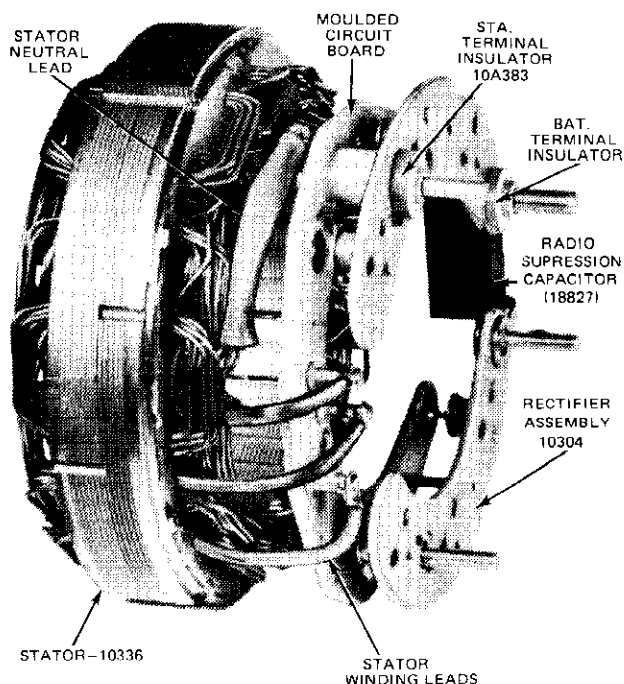


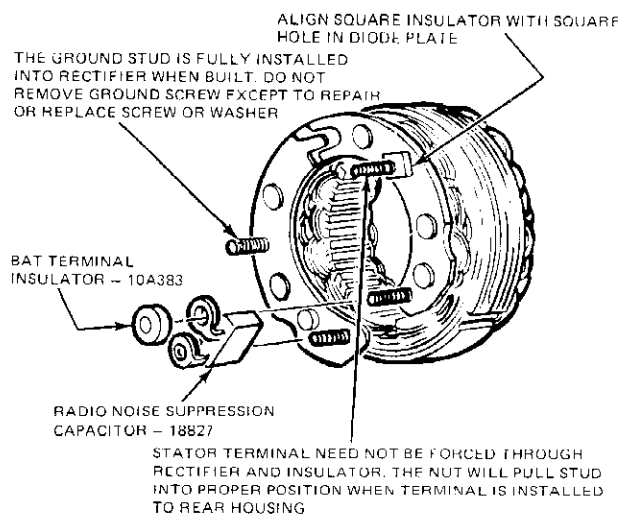


J1167-1F

FIG. 10 Stator Lead Connections—Except 61-Ampere Alternator

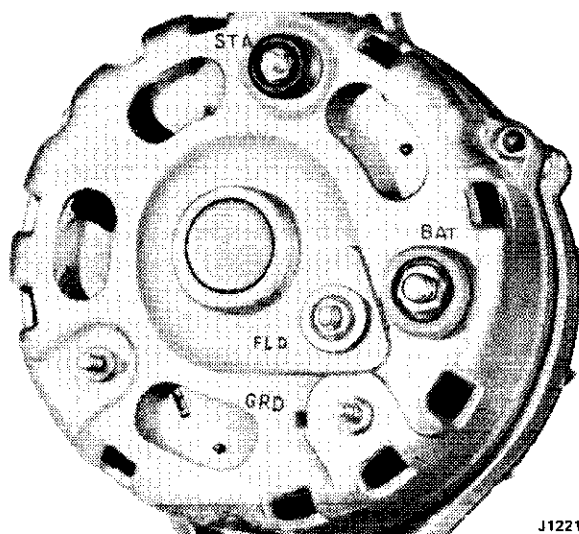
11. For single circuit boards with built-in diodes, insert the screws straight through the wire lug, insulating washer and rectifier into the square hole in the rectifier into the insulator (Fig. 6). **The dished washers are to be used only on the circuit board with exposed diodes (Fig. 5).** If they are used on the integral rectifier, a short circuit will occur. A flat insulating washer is to be used between the stator terminal and the board when an integral rectifier is used (Fig. 6).
12. Position the radio noise suppression capacitor on the rectifier terminals. On the circuit board with exposed diodes, install the STA and BAT terminal insulators (Fig. 10).
13. On the single circuit board, position the square stator terminal insulator in the square hole in the rectifier assembly (Fig. 6). Position the BAT terminal insulator (Fig. 11).

Position the stator and rectifier assembly in the rear housing. Make certain that all terminal insulators are seated properly in the recesses (Fig. 10). Position the STA (black), BAT (red) and FLD



J1429-1D

FIG. 11 Terminal Insulators—Circuit Board with Built-In Diodes



J1221-1F

FIG. 12 Alternator Terminal Locations

(orange) insulators on the terminal bolts, and install the retaining nuts (Fig. 12).

14. Wipe the rear end bearing surface of the rotor shaft with a clean, lint-free rag.
15. Position the rear housing and stator assembly over the rotor and align the scribe marks made during disassembly. Seat the machined portion of the stator core into the step in both end housings. Install the housing through bolts. Remove the brush retracting wire, and put a daub of waterproof cement over the hole to seal it.

SPECIFICATIONS

ALTERNATOR

Supplier	Stamp Color	Rating		Field Current Amps. @ 12 V*	Slip-Ring Turning (Inches)		Brush Length (Inches)		Pulley Nut Torque ft-lbs	Belt ① Tension (Lbs.)
		Amperes @ 15V	Watts @ 15V		Min. Dia.	Max. Runout	New	Wear-Limit		
Ford	Orange	40	600	2.9	1.22	0.0005	1/2	5/16	60-100	90-110
Ford	Green	60	900	2.9	1.22	0.0005	1/2	5/16	60-100	90-110
Ford	Green	60	900	4.0	1.22	0.0005	1/2	3/16	60-100	90-110
① Used Belt. New Belt 150. A used belt is one that has been in operation more than 10 minutes. If belt tension is out of specification or belt has been removed, reset to 110 lbs. * A Field Current of 4 amps is used with solid-state alternator.										

SPECIAL TOOLS

Ford Tool No.	Former No.	Description		Ford Tool No.	Former No.	Description
T63L-8620-A	8620 or BT-33-73-F	Belt Tension Gauge		T65P-10300-B		Alternator Pulley Remover

CJ1446-2H

E.E.D. Side Terminal Alternator

PART
31-12

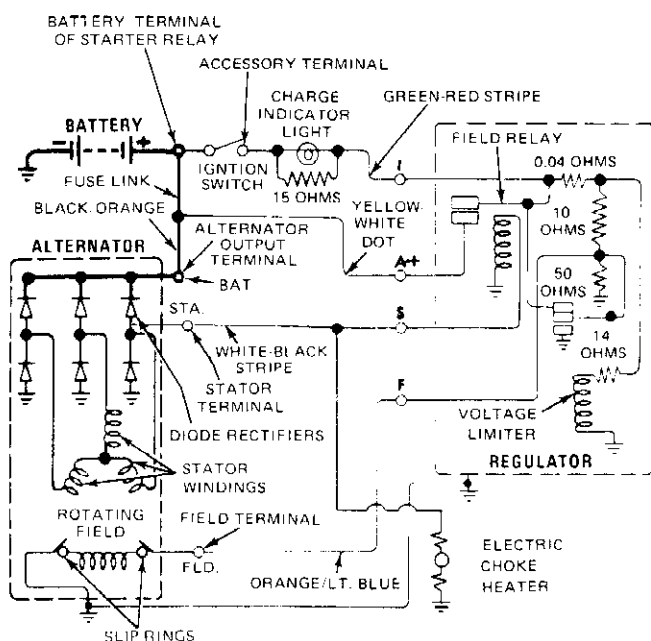
Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	12-1	MAJOR REPAIR OPERATIONS	
TESTING	12-2	Brush Replacement	12-5
ADJUSTMENTS		Overhaul	12-3
Belt Adjustment	12-2	Rectifier Replacement	12-5
REMOVAL AND INSTALLATION	12-2	SPECIFICATIONS AND	
		SPECIAL TOOLS	12-6

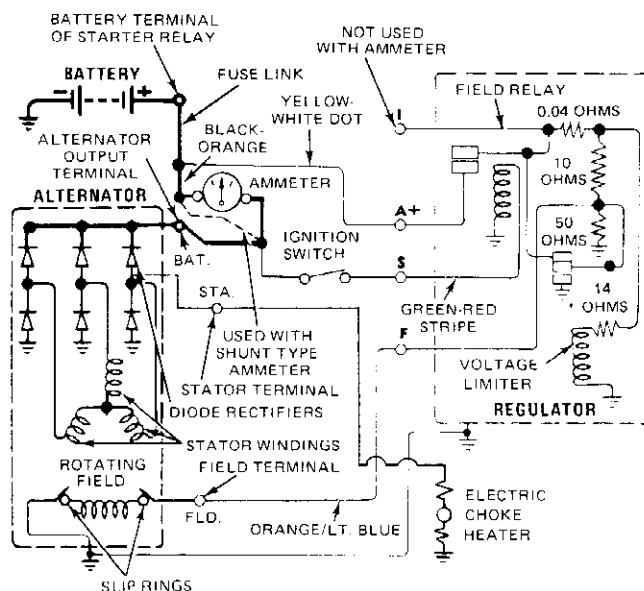
CK3362-2B

DESCRIPTION AND OPERATION

The operation of the E.E.D. side terminal alternator is the same as that for the E.E.D. rear terminal alternator given in Part 31-10. However, the internal wiring is different and is shown in Figs. 1 and 2.



INDICATOR LIGHT



AMMETER

J1568-2B

FIG. 1 70-Ampere Side Terminal Alternator Charging System

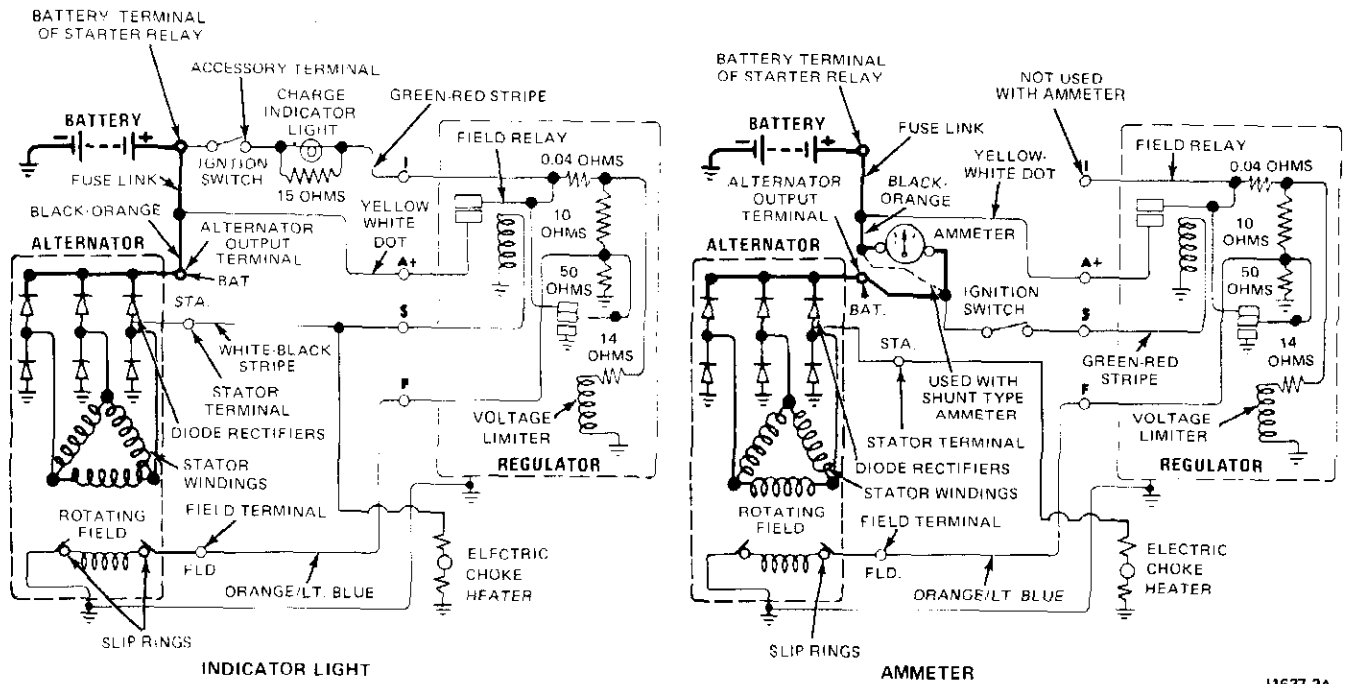


FIG. 2 90-Ampere Side Terminal Alternator Charging System

TESTING

ON VEHICLE TESTS

Check the alternator drive belt and adjust it to specification, if necessary, before proceeding with any tests. **Do not run the engine with the battery disconnected.**

Refer to Part 31-01 for Charging System Diagnosis and Test Procedures.

ADJUSTMENTS

BELT ADJUSTMENT

1. Check the belt tension with Tool T63L-8620-A or equivalent. The belt tension should be within specification.
2. If the belt is not within specification, loosen the alternator mounting bolt to a snug position and loosen the adjusting arm bolt.

3. Apply pressure to the alternator front housing adjusting ear with 1-1/8 inch open end wrench to increase the belt tension. Then, tighten the adjusting arm-to-alternator bolt.
4. Check the belt tension with Tool T63L-8620-A or equivalent. Repeat the procedure until the belt tension is within specification. Then, tighten all alternator mounting bolts.

REMOVAL AND INSTALLATION

CAUTION: Exercise care. Do not permit flames, sparks or lighted tobacco to come near battery.

SIDE TERMINAL ALTERNATOR

Removal

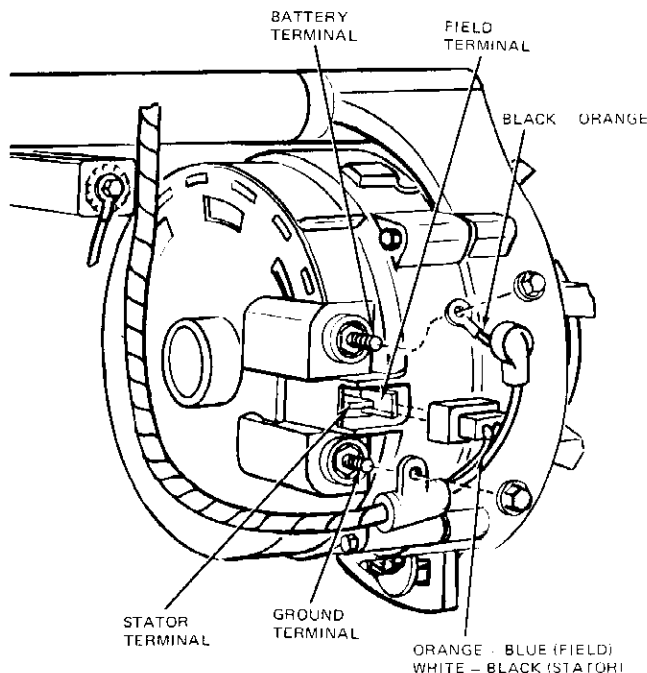
1. Disconnect the battery ground cable.

2. Loosen the alternator attaching bolt and remove the adjustment arm-to-alternator attaching bolt. Then, disengage the drive belt from the alternator pulley.

3. Remove the electrical connectors from the alternator (Fig. 3). The stator and field connectors are the push-on blade type with a lock that engages with the alternator housing. Depress the lock tab and pull the connector straight off the terminals to prevent damage to them and the connector.
4. Remove the alternator attaching bolt, and remove the alternator.

Installation

1. Position the alternator to the engine, and install the spacer (if used) and the alternator attaching bolt. Tighten the bolt to a snug position.
2. Install the adjustment arm-to-alternator attaching bolt.
3. Position the drive belt on the alternator pulley and adjust the belt tension to specification with Tool T63L8620-A or equivalent. **Apply pressure on the alternator front housing adjusting ear with 1 1/8 inch open end wrench when tightening the belt.** Tighten the adjusting arm bolt and the alternator mounting bolt.
4. Connect the electrical connectors to the alternator (Fig. 3). Be sure each connection is clean and tight.
5. Connect the battery ground cable.



J1566-1C

FIG. 3 Typical Wiring Connections—Side Terminal Alternator

MAJOR REPAIR OPERATIONS SIDE TERMINAL ALTERNATOR

OVERHAUL

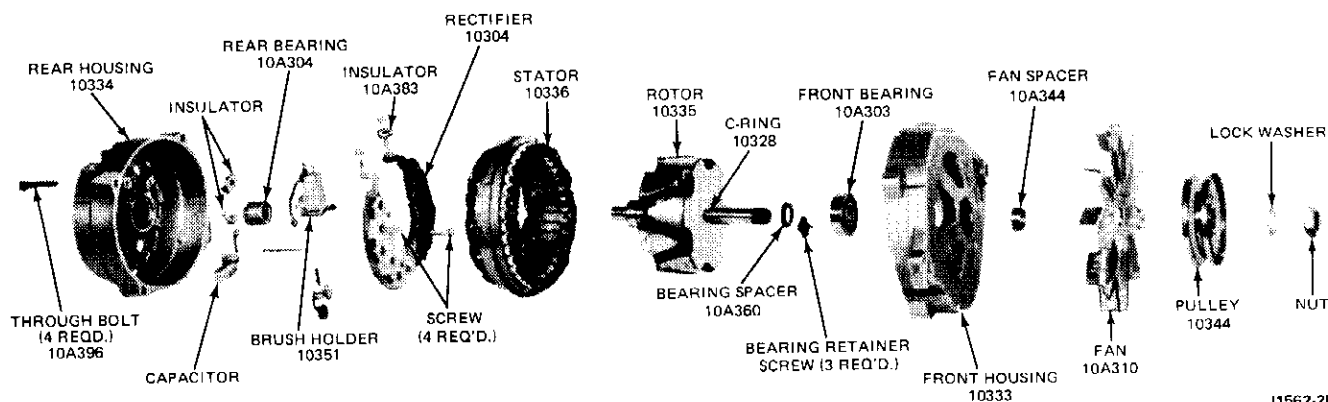
Disassembly

Fig. 4 shows a disassembled view of the side terminal alternator.

1. Mark both end housings and the stator with a scribe mark for assembly.
2. Remove the four housing through bolts, and separate the front housing and rotor from the rear

housing and stator. Slots are provided in the front housing to aid in disassembly. **Do not separate the rear housing from the stator at this time.**

3. Remove the drive pulley nut with the Tool shown in Fig. 5. Then, remove the lockwasher, pulley, fan and fan spacer from the rotor shaft.



J1562-2B

FIG. 4 Disassembled Side Terminal Alternator

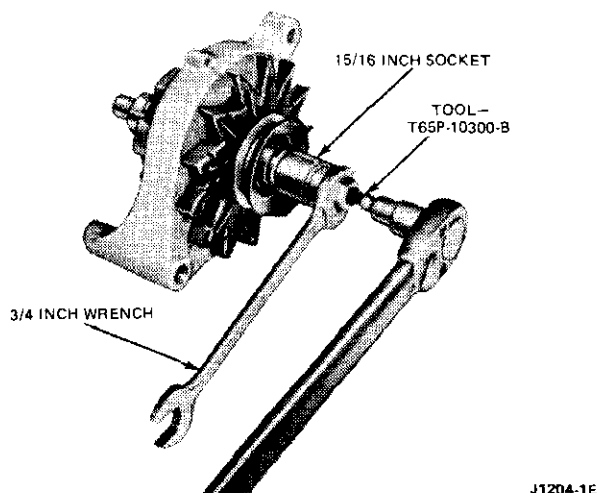


FIG. 5 Pulley Removal—Typical

4. Pull the rotor and shaft from the front housing, and remove the spacer from the rotor shaft.
5. Remove three screws retaining the bearing to the front housing. If the bearing is damaged or has lost lubricant, remove the bearing from the housing. To remove the bearing, support the housing close to the bearing boss and press the bearing from the housing.
6. Unsolder and disengage the three stator leads from the rectifier (Fig. 6). Work quickly to prevent overheating the rectifier.
7. Lift the stator from the rear housing.
8. Unsolder and disengage the brush holder lead from the rectifier. Work quickly to prevent overheating the rectifier.
9. Remove the screw attaching the capacitor lead to the rectifier.
10. Remove four screws attaching the rectifier to the rear housing (Fig. 6).

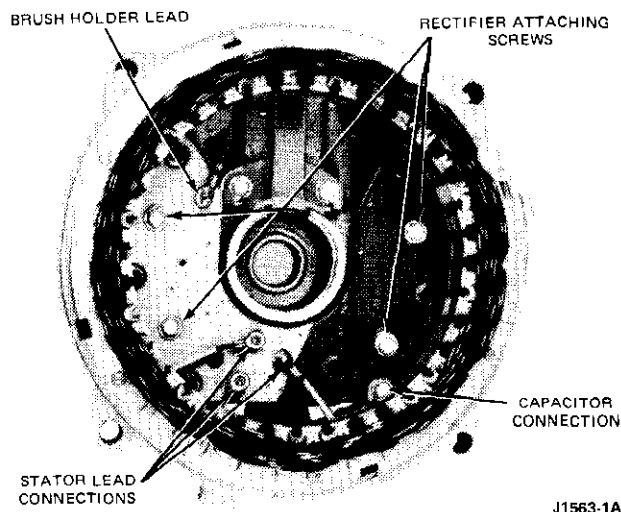


FIG. 6 Stator Lead Connections

11. Remove the two terminal nuts and insulator from outside the housing, and remove the rectifier from the housing.
12. Remove two screws attaching the brush holder to the housing and remove the brushes and holder.
13. Remove any sealing compound from the rear housing and brush holder.
14. Remove one screw attaching the capacitor to the rear housing and remove the capacitor.
15. If bearing replacement is necessary, support the rear housing close to the bearing boss and press the bearing out of the housing.

Assembly

The rotor, stator and bearings must not be cleaned with solvent. Wipe these parts with a clean cloth.

1. If the front housing bearing is being replaced, press the new bearing in the housing. **Put pressure on the bearing outer race only.** Then, install the bearing retaining screws.
2. Place the inner spacer on the rotor shaft and insert the rotor shaft into the front housing and bearing.
3. Install the fan spacer, fan, pulley, lockwasher and nut on the rotor shaft. Use the Tool shown in Fig. 5 to tighten the pulley nut.
4. If the rear bearing is being replaced, press a new bearing in from inside the housing until it is flush with the boss outer surface.
5. Position the brush terminal on the brush holder (Fig. 7). Install the springs and brushes in the brush holder, and insert a piece of stiff wire to hold the brushes in place (Fig. 7).

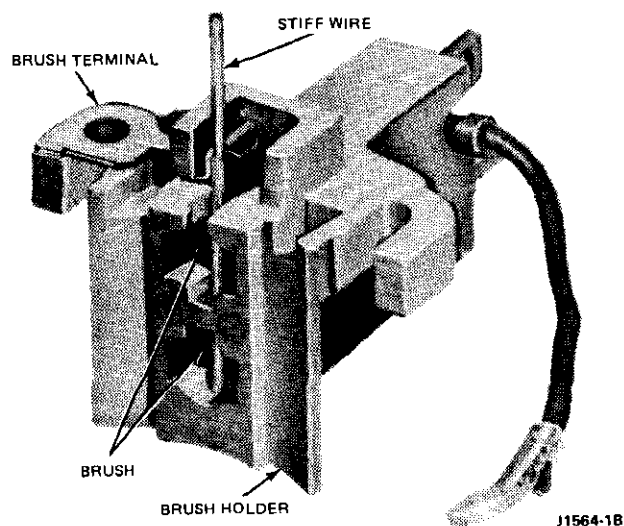


FIG. 7 Brush Holder Assembly

6. Position the brush holder in the rear housing and install the attaching screws. The brush retracting wire must stick out enough to be grabbed and pulled through later. Water-proof glue sealer may have to be pushed out. Allow wire to project out of housing. Push the brush holder toward the rotor shaft opening and tighten the brush holder attaching screws.
7. Position the capacitor to the rear housing and install the attaching screw.

8. Place the two (rectifier) insulators on the bosses inside the housing (Fig. 8).

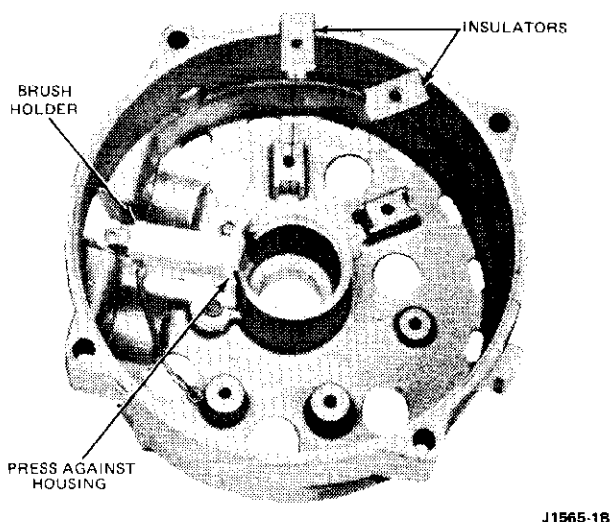


FIG. 8 Brush Holder and Rectifier Insulators Installed

9. Place the insulator on the BAT (large) terminal of the rectifier, and position the rectifier in the rear housing. Place the outside insulator on the BAT terminal, and install the nuts on the BAT and GRD terminals **finger tight**.
10. Install but do not tighten the four rectifier attaching screws.
11. Tighten the BAT and GRD terminal nuts on the outside of the rear housing. Then, tighten the four rectifier attaching screws.
12. Position the capacitor lead to the rectifier and install the attaching screw.
13. Press the brush holder lead on the rectifier pin and solder securely (Fig. 6). Work quickly to prevent overheating the rectifier.
14. Position the stator in the rear housing and align the scribe marks. Press the three stator leads on the rectifier pins and solder securely (Fig. 6). Work quickly to prevent overheating the rectifier.
15. Position the rotor and front housing into the stator and rear housing. Align the scribe marks and install the four through bolts. Tighten two opposing bolts and then the two remaining bolts.
16. Spin the fan and pulley to be sure nothing is binding within the alternator.
17. Remove the brush retracting wire and place a daub of waterproof cement over the hole to seal it.

BRUSH REPLACEMENT

Removal

1. Mark both end housings and the stator with a scribe mark for use during assembly.
2. Remove the four housing through bolts, and separate the front housing and rotor from the rear housing and stator. Slots are provided in the front housing to aid in disassembly. **Do not separate the rear housing and stator.**

3. Unsolder and disengage the brush holder from the rear housing. Remove brushes and springs from brush holders.
4. Remove the two brush holder attaching screws and lift the brush holder from the rear housing.
5. Remove any sealing compound from the rear housing and brush holder.

Installation

1. Install the springs and brushes in the brush holders and insert a piece of stiff wire to hold the brushes in place.
2. Position the brush holder to the rear housing, inserting the wire used to retract the brushes through the hole in the rear housing.
3. Install the brush holder attaching screws. Push the brush holder toward the rotor shaft opening and tighten the attaching screws.
4. Press the brush holder lead on the rectifier pin and solder securely. Work quickly to prevent overheating the rectifier.
5. Position the rotor and front housing into the stator and rear housing. Align the scribe marks and install the four through bolts. Tighten two opposing bolts and then the two remaining bolts.
6. Spin the fan and pulley to be sure nothing is binding within the alternator.
7. Remove the wire retracting the brushes, and place a daub of waterproof cement over the hole to seal it.

RECTIFIER REPLACEMENT

Removal

1. Mark both end housings and the stator with a scribe mark for assembly.
2. Remove the four housing through bolts, and separate the front housing and rotor from the rear housing and stator. Slots are provided in the front housing to aid in disassembly. **Do not separate the rear housing and stator at this time.**
3. Unsolder and disengage the three stator leads from the rectifier (Fig. 6). Work quickly to prevent overheating the rectifier. Then, lift the stator from the rear housing.
4. Unsolder and disengage the brush holder lead from the rectifier. Work quickly to prevent overheating the rectifier.
5. Remove the screw attaching the capacitor lead to the rectifier.
6. Remove four screws attaching the rectifier to the rear housing (Fig. 6).
7. Remove two terminal nuts and insulator from outside the housing, and remove the rectifier from the housing.

