

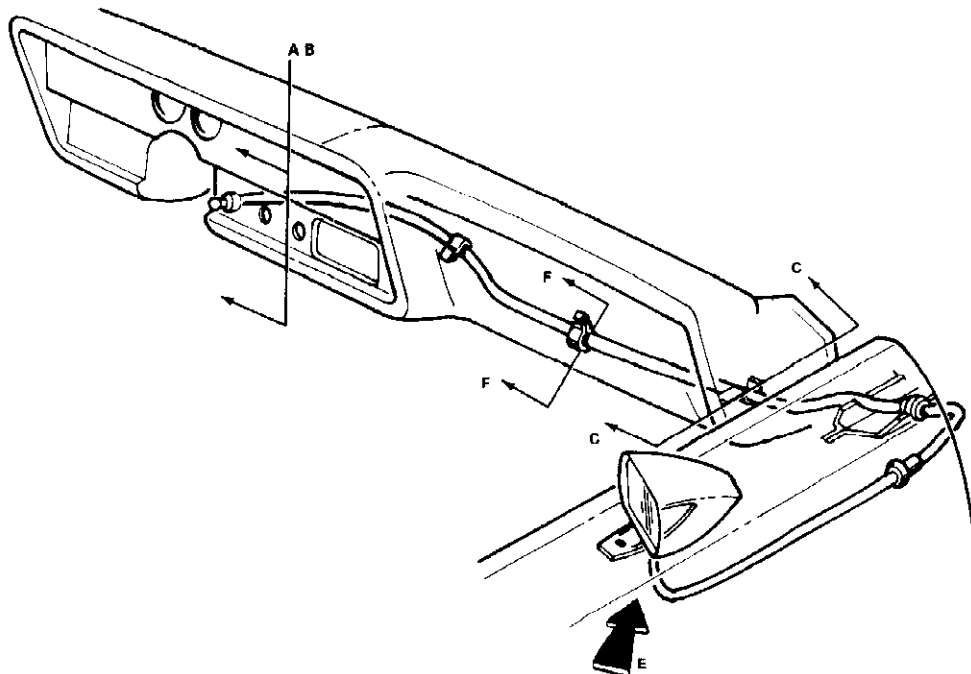
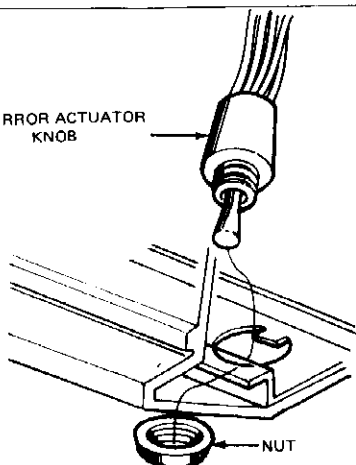
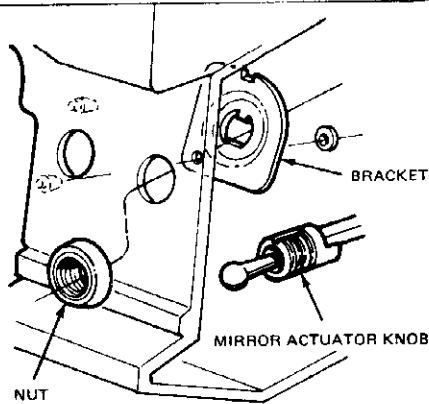
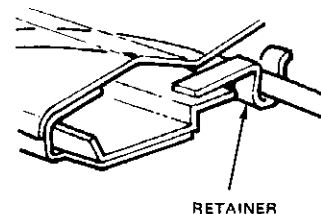
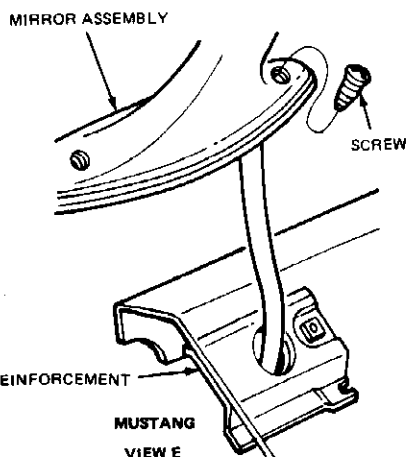
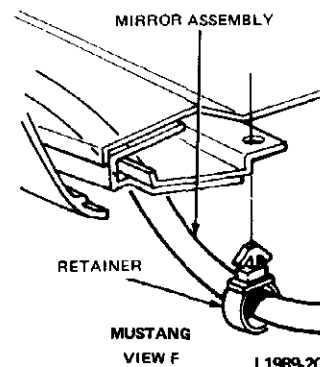
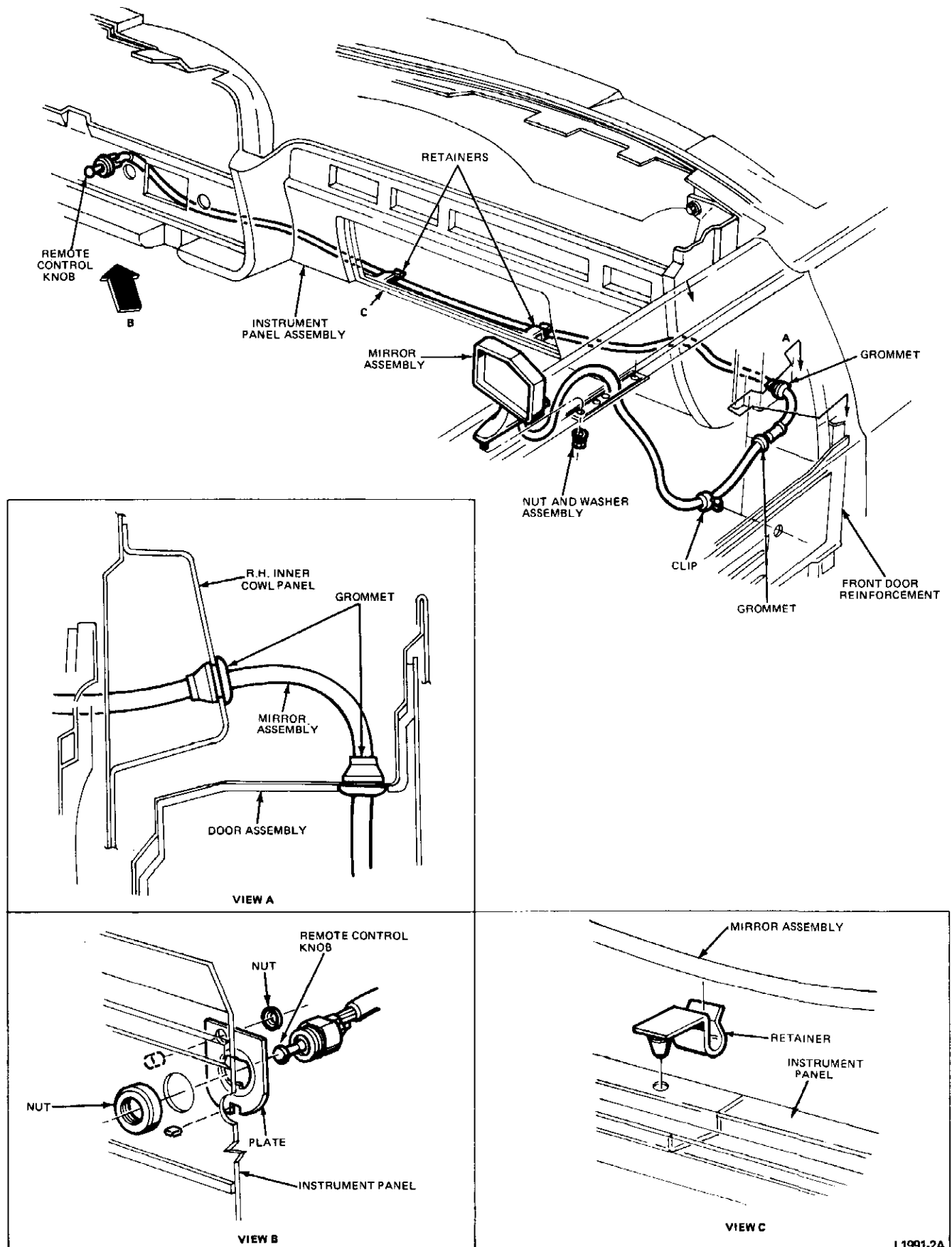
MIRROR ACTUATOR
KNOBPINTO, BOBCAT
VIEW AMUSTANG
VIEW BMUSTANG
VIEW C

FIG. 7 R.H. Remote Control Mirror Installation—Mustang, Pinto and Bobcat

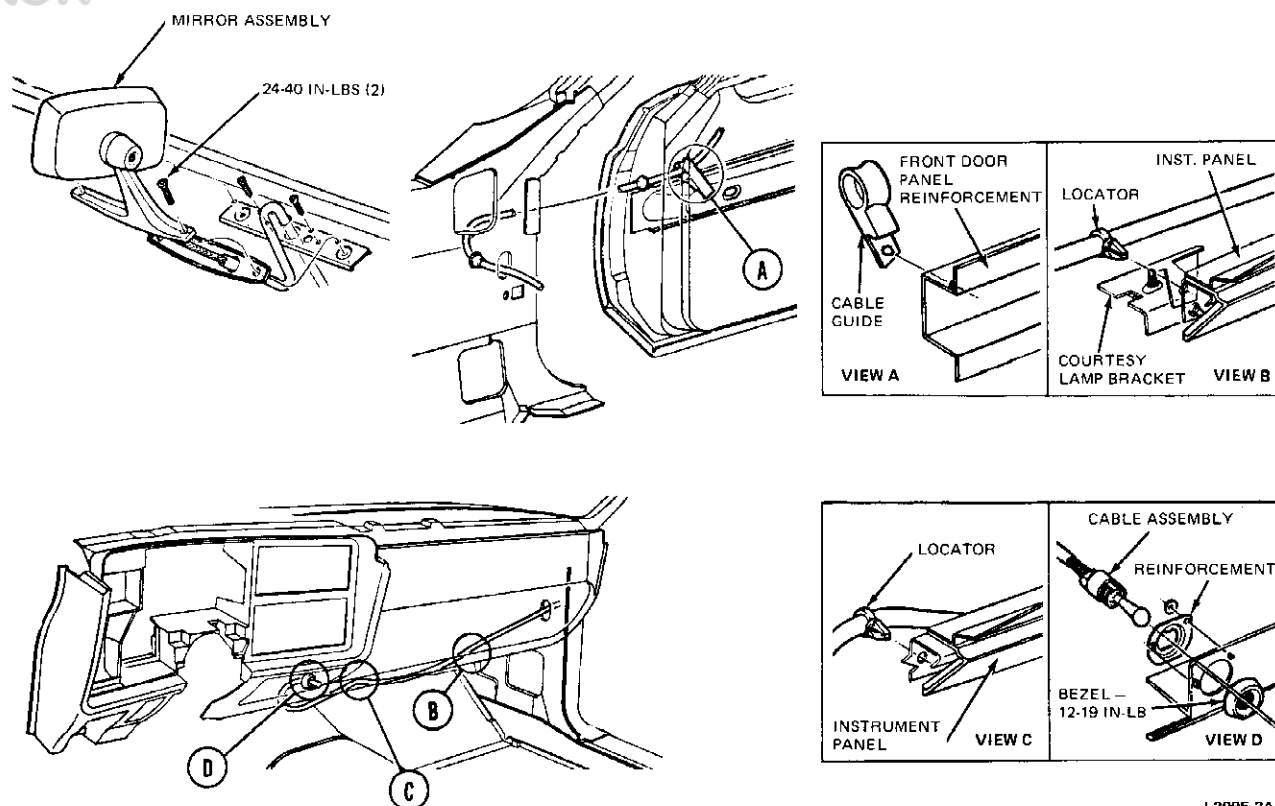
MUSTANG
VIEW F

L1989-2C



L1991-2A

FIG. 8 R.H. Remote Control Mirror Installation—LTD II and Cougar



L2095-2A

FIG. 9 R.H. Remote Control Mirror Installation—Granada, Monarch and Versailles

CLEANING

OUTSIDE REAR VIEW MIRROR

Outside rear view mirrors should not be cleaned with a dry cloth or abrasive cleaning powders. Do not remove ice with a scraper. The mirror should only be cleaned with a soft cloth and mild detergent and water, otherwise damage to the reflective surface may result.

DESCRIPTION

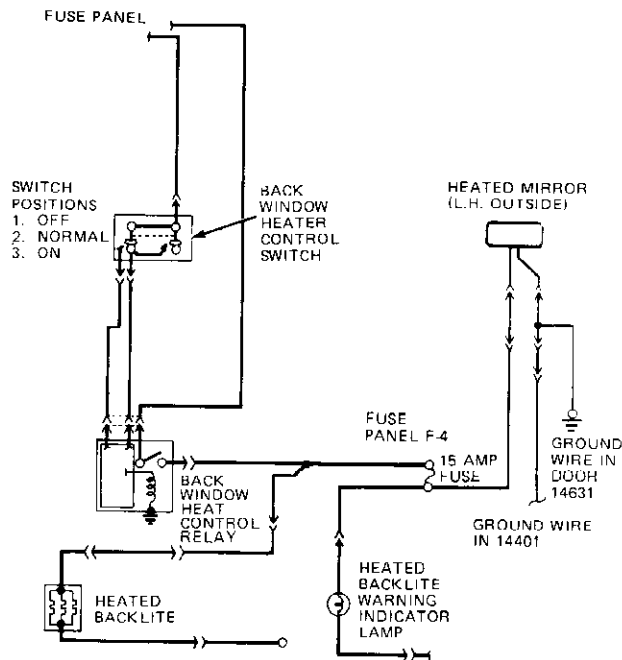
HEATED REAR VIEW MIRROR—CONTINENTAL MARK V AND LINCOLN CONTINENTAL (Fig. 10)

A new, electrically-heated, thermostatically-regulated outside rear view mirror has been released for the Mark V and Lincoln Continental cars. The thermostat is part of the mirror heating element, and cannot be serviced separately. The new mirror works in conjunction with the heated backlite, and cannot be purchased as a separate unit. The heated mirror wiring makes connection with the 14631 window wiring harness in the L.H. front door. The mirror, and backlite heat is controlled by the same switch in the instrument panel. The No. 186 feed wire circuit (Brown-Light Blue Hash Mark Wire Color) is protected by a 15 Amp. fuse in the fuse panel for Mark V and by a 10 Amp. circuit breaker located behind the glove box for Lincoln. The heated mirror is distinguished from the unheated mirror by the word "Heated" located on the upper L.H. portion of the mirror glass.

If the heated rear view mirror should not operate (heat up), disconnect the heated mirror harness from the 14401 harness and determine that the backlite is heating up. If the backlite is not functioning properly, follow procedures as shown in Part 36-86, pages 1 thru 4.

Reconnect the heated mirror harness to the 14401 wiring assembly and check for system function.

If the heated backlite indicator lamp is not "on" use a 12 volt test lamp and check for voltage at the 15 Amp. fuse in the fuse panel. If the fuse is defective replace fuse and check for correct operation. If fuse fails again the heated mirror circuits have to be checked for a possible short. Disconnect heated mirror feed from 14401 harness. Trace the No. 186 (Brown-Light Blue Hash Mark) feed wire into the L.H. front door. Check the continuity of the No. 186 circuit from the fuse panel in the instrument panel through the 14401 main harness through the 14631 L.H. front door wiring to the heated



L2446-1A

FIG. 10 Wiring Schematic for Heated Rear View Mirror

mirror. Also check for proper grounding of the mirror assembly thru its ground wire in the 14631 wire assembly. If continuity exists in the 14631 door wiring, check for continuity through the mirror heating element. If the heating element shows no continuity, or the mirror is mechanically defective remove and replace the mirror assembly in accordance with Part 35-50. Start the engine and check the system for proper operation. Verify that mirror and backlite, heat in conjunction with the control switch operation.

Windshield Wipers - Electric

**PART
35-60**
Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION (Cont'd.)	
Intermittent Governor Wiper System	60-1	Intermittent Governor	60-32
Windshield Wiper System	60-1	Left Pivot Shaft Assembly	60-37
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TESTING		Pivot Shaft and Link	60-36
Circuit Breaker Test	60-27	Right Pivot Shaft Assembly	60-37
Intermittent Governor Parking Test	60-27	Rubber Element	60-35
Wiper Motor Current Draw	60-26	Wiper Blade	60-35
Wiper Switch Continuity Test	60-27	Wiper Motor	60-31
ADJUSTMENTS		Wiper Switch	60-32
Arm and Blade Assembly	60-30	DISASSEMBLY AND ASSEMBLY	
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CL2303-2B

DESCRIPTION AND OPERATION

WINDSHIELD WIPER SYSTEM—NON DEPRESSED PARK

Bobcat, Pinto, Fairmont, Zephyr, Mustang II, Granada, Monarch and Versailles

The windshield wipers are actuated by a permanent magnet, rotary type electric motor. The two wiper arms and blades are mounted on a pivot shaft, one at each side of the windshield. The pivot shafts are connected to the motor by linkage arms and attaching clips.

WINDSHIELD WIPER SYSTEM—DEPRESSED PARK

Ford, Mercury, LTD II, Cougar, Lincoln Continental, Thunderbird and Continental Mark V

The wiper motor is a two-speed, permanent magnet depressed park type with the brush end plate at one end of the housing and a gear housing at the other end. The park switch is located in the gear cover and the park mechanism is located in the output arm.

The motor is mounted on the engine side of the cowl outer panel inboard of the master cylinder. A drive arm connects the motor directly to the drop arm of the right pivot shaft on Ford, Mercury, LTD II, Thunderbird, Lincoln Continental and Cougar. The drive arm connects

the motor to the drop arm of the left pivot shaft on Continental Mark V.

INTERMITTENT WIPER GOVERNOR

The intermittent operation of the windshield wiper motor is controlled by a variable resistor in the windshield wiper control switch, which in conjunction with the electronic governor, allows a variable pause between wiping cycles.

Normal operation of the wiper switch (except Ford, Granada, Monarch, Mustang II and Mercury), is to rotate the wiper-washer knob or switch to the right. The first position is for slow speed and the second is for high speed.

For intermittent operation, rotate the wiper-washer knob or switch to the left. The more it is rotated to the left, the greater the resistance and the longer the time between wiper blade sweeps.

Normal operation of the wiper switch on the Ford and Mercury vehicles, is to slide the wiper-washer knob towards the right. The first position (about 3/4" long) is for intermittent, the second is for low speed and the third is for high speed.

When the control knob or switch is placed at the left side of the intermittent position, the time interval between wiper blade sweeps is at maximum. As the

control is moved toward the right side of the intermittent position (before the detent is felt) the time interval between sweeps is reduced.

When the detent position is felt as the switch is moved toward the right, the wiper system will go into low speed and the next detent position, on the extreme right, is high speed.

The variable resistor in the switch in conjunction with electronic pause control, regulates the operation of the motor for the desired time interval.

Normal operation of the wiper switch on the Granada, Monarch and Mustang II vehicles is to slide the wiper switch towards the right. The first position is for intermittent, the second is for low and the third is for high speed.

When the wiper switch is placed in the intermittent position, the wipers complete a cycle and then pause before the next cycle. As you rotate the interval time control knob clockwise, the length of the pause is increased.

The governor used on all carlines except Granada, Monarch and Mustang II has a unique feature: Operation of the windshield washers while the switch is in the intermittent position, electrically overrides the governor, causing the wipers to operate at low speed.

Normal intermittent wipe operation resumes when the wash knob is released.

The governor used on Granada, Monarch and Mustang II has two unique features: electrically coordinated wash and wipe action when the wiper switch is in the "off" position and the washer button is depressed, and additionally, extra wipe cycles are provided for drying the windshield after the washer button is released. The wiper system will then automatically shut off.

The governor has a unique feature: Operation of the windshield washers while the switch is in the intermittent position, electrically overrides the governor, causing the wipers to operate at low speed.

When the wash knob is released, additional wipes are provided for drying the windshield after which normal intermittent wipe operation resumes.

DIAGNOSING

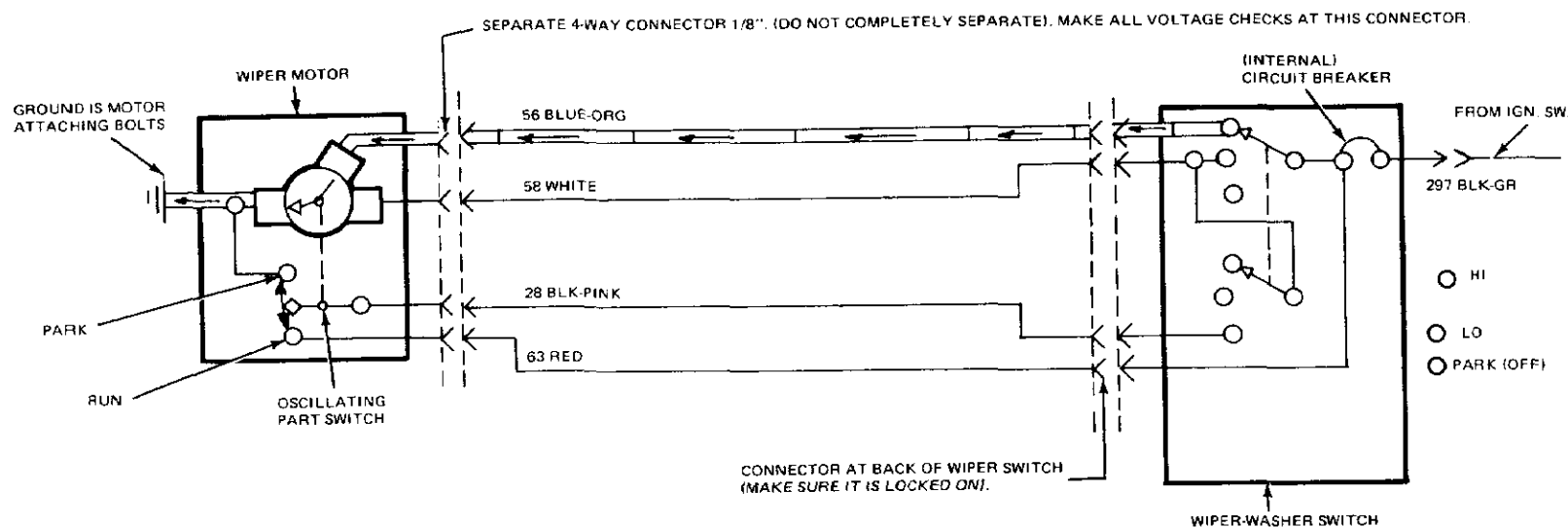
ELECTRICAL – WIPERS AND WASHERS		
CONDITION	POSSIBLE CAUSE	RESOLUTION
● Windshield wipers do not operate	● Open circuit breaker ● Open in wiring ● Switch ● Motor ● Bent or damaged linkage ● Inoperative governor on intermittent wiper system	● Replace C.B. If it goes again, check for short circuit ● Repair as required ● Perform switch test. Repair as required ● Perform motor test. Repair as required ● Repair or replace ● Replace governor
● Windshield washer does not operate	● Low fluid level ● Split, loose, pinched or kinked hose ● Fuse blown* ● Open in wiring ● Washer Motor	● Fill as required ● Inspect, repair as required ● Replace fuse. If fuse blows again, check for short circuit ● Repair as required ● Replace motor, seal and impeller assembly

*Ford-Mercury-Pinto-Bobcat Only. In others, the washer circuit protection is provided by the circuit breaker. **CL2316-2B**

**WINDSHIELD WIPER SYSTEM "A" MOTOR, NON-INTERVAL
PINTO/BOBCAT**

HIGH-SPEED OPERATION — WITH THE WIPER SWITCH IN THE "HIGH" SPEED POSITION, THE CURRENT FLOW IS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH THROUGH THE WIPER SWITCH TO THE WIPER MOTOR.

FIGURE 1 — (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)



HIGH SPEED TEST

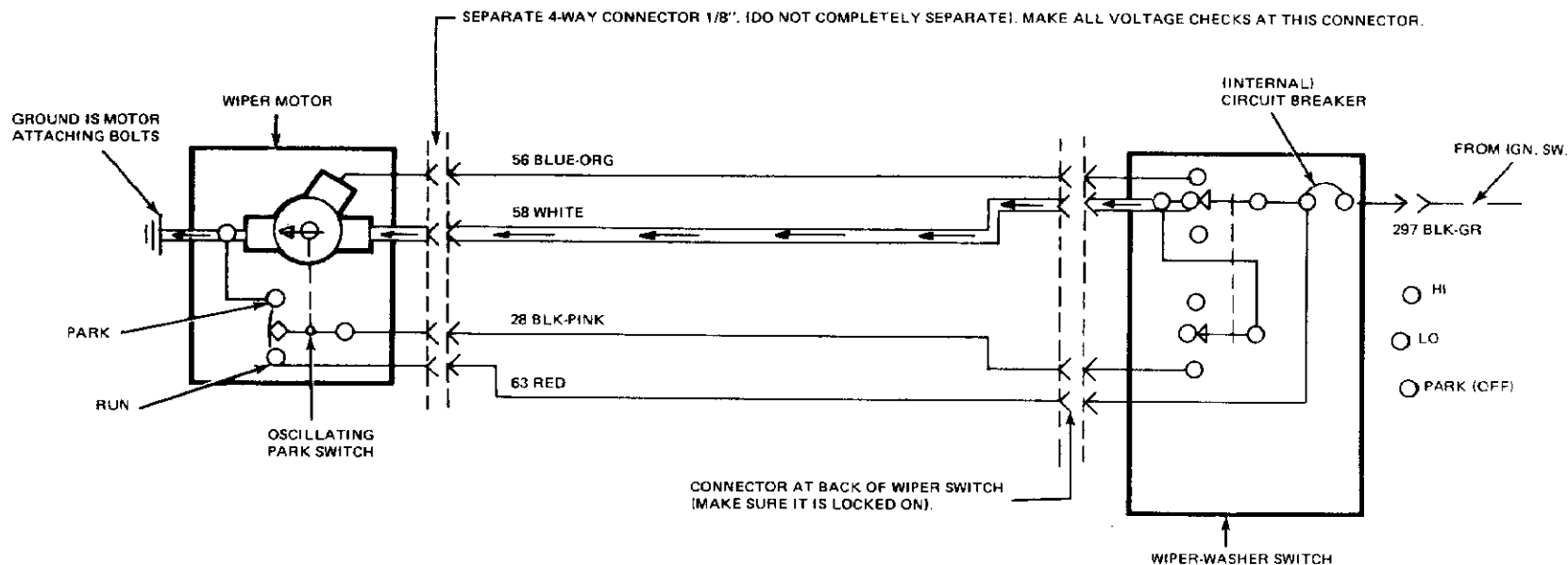
NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN HIGH POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT #56 CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN REPLACE IT.

WINDSHIELD WIPER SYSTEM "A" MOTOR, NON-INTERVAL PINTO-BOBCAT

LOW-SPEED OPERATION — WITH THE WIPER SWITCH IN THE "LOW" SPEED POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH THROUGH THE WIPER SWITCH TO THE WIPER MOTOR.

FIGURE 2 — (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



LOW-SPEED TEST

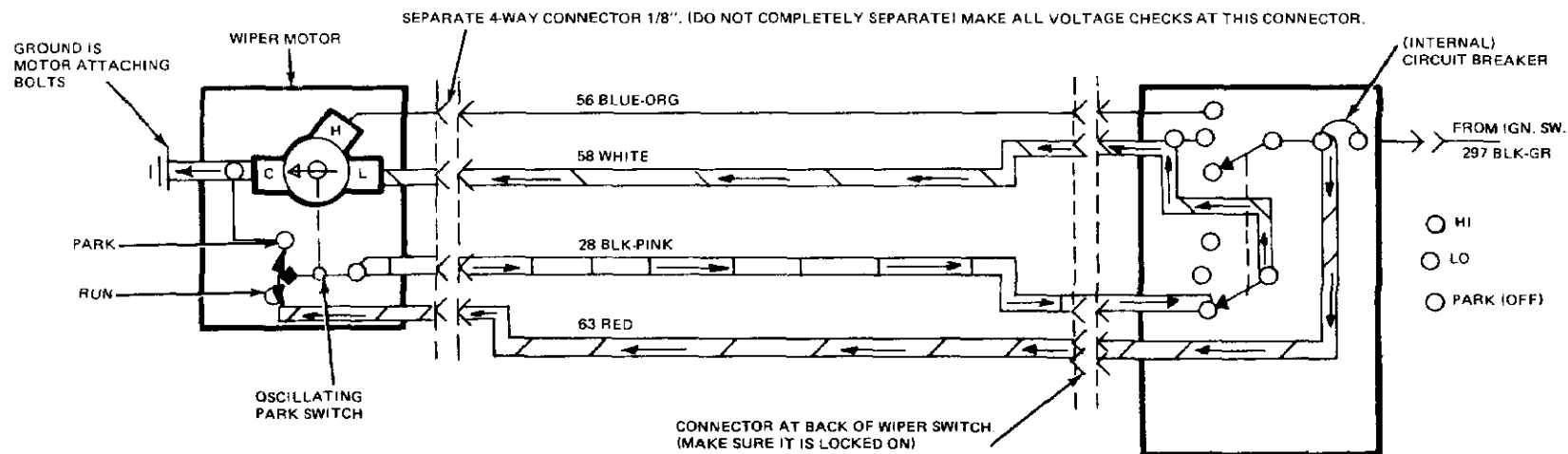
NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN LOW POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #58 CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN REPLACE IT.

WINDSHIELD WIPER SYSTEM "A" MOTOR, NON-INTERVAL
PINTO-BOBCAT

PARK OPERATION — WITH THE WIPER CURRENT FLOW IS ILLUSTRATED BY WIPER MOTOR'S OSCILLATING PARK SWITCH (RUN) FOR 9/10 OF ONE CYCLE. THE LOW SPEED RUN CIRCUIT IS FROM THE WIPER MOTOR'S PARK SWITCH TO THE MOTOR'S LOW SPEED BRUSH, ACROSS THE ARMATURE AND OUT A COMMON BRUSH TO GROUND. AT THE LAST 1/10 PORTION OF THE CYCLE, THE OSCILLATING PARK SWITCH MOVES FROM ITS (RUN, B+) POSITION TO (PARK, GROUND). STOPPING THE MOTOR IN THE PARK POSITION.

FIGURE 3 – (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



PARK TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "OFF" POSITION FOR WIPER MOTOR TEST.

