wire to 15 amp tail fuse. • Is the resistance less than 5 ohms?		Yes ▶ No ▶	GO to **IL9**. SERVICE W/GN wire.
IL9	CHECK 15 AMP TAIL FUSE		
• Check the 15 amp tail fuse. • Is the fuse OK?		Yes ▶ No ▶	GO to **IL12**. GO to **IL10**.
IL10	CHECK SYSTEM		
• Replace fuse. • Headlamp switch in the ON position. • Does the fuse blow again?		Yes ▶ No ▶	GO to **IL11**. GO to **IL12**.
IL11	CHECK FOR SHORTS TO GROUND		
• Replace fuse. • Disconnect the R/BK wire from the dimmer control unit and the audio system relay. • Measure the resistance on the R/BK wire(s) to ground. • Is the resistance less than 5 ohms?		Yes ▶ No ▶	SERVICE R/BK wire from dimmer control unit to audio system relay. GO to **IL12**.

CK15415-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
IL12	CHECK POWER DIMMER CONTROL UNIT		
	• Locate the dimmer control unit. • Headlamp switch in the ON position. • Measure the voltage on the R/BK wire to ground. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **IL13.** SERVICE R/BK wire.
IL13	CHECK GROUND OF DIMMER CONTROL UNIT		
	• Key OFF. • Measure the resistance from the dimmer control unit BK wire to ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **IL14.** SERVICE BK wire.
IL14	CHECK OPERATION OF DIMMER CONTROL UNIT		
	• Headlamp switch in the ON position. • Measure the voltage ranging from 0V to 12V on the R/GN wires from the dimmer control unit while operating the dimmer control switch from low to high illumination. • Are the voltages in the correct range(s)?	Yes ▶ No ▶	GO to **IL15.** REPLACE dimmer control switch.
IL15	CHECK VOLTAGE TO AUDIO SYSTEM		
	• Locate the audio system. • Disconnect the R/GN wire from the audio system connector. • Headlamp switch in the ON position. • Measure the voltage at the audio system R/GN wire and ground. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **IL16.** SERVICE R/GN wire.
IL16	CHECK VOLTAGE TO AUDIO SYSTEM RELAY		
	• Locate the audio system relay. • Disconnect the R/GN wire from the audio system relay connector. • Headlamp switch in the ON position. • Measure the voltage at the audio system relay R/GN wire and ground. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **IL17.** SERVICE R/GN wire.

CK15416-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
IL17	CHECK RELAY GROUND		
	• Measure the resistance between the audio system relay BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to IL18. SERVICE BK wire.
IL18	CHECK OPERATION OF AUDIO SYSTEM RELAY		
	• Disconnect audio system relay. • Measure the resistance between the following wire colors at the relay: **Wire Colors** — **Resistance** Y/BK, O/BK — Less than 5 ohms O/BK, R/GN — Greater than 10,000 ohms • Apply 12 volts to the R/BK terminal of the relay. • Ground the BK terminal of the relay. • Measure the resistance between the following wire colors at the relay: **Wire Colors** — **Resistance** O/BK, R/GN — Less than 5 ohms O/BK, Y/BK — Greater than 10,000 ohms • Are the resistances correct?	Yes ▶ No ▶	GO to IL19. REPLACE relay.
IL19	CHECK WIRE TO AUDIO		
	• Disconnect the Y/BK wire from the audio system relay and the audio system. • Measure the resistance from the audio system relay Y/BK wire to the audio system. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to IL20. SERVICE Y/BK wire.
IL20	CHECK RESISTANCE OF O/BK WIRES		
	• Disconnect the audio system connector. • Measure the resistance on the O/BK wire between the audio system relay, audio system, and the clock. • Are the resistances less than 5 ohms?	Yes ▶ No ▶	GO to IL21. SERVICE O/BK wire.

CK15417-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
IL21	TEST CLOCK LAMP		
	• Key OFF. • Locate the clock. • Apply 12 volts to the O/BK wire at the clock. • Ground the BK wire. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to IL22. REPLACE lamp.
IL22	CHECK WIRES TO LAMPS		
	• Key OFF. • Locate dimmer control unit. • Locate each illumination lamp connector. • Measure the resistance of the R/GN wires to the following lamp connectors: — Headlamp lift switch. — Meter illumination. — Headlamp switch. — Front fog lamp switch. — Cigar lighter. — Air conditioner switch. — Rear defroster switch. • Are all the resistances less than 5 ohms?	Yes ▶ No ▶	GO to IL23. SERVICE R/GN wire(s) in question.
IL23	TEST ILLUMINATION BULBS		
	• Apply 12 volts to the R/GN terminals and ground the BK terminals at the following lamp connectors: — Headlamp lift switch. — Meter illumination. — Headlamp switch. — Front fog lamp switch. — Cigar lighter. — Air conditioner switch. — Rear defroster switch. • Do all the lamps operate correctly?	Yes ▶ No ▶	GO to IL24. REPLACE the bulb(s) in question.
IL24	CHECK GROUND OF THE LAMPS		
	• Measure the resistance of the BK terminals and ground at the following lamp connectors: — Headlamp lift switch. — Meter illumination. — Headlamp switch. — Front fog lamp switch. — Cigar lighter. — Air conditioner switch. — Rear defroster switch. • Are all the resistances less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. SERVICE BK wire(s) in question.

CK15418-A

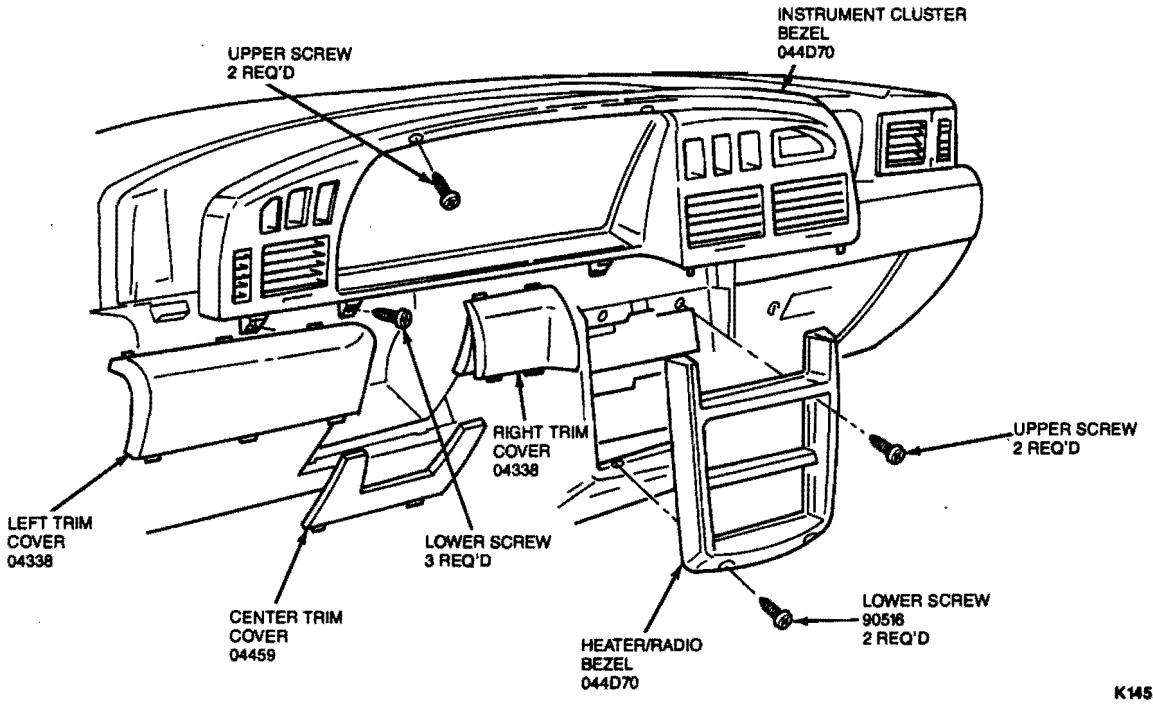
REMOVAL AND INSTALLATION

Instrument Cluster

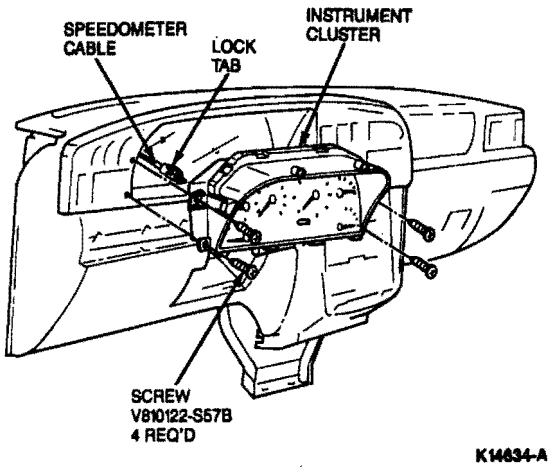
Removal

NOTE: Federal law requires that a label stating the odometer has been repaired or replaced be affixed to any vehicle that has had its odometer repaired, replaced or set to zero.

1. Disconnect negative battery cable.
2. Remove radio / heater control bezel, covers from both sides of steering column, and instrument panel bezel. Refer to Section 45-61.



3. Disconnect speedometer cable at transaxle.
4. Remove screws and slide instrument cluster outward.
5. Press lock tab and release speedometer cable from instrument cluster.
6. Remove connectors from rear of cluster.
7. Remove instrument cluster.



REMOVAL AND INSTALLATION (Continued)

Installation

NOTE: Prior to connecting speedometer cable to instrument cluster, apply a 4.6mm (3/16 inch) ball of Silicone Damping Grease D7A7-19A331-A (ESE-M1C171-A) or equivalent in the drive hole of the speedometer head.

1. Apply grease and connect speedometer cable to wiring connectors to instrument cluster. Make sure speedometer lock tab is fully engaged.
2. Slide cluster into place and install screws retaining cluster to instrument panel. Tighten screws to 3-4 N·m (2-3 lb-ft).
3. Connect speedometer cable at transaxle.
4. Install instrument panel bezel, covers on each side of steering column, and radio/heater control bezel.
5. Connect negative battery cable.

Speed Sensor

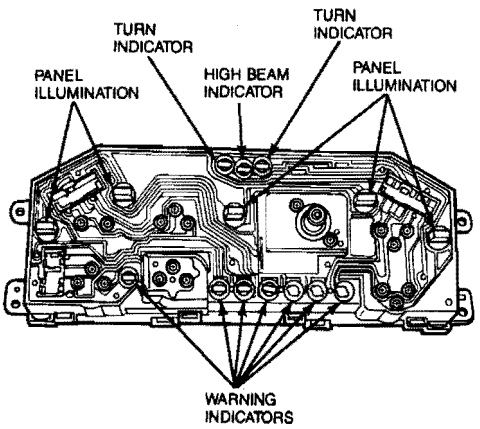
Removal and Installation

NOTE: On vehicles equipped with speed control, a speed sensor is mounted in the speedometer assembly. If replacement is required, the speedometer assembly must be replaced.

Instrument Cluster Bulbs

Removal and Installation

1. Remove instrument cluster as outlined.
2. Replace bulb(s).
3. Install instrument cluster as outlined.



K12951-A

Heater Control Panel Bulb

Removal and Installation

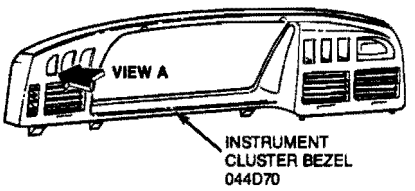
1. Remove heater control panel assembly. Refer to Section 36-10.
2. Replace bulb.
3. Install heater control panel assembly. Refer to Section 36-10.

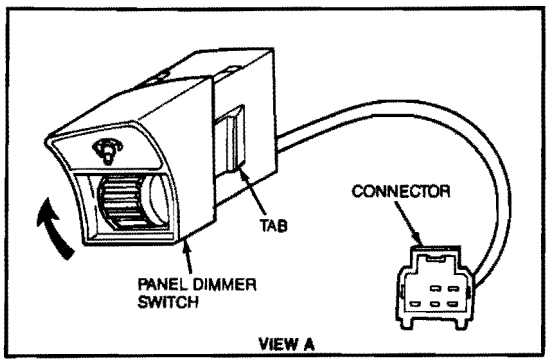
Panel Dimmer Switch

The panel dimmer switch is located on the LH side of the instrument cluster bezel.

Removal

1. Disconnect negative battery cable.
2. Remove instrument cluster bezel. Refer to Section 45-61.
3. Disconnect electrical connector from switch.
4. Depress tabs on both sides of switch and remove from bezel.





K12952-A

Installation

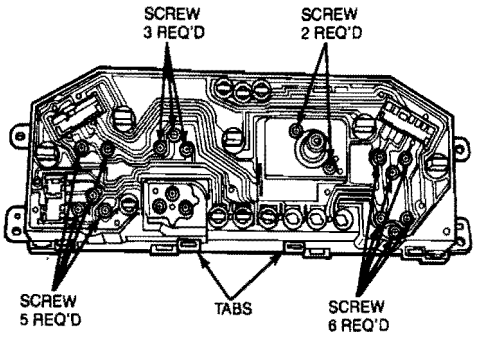
1. Insert switch into bezel.
2. Connect electrical connector to switch.
3. Install instrument cluster bezel.
4. Connect negative battery cable.
5. Check switch for proper operation.

DISASSEMBLY AND ASSEMBLY

Instrument Cluster

Disassembly

1. Remove instrument cluster as outlined.
2. Release tabs and separate upper housing from lower housing.
3. Remove screws from back of instrument cluster as shown.

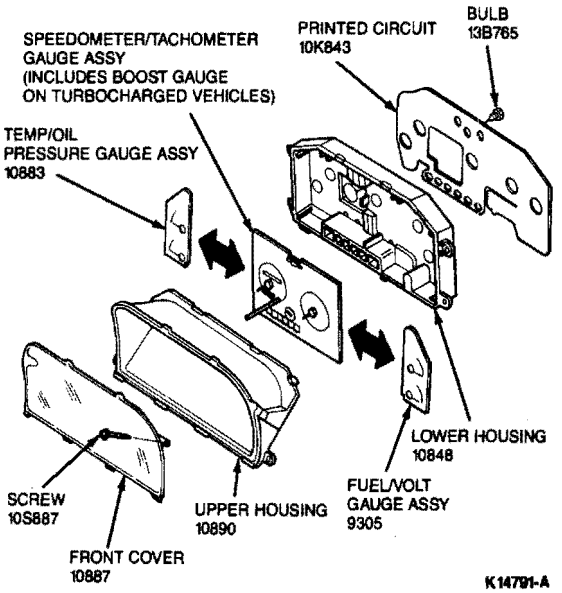


NATURALLY ASPIRATED VEHICLE CLUSTER SHOWN
TURBOCHARGED VEHICLE CLUSTER SIMILAR

K14524-A

NOTE: The gauges are serviced as three subassemblies. Individual gauge mechanisms are not available.