Installation

1. Position springs and brushes in the brush holder. Insert a piece of wire through the hole in the rear housing to hold the brushes in the retracted position.
2. Place the two rectifier insulators on the bosses inside the housing (Fig. 8).

3. Place the insulator on the BAT (large terminal) of the rectifier, and position the rectifier in the rear housing. Place the outside insulator on the BAT terminal, and install the nuts on the BAT and GRD terminals finger tight.
4. Install but do not tighten the four rectifier attaching screws.
5. Tighten the BAT and GRD terminal nuts on the outside of the rear housing. Then, tighten the four rectifier attaching screws.
6. Position the capacitor lead to the rectifier and install the attaching screw.
7. Press the brush holder lead on the rectifier pin and solder securely (Fig. 6). Work quickly to prevent overheating the rectifier.
8. Position the stator in the rear housing and align the scribe marks. Press the three stator leads on the rectifier pins and solder securely (Fig. 6). Work quickly to prevent overheating the rectifier.
9. Position the rotor and front housing into the stator and rear housing. Align the scribe marks, install and partially tighten all four through bolts. Tighten two opposing bolts and then the two remaining bolts.
10. Spin the fan and pulley to be sure nothing is binding within the alternator.
11. Remove the brush retracting wire and place a daub of waterproof cement over the hole in the rear housing to seal it.

SPECIFICATIONS

SIDE TERMINAL ALTERNATOR

Rating		Field Current Amps. @ 12V*	Stamp Color	Slip-Ring Turning (Inches)		Brush Length (Inches)		Pulley Nut Torque (Ft.-Lbs.)	Belt ① Tension (Lbs.)
Amperes @ 15V	Watts @ 15V			Min. Dia.	Max. Runout	New	Wear- Limit		
70	1050	2.9	Black	1.22	0.0005	1/2	5/16	60-100	90-110
90	1350		Red						
90	1350	4.0	Red	1.22	0.0005	1/2	5/16	50-100	90-110

① Used Belt. New Belt 150. A used belt is one that has been in operation more than 10 minutes. If belt tension is out of specification, or belt has been removed, reset to 110 lbs.

* A Field Current of 4 amps is used with solid-state regulator.

SPECIAL TOOLS

Tool No.	Former No.	Description	Tool No.	Former No.	Description
T63L-8620-A	8620 or BT-33-73-F	Belt Tension Gauge	T65P-10300-B		Alternator Pulley Remover

CJ1570-2E

Alternator Electro-Mechanical Regulator

PART
31-40

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	40-1	ADJUSTMENTS.....	40-2
TESTING		REMOVAL AND INSTALLATION	40-2
Voltage Regulation Calibration			
Test	40-1		

CK3363-2B

DESCRIPTION AND OPERATION

CAUTION: This regulator must not be used with the 4-amp field alternator. The alternator will burn the points of the mechanical regulator.

The alternator regulator has been designed to exercise control over the charging system, and also to compensate for temperature changes. The electro-mechanical regulator is factory calibrated and is not to be adjusted.

The alternator regulator is composed of two control units, a field relay and a voltage limiter, mounted as an assembly. Refer to Wiring Diagram Manual for schematics and locations of wiring harnesses. Figs. 1 and 2, Part 31-10 show schematics of the electro-mechanical voltage regulator system.

FIELD RELAY

The field relay serves to connect the charging system voltage to the field circuit when the engine is running.

CHARGE INDICATOR CIRCUIT—LIGHT

When the ignition switch is closed, the charge indicator light, shunted with a 15-ohm resistor, allows adequate starting field current.

When the alternator builds up enough voltage to close the field relay contacts, full voltage is applied to the field, and the charge indicator light goes out.

CHARGE INDICATOR CIRCUIT—AMMETER

When the ignition switch is closed, the field relay is energized. Closing the relay contacts connects the battery and alternator output to the field through the voltage limiter contacts.

VOLTAGE LIMITER

The temperature compensated voltage limiter is a double contact unit. Voltage limiting is accomplished by controlling the amount of current supplied to the rotating field.

TESTING

Use the voltmeter section of the Rotunda tester 27-0005 or equivalent, or a separate voltmeter to test the alternator regulator. Refer to Part 31-01 for Charging System Diagnosis and Test Procedures.

VOLTAGE REGULATOR CALIBRATION TEST

The alternator belt tension must be adjusted within specification, and the charging system electrical connections must be clean and tight before testing the regulator.

TEST PROCEDURE

Connect the voltmeter positive lead to the battery positive terminal, and the negative lead to the battery negative terminal. **Turn off all electrical loads.** Then, check and record the voltmeter reading. This is base

voltage reading. Connect the red lead of a tachometer to the distributor terminal of the coil and the black tachometer lead to a good ground.

Place the transmission shift lever in the NEUTRAL or PARK position, engage the parking brake and start the engine. Increase the engine speed to 1800-2200 rpm for 2 or 3 minutes. Note the voltmeter reading. It should be higher than the first reading but not more than 2.0 volts higher than base voltage. This is the regulated voltage reading. If the reading is greater than 2 volts, disconnect regulator and check alternator regulator wiring harness for open circuit or shorts, and regulator mounting screws for proper ground. Connect regulator and recheck voltage. If reading remains greater than 2 volts, replace the voltage regulator. If the reading is less

than 2.0 volts higher than base voltage, turn on the headlamps and heater blower. The full lead voltage should be at least 0.5 volt above the base voltage. If the voltage is less than 0.5, find cause of under-voltage condition. Replace the regulator if the voltage drop is greater than 1/2 volt below the

regulated voltage. Disconnect regulator and check alternator and wiring harness by placing a jumper wire from "A" to "F" terminals. Check for voltage at "S" and "I" terminals. (Voltage at "S" terminal should be 1/2 voltage reading of "I" terminal.) If alternator and harness are okay, replace regulator.

ADJUSTMENTS

The electro-mechanical regulator is factory calibrated and sealed and is not to be adjusted. If the regulator does not operate as specified in the Voltage Regulator Calibration Test, it must be replaced.

REMOVAL AND INSTALLATION

1. Remove the battery ground cable. Do not permit flame, spark or lighted tobacco near battery. On models with the regulator located behind the battery, it is necessary to loosen the battery hold down and position the battery away from the regulator.
2. Remove the regulator mounting screws.
3. Use screwdriver to unlock connector and then disconnect the regulator from the wiring harness (Fig. 1).
4. Connect the new regulator to the wiring harness.
5. Mount the regulator to the regulator mounting plate. Tighten regulator mounting screws to insure proper ground. The radio suppression condenser mounts under one mounting screw.
6. If the battery was moved to gain access to the regulator, position the battery and install the hold down. Connect the battery ground cable, and check the system for proper operation.

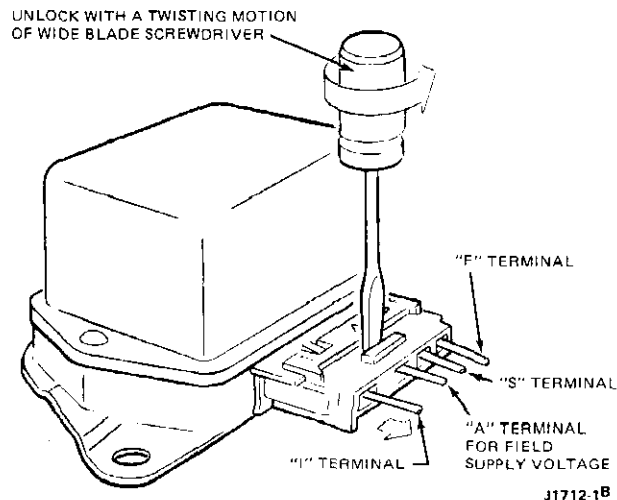


FIG. 1 Unlocking Wiring Harness Connector

Alternator Transistorized Regulator

PART
31-42

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	42-1	REMOVAL AND INSTALLATION	42-1
ADJUSTMENTS	42-1		

CK3364-2B

DESCRIPTION AND OPERATION

The transistorized voltage regulator controls the alternator voltage output in a similar manner to an electro-mechanical voltage regulator, by regulating the alternator field current. The regulation is accomplished electronically with the use of tran-

sistors and diodes rather than by a vibrating armature relay. The voltage, at which regulation occurs, is determined by a network of a voltage reference diode (zener), a resistive network, and a transistor.

ADJUSTMENTS

The only adjustment on the transistorized alternator regulator is the voltage limiter adjustment. A precision voltmeter must be used. Voltage is set with the engine running and with the battery fully charged.

Adjustment of the transistorized voltage regulator must be made with the regulator at normal operating temperature. Remove the regulator cover mounting

screws and remove the cover from the regulator. Use a fiber rod as a screwdriver for this adjustment. Turn clockwise to increase the voltage setting; counterclockwise to decrease the voltage setting. Turn off all electrical loads and increase engine speed to 1800-2000 rpm. Voltage adjustment should be made in 0.2 volt increments.

REMOVAL AND INSTALLATION

1. Remove the battery ground cable. **CAUTION: Exercise care at all times; do not permit flames, sparks, or lighted tobacco near battery.**
2. Remove the regulator mounting screws.
3. Disconnect the regulator from the wiring harness.
4. Connect the new regulator to the wiring harness.
5. Mount the regulator.
6. Connect the battery ground cable, and test the system for proper voltage regulation.

Alternator Electronic Regulator

PART
31-43

SUBJECT **PAGE**
DESCRIPTION 43-1

SUBJECT **PAGE**
REMOVAL AND INSTALLATION 43-4

CK3544-2A

DESCRIPTION

The electrical charging systems incorporate a new electronic voltage regulator. These regulators are 100% solid state, consisting of transistors, diodes, and resistors. The working functions are achieved using electronic components arranged in basically three(3) circuit divisions as follows:

The new regulator will be released under two(2) separate part numbers with color codes. The units will look alike, but are not interchangeable with the new regulator wiring harness connector plugs.

These units will be used on vehicles equipped with an ammeter, for alternator warning-indicator-lamp equipped cars. The regulators are calibrated and preset by the manufacturer. No readjustment is required or possible on these units.

INDICATOR LAMP REGULATORS (Figure 1)

Closing the ignition switch energizes the warning lamp and turns on the regulator output stage. The alternator is now receiving maximum field current and is ready to generate an output voltage. Once the alternator rotor speed increases from zero, its output and stator terminal voltages increase from zero to system regulation level determined by regulator setting.

When the ignition switch is turned off, the solid state relay circuit causes the output stage to be turned off, interrupting all current flow through the regulator so that there is no stand-by current drain on the battery.

CHARGING SYSTEM WITH ELECTRONIC REGULATOR AND INDICATOR LAMP
IGN. SW.

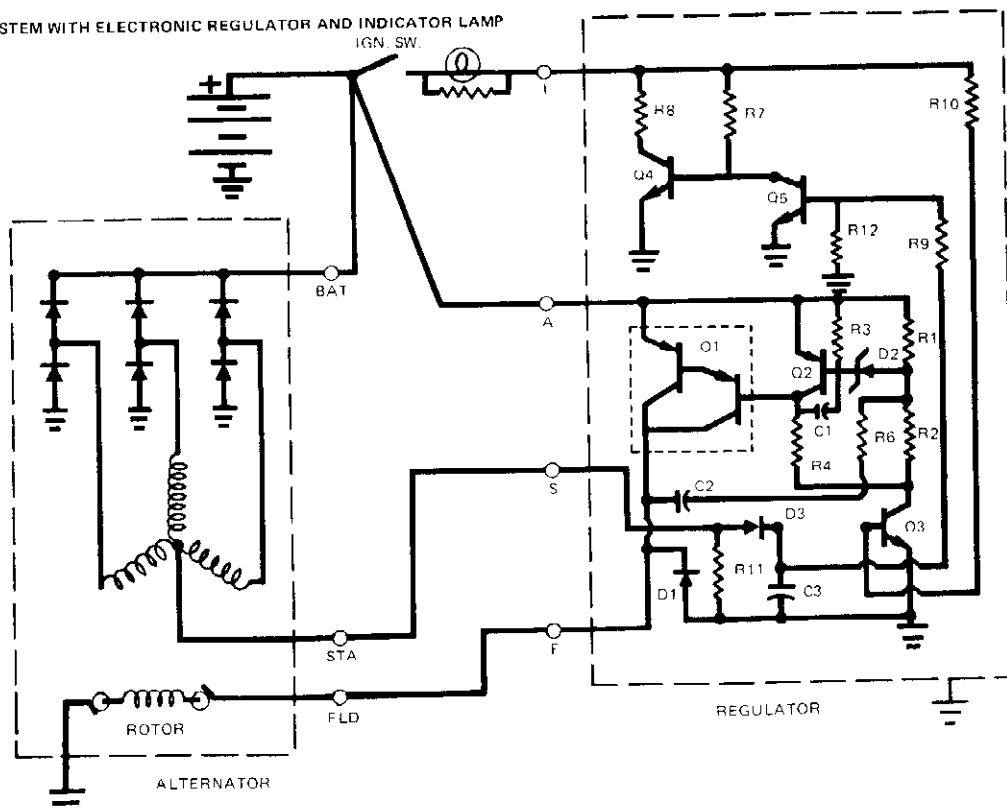


FIG. 1 Charging System with Electronic Regulator and Indicator Lamp Schematic

AMMETER REGULATORS (Figure 2)

The operating principle for the regulator used in ammeter equipped vehicles is much the same as the indicator lamp type.

REGULATOR APPLICATION — COMPONENTS

The new solid state regulators are being used in conjunction with other new components in the charging system and must be properly matched to prevent damage to the regulator or alternator. New components in the charging system are as follows: (Figures 3 and 4).

1. A new alternator with higher field current requirement.
2. A new warning indicator lamp shunt resistor.
3. The alternator to regulator wiring harness is changed to incorporate a new regulator connector plug. The new plug is designed so that the connector will not index with the regulator terminals when the wrong regulator is inadvertently installed in the vehicle.

APPLICATION

Whenever the system components are being replaced, the following precautions should be followed so that the charging system will work properly and components will not be damaged.

1. Always use the proper alternator in the system being serviced. The new higher field current alternator if used on the 1977 and prior model systems will destroy the electro-mechanical regulator. Also the older model alternators, if used in

the new system, will have a slightly reduced output. The older model alternator with the 3.80hm field will be used as replacement for vehicles with electro-mechanical and electronic regulators. Only the older model will be serviced.

2. Never use an electro-mechanical (77 and prior models) regulator in the new charging system. The connector plug on the new system wiring harness will not index properly with the electro-mechanical regulator.
3. The new electronic regulators are color coded for proper installation. Always use the black color coded regulator in systems which use the warning lamp indicator. The blue color coded regulators must be used in ammeter gauge systems.
4. The new charging systems use a 500 Ohm resistor on the back of the instrument cluster on cars with warning indicator lamp. Do not replace this item with the older (77 and prior models) 15 Ohm resistance wire.

VISUAL INSPECTIONS

1. Check battery for proper state of charge (at least 1.200 specific gravity).
2. Check and clean all terminal connections at battery, alternator, and regulator.
3. Check fuse link between starter relay and alternator.
4. Check alternator drive belt for proper tension.

CAUTION:

BE SURE FIELD TERMINAL CONNECTOR (PUSH ON TYPE) IS INSTALLED ON THE "FIELD" TERMINAL

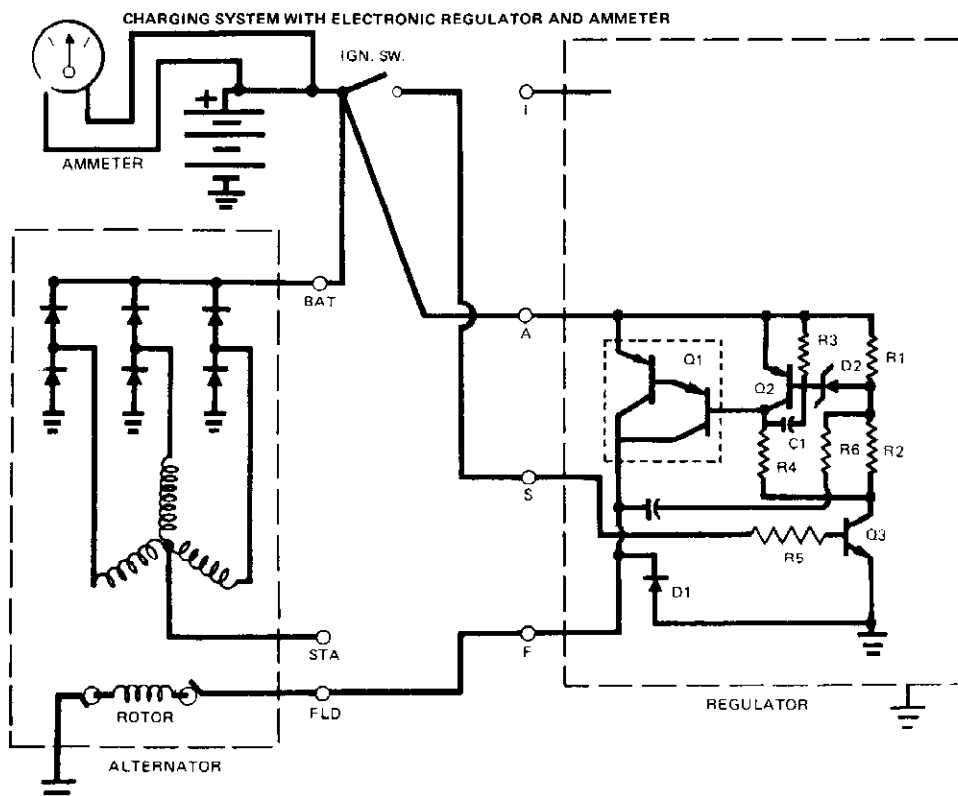


FIG. 2 Charging System with Electronic Regulator and Ammeter Schematic

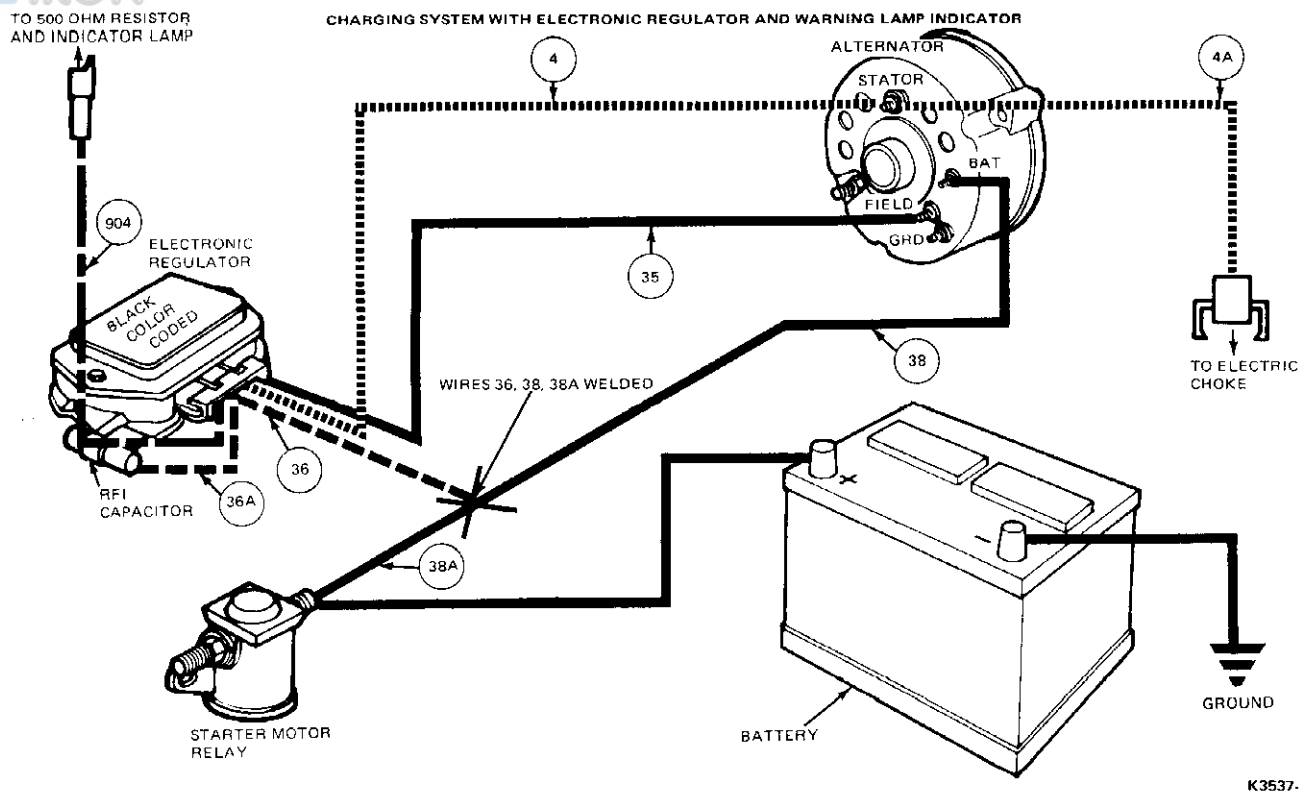


FIG. 3 Charging System with Electronic Regulator and Warning Lamp Indicator

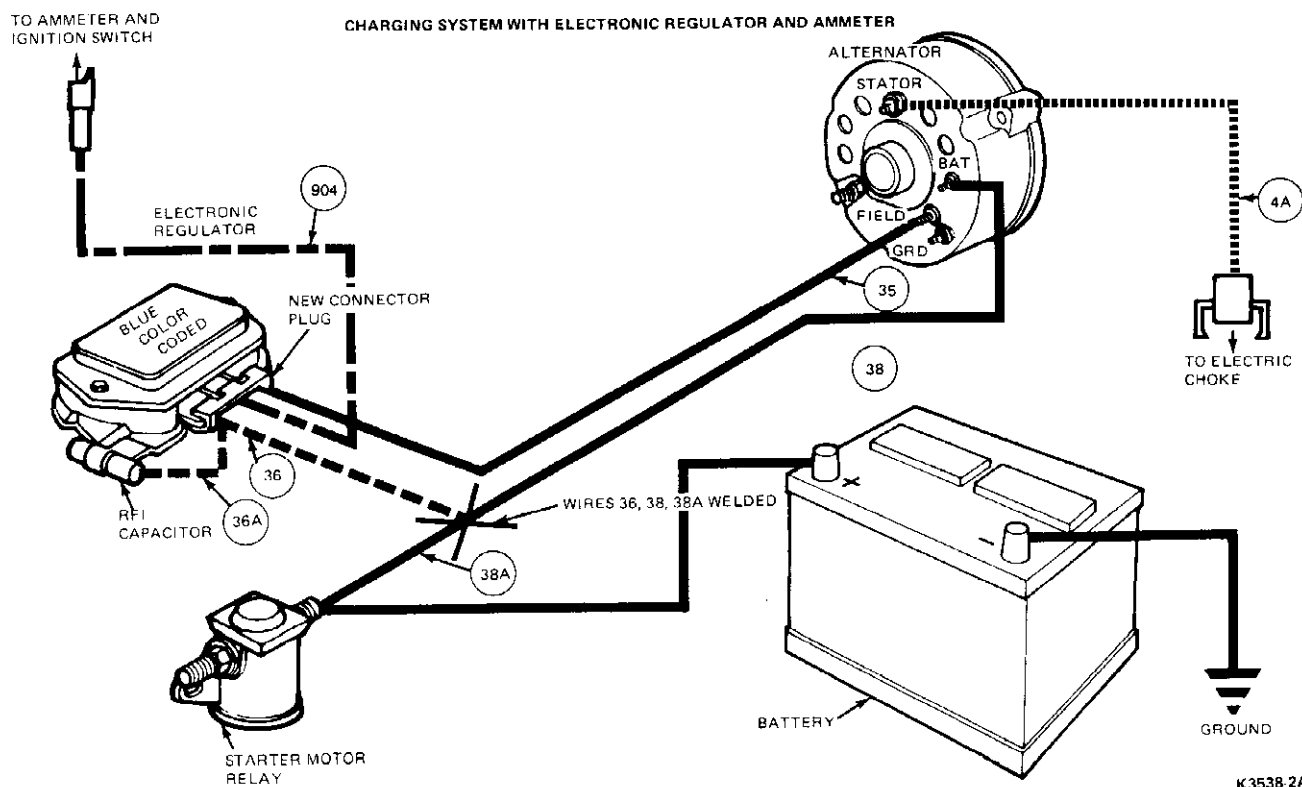


FIG. 4 Charging System with Electronic Regulator and Ammeter

NAL STUD AT ALTERNATOR AND NOT THE GROUND STUD.

ALWAYS DISCONNECT THE CONNECTOR PLUG FROM THE REGULATOR BEFORE CHECKING ALTERNATOR OUTPUT WITH TEST PROBES OR A JUMPER WIRE.

ALWAYS DISCONNECT THE CONNECTOR PLUG FROM THE REGULATOR BEFORE REMOVING THE REGULATOR MOUNTING SCREWS. REMOVING THE CONNECTOR FROM AN UN-GROUNDED

REGULATOR WITH THE IGNITION SWITCH ON WILL DESTROY THE REGULATOR.

BE SURE TO DISCONNECT ELECTRIC CHOKE WIRE FROM STATOR TERMINAL OR ALTERNATOR WHEN TROUBLE-SHOOTING CHARGING SYSTEM. CHECK ELECTRIC CHOKE WIRE FOR A GROUND CONDITION.

NEVER ATTEMPT TO POLARIZE OR TEST THE ALTERNATOR BY GROUNDING THE FIELD CIRCUIT, AS THIS WILL DESTROY THE REGULATOR.

REMOVAL AND INSTALLATION

Remove the battery ground cable. Remove the regulator mounting screws. Disconnect the regulator from the wiring harness (Fig. 1). Connect the new regulator to the wiring harness. Mount the regulator. Connect the battery ground cable, and test the system for proper voltage regulation.



LIGHTING SYSTEM

GROUP
32

PART TITLE	PART NO.	PART TITLE	PART NO.
AUTOMATIC HEADLAMP DIMMER	32-15	LAMP DELAY SYSTEM (AUTOLAMP)	32-12
HEADLAMP COVERS	32-06	LIGHTING SYSTEM GENERAL SERVICE	32-01
HEADLAMP SYSTEM	32-02	PARKING, REAR AND MARKER LAMPS ...	32-20
ILLUMINATED ENTRY	32-80	TURN SIGNAL AND HAZARD FLASHER	32-40
INTERIOR LAMPS	32-60		

CK3366-2B

Lighting System General Service

PART
32-01

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
GENERAL INFORMATION	01-1	DIAGNOSIS	01-2

CK3367-2B

GENERAL INFORMATION

Wherever high or low series models are designated, high series indicates the LTD, on Ford Models; and on Mercury models, high series indicates the Marquis, and

Brougham. All other Ford and Mercury models are low series.

