FORD MOTOR CO. ELECTRONIC INSTRUMENT PANELS

Lincoln Continental,
Town Car, Mark VI
Thunderbird, XR7

DESCRIPTION

The Electronic Instrument Panel is standard on the Continental and Mark VI, optional on Lincoln Town Car, Thunderbird and XR7. On Lincoln Town Car, Continental and Mark VI, the system includes an electronic speedometer, fuel gauge, coolant temperature gauge (Continental only), message center, keyboard, control module, lamp out warning system and various sensors. The system used on Thunderbird and XR7 includes the electronic speedometer, fuel gauge and lamp out warning system.

OPERATION

The speedometer is driven by a conventional cable and has a mechanical odometer. It can indicate speed in miles-per-hour or kilometers-per-hour. It also provides a speed reading for vehicles equipped with cruise control. The fuel gauge displays a bar graph which indicates fuel level. It is divided into 32 divisions (11 on Continental) which represent a percentage of fuel in the tank. The fuel pump symbol flashes when fuel level is down to the last division (last 2 on Continental) on the gauge.

The message center displays warning for low oil pressure, engine temperature, ammeter, etc. In addition, it has a computer which can calculate fuel consumption, distance traveled, distance to destination, average speed, estimated time of arrival and elapsed time. The message center keyboard is used to enter trip data for computer calculations.

The lamp out warning system monitors the headlights, tail lights and brake lights. If a lamp goes out in one of these areas, a change in voltage drop across a special section of the wiring harness provides a signal to the indicator light of the appropriate system.

All sensors used with the electronic instrument panel (except fuel sending unit) are the same as used on conventional systems. Sensor inputs go to the control module and are converted to written messages on the message center.

TROUBLE SHOOTING

NO FUEL GAUGE DISPLAY

Check for minimum of 10 volts between ground and ignition terminals on gauge. If voltage is not present, check wiring. If present, replace gauge. On Continental, check also for blown fuse, disconnected or loose ground connection or damaged EIM. Repair as needed.

FUEL GAUGE SYMBOLS FLASH

Disconnect sender at tank and short across terminals. If gauge stops flashing, check sending unit for open circuit (greater than 300 ohms). If not, check wiring and ground connections. Check for damaged EIM (Continental only).

FUEL GAUGE ERRATIC OR INACCURATE

Check ground and power connections. Test fuel sender. Check EIM.

SPEEDOMETER READS ZERO AT ANY SPEED

Check for display "188" when ignition is turned on. If not present, replace speedometer. Check odometer operation. If working, replace EIM on Continental, or check optical sensor location in speedometer housing on all other models. If odometer does not work, repair cable.

ERRATIC SPEED READINGS

Check speedometer cable. Check wiring and ground connections. If both checks are good, replace speedometer.

SPEEDOMETER DISPLAY INCORRECT

If display remains on "188", shows any number but "0" when vehicle is stopped, shows letters, or is much dimmer than fuel gauge, speedometer must be replaced.

LAMP OUT SYSTEM MALFUNCTION

Place ignition in "ON" position and check that all indicators are on. If not, replace bulb. If bulb is okay, check wiring connections between fuse block and warning module. If one circuit does not work, check continuity of wiring. Check warning module and repair or replace as needed.

TESTING

NOTE – *The following test procedures apply to Lincoln Town Car, Mark VI, Thunderbird and XR7.*

Fuel Gauge – 1) Remove wiring connector at fuel tank sender. Connect ohmmeter across terminals at sender. Ohmmeter should read between 3-10 ohms at empty, and between 195-211 ohms at full tank.

NOTE – *These readings are opposite those obtained with a conventional fuel tank sending unit.*

2) Connect a 72 ohm resistor across sending unit connector terminals. Gauge should display 10 to 13 segments after initial checkout. Connect a 10 ohm resistor across terminals; gauge should display 1 or no segments and gas pump display will flash.

3) If gauge display is correct, replace sender. If gauge does not display correctly, replace gauge.

Speedometer – Use troubleshooting procedures to test speedometer. Check connections at printed circuit board if speedometer is totally inoperative.

Message Center – The message center can be checked for good ground and power connections. A special tester (T80L-50-EMC) is required for diagnosis and testing of the complete message center. All sending units are identical to conventional warning light units and should be checked for good connections.