4. Carefully remove the gauge assembly. If necessary, separate the main assembly into one of the three subassemblies for service:
   a. Fuel / Volt Gauge Assembly.
   b. Temperature / Oil Pressure Gauge Assembly.
   c. Speedometer / Tachometer Gauge Assembly (includes boost gauge if used).
5. If necessary, the clear front cover can be removed from the upper housing after removing the two retaining screws.



K14791-A

Assembly

1. Install clear front cover onto upper housing with two retaining screws, if removed.

   NOTE: Two short screws are used for the speedometer, three medium screws are used for the boost gauge, and long screws are used in the remaining gauges.
2. Assemble the gauge panel and align it on the lower housing.
3. Attach the upper housing to the lower housing. Make sure tabs are fully enaged.
4. Install instrument cluster into vehicle as outlined.
5. Check operation of all gauges and indicator lamps.

SECTION 33-10 Speedometer

VEHICLE APPLICATION

Capri.

DESCRIPTION

The speedometer is connected to the differential of the transaxle by a flexible speedometer cable, and a drive gear located inside the transaxle. On vehicles equipped with speed control, a speed sensor is mounted in the speedometer assembly.

The cable drives the speedometer which registers speed in miles per hour and kilometers per hour. The cable also drives an odometer which records distance traveled in miles and tenths of a mile.

The speedometer is not serviced separately. It is part of the speedometer, tachometer and boost gauge assembly. The boost gauge is used only on turbocharged vehicles.

DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:

Mechanical

a. Malfunctioning speedometer.
b. Binding cable.
c. Broken cable.
d. Cable connections.
e. Condition of drive gear in transaxle.

Electrical

a. Refer to Section 33-01 for speedometer illumination.

2. Check speedometer cable for signs of wear or breakage.
3. Check speedometer cable for kinks or misrouting.
4. If fault is not visually evident, verify condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• Speedometer Not Working	• Broken cable. • Cable connections. • Damaged speedometer.	• Go to **S1.**
• Speedometer Reading Inaccurate	• Binding cable. • Damaged speedometer.	• Go to **S3.**
• Odometer Not Working But Speedometer OK	• Damaged speedometer.	• Replace speedometer.
• Speedometer Readings Fluctuate	• Binding cable. • Damaged speedometer.	• Replace cable. • Go to **S3.**
• Speedometer Noisy	• Lack of lubrication on cable. • Binding cable. • Damaged speedometer.	• Lube cable. • Replace cable. • Replace speedometer.

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
S1 SPEEDOMETER CABLE CHECK		

• Check the following speedometer cable connections:
  • Connection to transaxle
  • Connection to speedometer.
• Are connections in satisfactory condition?
	Yes ▶
	No ▶
		GO to **S2.**
		SERVICE as required.

S2 SPEEDOMETER CABLE CHECK		
• Disconnect speedometer cable from the transaxle. • Remove speedometer drive gear from transaxle. • Spin the speedometer cable and inspect the speedometer drive gear. • Are there any concerns present, such as binding cable or broken drive gear teeth?	Yes ▶ No ▶	SERVICE cable or gear as required. REPLACE speedometer.
S3 SPEEDOMETER CALIBRATION CHECK		
• Verify the chart below: **Standard Indication (km/h)** / **Allowable Range (km/h)** 40 / 40-44 80 / 80-88 120 / 120-130 **Standard Indication (MPH)** / **Allowable Range (MPH)** 30 / 27.0-34.5 60 / 54.0-69.0 90 / 81.0-103.5 • Do the readings fall in the allowable range? NOTE: Tire wear and pressure can cause incorrect readings.	Yes ▶ No ▶	Speedometer system OK. REPLACE speedometer.

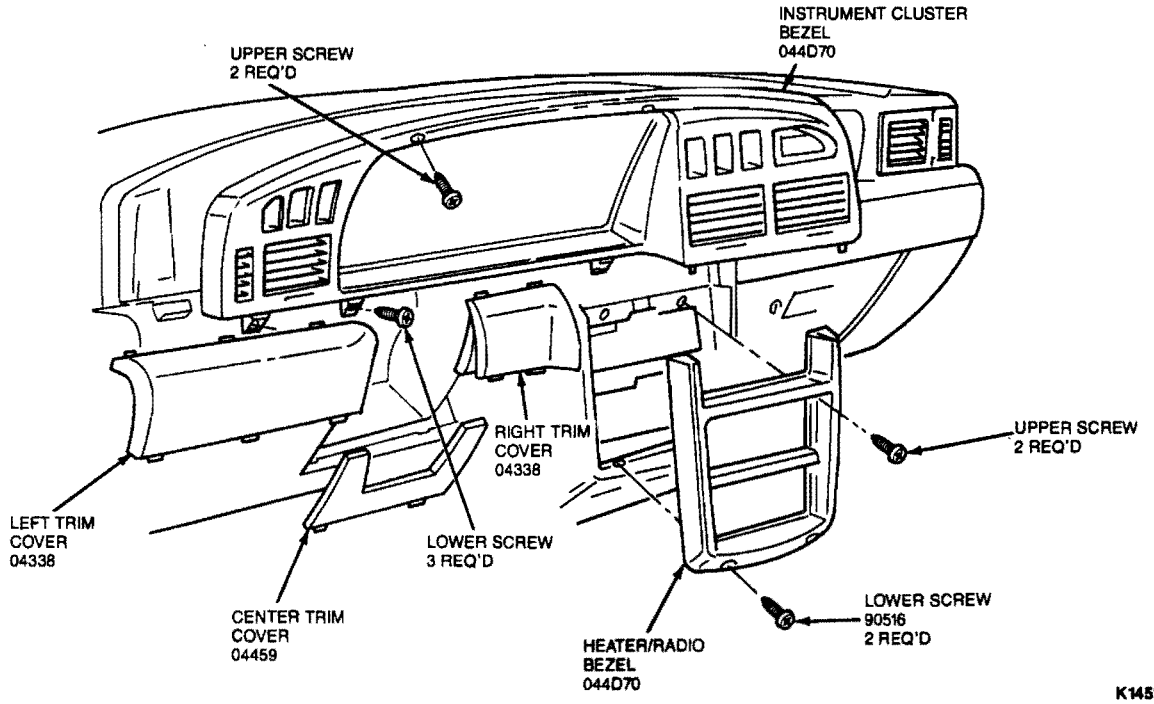
CK15406-A

REMOVAL AND INSTALLATION

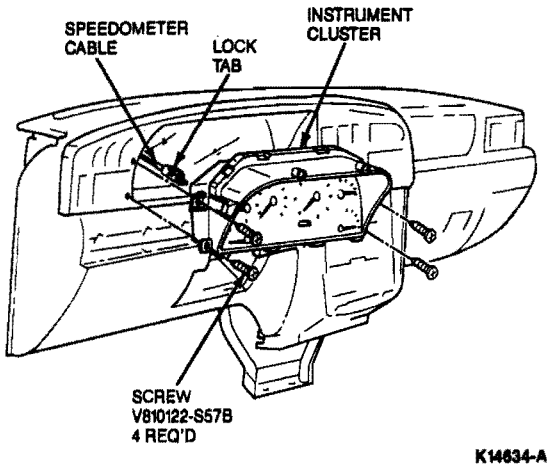
Speedometer Cable

Removal

1. Disconnect speedometer cable at transaxle.
2. Remove battery.
3. Remove radio / heater control bezel, covers from both sides of steering column and instrument panel bezel. Refer to Section 45-61.



4. Remove instrument cluster. Refer to Section 33-01.
5. Slide speedometer cable back, and using a thin, flat-bladed screwdriver, release plastic retainer tabs in dash panel.
6. Remove speedometer cable.



Installation

NOTE: Prior to connecting speedometer cable to instrument cluster, apply a 4.6mm (3 / 16 inch) ball of Silicone Damping Grease D7AZ-19A331-A (ESE-M1C171-A) or equivalent in the drive hole of the speedometer head.

REMOVAL AND INSTALLATION (Continued)

1. Insert cable into dash panel. Snap plastic retainer into place and attach cable boot to retainer.
2. Route cable through instrument panel.
3. Apply grease to speedometer cable connection on cluster. Position cluster in instrument panel and connect speedometer cable. Make sure speedometer lock tab is fully engaged.
4. Install instrument cluster. Refer to Section 33-01.
5. Install instrument panel bezel, covers on each side of steering column, and radio / heater control bezel. Refer to Section 45-61.
6. Connect speedometer cable at transaxle.
7. Install battery.
8. Check speedometer for proper operation.

Speedometer Cable Core

Removal and Installation

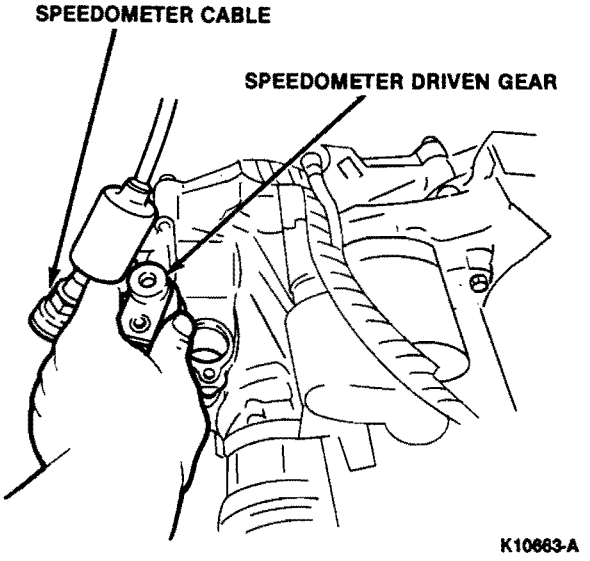
1. Remove speedometer cable assembly as outlined.
2. Pull core from cable.
3. Install core into speedometer cable.
4. Install speedometer cable as outlined.

Speedometer Driven Gear

Removal

1. Disconnect cable from speedometer driven gear at transaxle.
2. Remove bolt from driven gear.

   NOTE: The speedometer driven gear may stick in transaxle bore. To assist in removing it from transaxle bore, insert a flat-tipped screwdriver or equivalent between transaxle case and speedometer driven gear. Gently pry up until speedometer driven gear is removed from transaxle case.
3. Remove speedometer driven gear and O-ring.



Installation

1. Inspect O-ring for nicks or cuts; replace if damaged.
2. Install O-ring onto speedometer driven gear and insert into transaxle bore.
3. Install retaining bolt.
4. Connect cable into speedometer driven gear.

Speedometer Assembly

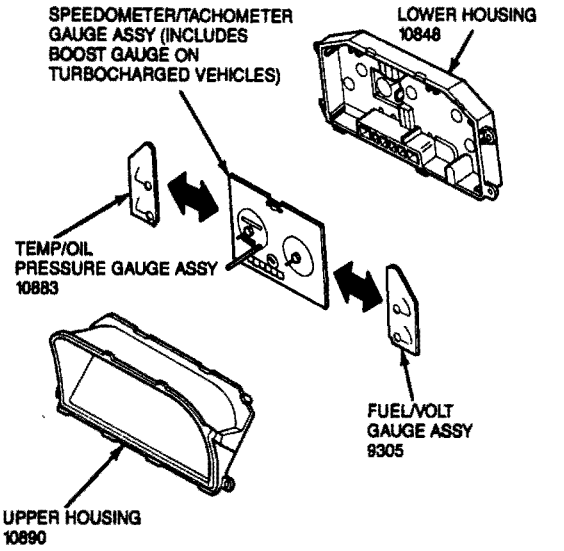
Removal

NOTE: Federal law requires that a label stating the odometer has been repaired or replaced be affixed to any vehicle that has had its odometer repaired, replaced or reset to zero.

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.

REMOVAL AND INSTALLATION (Continued)

3. Separate speedometer / tachometer / boost gauge assembly from other gauge assemblies.



Installation

CAUTION: The speedometer is calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position speedometer / tachometer / boost gauge assembly to other gauge assemblies.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check speedometer and all other gauges / indicators for proper operation.
5. Attach odometer notice label to vehicle.

SECTION 33-11 Tachometer

VEHICLE APPLICATION

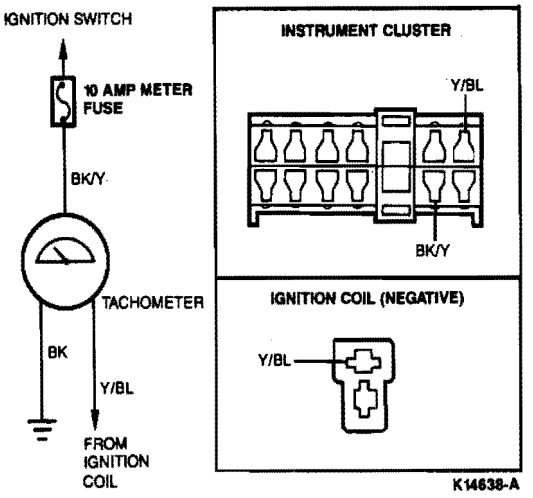
Capri.

DESCRIPTION

The tachometer is an electrically-operated instrument which indicates engine speed in revolutions per minute (rpm). The tachometer range is 0 to 6,500 rpm.

The tachometer is mounted in the instrument cluster assembly. The electrical schematic is shown in the illustration.

The tachometer is not serviced separately. It is part of the speedometer / tachometer / boost gauge assembly. (The boost gauge is used only on turbocharged vehicles).



DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components of the system. Check for:
   a. 10 amp meter fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged tachometer.
2. Inspect the tachometer for obvious opens or shorts causing partial operation.
3. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
4. If fault is not visually evident, determine condition and refer to the following chart.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Tachometer Does Not Function But All Cluster Components Do Function Properly	• Tachometer damage. • Damage to signal wire. • Open ground wire.	• Go to **T1.**
• Tachometer Reading Abnormally	• Tachometer damage.	• Go to **T5.**
• Tachometer Not Working	• Tachometer damage. • Damaged signal wire.	• Go to **T5.**

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
T1	TACHOMETER FUSE CHECK		
	• Access fuse panel. • Check 10 amp meter fuse. • Is fuse OK?	Yes ▶ No ▶	GO to T4. GO to T2.
T2	CHECK THE TACHOMETER SYSTEM		
	• Replace fuse. • Key ON, engine running. • Does fuse blow again?	Yes ▶ No ▶	GO to T3. GO to T4.
T3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK/Y wire from 10 amp meter fuse. • Measure resistance of BK/Y wire and ground. • Is resistance less than 5 ohms?	Yes ▶ No ▶	GO to T4. SERVICE/REPLACE BK/Y wire.
T4	CHECK FOR POWER SUPPLY TO TACHOMETER		
	• Key ON. • Access instrument cluster. • Measure voltage on the BK/Y wire at the tachometer. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to T5. SERVICE/REPLACE BK/Y wire.
T5	TACHOMETER PULSE CHECK NO. 1 (TACHOMETER NOT WORKING)		
	• Key OFF. • Disconnect the Y/BL wire from the ignition coil. • Connect a low wattage test lead between Y/BL wire and 12 volts. • Does the tachometer needle jump?	Yes ▶ No ▶	REFER to Section 23-03. GO to T6.