DIAGNOSING

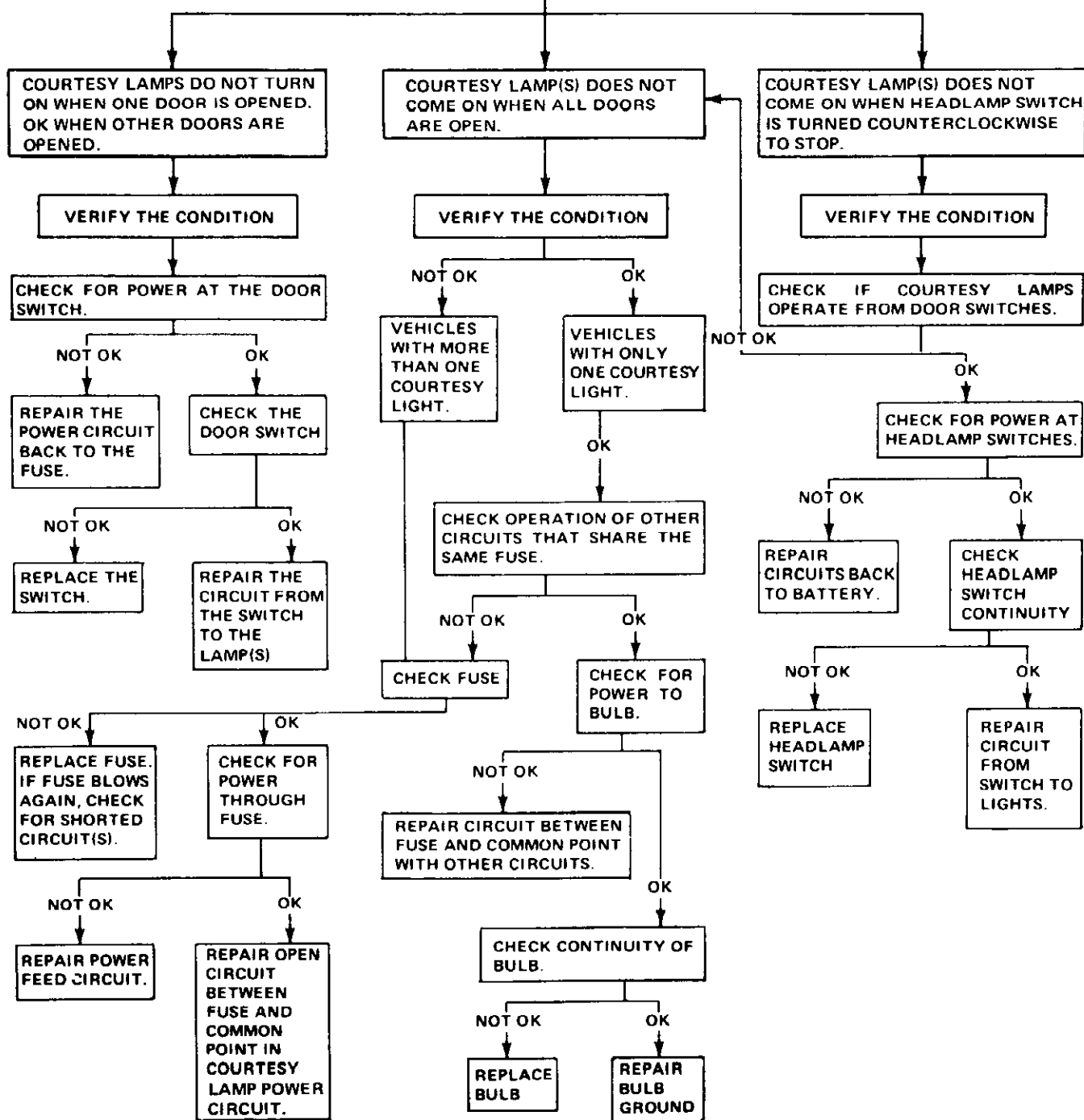
ELECTRICAL — LAMPS		
CONDITION	POSSIBLE CAUSE	RESOLUTION
Head Lamps • All exterior lamps do not light • One head lamp does not work • Both low beam or all high beam head lamps do not work • All head lamps out. Park and tail lamps OK	• Loose wiring connections • Open wiring • Damaged head lamp switch • Loose connection • Damaged sealed beam bulb • Corroded or defective socket • Loose connections • Damaged dimmer switch • Open wiring • Loose connections • Damaged dimmer switch • Damaged head lamp switch • Open wiring or poor ground	• Check and secure connections at head lamp switch and dash panel connector • Check power to and from head lamp switch. Check ground. Repair as necessary • Replace head lamp switch • Secure connection to head lamp, and ground • Replace sealed beam • Replace as required • Check and secure connections at dimmer switch and head lamp switch • Check dimmer switch operation. Inspect for corroded connector. Replace if necessary • Repair as necessary • Check and secure connections at dimmer switch and head lamp switch • Check dimmer switch operation. Inspect for corroded connector. Replace if necessary • Replace if necessary • Repair as necessary
Tail Lamps • One tail lamp out • All tail lamps and marker lamps out — head lamps OK	• Bulb burnt out • Open wiring or poor ground • Corroded bulb socket • Loose connections • Open wiring or poor ground • Damaged head lamp switch	• Replace bulb • Repair as necessary • Repair or replace socket • Secure wiring connections where accessible • Check operation of front park and marker lamps, repair as necessary • Repair head lamps switch
Back-Up Lamps • Back-up lamps — one light does not function	• Bulb burnt out • Loose connection • Open wiring	• Replace bulb • Tighten connectors • Repair as necessary

ELECTRICAL – LAMPS		
CONDITION	POSSIBLE CAUSE	RESOLUTION
Back-up Lamps Back-up lamps – both lamps do not function	- Fuse burnt out - Back-up lamp switch out of adjustment - Damaged back-up lamp switch - Loose connections - Open wiring or poor ground	- Check a circuit that shares the same fuse. Replace fuse - Adjust switch - Replace switch - Tighten connectors - Repair as required
Parking Lamps One parking lamp does not light	- Bulb burnt out - Open wiring or poor ground	- Replace bulb - Check for corroded socket. Repair as required
Both parking lamps do not light	- Loose connections - Open wiring or poor ground - Bulbs burnt out	- Tighten connections - Check for corroded socket. Repair as required - Replace bulbs
Front Side Marker Lamps Front side marker lamp does not light – park and taillamps OK	- Bulb burnt out - Open wiring or poor ground	- Replace bulb - Check socket for corrosion and good ground. Repair as required
Cornering Lamps Cornering lamps – Mark V, Lincoln. Both lamps will not operate. Turn signals OK	- Switch inoperative - Fuse burnt out - Loose connections - Open wiring or poor ground	- Replace T/S switch - Replace fuse. If fuse blows again, check for short circuit - Tighten connectors - Repair as necessary
Cornering lamps – Mark V, Lincoln. One lamp will not operate. Turn signals OK	- Bulb burnt out - Loose connection - Open wiring or poor ground - Switch inoperative	- Replace bulb - Tighten connectors - Repair as necessary - Replace T/S switch
Cornering lamps – Ford, Mercury, Thunderbird, LTD II, Cougar, Versailles, Granada & Monarch. One lamp will not operate. Turn signals OK	- Bulb burnt out - Loose connections - Open wiring or poor ground - Inoperative relay and/or poor ground	- Replace bulb - Tighten connectors - Repair as necessary - Repair bad ground or replace defective relay as required
Cornering lamps – Ford, Mercury, Thunderbird, LTD II, Cougar, Versailles, Granada & Monarch. Both lamps will not operate. Turn signals OK	- Fuse burnt out - Loose connections - Poor relay grounds - Open wiring	- Replace fuse. If fuse blows again, check for short circuit - Tighten connections - Repair ground - Repair as required

CK3395-2B2

ELECTRICAL – LAMPS		
CONDITION	POSSIBLE CAUSE	RESOLUTION
Stop Lamps Stop Lamps do not light	- Fuse burn out or C.B. open - Problem in turn signal circuit or switch - Loose connections - Stoplight switch inoperative - Open wiring	- Replace fuse or C.B. If device blows again check for short circuit. - Repair turn signal circuit or replace turn signal - Secure connections at stop lamp switch - Replace stop lamp switch - Repair as required
Turn Signal Lamps Turn signal lamps – one or more inoperative	- Bulb burnt out - Loose connections - Open wiring or poor ground - Turn signal switch inoperative	- Replace bulb - Secure connections - Repair as required - Replace turn signal switch
Turn signal lamps – all lamps inoperative	- Fuse burn out or C.B. open - Turn signal flasher - Loose connections - Open wiring or poor grounds - Turn signal switch inoperative	- Replace fuse or C.B. If device blows again check for short circuit. - Substitute a known good flasher - Tighten connections - Repair as required - Replace turn signal switch
Hazard Flasher Lamps Hazard flasher lamps – do not flash	- Turn signal operation improper - Fuse or C.B. burnt out - Hazard flasher inoperative - Open wiring - Hazard flasher switch inoperative	- Repair turn signal system - Replace fuse. If fuse blows again check for a short circuit - Substitute a known good flasher - Repair as required - Repair or replace the turn signal switch assembly which includes the hazard flasher switch

COURTESY LAMPS - IMPROPER OPERATION



Headlamp System

PART
32-02

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		ADJUSTMENTS	
Autolamp	02-2	Headlamp Aim	02-2
Automatic Headlamp Dimmer	02-2		
Dimmer Switch	02-2	REMOVAL AND INSTALLATION	
Headlamps	02-1	Headlamp Bulb	02-2
Headlamps ON Indicator	02-1	Headlamp Dimmer Switch	02-5
Headlamp Switch	02-1	Headlamp ON Indicator	02-5
Vacuum Headlamp Covers	02-2	Headlamp Switch	02-4
		Headlamp Switch Knob	02-5
TESTING	02-2		

CK3368-2B

DESCRIPTION AND OPERATION

HEADLAMPS

The Fairmont, Pinto, Thunderbird, Bobcat, Granada, Monarch and Mustang use two No. 2 or No. 2B type sealed-beam headlamps. Each lamp has low-beam and high-beam filaments.

On all other car lines, four sealed-beam headlamps are used. The two outboard or upper lamps have two filaments each, one for low-beam and one for high-beam. The numeral 2 or 2A is molded in the glass lens. Locating tabs, molded in the glass, allow the mounting of the No. 2 or 2A lamps in the outboard or upper headlamp support frames only.

The inboard or lower headlamps with a numeral 1 or 1A molded in the glass lens have only one filament. They are used together with the high-beam filaments of the No. 2 or 2A headlamps. Locating tabs molded in the glass allow the mounting of the No. 1 or 1A lamps in the inboard or lower headlamp support frames only.

HEADLAMP SWITCH (FIG. 1)

A combination three-position lighting switch, mounted at the lower left of the instrument panel, controls circuits to the headlamps, parking lamps, marker lamps, taillamps, license plate lamp, courtesy lamp and instrument panel lamps, and ashtray lamps. A circuit breaker in the switch protects the tail-lamp, license plate lamp, parking lamps and marker lamps. A separate circuit breaker protects the headlamps. See Part 34-30 for location of circuit breaker.

On vehicles equipped with headlamp covers, the distribution valve for the vacuum system is an integral part of the lighting switch. It is attached to the back of the switch body (Fig. 2).

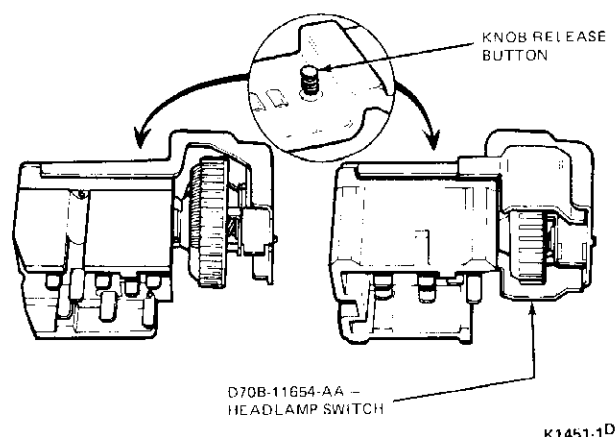


FIG. 1 Headlamp Switch

The instrument panel lamp circuit is routed through a rheostat on the switch, which is controlled by rotating the switch control knob.

A courtesy lamp switch is also a part of the lighting switch. It is actuated by rotating the switch control knob to the maximum counterclockwise position. The courtesy lamps also illuminate by the switch in the pillar when the doors are opened.

LAMPS-ON INDICATOR

Some vehicles are equipped with a Lights-On indicator and/or buzzer system, to tell the driver that he has left the exterior lamps on. It is activated when the driver's door is opened.

The indicator lamp and/or buzzer is connected between the left-hand front courtesy lamp switch and a relay. The relay completes the indicating circuit and ground when energized by the tail/park lamp feed from the headlamp switch.

AUTOMATIC HEADLAMP DIMMER

The automatic headlamp dimmer is a driver-operated electronic device which automatically switches the car headlamp beams in response to light from an approaching car, or light from the taillamps of a vehicle being overtaken. Refer to Part 32-15 for Service Procedures.

DIMMER SWITCH

Switching of the headlamp beams is accomplished by a floor-mounted dimmer switch.

A high beam indicator lamp, mounted in the cluster, glows when the dimmer switch is in the high beam position.

VACUUM HEADLAMP COVERS

The vacuum headlamp covers are controlled by the headlamp switch, which actuates a distribution valve located on the back of the headlamp switch. The distribution valve applies vacuum to the vacuum motors

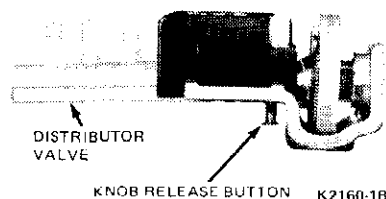


FIG. 2 Headlamp Switch With Distribution Valve

operating the vacuum covers. Refer to Part 32-06 for service procedures.

AUTOLAMP

See Part 32-12.

TESTING

Before performing any lighting system tests, be sure the battery is in a fully-charged condition and all battery cable connections are clean and tight.

A visual inspection is an important part of the lighting system test. Check for wires with frayed or

damaged insulation, loose connections and proper harness routing.

Any problems found by visual inspection should be corrected before performing further tests of the lighting system.

ADJUSTMENTS

HEADLAMP AIM

Headlamp aim adjustment on all models should be made with Headlamp Aiming Kit—Rotunda No. 04-0164 or equivalent. Use the latest instructions. The adjustment should be done with the headlamp door installed.

All headlamp adjustments should be made with a half-full tank, plus or minus one gallon, the vehicle

unloaded and the trunk empty, except for the spare tire and jacking equipment, and recommended pressure in all the tires.

The kit equipment can be calibrated to accommodate a slight slope in the floor, making it usable almost any place in the garage. However, area must be reasonably flat.

REMOVAL AND INSTALLATION

HEADLAMP BULB

ALL VEHICLES (FIGS. 3 AND 4)

1. If the vehicle is equipped with moveable headlamp covers (Thunderbird, Mercury, Continental Mark V, Lincoln Continental and Ford Hi-Series), close the bypass valve to raise the covers for access to the headlamp bulbs. The valve is located in the vacuum lines near the reservoir and left front fender.
2. On vehicles with exposed headlamps, remove the headlamp door mounting screws and remove the headlamp door.
3. Remove the retainer ring screws (4 on rectangular, 3 on round) and remove the retainer ring from the headlamp. Pull the headlamp bulb forward and disconnect the wiring assembly plug.

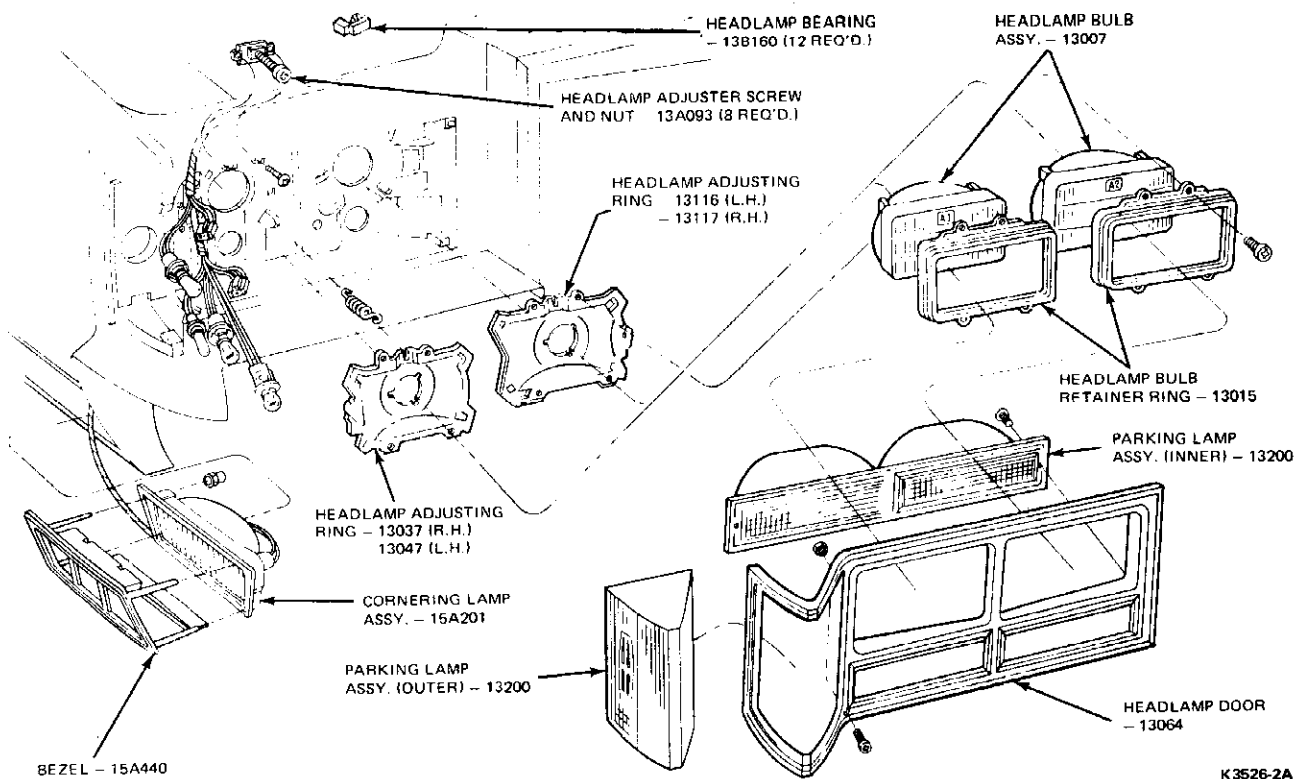


FIG. 3 Headlamp Bulb Removal—Typical Rectangular Headlamps

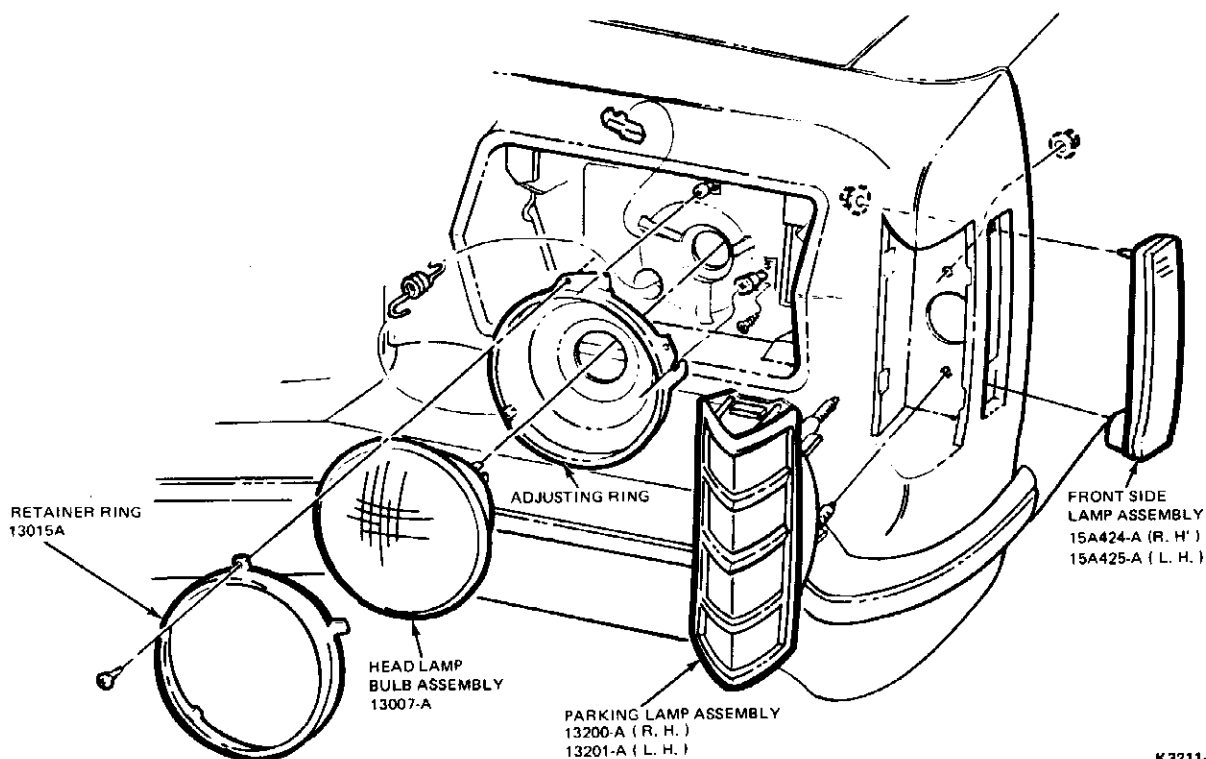


Fig. 4 Headlamp Bulb Removal – Typical Round Headlamp

4. Connect the wiring assembly plug to the new headlamp bulb and place the bulb in position, locating the bulb glass tabs in the positioning slots.
5. Attach the bulb retainer ring to the assembly with the retainer ring screws.
6. If so equipped, place the headlamp door in position and install the mounting screws. If equipped with headlamp covers, open the by-pass valve to lower the covers.
7. Check the headlamp bulb aim and adjust, as necessary.

HEADLAMP SWITCH

FORD AND MERCURY

Removal

1. Disconnect the ground cable from the battery.
2. Remove the knob from the wiper-washer switch.
3. Remove headlamp knob switch as described below in Headlamp Switch Knob.
4. *Remove the bezel nut from the light switch, and remove the finish panel lower attaching screw. Then, pull out on the bottom of the finish panel and pull out to remove.*
5. Remove three screws attaching the switch mounting plate to the instrument panel. Disconnect the wire connector from the switch, and disconnect the illumination light from the harness. Disconnect the vacuum hoses from the switch, if equipped with headlamp covers.
6. Remove the switch from the mounting plate.

Installation

1. Install the switch on the mounting plate.
2. Connect the wire harness to the switch and illumination light. Connect the vacuum hoses to the switch (if so equipped), and install the switch and mounting plate on the instrument panel.
3. Install the finish panel and headlamp switch bezel nut.
4. Install the headlamp switch knob and shaft, by inserting it into the switch and pushing it all-the-way in, until a distinct click is heard.
5. Install the knob on the wiper-washer switch.
6. Connect the ground cable to the battery and check the operation of the headlamp switch.

Mustang II

Removal

1. Disconnect the battery ground cable.
2. Pull headlamp switch knob to ON position BEFORE depressing release button. Through the hole in the underside of the instrument panel, press the release button with a screwdriver, and remove the knob and shaft assembly.
3. Remove the bezel nut, lower the switch and disconnect the multiple connector.
4. Remove the switch.

Installation

1. Install the multiple connector, position the switch to the cluster, and install the bezel nut.

2. Install the knob and shaft assembly.
3. Connect the battery ground cable.

LTD II, COUGAR, FAIRMONT, ZEPHYR AND LINCOLN CONTINENTAL (LINCOLN CONTINENTAL EQUIPPED WITH POTENTIOMETER REFER TO 32-12)

Removal

1. Disconnect the battery ground cable.
2. Pull the control knob to the full ON position. Remove LTD II headlamp switch knob as described under Headlamp Switch Knob. For other models, reach up from underneath the instrument panel, and press the release button on the switch housing. With the release button pressed in, pull the knob out of the switch. To gain access to the release button on Fairmont and Zephyr vehicles equipped with air conditioning, disconnect the A/C left duct from the duct-to-register connector, loosen the two nuts that retain the left register to the utility shelf, and then remove the connector from the register.
3. Unscrew the bezel nut with Tool T65L-700-A or equivalent to detach the switch assembly from the instrument panel, and lower the switch assembly.
4. Disconnect the multiple connector and remove the switch.

Installation

1. Connect the multiple plug to the headlamp switch. If equipped with headlamp doors, install the color-coded vacuum hoses to the distribution valve fittings, identified by corresponding colors. Make sure that all connections are tight.
2. Position the switch to the instrument panel and install the bezel nut with Tool T65L-700-A or equivalent.
3. Install the knob and shaft assembly by inserting and slightly rotating it all the way into the switch, until a distinct click is heard.
4. Connect the battery ground cable and check the operation of the switch.

PINTO AND BOBCAT

Removal

1. Disconnect the battery ground cable.
2. Remove the instrument cluster, as outlined in Part 33-50. Then pull the headlamp switch knob to ON and depress release button.
3. Remove the headlamp switch knob and shaft assembly and retaining nut.
4. Disconnect the multiple connector plug from the switch and remove the switch from the cluster opening.

Installation

1. Connect the multiple connector plug to the switch.
2. Position the switch assembly to the instrument panel and install the retaining nut and knob and shaft assembly.
3. Install the instrument cluster assembly.
4. Connect the battery ground cable.

THUNDERBIRD AND CONTINENTAL MARK V

Remove the cluster trim panel, as outlined in Group 33. Remove the switch mounting plate. Remove the bezel nut and disconnect the multiple connector. Then, remove the vacuum lines (if so equipped) and remove the switch.

HEADLAMPS-ON INDICATOR

1. It is available on all cars except Fairmont and Zephyr.
2. It utilizes the key warning buzzer and requires a relay.
3. In addition to the buzzer, the lamps -on indicator utilizes an instrument panel lamp on Mustang and Lincoln Continental. On console-equipped *Granada, Monarch and Versailles*, the lamp is on the console.
4. Relay locations are: above glove box in Pinto and Bobcat; on the right-hand side instrument panel under the glove box on Mustang; under the instrument panel to the right of the steering column on *Granada, Monarch and Versailles*; under the instrument panel centerline on Ford and Mercury; under the instrument panel inboard of the glove box on Lincoln Continental and Continental Mark V; and under the instrument panel left of the glove box on LTD II, Cougar and Thunderbird.

DIMMER SWITCH

To remove the headlamp dimmer switch, pull the floor carpet back from the area of the switch and remove the mounting screws (Fig. 5). In some vehicles, it may be necessary to loosen the scuff plate and remove the left cowl panel, in order to free the carpet. *Disconnect the three-wire connector (or the multiple connector and single wire connector, if equipped with automatic headlamp dimmer) from the switch.* To install the switch, connect the wire connector(s) to the switch terminals and install the switch to the floor. Replace the floor carpet, scuff plate, and trim panel, as required.

HEADLAMP SWITCH KNOB

FORD, MERCURY, MONARCH, GRANADA, VERSAILLES AND LTD II

On these models, the headlamp switch knob is retained on the switch shaft by a spring retainer. To remove the knob prior to switch removal, proceed as follows:

1. Bend a discarded bowden cable into the shape shown in Fig. 6.

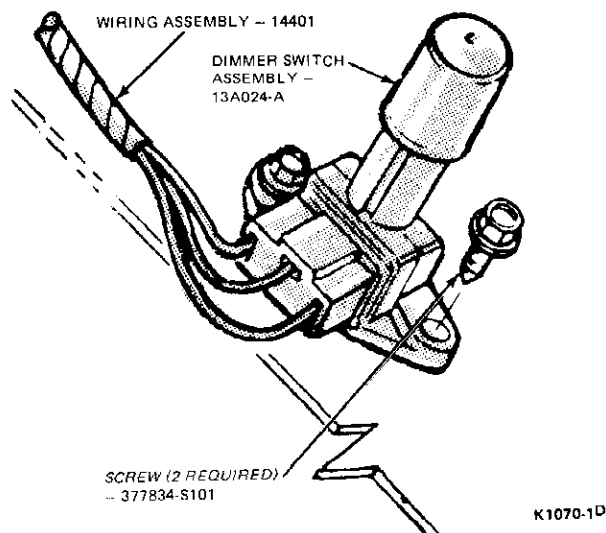


FIG. 5 Headlamp Dimmer Switch

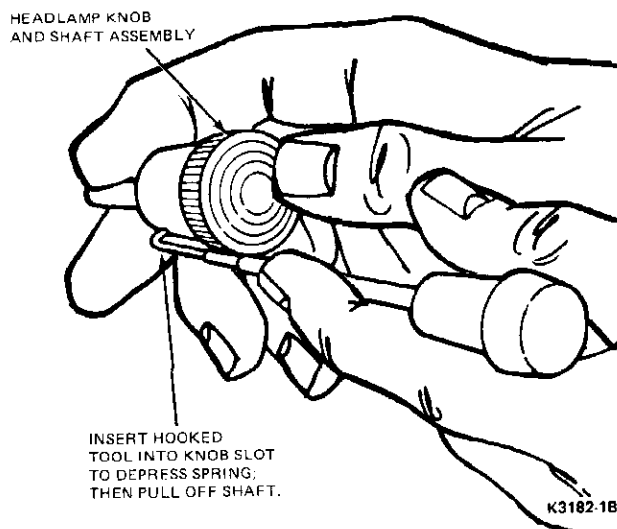


FIG. 6 Removing Headlamp Knob—Ford, Mercury, Monarch, Granada, Versailles and LTD II

2. Insert the hooked tool in the knob slot to depress the spring; then pull the knob from the shaft.
3. To install the knob, align triangular hole in knob and shaft, and simply press knob onto shaft until knob bottoms out.