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Lamp Out Warning System – 1) Turn ignition to "ACCY" position. Turn on low beam headlights and activate brake lights. All outside lights should work. If not, disconnect warning module. If lights now work, replace module. If outside lights still do not work, check fuses, bulbs, sockets or wiring, and repeat test.

2) If outside lights work properly, check if any lamp out indicators are on. If not, turn off outside lights, and disconnect both tail lights and one headlight. Turn ignition on. Turn on low beam headlights and activate brake lights. Headlight and tail light out indicators should light, indicating system is working properly.

3) If outside lights worked properly in step 1), but indicator lights are on, turn off lights and ignition. Disconnect warning module and turn ignition and headlights on. If indicator lights go off, check voltage between ground and circuits in module connector.

4) Voltage should be 10-15 volts. If not, check for open circuits in connector. If indicator lights remain on with module disconnected, check for shorts between ground and circuits in module connector.

REMOVAL & INSTALLATION

NOTE – *Removal procedures for components not listed here will be found in the Ford Motor Co. conventional instrument panels story in this section.*

INSTRUMENT CLUSTER

Removal (All Models) – 1) Disconnect battery ground cable. Remove steering column lower cover and lower instrument panel trim cover.

2) On Lincoln and Mark VI, remove keyboard trim panel and left dashboard trim panel. On all models, remove screws and instrument panel trim cover. On Continental, remove transmission indicator cable from steering column. On all models, remove 4 cluster retaining screws.

3) On Thunderbird and XR7, remove transmission indicator clamp from steering column. Detach cable loop from pin of steering column. On all models, pull cluster away from panel.

4) Disconnect feed plugs, ground wire, wiring harness and speedometer as required. On Lincoln and Mark VI, remove transmission indicator cable bracket and detach cable loop from pin on column. On all models, remove the cluster assembly.

Installation – 1) On Continental, connect wiring harness, position cluster on instrument panel and install retaining screws. On Lincoln Town Car, Mark VI, Thunderbird and XR7, lubricate speedometer cable head, position cluster on instrument panel and connect speedometer cable and wiring. Install cluster retaining screws.

2) On Continental, connect shift cable to steering column. On Lincoln Town Car, Mark VI, Thunderbird and XR7, place transmission indicator clamp on steering column and fit cable

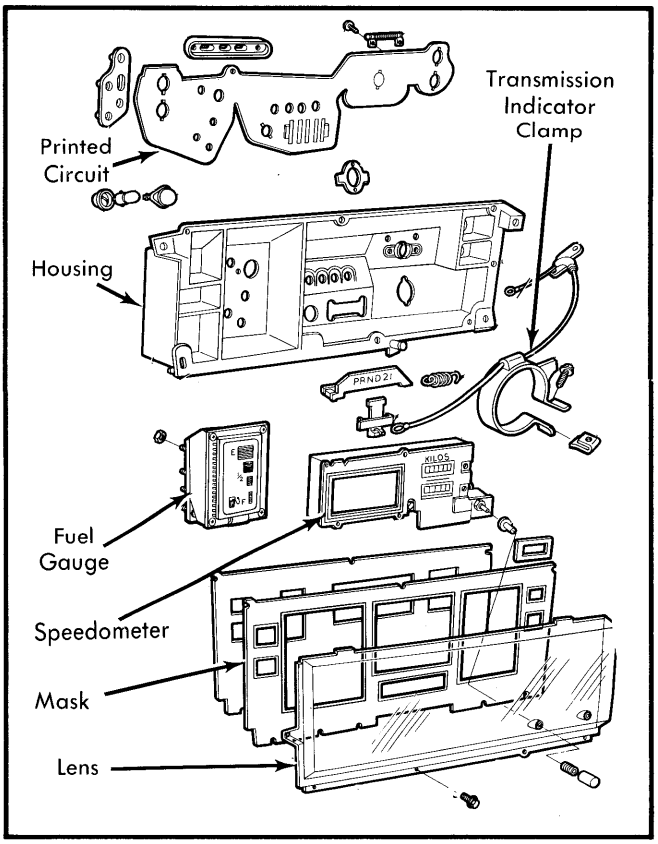

Fig. 1 Electronic Instrument Cluster (Thunderbird and XR7)