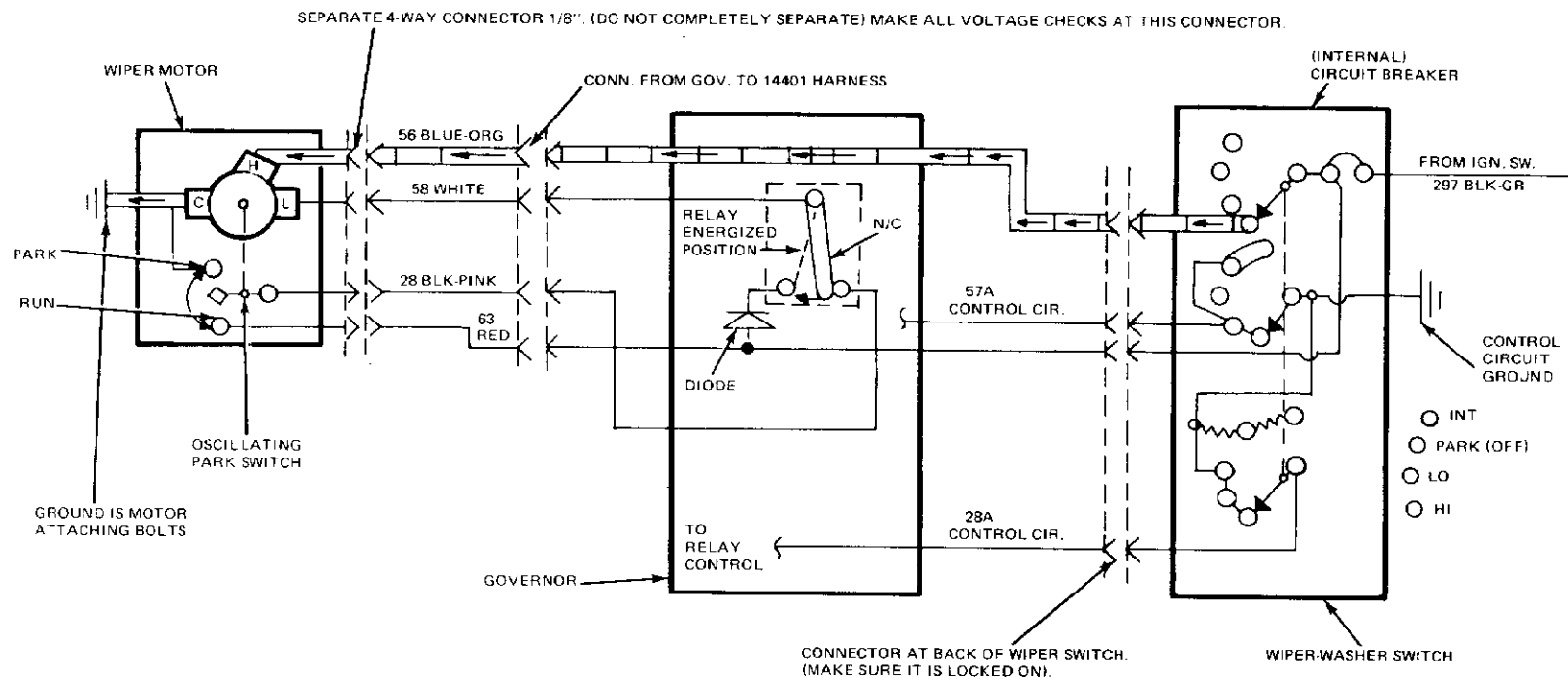
SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT #58, #28, #63 CIRCUITS. IF VOLTAGE IS PRESENT ON ALL THREE CIRCUITS AND WIPER BLADES ARE IN NON-PARK POSITION, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE WIPER MOTOR CASE. IF MOTOR PARKS, REPAIR MOTOR GROUND. IF MOTOR DOES NOT RUN TO PARK POSITION, REPLACE MOTOR.

- IF VOLTAGE IS ON THE #53 CIRCUIT ONLY, REPLACE THE MOTOR.
- IF VOLTAGE IS ON THE #53 AND #28 CIRCUITS ONLY, TRACE THE #28 AND #58 CIRCUITS BACK TOWARD THE WIPER SWITCH TO DETERMINE SOURCE OF PROBLEM.

WINDSHIELD WIPER SYSTEM "A" MOTOR – INTERVAL PINTO–BOBCAT

HIGH-SPEED OPERATION – WITH THE WIPER SWITCH IN THE HIGH SPEED POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH THROUGH THE WIPER SWITCH AND GOVERNOR TO THE WIPER MOTOR.

FIGURE 4 – (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW)



HIGH-SPEED TEST

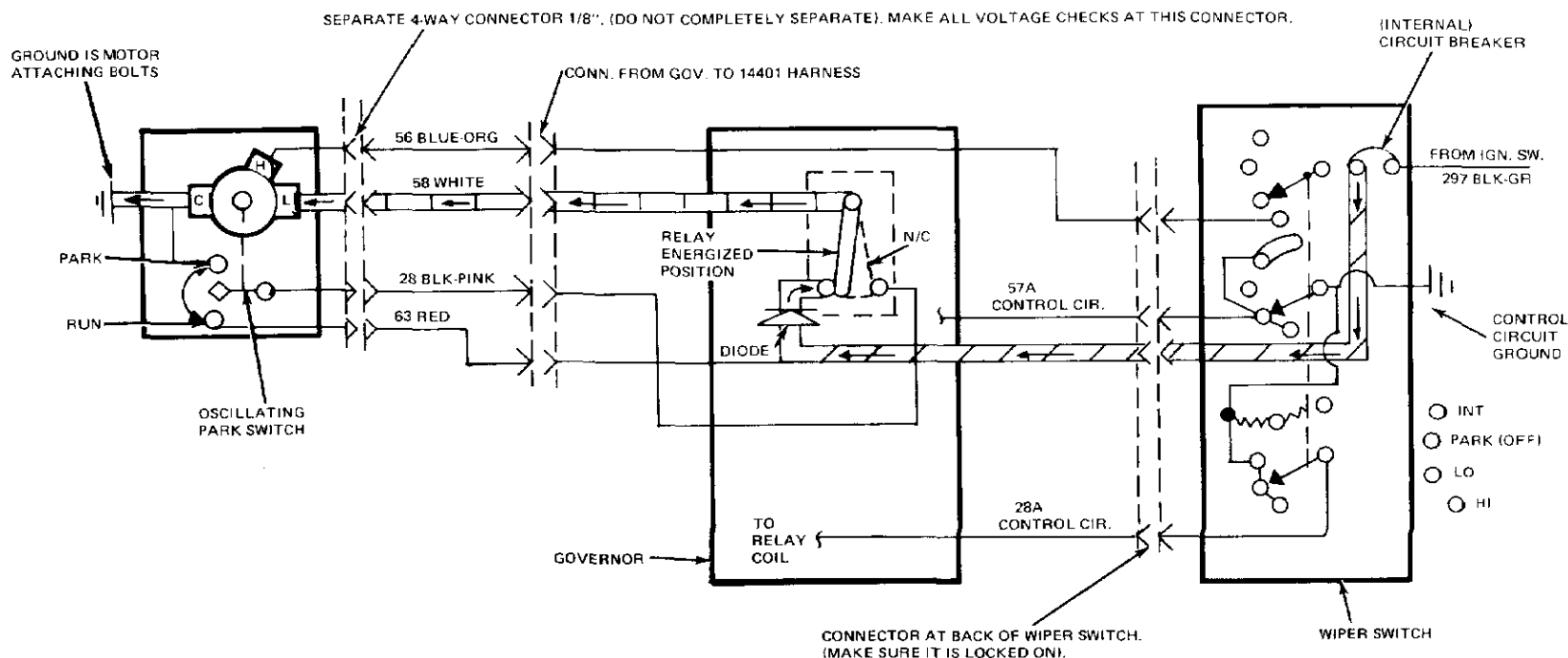
NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN HIGH POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #56 CIRCUIT. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.

WINDSHIELD WIPER SYSTEM "A" MOTOR - INTERVAL
PINTO-BOBCAT

LOW-SPEED OPERATION - WITH THE WIPER SWITCH IN THE LOW POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH THROUGH THE WIPER SWITCH AND ENERGIZED RELAY CONTACTS OF THE GOVERNOR TO THE WIPER MOTOR.

FIGURE 5 - (ARROWS INSIDE DOUBLE LINES DENOTE CURRENT FLOW DIRECTION)



LOW-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN LOW POSITION FOR WIPER MOTOR TEST.

- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #58 CIRCUIT. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR MOTOR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.
- IF VOLTAGE IS ON #63 CIRCUIT BUT NOT ON THE #58 CIRCUIT, GROUND CONTROL CIRCUITS AT THE WIPER SWITCH CONNECTOR. IF VOLTAGE IS NOW ON THE #58 CIRCUIT, REPAIR GOVERNOR GROUND CIRCUITS OR REPLACE WIPER SWITCH. IF NO VOLTAGE ON #58 CIRCUIT, REPLACE THE GOVERNOR.
- IF NO VOLTAGE ON THE #63 CIRCUIT (RED) TRACE THE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

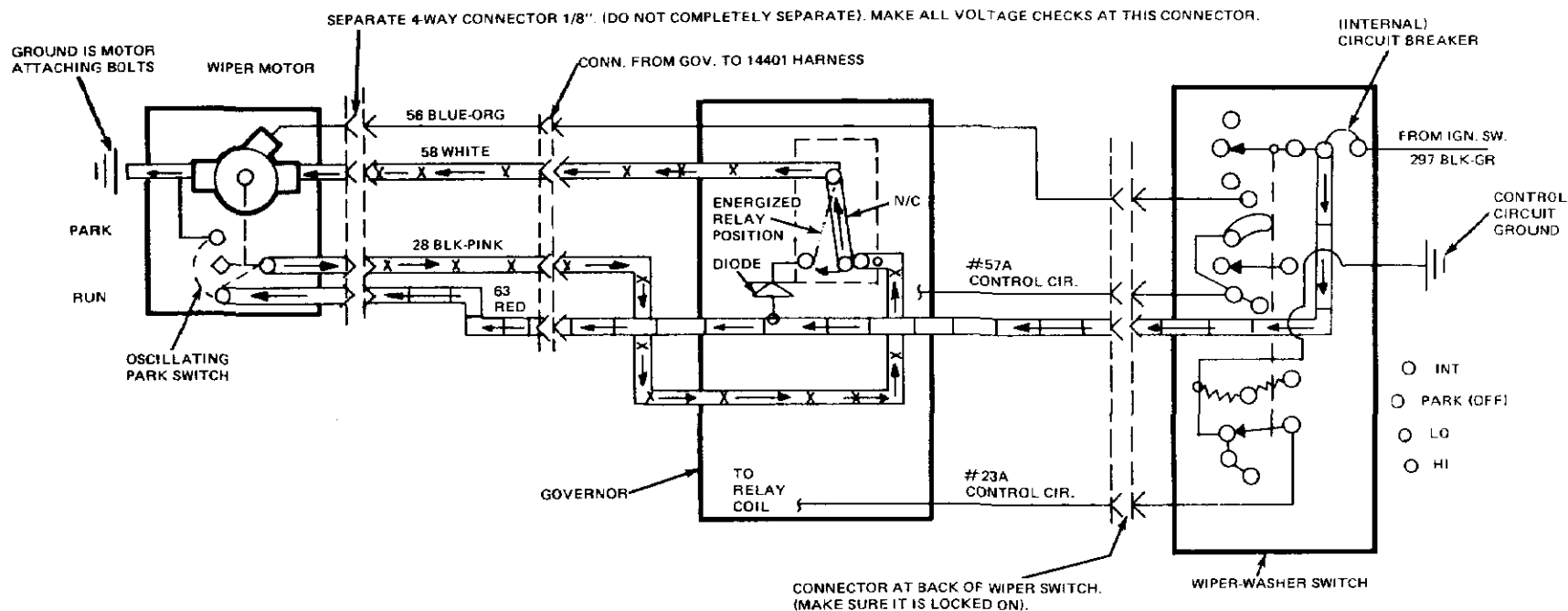
NOTE: IF DIODE FAILS OPEN OR RELAY IS INOPERATIVE, WIPERS WILL OPERATE IN HIGH SPEED AND PARK ONLY. LOW AND INTERMITTENT WILL NOT OPERATE.

CL2387-28⁵

WINDSHIELD WIPER SYSTEM "A" MOTOR - INTERVAL PINTO-BOBCAT

PARK OPERATION - WITH THE WIPER SWITCH IN THE OFF POSITION, THE WIPERS WILL COMPLETE ONE CYCLE THROUGH THE WIPER MOTOR'S PARK SWITCH. CURRENT FLOW IS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH ACROSS A CIRCUIT BREAKER IN THE WIPER SWITCH TO THE WIPER MOTOR'S OSCILLATING PARK SWITCH (RUN). FROM THE PARK SWITCH THROUGH N/C GOVERNOR RELAY CONTACTS (DE-ENERGIZED) TO THE MOTOR'S LOW SPEED BRUSH, ACROSS THE ARMATURE AND OUT A COMMON BRUSH TO GROUND FOR 9/10 OF ONE CYCLE. AT THE LAST 1/10 OF THE CYCLE, THE OSCILLATING PARK SWITCH MOVES FROM ITS (RUN, B+) POSITION TO (PARK, GROUND), STOPPING THE MOTOR IN THE PARK POSITION.

FIGURE 7 - (ARROWS INSIDE DOUBLE LINE DENOTES CURRENT FLOW DIRECTION)



PARK TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "OFF" POSITION FOR WIPER MOTOR TEST.

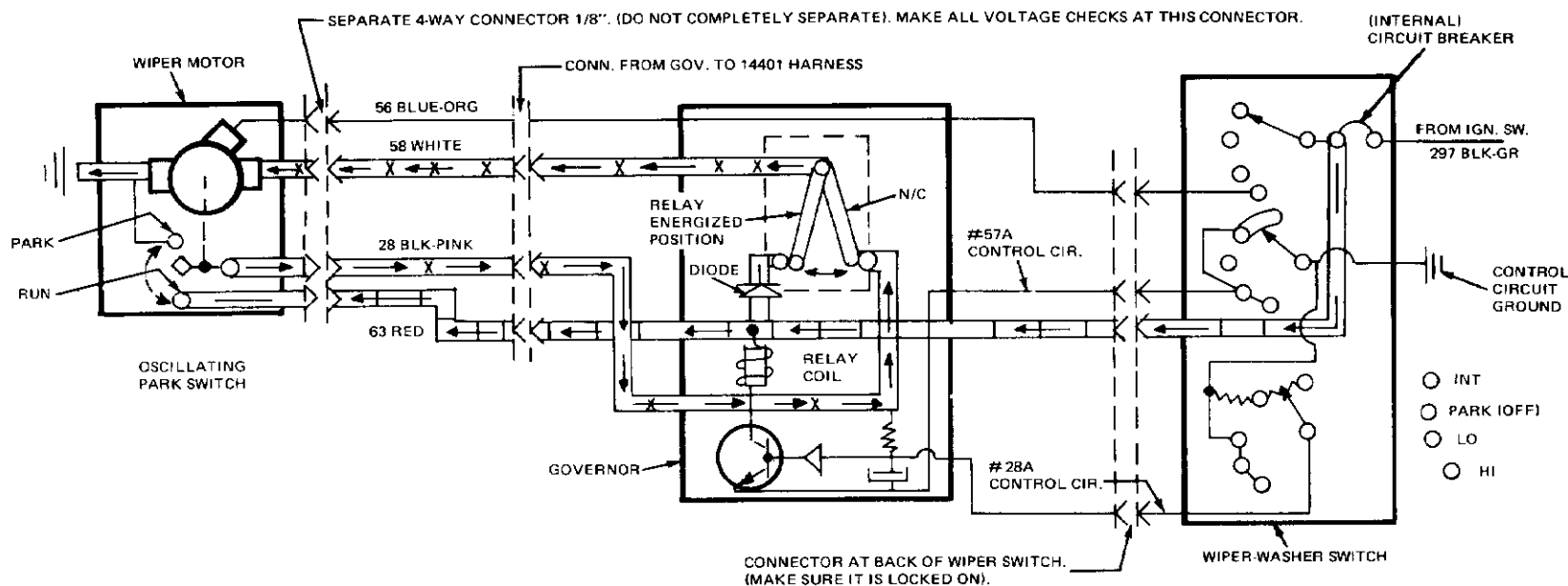
- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #58 CIRCUIT. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A JUMPER WIRE. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.
- IF THERE IS VOLTAGE ON CIRCUITS #63 AND #28 BUT NO VOLTAGE ON CIRCUIT #58, REPLACE THE GOVERNOR.
- IF THERE IS VOLTAGE ON CIRCUIT #63 BUT NOT ON #28, REPLACE THE WIPER MOTOR.
- IF NO VOLTAGE ON CIRCUIT #63, TRACE THE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

WINDSHIELD WIPER SYSTEM "A" MOTOR - INTERVAL
PINTO-BOBCAT

INTERMITTENT WIPER OPERATION - ASSUME WIPERS ARE IN THE PARK POSITION. WHEN THE WIPER SWITCH IS PLACED IN THE "INT" MODE, THE MOTOR'S OSCILLATING PARK SWITCH CONTACTS ARE AT GROUND, AND THE GOVERNOR RELAY IS ENERGIZED. INITIALLY, CURRENT FLOWS FROM THE IGNITION SWITCH, THROUGH A DIODE AND ENERGIZED CONTACTS IN THE GOVERNOR TO THE WIPER MOTOR'S LOW SPEED BRUSH. THE MOTOR ROTATES 1/10 OF A CYCLE. THE WIPER MOTOR'S OSCILLATING PARK SWITCH CONTACTS THEN CHANGE FROM PARK (GROUND) TO RUN (B+) AND MOMENTARILY AFTER THEY CHANGE POSITION THE RELAY IN THE GOVERNOR DE-ENERGIZES. A SECOND PATH TO THE WIPER MOTOR IS COMPLETED AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. THE MOTOR ROTATES THROUGH THE REMAINING 9/10 OF ONE REVOLUTION. WHEN THE OSCILLATING PARK SWITCH CONTACTS AGAIN TOUCH GROUND (PARK), THE MOTOR WILL PARK. THE GOVERNOR'S ELECTRONIC CIRCUIT DELAYS ENERGIZING OF THE RELAY UNTIL THE CIRCUIT TIMES OUT. THEN THE RELAY ENERGIZES AND THE LOW SPEED INTERMITTENT CYCLE IS REPEATED.

NOTE: DISCHARGE RATE OF THE GOVERNOR'S CAPACITOR TO GROUND THROUGH THE WIPER SWITCH CONTROLS THE TIME DELAY (RELAY "PICK-UP" TIME) OF THE SYSTEM.

FIGURE 6 - (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



INTERMITTENT WIPER TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE INTERMITTENT POSITION FOR WIPER MOTOR TEST.

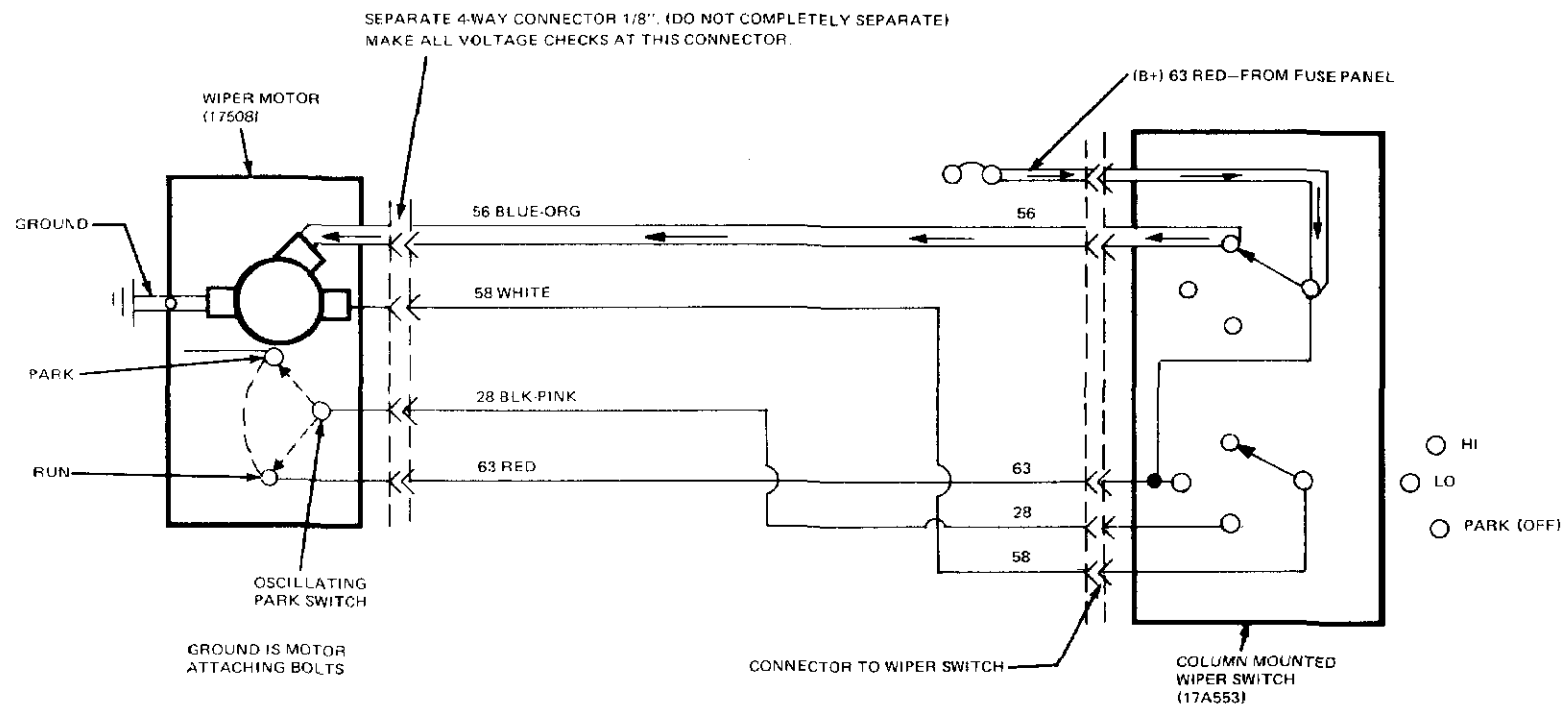
- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE ON THE #63, #28 AND #58 CIRCUITS. IF VOLTAGE IS ON THE #58 CIRCUIT, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE MOTOR CASE. IF MOTOR RUNS, REPAIR MOTOR GROUND. IF MOTOR DOES NOT RUN, REPLACE MOTOR.
- IF VOLTAGE IS ON #63 AND #28 CIRCUITS, (WIPERS ARE OUT OF PARK) BUT NO VOLTAGE ON #58 CIRCUIT, REPLACE THE GOVERNOR. IF WIPERS ARE IN PARK, GROUND CONTROL CIRCUITS #57A AND #28A AT THE WIPER SWITCH. IF VOLTAGE IS NOW ON #58 CIRCUIT, REPAIR GOVERNOR GROUND CIRCUITS OR REPLACE THE WIPER SWITCH. IF NO VOLTAGE ON #58 CIRCUIT, REPLACE THE GOVERNOR.
- IF THE WIPER MOTOR IS OUT OF THE PARK POSITION AND THERE IS VOLTAGE ON CIRCUIT #63 BUT NOT ON #28, REPLACE THE WIPER MOTOR.
- IF NO VOLTAGE ON CIRCUIT #63 TRACE THE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

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WINDSHIELD WIPER SYSTEM "A" MOTOR, NON-INTERVAL
FAIRMONT, ZEPHYR, MUSTANG II, GRANADA, MONARCH AND VERSAILLES

HIGH-SPEED OPERATION – WITH THE WIPER SWITCH IN THE “HIGH” SPEED POSITION, THE CURRENT FLOW IS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH, ACROSS A CIRCUIT BREAKER IN THE FUSE PANEL, THROUGH THE WIPER SWITCH TO THE WIPER MOTOR.

FIGURE 1 – (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)



HIGH-SPEED TEST

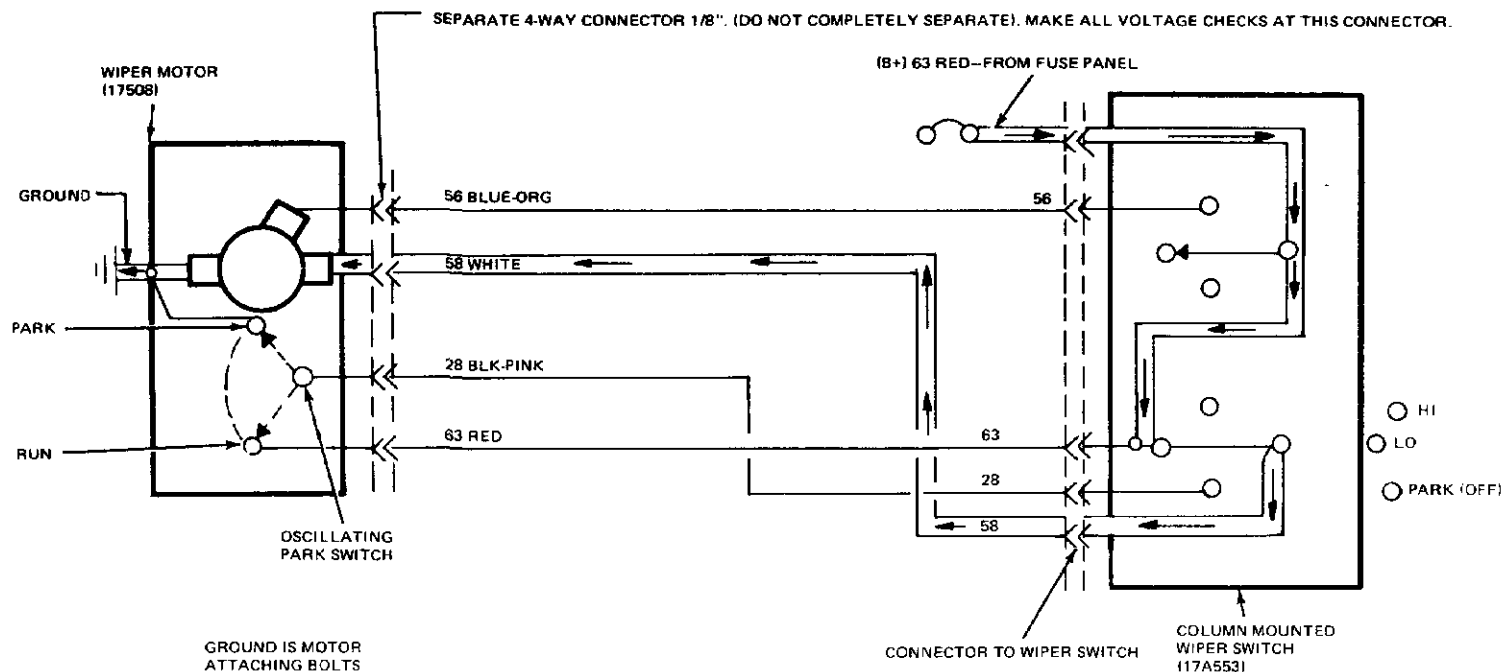
NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN HIGH POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #56 CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN REPLACE IT.

**WINDSHIELD WIPER SYSTEM "A" MOTOR, NON-INTERVAL
FAIRMONT, ZEPHYR, MUSTANG II, GRANADA, MONARCH AND VERSAILLES**

LOW-SPEED OPERATION — WITH THE WIPER SWITCH IN THE "LOW" SPEED POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH, ACROSS A CIRCUIT BREAKER PANEL, THROUGH THE WIPER SWITCH TO THE WIPER MOTOR.

FIGURE 2 — (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



LOW-SPEED TEST

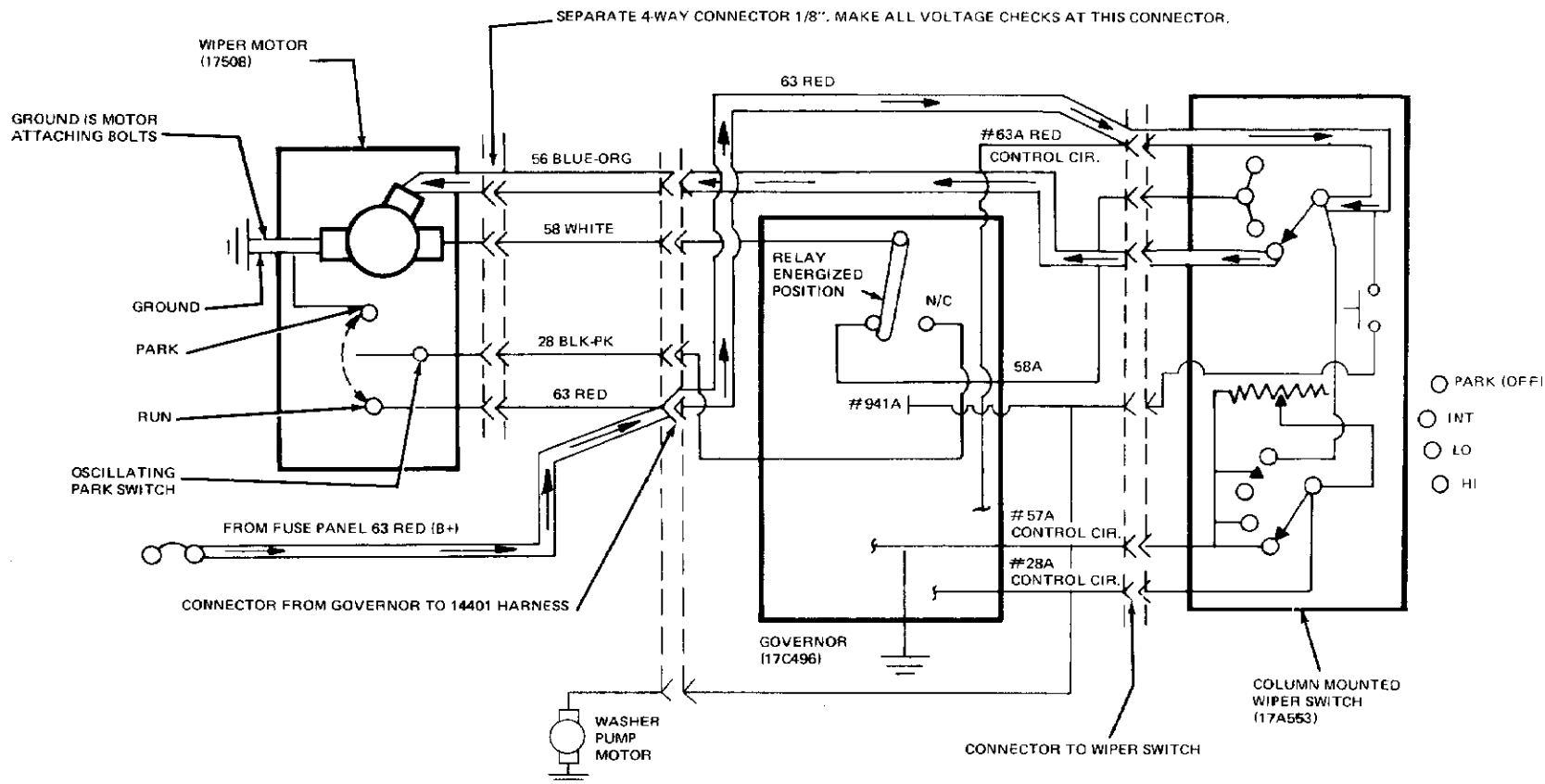
NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN LOW POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT #58 CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN REPLACE IT.