Headlamp Covers

PART
32-06

Applies To Mercury, Ford LTD Landau, Lincoln Continental, Continental Mark V and Thunderbird

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION			
Headlamp Covers -- Standard	06-1	Vacuum Test Probe	06-6
Headlamp Covers Autolamp	06-1		
TESTING		REMOVAL AND INSTALLATION	
Covers Will Not Close	06-6	Vacuum Motor	06-7
Covers Will Not Open	06-6	Vacuum Reservoir	06-7
Leak Test	06-6		

CK3369-2B

DESCRIPTION AND OPERATION

NOTE: For all other information not covered in this Part, refer to the Wiring and Vacuum Diagram Book.

HEADLAMP COVERS (STANDARD)

The headlamp covers are opened and closed by two vacuum motors on Mercury, Ford LTD Landau, Thunderbird and Lincoln Continental and Continental Mark V. Refer to Figs. 1, 2, 3 and 4 for location of the headlamp cover operating components and installation. Note the vacuum hose routing, connections and color codes.

The headlamp switch, when pulled full out actuates a distribution valve, located on the back of the headlamp switch. The distribution valve applies vacuum to the vacuum motor operating the headlamp covers. The distribution valve also provides a vacuum relief (exhaust) port to that side of the vacuum motor diaphragm to which vacuum is not applied.

When the headlamp switch is pushed in to turn the headlamps off, the vacuum supply and relief positions of the distribution valve are reversed. This subjects the opposite side of the vacuum motor diaphragm to engine vacuum, and also vents the vacuum at the opposing side of the diaphragm to atmospheric pressure. The vacuum motor closes the headlamp covers.

A reserve vacuum reservoir provides vacuum storage, which permits limited cycling of the headlamp covers without the car engine running.

A check valve is used in the vacuum source line, to prevent vacuum from leaking from the reservoir back through the engine.

Springs are used on all models to automatically open the covers, in the event the system should lose vacuum. On Ford LTD Landau, Mercury, Thunderbird, Continental Mark V and Lincoln Continental models, the spring is built into each motor. Vacuum applied to the vacuum motor diaphragm during closing overcomes this spring tension.

If the headlamp covers will not open automatically, a by-pass valve is provided, to vent the system and allow the covers to open. The valve is located in the vacuum lines near the reservoir and the left-hand front fender.

If the engine is shut down for a minimum of 18 hours, a normal system leak would allow the covers to open under the spring force.

HEADLAMP COVERS (AUTOLAMP)

See Part 32-12.

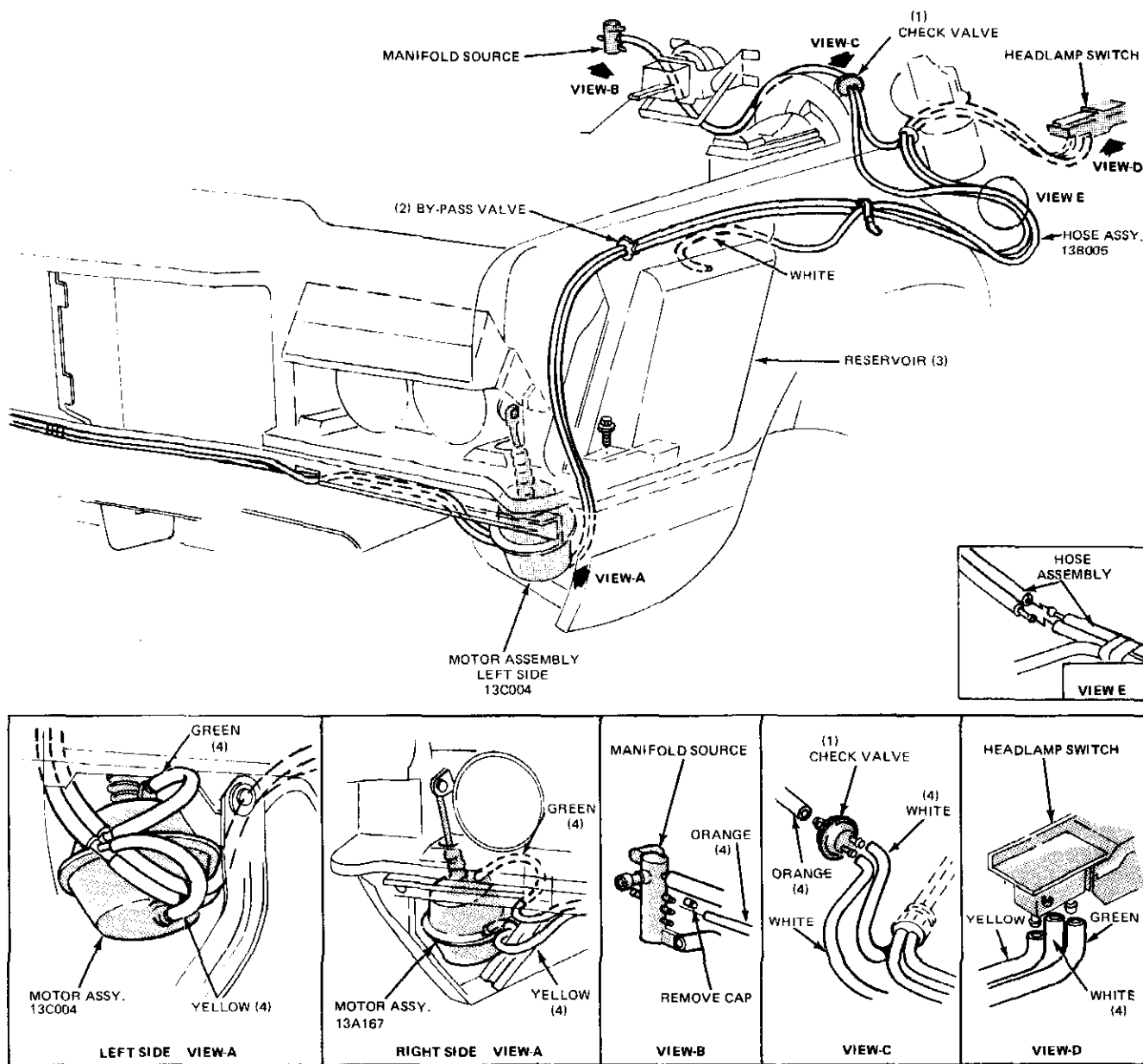


FIG. 1 Headlamp Covers and Vacuum System—Mercury and Ford High Series

K2166-2G

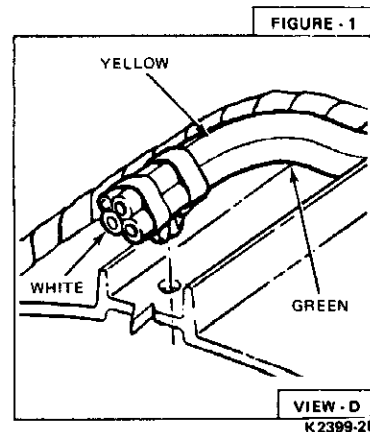
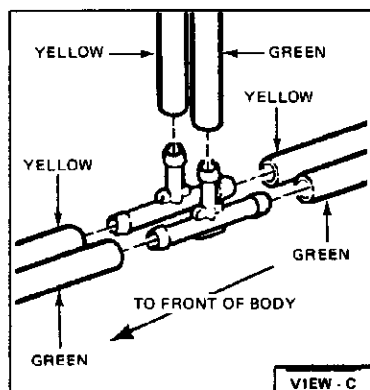
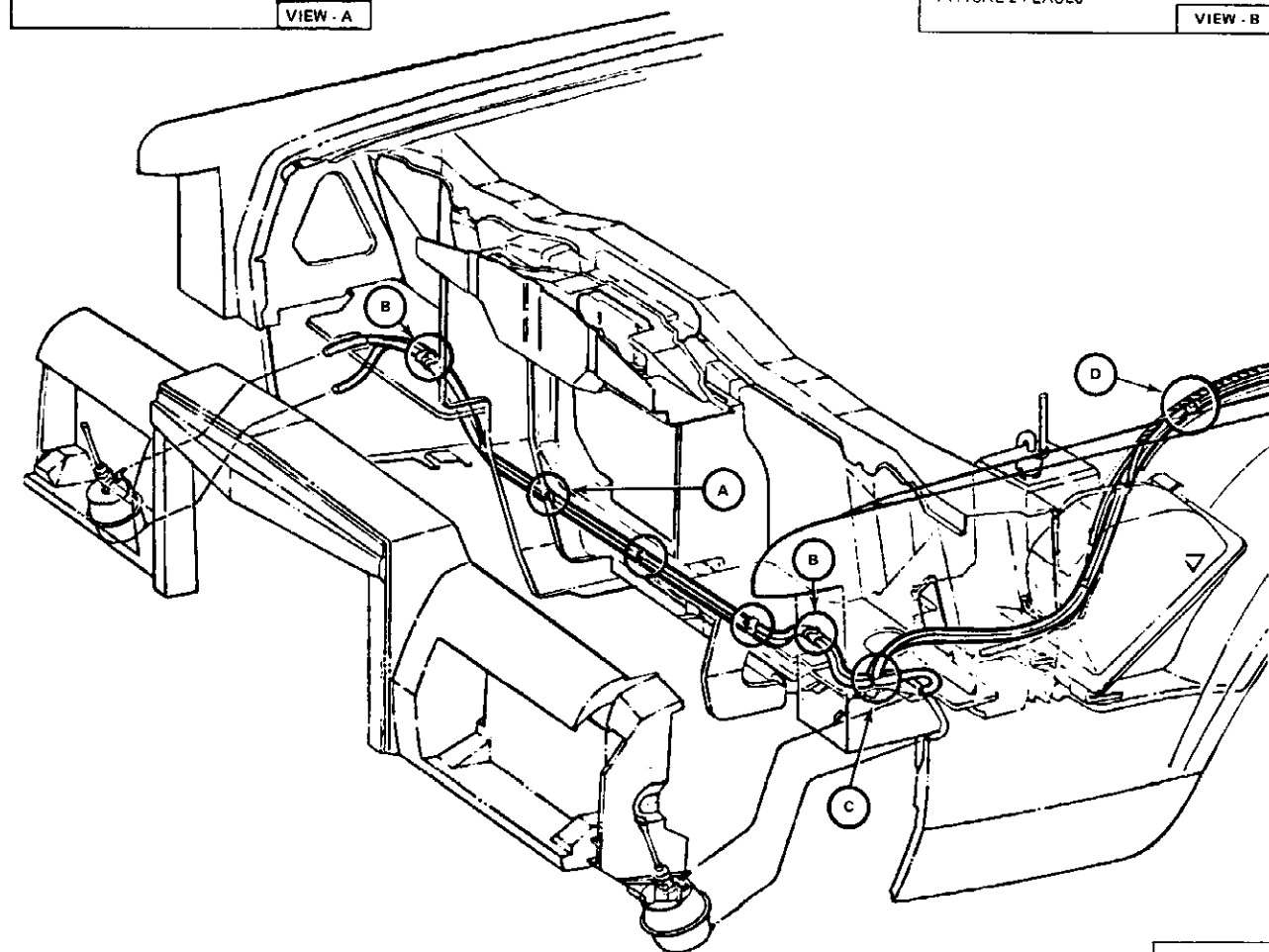
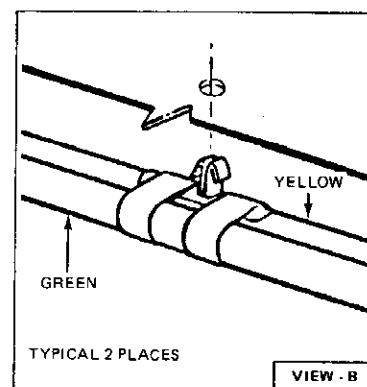
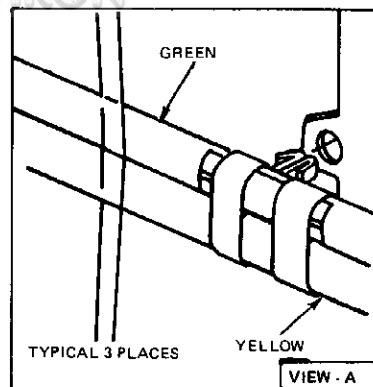


FIG. 2 Headlamp Covers and Vacuum System—Continental Mark V

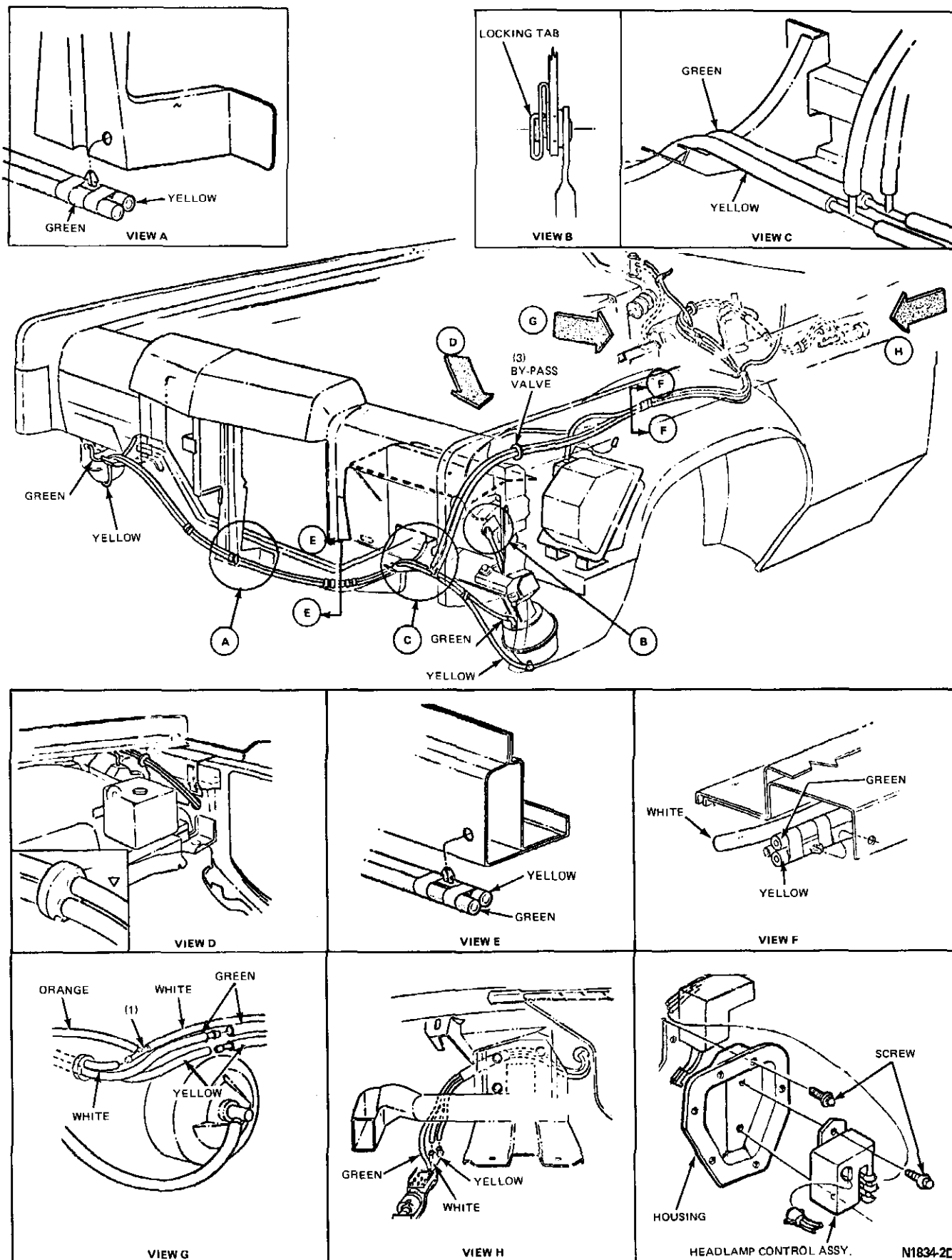


FIG. 3 Headlamp Covers and Vacuum System—Lincoln Continental

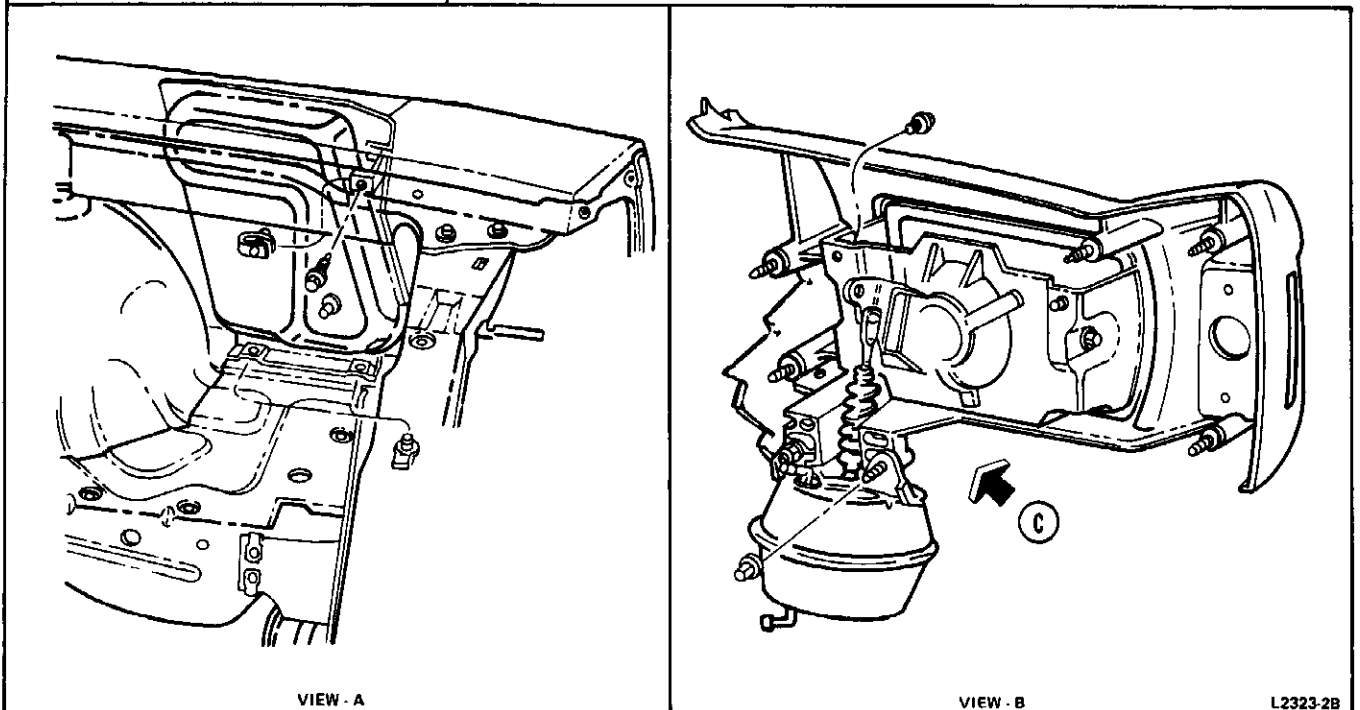
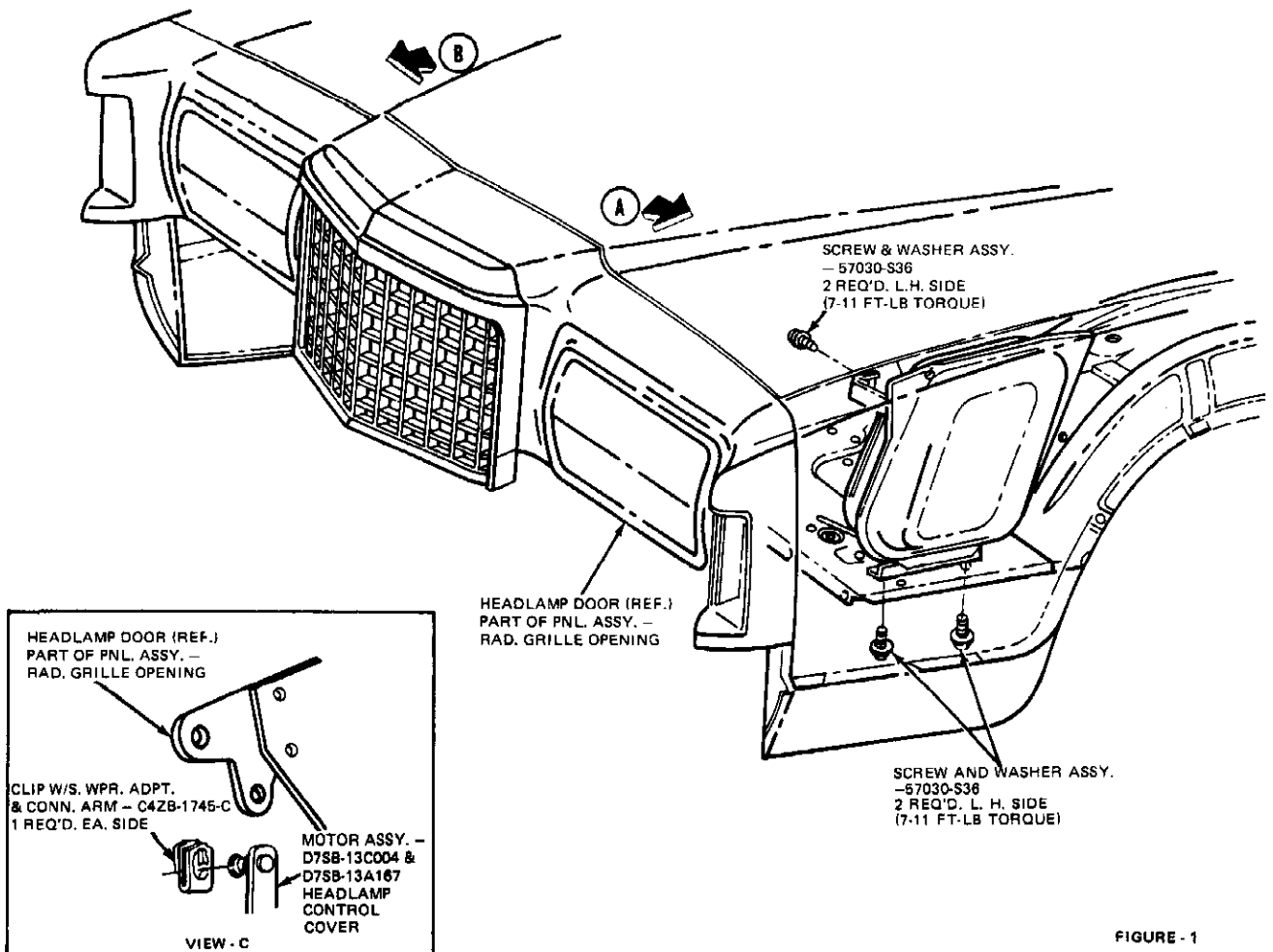


FIG. 4 Headlamp Covers and Vacuum System—Thunderbird

TESTING

HEADLAMP COVER VACUUM SYSTEM LEAK TEST

A leak test on any part or component of the headlamp cover vacuum system, can be accomplished with the use of the vacuum test probe. (Refer to Vacuum Test Probe for fabrication.) To perform the leak test, plug the probe into the system at the desired point. The reading on the gauge should momentarily fall below the preset value of 14 inches of vacuum. If there are no leaks in that part of the system being checked, the gauge reading should come back to 14 inches of vacuum and hold steady. If a leak is present in the system, the gauge reading will not come up to 14 inches of vacuum.

The leak test for the headlamp switch can be accomplished by attaching the vacuum test probe to the center (white) port of the headlamp switch and capping the two outside ports. Move the switch selector thru the OFF-PART-ON position, and observe the reading on the vacuum probe gauge. The gauge should read 14 inches of vacuum in all of the positions. If the reading should fall off at any of the positions, the headlamp switch should be replaced.

VACUUM TEST PROBE

A vacuum gauge is required to diagnose and test a vacuum control system. The Vacuum Test Tool T77L-9510-A or equivalent) is recommended. It is also recommended that the vacuum gauge be used, as a part of a vacuum probe test. Ordinarily, a vacuum gauge is used alone to measure the vacuum from a vacuum system hose or nipple, reservoir, or the engine intake manifold. A vacuum probe tester, on the other hand, is used to supply a definite amount of vacuum to a particular point in the system. It tests the system from this point to a component.

A vacuum probe tester is not commercially supplied, but it is easily made.

1. Cut or splice a length of 3/16-inch hose, long enough to reach from the engine intake manifold to the most remote component in the vacuum system. Call the ends of the hose the manifold end and the working end.
2. Insert a 4-way connector into the working end of the hose.
3. Attach a vacuum gauge to one of the 4-way connector nipples (Fig. 4).
4. Install a short length of 3/16" hose with an adjustable hose restrictor on another nipple of the 4-way connector.
5. Install a short length of hose on the last nipple of the 4-way connector. Insert a tee connector into this hose.
6. Install a short length of hose to the two open ends of the tee connector (Fig. 4). Install a 3/16"-1/8" reducer in one hose, and a 3/16" splice connector in the other hose. By adding or removing connectors (splices) to these test probe hoses, they can be connected to any 3/16"-1/8" hose nipple, or connector, while

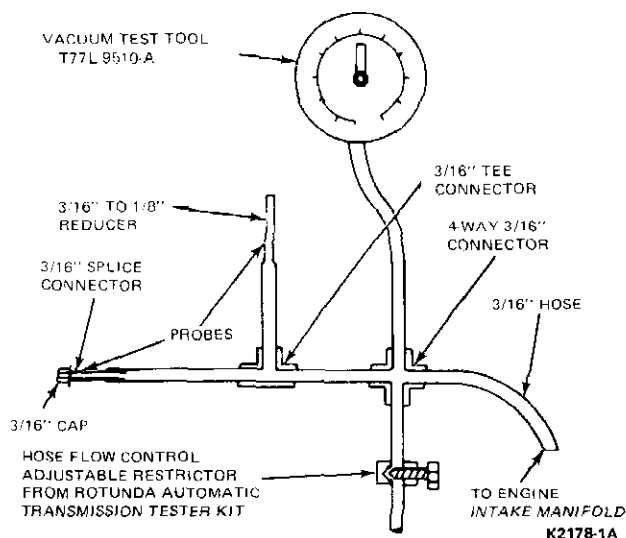


FIG. 5 Vacuum Test Probe

the other test hose is plugged, or both the 3/16" and 1/8" tester probes (see Fig. 5) can be used at the same time.

To adjust the probe to the required 14 inches of test vacuum, plug the test probe hoses into the vacuum source at the carburetor, and adjust the hose restrictor, until the vacuum gauge reads 14 inches. The vacuum supply at the end of the test probe hoses should be checked often, as the engine warms up, loads up, etc.

HEADLAMP COVERS WILL NOT OPEN

STANDARD SYSTEM

1. Turn on the headlamp switch.
2. Turn the by-pass valve to the vent position. If the headlamp covers have opened, check the hoses and connectors between the by-pass valve and the headlamp switch for kinks and obstructions (Fig. 5).
3. If kinks or obstructions are encountered, repair or replace as necessary.
4. If no kinks or obstructions were encountered, replace the headlamp switch.
5. If, after activating the headlamp switch and turning the by-pass valve to the vent position, the headlamp covers remained in the closed position, check the mechanisms for binds.
6. If a binding condition exists, replace or repair the faulty part.
7. If no binding condition is encountered, check the hoses and connectors between the by-pass valve and the vacuum motor(s) for kinks and obstructions.
8. If kinks or obstructions are present, repair or replace as necessary.
9. If no kinks or obstructions are found, replace the by-pass valve.