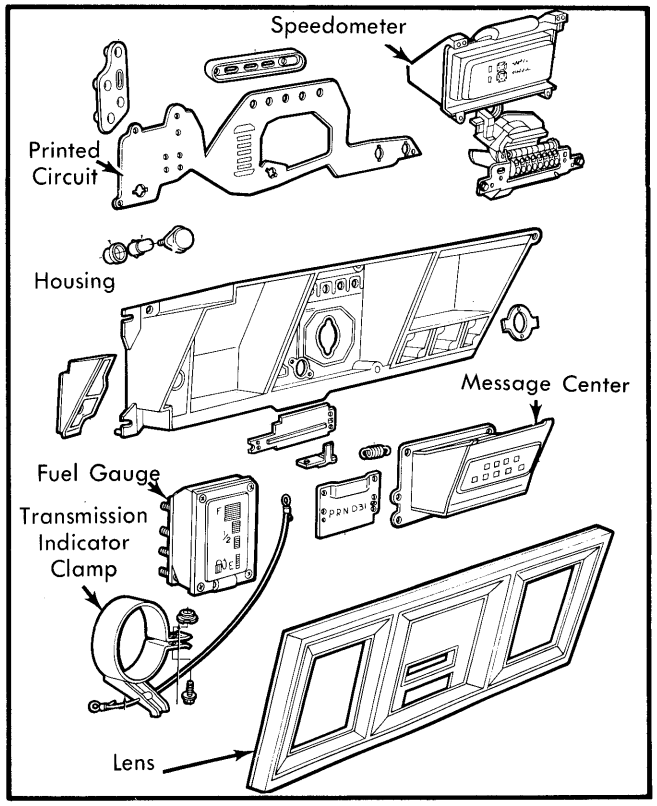

Fig. 2 Electronic Instrument Cluster (Lincoln and Mark VI)

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loop over pin. Place transmission in "D" and rotate clamp on column until indicator covers both calibration dots on cluster. Tighten clamp screw.

3) Replace instrument panel trim covers and steering column cover. Connect battery ground cable.

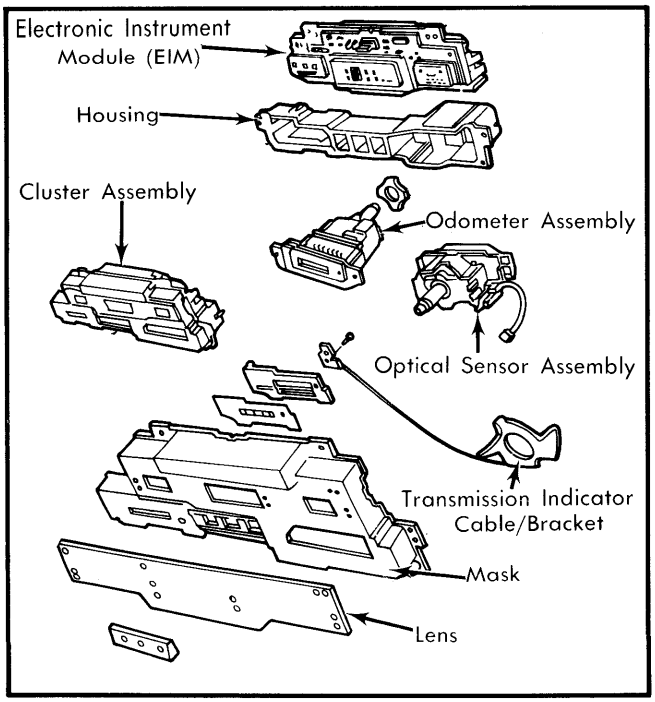

Fig. 3 Electronic Instrument Cluster (Continental)

ELECTRONIC INSTRUMENT MODULE

NOTE – *On Continental models, speedometer, fuel gauge, and coolant temperature gauge cannot be replaced separately. If either of these gauges is found to be faulty, the complete Electronic Instrument Module (EIM) must be replaced.*

Removal (Continental) – Remove optical sensor cable-to-connector retaining screw from back of EIM. Disconnect cable end. Remove 4 EIM-to-instrument cluster retaining screws. Remove EIM flexible circuit from mounting tabs. Slide EIM out of assembly.

Installation – Reverse removal procedures to install.

FUEL GAUGE

Removal (Lincoln Town Car, Mark VI, Thunderbird and XR7) – With instrument cluster removed, remove screws that hold mask and lens to housing. Remove mask and lens. Remove insulator from fuel gauge, then remove retaining nuts from the fuel gauge terminals on the back of the cluster. On Lincoln and Mark VI, remove lamp baffle from rear of housing. On all models, pull fuel gauge assembly out of housing.