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DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT	ACTION TO TAKE
T6	TACHOMETER PULSE CHECK NO. 2 (TACHOMETER NOT WORKING)		
	• Access instrument cluster. • Key ON. • Connect a low wattage test lamp between Y/BL wire and 12 volts. • Does the tachometer needle jump?	Yes ▶ No ▶	SERVICE/REPLACE Y/BL wire between tachometer and ignition coil. REPLACE tachometer.
T7	TACHOMETER CHECK (TACHOMETER READING ABNORMALLY)		
	• Disconnect Y/BL wire from ignition coil and place a signal generator and a tachometer tester between Y/BL wire and ground. • Compare tester and tachometer indications. • Are readings within allowable range?	Yes ▶ No ▶	REFER to Section 23-03. REPLACE tachometer (See Caution). **CAUTION: When removing or installing a tachometer, do not drop or subject it to sharp impact.**
	Standard Indication (RPM) / **Allowable Range (RPM)** 1000 / 1000-1050 2000 / 2000-2050 3000 / 3000-3050 4000 / 4000-4050 5000 / 5000-5050 6000 / 6000-6050		
T8	RESISTANCE CHECK BETWEEN TACHOMETER AND GROUND		
	• Key OFF. • Measure resistance between tachometer BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **T9.** SERVICE/REPLACE BK wire.
T9	RESISTANCE CHECK BETWEEN TACHOMETER AND IGNITION COIL		
	• Key OFF. • Measure resistance between tachometer Y/BL wire and ignition coil. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. SERVICE/REPLACE Y/BL wire.

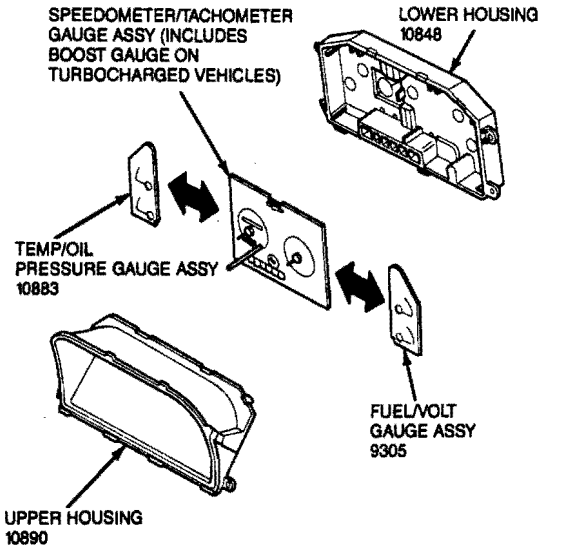
CK14647-A

REMOVAL AND INSTALLATION

Tachometer

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate speedometer / tachometer / boost gauge assembly from other gauge assemblies.



Installation

CAUTION: Tachometer is calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position speedometer / tachometer / boost gauge assembly to other gauge assemblies.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check tachometer and all other gauges / indicators for proper operation.

SECTION 33-15 Clock

VEHICLE APPLICATION

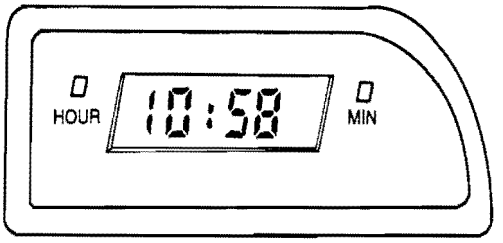
Capri.

DESCRIPTION

The quartz movement, electronic clock is mounted on the RH side of the instrument panel bezel. The illumination for the clock is set so that when the headlamps or parking lamps are turned on, the intensity of the clock lamp is lowered and controlled by the instrument panel lighting control. When all the lamps are turned off the intensity is increased for easier viewing in bright sunlight. The clock displays time in a twelve hour format and is always on. Changing the time can be done as follows:

To change the hour digits, press the "HOUR" button. Pressing the button once and then releasing it advances and sets the digits one at a time. Holding the button in, advances the digits rapidly.

To change the minute digits, press the "MIN" button. Pressing the button once and releasing it advances and sets the digits one at a time. Holding the button in, advances the digits rapidly.

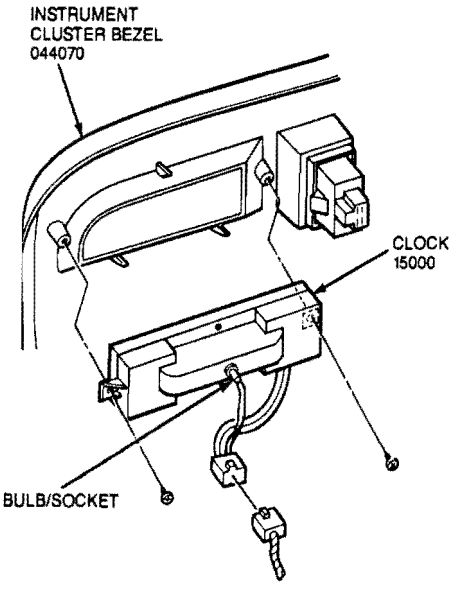


K12927-A

REMOVAL AND INSTALLATION

Removal

1. Remove instrument cluster bezel. Refer to Section 45-61.
2. Rotate bulb socket and remove.
3. Remove screws and clock assembly.



K12928-A

REMOVAL AND INSTALLATION (Continued)

Installation

1. Install clock with screws to instrument cluster bezel.
2. Install bulb socket to clock.
3. Install instrument cluster bezel. Refer to Section 45-61.

SECTION 33-20 Fuel Level Indicating System

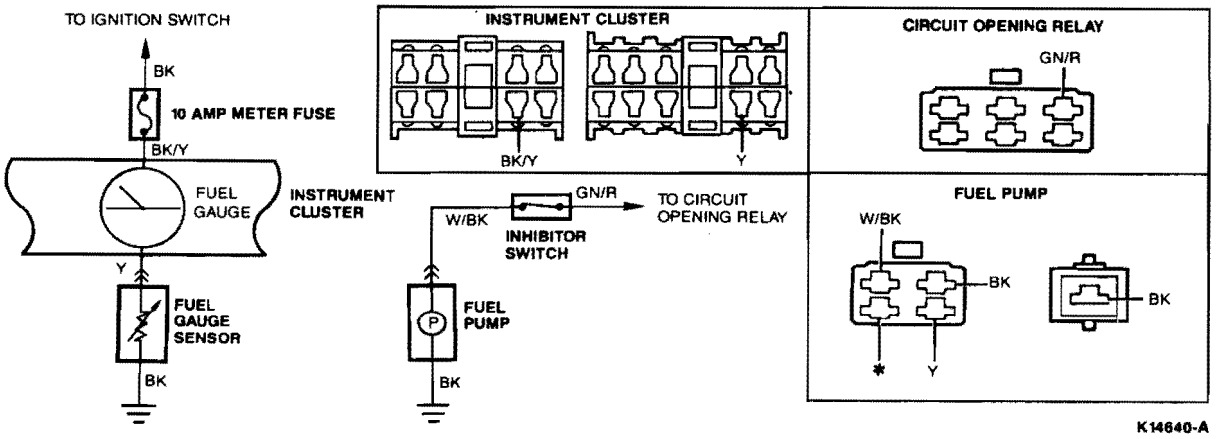
VEHICLE APPLICATION

Capri.

DESCRIPTION

The fuel level indicator gauge pointer is attached to a wire-wound bimetal strip, which, when heated by a signal from the fuel sender unit, produces the appropriate level indication. When the current is low, there is little heating effect and the pointer moves a short distance. As the current increases, it produces a greater heating effect, causing the pointer to move a greater distance.

The fuel gauge is not serviced separately. It is part of the fuel / volt gauge assembly.



DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:
   a. Blown 10 amp meter fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged fuel gauge.
   e. Damaged fuel gauge sender.
2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. Inspect the fuel gauge and the fuel gauge sender for obvious opens or shorts causing partial operation.
4. If fault is not visually evident, determine condition and refer to the following chart.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Fuel Gauge Always Reads Empty	• Open or damaged wires. • Damaged fuel gauge. • Blown fuse. • Damaged fuel sender.	• Go to **FG1.**
• Fuel Gauge Always Reads Full	• Yellow wire shorted to ground. • Damaged fuel gauge. • Damaged fuel sender.	• Go to **FG6.**
• Fuel Gauge Reads Inaccurately	• Corroded connections. • Damaged fuel gauge.	• Go to **FG7.**

	TEST STEP	RESULT ▶	ACTION TO TAKE
FG1	FUEL GAUGE FUSE CHECK		
	• Access fuse panel. • Check the 10 amp meter fuse. • Is the fuse OK?	Yes ▶ No ▶	GO to **FG4.** GO to **FG2.**
FG2	CHECK FUEL GAUGE SYSTEM		
	• Replace fuse. • Key ON. • Does the fuse blow again?	Yes ▶ No ▶	GO to **FG3.** GO to **FG4.**
FG3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Measure resistance of BK/Y wire and ground. • Measure resistance of BK/Y wire from 10 amp meter fuse. • Is resistance less than 5 ohms?	Yes ▶ No ▶	SERVICE BK/Y wire. GO to **FG4.**
FG4	CHECK FOR POWER TO FUEL GAUGE		
	• Key ON. • Access instrument cluster. • Measure voltage on the BK/Y wire and ground. • Is voltage greater than 10 volts?	Yes ▶ No ▶	GO to **FG5.** SERVICE BK/Y wire.
FG5	FUEL GAUGE CHECK (FUEL GAUGE ALWAYS READS EMPTY)		
	• Ground Y wire at instrument cluster. • Does fuel gauge read full?	Yes ▶ No ▶	GO to **FG6.** REPLACE fuel gauge.
FG6	FUEL GAUGE CHECK (FUEL GAUGE ALWAYS READS FULL)		
	• Apply 12 volts to Y wire at fuel gauge. • Does fuel gauge read empty?	Yes ▶ No ▶	GO to **FG7.** REPLACE fuel gauge.
FG7	FUEL GAUGE CONTINUITY CHECK (FUEL GAUGE ALWAYS READS EMPTY)		
	• Remove the back seat cushion. • Ground the Y wire at the fuel pump. • Does the fuel gauge read full?	Yes ▶ No ▶	GO to **FG8.** SERVICE Y wire between instrument cluster and fuel pump.

DIAGNOSIS AND TESTING (Continued)

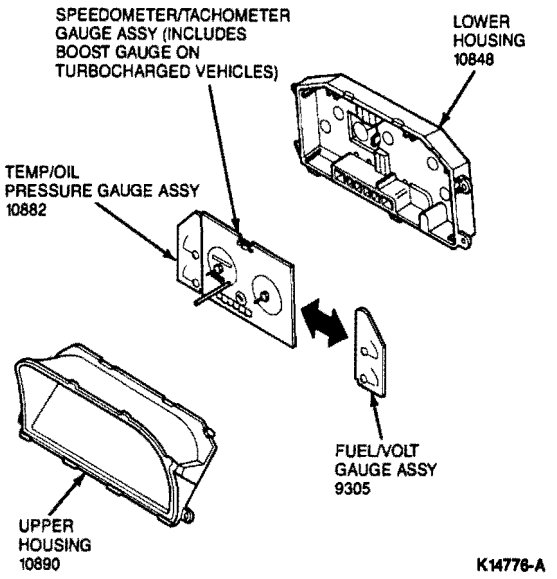
TEST STEP		RESULT ▶	ACTION TO TAKE
FG8	FUEL SENDER GROUND CHECK		
	• Measure resistance between the BK wires from the fuel sender to ground.	Yes ▶	GO to **FG9.**
	• Is the resistance less than 5 ohms?	No ▶	SERVICE ground as needed.
FG9	FUEL GAUGE SYSTEM CHECK		
	• Key ON.	Yes ▶	RETURN to condition chart.
	• Does the fuel gauge system operate correctly?	No ▶	REPLACE fuel sender unit.

REMOVAL AND INSTALLATION

Fuel Gauge

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate the fuel / volt gauge from the speedometer / tachometer / boost gauge assembly. (The boost gauge is used only on turbocharged vehicles.)



Installation

CAUTION: The gauges are calibrated at the factory. Excessive rough handling could disturb calibration.

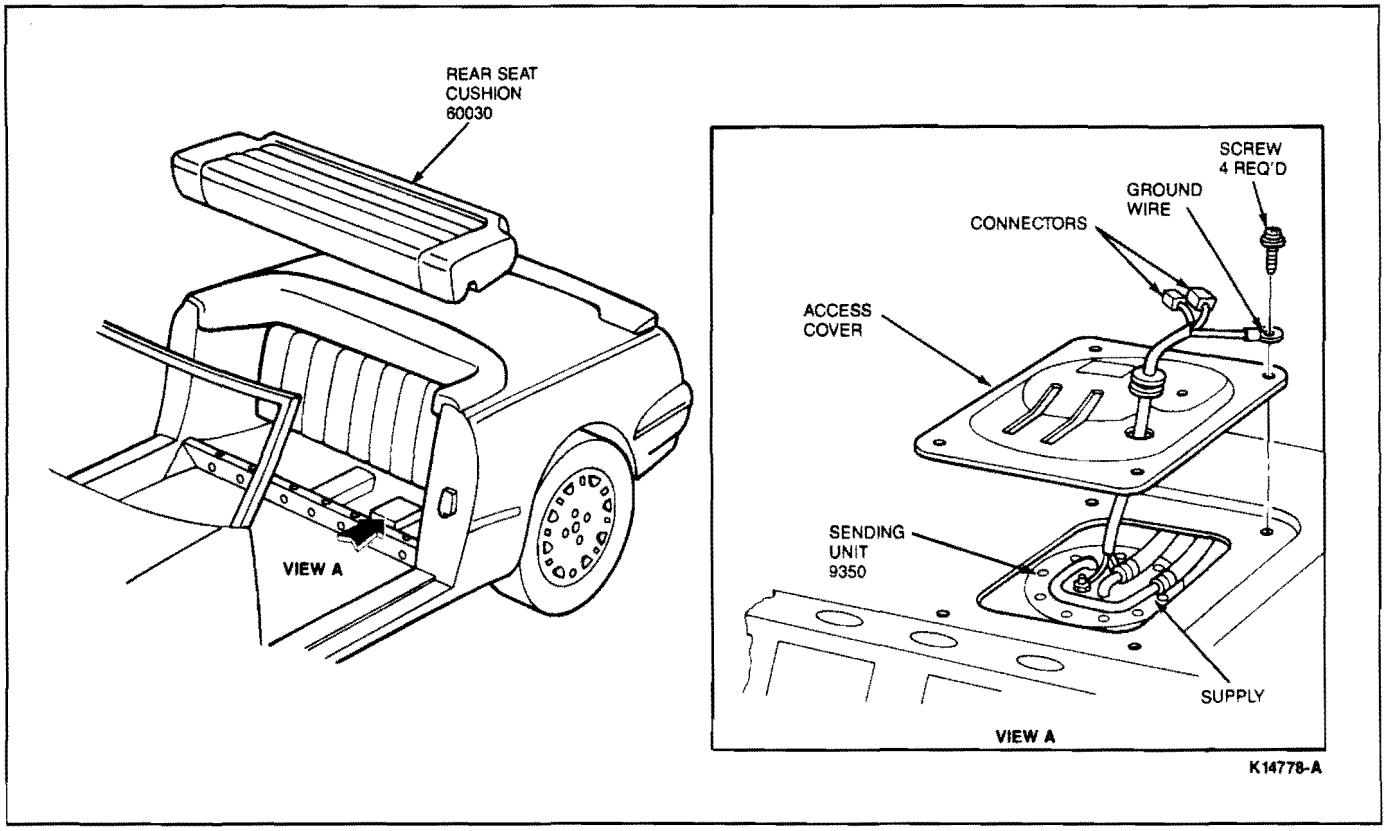
1. Position fuel / volt gauge to speedometer / tachometer / boost gauge assembly.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check all gauges and indicators for proper operation.