WINDSHIELD WIPER SYSTEM "A" MOTOR – INTERVAL
FAIRMONT, ZEPHYR, MUSTANG, MONARCH, GRANADA AND VERSAILLES

HIGH-SPEED OPERATION – WITH THE WIPER SWITCH IN THE HIGH SPEED POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH TO A CIRCUIT BREAKER IN THE FUSE PANEL, FROM THE FUSE PANEL THROUGH THE WIPER SWITCH AND TO THE WIPER MOTOR.

FIGURE 4 – (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW).



HIGH-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN HIGH POSITION FOR WIPER MOTOR TEST.

SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #56 CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.

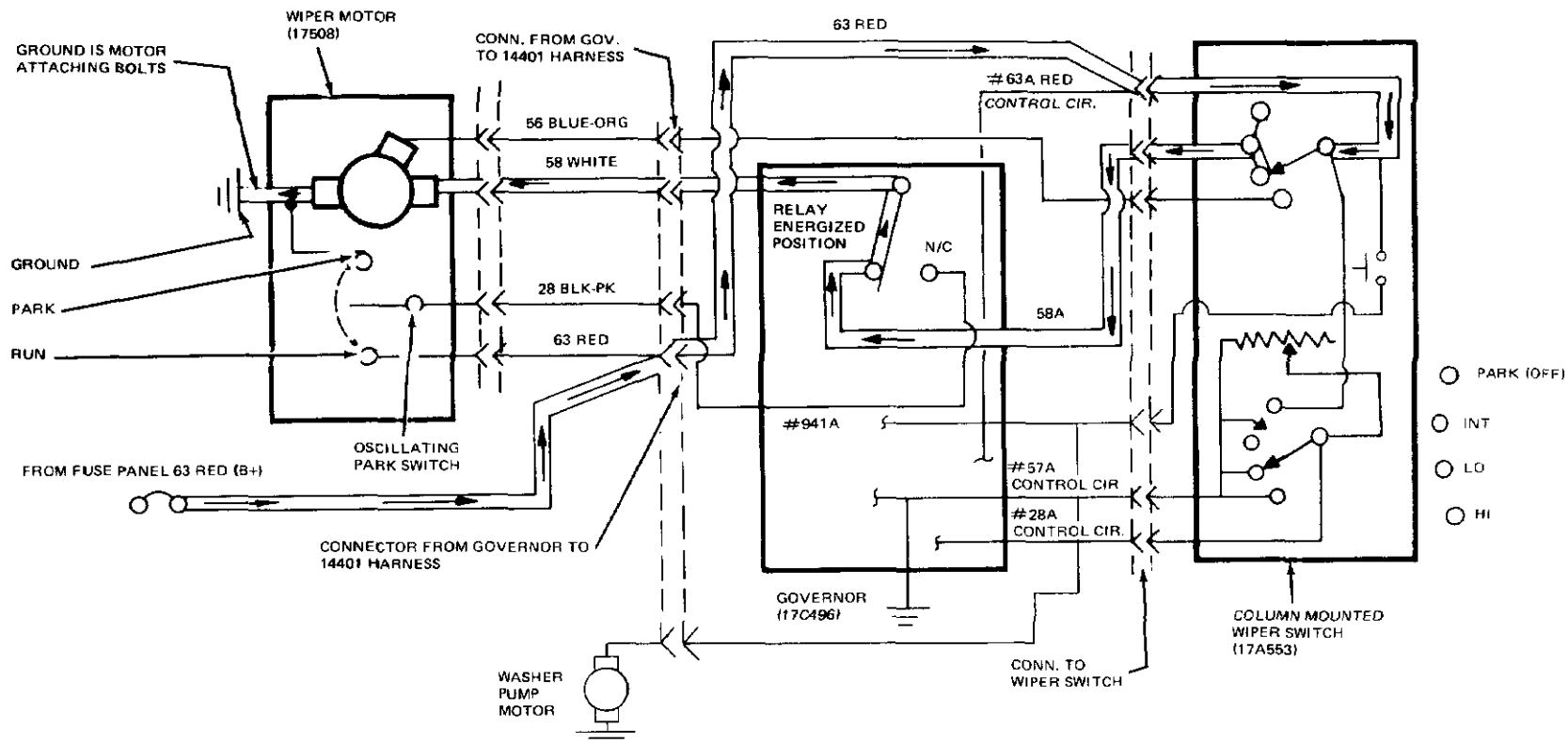
CL2387-2B11

**WINDSHIELD WIPER SYSTEM "A" MOTOR – INTERVAL
FAIRMONT, ZEPHYR, MUSTANG, MONARCH, GRANADA AND VERSAILLES**

LOW-SPEED OPERATION – WITH THE WIPER SWITCH IN THE LOW POSITION, THE CURRENT FLOW IS AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH TO THE FUSE PANEL, FROM THE FUSE PANEL THROUGH THE WIPER SWITCH AND ENERGIZES RELAY CONTACTS OF THE GOVERNOR TO THE WIPER MOTOR.

FIGURE 5 – (ARROWS INSIDE DOUBLE LINES DENOTE CURRENT FLOW DIRECTION).

SEPARATE 4-WAY CONNECTOR. (DO NOT COMPLETELY SEPARATE). MAKE ALL VOLTAGE CHECKS AT THIS CONNECTOR.



LOW-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN LOW POSITION FOR WIPER MOTOR TEST.

- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #58 CIRCUIT. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A WIRE JUMPER. IF MOTOR RUNS, REPAIR MOTOR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.
- IF VOLTAGE IS ON #58A CIRCUIT BUT NOT THE #58 CIRCUIT, GROUND CONTROL #28A CIRCUIT AT THE WIPER SWITCH CONNECTOR. IF VOLTAGE IS NOW ON THE #58 CIRCUIT, REPAIR GOVERNOR GROUND CIRCUITS OR REPLACE WIPER SWITCH. IF NO VOLTAGE ON #58 CIRCUIT, REPLACE THE GOVERNOR.
- IF NO VOLTAGE ON THE #58A CIRCUIT, TRACE THE CIRCUIT BACK THROUGH WIPER SWITCH TO #63 CIRCUIT.
- IF NO VOLTAGE ON THE #63 CIRCUIT, TRACE THE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

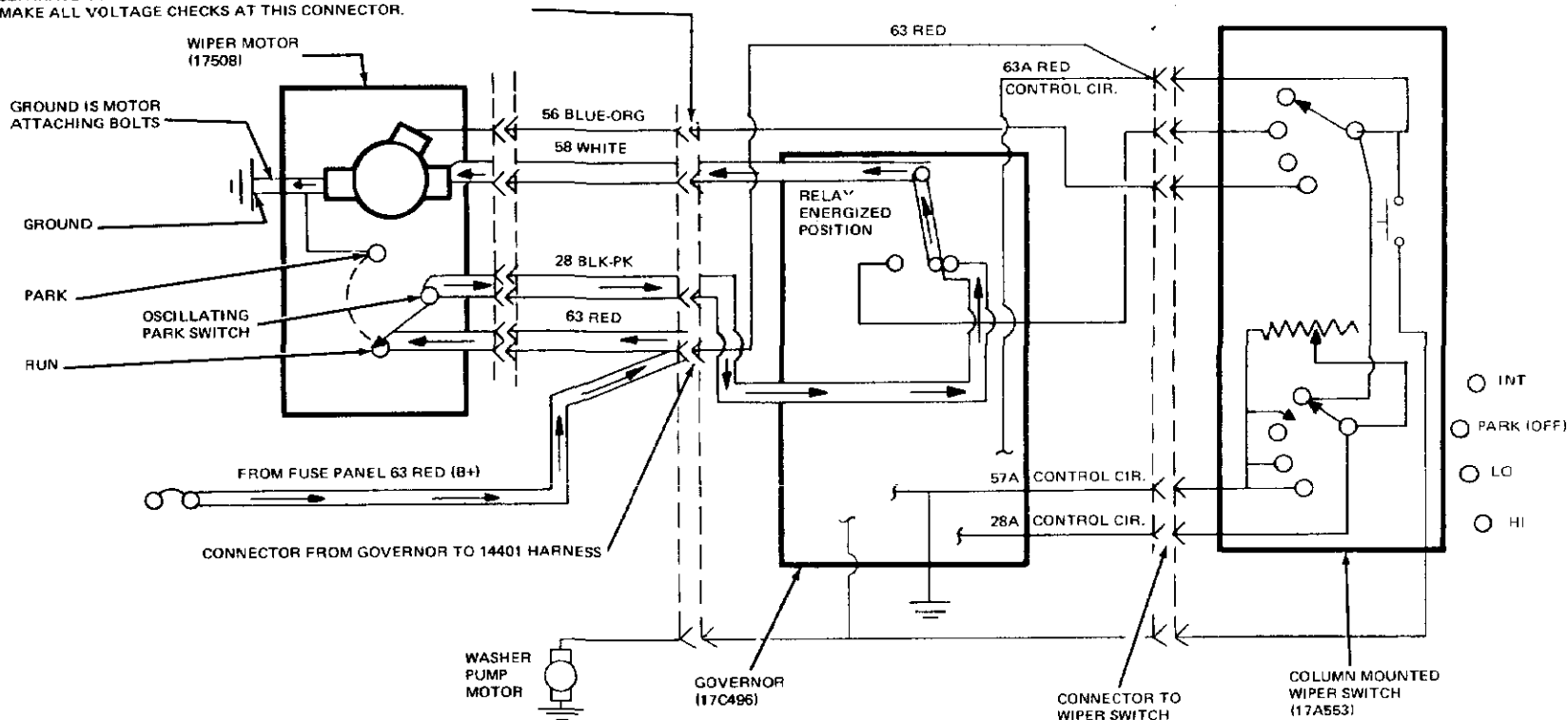
CL2387-2B12

WINDSHIELD WIPER SYSTEM "A" MOTOR - INTERVAL
FAIRMONT, ZEPHYR, MUSTANG, MONARCH, GRANADA AND VERSAILLES

PARK CIRCUIT OPERATION - WITH THE WIPER SWITCH IN THE "OFF" POSITION, THE WIPERS WILL COMPLETE ONE CYCLE THROUGH THE WIPER MOTOR'S PARK SWITCH. CURRENT FLOW IS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. CURRENT FLOWS FROM THE IGNITION SWITCH TO A CIRCUIT BREAKER IN THE FUSE PANEL. FROM THE FUSE PANEL INTO WIPER MOTOR'S OSCILLATING PARK SWITCH (RUN) FOR 9/10 OF ONE CYCLE. THE LOW SPEED RUN CIRCUIT IS FROM THE WIPER MOTOR'S PARK SWITCH, THROUGH THE NORMALLY CLOSED CONTACTS OF THE GOVERNOR, TO THE MOTOR'S LOW SPEED BRUSH, ACROSS THE ARMATURE AND OUT A COMMON BRUSH TO GROUND. AT THE LAST (1/10) PORTION OF THE CYCLE, THE OSCILLATING PARK SWITCH MOVES FROM ITS RUN (B+) POSITION TO PARK (GROUND), STOPPING THE MOTOR IN THE PARK POSITION.

SEPARATE 4-WAY CONNECTOR 1/8". (DO NOT COMPLETELY SEPARATE)
MAKE ALL VOLTAGE CHECKS AT THIS CONNECTOR.

FIGURE 6 - (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



PARK TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "OFF" POSITION FOR WIPER MOTOR TEST.

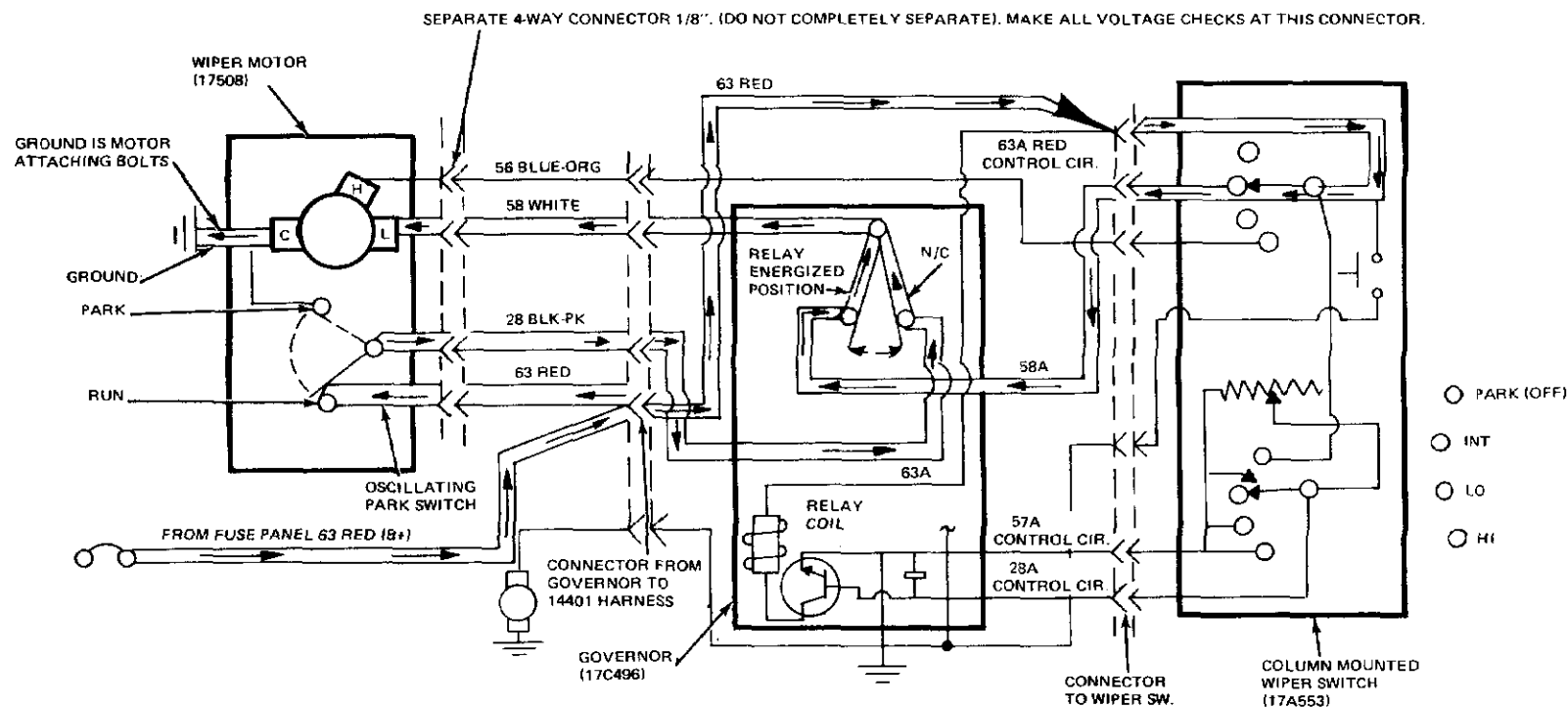
- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE AT THE #58 CIRCUIT. IF THERE IS VOLTAGE, GROUND THE MOTOR CASE TO THE BODY WITH A JUMPER WIRE. IF MOTOR RUNS, REPAIR GROUND. IF MOTOR DOES NOT RUN, REPLACE IT.
- IF THERE IS VOLTAGE ON CIRCUITS #63 AND #28 BUT NO VOLTAGE ON CIRCUIT #58, REPLACE THE GOVERNOR.
- IF THERE IS VOLTAGE ON CIRCUIT #63 BUT NOT ON #28, REPLACE THE WIPER MOTOR. (WIPERS OUT OF PARK).
- IF NO VOLTAGE ON CIRCUIT #63, TRACE THE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

CL2387-2813

WINDSHIELD WIPER SYSTEM "A" MOTOR - INTERVAL
FAIRMONT, ZEPHYR, MUSTANG-MONARCH & GRANADA AND VERSAILLES

INTERVAL WIPER OPERATION - ASSUME WIPERS ARE IN THE PARK POSITION, WHEN WIPER SWITCH IS PLACED IN THE "INT" MODE, THE MOTOR'S OSCILLATING PARK SWITCH CONTACTS ARE AT GROUND, AND GOV. RELAY IS ENERGIZED. CURRENT FLOWS FROM FUSE PANEL, THROUGH WIPER SWITCH, ACROSS ENERGIZED CONTACTS IN GOV. TO WIPER MOTOR'S LOW SPEED BRUSH. THE MOTOR ROTATES 1/10 OF A CYCLE. THE OSCILLATING PARK SWITCH CONTACTS THEN CHANGE FROM GROUND TO RUN (B+) AND MOMENTARILY AFTER THEY CHANGE POSITION THE RELAY IN GOV. DE-ENERGIZES. A SECOND PATH TO WIPER MOTOR IS COMPLETED AS ILLUSTRATED BY ARROWS ON THE CIRCUIT DIAGRAM. THE MOTOR ROTATES THROUGH REMAINING 9/10 OF ONE REVOLUTION. WHEN THE OSCILLATING PARK SWITCH CONTACTS AGAIN TOUCH GROUND (PARK), MOTOR WILL PARK. THE GOVERNOR'S ELECTRONIC CIRCUIT DELAYS ENERGIZING OF THE RELAY UNTIL THE CIRCUIT TIMES OUT. THEN GOV. RELAY ENERGIZES AND LOW-SPEED INTERVAL CYCLE IS REPEATED.

FIGURE 7 - (ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).



INTERVAL WIPER TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE INTERVAL POSITION FOR WIPER MOTOR TEST.

- SEPARATE 4-WAY CONNECTOR AT THE MOTOR APPROXIMATELY 1/8" TO ALLOW VOLTAGE CHECKS. CHECK FOR VOLTAGE ON #58 CIRCUIT. IF VOLTAGE IS ON #58 CIRCUIT, USE A JUMPER WIRE AND ELECTRICALLY GROUND MOTOR CASE. IF MOTOR RUNS, REPAIR MOTOR GROUND. IF MOTOR DOES NOT RUN, REPLACE MOTOR.
- IF VOLTAGE IS ON #63 AND #28 CIRCUITS, (WIPERS ARE OUT OF PARK) BUT NO VOLTAGE ON #58 CIRCUIT, REPLACE GOVERNOR. IF WIPERS ARE IN PARK, GROUND CONTROL CIRCUIT #28A AT WIPER SWITCH. IF NO VOLTAGE ON #58 CIRCUIT, REPAIR GOVERNOR GROUND CIRCUIT OR REPLACE THE WIPER SWITCH. IF NO VOLTAGE ON #58 CIRCUIT, REPLACE THE GOVERNOR.
- IF WIPER MOTOR IS OUT OF PARK POSITION AND THERE IS VOLTAGE ON CIRCUIT #63 BUT NOT ON #28, REPLACE WIPER MOTOR.
- IF NO VOLTAGE ON CIRCUIT #63 TRACE CIRCUIT BACK TO SOURCE TO DETERMINE PROBLEM.

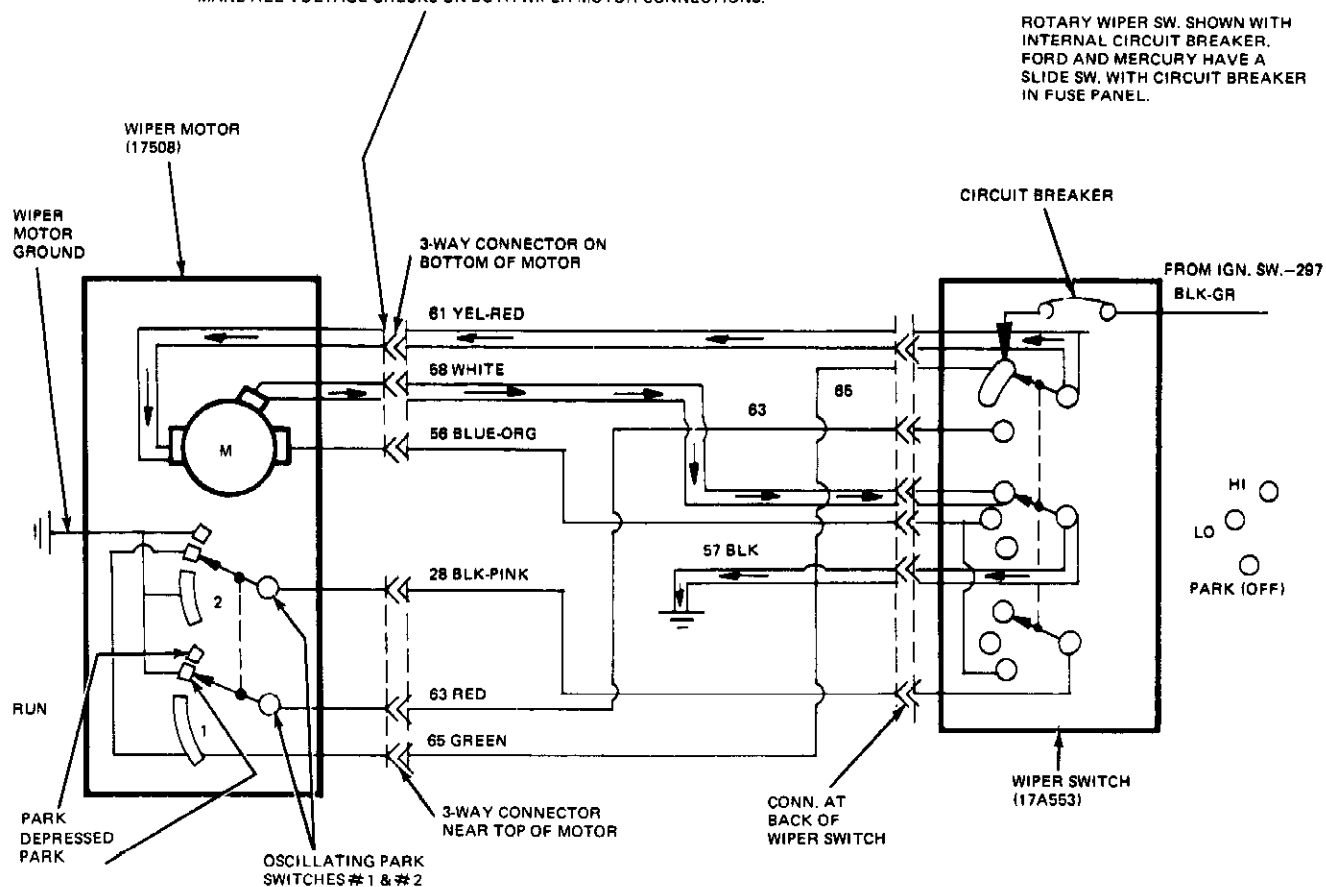
CL2387-2B¹⁴

WINDSHIELD WIPER SYSTEM "B" MOTOR — NON-INTERVAL SELECT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

HI-SPEED OPERATION — PLACE WIPER SWITCH INTO "HI" POSITION, CURRENT FLOW IS FROM IGN. SWITCH THROUGH CIRCUIT BREAKER, AND INTO #65 CIRCUIT AT WIPER SWITCH, ACROSS WIPER SWITCH CONTACTS INTO #61 CIRCUIT TO WIPER MOTOR COMMON BRUSH. ACROSS MOTOR ARMATURE AND OUT #58 CIRCUIT (WHITE) TO WIPER SWITCH. ACROSS WIPER SWITCH CONTACTS TO GROUND. (MOTOR GROUND IS NOT UTILIZED FOR RUN CIRCUITS).

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION START AT CIRCUIT BREAKER)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTIONS.



HI-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "HIGH" POSITION FOR ALL WIPER MOTOR OPERATION TESTS.

- IF VOLTAGE IS ON THE #61 CIRCUIT, WITH THE WIPER SWITCH IN THE HI POSITION, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE #58 CIRCUIT. IF THE MOTOR RUNS, REPAIR THE WIPER SWITCH GROUND CIRCUIT OR REPLACE THE WIPER SWITCH. IF THE MOTOR DOES NOT RUN, REPAIR MOTOR PER SECTION 35-60-16. (IF BRUSHES ARE REQUIRED, BRUSH AND END PLATE ASSY IS 17B583).
- IF VOLTAGE IS ON THE #65 CIRCUIT ONLY, REPLACE THE WIPER SWITCH.
- IF NO VOLTAGE ON #65 CIRCUIT, TRACE THE CIRCUIT BACK.

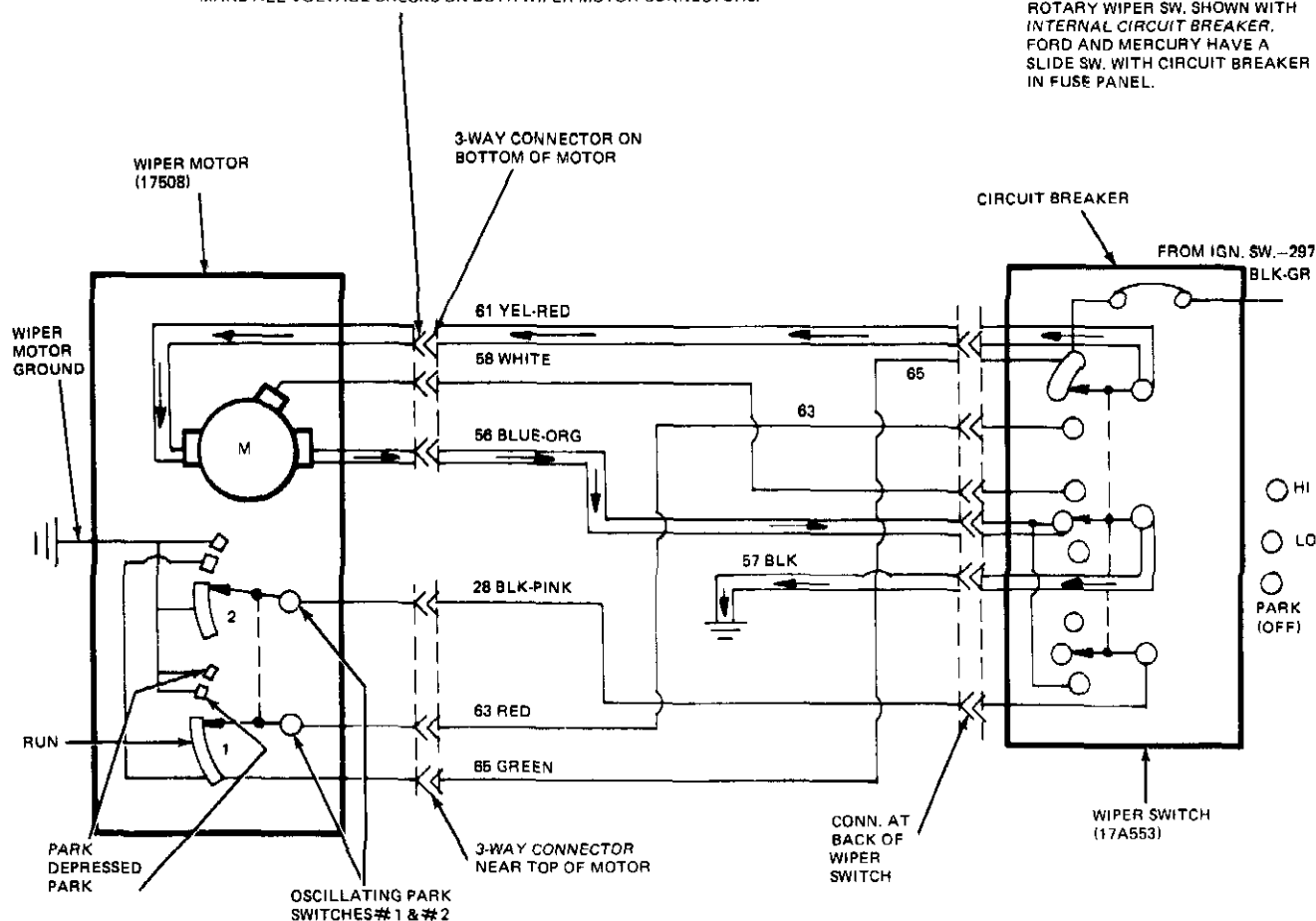
WINDSHIELD WIPER SYSTEM "B" MOTOR - NON-INTERVAL SELECT
COUGAR-LTD II-MARK V-THUNDERBIRD-LINCOLN-FORD-MERCURY-RANCHERO

LOW-SPEED OPERATION — PLACE WIPER SWITCH INTO THE "LOW" POSITION. CURRENT FLOW IS FROM THE IGN. SWITCH THROUGH CIRCUIT BREAKER, AND INTO THE **#65** CIRCUIT. ACROSS WIPER SWITCH CONTACTS INTO **#61** CIRCUIT TO WIPER MOTOR COMMON BRUSH. ACROSS MOTOR ARMATURE AND OUT **#56** CIRCUIT (BLUE-ORG) TO THE WIPER SWITCH. ACROSS THE WIPER SWITCH CONTACTS TO GROUND. (THE MOTOR GROUND IS NOT UTILIZED FOR RUN CIRCUITS.)

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION START AT CIRCUIT BREAKER).

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS.

ROTARY WIPER SW. SHOWN WITH
INTERNAL CIRCUIT BREAKER.
FORD AND MERCURY HAVE A
SLIDE SW. WITH CIRCUIT BREAKER
IN FUSE PANEL.



LOW-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "LOW" POSITION FOR ALL WIPER MOTOR OPERATION TESTS.

- A. IF VOLTAGE IS ON THE #61 CIRCUIT WITH THE WIPER SWITCH IN THE LOW POSITION, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE #56 CIRCUIT. IF THE MOTOR RUNS, REPAIR WIPER SWITCH GROUND CIRCUIT OR REPLACE THE WIPER SWITCH. IF THE MOTOR DOES NOT RUN, REPAIR MOTOR PER SECTION 35-60-16. (IF BRUSHES ARE REQUIRED: BRUSH AND END PLATE ASSY. IS 17B583.)
- B. IF VOLTAGE IS ON THE #65 CIRCUIT ONLY, REPLACE WIPER SWITCH.
- C. IF NO VOLTAGE ON #65 CIRCUIT, TRACE THE CIRCUIT BACK.