Installation – Reverse removal procedures to install.

SPEEDOMETER AND ODOMETER

Removal (Lincoln Town Car, Mark VI, Thunderbird and XR7) – **1)** Disconnect battery ground cable and remove instrument cluster. Remove screws attaching dial and lens to cluster and remove dial and lens.

2) Remove insulator and retaining nuts securing speedometer housing to cluster. Remove screws attaching speedometer frame to cluster and remove speedometer assembly.

3) Remove 4 screws attaching dial to bridge. Separate dial from electronic chassis. Remove screw attaching optical sensor ("T" shaped component) to bridge, and pull sensor from its hole.

Installation – To install, reverse removal procedure.

ELECTRONIC MESSAGE CENTER

NOTE – *The Electronic Message Center (EMC) is a modular unit containing the Message Center display, Electronic Tone Generator, Message Center Keyboard and Lamp Warning system. These assemblies are serviced as a unit only. If any one component is bad, the complete EMC must be replaced.*

Removal (Continental) – Disconnect battery ground cable. Remove instrument panel moulding and trim retaining screws. Remove trim assembly (lift panel pad as needed to clear trim). Remove 4 screws holding Message Center to instrument panel. Pull part way out, disconnect electrical connectors (2) from back side, and remove Message Center.

Installation – Reverse removal procedures to install.

MESSAGE CENTER KEYBOARD

Remove (Lincoln Town Car and Mark VI) – Disconnect battery ground cable. Remove keyboard trim panel and lower instrument panel cover. Remove keyboard retaining bracket screws, lower bracket, and remove wiring connector. Remove keyboard screws and keyboard.

Installation – To install, reverse removal procedure.

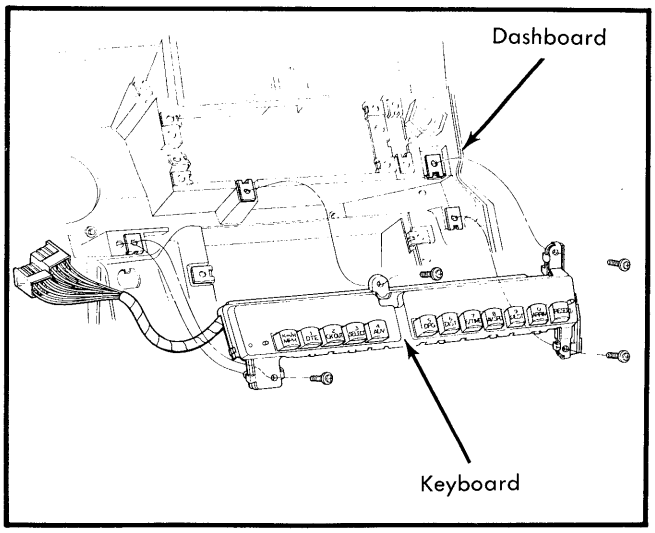

Fig. 4 Message Center Keyboard Mounting (All Models Exc. Continental)

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PRINTED CIRCUIT

Removal (Lincoln Town Car and Mark VI) – Remove Message Center Keyboard. Remove bulb and socket assemblies (5) from back of keyboard housing. Remove 2 attaching screws and remove printed circuit.

Installation – Reverse removal procedure to install.

MESSAGE CENTER INDICATOR

Removal (Lincoln Town Car, Mark VI, Thunderbird and XR7) – With instrument cluster removed, unplug 2 bulb and socket assemblies. Lift corner of printed circuit and remove message center screws and message center.

Installation – To install, reverse removal procedure.

MESSAGE CENTER CONTROL MODULE

Removal (Lincoln Town Car, Mark VI, Thunderbird and XR7) – Disconnect negative battery cable. Disconnect both control module feed connectors and remove 3 retaining screws from module bracket. Remove 1 screw from brake pedal support bracket. Lift and tilt rear of module up and pull straight down to removed.

Installation – To install, reverse removal procedure.

LAMP OUT WARNING MODULE

Removal & Installation (Thunderbird and XR7) – Remove glove compartment. Remove 2 screws attaching module to instrument panel at right of glove compartment. Disconnect electrical connection. Remove module. To install, reverse removal procedures.

Removal & Installation (Lincoln and Mark VI) – Remove 2 screws attaching module to brace beneath instrument panel to right of accelerator. Disconnect electrical connectors and remove module. To install, reverse removal procedure.