Fuel Tank Sending Unit

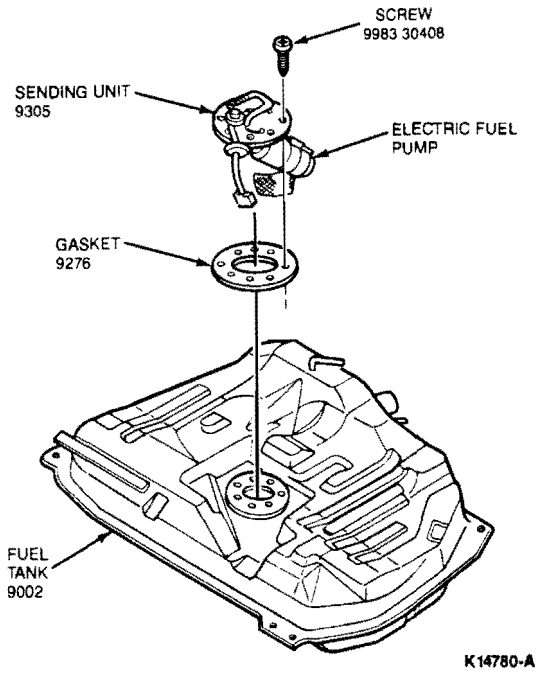
Removal

1. Remove rear seat cushion. Refer to Section 41-20.
2. Relieve fuel pressure as follows:
   a. Run engine while disconnecting fuel pump electrical connector.
   b. Allow engine to run until it stalls. Fuel pressure is now relieved.

REMOVAL AND INSTALLATION (Continued)



3. Disconnect fuel pump ground wire from access cover.
4. Remove access cover.
5. Remove and plug supply and return lines.
6. Remove sending unit retaining bolts.
7. Remove sending unit and gasket from fuel tank. Cover opening of fuel tank to prevent dirt from entering tank.
8. Remove fuel pump. Refer to Section 24-35.



Installation

1. Install fuel pump onto sending unit. Refer to Section 24-35.

REMOVAL AND INSTALLATION (Continued)

2. Position a new gasket onto fuel tank and install sending unit with retaining bolts.
3. Unplug and connect supply and return lines and secure with clamps.
4. Install access cover.
5. Install fuel pump connector and ground wire.
6. Start engine and check for leaks. Check the operation of the fuel gauge.
7. Install rear seat cushion. Refer to Section 41-20.

SECTION 33-25 Engine Coolant Temperature Indicating System

VEHICLE APPLICATION

Capri.

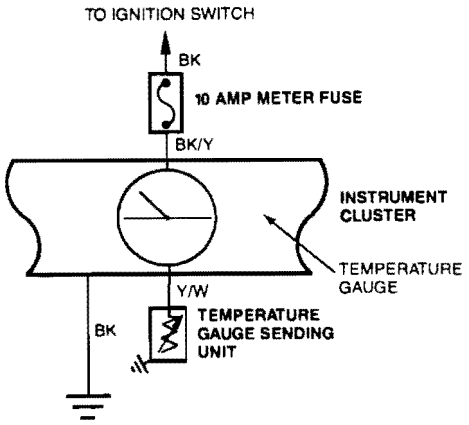
DESCRIPTION

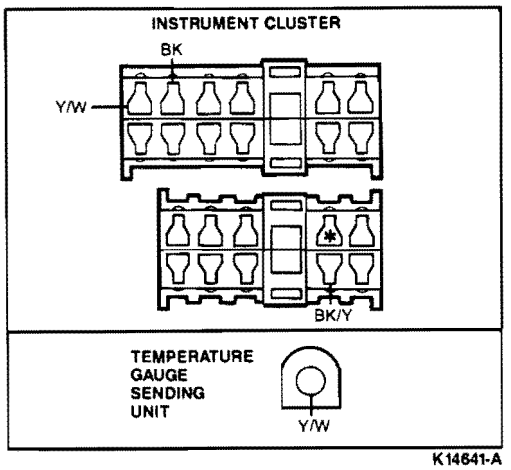
The engine coolant temperature indicating system consists of a sender unit mounted on the front of the cylinder head and a temperature gauge mounted in the instrument cluster. The sending unit located in the thermostat housing operates the electric fan.

When the engine coolant temperature is low, the sender resistance is high, resulting in low current flow through the gauge and little pointer movement.

The gauge pointer may indicate at the top of the normal band with the coolant temperature within specification under certain driving conditions, such as heavy traffic or stop and go driving in hot weather.

The temperature gauge is not serviceable and must be replaced as part of the temperature / oil pressure gauge assembly.





DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:
   a. 10 amp meter fuse.
   b. Loose or corroded connections.
   c. Damage to wiring harness.
   d. Damaged temperature gauge.
2. Inspect the temperature gauge for obvious opens or shorts causing partial operation.
3. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.

DIAGNOSIS AND TESTING (Continued)

4. If fault is not visually evident, determine condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• Temperature Gauge Always Reads Cold	• Temperature gauge wire open. • Damaged temperature gauge sending unit. • Damaged temperature gauge. • Blown 10 amp meter fuse. • Open power wire.	• Go to **TG1.**
• Temperature Gauge Always Reads Hot	• Short to ground. • Damaged temperature gauge sending unit. • Temperature gauge.	• Go to **TG7.**
• Temperature Gauge Inaccurate	• Open wires. • Temperature gauge sending unit.	• Go to **TG10.**

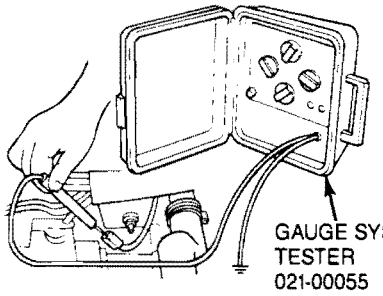
TEST STEP		RESULT ▶	ACTION TO TAKE
TG1	TEMPERATURE GAUGE FUSE CHECK		
	• Access fuse panel. • Check 10 amp meter fuse. • Is fuse OK?	Yes ▶ No ▶	GO to **TG4.** GO to **TG2.**
TG2	CHECK TEMPERATURE GAUGE SYSTEM		
	• Replace fuse. • Key ON. • Does fuse blow again?	Yes ▶ No ▶	GO to **TG3.** GO to **TG4.**
TG3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK / Y wire from 10 amp meter fuse. • Measure resistance of BK / Y wire and ground. • Is resistance less than 5 ohms?	Yes ▶ No ▶	SERVICE BK / Y wire. GO to **TG4.**
TG4	CHECK FOR POWER TO TEMPERATURE GAUGE		
	• Key ON. • Locate instrument cluster connector. • Measure voltage on the BK / Y wire and ground. • Is voltage greater than 10 volts?	Yes ▶ No ▶	GO to **TG5.** SERVICE BK / Y wire.
TG5	TEMPERATURE GAUGE CHECK (TEMPERATURE GAUGE ALWAYS READS COLD)		
	• Locate instrument cluster connector. • Place a jumper wire from the Y / W wire at instrument cluster to ground. • Does temperature gauge read hot?	Yes ▶ No ▶	GO to **TG6.** REPLACE temperature gauge.
TG6	TEMPERATURE SENSOR CHECK (TEMPERATURE GAUGE ALWAYS READS COLD)		
	• Place a jumper wire from Y / W wire at the temperature gauge sending unit to ground. • Does the temperature gauge read hot?	Yes ▶ No ▶	GO to **TG7.** SERVICE Y / W wire between the temperature gauge sending unit and temperature gauge.

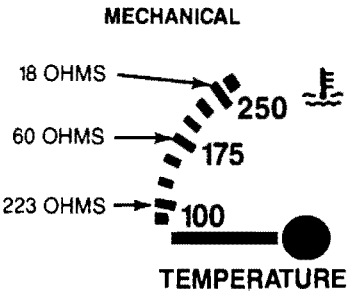
DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
TG7	TEMPERATURE GAUGE SHORT CHECK (TEMPERATURE GAUGE ALWAYS READS HOT)		
	• Remove Y/W wire from the temperature gauge sending unit.	Yes ▶	GO to **TG8.**
	• Does the temperature gauge read cold?	No ▶	REPLACE the sending unit.
TG8	TEMPERATURE GAUGE SHORT CHECK (TEMPERATURE GAUGE ALWAYS READS HOT)		
	• Disconnect instrument cluster connector.	Yes ▶	REPLACE temperature gauge.
	• Does the temperature gauge still read hot?	No ▶	GO to **TG9.**
TG9	CHECK TEMPERATURE GAUGE GROUND		
	• Locate instrument cluster connector.	Yes ▶	GO to **TG10.**
	• Disconnect instrument cluster connector.	No ▶	SERVICE BK wire.
	• Measure resistance between temperature gauge BK wire and ground.		
	• Is the resistance less than 5 ohms?		

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
TG10 TEMPERATURE GAUGE CHECK (TEMPERATURE GAUGE IS INACCURATE)		
• Remove the connector from the temperature gauge sending unit. • Connect one lead of the Rotunda Gauge System Tester 021-00055 or equivalent to the connector and the other lead to ground. • Set the gauge tester to the resistance values shown. • Place the ignition switch to the ON position and check to see that the needle indicator displays the correct reading. • Continue each inspection for two minutes to correctly judge the condition (allowable readings are twice the width of the needle). • Are readings within the allowable range?	Yes ▶ No ▶	GO to **TG11.** REPLACE temperature sensor.
TG11 TEMPERTURE GAUGE SENDING UNIT CHECK (TEMPERATURE GAUGE IS INACCURATE)		
• Remove the sending unit. • Place the sending unit in a container of water and heat to 80°C (176°F). • Measure the resistance between the case and the terminal of the sending unit. • Does the resistance measure between 49.3 ohms and 57.7 ohms?	Yes ▶ No ▶	GO to **TG12.** REPLACE sending unit.
TG12 RESISTANCE CHECK BETWEEN TEMPERATURE GAUGE SENDING UNIT AND GROUND		
• Key OFF. • Measure resistance between sending unit casing and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. REPLACE sending unit.





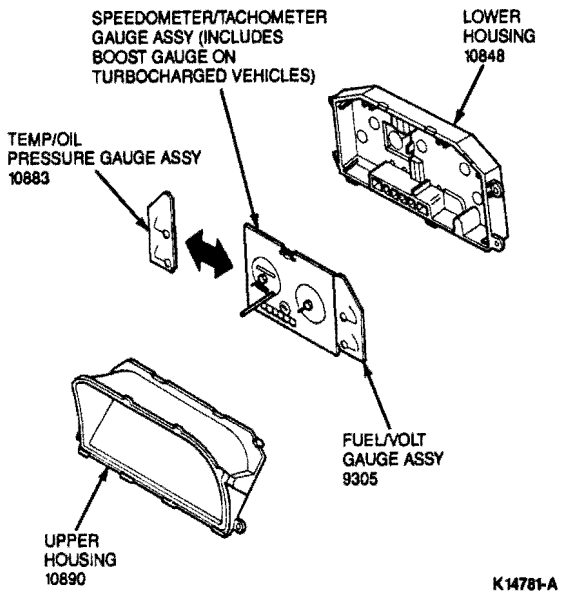
CK15413-A

REMOVAL AND INSTALLATION

Temperature Gauge

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate the temperature / oil pressure gauge from the speedometer / tachometer / boost gauge assembly. (The boost gauge is used only on turbocharged vehicles.)



Installation

CAUTION: The gauges are calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position temperature / oil pressure gauge to speedometer / tachometer / boost gauge assembly.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check all gauges and indicators for proper operation.

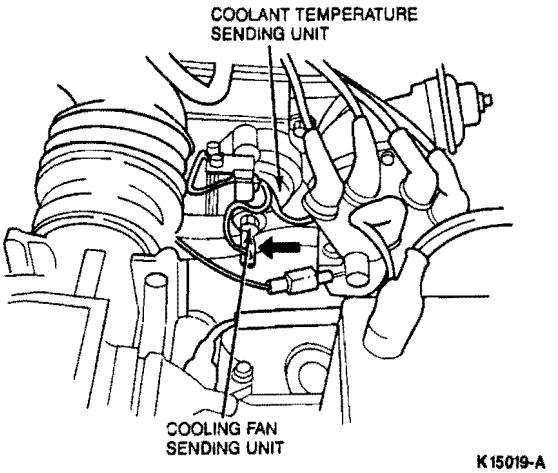
Temperature Sending Unit

Removal

1. Relieve cooling system pressure.

WARNING: NEVER REMOVE THE RADIATOR CAP UNDER ANY CIRCUMSTANCES WHILE THE ENGINE IS OPERATING. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY FROM HOT COOLANT OR STEAM BLOW OUT (AND / OR DAMAGE TO THE COOLING SYSTEM OR ENGINE). SWITCH OFF THE ENGINE AND WAIT UNTIL IT HAS COOLED. EVEN THEN, USE EXTREME CARE WHEN REMOVING THE CAP FROM A HOT RADIATOR. WRAP A THICK CLOTH AROUND THE CAP AND TURN IT SLOWLY TO THE FIRST STOP. STEP BACK WHILE THE PRESSURE IS RELEASED FROM THE COOLING SYSTEM. WHEN CERTAIN ALL THE PRESSURE HAS BEEN RELEASED, PRESS DOWN ON THE CAP WITH A CLOTH, TURN AND REMOVE IT.

2. Partially drain engine coolant. Refer to Section 27-01.
3. Disconnect electrical connector from sending unit.
4. Using a suitable tool, unscrew sending unit.



Installation

1. Apply Pipe Sealant With Teflon® D8AZ-19554-A (ESG-M4G194-A or ESR-M18P7-A), or equivalent to threads of sending unit.
2. Install sending unit into cylinder head. Tighten securely.
3. Connect electrical connector onto sending unit terminal.
4. Fill cooling system to proper level. Refer to Section 27-01.
5. Check gauge for proper operation.