WINDSHIELD WIPER SYSTEM "B" MOTOR — NON-INTERVAL SELECT

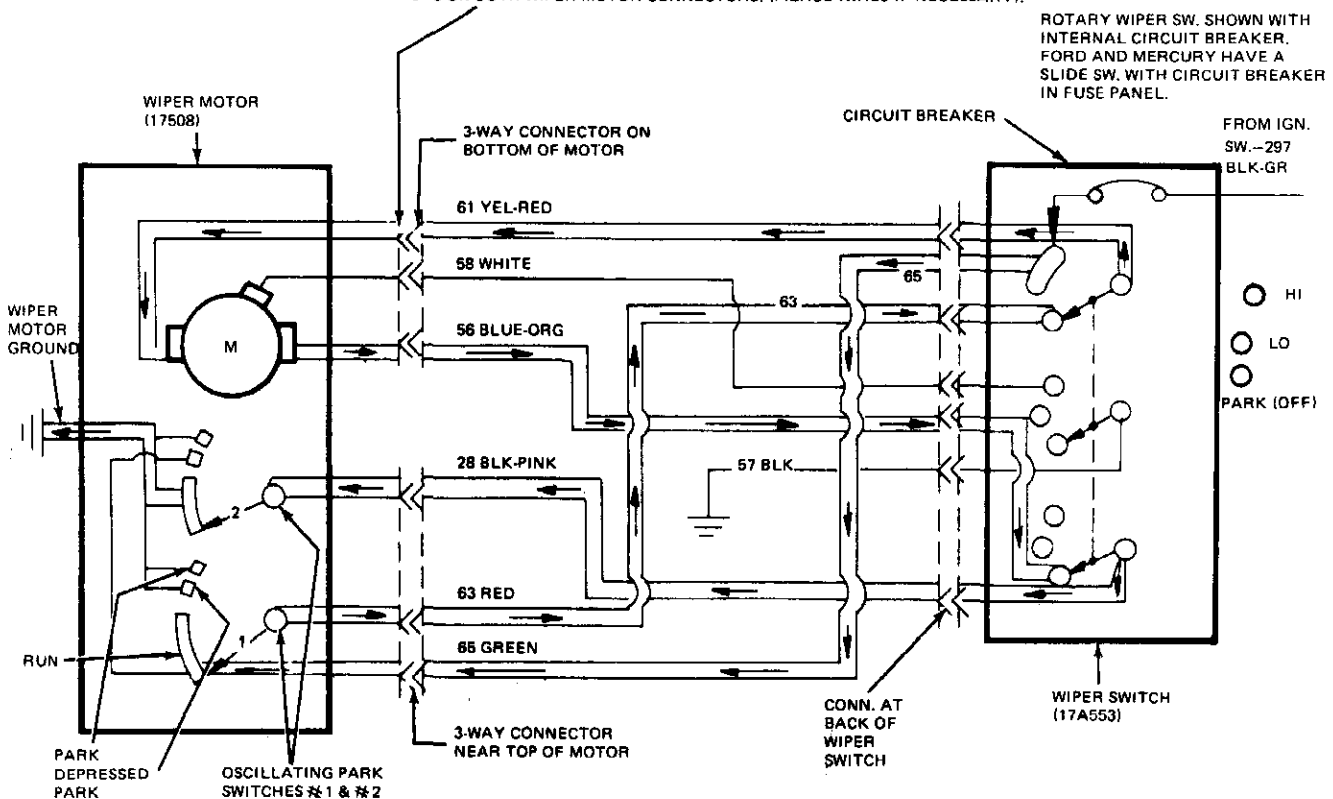
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

PARK CIRCUIT OPERATION — DURING NORMAL RUNNING OF MOTOR (HIGH & LOW SPEEDS), TWO SETS OF MOTOR PARK SWITCH CONTACTS ATTACHED TO THE #28 AND #63 CIRCUITS INSIDE THE MOTOR OSCILLATE BETWEEN THE (RUN CONTACTS) AND (DEPRESSED PARK CONTACTS) WHEN THE MOTOR ARMATURE IS ROTATING. THE (PARK CONTACTS) OF BOTH SWITCHES #1 & #2 ARE NOT UTILIZED UNTIL THE MOTOR HAS STOPPED AT THE END OF THE DEPRESSED PARK CYCLE.

WHEN THE WIPER SWITCH IS TURNED "OFF" CURRENT FLOWS FROM THE #65 CIRCUIT, THROUGH THE #1 WIPER MOTOR PARK SWITCH CONTACTS (RUN) TO THE #63 CIRCUIT, THROUGH THE WIPER SWITCH TO #61 CIRCUIT (COMMON BRUSH), ACROSS THE MOTOR ARMATURE AND OUT THE #56 CIRCUIT (LOW BRUSH), INTO THE WIPER SWITCH AND OUT THE #28 CIRCUIT, THROUGH THE #2 WIPER MOTOR PARK SWITCH CONTACTS (RUN) WHICH ARE AT GROUND. THE MOTOR CONTINUES TO RUN UNTIL THE WIPER BLADES REACH THE LOW END OF THEIR STROKE. THE #1 SET OF CONTACTS CHANGE TO GROUND AND #2 SET OF CONTACTS CHANGE TO B+. THIS WILL STOP THE MOTOR'S FORWARD ROTATION AND START THE MOTOR ROTATING FOR THE DEPRESSED PARK (HIDDEN WIPERS) POSITION.

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION START AT CIRCUIT BREAKER).

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY).



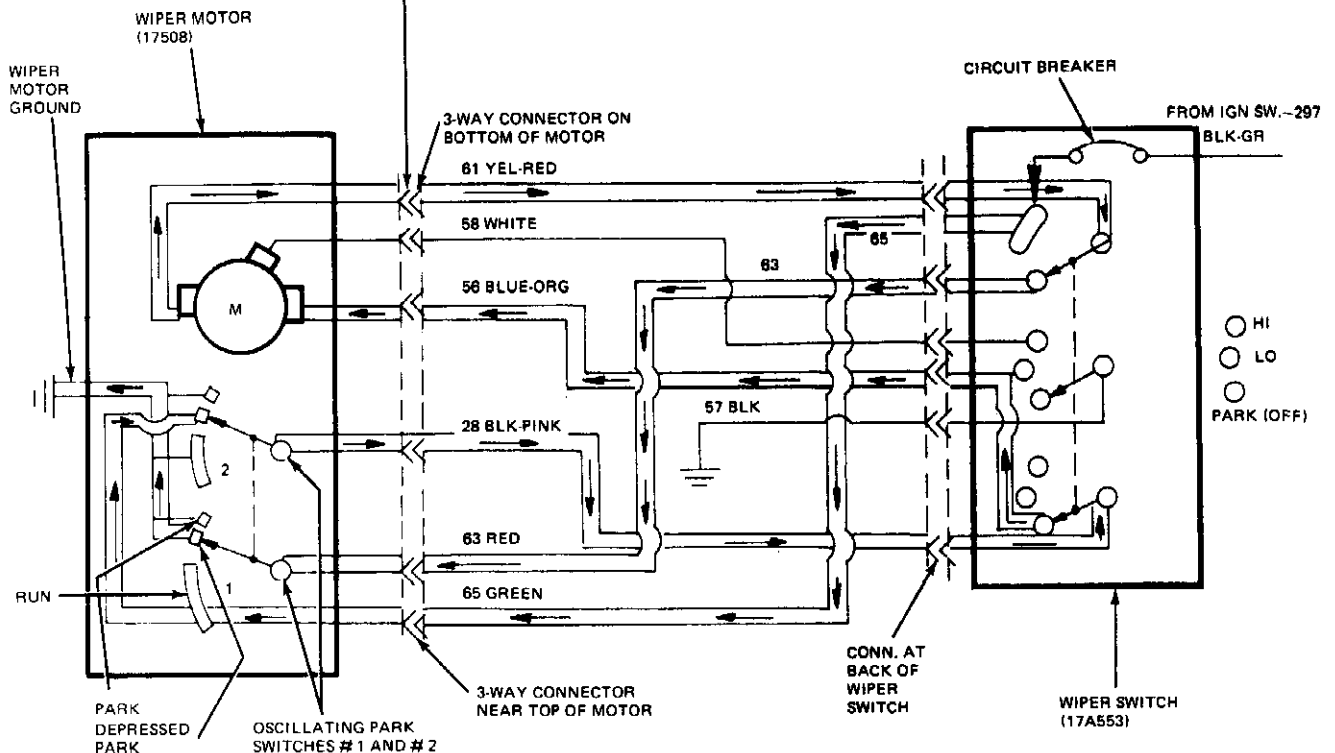
WINDSHIELD WIPER SYSTEM "B" MOTOR — NON-INTERVAL SELECT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

DEPRESSED PARK POSITION — WITH # 1 SET OF CONTACTS AT GROUND AND # 2 CONTACTS AT B+ (DEPRESSED PARK POSITION). CURRENT FLOWS IN THE OPPOSITE DIRECTION THROUGH THE MOTOR ARMATURE AND THE WIPER BLADES START TO GO INTO THE DEPRESSED PARK POSITION. CURRENT FLOWS FROM # 65 CIRCUIT (B+) ACROSS THE WIPER MOTOR # 2 POINTS INTO # 28 CIRCUIT TO THE WIPER SWITCH, OUT THE WIPER SWITCH ON # 56 CIRCUIT TO THE MOTOR LOW BRUSH, ACROSS THE ARMATURE AND OUT # 61 CIRCUIT (COMMON BRUSH) TO THE WIPER SWITCH. THROUGH THE WIPER SWITCH TO # 63 CIRCUIT AND # 1 WIPER MOTOR PARK SWITCH CONTACTS WHICH ARE NOW AT GROUND. WHEN THE WIPER BLADES REACH THE LOW END OF THE HIDDEN PARK POSITION, THE # 1 AND # 2 PARK CONTACTS ARE MOVED TO WIPER MOTOR GROUND (PARK POSITION) AND THE MOTOR AND BLADES STOP IN THE HIDDEN PARK POSITION.

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION START AT CIRCUIT BREAKER)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY).

ROTARY WIPER SW. SHOWN WITH INTERNAL CIRCUIT BREAKER. FORD AND MERCURY HAVE A SLIDE SW. WITH CIRCUIT BREAKER IN FUSE PANEL.



PARK TEST

NOTE: IGNITION SWITCH MUST BE "ON" FOR ALL WIPER MOTOR OPERATION TESTS.

IF WIPERS STOP ANYWHERE ON WINDSHIELD AND/OR DO NOT DEPRESS TO HIDDEN PARK POSITION WHEN TURNED "OFF" (HI AND LO SPEEDS O.K.).

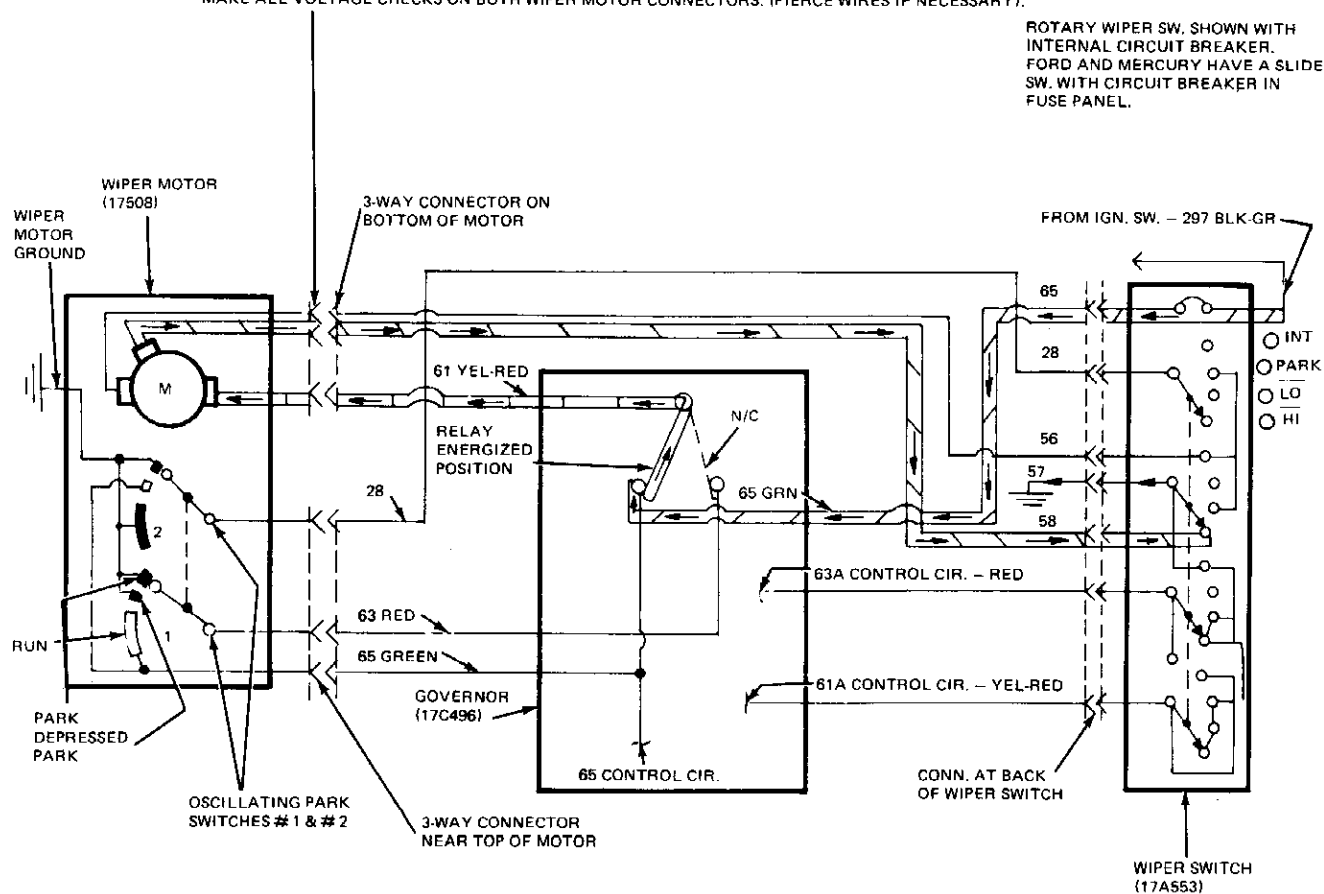
- CHECK FOR VOLTAGE ON # 65 MOTOR CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK. IF # 65 MOTOR CIRCUIT HAS VOLTAGE, PERFORM STEP "B".
- CHECK # 63 MOTOR CIRCUIT FOR VOLTAGE. IF # 63 MOTOR CIRCUIT HAS VOLTAGE—LOCATE AND REPAIR OPEN GROUND CIRCUIT. (INCLUDE # 2 CONTACTS IN WIPER MOTOR PARK SWITCH AS PART OF GROUND CIRCUIT). IF # 63 MOTOR CIRCUIT DOES NOT HAVE VOLTAGE, PERFORM WIPER MOTOR COVER AND SWITCH TEST AS SHOWN IN SECTION 35-60-16.
- IF COVER AND SWITCH TEST ARE O.K., THEN THE SYSTEM HAS AN OPEN GROUND CIRCUIT THROUGH WIPER SWITCH OR WIPER MOTOR DEPRESSED PARK OUTPUT ARM ASSEMBLY IS FAULTY.
 - IF WIPER MOTOR CAN BE HEARD TO RUN FOR A FEW MOMENTS AFTER WIPER SWITCH IS TURNED TO "OFF", REPAIR WIPER MOTOR OUTPUT ARM ASSEMBLY PER SECTION 35-60-16, 17, 18.
 - IF WIPER MOTOR STOPS RUNNING THE INSTANT WIPER SWITCH IS TURNED "OFF," REPAIR OPEN GROUND CIRCUIT OR REPLACE WIPER SWITCH (17A553).

**WINDSHIELD WIPER SYSTEM "B" MOTOR — INTERVAL SELECT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO**

HI-SPEED OPERATION — PLACE WIPER SWITCH INTO "HI" POSITION. CURRENT FLOW IS FROM IGN. SWITCH TO CIRCUIT BREAKER, ACROSS CIRCUIT BREAKER AND DOWN #65 CIRCUIT (GREEN), DIRECTLY TO GOVERNOR ENERGIZED RELAY POINT. UP ENERGIZED RELAY POINTS AND DOWN #61 CIRCUIT TO WIPER MOTOR COMMON BRUSH. ACROSS MOTOR ARMATURE AND OUT #58 CIRCUIT (HI BRUSH) TO WIPER SWITCH. ACROSS WIPER SWITCH CONTACTS TO GROUND. (THE MOTOR GROUND IS NOT UTILIZED FOR RUN CIRCUITS).

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION).

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY).



ROTARY WIPER SW. SHOWN WITH INTERNAL CIRCUIT BREAKER. FORD AND MERCURY HAVE A SLIDE SW. WITH CIRCUIT BREAKER IN FUSE PANEL.

HI-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND THE WIPER SWITCH IN "HIGH" POSITION FOR ALL WIPER MOTOR OPERATION TESTS.

- IF VOLTAGE IS ON THE #61 MOTOR CIRCUIT, WITH THE WIPER SWITCH IN THE "HI" POSITION, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE #58 MOTOR CIRCUIT. IF THE MOTOR RUNS, REPAIR THE WIPER SWITCH GROUND CIRCUIT OR REPLACE THE WIPER SWITCH. IF THE MOTOR DOES NOT RUN, REPAIR MOTOR PER SECTION 35-60-16, 17, 18.
- IF VOLTAGE IS ON THE #65 MOTOR CIRCUIT ONLY, ELECTRICALLY GROUND CONTROL CIRCUITS #61A & 63A NEAR THE WIPER SWITCH. IF #61 MOTOR CIRCUIT NOW HAS VOLTAGE, PERFORM STEP "A". IF MOTOR CIRCUIT #61 DOES NOT HAVE VOLTAGE, REPLACE GOVERNOR.
- IF NO VOLTAGE ON #65 CIRCUIT, TRACE THE CIRCUIT BACK.

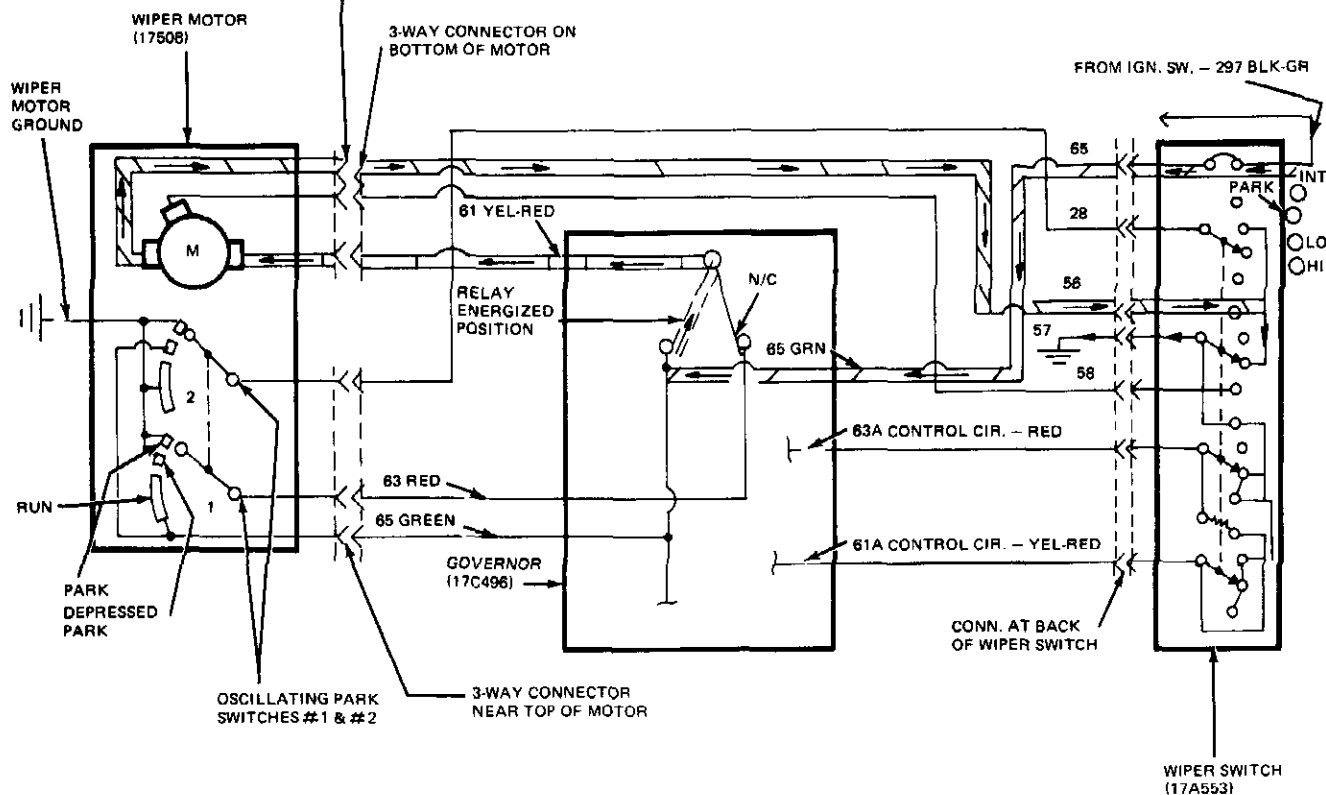
WINDSHIELD WIPER SYSTEM "B" MOTOR — INTERVAL SELECT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

LOW-SPEED OPERATION — PLACE THE WIPER SWITCH INTO THE "LOW" POSITION. CURRENT FLOW IS FROM THE IGN. SWITCH TO THE CIRCUIT BREAKER, ACROSS THE CIRCUIT BREAKER AND DOWN THE #65 CIRCUIT (GREEN), DIRECTLY TO THE GOVERNOR ENERGIZED RELAY CONTACT POSITION. UP THE ENERGIZED RELAY POINTS AND DOWN THE #61 CIRCUIT TO WIPER MOTOR COMMON BRUSH. ACROSS MOTOR ARMATURE AND OUT #56 CIRCUIT (BLUE-ORG) TO THE WIPER SWITCH. ACROSS THE WIPER SWITCH CONTACTS TO GROUND. (THE MOTOR GROUND IS NOT UTILIZED FOR RUN CIRCUITS).

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY).

ROTARY WIPER SW. SHOWN WITH INTERNAL CIRCUIT BREAKER. FORD AND MERCURY HAVE A SLIDE SW. WITH CIRCUIT BREAKER IN FUSE PANEL.



LOW-SPEED TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND THE WIPER SWITCH IN "LOW" POSITION FOR ALL WIPER OPERATION TESTS.

- IF VOLTAGE IS ON THE #61 MOTOR CIRCUIT WITH THE WIPER SWITCH IN THE "LOW" POSITION, USE A JUMPER WIRE AND ELECTRICALLY GROUND THE #56 MOTOR CIRCUIT. IF THE MOTOR RUNS, REPAIR WIPER SWITCH GROUND CIRCUIT OR REPLACE THE WIPER SWITCH. IF THE MOTOR DOES NOT RUN, REPAIR MOTOR PER SECTION 35-60-16, 17, 18. (IF BRUSHES ARE REQUIRED: USE PART 17B583).
- IF VOLTAGE IS ON THE #65 MOTOR CIRCUIT ONLY, ELECTRICALLY GROUND CONTROL CIRCUITS #61A AND #63A NEAR THE WIPER SWITCH. IF MOTOR CIRCUIT #61 NOW HAS VOLTAGE, PERFORM STEP "A". IF MOTOR CIRCUIT #61 DOES NOT HAVE VOLTAGE, REPLACE GOVERNOR.
- IF NO VOLTAGE ON #65 CIRCUIT, TRACE THE CIRCUIT BACK.

WINDSHIELD WIPER SYSTEM "B" MOTOR — INTERVAL SELECT

COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

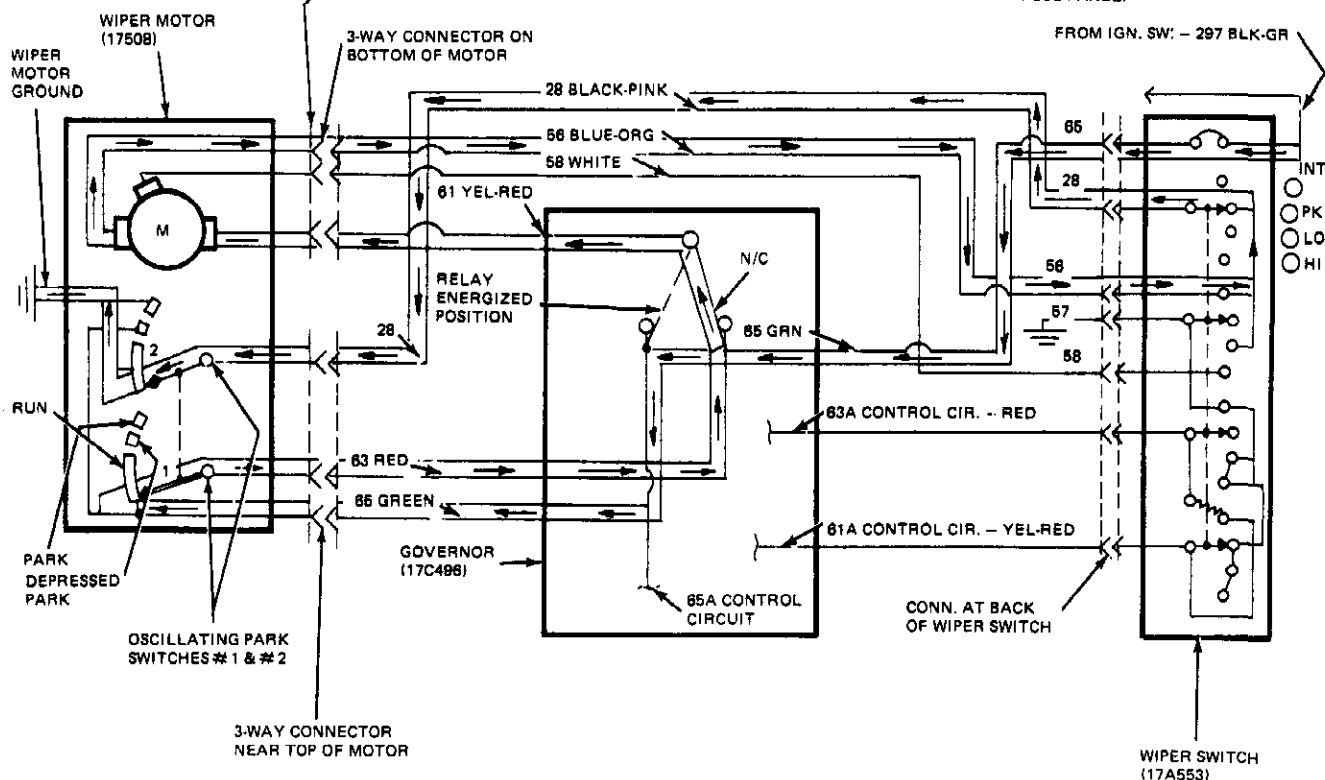
PARK CIRCUIT OPERATION — DURING NORMAL RUNNING OF MOTOR (HIGH & LOW SPEEDS), TWO SETS OF MOTOR PARK SWITCH CONTACTS ATTACHED TO THE # 28 AND # 63 CIRCUITS INSIDE THE MOTOR OSCILLATE BETWEEN THE (RUN CONTACTS) AND (DEPRESSED PARK CONTACTS) WHEN THE MOTOR ARMATURE IS ROTATING. THE (PARK CONTACTS) OF BOTH SWITCHES # 1 & # 2 ARE NOT UTILIZED UNTIL THE MOTOR HAS STOPPED AT THE END OF THE DEPRESSED PARK CYCLE.

WHEN THE WIPER SWITCH IS TURNED "OFF" CURRENT FLOWS FROM THE # 65 CIRCUIT, THROUGH THE # 1 WIPER MOTOR PARK SWITCH CONTACTS (RUN) TO THE # 63 CIRCUIT, THROUGH THE GOVERNOR N/C RELAY CONTACTS, THROUGH THE WIPER SWITCH TO # 61 CIRCUIT (COMMON BRUSH), ACROSS THE MOTOR ARMATURE AND OUT THE # 56 CIRCUIT (LOW BRUSH), INTO THE WIPER SWITCH AND OUT THE # 28 CIRCUIT, THROUGH THE # 2 WIPER MOTOR PARK SWITCH CONTACTS (RUN) WHICH ARE AT GROUND. THE MOTOR CONTINUES TO RUN UNTIL THE WIPER BLADES REACH THE LOW END OF THEIR STROKE. THE # 1 SET OF CONTACTS CHANGE TO GROUND AND # 2 SET OF CONTACTS CHANGE TO B+. THIS WILL STOP THE MOTOR'S FORWARD ROTATION AND START THE MOTOR ROTATING FOR THE DEPRESSED PARK (HIDDEN WIPERS) POSITION.

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY)

ROTARY WIPER SW. SHOWN WITH INTERNAL CIRCUIT BREAKER. FORD AND MERCURY HAVE A SLIDE SW. WITH CIRCUIT BREAKER IN FUSE PANEL.

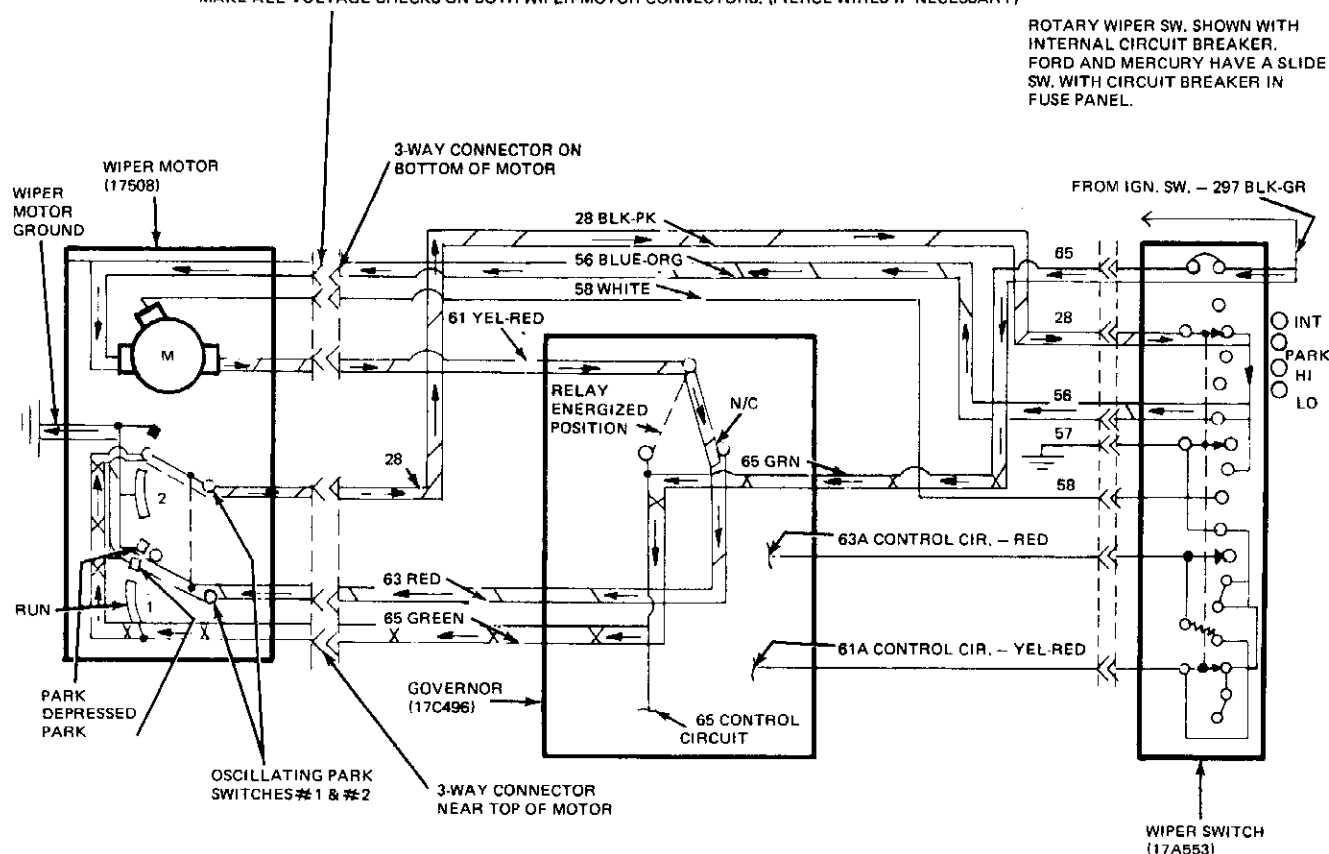


**WINDSHIELD WIPER SYSTEM "B" MOTOR — INTERVAL SELECT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO**

DEPRESSED PARK POSITION — WITH #1 SET OF CONTACTS AT GROUND AND #2 CONTACTS AT B+ (DEPRESSED PARK POSITION), CURRENT FLOWS IN THE OPPOSITE DIRECTION THROUGH THE MOTOR ARMATURE AND THE WIPER BLADES START TO GO INTO THE DEPRESSED PARK POSITION. CURRENT FLOWS FROM #65 CIRCUIT (B+) ACROSS THE WIPER MOTOR #2 POINTS INTO #28 CIRCUIT TO THE WIPER SWITCH. OUT THE WIPER SWITCH ON #56 CIRCUIT TO THE MOTOR LOW BRUSH, ACROSS THE ARMATURE AND OUT #61 CIRCUIT (COMMON BRUSH) TO THE GOVERNOR N/C RELAY CONTACTS, THROUGH THE GOVERNOR CONTACTS TO THE WIPER SWITCH, THROUGH THE WIPER SWITCH TO #63 CIRCUIT AND #1 WIPER MOTOR PARK SWITCH CONTACTS WHICH ARE NOW AT GROUND. WHEN THE WIPER BLADES REACH THE LOW END OF THE HIDDEN PARK POSITION, THE #1 AND #2 PARK CONTACTS ARE MOVED TO WIPER MOTOR GROUND (PARK POSITION) AND THE MOTOR AND BLADES STOP IN THE HIDDEN PARK POSITION.