HEADLAMP COVERS WILL NOT CLOSE

STANDARD SYSTEM

1. Check the by-pass valve by turning it to the normal position, and placing the headlamp switch in the OFF position.

2. Check for leaks and kinks or obstructions through the check valve from the intake manifold.
3. If any irregularities are found, repair or replace the hose between the intake manifold and the check valve.
4. If no irregularities are encountered, disconnect the reservoir hose at the check valve. Check the hose and reservoir for leaks.
5. If leaks are found, replace or repair as necessary.
6. If no leaks were found, check the valve port that connects to headlamp switch for vacuum and leaks.
7. If a leak is found, replace the check valve.
8. If no leak is found at the check valve port, check the valve port that connects to the headlamp switch for vacuum and for leaks.
9. If a leak is found, replace the check valve.
10. If no leak was indicated check the headlamp switch, hoses, connectors and motors in the open circuit (green hose) for kinks or obstructions.
11. If kinks or obstructions are found, replace or repair as necessary.
12. If no kinks or obstructions are found, check for leaks or obstructions at the headlamp switch, hoses, connectors and motors in the close circuit (yellow hose).
13. If leaks or obstructions are found, repair or replace as necessary.
14. If no leaks, kinks or obstructions were found, check the headlamp cover mechanism for binds, and replace or repair as necessary.

REMOVAL AND INSTALLATION

VACUUM MOTOR

Mercury, Ford LTD Landau, Thunderbird, Continental Mark V and Lincoln Continental

1. Disconnect the two vacuum hoses from the cover motor.
2. Disconnect the motor control rod from the headlamp cover.
3. Remove two nuts retaining the motor to the motor support, and remove the motor through the opening at the bottom of the vehicle.
4. Position the motor to the support bracket and install the two retaining nuts.
5. Connect the motor control rod to the headlamp cover, and connect the vacuum hoses to the motor. Be sure to connect the green stripe hose to the top of the motor, and the yellow to the bottom of the motor. Then, check the operation of the system.

VACUUM RESERVOIR

1. Raise the left front of the vehicle and remove the left front tire and wheel assembly.
2. From under the fender, remove the nuts and washers retaining the headlamp cover vacuum reservoir to the front fender apron and wheel housing.
3. Disconnect the vacuum hose from the reservoir and remove the reservoir.
4. Connect the vacuum hose to the vacuum reservoir.
Place the reservoir in position, fitting the retaining studs into the holes in the front fender apron and wheel housing. From under the fender, install the nuts and washers to the studs.
5. Install the left front tire and wheel assembly and lower the vehicle. Check the operation of the headlamp covers.

Headlamp Delay System -- Autolamp		PART 32-12	
SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	12-1	REMOVAL AND INSTALLATION	
DIAGNOSIS	12-3	Complete Checkout Procedure	12-7
ADJUSTMENTS	12-4	Headlamp Switch and/or Potentiometer	12-4
		Sensor Amplifier	12-4

CK3370-2B

DESCRIPTION AND OPERATION

The Autolamp system provides light sensitive automatic on-off control of the exterior lamps normally controlled by the regular headlamp switch. This system also provides for increased visibility for occupants when leaving the vehicle. The Autolamp system keeps the lamps on for a preselected period of time after the ignition is turned off. The preselected time lapse can be adjusted by the operator up to 4-1/2 minutes.

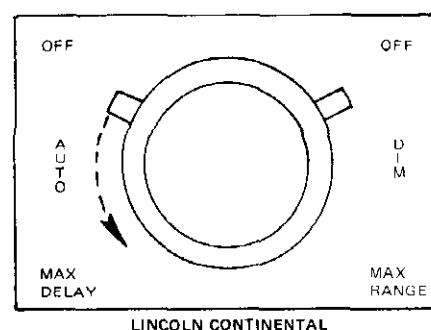
The system consists of a light sensitive photocell assembly, a transistorized amplifier, and a time-delay control which includes an on-off switch. Connections to the vehicle lights parallel the regular headlamp switch connections requiring the headlamp switch to be in the off position for the automatic control feature (Fig. 1).

In normal operation the system will turn the exterior lamps "on" when the natural outside light available to the photocell decreases below a predetermined level, such as at sunset. Also the lamps will automatically turn "off" when the level of outside light exceeds a predetermined level during daylight hours. On a car equipped with headlamp covers, the system will synchronize and control their "open" and "close" operation with that of the vehicle headlamps.

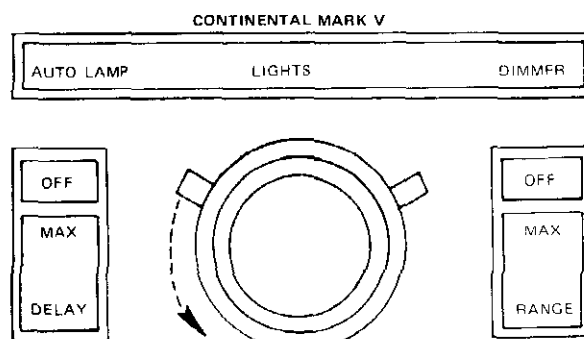
The system photocell is mounted under a group of perforated holes in the upper instrument finish panel, left of the steering column. The photocell must always be exposed to outside light to function properly. Photocell and amplifier are a matched set.

Do not place any items in the left hand corner of the windshield which may block light to the photocell.

The Lincoln Continental and Continental Mark V Autolamp Control Switch and driver's delay adjustment is located to the rear of the main headlamp switch control knob. The Autolamp system is functional for automatic operation when the "On-Off" control is moved from the "Off" position. The closer the flap control is moved toward the max-delay, the longer the lamps will stay on after the ignition is turned off (Fig. 1).



LINCOLN CONTINENTAL



K3108-2C

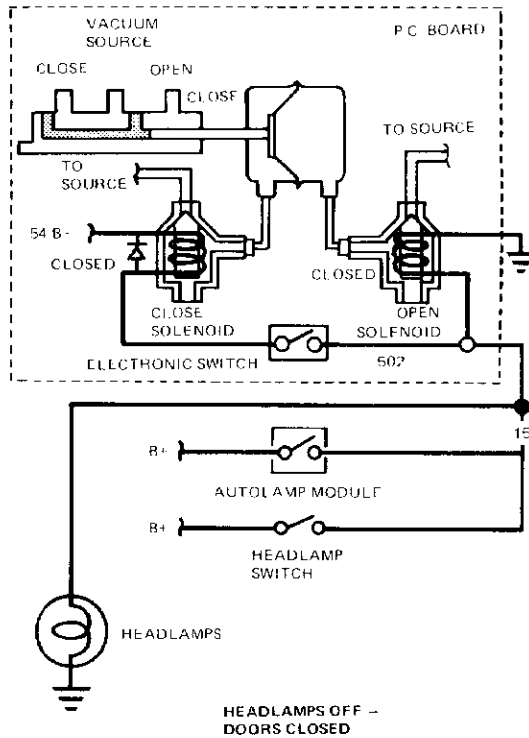
FIG. 1 Autolamp System Driver Control

If the driver desires to override the autolamp, he may do so by pulling out the regular headlamp switch. Automatic operation will not be possible until the regular headlamp switch is pushed in.

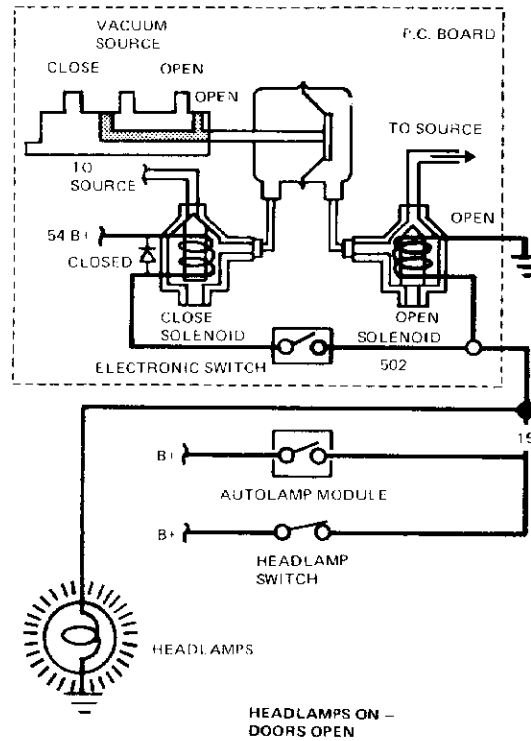
HEADLAMP COVER SOLENOID VACUUM SWITCH IN AUTOLAMP SYSTEM

When the headlamps (wire 15 in Fig. 2) are turned ON, either by manual headlamp switch or by the

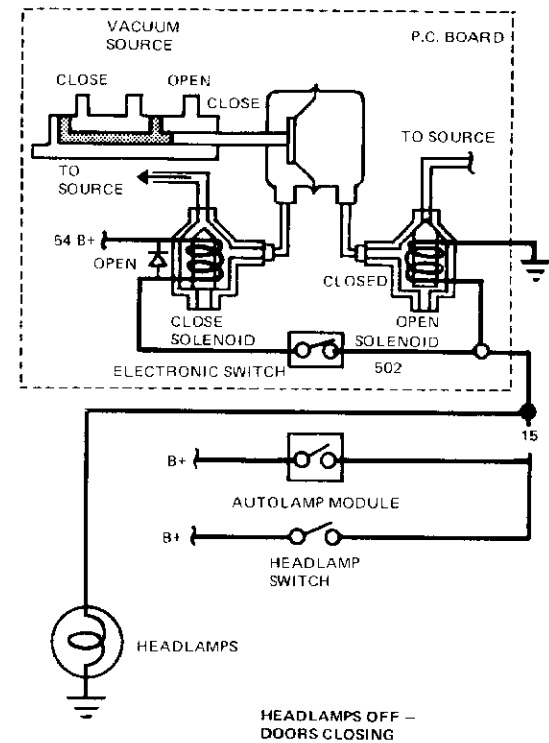
①



②



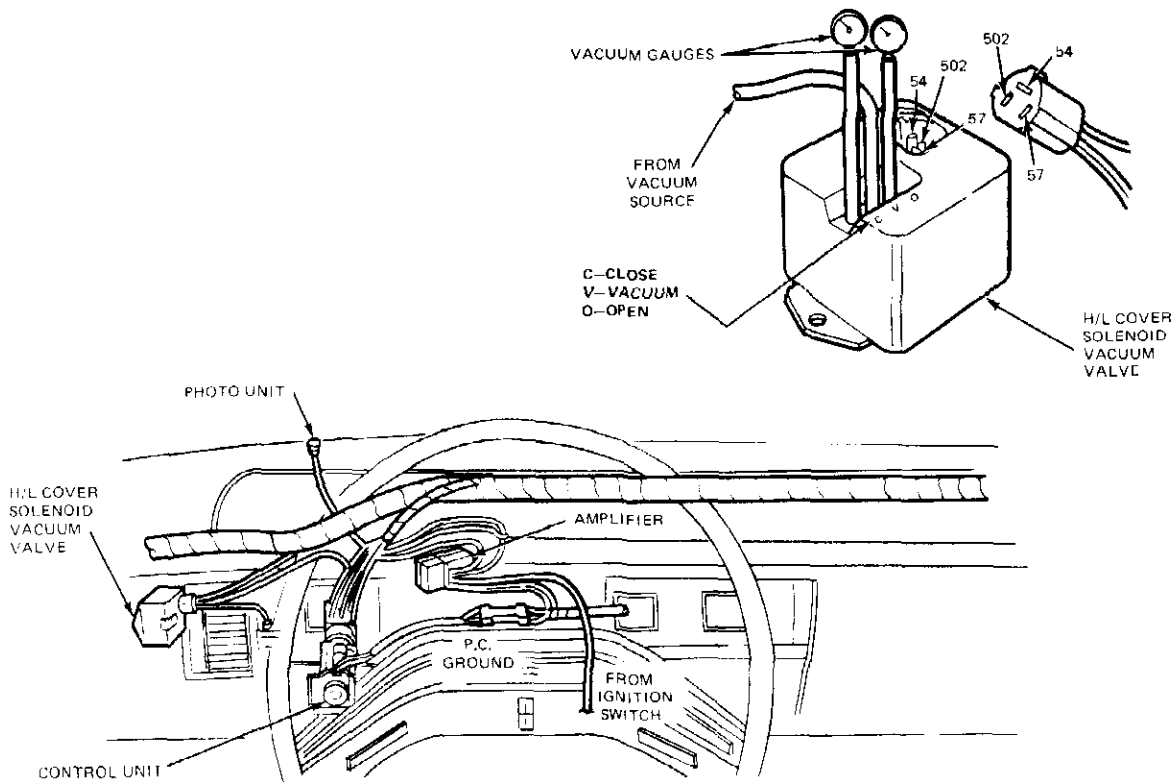
③



④

HEADLAMP ACTUATOR REVERTS TO ① ABOVE IN P.C. BOARD.
CAPACITOR CHARGES AND OPENS CIRCUIT.

FIG. 2 Headlamp Cover Solenoid Vacuum Switch Operation in Autolamp System



K3452-2A

FIG. 3 Headlamp Cover Solenoid Vacuum Valve in System

Autolamp amplifier, power is supplied through wire 502 to the headlight cover solenoid vacuum valve (Fig. 3).

This actuates one of two solenoids in the valve to connect vacuum to the OPEN side of the headlamp cover vacuum motor. This OPEN solenoid remains actuated as long as wires 15/502 are "hot".

The other (CLOSE) solenoid in the vacuum valve is connected between leads 502 and 54 (which are energized all the time) through an electronic switch. As long as both circuits are at the same voltage, no current can flow through this solenoid.

When circuits 15/502 are turned OFF by the Autolamp amplifier or by the manual headlamp switch, however, several things happen:

1. The OPEN solenoid is de-activated and vents the OPEN side of the headlamp cover vacuum motor.
2. The drop in voltage in lead 502 causes the electronic switch to close and connect the CLOSE solenoid to circuit 502 (which is now at zero voltage).
3. Current flows from wire 54 through the CLOSE solenoid, through the electronic switch, through wires 502 and 15, and through the headlamps to ground. This actuates the CLOSE solenoid to connect vacuum to the CLOSE side of the headlamp cover vacuum motor.
4. The drop in voltage at wire 502 also actuates a time delay capacitor in the electronic switch. When the capacitor becomes fully charged (the delay is long enough for the headlamp doors to operate), the electronic switch opens to cut off the current flow through the CLOSE solenoid.

DIAGNOSIS

SYSTEM CHECK—HEADLAMP COVER SOLENOID VACUUM VALVE

At harness connector:

1. Verify power available at Socket 54.
2. Verify power available at Socket 502.
 - a. Headlamps ON—power.
 - b. Headlamps OFF—no power.
 - c. Check power both from manual headlamp switch and from amplifier.
3. Check for zero resistance—Socket 57 to ground.

At valve connector:

(Before removing vacuum solenoid for testing, make sure that headlamps are turned OFF with vacuum present, to ensure that vacuum solenoid is in the CLOSE mode.)

1. With no power applied:
 - a. There should be continuity between blades 502 and 57.

- b. There should be **no** continuity between blade 54 and any other blade. (Ground blade 502 to blade 54 to discharge capacitor before checking.)
2. Attach vacuum gauges to nipples C and O. Apply 15 inch vacuum to nipple V.
 - a. Vacuum should show at nipple C; no vacuum at O.
 - b. Trap vacuum at nipple V.
 - c. Vacuum at nipple C should hold for 1 minute.
 - d. Nipple O should be open to atmosphere.
3. Attach vacuum gauges to nipples O and C. Apply 15 inch vacuum to nipple V. Apply 12 volts to blades 502 and 54. Jumper blade 57 to ground.
 - a. Vacuum should show at nipple O. No vacuum at C.
 - b. Trap vacuum at nipple V.
 - c. Vacuum at nipple O should hold for 1 minute.
 - d. Nipple C should be open to atmosphere.
4. Attach vacuum gauge to nipples C and O. Apply 15 inch vacuum to nipple V. Disconnect 12 volts from 502 and immediately connect 12 volts test light between blade and ground.

- a. Vacuum should show at nipple C—no vacuum at O.
- b. Light should glow for 30-60 seconds, then go out.
- c. Trap vacuum at nipple V—vacuum at nipple C should hold for 1 minute.
- d. Nipple O should be open to atmosphere.
- e. After 60 seconds, continuity should check same as in 1.

DIAGNOSIS TIPS—QUICK CHECKS

1. Make sure lens of photo unit is clean and not obstructed.
2. Make sure there is a clean, tight ground connection for circuit 57 from the potentiometer control unit at the headlamp switch.
3. Make sure that headlamps operate normally from the **manual** headlamp switch.
4. Make sure that fuse supplying circuit 504 is O.K.
5. Remember that it is **normal** to have a slight delay between turning the switch ON or OFF (or covering or uncovering the photo unit lens) and the response of the headlamps.

ADJUSTMENTS

Two different amplifiers may be found in 1978. Both amplifiers utilize a label attached to the case which provides instructions for making adjustments as shown in Fig. 10. If it is necessary to have the headlamps turned on earlier than that which is afforded by the

original setting, the adjustment screw is turned clockwise in the direction of the arrow shown as **EARLY**. For later turn-on of the headlamps, the adjusting screw is turned in the counterclockwise direction of the arrow shown as **LATE**.

REMOVAL AND INSTALLATION

SENSOR AMPLIFIER

NOTE: If the amplifier is replaced, the photocell must also be replaced; the amplifier and photocell are a matched set.

1. Unscrew the 2 screws holding the sensor amplifier bracket to the lower instrument panel support bracket.
2. Remove the connector from the sensor amplifier.
3. Remove the bracket from the amplifier by removing the 2 screws holding the bracket to the sensor amplifier.
4. Place the bracket in position on the replacement amplifier after removing the photocell and carefully setting it aside for later installation as described below under photocell.
5. Tighten the 2 screws into the amplifier.
6. Plug the connector into the amplifier.
7. Place the amplifier and bracket in position on the lower instrument panel support bracket and fasten with the 2 screws.

For headlamp switch removal and installation refer to Part 32-02.

HEADLAMP SWITCH AND/OR POTENTIOMETER

An additional feature of the Autolamp System is the removable potentiometer from the headlamp switch. Either the headlamp switch or the potentiometer can be replaced separately. The headlamp switch assembly must be removed from the vehicle in order to separate the potentiometer from the headlamp switch.

Removal

1. Disconnect the ground cable from the battery.
2. Remove the headlamp switch knob and shaft (Fig. 4).
3. Pull the two autolamp control bezels with pliers. Do not damage the bezel(s).
4. Remove the threaded headlamp switch bezel from the front of the headlamp switch. On Lincoln Continental, remove the single screw in the rear corner of the bracket. On Continental Mark V, remove the cluster opening finish panel. Refer to Part 33-50.
5. Remove the four screws from the bracket on the front of the headlamp switch (Continental Mark V).

6. Disconnect all wires and remove the headlamp switch.
7. Remove the bracket from the headlamp switch (Continental Mark V only).
8. Remove the nut and washer from the potentiometer or headlamp switch (Fig. 4). **NOTE:** When assembling, notice that the top straight edge of the potentiometer is located under the two 90 degree tabs on the headlamp switch bracket (Fig. 5).

Installation

1. Assemble the headlamp switch to the potentiometer, and/or the potentiometer to the headlamp switch.
2. Then, secure with nut and washer (Fig. 6).
3. Position the bracket to the headlamp switch (Continental Mark V).

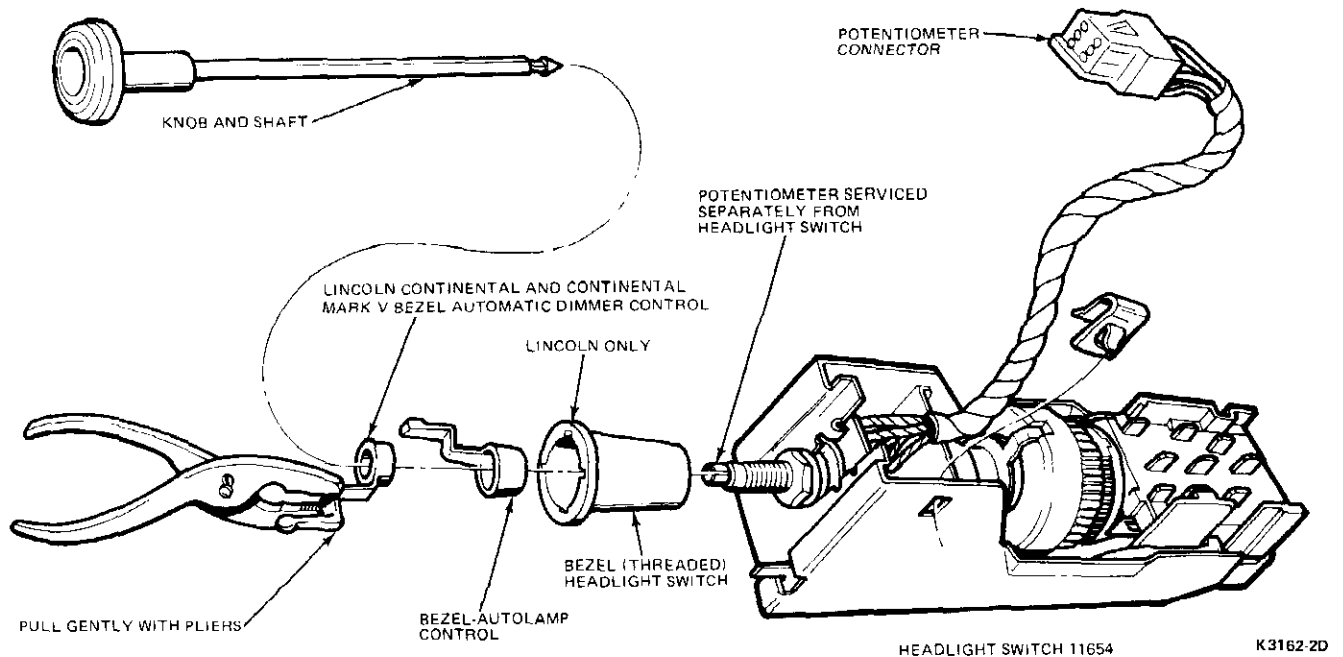


FIG. 4 Autolamp Headlamp Switch

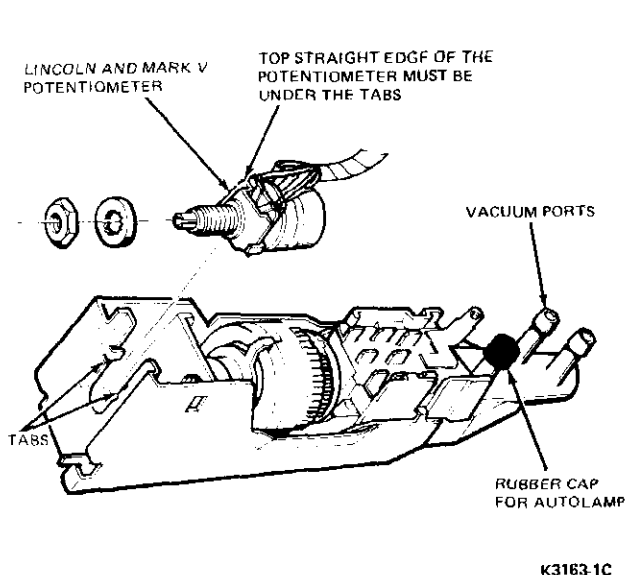


FIG. 5 Headlamp Switch—Lincoln Continental, Continental Mark V

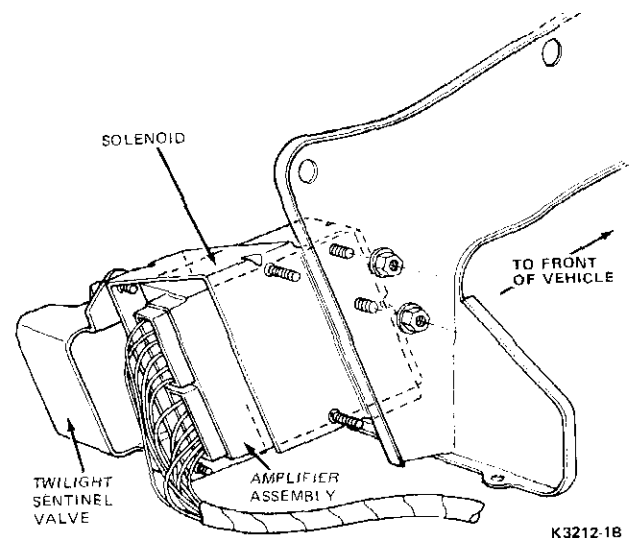
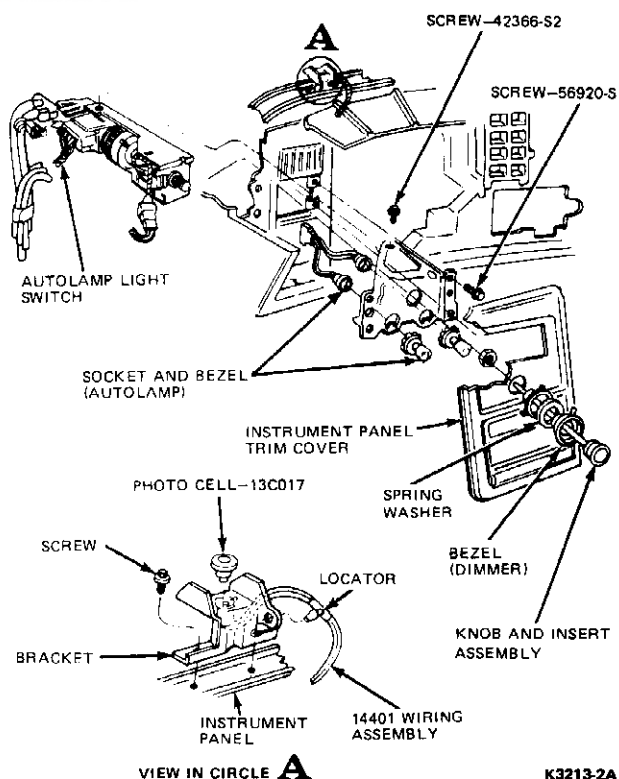


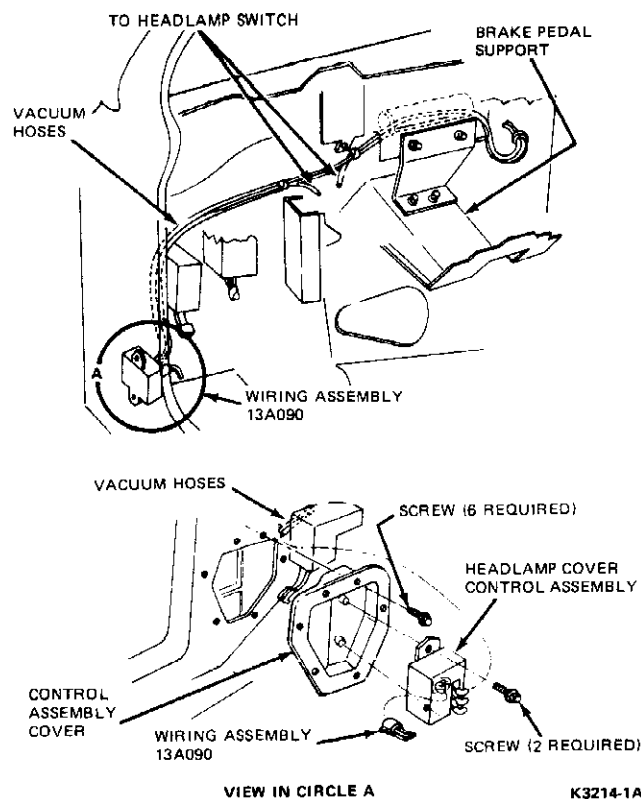
FIG. 6 Installation of Solenoid Valve—Continental Mark V, Lincoln Continental Similar



K3213-2A

FIG. 7 Autolamp Switch—Continental Mark V Shown, Lincoln Continental Similar

4. Connect the headlamp switch wiring and install the headlamp switch.
5. Install the threaded headlamp switch bezel on the front of the headlamp switch. Be sure to install the single screw on the rear corner of the bracket (Lincoln Continental only). Install the cluster opening finish panel (Continental Mark V).
6. Install the autolamp control bezel (two on Lincoln Continental and Continental Mark V).
7. Install the headlamp switch knob and shaft.
8. Connect the ground cable to the battery.