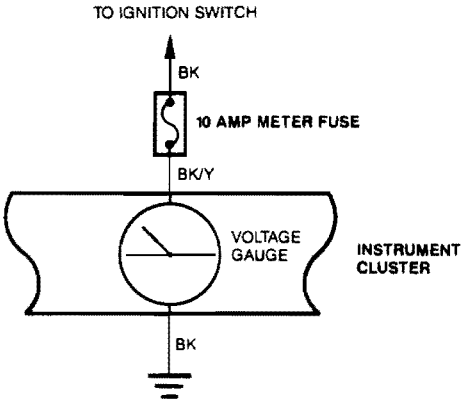
SECTION 33-32 Charge Indicator

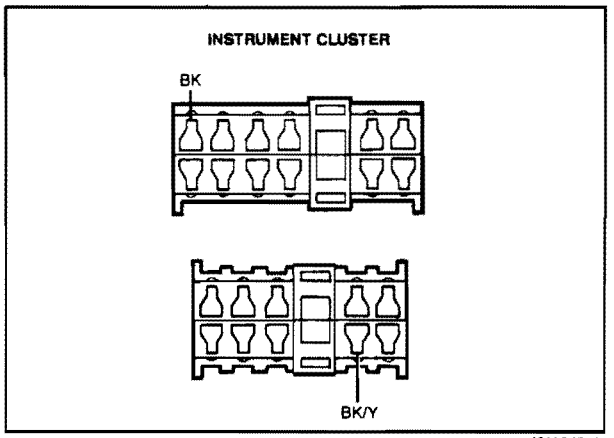
VEHICLE APPLICATION

Capri.

DESCRIPTION

The voltmeter indicates the voltage potential at the battery. It is not serviceable and must be replaced as part of the fuel / volt gauge assembly.





DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:
   a. Blown 10 amp meter fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged voltmeter.
2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. Inspect the voltmeter for obvious opens or shorts causing partial operation.
4. If fault is not visually evident, determine condition and refer to the following chart.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Gauge Always Reads Low	• Open signal wire. • Open power wires. • Damaged voltmeter. • Corroded or loose connections. • Charging system.	• Go to **VM1.** • Refer to Section 31-17.
• Gauge Always Reads High	• Damaged voltmeter. • Corroded or loose connections. • Charging system.	• Go to **VM1.** • Refer to Section 31-17.
• Gauge Is Inaccurate	• Damaged voltmeter. • Corroded or loose connections.	• Go to **VM1.**

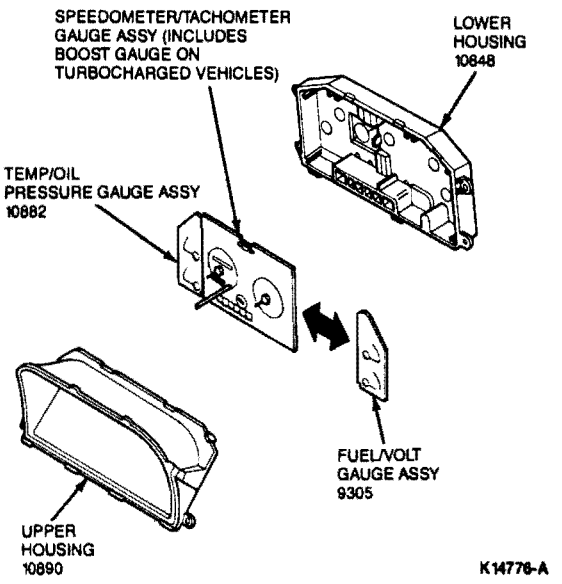
TEST STEP		RESULT ▶	ACTION TO TAKE
VM1	VOLTMETER FUSE CHECK		
	• Access fuse panel. • Check 10 amp meter fuse. • Is fuse OK?	Yes ▶ No ▶	GO to **VM4.** GO to **VM2.**
VM2	CHECK VOLTMETER SYSTEM		
	• Replace fuse. • Key ON. • Does fuse blow again?	Yes ▶ No ▶	GO to **VM3.** GO to **VM4.**
VM3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK/Y wire from 10 amp meter fuse. • Measure resistance of BK/Y wire and ground. • Is resistance less than 5 ohms?	Yes ▶ No ▶	SERVICE BK/Y wire. GO to **VM4.**
VM4	CHECK FOR POWER TO VOLTMETER		
	• Key ON. • Access instrument cluster. • Measure voltage at instrument cluster BK/Y wire and ground. • Is voltage greater than 10 volts?	Yes ▶ No ▶	GO to **VM5.** SERVICE BK/Y wire between instrument cluster and fuse panel.
VM5	VOLTMETER GROUND CHECK		
	• Key ON. • Measure voltage on the BK wire at instrument cluster. • Is voltage greater than 10 volts?	Yes ▶ No ▶	SERVICE BK wire between instrument cluster and ground. REPLACE voltmeter.

REMOVAL AND INSTALLATION

Voltmeter

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate the fuel / volt gauge from the speedometer / tachometer / boost gauge assembly. (The boost gauge is used only on turbocharged vehicles.)



Installation

CAUTION: The gauges are calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position fuel / volt gauge to speedometer / tachometer / boost gauge assembly.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check all gauges and indicators for proper operation.

SECTION 33-34 Oil Pressure Indicating System

VEHICLE APPLICATION

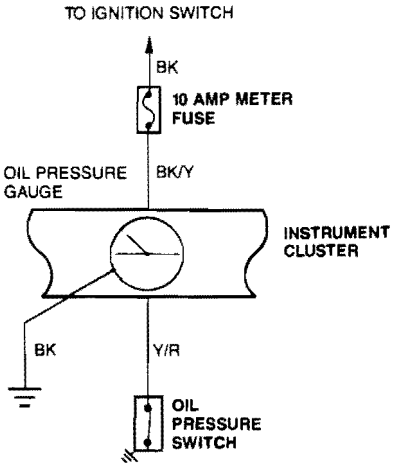
Capri.

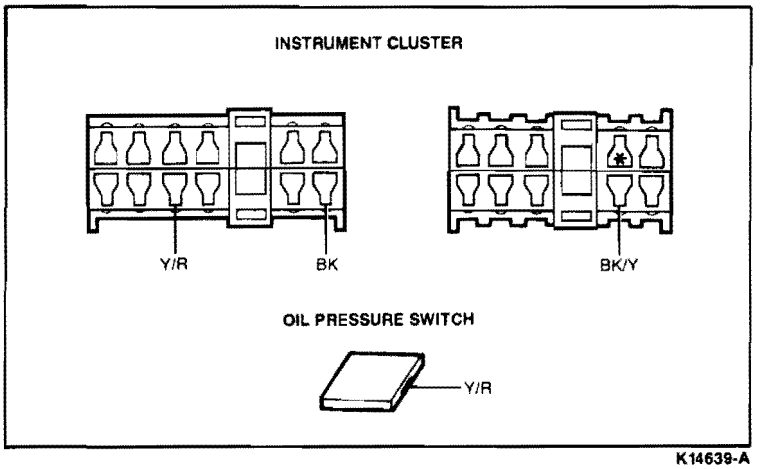
DESCRIPTION

The oil pressure indicating system consists of a sender unit mounted on the RH side of the engine block and a gauge mounted in the instrument cluster.

When the engine oil pressure is low, the sender resistance is high, resulting in low current flow through the gauge and little pointer movement.

The oil pressure gauge is not repairable and must be replaced as part of the temperature / oil pressure gauge assembly.





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DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components of the system. Check for:
   a. Blown fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged oil pressure switch.
   e. Damaged oil pressure gauge.
2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. Inspect the oil pressure gauge and the oil pressure switch for obvious opens or shorts causing partial operation.
4. If fault is not visually evident, determine condition and refer to the following chart.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Oil Pressure Gauge Always Reads Low	• Open signal wire. • Damaged pressure sensor. • Damaged pressure gauge. • Blown fuse. • Open power wire.	• Go to **OG1.**
• Oil Pressure Gauge Always Reads High	• Oil pressure gauge wire shorted to ground. • Damaged oil pressure sensor. • Damaged oil pressure gauge.	• Go to **OG7.**
• Oil Pressure Gauge Reads Inaccurately	• Corroded connections. • Damaged oil pressure sensor.	• Go to **OG10.**

TEST STEP		RESULT ▶	ACTION TO TAKE
OG1	OIL PRESSURE GAUGE FUSE CHECK		
	• Access fuse panel. • Check the 10 amp meter fuse. • Is fuse OK?	Yes ▶ No ▶	GO to **OG4.** GO to **OG2.**
OG2	CHECK OIL PRESSURE GAUGE SYSTEM		
	• Replace fuse. • Key ON, engine running. • Does fuse blow again?	Yes ▶ No ▶	GO to **OG3.** GO to **OG4.**
OG3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK wire from 10 amp meter fuse. • Measure resistance of BK/Y wire and ground. • Is resistance less than 5 ohms?	Yes ▶ No ▶	GO to **OG4.** SERVICE/REPLACE BK wire.
OG4	CHECK FOR POWER TO THE OIL PRESSURE GAUGE		
	• Access instrument cluster. • Key ON, engine running. • Measure voltage between the BK/Y wire and ground. • Is voltage greater than 10 volts?	Yes ▶ No ▶	GO to **OG5.** SERVICE/REPLACE BK/Y wire.
OG5	OIL PRESSURE GAUGE CHECK (OIL PRESSURE GAUGE ALWAYS READS LOW)		
	• Key OFF. • Place a jumper wire from the Y/R wire at instrument cluster to ground. • Does the oil pressure gauge read high?	Yes ▶ No ▶	GO to **OG6.** REPLACE oil pressure gauge.
OG6	OIL PRESSURE GAUGE CHECK (OIL PRESSURE GAUGE ALWAYS READS LOW)		
	• Place a jumper wire from Y/R wire at the oil pressure switch to ground. • Does the oil pressure gauge read high?	Yes ▶ No ▶	GO to **OG7.** SERVICE/REPLACE Y/R wire between oil pressure switch and oil pressure gauge.

DIAGNOSIS AND TESTING (Continued)

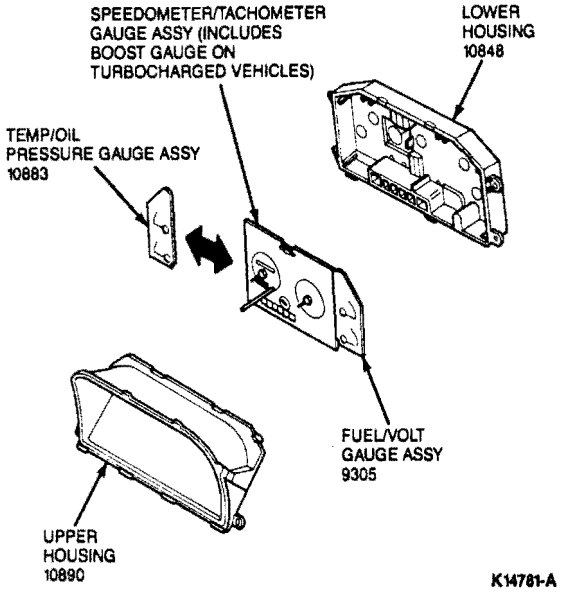
	TEST STEP	RESULT ▶	ACTION TO TAKE
OG7	OIL PRESSURE GAUGE SHORT CHECK (OIL PRESSURE GAUGE ALWAYS READS HIGH)		
	• Remove Y/R wire from the oil pressure switch. • Does oil pressure gauge read low?	Yes ▶ No ▶	GO to **OG8.** REPLACE oil pressure switch.
OG8	OIL PRESSURE GAUGE SHORT CHECK (OIL PRESSURE GAUGE ALWAYS READS HIGH)		
	• Disconnect instrument cluster connector. • Does the oil pressure gauge still read low?	Yes ▶ No ▶	REPLACE oil pressure switch. GO to **OG9.**
OG9	CHECK OIL PRESSURE GAUGE GROUND		
	• Disconnect instrument cluster connector. • Measure resistance between the oil pressure gauge BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **OG10** SERVICE/REPLACE BK wire.
OG10	OIL PRESSURE GAUGE CHECK (OIL PRESSURE GAUGE IS INACCURATE)		
	• Disconnect oil pressure switch. • Connect one lead of Rotunda Gauge System Tester 021-00038 or equivalent to the Y/R wire of the connector and the other lead to ground. • Set the tester to resistance values shown. • Place the ignition switch to the ON position and check to see that the needle indicator displays the correct values. • Continue each inspection for two minutes to correctly judge the condition (allowable readings are twice the width of the needle). • Are readings within the allowable range?	Yes ▶ No ▶	REPLACE oil pressure switch. REPLACE oil pressure gauge.

REMOVAL AND INSTALLATION

Oil Pressure Gauge

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate the temperature / oil pressure gauge from the speedometer / tachometer / boost gauge assembly. (The boost gauge is used only on turbocharged vehicles.)



Installation

CAUTION: The gauges are calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position temperature / oil pressure gauge to speedometer / tachometer / boost gauge assembly.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check all gauges and indicators for proper operation.

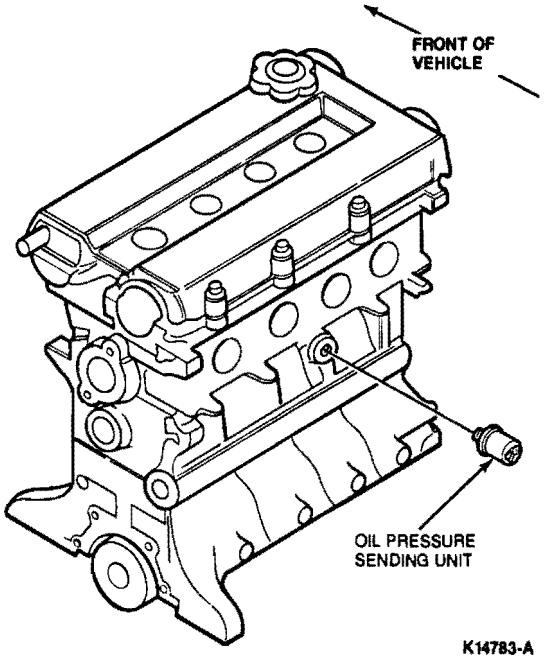
Oil Pressure Sending Unit

Removal

1. Disconnect electrical lead wire from oil sending unit.

CAUTION: Do not use locking-type pliers to remove or install oil sending unit. The diaphragm in the sending unit could be damaged with the use of locking-type pliers.