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS. (PIERCE WIRES IF NECESSARY)



PARK TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "OFF" POSITION FOR ALL WIPER MOTOR OPERATION TESTS.

IF WIPERS STOP ANYWHERE ON WINDSHIELD AND/OR DO NOT DEPRESS TO HIDDEN PARK POSITION WHEN TURNED "OFF" (HI AND LOW SPEEDS O.K.)

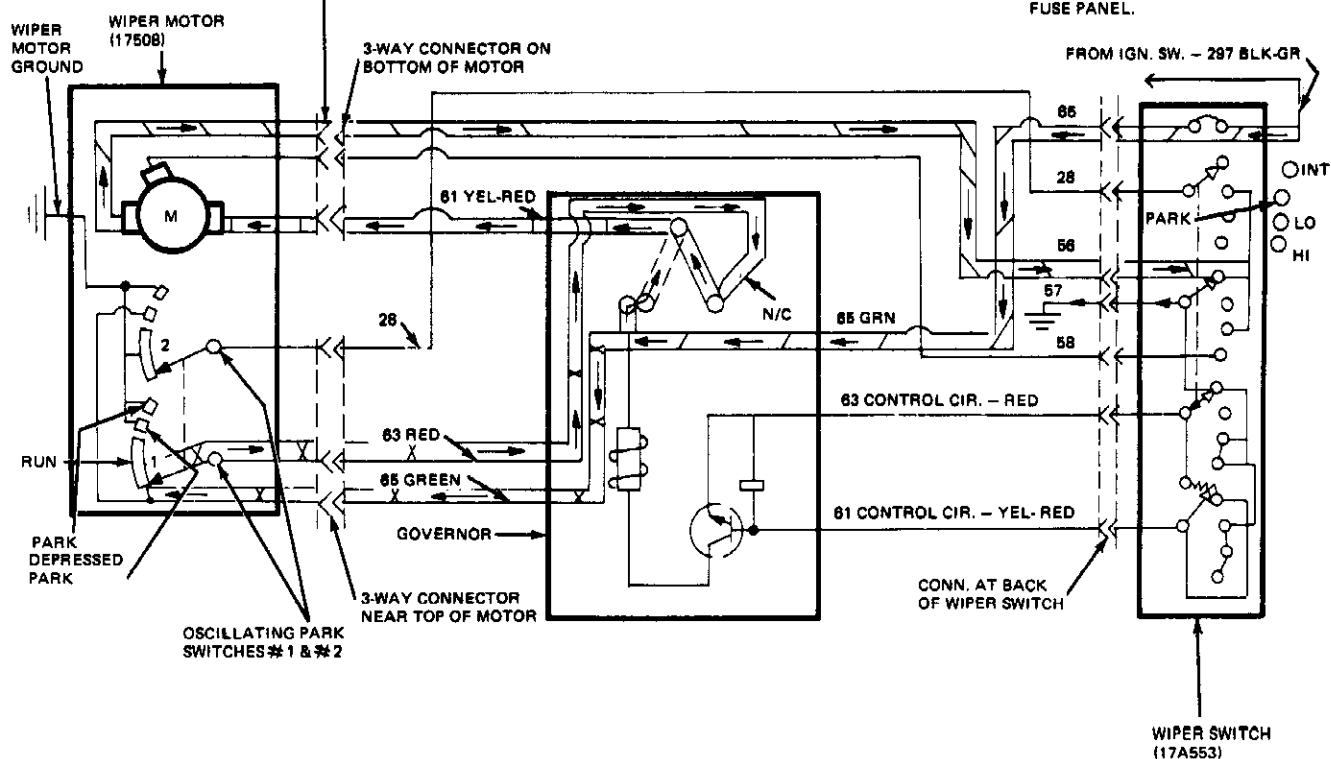
- A. CHECK FOR VOLTAGE ON #65 MOTOR CIRCUIT. IF NO VOLTAGE, TRACE CIRCUIT BACK. IF #65 MOTOR CIRCUIT HAS VOLTAGE, PERFORM STEP "B".
- B. CHECK #63 MOTOR CIRCUIT FOR VOLTAGE. IF #63 MOTOR CIRCUIT HAS VOLTAGE—LOCATE AND REPAIR OPEN GROUND CIRCUIT. (INCLUDE #2 CONTACTS IN WIPER MOTOR PARK SWITCH AS PART OF GROUND CIRCUIT). IF #63 MOTOR CIRCUIT DOES NOT HAVE VOLTAGE, PERFORM WIPER MOTOR COVER AND SWITCH TEST AS SHOWN IN SECTION 35-60-16.
- C. IF COVER AND SWITCH TEST ARE O.K. THEN THE FAULT IS AN OPEN GROUND CIRCUIT THROUGH WIPER SWITCH, INTERVAL SELECT GOVERNOR, OR WIPER MOTOR DEPRESSED PARK OUTPUT ARM ASSEMBLY.
 1. IF WIPER MOTOR CAN BE HEARD TO RUN FOR A FEW MOMENTS AFTER WIPER SWITCH IS TURNED TO "OFF", REPAIR WIPER MOTOR OUTPUT ARM ASSEMBLY PER SECTION 35-60-16, 17, 18.
 2. IF WIPER MOTOR STOPS RUNNING THE INSTANT WIPER SWITCH IS TURNED TO "OFF", DISCONNECT BOTH CONNECTORS TO WIPER MOTOR AND WITH A TEST LIGHT, CHECK FOR CONTINUITY THROUGH N/C GOVERNOR CONTACTS (DE-ENERGIZED), BETWEEN #63 CIRCUIT AND #61 CIRCUIT. IF NO CONTINUITY, REPLACE GOVERNOR ASSEMBLY. IF TEST LIGHT ILLUMINATES REPLACE WIPER SWITCH.

WINDSHIELD WIPER SYSTEM "B" MOTOR - INTERMITTENT
COUGAR—LTD II—MARK V—THUNDERBIRD—LINCOLN—FORD—MERCURY—RANCHERO

INTERVAL SELECT OPERATION — THE INTERVAL MODE OF OPERATION IS A COMBINATION OF LOW SPEED AND A MODIFIED PARK OPERATION CONTROLLED IN A SEQUENTIAL MANNER BY THE INTERVAL SELECT GOVERNOR. ASSUME THE WIPERS ARE IN PARK POSITION. WHEN THE WIPER SWITCH IS PLACED IN THE "INT" MODE THE MOTOR OSCILLATING PARK SWITCH CONTACTS ARE AT GROUND AND THE GOVERNOR RELAY IS ENERGIZED TO CONNECT CIRCUITS #65 AND #61. CURRENT FLOW IS FROM THE #65 CIRCUIT, THROUGH THE ENERGIZED RELAY CONTACTS TO CIRCUIT #61, TO THE WIPER MOTOR COMMON BRUSH, ACROSS THE MOTOR ARMATURE, OUT THE WIPER MOTOR LOW SPEED BRUSH TO CIRCUIT #56, THROUGH THE WIPER SWITCH, TO CIRCUIT #57 WHICH IS GROUND. THE WIPER MOTOR STARTS TO ROTATE AT LOW SPEED. AS THE WIPER BLADES LEAVE THE "HIDDEN" PARK POSITION AND MOVE UP TO THE LOW END OF THE STROKE POSITION THE OSCILLATING PARK SWITCH CONTACT #1 OF THE WIPER MOTOR MOVES TO THE POSITION WHERE IT CONNECTS CIRCUITS #63 AND #65. CURRENT FLOWS FROM #65 CIRCUIT THRU #1 POINTS TO #63 CIRCUIT CAUSING THE GOVERNOR RELAY POINTS TO MOVE TO THE N/C POSITION (DE-ENERGIZED) MAKING THE CONNECTION BETWEEN CIRCUITS #63 AND #61. CURRENT CONTINUES TO FLOW TO WIPER MOTOR ARMATURE AS BEFORE EXCEPT CURRENT SOURCE IS NOW CIRCUIT #63 INSTEAD OF #65. THE MOTOR CONTINUES TO RUN IN LOW SPEED MODE UNTIL WIPER BLADES REACH THE "DOWN" END OF THE STROKE AT WHICH TIME #1 PARK SWITCH CONTACT MOVES TO GROUND CAUSING MOTOR TO STOP. NOW THE CONTROL CIRCUIT LEAVES THE GOVERNOR RELAY CONTACTS ON CIRCUIT #63 (WHICH IS NOW GROUND) UNTIL THE CONTROL CIRCUIT TIMES OUT. THEN THE CONTROL CIRCUIT CHANGES THE GOVERNOR RELAY CONTACTS TO THE #65 CIRCUIT (B+) AND LOW SPEED INTERMITTENT IS STARTED AGAIN.

(ARROWS INSIDE DOUBLE LINE DENOTE CURRENT FLOW DIRECTION)

MAKE ALL VOLTAGE CHECKS ON BOTH WIPER MOTOR CONNECTORS.



ROTARY WIPER SW. SHOWN WITH INTERNAL CIRCUIT BREAKER. FORD AND MERCURY HAVE A SLIDE SW. WITH CIRCUIT BREAKER IN FUSE PANEL.

INTERVAL TEST

NOTE: IGNITION SWITCH MUST BE "ON" AND WIPER SWITCH IN THE "INTERMITTENT" POSITION FOR ALL WIPER OPERATION TESTS.

- A. IF THE MOTOR RUNS CONTINUOUSLY IN LOW SPEED WITH THE WIPER SWITCH IN MAXIMUM "INT" POSITION. CHECK THE #63 MOTOR CIRCUIT FOR VOLTAGE. IF NO VOLTAGE ON THE #63 MOTOR CIRCUIT, PERFORM WIPER MOTOR & SWITCH TEST AS SHOWN IN SECTION 35-60-16.
- B. IF #63 MOTOR CIRCUIT HAS VOLTAGE, REPLACE GOVERNOR.

TESTING

WIPER MOTOR CURRENT DRAW—NON-DEPRESSED PARK

Pinto, Bobcat, Fairmont, Zephyr, Mustang II, Granada, Monarch and Versailles

Disconnect the battery. Disconnect the linkage from the motor and disconnect the electrical plug to test the motor on the vehicle. Connect the green lead from the test equipment to the battery positive post (Fig. 1). Connect the positive (red) lead from the tester first to the low speed connection and then to the high speed connections at the connector plug as shown. In either case, the current draw should not exceed 3 amperes.

WIPER MOTOR CURRENT DRAW—DEPRESSED PARK

Ford, Mercury, LTD II, Cougar, Lincoln Continental, Thunderbird and Continental Mark V

The Windshield Wiper Motor Tests can be performed with the wiper motor installed in the vehicle with linkage disconnected or on the bench.

The motor terminals are too small to make the necessary test connections without using connector sleeves and wires between the motor terminals and the test equipment as shown in Fig. 2. The connector sleeves (available in Kit No. C4AZ-14294 or equivalent) should be crimped onto both ends of the wires.

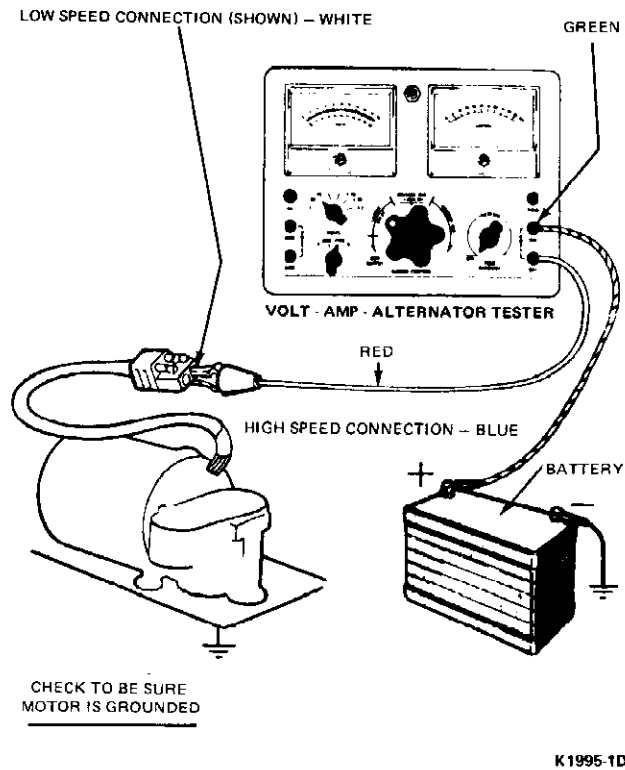


FIG. 1 Wiper Motor Current Draw Test Connections

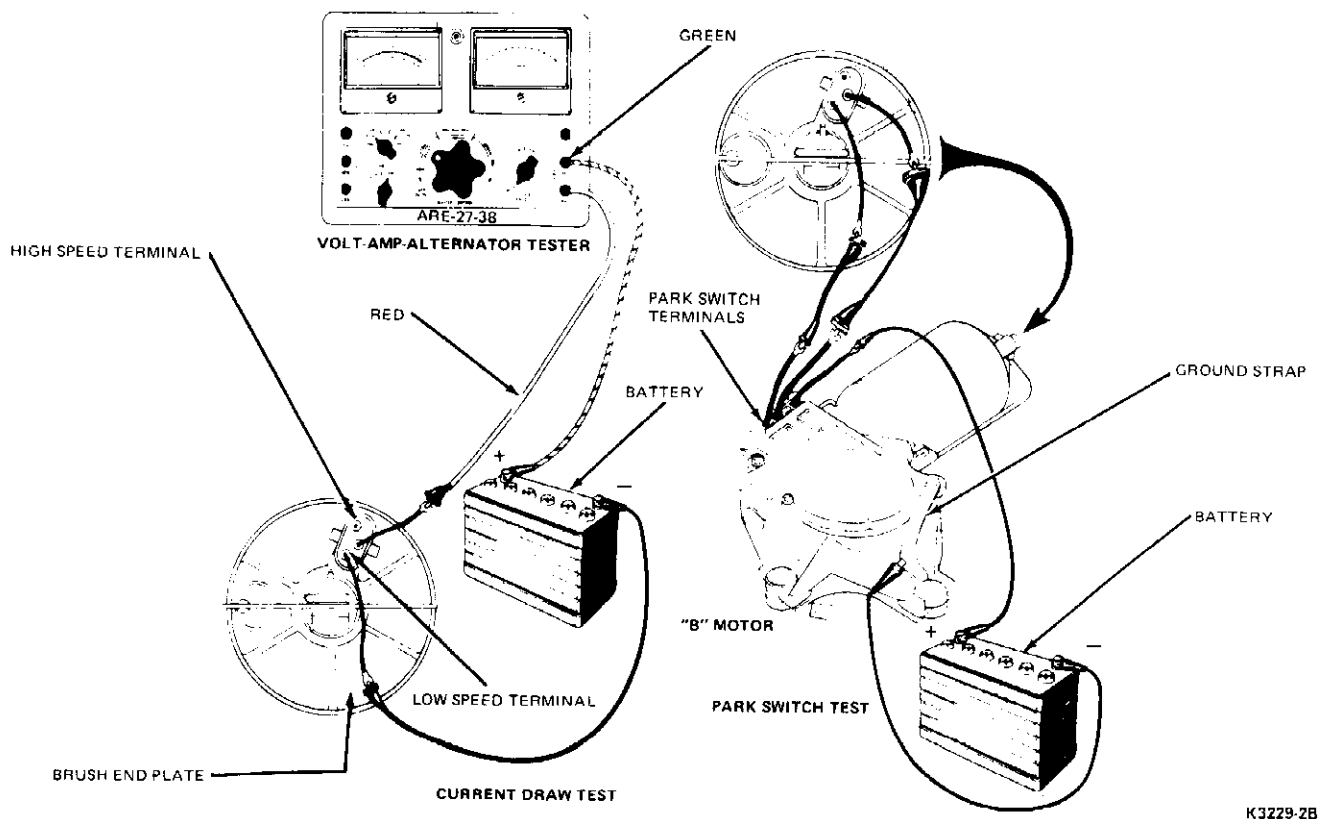


FIG. 2 Windshield Wiper Motor Tests—Depressed Park Type

Connect the positive (red) lead from the test equipment to the center terminal on the motor end plate, and connect the green lead from the tester to the battery positive post (Fig. 2). Connect a jumper wire from the battery negative post to the low speed terminal on the motor end plate and read the current draw. Move the jumper wire from the low speed terminal to the high speed terminal, and read the high speed current draw. In either case, the current draw should not exceed 3.5 amperes. If the current draw does exceed 3.5 amperes, check the output arm and windlatch mechanism for binding or damage, before replacing the motor.

INTERMITTENT GOVERNOR

For component location of intermittent governor, refer to Fig. 3.

CIRCUIT BREAKER TEST

The circuit breaker is located in the wiper control switch, except Ford and Mercury which has an 8-1/4 amp circuit breaker in the fuse panel and Mustang II, Granada, Monarch, Versailles, Fairmont and Zephyr which has a 6-amp circuit breaker in the fuse panel.

All rotary pin terminal switches have a circuit breaker rating of 8-1/4 amps and all rotary blade terminal switches have a rating of 7 amps. All slide and column-mounted switches are without circuit breakers.

Two separate tests are necessary to check for correct circuit breaker operation. On Mustang II, Granada, Monarch, Ford, Mercury, Versailles, Fairmont and Zephyr, remove the circuit breaker from the fuse panel and connect the tester leads to the circuit breaker.

Test 1

1. Before connecting the switch to the volt-amp tester as shown in Fig. 4, short the tester leads together and adjust the current draw, until it equals the circuit breaker rating.
2. Connect the switch to the tester as shown in Fig. 4. Leave the switch connected to the tester for ten minutes. Hold the current reading on the ammeter

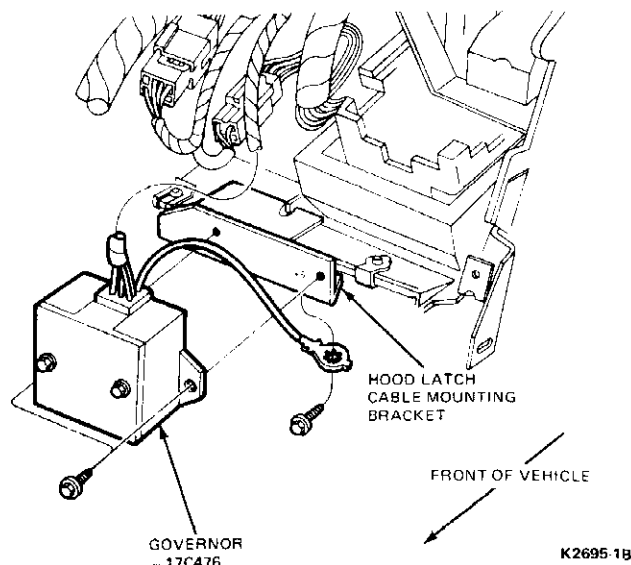


FIG. 3 Windshield Wiper Intermittent Governor

at the rated current. If the circuit breaker opens during the ten minutes, replace the wiper switch assembly. On Mustang II, Ford, Mercury, Granada, Monarch, Versailles, Fairmont and Zephyr replace the circuit breaker.

Test 2

1. Short the tester leads together and adjust the current draw until it is twice the rated current.
2. Connect the switch as shown in Fig. 3. Hold the current reading on the ammeter at twice the rated current.

The current reading on the ammeter should drop to zero within 30 seconds. If it takes longer than 30 seconds for the circuit breaker to open (current reading drops to zero), replace the wiper switch assembly. On Mustang II, Ford, and Mercury, replace the circuit breaker.

WIPER SWITCH CONTINUITY TEST

Check the continuity between the switch terminals as shown in Figs. 5 and 6. Either a self-powered test light or an ohmmeter can be used to test a standard two-speed switch. An ohmmeter must be used to test a switch used with the intermittent wiper system.

To detect marginal operation of the switch, rotate the switch control knob while each reading is being taken.

If the switch does not exhibit continuity as shown in Figs. 5 and 6, or if poor continuity exists in any switch position, replace the switch.

PARKING TEST—NON-DEPRESSED PARK

Pinto, Bobcat, Fairmont, Zephyr, Granada, Monarch, Versailles and Mustang II

Stop the wiper system with the ignition switch so that the wiper blades are not in park position. Connect jumper wires as shown in Fig. 7. The wipers should not run more than one full cycle and then park. If the motor will not park or will not run to park position, replace

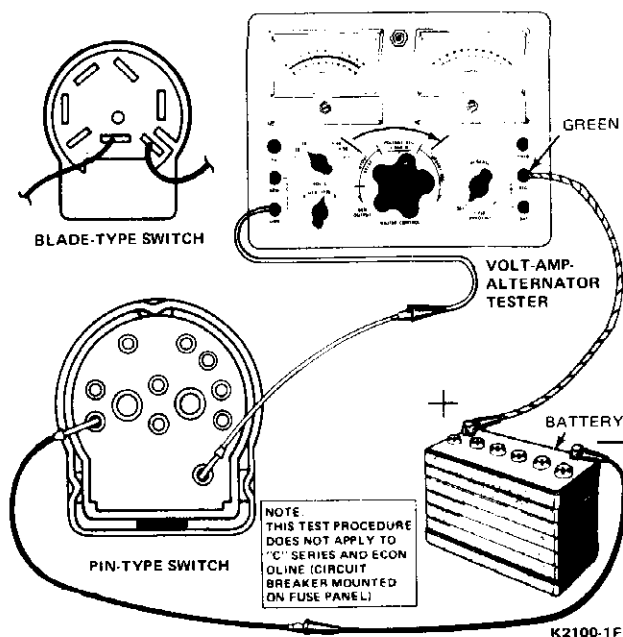
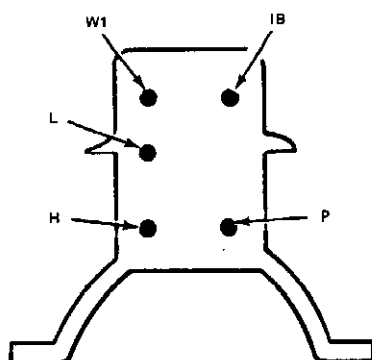


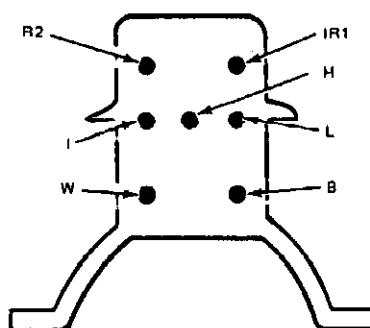
FIG. 4 Circuit Breaker Test

FAIRMONT AND ZEPHYR



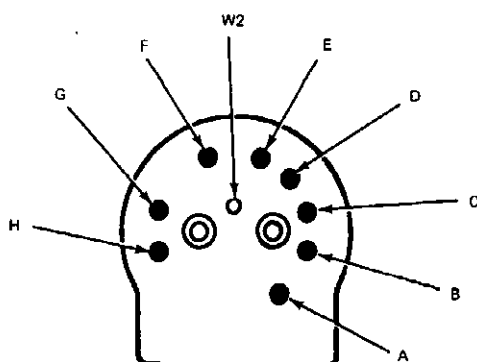
STANDARD

SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	P-L
LOW	B-L
HIGH	B-H
WASH	B-W



INTERVAL

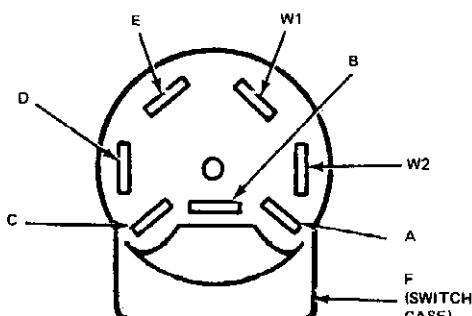
SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	--
LOW	B-L
HIGH	B-H-L
INTERMITTENT	B-I VARIABLE RESISTANCE BETWEEN R1 AND R2: MIN. 300 MAX. 15,000
WASH	B-W

PIN-TYPE SWITCH
STANDARD EQUIPMENT (2-SPEED)

SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF (PARK)	B-C A-H F-G
LOW	C-D
WASH	A-G-H W, W2

INTERVAL

SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF (PARK)	B-C A-H F-G C-D-F-G
LOW	A-H
HIGH	D-E-F-G A-H
INTERMITTENT	A-H C-D-F-G VARIABLE RESISTANCE BETWEEN F AND G: MIN. 100-900 OHMS MAX. 5600-8400 OHMS
WASH	W1-W2



BLADE-TYPE SWITCH (2-SPEED)

SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF (PARK)	C-D A-B
LOW	A-B-C
HIGH	A-B-E
WASH	W1-W2

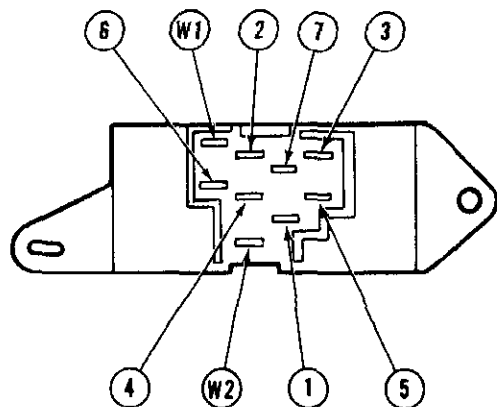
INTERVAL

SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF (PARK)	A-B D-E
LOW	A-B D-E-F
HIGH	D-E-F A-B-C
INTERMITTENT	E-F A-B VARIABLE RESISTANCE BETWEEN D AND E: MIN. 480-720 OHMS MAX. 5600-8400 OHMS

FIG. 5 Wiper Switch Continuity Test

SLIDE WIPER/WASHER SWITCH
CONTINUITY TEST

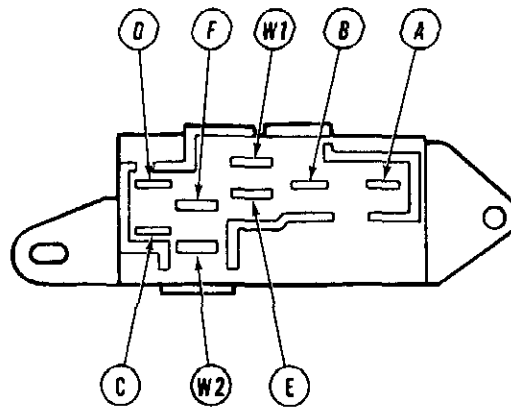
STANDARD SWITCH



SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	1-5, 3-7
LO	1-4, 2-7
HI	1-4, 2-6
WASH	W1-W2

* RESISTANCE BETWEEN TERMINALS F AND C VARIES FROM 500Ω ± 400 Ω AT MIN. DWELL TO 8 TO 13 KΩ AT MAX. DWELL

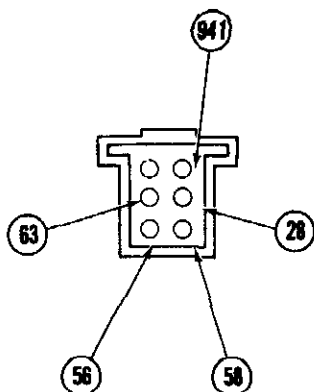
INTERMITTENT SWITCH



SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	A-E
INT.	B-E-F, *
LO	B-E-F-C
HI	D-B-F-C
WASH	W1-W2

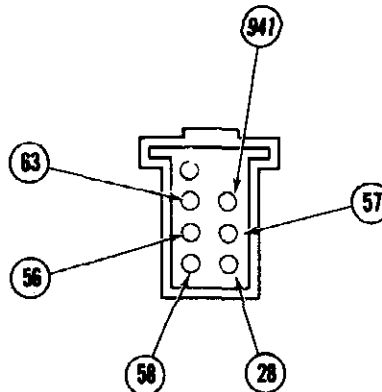
COLUMN-MOUNTED WIPER SWITCH
CONTINUITY TEST

STANDARD



SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	28 AND 58
LOW	58 AND 63
HI	63 AND 56
WASH	941 AND 950

INTERVAL

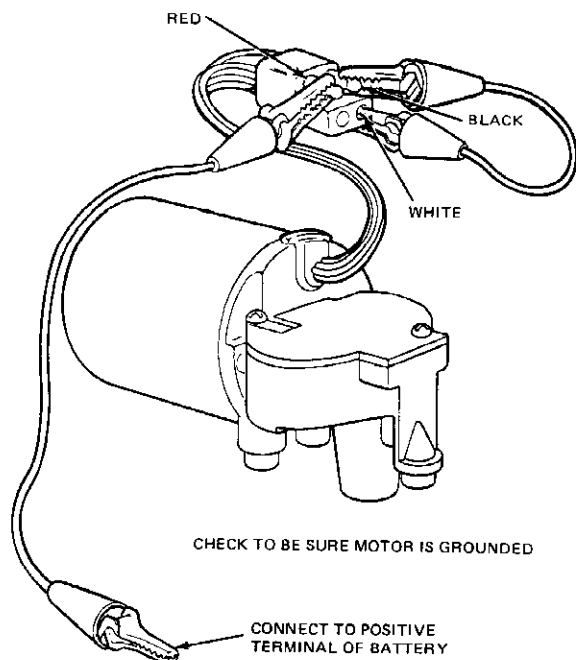


SWITCH POSITION	CONTINUITY BETWEEN TERMINALS
OFF	58 AND 63 - 28 AND 63*
INT	58 AND 63
LOW	58 AND 63 - 28 AND 57
HIGH	63 AND 56 - 28 AND 57
WASH	941 & 950

*RESISTANCE BETWEEN TERMINALS 63 AND 57, WITH THE SLIDE SWITCH IN THE OFF POSITION VARIES FROM 1500 Ω / 3000 Ω AT MINIMUM DWELL TO 28,000 Ω / 42,000 Ω AT MAXIMUM DWELL.