K3214-1A

FIG. 8 Autolamp Headlamp Dimmer and Autolamp System—Lincoln Continental Shown, Continental Mark V Similar

PHOTOCELL

1. Remove the crash pad and upper finish panel as outlined in Group 45.
2. Remove photocell from socket locations as shown in Figs. 3 and 7.
3. Carefully install new photocell from replacement amplifier. NOTE: It is important that the installed photocell is the one which came with the replacement amplifier as they were calibrated together as a matched set. The system will not perform properly unless this is done.
4. Replace crash pad and upper finish panel. Refer to Group 45.

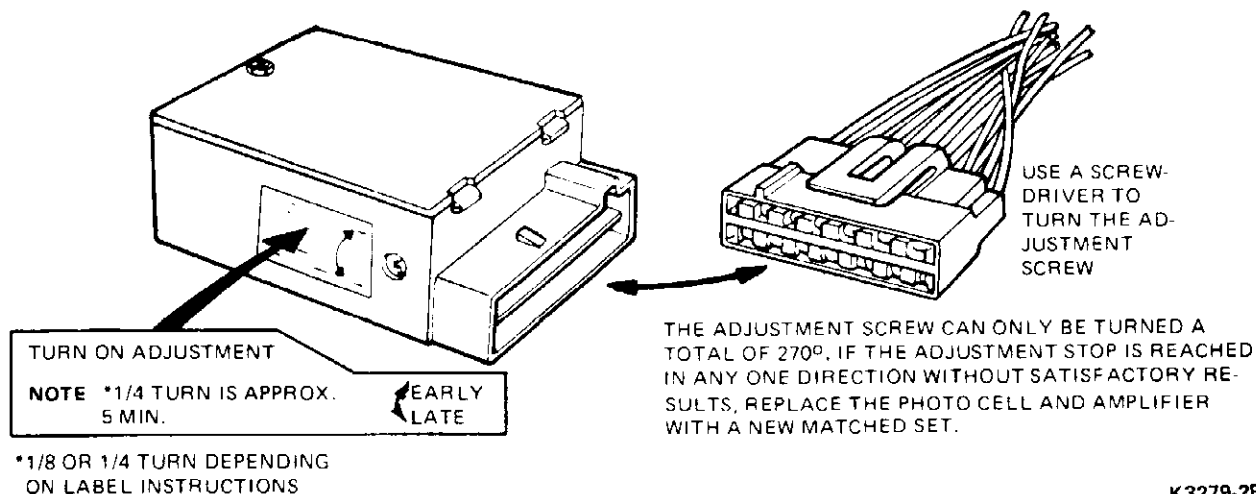
SYMPTOMS OF OPERATIONAL CONDITIONS: The autolamp system will not operate. The autolamp system will not delay long enough after the vehicle has been shut down.	TO RESOLVE OPERATOR ERROR Problems resulting from Operator Error are caused by failure to follow operating procedure or sequence requirements that have been designed into the AUTOLAMP (ON/OFF DELAY SYSTEM).
SYMPTOMS AND QUICK CHECKS OF THE ELECTRICAL SYSTEM: • Headlamps do not turn on when it gets dark outside. • Headlamps turn on too late at evening. • Headlamps turn on too early at evening. • Headlamps turn off too late in the morning. • Headlamps turn off too early in the morning.	"QUICK CHECK" Place autolamp control in the "off" position. Turn on headlamps using standard headlamp switch control. If headlamps do not operate, check out and correct the standard headlamp circuit. If headlamp operation is OK using the standard headlamp switch, check the Autolamp fuse. If the fuse is OK proceed with a complete check-out procedure. Refer to Autolamp amplifier adjustment.

CK3278-2B

COMPLETE CHECKOUT PROCEDURE (FIGS. 6-9)

1. Remove sensor amplifier bracket from the lower instrument panel support bracket and separate the wiring connector from the sensor amplifier.
2. Before proceeding with the Circuit Checkout Procedure on the following pages, check all

terminal pins in the amplifier wiring connector to make sure they are properly installed and in position.



K3279-2B

FIG. 9 Autolamp Amplifier Adjustment—Lincoln Continental, Continental Mark V

AUTOLAMP CONNECTOR (ON/OFF DELAY SYSTEM)

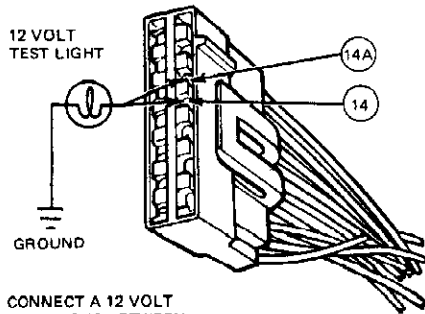
TERMINAL PIN NUMBER		CIRCUIT NUMBER	WIRE COLOR CODE		CIRCUIT NUMBER	WIRE COLOR CODE
222 8	7 221A	1 216	TAN-LIGHT BLUE STRIPE (AUTOLAMP SENSOR AMPLIFIER TO RHEOSTAT) (CONNECTOR TERMINAL SLOT #1)	8 222	222	BROWN-LIGHT GREEN DOT (PHOTOCELL TO AUTOLAMP SENSOR AMPLIFIER) (CONNECTOR TERMINAL SLOT #8)
219 9	6 221	2 217	DARK BLUE-ORANGE DOT (AUTOLAMP SENSOR AMPLIFIER TO RHEOSTAT) (CONNECTOR TERMINAL SLOT #2)	9 & 10 219A 219	219	DARK GREEN-YELLOW DOT (HEADLAMP SWITCH TO AUTOLAMP SENSOR AMPLIFIER) (CONNECTOR TERMINAL SLOT #9 & 10)
219A 10	5 14A	3 220	PURPLE-ORANGE DOT (AUTOLAMP SENSOR AMPLIFIER TO CONTROL SWITCH) (CONNECTOR TERMINAL SLOT #3)	11 218	218	WHITE-PURPLE HASH (AUTOLAMP SENSOR AMPLIFIER TO PHOTOCELL) (CONNECTOR TERMINAL SLOT #11)
218 11	4 14	4 & 5 14A 14	BROWN (AUTOLAMP SENSOR AMPLIFIER TO TAIL LAMPS AND SIDE MARKER LAMPS) (CONNECTOR TERMINAL SLOT 4 & 5)	12 & 13 15A 15	15	RED-YELLOW STRIPE (HEADLAMP SWITCH TO AUTOLAMP SENSOR AMPLIFIER TO HEADLAMPS) (CONNECTOR TERMINAL SLOT #12 & 13)
15 12	3 220	6 & 7 221A 221	ORANGE-WHITE HASH (HEADLAMP SWITCH TO AUTOLAMP SENSOR AMPLIFIER) (CONNECTOR TERMINAL SLOT #6)	14 *454 504	504	DARK BLUE-WHITE HASH (FUSE PANEL TO AUTOLAMP SENSOR AMPLIFIER) (CONNECTOR TERMINAL SLOT #14)
15A 13	2 217					
*454 14	1 216					
504						

*LINCOLN CONTINENTAL ONLY

CK3280-2B

AUTOLAMP (ON/OFF DELAY SYSTEM)

OPERATION



CONNECT A 12 VOLT TEST LIGHT BETWEEN TERMINALS 4 OR 5 AND A GOOD GROUND

TAIL LAMP CIRCUIT

TEST AND RESULT

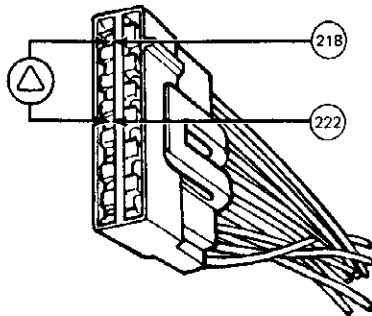
WITH MANUAL HEADLAMP SWITCH IN PARK OR FULL "ON" POSITION, VOLTAGE SHOULD BE MEASURED AT AUTOLAMP CONNECTOR (CIRCUITS NOS. 14 AND 14A) THIS CHECKS FOR CORRECT WIRING TO TAIL LAMP CIRCUIT.

IF NOT OK, CHECK CONTINUITY OF THE 14 BROWN WIRE BETWEEN THE AUTOLAMP AMPLIFIER CONNECTOR AND THE COMMON POINT WITH THE REAR LAMP CIRCUIT.

CK3351-2B

PHOTOCELL

OHMMETER



CONNECT AN OHMMETER BETWEEN TERMINALS 8 AND 11

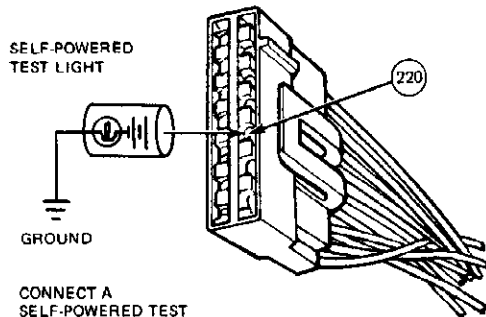
TEST RESISTANCE OF PHOTOCELL. (CIRCUIT NO. 218 AND 222). WITH PHOTOCELL IN DARKNESS, READING WILL EXCEED 100,000 OHMS. WITH PHOTOCELL UNDER BRIGHT LIGHT OR DAYLIGHT, READING WILL BE LESS THAN 1,000 OHMS.

IF NOT, REPLACE THE PHOTOCELL AND THE AUTOLAMP AMPLIFIER AS A UNIT.

CK3352-2C

ON-OFF CONTROL SWITCH

OPERATION



CONNECT A SELF-POWERED TEST LIGHT TO TERMINAL NO. 3 AND A GOOD GROUND

TEST AND RESULT

CHECK FOR SYSTEM GROUND THROUGH DRIVER'S DELAY CONTROL SWITCH. GROUND SHOULD BE MEASURED WITH AUTOLAMP SWITCH IN "ON" POSITION. CIRCUIT IS OPEN WITH SWITCH IN "OFF" POSITION.

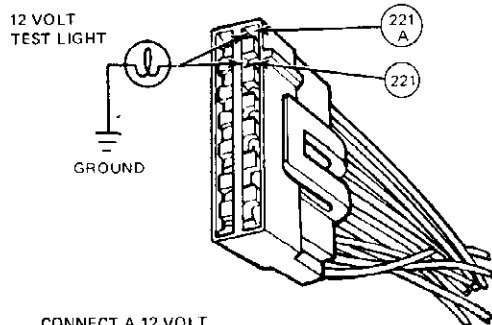
IF NOT OK, PERFORM STEPS NOS. 1 & 2 OF THE POTENTIOMETER TEST.

IF POTENTIOMETER TESTS OK, CHECK THE 220 CIRCUIT—PURPLE WIRE WITH ORANGE DOTS—BETWEEN THE POTENTIOMETER CONNECTOR AND AUTOLAMP AMPLIFIER CONNECTOR.

CK3353-2A

AUTOLAMP (ON/OFF DELAY SWITCH) HEADLAMP CIRCUIT BREAKER

OPERATION



CONNECT A 12 VOLT TEST LIGHT BETWEEN TERMINAL NO. 6 OR 7 AND A GOOD GROUND

TEST AND RESULT

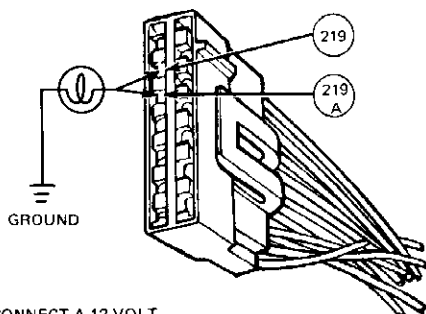
TEST FOR POWER FEED FROM THE HEADLIGHT SWITCH CIRCUIT BREAKER AT AUTOLAMP CONNECTOR. (CIRCUIT NO. 221 OR 221A).

IF NOT OK, CHECK THE OPERATION OF THE HEADLAMP SWITCH. IF IT IS OK, CHECK CONTINUITY OF THE 221 ORANGE WIRE WITH WHITE HASH MARKS BETWEEN THE HEADLIGHT SWITCH AND THE AUTOLAMP AMPLIFIER CONNECTOR.

CK3281-2B

TAIL LAMP CIRCUIT BREAKER

12 VOLT TEST LAMP



CONNECT A 12 VOLT TEST LIGHT BETWEEN TERMINAL NO. 9 OR 10 AND A GOOD GROUND

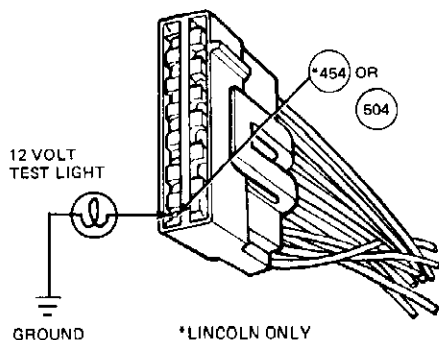
TEST FOR POWER FEED FROM HEADLAMP SWITCH CIRCUIT BREAKER AT AUTOLAMP CONNECTOR. (CIRCUIT NO. 219 OR 219A).

IF NOT OK, CHECK THE OPERATION OF THE REAR TAILLAMP. IF OK, CHECK CONTINUITY OF THE 219 CIRCUIT—DARK GREEN WIRE WITH THE YELLOW DOTS—BETWEEN THE HEADLAMP SWITCH AND THE AUTOLAMP AMPLIFIER CONNECTOR.

CK3282-2C

AUTOLAMP (ON/OFF DELAY SYSTEM) IGNITION RUN

OPERATION



CONNECT A 12 VOLT TEST LIGHT BETWEEN TERMINAL 14 AND A GOOD GROUND

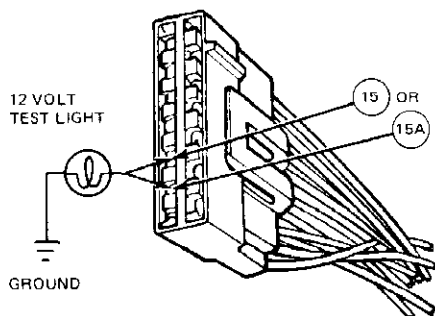
TEST AND RESULT

TEST FOR POWER FEED FROM ACCESSORY CIRCUIT OF IGNITION SWITCH. VOLTAGE IS MEASURED WITH IGNITION SWITCH IN "RUN" POSITION. (CIRCUIT NO. 454 OR 504).

IF THIS DOES NOT CHECK OUT, CHECK THE FUSE AND/OR CONTINUITY OF 504 CIRCUIT—DARK BLUE WIRE WITH WHITE HASH—(454-RED WITH LIGHT GREEN STRIPE FOR LINCOLN) BETWEEN THE FUSE PANEL AND AUTOLAMP AMPLIFIER CONNECTOR.

CK3283-2A

CONNECT A 12 VOLT TEST LIGHT BETWEEN TERMINAL NO. 12 OR 13 AND A GOOD GROUND



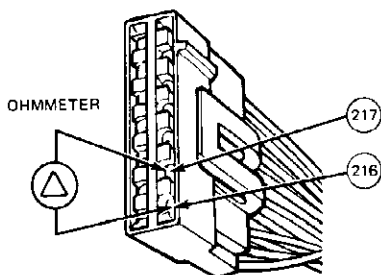
HEADLAMP CIRCUIT

WITH MANUAL HEADLAMP SWITCH IN FULL ON POSITION, VOLTAGE SHOULD BE MEASURED AT AUTO-LAMP CONNECTOR. THIS CHECKS FOR CORRECT WIRING TO HEADLAMP CIRCUIT (CIRCUIT NO. 15 OR 15A).

IF NOT OK, CHECK CONTINUITY OF THE 15 CIRCUIT - RED AND YELLOW WIRE - BETWEEN THE HEADLIGHT SWITCH CONNECTOR AND THE AUTOLAMP AMPLIFIER CONNECTOR.

CK3284-2B

CONNECT AN OHMMETER BETWEEN TERMINALS NO. 1 & 2



DELAY CONTROL POTENTIOMETER

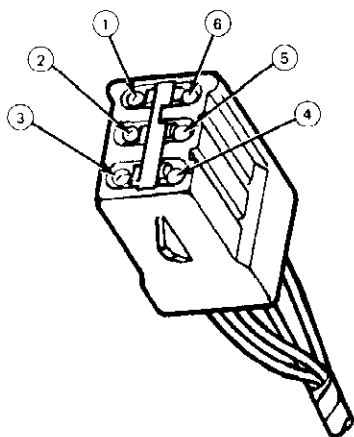
TEST FOR CONTINUITY TO DRIVER DELAY CONTROL. WITH CONTROL IN "MAXIMUM" DELAY POSITION READING SHOULD BE APPROXIMATELY 200,000 OHMS FOR LINCOLN, MARK V AND THUNDERBIRD.

IF NOT OK, PERFORM STEP NO. 3 OF THE POTENTIOMETER TEST. IF POTENTIOMETER TESTS OK, CHECK THE 216 TAN WIRE WITH LIGHT BLUE STRIPE & THE 217 CIRCUIT DARK BLUE WIRE WITH ORANGE DOTS BETWEEN THE POTENTIOMETER CONNECTOR & AUTOLAMP AMPLIFIER CONNECTOR.

IF POTENTIOMETER TEST NOT OK REPLACE THE POTENTIOMETER.

IF ALL OF THE PRECEEDING TESTS CHECK OUT OK, AND THE AUTOLAMP (ON/OFF DELAY) SYSTEM IS MALFUNCTIONING, THE AUTOLAMP AMPLIFIER IS THE CAUSE OF THE PROBLEM. IT WILL BE NECESSARY TO REPLACE THE AMPLIFIER AND THE PHOTOCCELL AS A MATCHED SET.

CK3354-2C



HEADLAMP SWITCH POTENTIOMETER CONTROL

1. USING A SELF POWERED TEST LIGHT CHECK THE CIRCUIT CONTINUITY FROM THE WIRE IN CONNECTOR CAVITY NUMBER 5, TO THE SWITCH BRACKET.
2. USING EITHER A SELF POWERED TEST LIGHT OR AN OHMMETER, CHECK THE AUTOLAMP "ON-OFF" SWITCH FUNCTION BY ROTATING THE "AUTOLAMP" CONTROL KNOB FROM "OFF" TO "ON". IT IS NECESSARY TO GO JUST PAST THE DETENT POSITION WITH THE CONTROL SWITCH IN THE "ON" POSITION. THE CONTINUITY CHECK IS PERFORMED BETWEEN CONNECTORS CAVITY NO. 5 AND 2.
3. USING AN OHMMETER CHECK THE RESISTANCE VALUE AS THE AUTOLAMP CONTROL IS ROTATED FROM "OFF" TO THE MAXIMUM TIME DELAY. THE RESISTANCE SHOULD GRADUALLY INCREASE FROM 2500/4500 OHMS AT THE "OFF" POSITION TO 140/260 K OHMS FOR THE LINCOLN, MARK V AND THUNDERBIRD. THIS CHECK IS PERFORMED BETWEEN CONNECTOR CAVITIES NO. 1 AND 6.
4. CAVITY NUMBERS 3 AND 4 ARE USED FOR AUTOMATIC HEADLAMP DIMMER OPERATION.

CK3355-2C

Automatic Headlamp Dimmer		PART 32-15	
Applies to Continental Mark V and Lincoln Continental			
SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	15-1	REMOVAL AND INSTALLATION	
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CK3371-2B

DESCRIPTION AND OPERATION

The automatic headlamp dimmer is a driver-operated electronic device, which automatically switches the headlamps from high to low beam, in response to light from an approaching vehicle, or light from the taillamps of a vehicle being overtaken.

Major components of the system are: a sensor-amplifier unit, a power relay, a foot switch, a driver sensitivity control, and an interconnecting wire harness.

The sensor-amplifier unit combines a light-sensing optical device and a transistorized amplifier into one unit, with sufficient power to operate a power relay for switching headlamp beams. The Lincoln Continental and Continental Mark V sensor-amplifier unit is located between the headlamps on the driver's side. The Lincoln Continental sensor-amplifier unit and mounting bracket assembly is located in the engine compartment, attached to the left side of the radiator support assembly. A pre-calibrated level assembly is attached as a part of the sensor-amplifier unit for setting the correct vertical aim. The unit is adjusted for sensitivity at the factory and then completely sealed by filling the interior of the metal case with a moisture-proof epoxy material. The epoxy forms a capsule around all the interior parts and prohibits access to factory sensitivity adjustments or other interior parts.

The power relay is a dust sealed, single pole, double throw, 12 V.D.C. unit which provides the heavy duty contacts for switching the headlamp beams. The upper beam position is the normally closed position. The power relay also contains a diode for electrical transient damping purposes, to protect the sensor-amplifier. Observe proper polarity when connecting, to prevent burn-out of the diode and subsequent damage to the sensor-amplifier.

The foot switch is a special dimmer over-ride type that replaces the standard foot dimmer switch. One position provides automatic control of the headlamp beams, and the other position is the lower beam. It also contains an over-ride section for obtaining an over-riding high beam, when in the automatic position. The over-ride section functions as follows: With the foot switch in the automatic position, a slight downward pressure on the switch provides upper beam, regardless of the amount of light on the sensor-amplifier lens. This arrangement permits signaling an approaching vehicle, if it fails to switch to lower beam, or as a passing signal to a vehicle being overtaken. It also provides a simple test for finding the automatic position of the foot switch.

The driver sensitivity control is the ring knob on the headlamp switch. This allows the driver to adjust the sensitivity of the system to the surrounding light. With the control knob positioned at the center of its travel, the sensitivity will closely approximate factory adjustment. Rotating the knob clockwise increases sensitivity and the headlamps will switch to the lower beam, when an approaching car is farther away.

Rotating the knob counterclockwise decreases the sensitivity, allowing an approaching car to come nearer before the headlamp switching occurs. If the control is rotated to the full counterclockwise position, manual operation of the headlamp beams with the foot dimmer switch is provided.

An in-line 4 ampere (SFE-4) fuse is incorporated into the wire harness. If this fuse should blow, the circuit will revert to manual control of the headlamp beams by means of the foot switch. Removing the fuse will also revert the system to manual control.

TESTING

All components of the automatic headlamp dimmer should hold their factory adjustments indefinitely.

However, an incorrect vertical aim adjustment, loose or incorrect wiring connections, or even misunderstanding

of the operation of the unit may lead an owner to believe an adjustment or part replacement is necessary.

The following checks should be performed, in sequence, to determine the cause and correction of trouble and to eliminate unnecessary service work. This unit is transistorized and does not require a warm-up time. With the vehicle in a well-lighted area, check the system as follows:

1. Check the position of the driver sensitivity control knob. If it is rotated to either the full counterclockwise or the full clockwise position, check with the owner, to be sure he understands the operation of the unit.
2. Operate the engine at fast idle.

c. Disconnect the sensor-amplifier cable at the in-line connector. Fabricate a test lamp with a socket and a No. 53 bulb and 2 pieces of wire. Ground one test lamp lead and touch the other to the yellow terminal in the female connector. The test lamp should light. If not, check for a blown fuse or a loose connection at the driver sensitivity control connector or power relay.

d. Connect one test lamp lead to battery voltage and touch the other lead to the white terminal in the connector. Rotating the driver sensitivity control knob completely counterclockwise to the OFF position should cause the bulb to light. If not, check for a loose connection at the driver sensitivity control connector, a poor solder connection at the

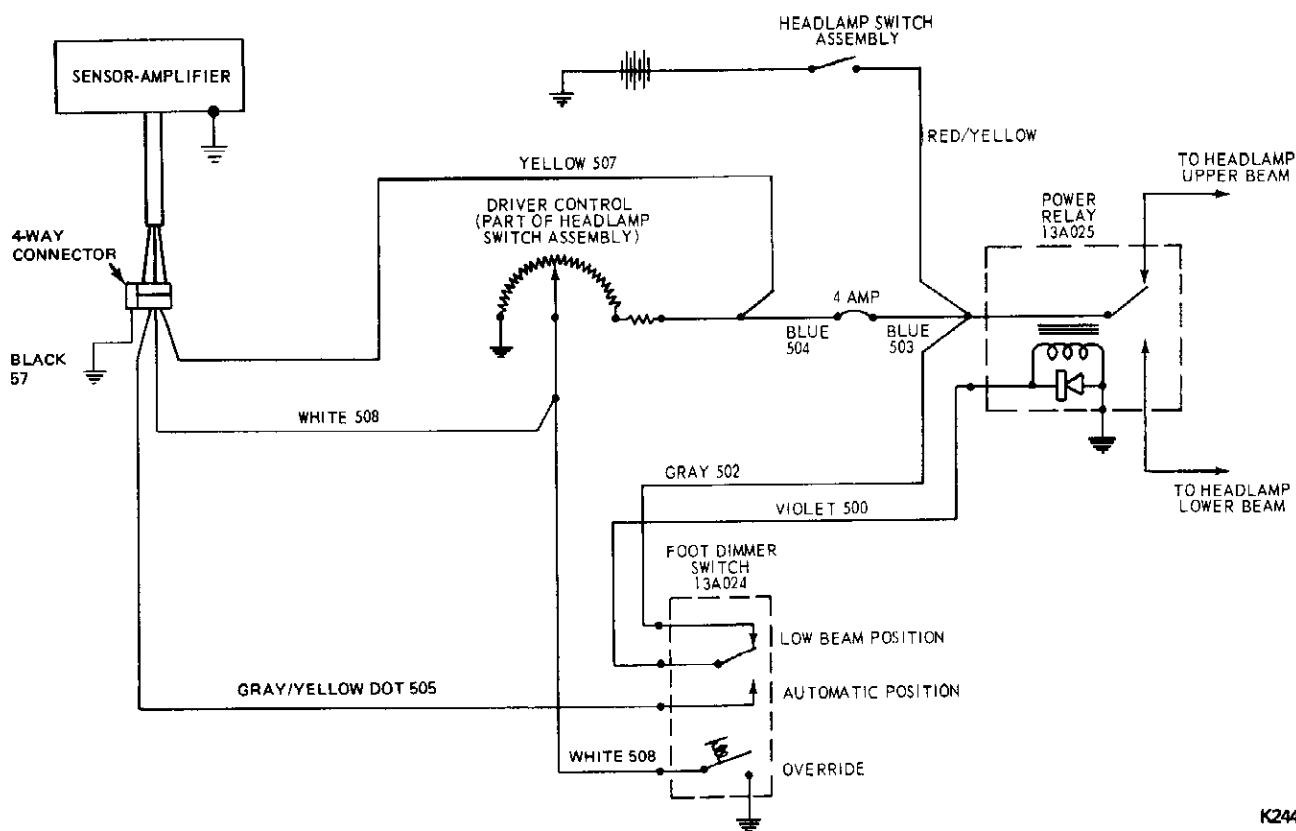


FIG. 1 Automatic Headlamp Dimmer Wiring Diagram

3. Turn the light switch on. Set the driver sensitivity control knob at the approximate center of its rotation. Actual position is dependent on ambient light level.
4. The headlamps should remain on the lower beam in both positions of the foot switch. If so, proceed to step 5. If not, perform the following checks:
 - a. Check for a loose connection at the foot switch, power relay, connector near driver sensitivity control, or in-line connector between the sensor-amplifier cable and the interconnecting wire harness.
 - b. Disconnect the white wire (override) from the foot switch (Fig. 1). If the lower beam is obtained in both positions of the foot switch, replace the foot switch.

driver sensitivity control, or a damaged driver sensitivity control (open circuit).

The function of the driver control can be fully checked with a voltmeter connected between ground and the white wire (508) terminal. With the control fully clockwise, the meter should read approximately battery voltage. With the control rotated counterclockwise to the minimum sensitivity detent position (not fully OFF), the meter reading should not exceed 3 volts. In the fully counterclockwise or OFF position, the meter should read 0 volts. Rotation of the control between minimum and maximum sensitivity positions should provide a smooth, continuous voltage change without discontinuities. Replace control if it does not function as described.