2. Unscrew oil sending unit with a suitable tool.



Installation

1. Apply pipe sealant with Teflon® D8AZ-19554-A (ESG-M4G194-A or ESR-M18P7-A) or equivalent to threads of sending unit.
2. Install sending unit into cylinder head. Tighten to 16-23 N·m (12-17 lb-ft).
3. Connect electrical lead onto sending unit terminal.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	Nom	Lb-Ft
Oil Pressure Sending Unit	16-23	12-17

SECTION 33-36 Turbo Boost Indicating System

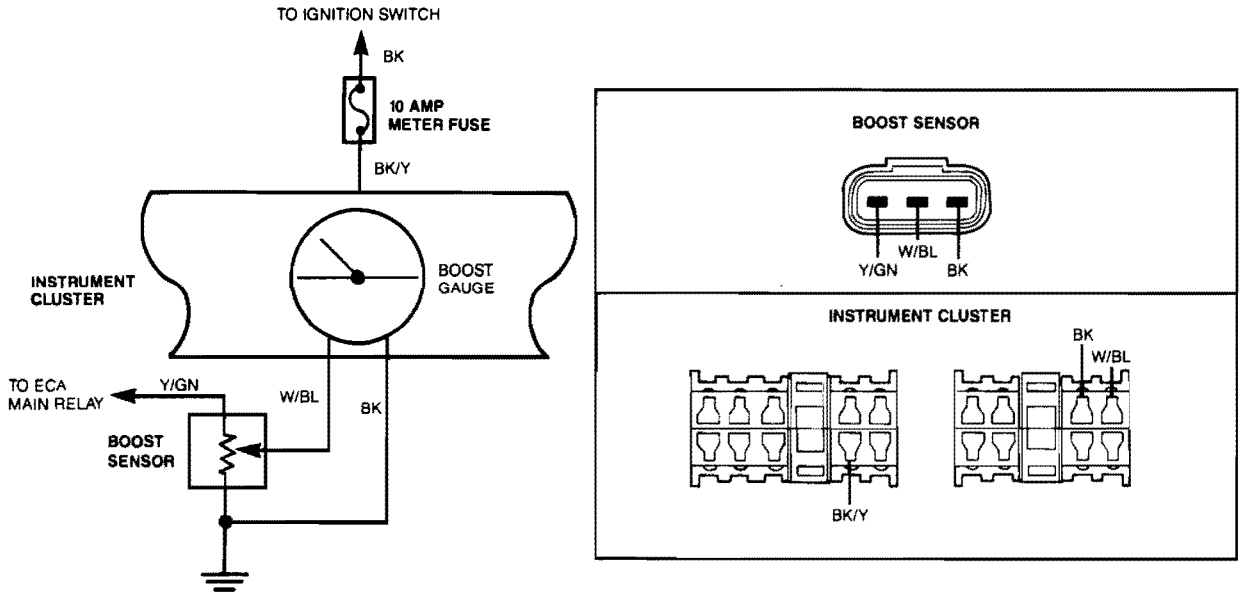
VEHICLE APPLICATION

Capri.

DESCRIPTION

The turbo boost indicating system consists of an electrically operated gauge mounted in the instrument cluster and a sensor mounted in the engine compartment. The sensor converts a vacuum signal to electrical input for the gauge.

The boost gauge is not serviced separately. It is part of the speedometer, tachometer and boost gauge assembly.



DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:
   a. Blown fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged boost gauge.

DIAGNOSIS AND TESTING (Continued)

e. Damaged boost sensor.

2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. Inspect the boost gauge and the boost sensor for obvious opens or shorts causing partial operation.
4. If fault is not visually evident, determine condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• Turbo Boost Gauge Always Reads Low	• Open wires. • Damaged boost sensor. • Damaged boost gauge. • Blown fuse. • Corroded or loose connections.	• Go to **BG1.**
• Turbo Boost Gauge Always Reads High	• Damaged signal wire. • Damaged boost sensor. • Damaged boost gauge.	• Go to **BG4.**
• Turbo Boost Gauge Is Erratic	• Corroded or loose connections. • Damaged boost sensor. • Damaged boost gauge.	• Go to **BG4.**

TEST STEP		RESULT ▶	ACTION TO TAKE
BG1	BOOST GAUGE FUSE CHECK		
	• Access fuse panel. • Check the 10 amp meter fuse. • Is fuse OK?	Yes ▶ No ▶	GO to **BG4.** GO to **BG2.**
BG2	CHECK SYSTEM		
	• Replace fuse. • Key ON. • Does fuse blow again?	Yes ▶ No ▶	GO to **BG3.** GO to **BG4.**
BG3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK/Y wire from 10 amp meter fuse. • Measure resistance of BK/Y wire and ground. • Is resistance less than 5 ohms?	Yes ▶ No ▶	GO to **BG4.** SERVICE BK/Y wire.
BG4	CHECK FOR POWER TO THE BOOST GAUGE		
	• Access instrument cluster. • Key ON. • Measure voltage on the BK/Y wire and ground. • Is voltage greater than 10 volts?	Yes ▶ No ▶	GO to **BG5.** SERVICE BK/Y wire.
BG5	CHECK BLACK WIRE TO GROUND		
	• Disconnect instrument cluster 8 pin connector and the boost sensor connector. • Measure the resistance on the BK wire from each connector to ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **BG6.** SERVICE BK wire.

DIAGNOSIS AND TESTING (Continued)

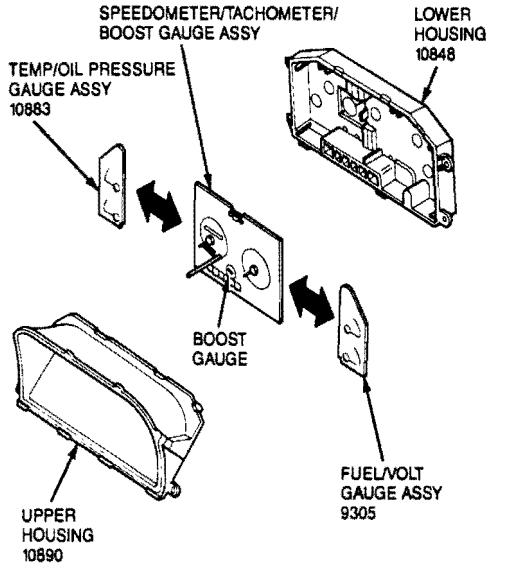
	TEST STEP	RESULT ▶	ACTION TO TAKE
BG6	CHECK VOLTAGE AT BOOST SENSOR		
	• Access boost sensor connector. • Disconnect boost sensor connector. • Key ON. • Measure voltage across Y / GN and BK wires at the boost sensor connector.. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **BG7.** SERVICE Y / GN and BK wires as needed, going to the boost sensor.
BG7	CHECK BOOST GAUGE SIGNAL WIRE		
	• Access instrument cluster. • Disconnect instrument cluster 8-pin connector. • Disconnect boost sensor. • Measure resistance across the W / BL wire from instrument cluster to boost sensor connector. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **BG8.** SERVICE W / BL wire.
BG8	CHECK BOOST GAUGE		
	• Disconnect instrument cluster 8 pin connector. • Key ON. • Ground W / BL wire at boost gauge. • Does boost gauge read low? • Apply 12 volts to W / BL wire at boost gauge. • Does boost gauge read high?	Yes ▶ No ▶	GO to **BG9.** REPLACE boost gauge.
BG9	BOOST SENSOR CHECK		
	• Disconnect boost sensor. • Place a jumper wire between Y / GN and W / BL wires on connector. • Does the boost gauge read full?	Yes ▶ No ▶	REPLACE boost sensor. RETURN to condition chart.

REMOVAL AND INSTALLATION

Boost Gauge

Removal

1. Disconnect negative battery cable.
2. Remove and disassemble instrument cluster assembly. Refer to Section 33-01.
3. Separate speedometer / tachometer / boost gauge assembly from other gauge assemblies.



Installation

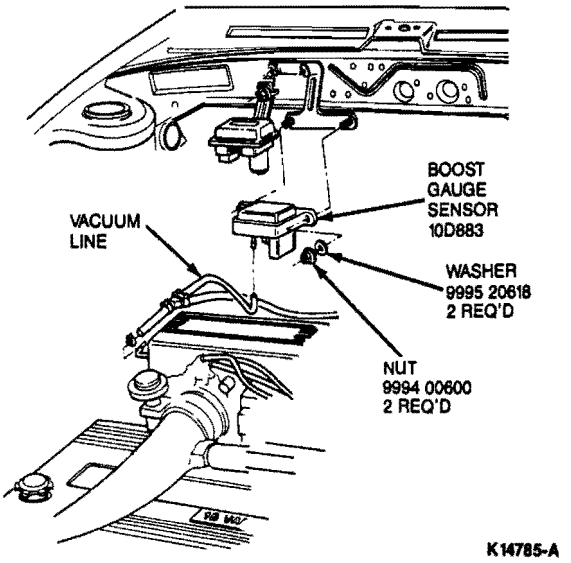
CAUTION: Gauges are calibrated at the factory. Excessive rough handling could disturb calibration.

1. Position speedometer, tachometer, and boost gauge assembly to other gauge assemblies.
2. Install gauge assembly into instrument cluster and install cluster. Refer to Section 33-01.
3. Connect negative battery cable.
4. Check all gauges and indicators for proper operation.

Boost Gauge Sensor

Removal

1. Disconnect vacuum line and electrical connector from sensor.
2. Remove two nuts and washers.
3. Remove sensor.



Installation

1. Install sensor with two washers and nuts. Tighten to 6-10 N·m (4-7 lb-ft).
2. Inspect vacuum lines and replace as required.
3. Connect vacuum line and electrical connector to sensor.
4. Check all gauges for proper operation.

SECTION 33-45 Warning Indicators

VEHICLE APPLICATION

Capri.

DESCRIPTION

Instrument Panel Lamps

All instrument panel lamps should illuminate when the ignition switch is turned to the "ON" position except the brake warning lamp. The brake warning lamp should illuminate for a few seconds when the ignition is turned to the "START" position.

Some switches include indicator lamps as part of the switch. These are not serviced separately. The fog lamp switch, headlamp switch, and defogger switch all include indicator lamps.

Safety Belt Indicator

The system incorporates a buzzer and lamp as warning devices. The safety belt warning lamp illuminates for several seconds after the ignition switch is turned to the RUN position, regardless of safety belt usage. The safety belt warning buzzer is grounded by a switch in the left inboard buckle. The safety belt warning buzzer will sound unless the driver's belt is connected.

Check Engine Warning Lamp

The check engine warning lamp illuminates when there is a problem in the engine control or emission system. Refer to Engine/Emissions for further information.

Brake Indicator

The brake indicator illuminates when the parking brake lever is lifted up, a leak in the brake hydraulic system occurs, the brake fluid in the reservoir is low, or too much air is contained in the hydraulic system causing the two separate hydraulic systems to become unbalanced. The ignition switch must be in the RUN position.

The lamp will illuminate when the ignition is turned to the START position and should go out when the engine is started.

The brake indicator circuit consists of the parking brake switch and a pressure differential warning switch.

DESCRIPTION (Continued)

Alternator Warning Lamp

This lamp illuminates if there is a problem in either the alternator or wiring systems. Refer to Section 31-01 for additional information.

Air Bag Lamp

Refer to Section 41-58 for information on the air bag warning lamp.

Turn Signal Indicators

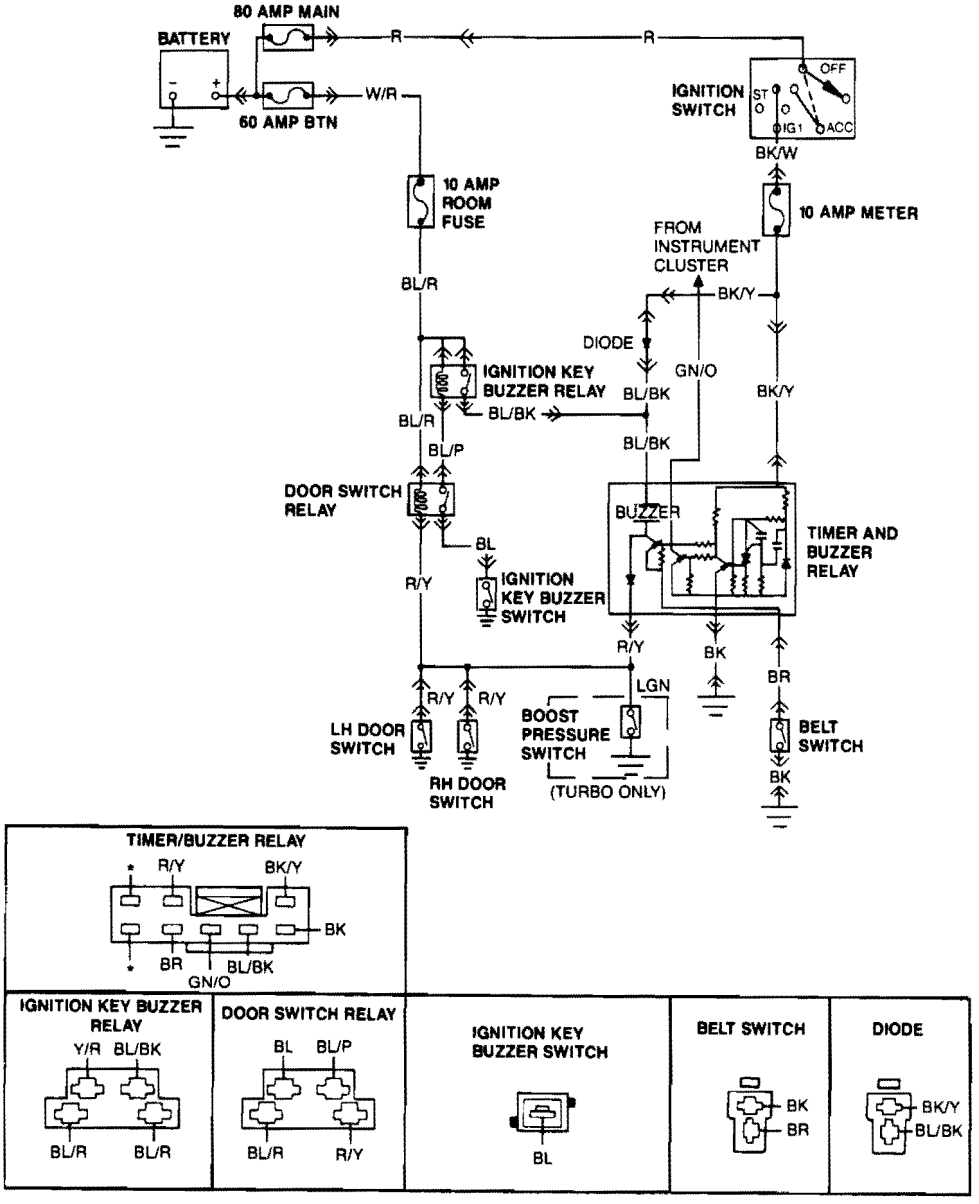
The turn signal system consists of the multi-function switch, turn signal / hazard flasher, indicating lamps and necessary wiring. Refer to Section 32-40 for additional information.

High Beam Indicator

This indicator lamp illuminates when the headlamps are on and in high beam position or when the flash-to-pass switch is activated.