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FIG. 6 Windshield Wiper/Washer Switch Continuity Test



K2494-1A

FIG. 7 Parking Test—Non-Depressed Park

the motor. If the motor stops, check the windshield wiper manual control switch and the wiring for continuity.

ADJUSTMENTS

ARM AND BLADE ASSEMBLY

Remove the arm and blade assemblies from the pivot shafts. See Removal and Installation. Turn on the wiper switch, allow the motor to move the pivot shafts three or four cycles, and then turn off the wiper switch. This will place the pivot shafts in park position.

Install the arm and blade assemblies on the pivot shafts to dimension X, as shown in Fig. 8. See Removal

PARKING TEST—DEPRESSED PARK

Ford, Mercury, LTD II, Cougar, Lincoln Continental, Thunderbird and Continental Mark V

After the current Draw Test, the leads should be disconnected from the motor, so that the output arm stops approximately 90 degrees past the park position for this test.

Using the appropriate connector sleeves and wires, make electrical connections to the motor from a 12-volt battery as shown in Fig. 2. With this hookup, the motor output arm should move in the following cycle:

Rotate in the normal direction.

Reverse direction of rotation for approximately 10 degrees to 15 degrees.

Stop rotating while the crank pin is moved radially outward in a semicircular motion.

Stop in the final park position with the current draw going to zero.

If the output arm rotates in the reverse direction more than 15 degrees or if the motor stalls or jams while the output arm is rotating in the reverse direction, replace the arm and windlatch assembly with the appropriate kit.

If the motor does not run or does not park, check the wiring connections at the motor before removing the motor from the vehicle.

For any other deviation from the above cycle, replace the gear cover and switch assembly with the appropriate kit.

and Installation. Dimension X is the distance between the centerline of the blade saddle and the edge of the glass on LTD II, Ford, Mercury, Thunderbird, Continental Mark V, Cougar and Lincoln Continental. On Monarch, Granada, Fairmont, Zephyr, Versailles Pinto, Bobcat and Mustang II, dimension X is the distance between the windshield lower moulding or weatherstrip and the blade saddle centerline. The value of dimension X for each carline is given in Fig. 9.

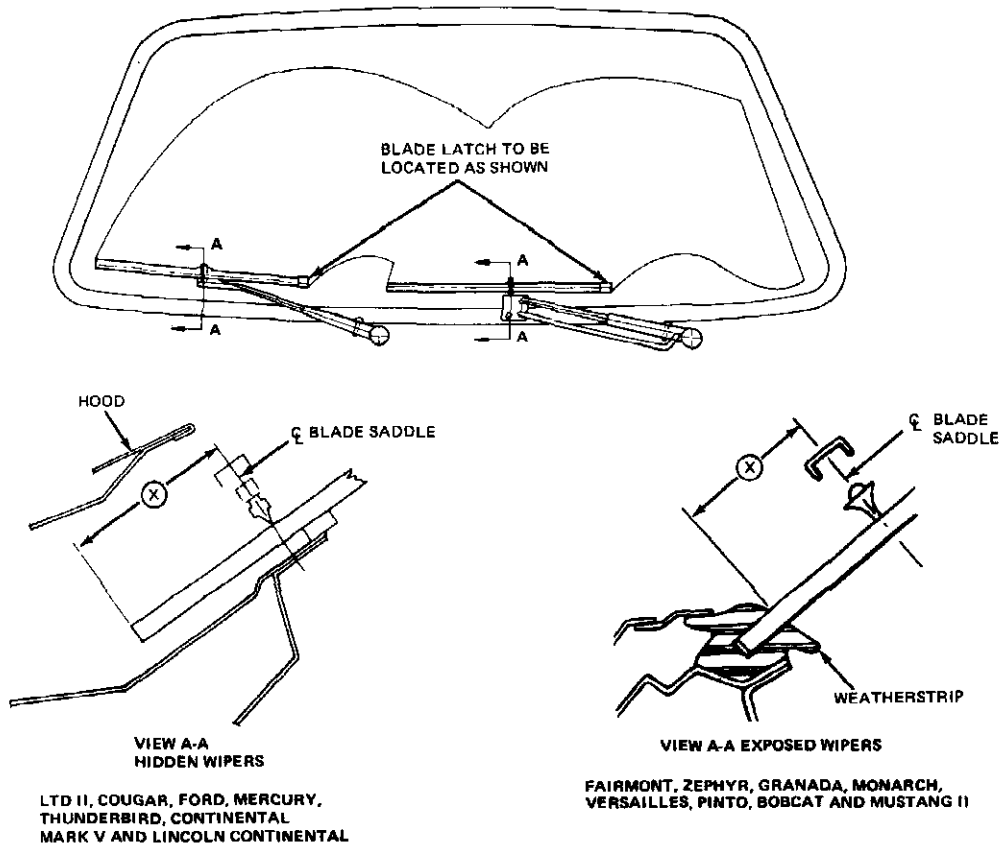


FIG. 8 Adjustment of Wiper Arm and Blade Assembly

Car Line	Dimension x (inches)	
	Drivers Side	Passenger Side
Cougar and LTD II (Depressed Park) Thunderbird	1/4 to 1-5/8	0 to 1-3/8
Fairmont, Zephyr	2.00 to 3.20	2.30 to 3.50
Mustang II	2-1/8 to 3-1/4	2-1/4 to 3-1/2
Ford, Meteor, Mercury	0.00 to 1.38	0.00 to 1.38
Continental Mark V	+1 to -1/4	+1 to -1/4
Lincoln Continental	0.00 to 1.38	0.00 to 1.38
Pinto, Bobcat	2.38-3.38	2.5-3.5
Granada, Monarch, Versailles	2.50 to 3.75	2.00 to 3.25

FIG. 9 Values of Dimension X for Correct Arm and Blade Assembly Adjustment

REMOVAL AND INSTALLATION

WIPER MOTOR

When installing the drive arm to a new motor, be sure to follow the instructions included in the new motor kit.

The internal permanent magnets used in the wiper motor are a ceramic (glass-like) material. Care must be exercised in handling the motor to avoid damaging the magnets. The motor must not be struck or tapped with a hammer or other object.

Ford, Mercury, LTD II, Cougar, Lincoln Continental, Thunderbird and Continental Mark V—Depressed Park

Removal

1. Disconnect the battery ground cable.
2. Remove the wiper arm and blade assemblies from the pivot shafts.
3. Remove the left cowl screen for access through the cowl opening.
4. Disconnect the linkage drive arm from the motor output arm crankpin by removing the retaining clip.
5. From the engine side of the dash, disconnect the two (push-on) wire connectors from the motor.
6. Remove the three bolts that retain the motor to the dash and remove the motor. If the output arm catches on the dash during removal, hand turn the

arm clockwise, so that it will clear the opening in the dash.

Before installing the motor, be sure that the output arm is in park position.

Granada, Monarch, and Versailles—Non-Depressed Park

Removal

1. Disconnect the battery ground cable.
2. Remove instrument panel pad (8 screws).
3. Remove speaker mounting bracket (3 screws). Disconnect speaker and remove.
4. Remove defroster nozzle and air distribution duct (4 screws).
5. Remove interlock module from bracket (2 screws) and disconnect multiple connector.
6. Remove motor bracket to cowl bolts and drive arm clip.

Installation

1. Transfer the drive arm and motor bracket (1 nut).
2. Install motor, including arm and clip, and connect electrical lead.
3. Install interlock module to bracket (2 screws) and connect air distribution duct and defroster nozzle.
4. Position speaker and bracket assembly. Install with 3 screws and connect speaker lead.
5. Reinstall instrument panel pad (8 screws) and connect battery cables.
6. Test wiper motor operation.

Fairmont and Zephyr

1. Disconnect the battery ground cable.
2. Remove left-hand wiper arm from pivot shaft and lay on cowl top grille.
3. Remove cowl top grille screws.
4. Raise forward left-hand corner of cowl top grille for access to linkage drive arm.
5. Disconnect the linkage drive arm from motor output crank arm pin by removing retaining clip.
6. Disconnect wiper motor wire connector.
7. Remove bolts that retain motor to cowl panel and remove motor.
8. To install, reverse above procedure.

Pinto, Bobcat and Mustang II

Removal

1. Loosen the two nuts and disconnect the wiper pivot shaft and link assembly from the motor drive arm ball (Pinto and Bobcat only). A link retaining clip is used on the Mustang II only.
2. Remove three motor attaching screws and lower the motor away from under the left side of the instrument panel.
3. Disconnect the wiper motor wires and remove the motor.

Installation

1. Position the wiper motor under the instrument panel and connect the motor wires.

2. Position the wiper motor to the dash panel and install the three attaching screws. Tighten the screws to 5-7 ft.-lbs. torque.
3. Position the wiper pivot shaft and link assembly to the motor drive arm ball, and tighten the two nuts. Tighten the nuts to 15-30 in.-lbs. (Pinto and Bobcat only). On the Mustang II only, install the retaining clip.
4. Test the wiper motor operation.

INTERMITTENT GOVERNOR

To locate the intermittent governor on: (a) Continental Mark V, remove the instrument panel pad as outlined in group 45; (b) Lincoln Continental, Ford, Mercury, Granada, Monarch, Versailles, Fairmont and Zephyr, reach behind the left side of instrument panel; (c) Pinto and Bobcat, remove fuse panel bracket (governor mounted on back side); (d) Cougar, LTD II and Thunderbird, remove two screws from under center of panel and lower governor.

WIPER SWITCH

Ford and Mercury

Disconnect the battery ground cable. Remove the wiper/washer and the headlamp switch control knobs. Remove the headlamp switch bezel. Remove the trim panel retaining screw and remove the panel. Remove the two wiper/washer switch retaining screws and pull the switch assembly rearward. Disconnect the multiple connector at the rear of the switch and remove the switch.

To install, connect the multiple connector to the rear of the switch. Position the switch and install the two retaining screws. Position the trim panel and install the retaining screw. Install the headlamp switch bezel. Install the wiper/washer and the headlamp switch control knobs and connect the battery ground cable. Check the operation of the switch.

Continental Mark V

Disconnect the battery ground cable and remove the cluster finish panel, as outlined in Group 33, Part 50. Remove the wiper switch mounting plate, and disconnect the switch and cigar lighter wiring. Remove the nut that attaches the switch to the mounting plate.

To install, position the switch to the mounting plate and install the attaching nut. Connect the switch and cigar lighter wiring, position the switch and bracket assembly and install the retaining screws. Install the instrument cluster finish panel and connect the battery ground cable.

Lincoln Continental

Disconnect the battery ground cable and remove the switch knob (Fig. 10). Remove the bezel nut, pull out the switch from underneath the panel, and remove the connector.

To install, connect the connector to the switch, position the switch and install the bezel nut. Then, install the switch knob, connect the battery ground cable and check the operation of the switch.

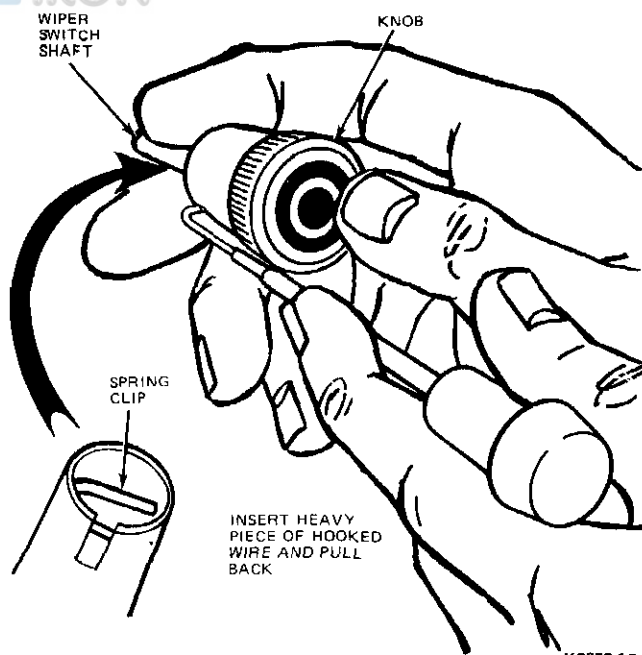


FIG. 10 Wiper Switch Knob Removal

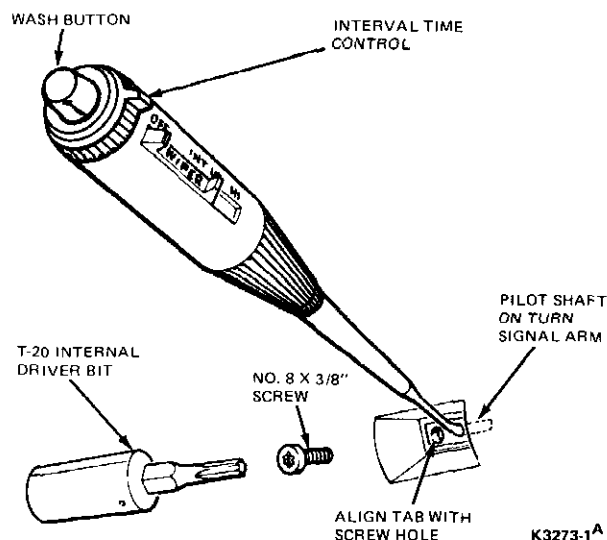


FIG. 11 Wiper Switch Removal

Thunderbird, Cougar and LTD II

Disconnect the battery ground cable and remove the switch knob (see Fig. 10). Remove the bezel nut, pull the switch assembly out of the mounting hole, and remove the connector.

To install, connect the connector to the wiper switch. Be sure that the main wiring harness shield is trapped between the switch and the instrument panel. Position the switch and install the bezel nut. Install the switch knob and connect the battery ground cable.

Pinto and Bobcat

Remove the instrument cluster, as outlined in Group 33, Part 50. Remove the windshield wiper control knob as shown in Fig. 10. Remove the switch bezel nut, unplug the connector from the switch and remove the switch.

To install, plug the connector on the switch, position the switch to the instrument panel and install the bezel nut and switch knob. Install the instrument cluster.

Fairmont and Zephyr

Remove the split steering column cover retaining screws. Separate the two halves and remove the wiper switch two retaining screws. Disconnect the electrical connector. To install, reverse removal procedure.

Mustang II, Granada, Monarch, Versailles, Fairmont and Zephyr

The windshield wiper switch turn signal arm assembly can be removed from the steering column with a No. T-20 internal driver bit, allen wrench or equivalent as a substitute tool to remove the retaining screw (See Fig. 11).

To reinstall, insert the pilot shaft in the turn signal switch. Align the bottom tab with the screw hole and install the screw. Tighten screw to 35-50 in-lbs torque.

The wiper/washer switch is an integral part of the turn signal arm and cannot be repaired separately.

Removal

1. Insert a screwdriver in the locking tabs and twist while pulling the connector apart as illustrated in Fig. 13. Repeat procedure on the opposite side of the connector and separate connector.
2. Take out two lower instrument panel screws as illustrated in Fig. 12 and remove lower instrument panel shield.
3. Remove two steering column cover screws and separate the steering column cover halves.
4. Pull the wiring cover from the bottom and remove it.
5. Insert a screwdriver under the wiring shield as shown in Fig. 12 and push the tang to remove shield.

ARM AND BLADE ASSEMBLY

NOTE: To prevent glass and/or paint damage, do not pry arm from pivot with metal or sharp tool.

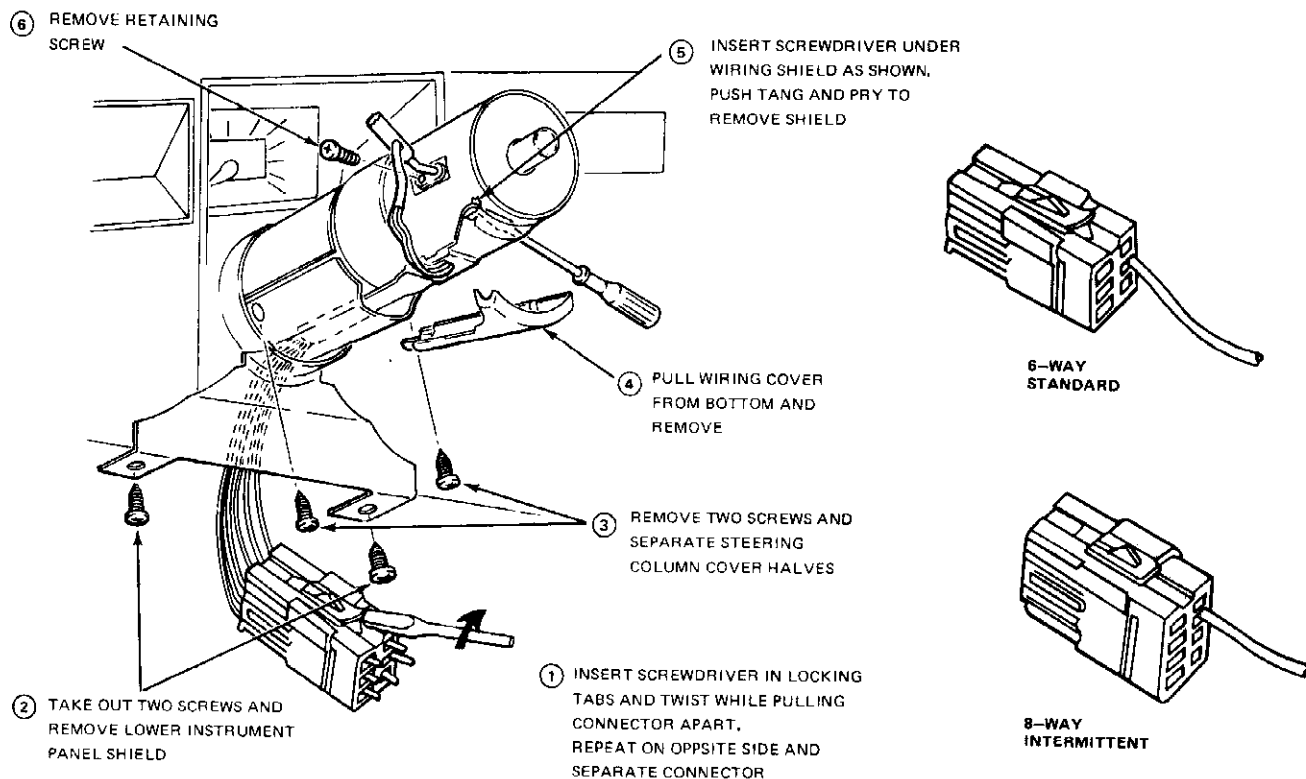
Mustang II

The windshield wiper arm installation is shown in Fig. 13.

Swing the arm and blade assembly away from the windshield. While holding the assembly in this position, pull the arm off the pivot shaft, using Tool No. AT-2 or equivalent.

To install, hold the arm and blade assembly in the swing out position with the tool and push the arm onto the pivot shaft.

When installing the arm, be sure that it is adjusted to the proper dimension.



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FIG. 12 Windshield Wiper Switch Removal—Mustang II, Granada, Monarch, Fairmont and Zephyr

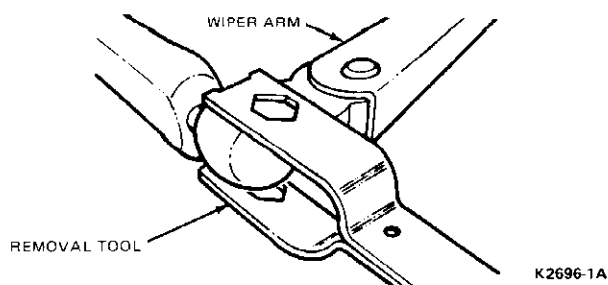


FIG. 13 Wiper Arm Removal – Mustang II

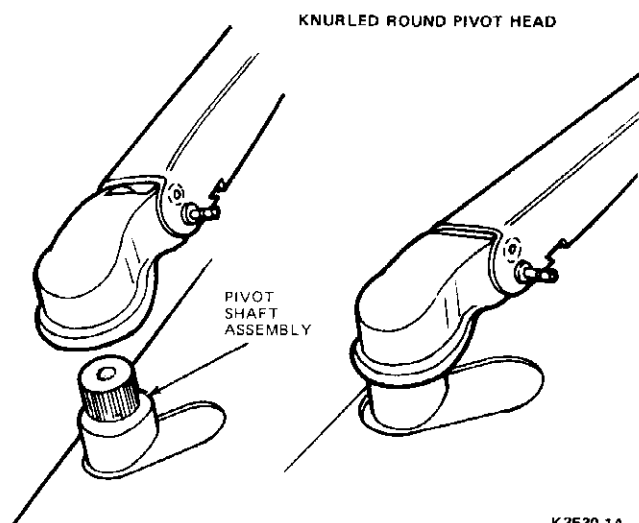


FIG. 14 Wiper Arm Removal—Pinto and Bobcat

Pinto and Bobcat

To remove the arm and blade assembly from the pivot shaft, swing the arm and blade away from the windshield and a 3/32 inch pin through the pin hole. Swinging the assembly away from the windshield will release the spring-loaded attaching clip in the arm from the pivot shaft. Inserting the pin will hold it in released position. The arm can now be pulled off the pivot shaft. **Do not pry off with a screwdriver.**

Leave the pin in the arm until after installation. A new service replacement arm comes with a pin already installed to hold it in released position.

When installing the assembly, be sure that the pivot shaft is in park position and that the blade assembly is positioned to the correct dimension as outlined in Adjustment. Push the arm onto the pivot shaft. Lock the arm to the pivot shaft by removing the pin. Refer to Fig. 14.

LTD II, Cougar, Ford, Mercury, Lincoln Continental, Thunderbird, Continental Mark V, Granada, Monarch and Versailles

Raise the blade end of the arm off of the windshield and move the slide latch (Fig. 15) away from the pivot shaft. This will unlock the wiper arm from the pivot shaft and hold the blade end of the arm off of the glass at the same time. The wiper arm can now be pulled off of the pivot shaft without the aid of any tools.

To install, position the auxiliary arm (if so equipped) over the pivot pin, hold it down and push the main arm head over the pivot shaft. Be sure that the pivot shaft is in park position, refer to Adjustments, and that the blade assembly is positioned to the correct dimension.

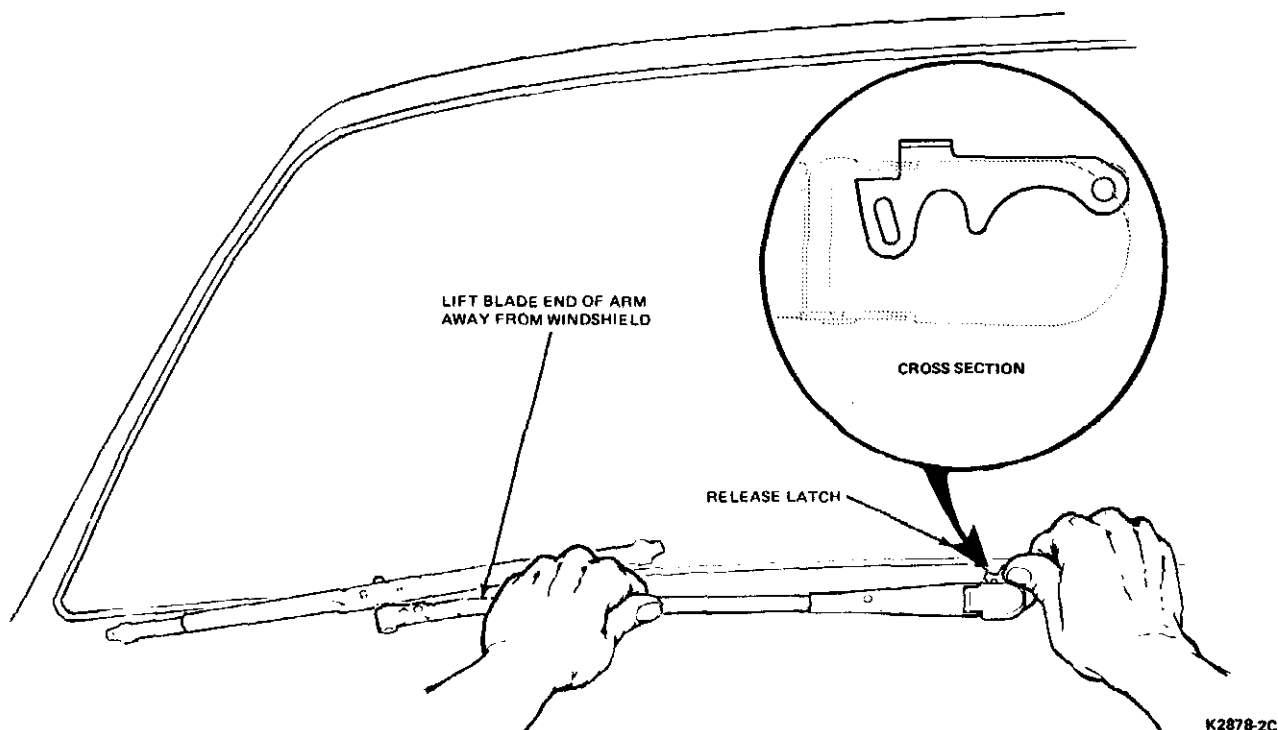


FIG. 15 Installation of Arm and Blade Assembly to Pivot Shaft—Ford, Mercury, Lincoln Continental, LTD II, Thunderbird, Continental Mark V, Cougar, Granada, Monarch and Versailles

Hold the main arm head onto the pivot shaft while raising the blade end of the wiper arm and push the slide latch into the lock under the pivot shaft. Then, lower the blade to the windshield. If the blade does not touch the windshield, the slide latch is not completely in place.

Fairmont and Zephyr

1. To remove blade assembly from wiper arm, pull up on spring lock and pull blade assembly from pin. Be sure the spring lock is not bent.
2. To engage, push the blade assembly onto the pin, so that the spring lock engages the pin. Be sure the blade assembly is securely attached to the pin.

AUXILIARY ARM—DRIVER'S SIDE ONLY

LTD II, Cougar, Ford, Mercury, Lincoln Continental, Thunderbird, Continental Mark V, Granada, Monarch and Versailles

The auxiliary arm is held on the pin by the shoulder of the main arm. Remove the main wiper arm and the auxiliary arm assembly.

BLADE ASSEMBLY TO WIPER ARM

We will use the first letter of the manufacturer's trade name to indicate the type of blade.

T blades come in two types. With a bayonet type, the blade saddle slides over the end of the arm and is engaged by a locking stud. With a side saddle pin type,

a pin on the arm indexes into the side of the blade saddle and engages a loaded spring.

Bayonet Type

To remove a T-type blade, press down on the arm to unlatch the top stud. Depress the tab on the saddle (Fig. 16) and pull the blade from the arm.

To install a new blade assembly, slide the blade saddle over the end of the wiper arm so that the locking stud snaps into place. Be sure the blade is securely attached to the arm.

Side Saddle Pin Type

To remove a pin type T-type blade, insert an appropriate tool into the spring release opening of the blade saddle, depress the spring clip and pull the blade from the arm (Fig. 17).

To install, push the blade saddle onto the pin, so that the spring clip engages the pin (Fig. 17). Be sure the blade is securely attached to the arm.

RUBBER ELEMENT TO WIPER BLADE

The rubber element in all blades can be replaced.

T—Type

At one end of the rubber blade element, locate a notch approximately one inch from the end. Stand assembly on a firm surface with notched end up. Grasp frame and push down until blade assembly is tightly bowed. Then twist. The blade element will snap out of retaining tabs. Lift wiper assembly and slide blade element down the frame until the notch lines up with

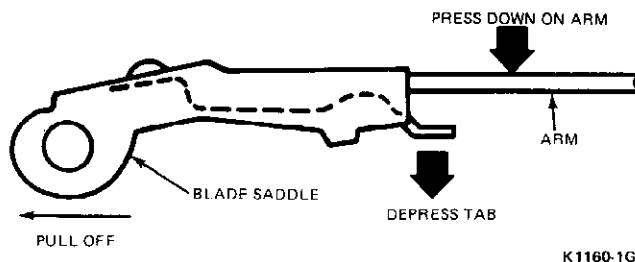


FIG. 16 T Blade—Bayonet Type Removal

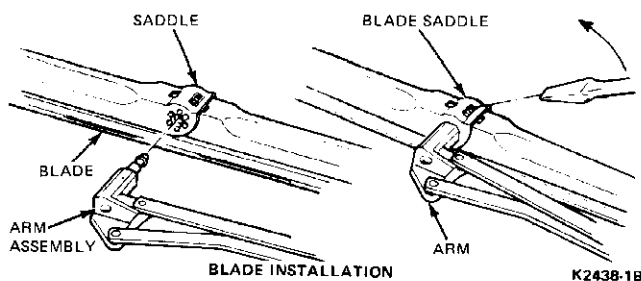


FIG. 17 T Blade—Pin Type Removal

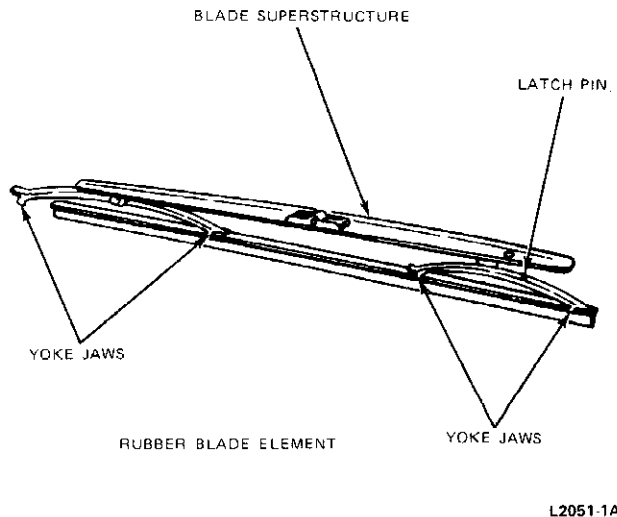


FIG. 18 Rubber Element Replacement

the locking tabs. Twist and the blade element will slip out. To install, reverse above procedure. See Fig. 18.

PIVOT SHAFT AND LINK ASSEMBLY

Ford, Mercury and Lincoln Continental

Removal

1. Disconnect the battery and remove the windshield wiper arm and blade assemblies from the pivot shafts.
2. Remove the cowl screens (center and left hand only), for access to the linkage.

3. Disconnect the left linkage arm from the drive arm by removing the clip.
4. Remove the three bolts retaining the left pivot shaft assembly to the cowl, and remove the left arm and pivot shaft assembly through the cowl opening.
5. Disconnect the linkage drive arm from the motor crank pin by removing the clip.
6. Remove the three bolts that connect the drive arm pivot shaft drive arm and right arm as an assembly.

Installation

1. When installing the pivot shaft assembly retaining bolts, tighten them to 3-7 ft-lbs torque. When installing the linkage connecting clips, be sure to force the clip locking flange into locked position, as shown in Fig. 19.