- e. Connect one test lamp lead to battery voltage and touch the other lead to the grey-yellow dot (505) terminal in the connector. Operate the foot switch two or three times. The test bulb should light in one position of the foot switch and the headlights should be on lower beam for both positions of the foot switch. If not, check for loose connections at the foot switch or power relay, a poor ground at the power relay, or a damaged foot switch or power relay. If the problem was not found in step 4, the sensor amplifier is not functioning properly and should be replaced. Reconnect sensor-amplifier headlamp dimmer assembly.
5. Place the foot switch in the automatic position and depress slightly. The headlamps should switch to the upper beam. If so, proceed to step 6. If not, perform the following checks:
 - a. Check for a disconnected white wire at the foot switch.
 - b. Disconnect the white wire from the foot switch and ground it to the vehicle body. If the upper beam is obtained, replace the foot switch. If not, connect the wire to the foot switch and check the continuity of the white wire to the 2-way connector near the driver sensitivity control (3-way connector Continental Mark V which includes a ground connector).
 - c. Complete continuity of the white wire can be checked by disconnecting the sensor-amplifier cable from the interconnecting harness at the in line connector. Using a test lamp (No. 53 bulb), connect one lead to battery voltage and touch the other to the white terminal in the in-line connector. Push down slightly on the foot switch and the bulb should light. If not, check the continuity from the in-line connector to the foot switch.
6. Place the foot switch in the automatic position and cover the sensor-amplifier lens with a black cloth. The headlamps should switch to the upper beam. If so, remove black cloth and proceed to step 7. If not, disconnect the sensor-amplifier at the in-line connector. If the headlamps switch to the upper beam, replace the sensor-amplifier unit.
7. With the headlamps on automatic lower beam, rotate the driver sensitivity control all-the-way counterclockwise. The headlamps should switch to the upper beam. If so, proceed to step 8. If not, check the driver sensitivity control for a poor connection to ground.
8. If the system responded to step 4 thru 7 without failure, the unit is functioning properly and all that remains to be checked is the aiming and sensitivity (Refer to the Adjustment Section).

ADJUSTMENTS

HORIZONTAL AIMING ADJUSTMENT

The sensor-amplifier unit was designed to be aimed slightly to the left (2 degrees) in the horizontal plane for proper performance.

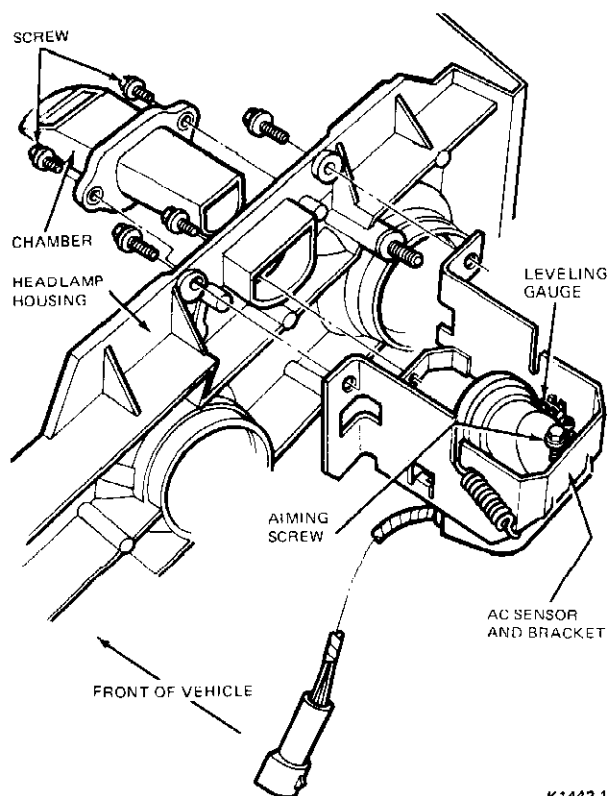
VERTICAL AIMING ADJUSTMENT

Accurate vertical aim is essential to proper performance. If the sensor-amplifier is aimed too low, reflected road light from the vehicle's own headlamps can cause the unit to hold the headlamps on low beam. The unit must be aimed as low as possible to provide maximum tolerance for vehicle loading and weight distribution.

The aiming procedures should be rechecked on new vehicles which have been driven 2,000 miles.

1. Sensor-amplifier vertical aiming should be performed with the vehicle unloaded, the trunk empty, except for the spare tire and jack assembly, gas tank at least half full, and the tires at the recommended air pressure(s).
2. Locate the vehicle on a known level floor (level within 1/4 inch fore and aft). If the floor is not level as described, the aiming procedure will not be effective.
3. Rock the vehicle sideways to equalize the springs.

Adjust the vertical aiming screw (Fig. 2) at the rear of the sensor-amplifier and bracket assembly, until the bubble is centered in the level. Do not tamper with the screw near the end of the level. Always make the final adjustment while turning the vertical aiming screw clockwise.



K1442-1E

FIG. 2 Vertical Aim Adjustments on Sensor Amplifier Installation

REMOVAL AND INSTALLATION

SENSOR-AMPLIFIER

If the automatic headlamp dimmer malfunctions and cannot be removed for repair immediately, manual operation of the headlamps may be obtained at the foot dimmer switch, in most cases, by removing the fuse from the fuse holder. The fuse holder is located in the wiring harness near the headlamp switch.

Should the car have to be driven with the sensor-amplifier unit removed, manual headlamp beam operation with the foot dimmer switch will be obtained. If both the sensor-amplifier unit and the power relay are removed, manual operation with the foot dimmer switch may be obtained by replacing the override type foot dimmer switch with a standard foot dimmer switch, and plugging the standard car wiring into it.

The driver sensitivity control (available to the driver at the light switch), will provide any adjustment requirement normally needed. However, when a sensor-amplifier unit is replaced, it will be necessary to readjust the vertical aim, as described in Vertical Aiming Adjustment in the Adjustment Section.

Removal

1. Disconnect the ground cable from the battery.
2. Disconnect the harness at the rear of the sensor-amplifier unit. Do not pull on the cable sheathing, otherwise the leads could be damaged.
3. Remove the three sensor-amplifier and bracket assembly mounting screws and lockwashers. See Fig. 3.
4. Remove the sensor-amplifier mounting bracket and chamber (Lincoln Continental only) from the vehicle.
5. Position car on a known-level surface. Vehicle should have half tank of gas, empty trunk (except for jack and spare tire), and recommended air pressure for tires. Level sensor-amplifier at hex-head screw on rear of bracket. Do **not** attempt to adjust sensor spirit level.
6. Make sure headlamp system is properly aimed. With headlamp covers open and headlamps off, look through the front chamber to see that at least 50 percent of the sensor lens can be seen. Road test under night driving conditions.

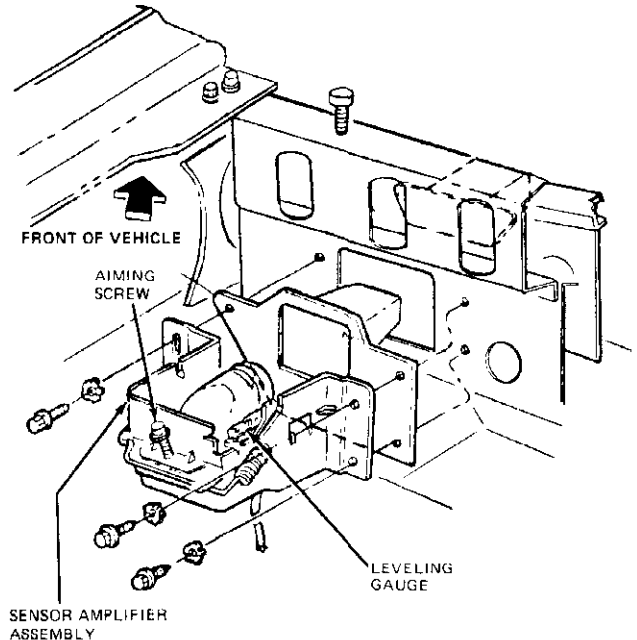
Installation

1. Position the sensor-amplifier and mounting bracket assembly, chamber (Lincoln Continental only) and install the mounting screws.
2. Connect the harness connector to the harness at the rear of the sensor-amplifier unit.
3. Connect the battery cable.
4. Test the unit for proper operation. If necessary, adjust the vertical aiming, as described in the Adjustment Section.

FOOT DIMMER SWITCH

Removal

1. Disconnect the ground cable from the battery.
2. Position the left side of the floor mat back away from the area of the foot dimmer switch. Removal



K3453-1A

FIG. 3 Sensor Amplifier Installation (Lincoln Continental Shown, Continental Mark V Similar)

- of the left-hand scuff plate and trim panel may be required to allow repositioning of the floor mat.
3. Remove the two screws attaching the foot dimmer switch to the floor pan. Lift the foot dimmer switch from the floor pan (Fig. 4).
4. Disconnect the plug connectors from the foot dimmer switch.

Should installation of a standard foot dimmer switch be necessary, connect the car headlamp wiring harness to the standard foot dimmer switch.

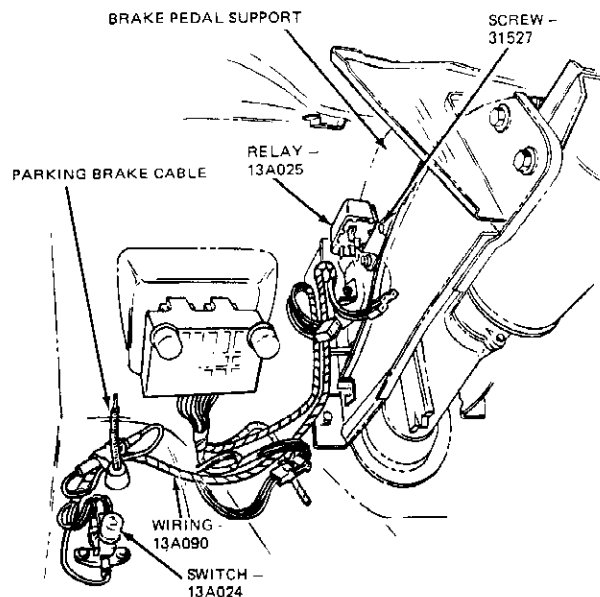
Installation

1. Connect the plug connectors to the foot dimmer switch.
2. Position the foot dimmer switch on the floor pan, and install the two attaching screws.
3. Position the floor mat in the area of the foot dimmer switch.
4. Connect the ground cable to the battery.

POWER RELAY

Removal

1. Disconnect the battery ground cable.
2. Disconnect the two plug connectors from the relay (Fig. 4).
3. Remove the two attaching screws, securing the relay to the brake pedal support and remove the relay.



K2372-1C

Installation

1. Position the power relay to the brake pedal support. The terminals of the relay must point down and rearward the vehicle. Install the two attaching screws.
2. Connect the two plug connectors to the power relay.
3. Connect the battery ground cable.
4. Test the system for proper operation.

DRIVER SENSIVITY CONTROL

Refer to Part 32-02 for Headlamp Switch Removal and Installation.

FIG. 4 Dimmer Switch, Power Relay and Harness Connections

Parking, Rear and Marker Lamps

PART
32-20

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	20-1	REMOVAL AND INSTALLATION (Cont'd.)	
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Back-up Lamps	20-13	Marker Lamps	20-8
Back-up Lamp Switch	20-13	Parking Lamps	20-2
Coach Lamp	20-14	Rear Lamps	20-3
Cornering Lamp	20-8	Stop Lamp Switch	20-11
		Wiring — Rear Lamps	20-14

CK3372-2B

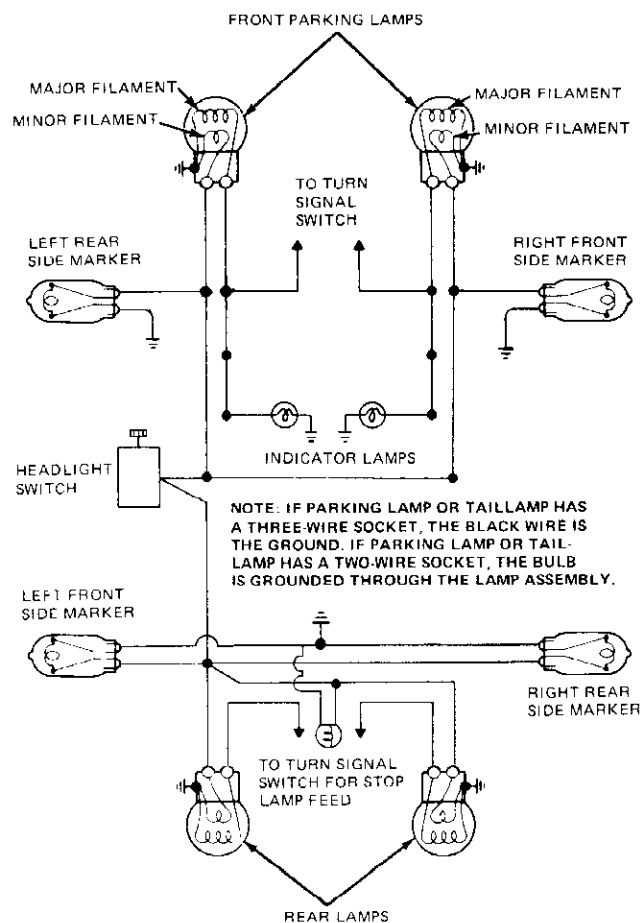
DESCRIPTION AND OPERATION

The parking, rear, coach and marker lamp circuits are controlled by the headlamp switch. When the headlamp switch is pulled out to the first detent, only the parking lamps, side marker lamps, coach lamps, license lamps, and taillamps are activated.

When the headlamp switch is pulled out to the second detent, the parking lamps, side marker lamps, coach lamps and taillamps remain on, while the headlamps are activated.

On Thunderbird, Continental Mark V, and Lincoln Continental vehicles, a cornering lamp bulb is installed in the same lamp body with the side marker bulb on vehicles so equipped. The cornering lamps are fed from the turn signal circuit in such a way that when the turn signal switch is activated, the cornering lamp on the turn side will burn with a steady glow.

The side marker lamps are connected in parallel with the feed circuit (from the headlamp switch) that feeds the minor filaments of the front parking and rear taillamps (Fig. 1).



K1209-1F

FIG. 1 Typical Side Marker Lamp Circuit

REMOVAL AND INSTALLATION

PARKING LAMPS

Ford

The front parking lamps are located in the fender. To replace the bulb, remove the door from the lamp assembly. Three screws attach the door.

To replace the lamp assembly, unplug the wires from the harness (Fig. 2).

Mercury

The front parking lamps are located in the fender on all models.

To replace the lamp assembly on Mercury models, remove the headlamp door bezel by removing the six attaching screws. Pull the bezel and lamp housing away from the fender. To replace the bulb on Mercury models, twist the socket one-third turn counterclockwise and remove bulb and socket assembly. Push bulb in and turn counterclockwise to remove from socket.

LTD II

Combination parking lamps and side markers are located in the grille opening panel. To replace the bulbs, twist the socket and pull it from the lamp assembly.

To replace the lamp assembly on the LTD II, remove two nuts from the rear and pull the assembly. Then, disconnect the bulbs and sockets from the lamp assembly.

Granada and Monarch

To replace the bulbs, twist the socket and pull it from the lamp assembly. To replace the lamp assembly,

remove the screws that retain the headlamp door. Remove screws retaining parking lamp assembly. Pull the lamp frontwards and remove lamp sockets.

Cougar and Versailles

The parking lamps are located in the outboard side of the headlamp doors. To replace the bulb or parking lamp assembly, remove the six screws from the front and pull assembly from the fender. Then disconnect the bulb and socket from the lamp assembly.

Fairmont and Zephyr

To remove the lamp body, remove screws that retain the headlamp door. Then remove screws that retain the lamp body. Pull lamp toward front of vehicle and remove lamp sockets. See Fig. 3.

Pinto, Bobcat and Mustang II—Bulb Replacement

To replace the parking lamp bulb. Remove the socket and bulb from the rear of the assembly. Remove the clips that retain the lamp assembly to the door and grille assembly. Remove the lamp. Install the socket in the parking lamp body.

Pinto and Bobcat—Body Replacement

To replace the parking lamp body assembly, remove the socket from the parking lamp body, remove 2 screws retaining the lamp body to the grille and remove lamp body. To install, reverse procedure.

Mustang II—Body Replacement

Remove the lamp socket and bulb from the rear of the lamp assembly. Remove 2 clips retaining lamp

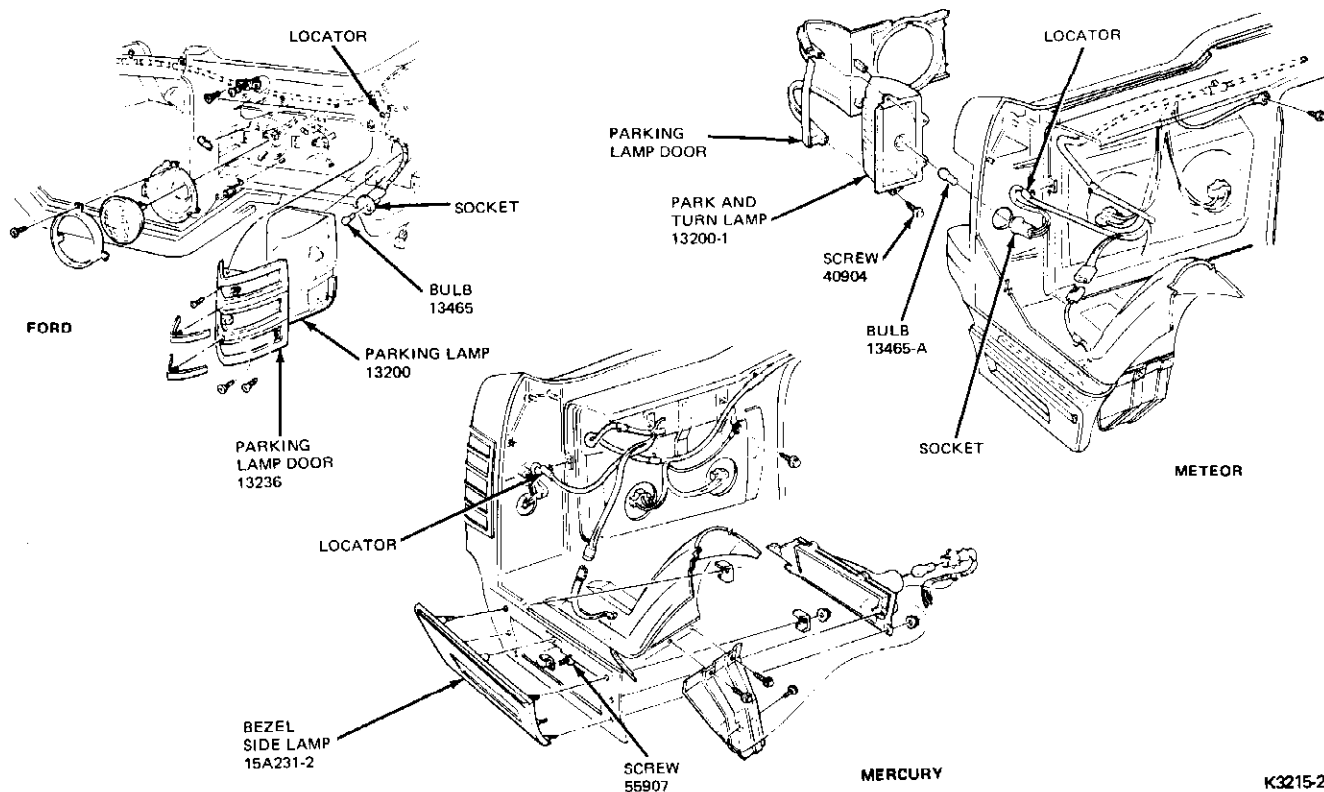
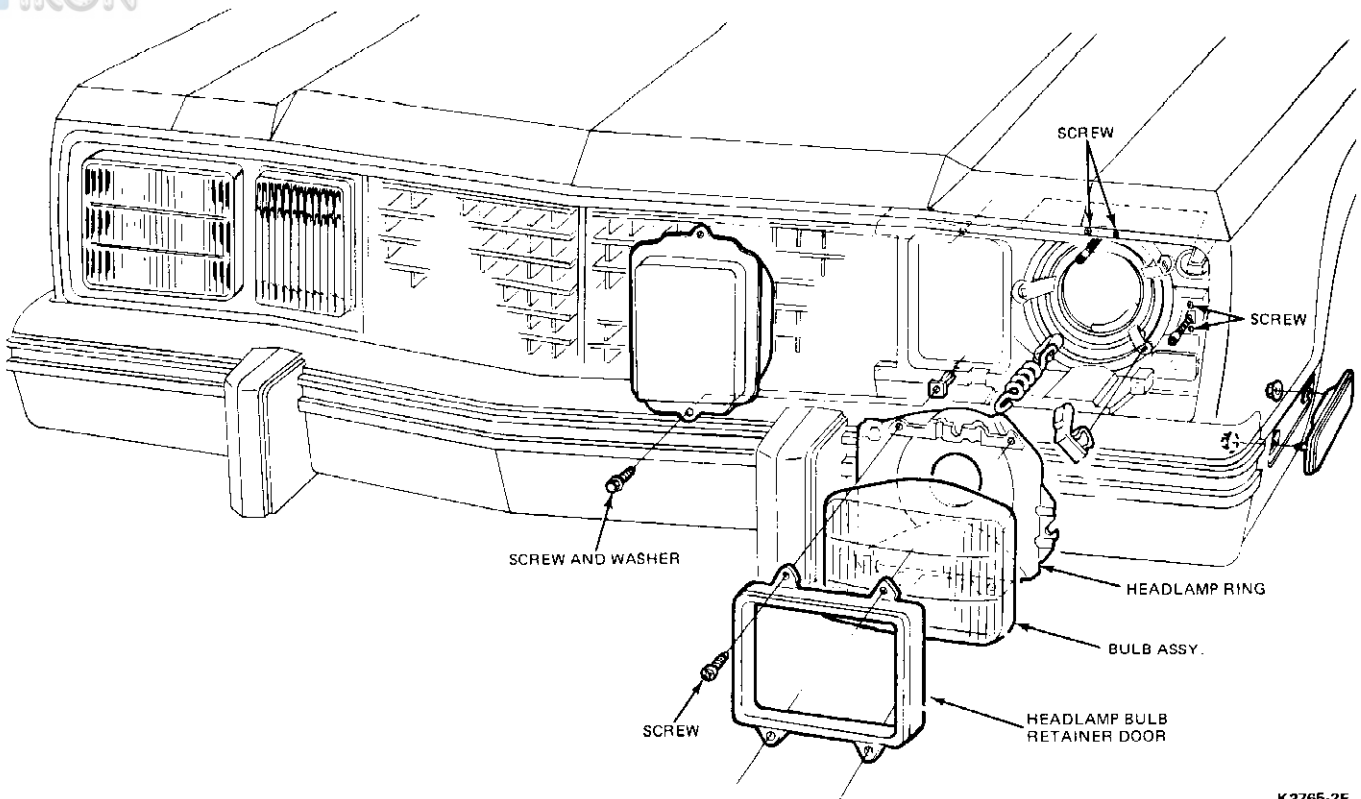


FIG. 2 Parking Lamp Assembly—Ford and Mercury



K2765-2F

FIG. 3 Parking Lamp Installation—Fairmont Shown (Zephyr Similar)

assembly to the door or grille assembly. Remove the lamp. To install clips, push inward. Locking boss must snap into boss opening.

To replace the parking lamp body assembly remove the socket from the parking lamp body, remove the two screws retaining the lamp body to the grille and remove the lamp body assembly.

To install, position the lamp body to the grille and install the two retaining screws (Fig. 4). Then, install the socket to the lamp body assembly.

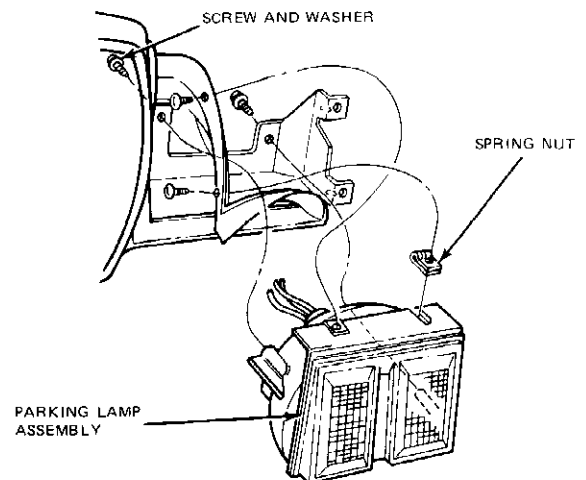
Lincoln Continental

To replace parking lamp bulb, remove door attaching screws and remove the lens and bulb. The front parking lamp assembly is located in the fender; to replace, remove two nuts, disengage wire locator and pull assembly from fender. When attaching lamp assembly, tighten nuts to 30-60 in-lbs torque. Refer to Fig. 5.

Thunderbird and Continental Mark V—Bulb Replacement

Removal

1. To replace the parking lamp bulb, it is not necessary to remove the parking lamp body. Remove the socket from the parking lamp body and replace the bulb. Install the socket in the parking lamp body.
2. To replace the lamp assembly, disconnect the parking lamp multiple connector from the dash-to-headlight junction wiring assembly under the top of the fender behind the parking lamp.
3. Remove the two retaining nuts from the lamp assembly studs at the rear of the parking lamp.



K2718-1B

FIG. 4 Parking Lamp Installation—Pinto Shown

4. Pull the lamp body straight forward and remove it from the vehicle.

Installation

1. Position the lamp body to the fender, routing the lamp wiring through the holes in the front sheet metal. Install the two retaining nuts to the lamp body studs.
2. Connect the multiple connector to the wire harness.

REAR LAMPS

Two types of rear lamp bulb sockets are used (Figs. 6 and 7).

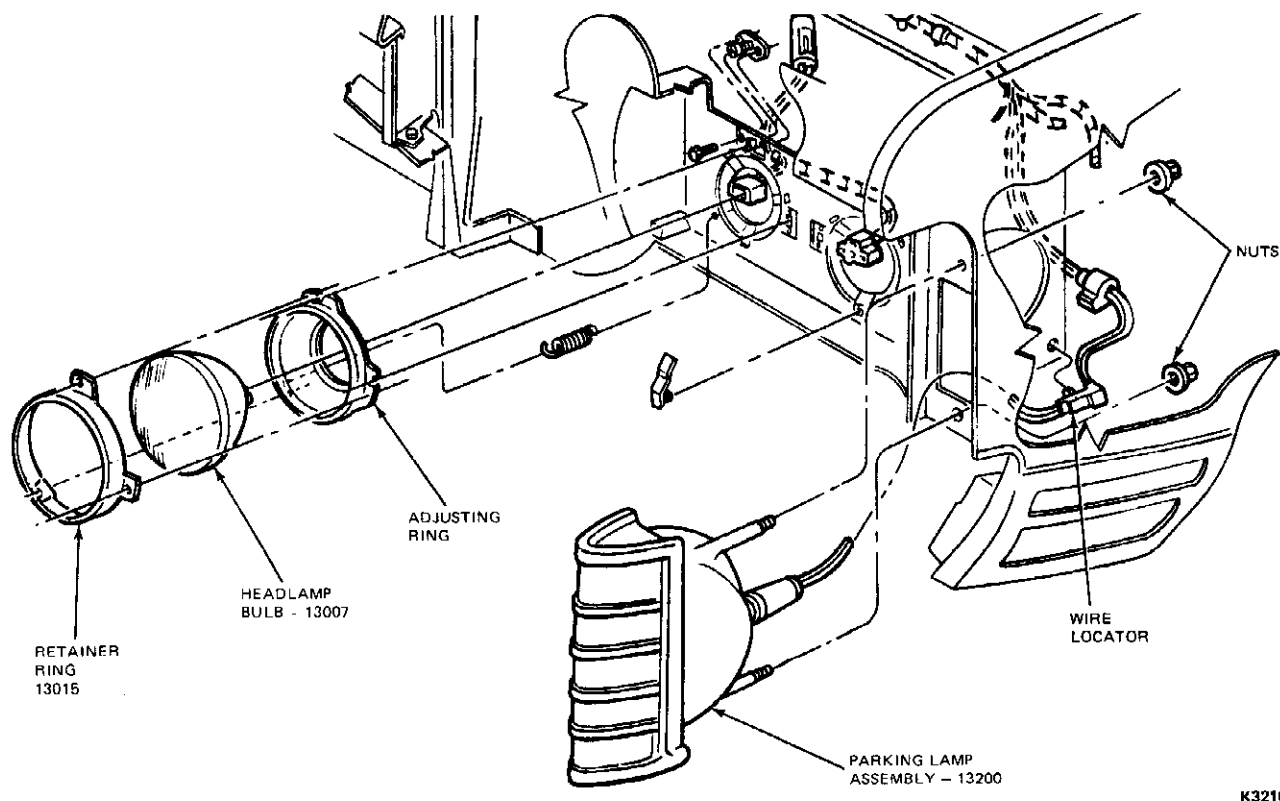


FIG. 5 Parking, Marker and Cornering Lamps—Lincoln Continental

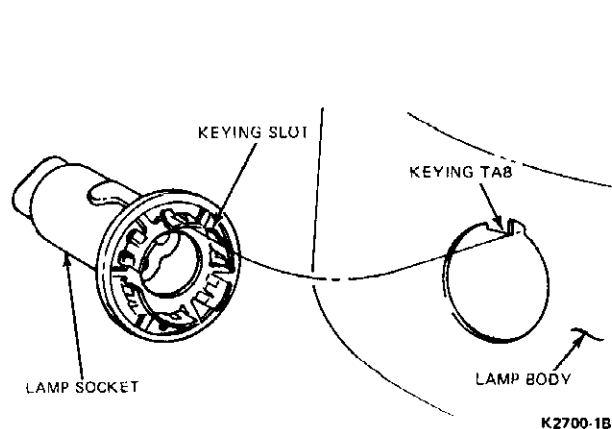


FIG. 6 Rear Lamp Bulb Socket

To remove the metal socket assembly (Fig. 6), turn the socket counterclockwise to the stop, then press the socket downward from the keying tab and rock it out of the lamp body. To install, line up the socket with the keying tab on the lamp body and press into position.