DESCRIPTION (Continued)

Buzzer System



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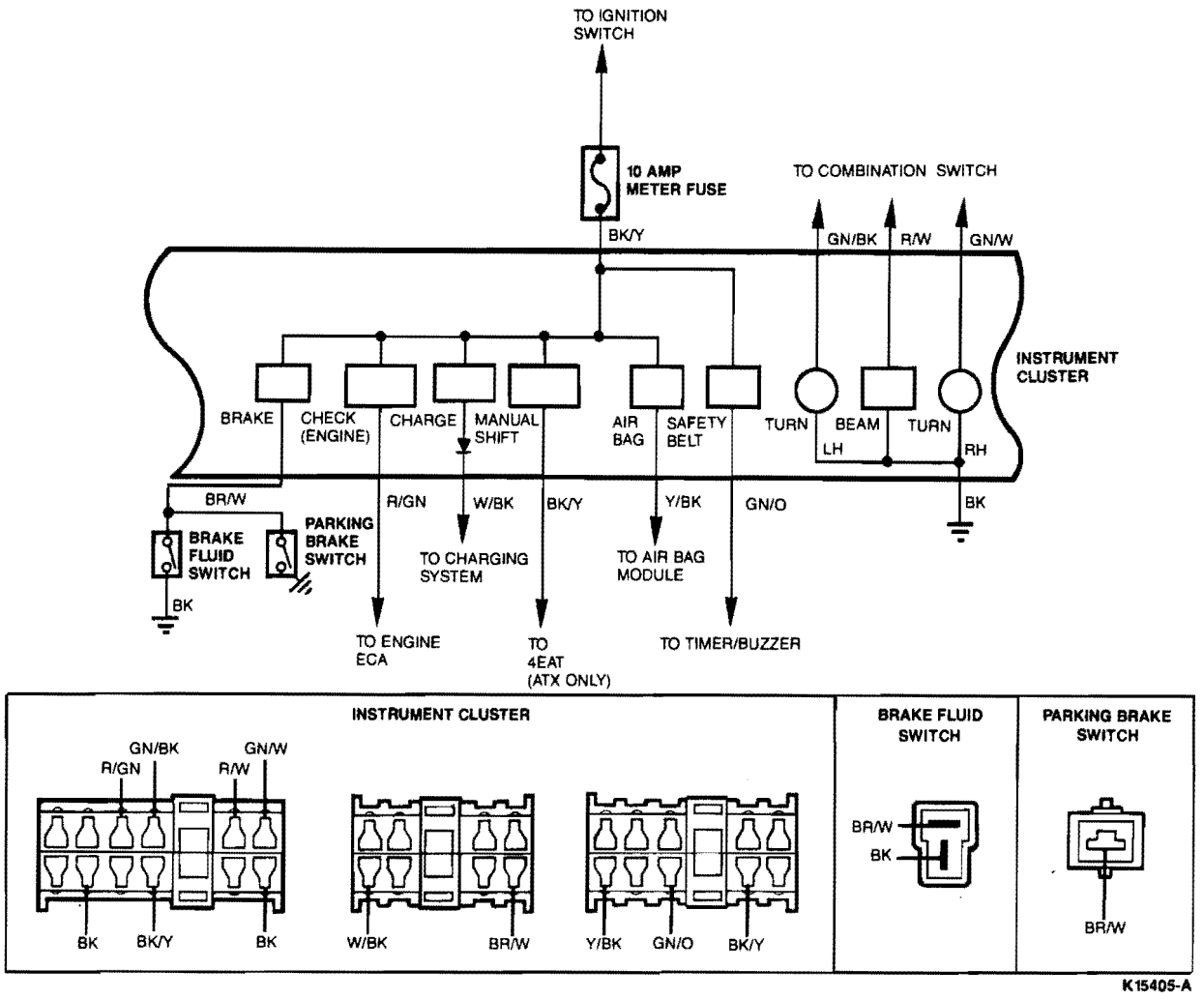
DESCRIPTION (Continued)



DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components of the system. Check for:
   a. 10 amp meter fuse and the 10 amp room fuse.
   b. Damage to wiring harness.
   c. Loose or corroded connections.
   d. Damaged warning indicator(s) lamps.
   e. Damaged parking / brake fluid switch(es).
2. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
3. If fault is not visually evident, determine condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
• Timer / Buzzer Not Operating Correctly	• Blown fuse(s). • Damaged switches. • Loose or corroded connections. • Damaged wires. • Damaged timer / buzzer relay.	• Go to **BT1.**

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
• Buzzer Not Operating With Key in the Ignition	• Damaged door switch relay. • Loose or corroded connections. • Damaged wires. • Damaged ignition key buzzer relay.	• Go to **BT10.**
• Buzzer Not Operating With the Doors Open	• Damaged door switches. • Loose or corroded connections. • Damaged wires. • Damaged door switch relay.	• Go to **BT27.**
• Buzzer Not Operating With the Safety Belts Not Connected	• Damaged belt switch. • Loose or corroded connections. • Damaged wires. • Damaged timer / buzzer relay.	• Go to **BT34.**
• No buzzer With Safety Belt Illumination Lamp On	• Loose or corroded connections • Damaged wires. • Damaged timer / buzzer relay.	• Go to **BT26.**
Buzzer Constantly Operating With the Key in the Ignition	• Damaged door switches. • Loose or corroded connections. • Damaged wires. • Damaged timer / buzzer relay.	• Go to **BT25.**
• All Warning Lamps Not Operating Correctly	• Blown fuse. • Blown bulbs. • Corroded or loose connections. • Damaged wires. • Damaged circuit panel.	• Go to **WI1.**
• Some Warning Lamps Not On	• Blown bulb(s). • Corroded or loose connections. • Damaged wires. • Damaged circuit panel.	• Go to **WI1.**
• Combination Switch in the LH Turn Position, Lamp Not On	• Damaged wires. • Damaged circuit panel. • Blown bulb. • Corroded or loose connections.	• Go to **WI26.**
• Combination Switch in the RH Turn Position, Lamp Not On	• Damaged wires. • Damaged circuit panel. • Blown bulb. • Corroded or loose connections.	• Go to **WI30.**
• Combination Switch in the High Beam Position, Lamp Not On	• Damaged wires. • Damaged circuit panel. • Blown bulb. • Corroded or loose connections.	• Go to **WI34.**

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
BT1	TIMER/BUZZER FUSES CHECK		
	• Locate main fuse panel.	Yes ▶	GO to **BT5.**
	• Check the 60 amp BTN fuse and the 80 amp main fuse.	No ▶	GO to **BT2.**
	• Are the fuses OK?		
BT2	SYSTEM CHECK		
	• Replace fuse(s).	Yes 60 amp BTN ▶	GO to **BT3.**
		Yes 80 amp main ▶	GO to **BT4.**
	• Does the fuse(s) blow again?	No ▶	GO to **BT5.**
BT3	CHECK FOR SHORTS TO GROUND		
	• Disconnect the positive battery cable.	Yes ▶	SERVICE the W/R wire from 60 amp BTN fuse to the 10 amp room fuse.
	• Disconnect the W/R wire from the 60 amp BTN fuse.	No ▶	GO to **BT5.**
	• Measure the resistance of the W/R wire to ground.		
	• Is the resistance less than 5 ohms?		
BT4	CHECK FOR SHORTS TO GROUND		
	• Disconnect the positive battery cable.	Yes ▶	SERVICE the R wire from 80 amp main fuse to the ignition switch.
	• Disconnect the R wire from the 80 amp main fuse.	No ▶	GO to **BT19.**
	• Measure the resistance of the R wire to ground.		
	• Is the resistance less than 5 ohms?		
BT5	CHECK FOR POWER TO 10 AMP ROOM FUSE		
	• Locate the interior fuse panel.	Yes ▶	GO to **BT6.**
	• Disconnect the W/R wire from the 10 amp room fuse.	No ▶	SERVICE the W/R wire from 60 amp BTN fuse to the 10 amp room fuse.
	• Measure the voltage on the W/R wire and ground at the 10 amp room fuse.		
	• Is the voltage greater than 10 volts?		
BT6	CHECK 10 AMP ROOM FUSE		
	• Check the 10 amp room fuse.	Yes ▶	GO to **BT9.**
	• Is the fuse OK?	No ▶	GO to **BT7.**
BT7	CHECK SYSTEM		
	• Replace fuse.	Yes ▶	GO to **BT8.**
	• Does the fuse blow again?	No ▶	GO to **BT9.**
BT8	CHECK FOR SHORTS TO GROUND		
	• Replace fuse.	Yes ▶	SERVICE the BL/R wire(s) from the 10 amp room fuse to the ignition key buzzer relay and the door switch relay.
	• Disconnect the BL/R wire(s) from ignition key buzzer relay and the door switch relay.	No ▶	GO to **BT9.**
	• Measure the resistance on the BL/R wires to ground.		
	• Is the resistance less than 5 ohms?		

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
BT9	CHECK FOR POWER TO RELAYS		
	• Locate the ignition key buzzer relay and the door switch relay.	Yes ▶ Buzzer Relay	GO to **BT12.**
	• Measure the voltage on the BL / R wire(s) to ground at each of the relays.	Switch Relay ▶	GO to **BT10.**
	• Is the voltage greater than 10 volts?	No ▶	SERVICE the BL / R wire(s) to the relay in question.
BT10	CHECK OPERATION OF DOOR SWITCH RELAY		
	• Disconnect the door switch relay 4-pin connector.	Yes ▶	GO to **BT11.**
	• Measure the resistance between the BL / P and BL terminals on the relay.	No ▶	REPLACE door switch relay.
	• Is the resistance greater than 10,000 ohms?		
BT11	CHECK OPERATION OF DOOR SWITCH RELAY		
	• Apply 12 volts to the BL / R terminal on the relay.	Yes ▶	GO to **BT27.**
	• Ground the R / Y terminal on the relay.	No ▶	REPLACE door switch relay.
	• Measure the resistance between the BL / P and BL terminals on the relay.		
	• Is the resistance less than 5 ohms?		
BT12	CHECK OPERATION OF IGNITION KEY BUZZER RELAY		
	• Disconnect the ignition key buzzer relay.	Yes ▶	GO to **BT13.**
	• Measure the resistance between the BL / R and BL / BK terminals on the relay.	No ▶	REPLACE ignition key buzzer relay.
	• Is the resistance greater than 10,000 ohms?		
BT13	CHECK OPERATION OF IGNITION KEY BUZZER RELAY		
	• Apply 12V to the BL / R terminal on the relay.	Yes ▶	GO to **BT14.**
	• Ground the BL / P terminal on the relay.	No ▶	REPLACE ignition key buzzer relay.
	• Measure the resistance between the BL / R and BL / BK terminals on the relay.		
	• Is the resistance less than 5 ohms?		
BT14	CHECK WIRE BETWEEN TWO RELAYS		
	• Disconnect the ignition key buzzer relay and the door switch relay.	Yes ▶	GO to **BT15.**
	• Measure the resistance on the BL / P wire between both of the relays.	No ▶	SERVICE the BL / P wire between the two relays.
	• Is the resistance less than 5 ohms?		
BT15	CHECK IGNITION KEY BUZZER SWITCH OPERATION		
	• Disconnect the door switch relay.	Yes ▶	GO to **BT17.**
	• Measure the resistance from the BL wire to ground.	No ▶	GO to **BT16.**
	• Key in ignition—Less then 5 ohms Key removed from ignition—Greater than 10,000 ohms		
	• Are the resistance(s) correct?		

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
BT16	CHECK WIRE FROM DOOR SWITCH RELAY TO IGNITION KEY BUZZER SWITCH		
	• Disconnect the door switch relay.	Yes ▶	REPLACE the ignition key buzzer switch.
	• Disconnect the BL wire from ignition key buzzer switch.	No ▶	SERVICE the BL wire.
	• Measure the resistance on the BL wire from the door switch relay to the ignition key buzzer switch.		
	• Is the resistance less than 5 ohms?		
BT17	CHECK WIRE FROM IGNITION KEY BUZZER RELAY AND TIMER / BUZZER		
	• Disconnect the ignition key buzzer relay 4-pin connector.	Yes ▶	GO to **BT18.**
	• Disconnect the timer / buzzer relay 8-pin connector.	No ▶	SERVICE the BL / BK wire between the two relays.
	• Measure the resistance on the BL / BK wire between the two relays.		
	• Is the resistance less than 5 ohms?		
BT18	CHECK WIRE BETWEEN THE DIODE AND TIMER / BUZZER RELAY		
	• Locate the in-line diode.	Yes ▶	GO to **BT24.**
	• Disconnect the timer / buzzer relay 8-pin connector.	No ▶	SERVICE the BL / BK wire.
	• Measure the resistance on the BL / BK wire between the in-line diode and the timer / buzzer relay.		
	• Is the resistance less than 5 ohms?		
BT19	CHECK IGNITION SWITCH		
	• Locate the ignition switch.	Yes ▶	GO to **BT20.**
	• Disconnect the BK / W wire from the ignition switch.	No ▶	REPLACE ignition switch.
	• Ignition key in the ON position.		
	• Measure the voltage on the BK / W terminal on the ignition switch.		
	• Is the voltage greater than 10 volts?		
BT20	CHECK WIRE FROM IGNITION SWITCH TO THE 10 AMP METER FUSE		
	• Ignition switch in the ON position.	Yes ▶	GO to **BT21.**
	• Locate the 10 amp meter fuse.	No ▶	SERVICE the BK / W wire.
	• Measure the voltage at the 10 amp meter fuse BK / W wire to ground.		
	• Is the voltage greater than 10 volts?		
BT21	CHECK THE 10 AMP METER FUSE		
	• Check the 10 amp meter fuse.	Yes ▶	GO to **BT23.**
	• Is the fuse OK?	No ▶	GO to **BT22.**
BT22	CHECK SYSTEM		
	• Replace fuse.	Yes ▶	GO to **BT23.**
	• Does the fuse blow again?	No ▶	GO to **BT24.**

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT ▶	ACTION TO TAKE
BT23	CHECK FOR SHORTS TO GROUND		
	• Replace fuse.	Yes ▶	SERVICE the BK / Y wire from the 10 amp meter fuse to timer / buzzer relay.
	• Disconnect the BK / Y wire from the timer / buzzer relay 8-pin connector. • Measure the resistance on the BK / Y wire to ground. • Is the resistance less than 5 ohms?	No ▶	GO to **BT24.**
BT24	CHECK WIRE TO THE IN-LINE DIODE		
	• Ignition switch in the ON position.	Yes ▶	GO to **BT25.**
	• Locate the in-line diode.	No ▶	SERVICE the BK / Y wire.
	• Measure the voltage at the in-line fuse BK / Y wire to ground. • Is the voltage greater than 10 volts?		
BT25	CHECK THE IN-LINE DIODE		
	• Ignition switch in the ON position.	Yes ▶	GO to **BT26.**
	• Locate the timer / buzzer relay.	No ▶	REPLACE the in-line diode.
	• Measure the voltage at the timer / buzzer relay BL / BK wire to ground. • Is the voltage greater than 10 volts?		
BT26	CHECK WIRE FROM INSTRUMENT CLUSTER TO TIMER / BUZZER RELAY		
	• Locate the instrument cluster 10-pin connector.	Yes ▶	REFER to condition chart.
	• Measure the resistance of the GN / O wire from the instrument cluster to the timer / buzzer relay. • Is the resistance less than 5 ohms?	No ▶	SERVICE the GN / O wire.
BT27	CHECK WIRES TO THE DOOR SWITCHES		
	• Disconnect the door switch relay 4-pin connector.	Yes ▶	GO to **BT28.**
	• Locate the door switches.	No ▶	SERVICE the wire(s) in question.
	• Locate the timer / buzzer relay. • Measure the resistance(s) from the door switch relay R / Y wire to the following: ●Door switches. ●Boost pressure switch (turbo only). ●Timer / buzzer relay. • Are all resistance(s) less than 5 ohms?		