Pinto, Bobcat and Mustang II Without A/C

Removal

1. Remove the windshield wiper arms and blades from the pivot shafts.
2. Loosen two nuts retaining the wiper pivot shaft and link assembly to the motor drive arm ball.
3. Remove screws attaching each pivot shaft (Fig. 20).
4. Remove the pivot shaft and link assembly from under the left side of the instrument panel.

Installation

NOTE: Apply a 3/16 inch bead of sealer around each screw and main pivot stem before installing gasket.

1. Cement the gaskets to the pivots.
2. Position the pivot shaft and link assembly to the vehicle, and install the three attaching screws at pivot (Fig. 20). Tighten the screws to 3-6 ft-lbs torque.
3. Position the pivot shaft and link assembly to the motor drive arm ball, and tighten the two retaining nuts.
4. Install the wiper arms and blades on pivot shaft.

Pinto and Bobcat With A/C

The blower motor and housing will have to be removed to gain access to the wiper pivot and link assembly. Refer to Group 36 for blower motor and housing removal and installation.

After removing the blower motor and housing, follow the procedure outlined above for pivot and link assembly removal and installation.

LTD II, Thunderbird and Cougar

Removal

1. Open the hood, disconnect the battery ground cable and remove the wiper arm and blade assemblies from their pivot shafts.
2. Remove the cowl top left vent screen (4 retaining drive pins).
3. Remove the drive arm to pivot retaining clip.
4. Remove the three retaining screws from each pivot and remove the pivot shaft and link assembly.

5. Transfer the right pivot, if necessary, by removing the connecting clip (the left pivot is part of the link assembly).

Installation

1. Position the pivot shaft and link assembly in the cowl, install the pivot shaft retaining screws and tighten to 3-7 ft-lbs torque.
2. Position the left link on the motor drive arm and install the connecting clip. Be sure to force the clip locking flange into locked position, as shown in Fig. 19.
3. Install the wiper arms and blades.
4. Check the wiper operation.
5. Install the cowl top vent screen and secure with four drive pins (Cougar only).

Continental Mark V

Removal

1. Disconnect the battery and remove the wiper arm and blade assemblies from the pivot shafts.
2. Remove the cowl top (left and center) retaining screws.
3. Disconnect the linkage drive arm from the motor by removing the retaining clip.
4. Remove the pivot shaft retaining bolts and remove the linkage and pivot shaft assemblies. Be sure to force the linkage connecting clip into the locked position, as shown in Fig. 19, (when installing).

LEFT PIVOT SHAFT ASSEMBLY

Granada, Monarch and Versailles

The instrument cluster must be removed for access to the left pivot shaft and link.

Remove the wiper arm and blade assembly from the pivot shaft. Working through the cluster opening, disconnect both pivot shaft links from the motor drive arm by removing the retaining clip. Remove the three bolts that retain the left pivot shaft assembly to the cowl, and take the left pivot shaft and link assembly out through the cluster opening.

NOTE: For pivot shafts using leather gaskets for sealing, apply a 3/16" bead of sealer around each screw and main pivot stem before installing gasket. A mastic-type gasket is required with the new pivot shaft with small rills or beads around each screw hole. See Fig. 21.

Fairmont and Zephyr

Removal

1. Disconnect the battery and remove the wiper arm and blade assemblies from the pivot shafts.
2. Remove the cowl top retaining screws.
3. Disconnect the linkage drive arm from the right drive arm by removing the retaining clip.
4. Remove the pivot shaft retaining screws and remove the linkage and pivot shaft assemblies. Be sure to force the linkage connecting clip into the locked position (Fig. 19).

RIGHT PIVOT SHAFT ASSEMBLY

Granada, Monarch and Versailles

Disconnect the battery and remove the wiper arm and blade assembly from the pivot shaft.

If the vehicle is equipped with air conditioning, the right duct assembly will have to be removed for access to the right pivot shaft. Unclip the duct from the right connector and slide the left end out of the plenum chamber. Lower the duct assembly out from under the instrument panel.

From under the instrument panel, disconnect first the left, and then the right pivot shaft link from the motor drive arm, by removing the retaining clip. Reaching between the utility shelf and the instrument panel, remove the three bolts that retain the right pivot shaft and link assembly to the cowl. Lower the assembly out from under the instrument panel.

NOTE: Apply a 3/16 inch bead of sealer around each screw and main pivot stem before installing gasket. After installing the pivot shaft and link assembly to the cowl, be sure that the right pivot shaft link is connected to the motor drive arm before connecting the left link. Be sure that the connecting clip is in locked position, as shown in Fig. 19.

When installing the right duct on air conditioned vehicles, insert the end without the clip into the plenum chamber and fasten the clip end to the right connector.

FAIRMONT AND ZEPHYR

Removal

1. Disconnect the battery and remove the wiper arm and blade assemblies from the pivot shafts.
2. Remove the cowl top retaining screws.
3. Disconnect the linkage drive arm from the motor and the left drive arm by removing the retaining clips.
4. Remove the pivot shaft retaining screws and remove the linkage and pivot shaft assemblies. Be sure to force the linkage connecting clip into the locked position (see Fig. 19).

COVER AND SWITCH—DEPRESSED PARK

Use a battery-powered test light or ohmmeter.

1. Check motor housing for ground. If no ground check park switch cover screws for tightness and/or repair motor ground strap.
2. Go to 3-way connector near top of motor and green wire motor terminal. Remove 3-way connector and shift it out of the way. Connect an external ground wire to marked terminal on wiper motor (green wire). Check remaining two terminals for continuity. If both terminals do not have continuity, repair wiper motor park switch.

LIFTGATE WIPER MOTOR AND BRACKET

Fairmont and Zephyr

Removal and Installation

1. Assure ignition switch is in OFF position.
2. Remove wiper arm and blade assembly and pivot shaft attaching nut.

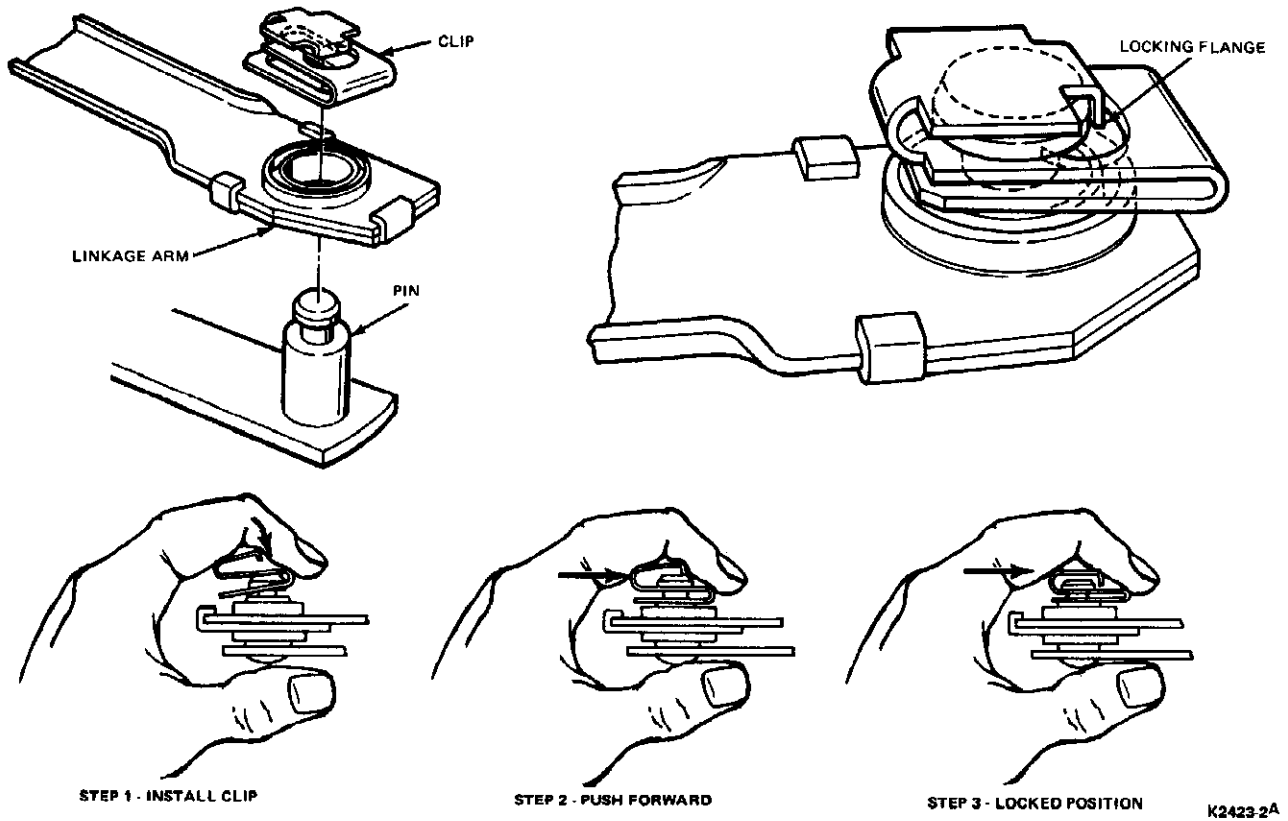


FIG. 19 Installation of Wiper Arm Connecting Clips—If So Equipped

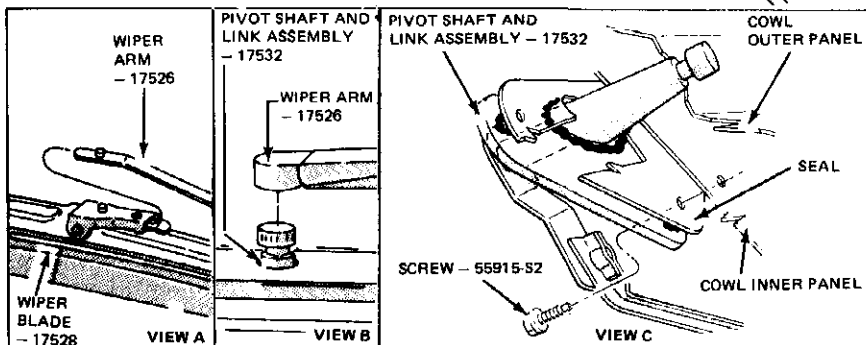
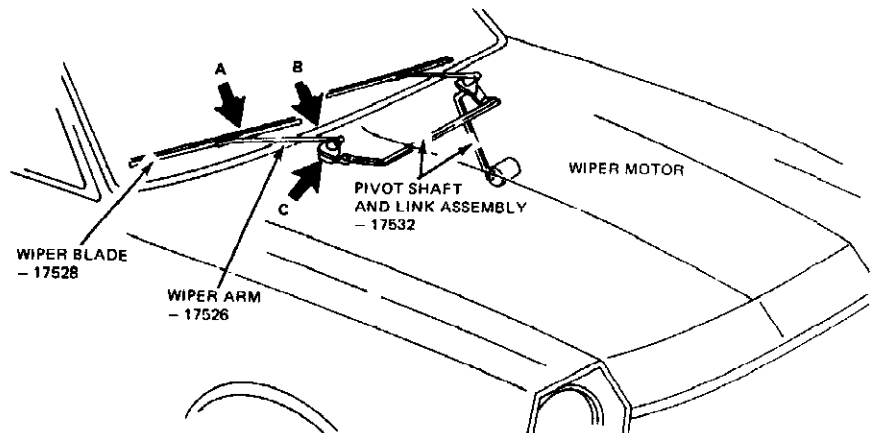
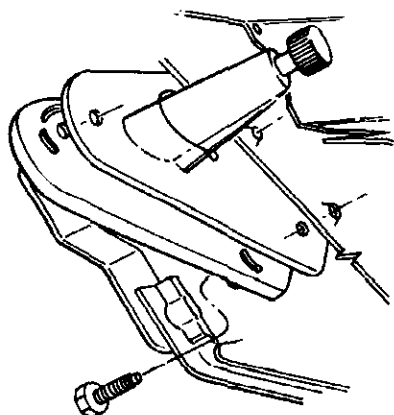


FIG. 20 Pivot Shaft and Link Assembly—Pinto and Bobcat Without A/C

K2731-2D



K3276-1B

FIG. 21 Pivot Shafts With Mastic Type Gaskets

DISASSEMBLY AND ASSEMBLY

The wiper motor is not serviced in a complete assembly or in individual parts, but in kits of the major sub-assemblies. Removal and installation procedures are given here for the kits.

The internal permanent magnets used in the wiper motor are a ceramic (glass-like) material. Care must be exercised in handling the motor to avoid damaging the magnets. The motor must not be struck or tapped with a hammer or other object.

COVER AND SWITCH—DEPRESSED PARK

Ford, Mercury, Cougar, Lincoln Continental, Thunderbird, Continental Mark V and LTD II

Remove the four cover retaining screws to remove the assembly. Replace with the appropriate kit. Be sure to reassemble the ground strap under the cover screw. Use the new screws supplied with the kit and tighten to 15-25 in-lb torque.

BRUSH END PLATE—DEPRESSED PARK

Ford, Mercury, Lincoln Continental, Thunderbird, Continental Mark V, LTD II and Cougar

Carefully observe the original position of the bale retainer and pry it off with a screwdriver. Remove the end plate and plug. Replace it with the appropriate kit.

When installing the end plate, use a fine wire probe through the hub opening to position the brushes on the commutator. Rotate end plate to position the key in the notch and assemble the plug. Reinstall the bale retainer carefully with a screwdriver to avoid overbending.

OUTPUT ARM AND WINDLATCH—DEPRESSED PARK

Ford, Mercury, Lincoln Continental, Thunderbird, Continental Mark V, LTD II and Cougar

Removal

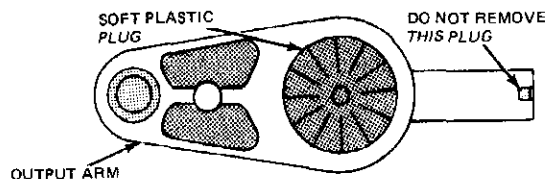
1. With a sharp pointed tool, puncture and pry off the soft plastic plug from the upper surface of the arm (Fig. 22).

3. Remove license plate housing attaching screws from liftgate inner panel.
4. Swing license housing outward at bottom, then down. Disconnect license lamp wiring. Remove housing.
5. Disconnect wiring harness from wiper motor.
6. Remove locking clip from wiper linkage. Pry off linkage arm with screwdriver. Remove linkage. Remove wiper motor and bracket through license housing opening.
7. For installation, reverse above procedure.

2. Remove the retaining bolt from the shaft, being certain not to rotate the shaft.
3. Remove the arm from the shaft with a suitable puller (Fig. 23). Do not attempt to drift the arm from the shaft.
4. Note the correct positioning of the windlatch in its guide for proper reassembly (Fig. 24). Lift the plastic windlatch out of the integral cover plate and guide.
5. Unclip the windlatch spring from the guide and remove it (Fig. 25).

Installation

1. Snap the windlatch spring in place (Fig. 25).
2. Parts in the kits are supplied with a special water wash resistant lubricant. Do not remove the lubricant and do not add any lubricant. Position the windlatch in the integral cover plate and guide, as shown in (Fig. 25).
3. Position the arm and cam assembly on the shaft, so that the locating marks are aligned (Figs. 26 and 27). (Note that the service replacement arm (Fig. 27) comes with the cam pin engaged in the detent.) Therefore, when installed with the correct cam-to-



K1163-1C

FIG. 22 Output Arm with Plastic Plug Installed

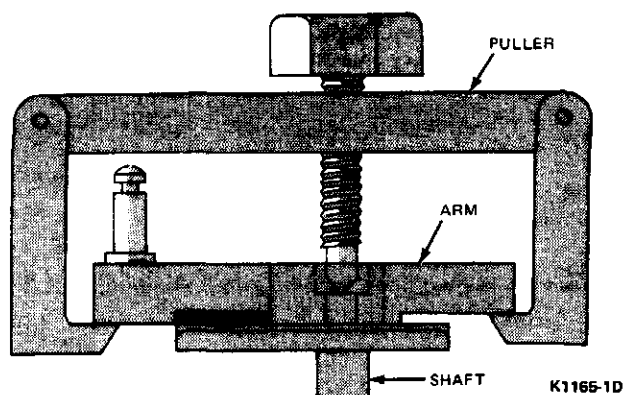


FIG. 23 Output Arm Removal

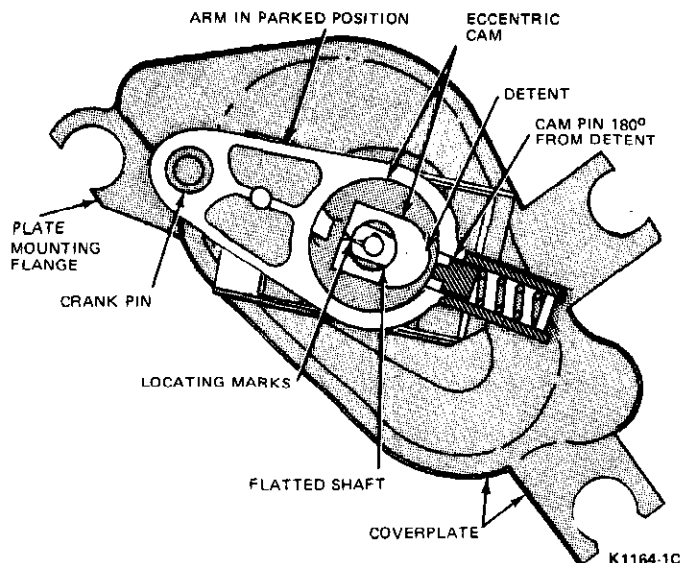


FIG. 26 Output Arm in Parked Position

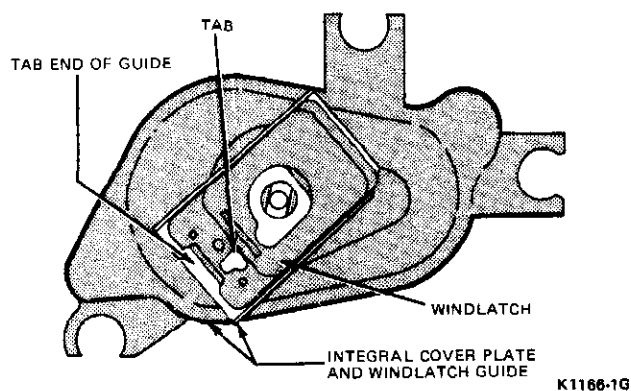


FIG. 24 Windlatch Installation

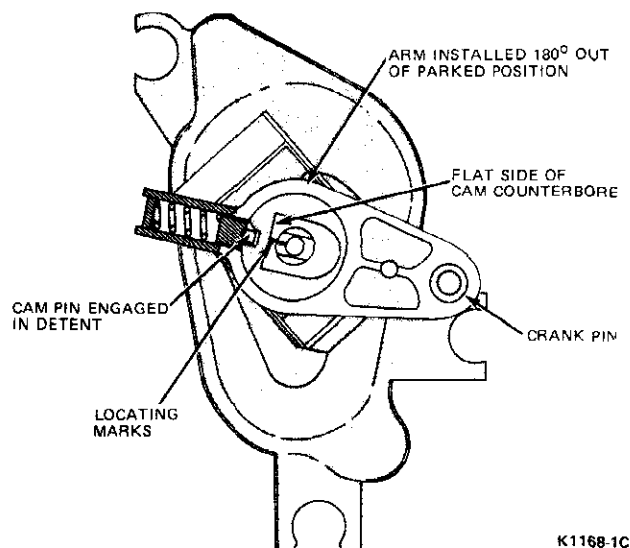


FIG. 27 Service Replacement Arm Installation

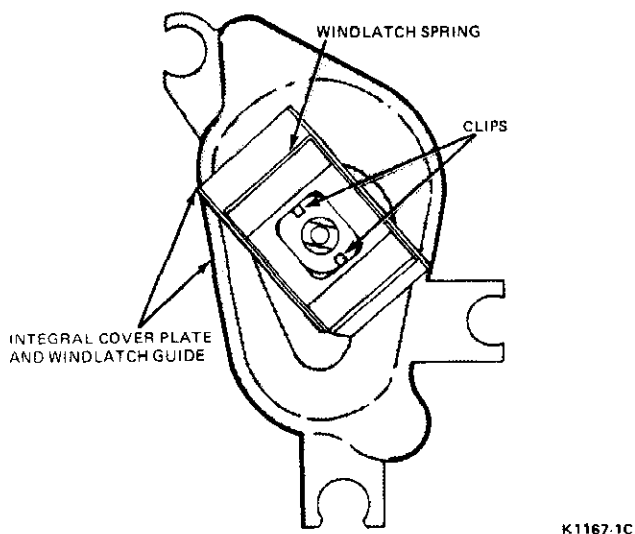


FIG. 25 Windlatch Spring Installation

shaft relationship (marks aligned), the arm will be 180 degrees out of parked position. It will be returned to park position when you perform the final step of this procedure.

4. Draw the arm and cam assembly onto the output shaft with the retaining screw, applying 8-10 ft-lb of torque. Before tightening the screw, however, slide the windlatch into its guide to make sure that the upstanding tab clears the underside of the arm as it is being drawn onto the shaft.
5. Install a new soft plastic plug (Fig. 22).
6. Make sure that the output arm is in park position (Fig. 26), as outlined in the following procedure.

Before attempting to install the motor in the vehicle, be sure that the output arm is in the park position, as shown in Fig. 26. If it is not in park position, as in the case of the service replacement (Fig. 27), proceed as follows:

- a. Place the motor on the left fender near the feed wires at the dash panel.

- b. Temporarily connect the motor to the feed wires (2 plugs).
- c. Ground the motor by connecting a jumper wire from the ground strap to the body.
- d. Move the control switch lever in the vehicle to operate the motor. The output arm and cam will move together in clockwise rotation.
- e. Allow the arm and cam to move at least one full revolution, and then move the control switch to off position. This will cause the motor output arm to proceed through the following cycle: Rotate in the normal direction; reverse direction of rotation for approximately 10 degrees to 15 degrees; stop rotating while the crank pin moves radially outward in a semi-circular motion and stop in the final park position (Fig. 27).

WIPER MOTOR—NON-DEPRESSED PARK

Mustang II, Pinto, Bobcat, Granada, Monarch, Fairmont, Zephyr and Versailles

Disassembly

1. Remove the gear cover retaining screws and cover (Fig. 28).
2. Remove the idler gear by pressing shaft with retainer out of the motor housing.
3. Remove the motor through bolts, motor round case, switch terminal insulator sleeve, and armature. **Remove armature shaft end play spring. Do not pound the motor case magnet assembly as the ceramic magnets may be damaged.**
4. Mark the position of the output arm with respect to the output shaft for assembly. Remove the output

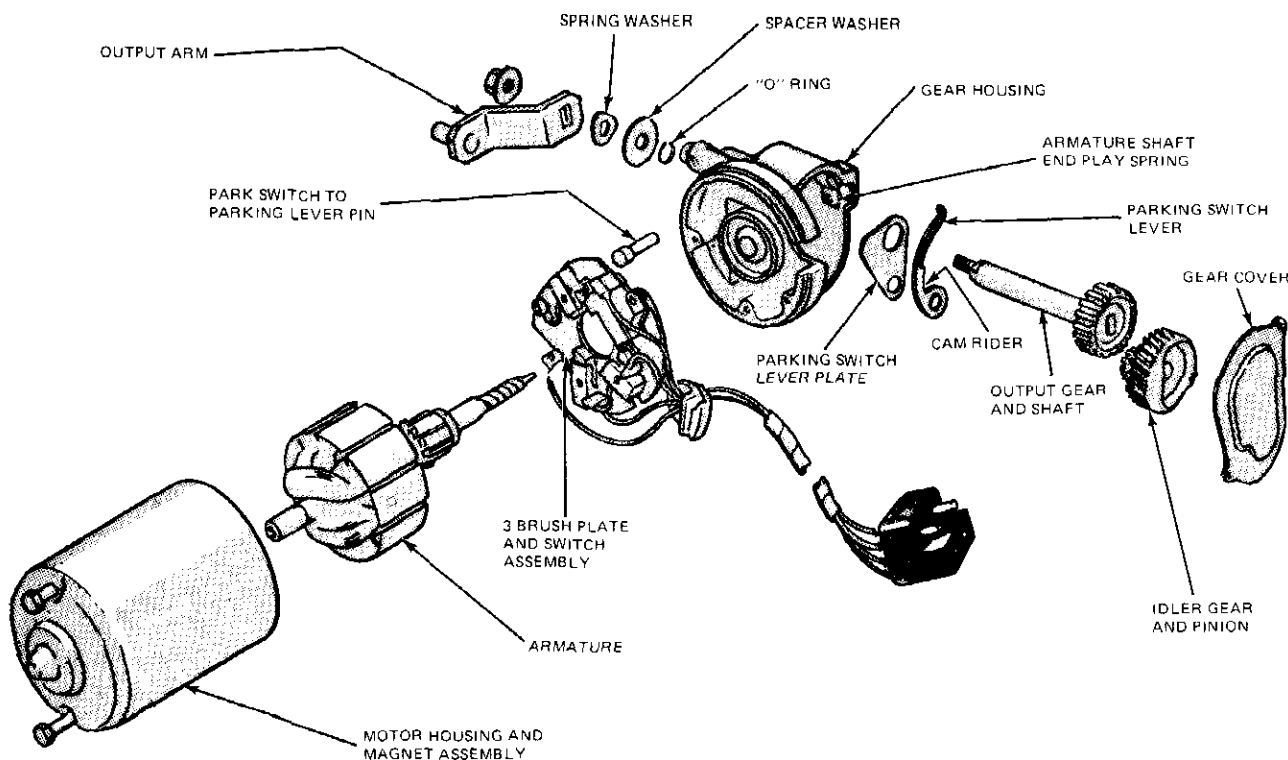
arm retaining nut, output arm, wave washer, flat washer, O-ring, leaf spring, output gear/shaft assembly, and parking switch lever and parking switch lever plate.

5. Remove the brushes, brush spring, and wire harness.
6. Remove the brush plate and switch assembly and remove the switch contact to parking lever pin from the gear housing.

Assembly

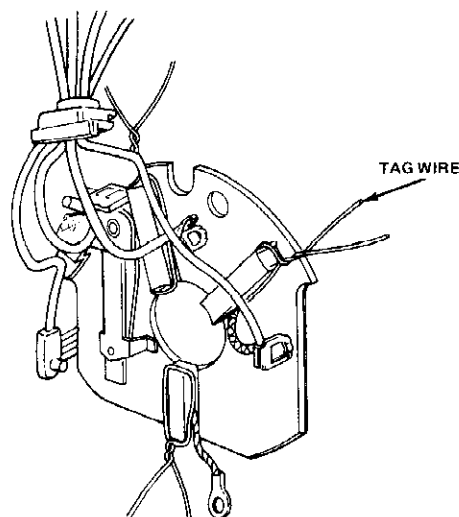
It is essential that the idler gear shaft with the push-nut be reset to the original, proper depth in the gear housing. Refer to kit for instructions.

1. Place the housing on a flat surface, with the inside of the housing facing up.
2. Position the parking switch lever and lever plate with the cam rider pointing toward the gear housing output shaft hole.
3. Apply a film of Sun Prestige grease or equivalent to the output gear teeth and shaft bearing surface. Insert the shaft in the bearing. Make certain that the parking switch lever is clear of the cam and gear assembly.
4. Place the spacer washer and spring washer on the shaft, position the output arm on the shaft in the marked position, from which it was removed, and install the mounting nut. Apply ample Sun Prestige Grease or equivalent under idler gear onto bottom of idler shaft.
5. After installing idler gear on shaft, insert shaft through park lever and plate. Use a drift and hammer to lightly tap the gear and pinion shaft to



K1632-2E

FIG. 28 Disassembled Wiper Motor



K3277-1A

FIG. 29 Three-Brush Plate and Switch Assembly

proper depth. (Do not allow push-nut to put a pre-load on gear. A .001-.020 in. clearance is required.)

6. Position the brush springs and brushes in the holders and wrap wire around them to hold them in the fully retracted position. Push the insulated brush connector into the switch terminal. See Fig. 29.
7. Place the switch contact to parking lever pin in the gear housing. Position the brush plate assembly to the housing and install the retaining screws.

8. Apply Sun Prestige grease or equivalent to the ball bearing in the end of the armature shaft. Position the armature shaft in the gear housing and remove the brush retracting wires.
9. Holding the armature in position, install the motor case and magnet assembly, and through bolts. Align indicator marks on motor case and gear box housing before inserting through bolts.
10. Apply Sun Prestige grease or equivalent to the worm gear and pinion and idle gear. Install end play spring in housing.
11. Apply a generous amount of Sun Prestige grease or equivalent to the area around the end of the armature shaft. Install the gear housing cover.

Cleaning and Inspection

1. Clean the gear housing of all old grease. Do not allow any cleaning fluid to contact the armature shaft and output shaft bearings.
2. Wipe all other parts with a clean cloth.
3. Inspect the gear housing for cracks or distortion. Replace a cracked or distorted housing.
4. Check all shafts, bushings, and gears for scored surfaces. Replace damaged parts, and add new grease to the housing and gears.

SPECIFICATIONS

ELECTRIC WINDSHIELD WIPER MOTOR AND SWITCH TEST CURRENT LIMITS

Motor Type	Motor Current Draw Test	Circuit Breaker/Switch Low Current Pass Test	Circuit Breaker/Switch High Current Pass Test
Non-Depressed Park	2.5 amperes	7 amperes **6 amperes	14 amperes **12 amperes
Depressed Park	3.5 amperes	8.25 amperes	16.5 amperes

*Motor maximum current when operated without linkage attached.

**Mustang II.

CK2501-2F

Windshield Washers

**PART
35-70**

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION	
Washer System	70-1	Motor, Seal and Impeller Assembly	70-2
TESTING		Washer Nozzle	70-2
Washer Pump Current Draw	70-1	Washer Pump	70-2
ADJUSTMENTS			
Washer Nozzle	70-2		

CL2304-2B

DESCRIPTION AND OPERATION

WASHER SYSTEM

The washer system consists of a control switch, integral with the wiper motor control switch, reservoir,

motor assembly and the necessary hoses, nozzles and attaching parts.

For diagnostic chart on windshield washers, refer to Diagnosis in Part 35-60.

TESTING

WASHER PUMP CURRENT DRAW

Attach the leads of the Volt-Amp Tester as shown in Fig. 1. The current draw should not exceed four amps, or indicate less than two amps, while the washer pump motor is pumping fluid.