To remove the plastic socket assembly (Fig. 7), turn the socket counterclockwise to the stop, and remove the socket.

To install, index the smallest tab for locating the three locking tabs then press the socket into the lamp body and rotate clockwise to the stop.

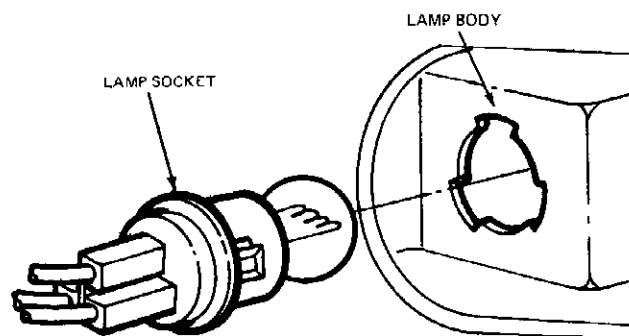


FIG. 7 Rear Lamp Bulb Socket—3 Tab Type

Versailles, Zephyr and Fairmont (Lens Replacement)

Removal

1. The lamp assembly will not have to be removed from the vehicle to replace the lens.
2. From inside the luggage compartment, remove the lamp sockets and bulb.
3. Using a hammer, break out the large portions of the damaged lens.
4. Remove the remainder of the broken lens with a chisel or sharpened screwdriver. The surface should

be smoothed to within 1/64-inch of the normal surface.

Installation

1. Locate position of the water drainage notches on bottom edge of new lens assembly.
2. Mark positions of notches on lamp body.
3. Starting at a drainage notch location on the lamp body, apply a strip of butyl seal around the perimeter. Leave a 1/2-inch gap between ends of seal, centered about each notch in the lens for water drainage.

NOTE: Special care should be taken to avoid bunching or tearing the seal when applying around corners.

4. Firmly press and hold for ten seconds the replacement lens into position, assuring that the butyl tape seals the lens to the body around the entire perimeter.

CAUTION: Avoid applying pressure to the middle of the lens to keep from breaking the new part.

5. Reinstall the lamp sockets and bulbs.
6. Test the tail lamps, turn signals and back-up lamp for proper operation.

Fairmont, Zephyr, Monarch, Granada, and Versailles (Lamp Bulb Replacement)

From inside the luggage compartment, remove the lamp sockets and replace the bulbs.

Fairmont, Zephyr and Versailles (Body Replacement)

To remove lamp assembly, follow same procedure as for Granada and Monarch.

Granada and Monarch (Lens and Body Replacement)

Removal

1. The lamp assembly must be removed to replace the lens on Granada and Monarch.
2. From inside luggage compartment remove screws that retain lining board to lower back panel. Remove lining board.
3. Remove 4 lamp sockets from the lamp body.
4. Remove the nuts retaining the lamp body to the lower back panel and remove the lamp assembly.
5. Remove the screws retaining the lamp bezel and separate it from the body assembly.
6. Secure the lamp body assembly in a vise and remove the remainder of the broken lens with a chisel or a sharpened screwdriver. Sealing surface should be smoothed to within 1/64 inch of normal surface.

Installation

1. Temporarily position the new lens on the cleaned lamp body and mark the location of the two drainage notches at the bottom of the lens.
2. Remove the new lens and apply a continuous strip of butyl tape around the lamp body, following the contour of the outer rib. Leave 1/2-inch gaps in the butyl in the area of the drainage notches.

3. Firmly press, for ten seconds, the replacement lens into position, assuring that the butyl tape seals the lens to the body around the entire perimeter. Do not apply pressure to the middle of the lens.
4. Reassemble the bezel to the lamp body and tighten the attaching screws.
5. Reinstall the lamp assembly to the vehicle.
6. Reinstall the lamp sockets in the lamp assembly and test bulbs.
7. Replace the lining board to the lower back panel.

All Ford Except Wagons

The bulb can be serviced from inside the luggage compartment by removing socket from lamp body. To remove the lamp body assembly; remove three attaching nuts from inside luggage compartment, remove two sockets from housing and remove lamp assembly from vehicle. The lens cannot be serviced separately; the lens and body assembly is serviced as one unit. Refer to Fig. 8.

All Mercury Except Wagons

The bulbs can be serviced by loosening the luggage compartment trim cover and removing the sockets from the lamp body. To remove the lamp assembly from the vehicle, remove all sockets and the 7 nuts and washers from the lamp attaching studs. Pull lamp assembly rearward. To service the lens, remove the lamp assembly and 8 screws attaching the lamp body to the lamp door. To install, reverse above procedure, using new nuts and washers to provide an adequate seal. Refer to Fig. 9.

Ford and Mercury Station Wagons and Ranchero

To remove the lamp body and/or bulbs, remove six screws attaching the lamp body to the rear quarter (Fig. 10). Pull the lamp body from the quarter opening and remove the lamp sockets from the lamp body. To remove the lens, remove four lens attaching screws and separate the lens from the lamp body.

Cougar and LTD II

The bulb can be replaced by removing the bulb sockets from the rear of the lamp body inside the luggage compartment (Fig. 11).

To remove the lamp assembly, remove 2 bulb sockets from the lamp body. Remove 5 nuts that retain the quarter panel extension assembly and remove it with the lamp assembly from the vehicle. Remove 4 nuts from the lamp studs to separate the lamp from the extension. To service the door or the lens and body assembly, remove 3 retaining screws from the back of the lamp. To reassemble the lamp to the extension and install in vehicle, reverse procedure.

Cougar XR-7

The bulbs can be replaced by removing the bulb sockets from the rear of the lamp body inside the luggage compartment. To remove the lamp assembly, remove 3 bulb sockets from the lamp body and 5 nuts from the lamp studs. Remove lamp from lower back panel. To service lens, body or door, remove 6 screws from back of lamp. To reassemble lamp, reverse the procedure, insuring that the outboard sight shield is hooked into the lamp door during installation on the vehicle.

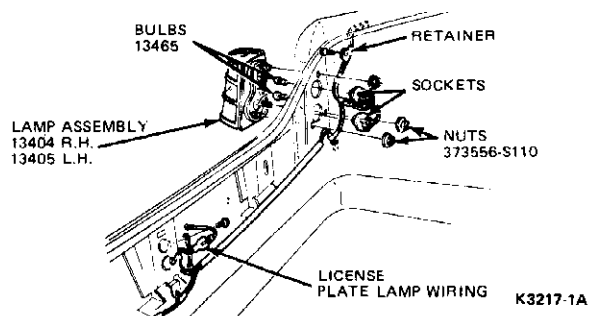


FIG. 8 Rear Lamp Installation—Ford—Except Station Wagons

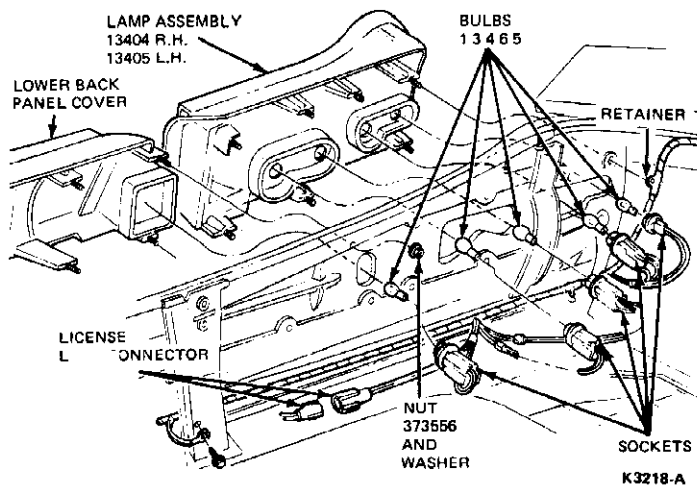


FIG. 9 Rear Lamp Installation—Mercury Except Station Wagons

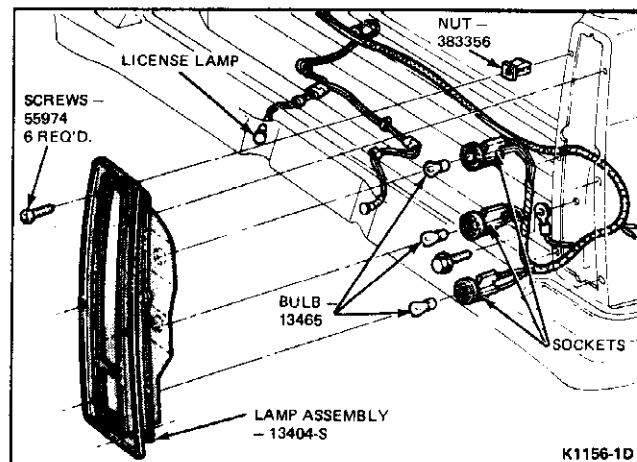


FIG. 10 Rear Lamp Installation—Ford and Mercury Station Wagons

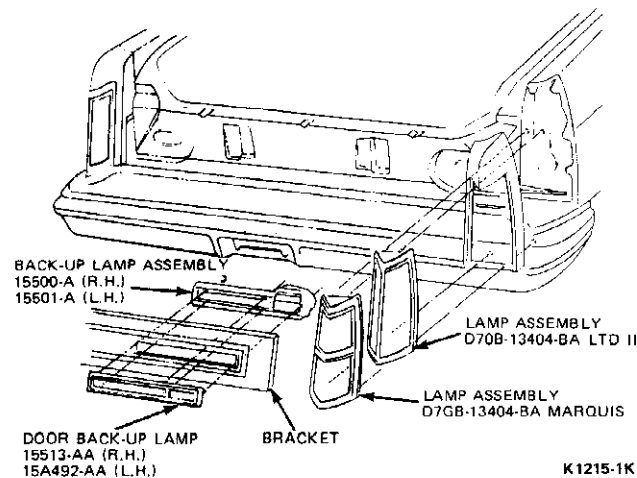


FIG. 11 Rear Lamp Installation—LTD II

Pinto and Bobcat—Station Wagons

To remove the bulbs, (Fig. 13) remove the lamp assembly from vehicle and twist the socket counterclockwise and remove from lamp body.

To remove the lamp body, remove the six retaining screws and disengage the sockets. Remove the lamp body assembly.

Pinto, Bobcat, Fairmont and Zephyr—Except Station Wagons

From inside the luggage compartment, remove the two lamp bulb sockets from the body and remove the six (seven on Bobcat) lamp body-to-back panel attaching nuts from the studs (Figs. 14 and 15). Remove the lamp body and door assembly from the outer side of the back panel.

Fairmont and Zephyr—Station Wagon

To replace the lamp assembly, remove the four screws that retain the lamp lens and body to the rear quarter opening. Pull the lamp out of the opening and remove the lamp socket and bulb.

Mustang II

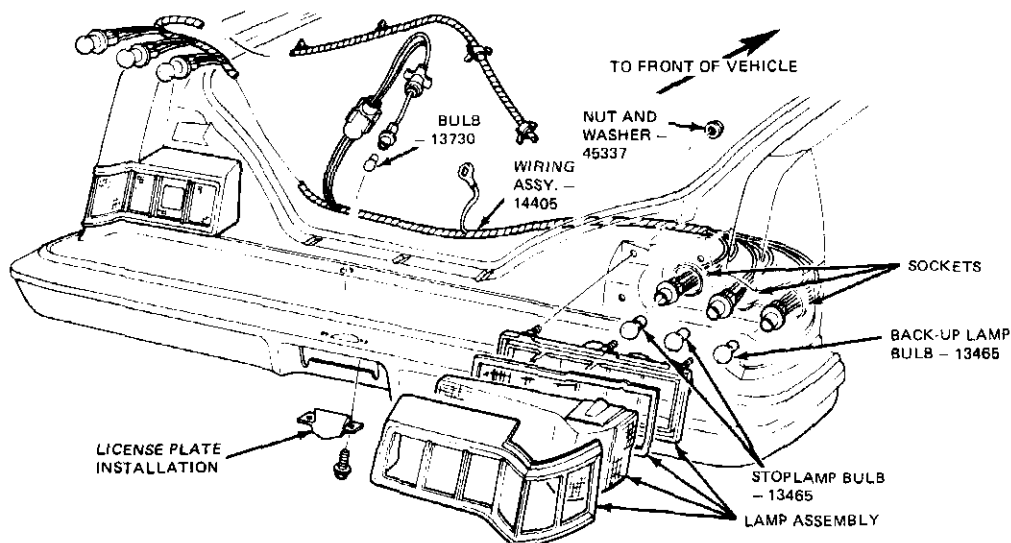
From inside the luggage compartment, remove (4) bulb sockets from the lamp body and the (6) door-to-body attaching nuts from the studs. Remove the lamp body from inside the luggage compartment, and the door from the outer side of the back panel. Refer to Fig. 16.

To replace the lens, remove the (8) phillips head screws to separate the lens from the body.

Assemble the lens to the body by installing (8) screws. Install the lamp into the inside of the luggage compartment and the door from the outer side of the back panel and install (6) door to body attaching nuts to studs.

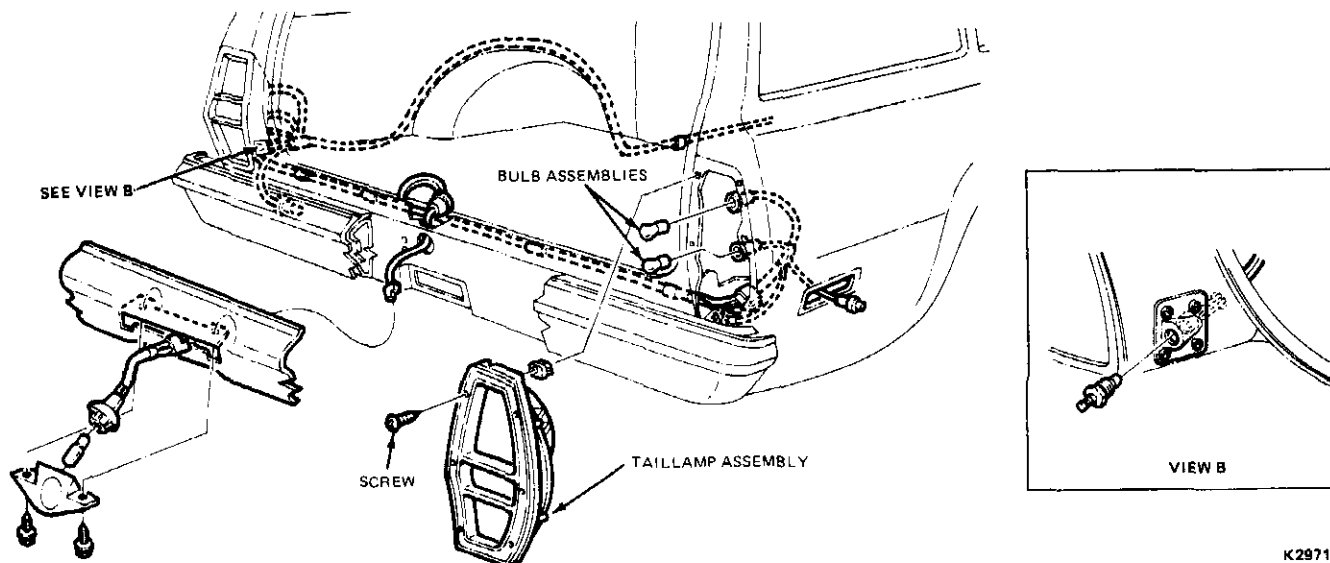
Lincoln Continental (Fig. 17)

1. Service of either rear lamp requires removal of both rear lamps and the center reflector assembly. During the rear lamp and center reflector assembly removal, support both to prevent bending the lower mouldings.



K2636-2B

FIG. 12 Rear Lamp Installation—Cougar XR-7



K2971-2C

FIG. 13 Rear Lamp Installation—Pinto and Bobcat—Station Wagons

2. From under rear bumper, remove two screws retaining the rear sight shield to both rear lamps.
3. From inside the luggage compartment, remove the rear lamp trim panel, rear and back-up lamp sockets. Remove retaining nuts from both rear lamps and center reflector.
4. With assistance from another person, lift both rear lamps and center reflector from the vehicle and place on a clean bench. Support rear lamps and center deflector to prevent bending of lower moulding.
5. Remove the screws retaining the lower moulding to the rear lamp(s).
6. Reinstall in reverse order. Tighten nuts on rear lamps and center reflector to 25-45 in-lbs torque.

Thunderbird

1. Remove the 6 screws and 2 nuts that retain the lining board to the lower back panel in the luggage compartment. Remove the lining board.
2. From inside the luggage compartment, remove the 6 rear lamp sockets and 11 retaining nuts from the rear lamp assembly.
3. Let rear lamp assembly sag as far as the stud clearance holes in the lower back panel will allow.
4. Tape the upper edge of the bumper so the bumper will not scratch the sight shield.
5. Get the center sight shield from under the overlapping portion of the right and left hand sight shields. Insert a screwdriver between the shield and the top of the bumper and slide the screwdriver the full length of the bumper, putting the sight shield above the bumper (see Fig. 18).
6. The taillamp and sight shield assembly can now be removed.
7. Remove the 7 screws that retain the sight shield to the bottom of the rear lamp assembly.
8. Install the center sight shield to the new lamp assembly and reinstall the lamp assembly to the vehicle by reversing the removal procedure.
9. Tighten all rear lamp attaching nuts to 30-60 in-lbs torque.
10. Test taillamps, turn signals and back-up lamps.

Continental Mark V

1. The bulbs can be removed by removing the rear luggage compartment trim panel and removing the plastic sockets from the lamp, turning socket counterclockwise, through holes in lower back panel (Fig. 19).
2. To remove rear lamp from vehicle, remove lamp sockets (per above) and the two washer nuts on the lamp attaching studs. Pull lamp from vehicle.
3. To service any lamp component, remove lamp (as in Step 1 and 2) and remove lamp seal from lamp body. Removal of four screws (located under body seal) will allow lamp door to separate from body.

To install the lamp body:

1. Position the lamp to the quarter panel and install the retaining nuts.
2. Position the wire grommets in the back panel and connect the wire connectors.

3. Install the compartment trim cover.
4. Check the operation of the lights.

MARKER LAMPS

Front

1. Reach behind the fender and disengage the bulb socket from the lamp body.
2. Remove the two lamp body retaining nuts and one wire retaining clip. Remove the lamp body and the retainer.
3. Position the lamp body and retainer to the fender and install the two retaining nuts and one wire clip.
4. Install the bulb socket into the lamp body.

Rear

1. Remove the lower rear corner of the trim panel in the luggage compartment, if required.
2. Remove the bulb socket from the lamp body.
3. Remove the two retaining nuts and remove the lamp body assembly (Fig. 20).
4. Position the lamp body to the panel and install the two retaining nuts.
5. Install the bulb socket into the lamp body.
6. Install the trim panel.

Granada, Monarch, Versailles, Cougar, LTD II, Ford and Mercury—Except Station Wagons

The rear marker lamps are integral with the rear lamp assembly.

CORNERING LAMP

Ford and Mercury

The cornering lamp bulb can not be removed without first removing the lamp body and the lens. From behind the fender, disconnect the lead wires at the connector, remove the four lamp retaining nuts and withdraw the lamp assembly from the inside. Remove the lens (six retaining screws) from the outer side of the lamp body. Remove the bulb from the socket and install a new one. After replacing the lens, install the lamp assembly and secure it in place by installing the retaining nuts to the studs at the inner side of the fender.

If the lamp body is being replaced, remove the lens retaining screws and transfer the bulbs to the new body.

Before installing the lamp body to the mounting bracket on the Thunderbird, be sure that the four clip and stud assemblies are properly positioned in the bracket tabs. After connecting the lead wires at the multiple plug, be sure that the lead wire locator is engaged in the locator hole.

Granada, Monarch, Versailles, Continental Mark V, Lincoln Continental, Cougar and Thunderbird

The cornering lamp bulb can be replaced from behind the front bezel by removing the socket from the body. Replace the bulb in the socket and install back in the lamp body.

To remove the lamp body, disconnect the lead wires at the multiple connector, remove the lamp body-to-bezel screws, and lower the lamp body and lead wire assembly out from behind the bumper extension.

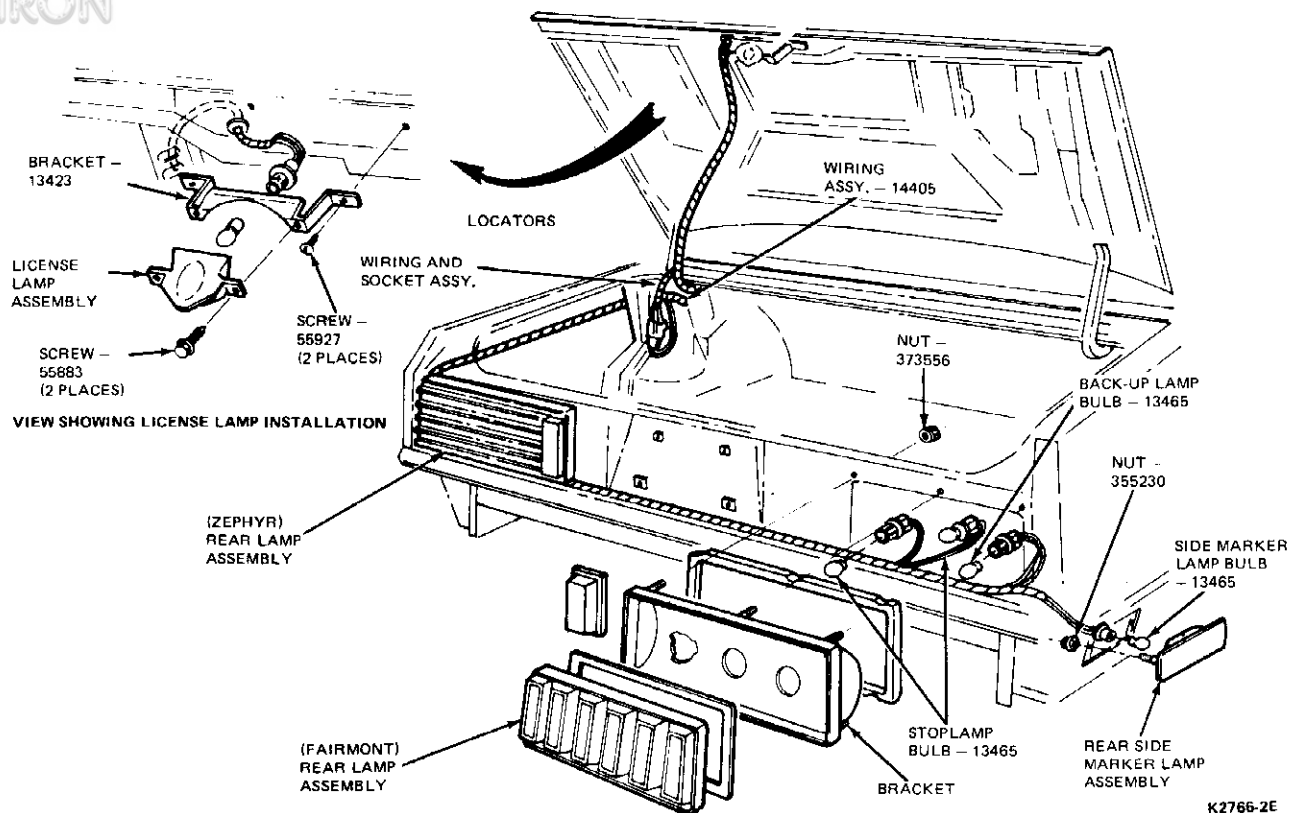


FIG. 14 Rear Lamp Installation—Fairmont and Zephyr

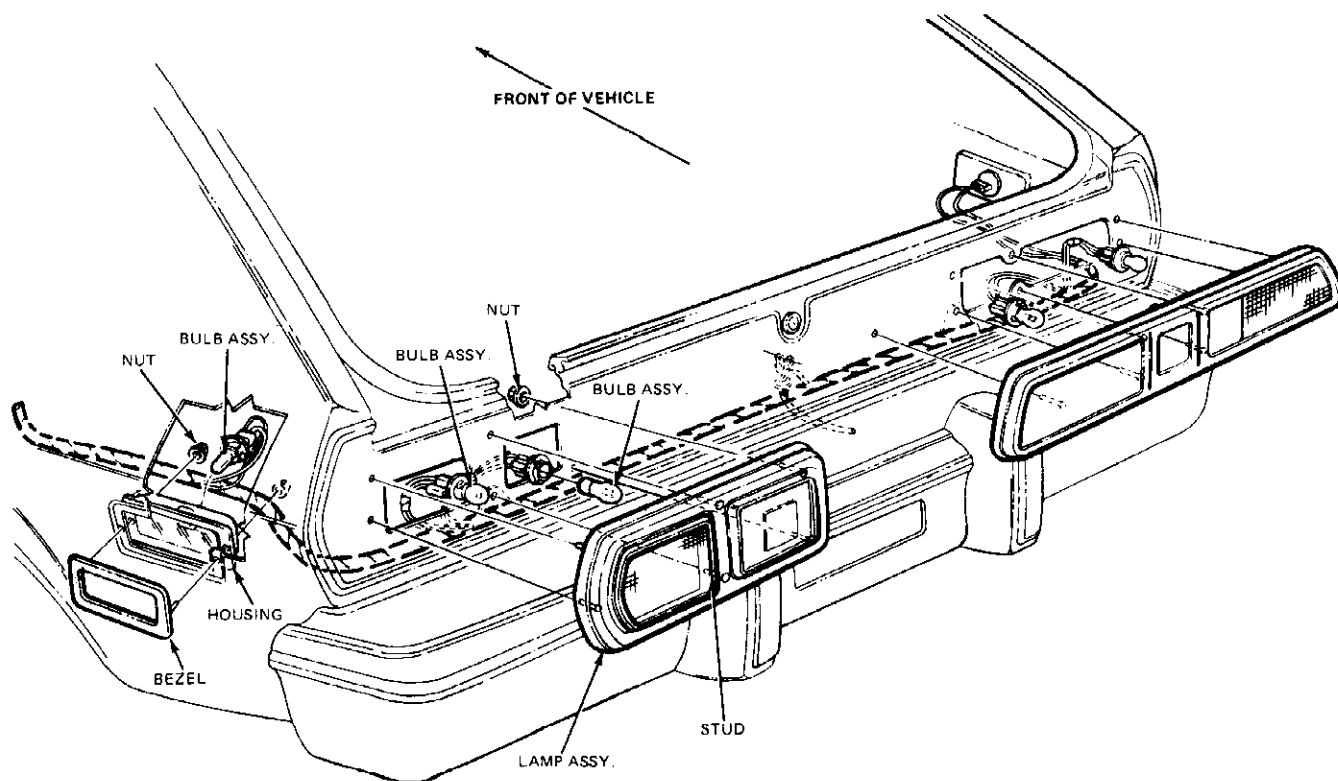


FIG. 15 Rear Lamp Installation—Pinto and Bobcat Sedan