DIAGNOSIS AND TESTING (Continued)

TEST STEP	RESULT	ACTION TO TAKE
BT28 CHECK OPERATION OF DOOR SWITCHES		
• Disconnect the door switches. • Measure the resistance from the R/Y terminal on each switch to the switch case. **Switch Position** — **Resistance** Depressed — Greater than 10,000 ohms Released — Less than 5 ohms • Is the resistance(s) OK?	Yes ▶ No ▶	GO to **BT29.** REPLACE the door switch in question.
BT29 SHORT TO GROUND CHECK		

• Disconnect the following:
  • Timer/buzzer relay.
  • Boost pressure switch (turbo only).
  • Door switch relay.
• Leave the door switches disconnected.
• Measure the resistance of the R/Y wire to ground.
• Is the resistance greater than 10,000 ohms?
	Yes ▶
	No ▶
		GO to **BT30.**
		SERVICE the R/Y wire.

BT30 CHECK BOOST PRESSURE SWITCH GROUND (TURBO ONLY)		
• Measure the resistance from the boost pressure switch to ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **BT31.** SERVICE the grounds as needed.
BT31 CHECK WIRE TO THE BOOST PRESSURE SWITCH (TURBO ONLY)		
• Disconnect the boost pressure switch. • Disconnect the timer/buzzer relay. • Measure the resistance between the timer/buzzer relay R/Y wire and the boost pressure switch LGN wire. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	GO to **BT32.** SERVICE the R/Y wire from timer/buzzer relay and the boost pressure switch LGN wire.

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DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
BT32	CHECK OPERATION OF BOOST PRESSURE SWITCH		
	• Disconnect the boost pressure switch connector.	Yes ▶	GO to **BT33.**
	• Connect a pressure tester to the switch.	No ▶	REPLACE the boost pressure switch.
	• Measure the resistance across the terminals of the switch.		
	• Compare the readings with the chart.		
	Pressure / **Resistance** 0 kPa (0 psi) / Over 10,000 ohms 72-80 kPa (10-12 psi) / Under 5 ohms		
	• Are the measurements OK?		
BT33	CHECK GROUND OF THE TIMER/BUZZER RELAY		
	• Disconnect the timer/buzzer relay.	Yes ▶	GO to **BT34.**
	• Measure the resistance of the BK wire to ground.	No ▶	SERVICE the BK wire.
	• Is the resistance less than 5 ohms?		
BT34	CHECK WIRE FROM THE TIMER/BUZZER TO BELT SWITCH		
	• Disconnect the belt switch 2-pin connector.	Yes ▶	GO to **BT35.**
	• Measure the resistance on the BR wire from the timer/buzzer relay to the belt switch.	No ▶	SERVICE the BR wire.
	• Is the resistance less than 5 ohms?		
BT35	CHECK THE BELT SWITCH GROUND		
	• Measure the resistance from the BK wire at the switch to ground.	Yes ▶	GO to **BT36.**
	• Is the resistance less than 5 ohms?	No ▶	SERVICE the BK wire.
BT36	CHECK THE BELT SWITCH OPERATION		
	• Place a jumper wire from the BR wire at the switch to ground.	Yes ▶	REPLACE the timer/buzzer relay.
	• Does the timer/buzzer operate correctly?	No ▶	REPLACE the belt switch.

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DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
WI1	WARNING INDICATORS FUSE CHECK		
	• Access fuse panel. • Check the 10 amp meter fuse. • Is the fuse OK?	Yes ▶ No ▶	GO to **WI4.** GO to **WI2.**
WI2	CHECK SYSTEM		
	• Replace fuse. • Key ON. • Does the fuse blow again?	Yes ▶ No ▶	GO to **WI3.** GO to **WI4.**
WI3	CHECK FOR SHORTS TO GROUND		
	• Replace fuse. • Disconnect BK/Y wire from 10 amp meter fuse. • Measure the resistance of the BK/Y wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	SERVICE BK/Y wire from fuse panel to instrument cluster. GO to **WI4.**
WI4	CHECK FOR POWER TO INSTRUMENT CLUSTER		
	• Key ON. • Locate instrument cluster 12 pin connector. • Measure the voltage on the BK/Y wire at the instrument cluster. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **WI5.** SERVICE BK/Y wire.
WI5	FAULT SYMPTOM CHART		
	• Inspect which indicator lamp(s) not operating correctly.	Brake ▶ Check (Engine) ▶ Charge ▶ Manual Shift (ATX) ▶ Air Bag ▶ Safety Belt ▶	GO to **WI6.** GO to **WI11.** GO to **WI14.** GO to **WI17.** GO to **WI20.** GO to **WI23.**
WI6	CHECK BRAKE INDICATOR LAMP		
	• Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the brake indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI8.** GO to **WI7.**
WI7	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the brake indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI8.** SERVICE circuit panel.

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
WI8	CHECK WIRE(S) TO BRAKE SWITCH		
	• Key OFF. • Access instrument cluster. • Measure the resistance from the instrument cluster BR / W wire to both the brake fluid switch and the parking brake switch. • Is the resistance(s) less than 5 ohms?	Yes ▶ No ▶	GO to **WI9.** SERVICE BR / W wire.
WI9	CHECK BRAKE SWITCH(ES) GROUND		
	• Key OFF. • Measure the resistance of the brake fluid switch (BK wire) and the parking brake switch casing to ground. • Is the resistance(s) less than 5 ohms?	Yes ▶ No ▶	GO to **WI10.** SERVICE grounds as needed.
WI10	CHECK BRAKE SWITCH(ES) OPERATION		
	• Key ON. • Access the parking brake and the brake fluid switches. • Using a jumper wire, connect the BK wire of the brake fluid switch and the parking brake switch casing to ground. • Does the brake indicator lamp operate correctly?	Yes ▶ No ▶	RETURN to condition chart. REPLACE switch in question.
WI11	CHECK THE CHECK (ENGINE) LAMP		
	• Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the check (engine) lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI13.** GO to **WI12.**
WI12	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the check (engine) lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI13.** SERVICE circuit panel.
WI13	CHECK WIRE TO ECA		
	• Key OFF. • Disconnect the 12 pin instrument cluster connector. • Access ECA. • Measure the resistance between the instrument cluster R / GN wire and the ECA. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	REFER to Engine / Emissions, Section 16. SERVICE the R / GN wire.

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
WI14	CHECK CHARGE INDICATOR LAMP		
	• Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the charge indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI16.** GO to **WI15.**
WI15	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the charge indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI16.** SERVICE circuit panel.
WI16	CHECK WIRE TO THE ALTERNATOR		
	• Key OFF. • Disconnect the 8 pin instrument cluster connector. • Disconnect the alternator connector. • Measure the resistance between the instrument cluster W/BK wire and the alternator. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	REFER to Section 31-01. SERVICE the W/BK wire.
WI17	CHECK MANUAL SHIFT INDICATOR LAMP		
	• Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the manual shift indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI19.** GO to **WI18.**
WI18	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK/Y wire at the instrument cluster. • Using a jumper wire, ground the manual shift indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI19.** SERVICE circuit panel.
WI19	CHECK WIRE TO 4EAT MODULE		
	• Key OFF. • Disconnect the 10 pin instrument cluster connector. • Access 4EAT module. • Measure the resistance between the instrument cluster BK/Y wire and the 4EAT module. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	REFER to Section 17-01. SERVICE the BK/Y wire.

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
WI20	CHECK AIR BAG INDICATOR LAMP		
	• Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the air bag indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI22.** GO to **WI21.**
WI21	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the air bag indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI22.** SERVICE circuit panel.
WI22	CHECK WIRE TO AIR BAG MODULE		
	• Key OFF. • Disconnect the 10 pin instrument cluster connector. • Access air bag module. • Measure the resistance between the instrument cluster Y / BK wire and the air bag module. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	REFER to Section 41-58. SERVICE the Y / BK wire.
WI23	CHECK SAFETY BELT INDICATOR LAMP		
	• Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the safety belt indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI25.** GO to **WI24.**
WI24	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the BK / Y wire at the instrument cluster. • Using a jumper wire, ground the safety belt indicator lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI25.** SERVICE circuit panel.
WI25	CHECK WIRE TO TIMER / BUZZER		
	• Key OFF. • Disconnect the 10 pin instrument cluster connector. • Access timer / buzzer. • Measure the resistance between the instrument cluster GN / BR wire and the timer / buzzer. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	REFER to Section 41-50. SERVICE the GN / BR wire.

DIAGNOSIS AND TESTING (Continued)

	TEST STEP	RESULT ▶	ACTION TO TAKE
WI26	CHECK FOR POWER TO INSTRUMENT CLUSTER		
	• Key ON. • Access instrument cluster. • Combination switch in the LH turn position. • Disconnect the 12 pin instrument cluster connector. • Measure the voltage on the GN/BK wire at the instrument cluster. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	Go to **WI27.** SERVICE the GN/BK wire.
WI27	CHECK LH TURN SIGNAL LAMP		
	• Key OFF. • Apply 12 volts to the GN/BK wire at the instrument cluster. • Using a jumper wire, ground the LH turn signal lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI29.** GO to **WI28.**
WI28	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the GN/BK wire at the instrument cluster. • Using a jumper wire, ground the LH turn signal lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI29.** SERVICE circuit panel.
WI29	CHECK GROUND		
	• Key OFF. • Access instrument cluster. • Disconnect the 12 pin instrument cluster connector. • Measure the resistance between the instrument cluster BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. SERVICE BK wire.
WI30	CHECK FOR POWER TO INSTRUMENT CLUSTER		
	• Key ON. • Access instrument cluster. • Combination switch in the RH turn position. • Disconnect the 12 pin instrument cluster connector. • Measure the voltage on the GN/W wire at the instrument cluster. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **WI31.** SERVICE the GN/W wire.
WI31	CHECK RH TURN SIGNAL LAMP		
	• Key OFF. • Apply 12 volts to the GN/W wire at the instrument cluster. • Using a jumper wire, ground the RH turn signal lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI33.** GO to **WI32.**

DIAGNOSIS AND TESTING (Continued)

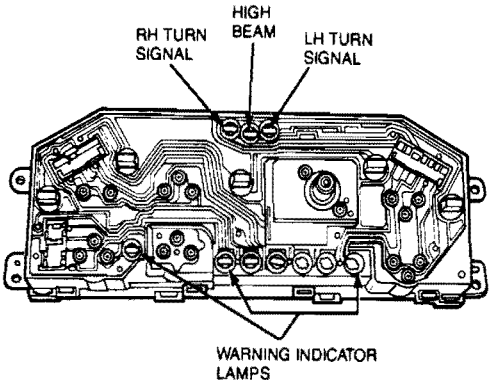
	TEST STEP	RESULT ▶	ACTION TO TAKE
WI32	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the GN/W wire at the instrument cluster. • Using a jumper wire, ground the RH turn signal lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI33.** SERVICE circuit panel.
WI33	CHECK GROUND		
	• Key OFF. • Access instrument cluster. • Disconnect the 12 pin instrument cluster connector. • Measure the resistance between the instrument cluster BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. SERVICE BK wire.
WI34	CHECK FOR POWER TO INSTRUMENT CLUSTER		
	• Key ON. • Access instrument cluster. • Combination switch in the high beam position. • Disconnect the 12 pin instrument cluster connector. • Measure the voltage on the R/W wire at the instrument cluster. • Is the voltage greater than 10 volts?	Yes ▶ No ▶	GO to **WI35.** SERVICE the R/W wire.
WI35	CHECK HIGH BEAM LAMP		
	• Key OFF. • Apply 12 volts to the R/W wire at the instrument cluster. • Using a jumper wire, ground the high beam lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI37.** GO to **WI36.**
WI36	CHECK INSTRUMENT CLUSTER		
	• Replace bulb. • Key OFF. • Apply 12 volts to the R/W wire at the instrument cluster. • Using a jumper wire, ground the high beam lamp. • Does the lamp operate correctly?	Yes ▶ No ▶	GO to **WI37.** SERVICE circuit panel.
WI37	CHECK GROUND		
	• Key OFF. • Access instrument cluster. • Disconnect the 12 pin instrument cluster connector. • Measure the resistance between the instrument cluster BK wire and ground. • Is the resistance less than 5 ohms?	Yes ▶ No ▶	RETURN to condition chart. SERVICE BK wire.

REMOVAL AND INSTALLATION

Warning/Indicator Lamp Bulbs

Removal and Installation

1. Remove instrument cluster. Refer to Section 33-01.
2. Replace bulb(s).
3. Install instrument cluster.



High Beam Switch

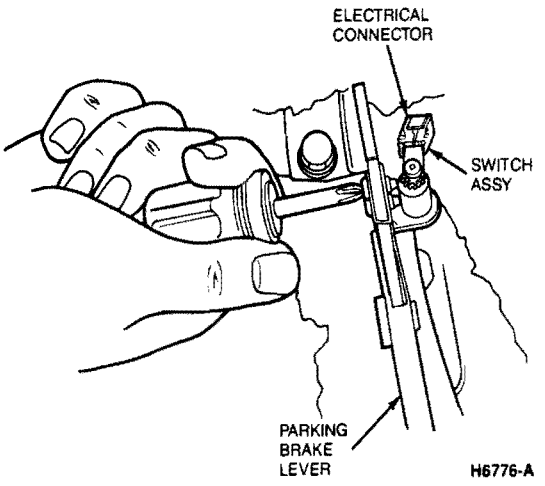
Removal and Installation

The high beam and flash-to-pass switches are part of the turn signal switch assembly. Refer to Section 32-40 for service.

Parking Brake Switch

Removal

1. Remove rear console. Refer to Section 45-31.
2. Remove retaining screws and parking brake warning lamp switch from parking brake lever.



Installation

1. Install parking brake warning lamp switch onto parking brake lever.
2. Adjust switch as required to operate warning lamp in instrument cluster when brake handle is lifted more than two notches.
3. Install console. Refer to Section 45-31.

Brake Fluid Level Switch

Removal and Installation

The low brake fluid level switch is located in the base of the master cylinder reservoir. Refer to Section 12-01 for service.

Safety Belt Switch

Removal

1. Remove front safety belt retractor. Refer to Section 41-50.
2. Disconnect electrical wiring from switch.
3. Remove switch.

Installation

1. Install switch.
2. Connect electrical wiring onto switch.
3. Install front safety belt retractor. Refer to Section 41-50.

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