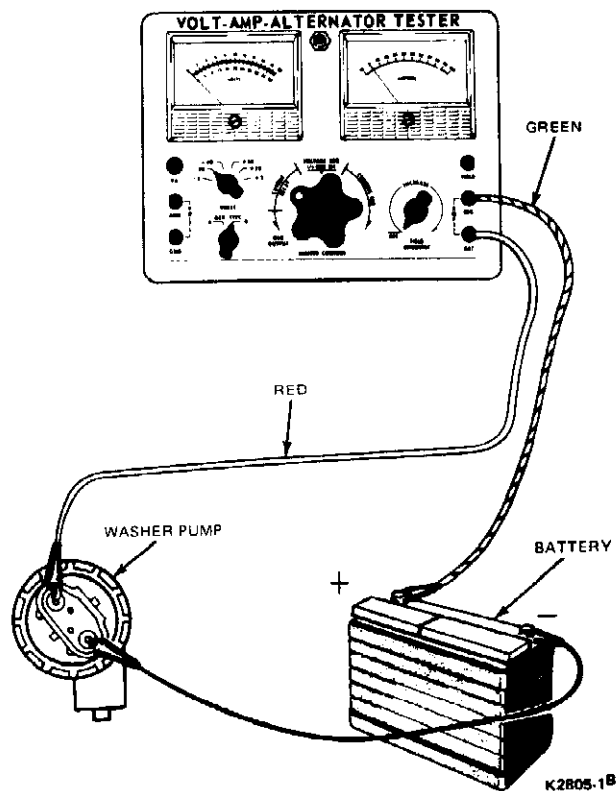


FIG. 1 Washer Pump Current Draw Test

ADJUSTMENTS

WASHER NOZZLE

Pinto, Bobcat, Fairmont, Zephyr, Granada, Monarch and Versailles

Use a pair of needle nose pliers and very carefully bend the nozzle. Care is necessary to prevent crimping the nozzle jet openings.

FORD, MERCURY, LINCOLN CONTINENTAL, THUNDERBIRD, CONTINENTAL MARK V, LTD II, AND COUGAR

These nozzles are mounted on the windshield wiper arms and are non-adjustable.

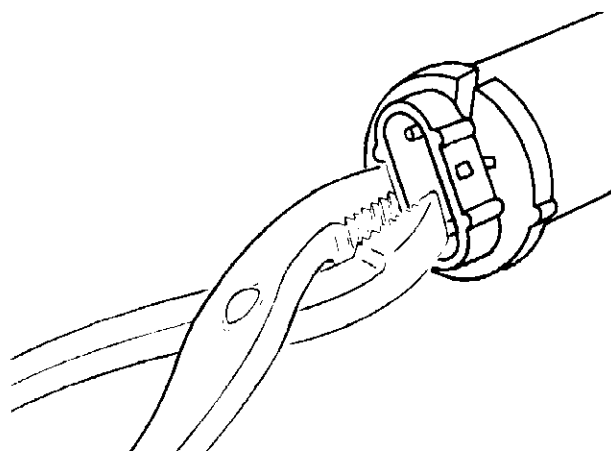
REMOVAL AND INSTALLATION

WASHER PUMP

To remove the electric windshield washer reservoir and motor assembly from the vehicle, disconnect the lock-tab wire connector (use a small screwdriver to unlock tabs) and hose, remove the retaining screws and lift the assembly from the left fender apron (or radiator support). Disconnecting the hose will drain the reservoir. The washer reservoir and cover assembly are serviced separately. The motor, retaining ring, seal and pump impeller assembly are also serviced separately.

MOTOR, SEAL AND IMPELLER ASSEMBLY

1. Remove reservoir assembly from vehicle. Disconnect electrical plug and hose.
2. Using a small bladed screwdriver, pry out retaining ring (Fig. 2).



K2621-1A

FIG. 3 Disassembling Motor, Seal and Impeller Assembly

5. Align small projection on the motor end cap with the slot in the reservoir (Fig. 2), and assemble so that the seal seats against the bottom of the motor cavity.
6. Using a 1" socket (preferably 12 point) hand press retaining ring securely against motor end plate.
7. Connect electrical plug and hose and replace the reservoir assembly in the vehicle.
8. Fill the reservoir and operate the washer system.
9. Check for leaks and align the cowl-mounted jets if necessary. **CAUTION:** Do not operate pump until fluid is added to reservoir.

WINDSHIELD WASHER NOZZLE

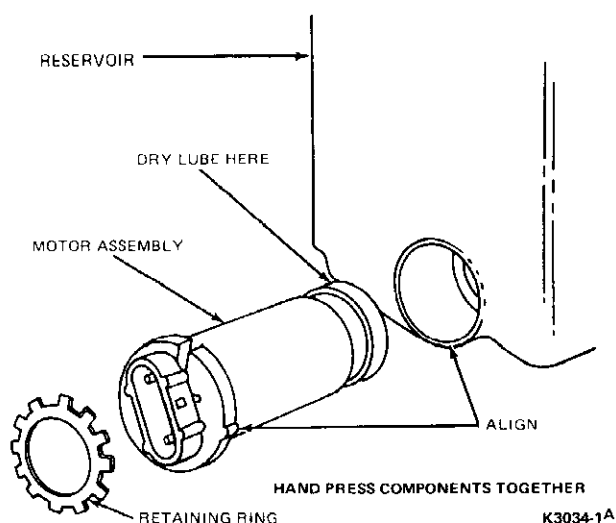
Ford, Mercury, Lincoln Continental, Thunderbird, Continental Mark V, LTD II and Cougar

Windshield washer nozzles are attached to the wiper arms, allowing the spray pattern to follow the wiper arms as they move over the windshield.

Remove the windshield wiper arm as outlined in Part 35-60, and remove the washer hose from the connector. Refer to Fig. 4, for Removal and Installation Procedures.

FAIRMONT AND ZEPHYR

1. Remove both wiper arms.



K3034-1A

FIG. 2 Windshield Washer Motor Replacement

3. Using pliers to grip one wall around the electrical terminals (Fig. 3), pull out the motor, seal and impeller assembly. If the impeller and seal come off when the motor is pulled, they can be reassembled. Make certain the reservoir pump chamber is free of foreign material prior to re-installing the old motor in the new reservoir.
4. Before installing the assembly, lubricate the outside diameter of the seal (Fig. 2), with a dry lubricant such as powdered graphite. This will prevent the seal from sticking to the wall of the reservoir motor cavity and make assembly easier.

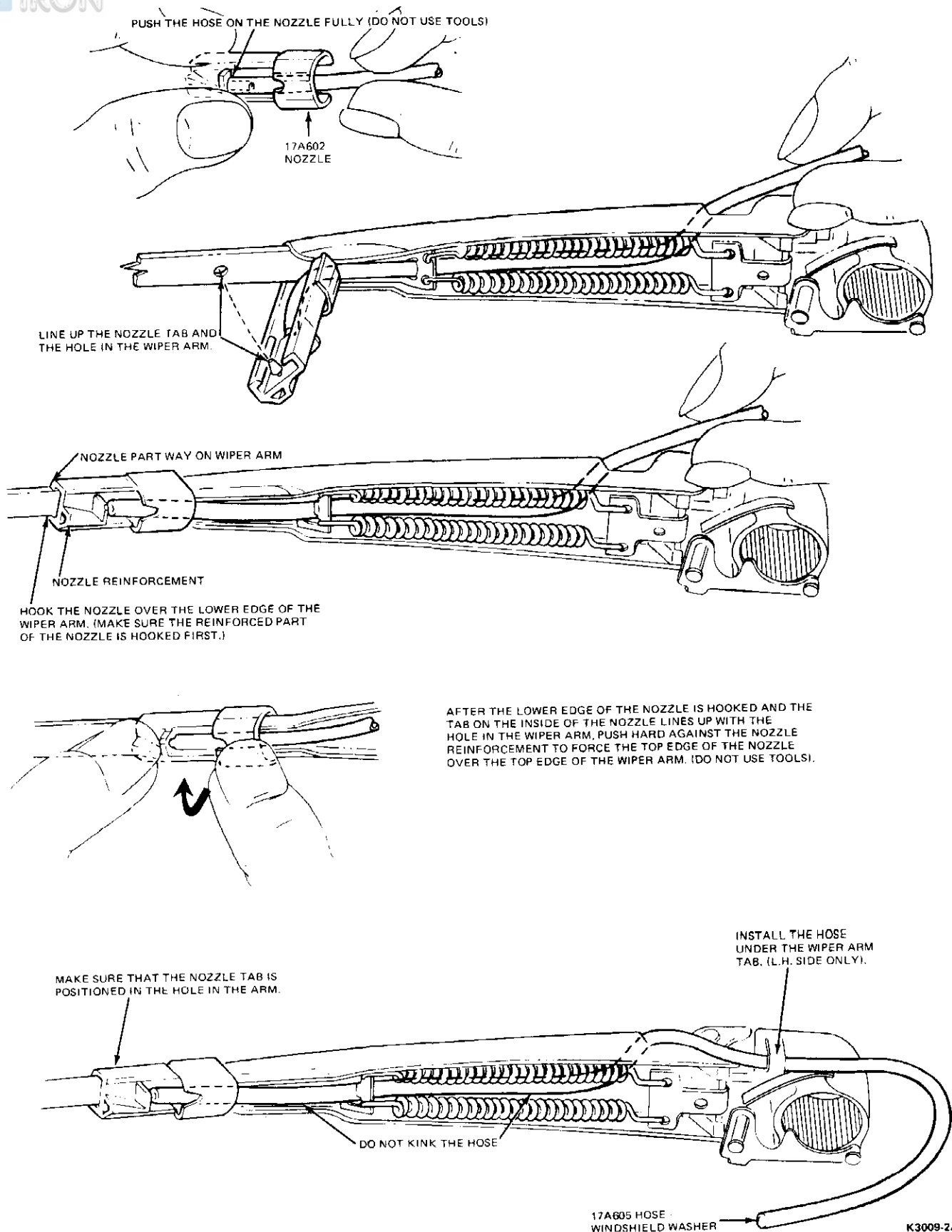


FIG. 4 Windshield Washer Hose and Nozzle Installation—Typical

2. Remove washer nozzle from underside of wiper arm. Insert a screwdriver between arm and nozzle and twist to disengage locking tabs.
3. Remove seven screws from cowl top grille.
4. Raise cowl top grille for access to nozzle hose.
5. Disengage nozzle hose retaining clips and grommets and remove hose from tee.
6. To install nozzle and hose assembly, reverse above procedure.

NOTE: See Fig. 5 for nozzle configuration for R.H. LTD II, Thunderbird and Cougar. Procedures for Removal and Installation are same as in Fig. 4.

Soap may be used to install washer hose to washer nozzle, for ease of installation. The hose must be kept taut when routing (as shown in Fig. 4) and inspected for cracks before installing the wiper arm.

Pinto, Bobcat, Mustang II, Granada, Monarch and Versailles.

Removal

1. Open the hood. Remove the nozzle assembly bracket retaining screw from the cowl top grille panel.

2. Carefully slide the nozzle assembly out of its locating hose in the top grille panel.
3. Remove the nozzle assembly from the washer hose.

Installation

1. Attach the washer hose on the nozzle assembly.
2. Position the nozzle assembly through its locating hole. The nozzle opening should position itself at the third (inboard) cowl top grille panel opening. A small hooked tool can be used if necessary to help position the nozzle through the cowl top grille opening.
3. Install the nozzle bracket retaining screw.

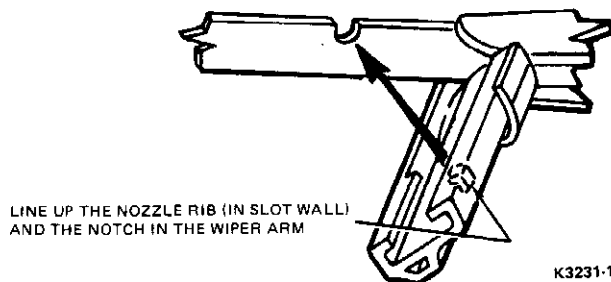


FIG. 5 R.H. Windshield Washer Nozzle Installation—LTD II, Thunderbird and Cougar

Horns

**PART
35-80**
Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION	
Horn Pad	80-1	Button Blow Horn	80-3
Horn Switch	80-1	Horn	80-2
Horn System	80-1	Horn Mounting Location	80-2
TESTING	80-2	Horn Relay	80-3
ADJUSTMENTS	80-2	Pad Blow Horns	80-3

CL2305-2B

DESCRIPTION AND OPERATION

HORN SYSTEM

The Pinto, Bobcat, Mustang II, Fairmont, Zephyr, Granada and Monarch and most models of the LTD II, Cougar and low series Ford car lines have a single low pitch horn.

The Lincoln Continental, Continental Mark V, Mercury, Thunderbird, Cougar XR-7, high-series Ford and Granada and Monarch Ghias are equipped with a pair of tuned horns. The Versailles has a third horn. The horn switch closes the circuit to the horns without the use of a relay. One of the horns has a high-pitched tone, the other a low-pitched tone.

Vehicles equipped with a speed control have a relay in the circuit.

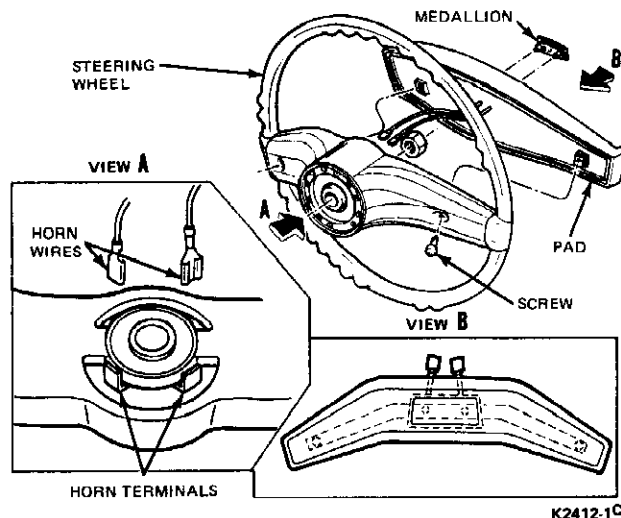
HORN SWITCH—BASE PINTO (BUTTON)

The base Pinto uses a straight spoke steering wheel with a pressure-sensitive horn switch in the center of the wheel. The pressure switch consists of two copper rings separated by insulators with two wires attaching to the steering wheel horn terminals. If the switch needs to be replaced, the entire horn switch and trim cover assembly will have to be replaced.

HORN SWITCH—BASE/DELUXE HORN PAD

All Except Thunderbird, Lincoln Continental and Continental Mark V

The base/deluxe uses pressure-sensitive switches at each end of the center spokes. Each switch starts at the ribs and extends toward the center to the curved portion of the pad. The pressure switches consist of copper contacts separated by insulators with two wires attaching to the steering wheel horn terminals (see Fig. 1). If the switch needs to be replaced, the entire horn switch and trim cover assembly must be replaced.



K2412-1C

FIG. 1 Typical Two Spoke Wheel and Horn Switch

HORN SWITCH—LUXURY AND SPEED CONTROL HORN PADS

Ford, Mercury, LTD II, Cougar, Granada, Monarch, Versailles, Thunderbird, Lincoln Continental and Continental Mark V

The luxury and speed control horn pads use a spring-loaded horn bar which runs the length of the spoke. The horn switch consists of two copper strips separated by springs with two (three for speed control) wires attaching to the steering wheel horn terminals. If the switch needs to be replaced, the entire horn switch and trim cover, except for the lower woodgrain applique insert, must be replaced (See Fig. 2).

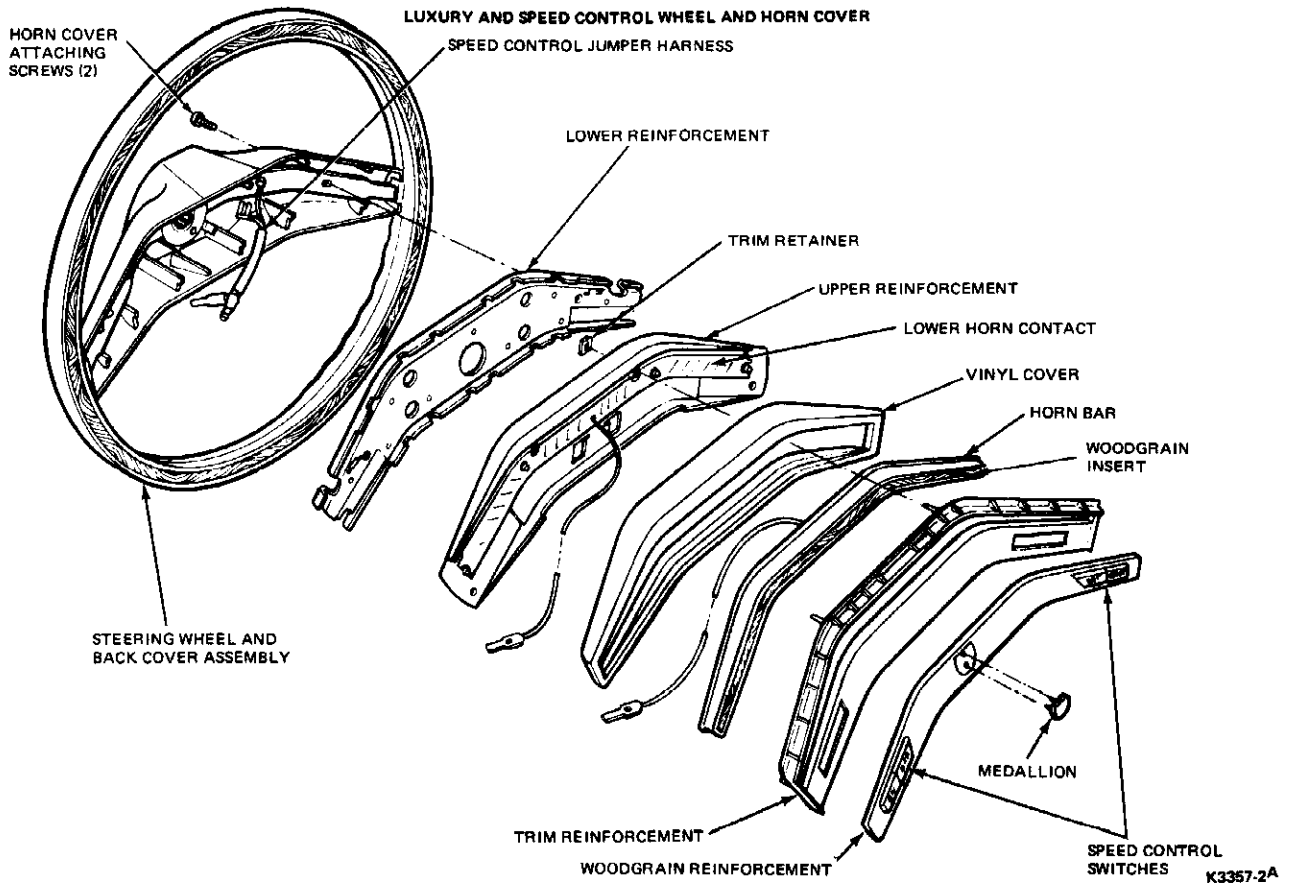


FIG. 2 Luxury and Speed Control Wheel and Horn Cover

TESTING AND ADJUSTMENTS

WITH EQUIPMENT

Connect a voltmeter and ammeter to the horn and to the vehicle battery. Attach a wire between the positive (+) terminal of vehicle battery and the horn as shown in Fig. 3. If current reads zero amperes, (open circuit) turn the adjusting screw counterclockwise until meter indicates 5.0-5.5 amperes, then secure. If current is greater than 5.5 amperes, turn adjusting screw clockwise until reading is 5.5 amperes, then secure. If 5.0-5.5 amperes limit cannot be met, remove horn and replace.

WITHOUT EQUIPMENT

Connect a wire between the negative (-) terminal of the battery as shown in Fig. 3. Connect another wire from the horn to the positive (+) terminal of the battery. If the horn does not sound and there is no evidence of a spark at the battery terminal, turn the adjusting screw counterclockwise 1/4 turn minimum to 3/8 turn maximum, then secure. If horn does not function after adjustment, remove and replace.

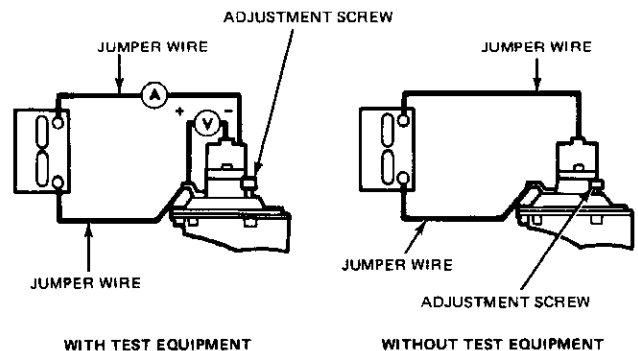


FIG. 3 Horn Current Test

L2437-1A

REMOVAL AND INSTALLATION

HORN

Disconnect the horn wire from the terminal and remove the mounting bolt. When installing a horn and bracket assembly, tighten the mounting bolt to 12-18 ft-lb.

HORN MOUNTING LOCATION

The horn and bracket assembly on all vehicles except Lincoln Continental, Continental Mark V, Pinto and Bobcat are mounted in the forward part of the engine compartment, usually in the area of the left fender

apron. The Lincoln Continental, Continental Mark V, Pinto, and Bobcat mounting locations are on the right side of the engine compartment.

BUTTON-BLOW HORN—PINTO ONLY

Grip the horn button and exert counterclockwise pressure to release the button from the wheel. Disconnect the horn wires from the wheel terminals. If the switch needs replacement, the entire horn switch and trim cover (button) assembly must be replaced. To install, connect the horn wires to the terminals in the wheel. Position the button so the slots in the button align with the (3) plastic studs in the wheel. Align the horn button notch with the locator boss on the wheel. Exert clockwise pressure to lock the button to the wheel.

PAD BLOW HORNS

Ford, Mercury, Granada, Monarch, Versailles, LTD II, Mustang, Cougar, Fairmont, Zephyr, Pinto and Bobcat

Remove the retaining screw from the underside of each spoke and lift off the pad, switch/trim cover and medallion as an assembly. Disconnect the horn wires from the terminals. If the switch needs replacement, separate the medallion and the horn

switch/trim cover assembly from the pad (Fig. 1). Install a new horn switch/trim cover assembly to the pad with the switch wires going through the hole at the top of the switch indent in the pad. Install the medallion to the switch/trim cover and pad assembly. Connect the two-wire (push on) connectors to the terminals and install the entire assembly to the steering wheel with the wire hole in the indent to the top. Install the retaining screw from the underside of each spoke. Tighten the retaining screws 2-7 in-lb torque. For speed control switch removal and installation, refer to Part 37-01.

HORN RELAY

Vehicles Equipped With Speed Control

The horn relay is mounted to the speed control amplifier bracket under the instrument panel. Remove the screws retaining the amplifier and bracket assembly to the dash lower assembly and remove. Pull the connector plug from the relay, remove the bolt and nut retaining the relay to the amplifier bracket and remove the relay. Plug in the new relay, mount the relay to the amplifier bracket, and mount the entire assembly to the dash.

Ventilating, Heating and Air Conditioning

**GROUP
36**

PART TITLE	PART NO.	PART TITLE	PART NO.
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Air Conditioning General Service –		Conditioner System	36-40
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Cougar and LTD II Heating System	36-12	Heating General Service	36-10
Cougar and LTD II Heater/Air		Lincoln Continental Automatic	
Conditioner System	36-45	Temperature Control System	36-73
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Ford and Mercury Heating System	36-11	Conditioner System	36-43
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Temperature Control System	36-71	Conditioner System	36-43
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Temperature Control	36-74	Six-Cylinder Compressor	36-34
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CL2333-2B

Ventilating Systems

**PART
36-01**

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION	
Front Air Vents	01-2	Granada, Monarch, Fairmont and Zephyr	01-10
Pressure Release Grilles	01-2	LTD II, Thunderbird and Cougar	01-9
ADJUSTMENTS		Mustang II	01-9
Air Vent Cable	01-8	Pinto and Bobcat	01-9
		Pressure Release Grilles	01-10
		Registers (Luxury Trim)	01-10

CL2334-2B

All heating systems and all heater-A/C systems perform the greater part of the ventilation function integrally with the heating or cooling functions. Those components of the ventilation system that are integral with a heater assembly or with a heater-A/C assembly

are covered in the appropriate Shop Manual Part in this Group. This Shop Manual Part covers only those components of the ventilation system that are not integral with a heater or heater-A/C assembly.

DESCRIPTION AND OPERATION

FRONT AIR VENTS

Ford and Mercury

The ventilation air ducts are located in the right and left cowl panels and are accessible for service by removing the cowl trim panels. The air vent grilles are an integral part of the trim panels.

When the vehicle is in motion, outside air enters the vehicle through the cowl air intake immediately forward of the windshield, down the right and left cowl side panels and through the air ducts, into the passenger compartment.

The vent air doors are balanced doors in the side cowl assemblies, controlled by Bowden cables. These cables are not adjustable. Pull the control knobs for outside air; push in to close the vents. The location of the vents and control knobs is shown in Fig. 1.

LTD II, Thunderbird and Cougar

The body ventilation air ducts allow outside ram air to be discharged through two air registers in the instrument panel as well as to the floor area. When the control knobs are pushed in, the cowl vent ducts are closed; pulled out, air is discharged through the registers. With the controls in mid (detent) position, most of the air is discharged to the floor with a small amount through the registers. Moving the controls from the mid (detent) position to the full open position gradually increases the amount of discharge air through the registers as it decreases the amount of air to the floor area (Fig. 2).

The right register is a horizontal register with vertical louvers that can be moved from side to side. The register can be pivoted up and down for vertical air distribution. The louvers can be closed by moving them to the left. The left register is a ball type register which can be rotated as required for air distribution and for shut-off (Fig. 3).

Granada, Monarch, Fairmont and Zephyr

The body ventilation ducts have been designed to discharge ram air through two air registers in the instrument panel, as well as to the floor area. When the controls are pushed in, the cowl vent inlet ducts are closed; pulled out, air is discharged to the floor with a small amount through the registers. Moving the controls from the mid-position to the full open position gradually increases the percent of discharge air through the registers as it decreases the amount of air to the floor area (Fig. 4).

The right register is a vertically-mounted type with horizontal louvers that can be moved up and down. The

register can be pivoted from side to side for horizontal air distribution. The louvers can be closed by moving them upward.

The left register is a horizontally-mounted type with vertical louvers that can be moved from side to side. The registers can be pivoted up and down for vertical air distribution. The louvers can be closed by moving them to the left.

Pinto and Bobcat

Outside ram air enters through the cowl top grille and flows into the left and right cowl vent ducts. The right vent is attached to the heater assembly; the left vent is separate from the heater. Both vents operate in the same way. A left and right control knob operates a door in the left and right vent duct, respectively, to control air discharge (Figs. 5 and 6). The control knobs have three positions: pushed in, the cowl vent doors are closed; in mid-position (detent), about 25 percent of the air discharges through the registers in the instrument panel and 75 percent to the floor; and pulled out, the doors deflect all the air to the registers. The right vent door should be closed when operating the heating system.

Mustang II

Outside ram air enters through the cowl top grille and flows into the left and right cowl vent ducts. The right vent is attached to the heater assembly; the left vent is separate from the heater. Both vents operate in the same way. A left and right control knob operates a door in the left and right vent duct, respectively, to control air discharge (Fig. 7). The control knobs have three positions. Pushed in, the cowl vent doors are closed. Pulled out, the doors are wide open allowing all the air to discharge through the registers. In the mid-position, part of the air is discharged to the floor and part passes through the registers. Moving the controls from mid-position to the full open position gradually increases the flow of air through the registers as it decreases the flow to the floor. The right vent door should be closed when operating the heating system.

PRESSURE RELEASE GRILLES

Pressure release grilles are installed on the quarter pillars of some models to assist body ventilation (Fig. 8). Air pressure in the passenger compartment passes under the rear seat into the luggage compartment. Since the quarter pillar weatherstripping is inboard of the registers, the air from the luggage compartment exhausts through the registers.

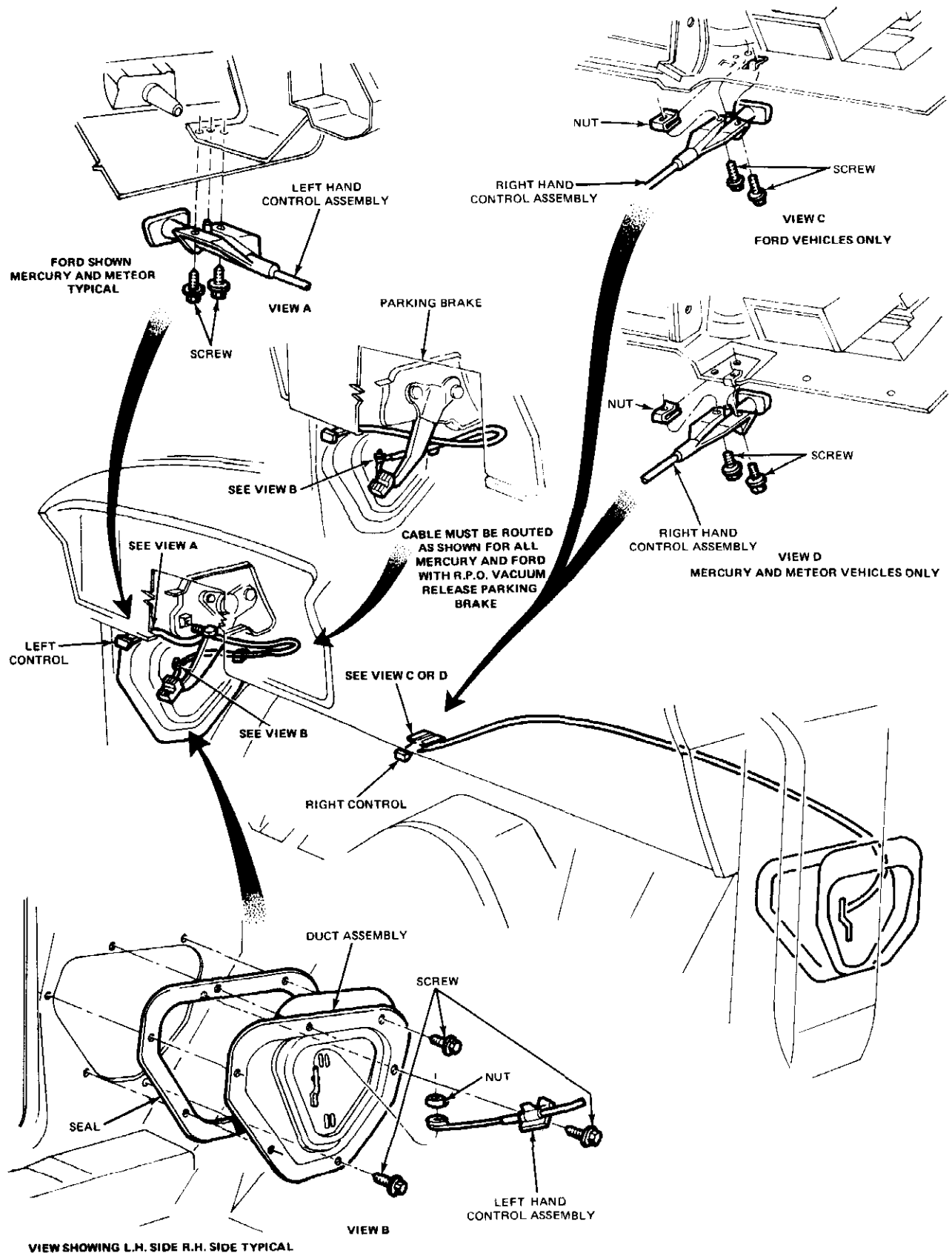
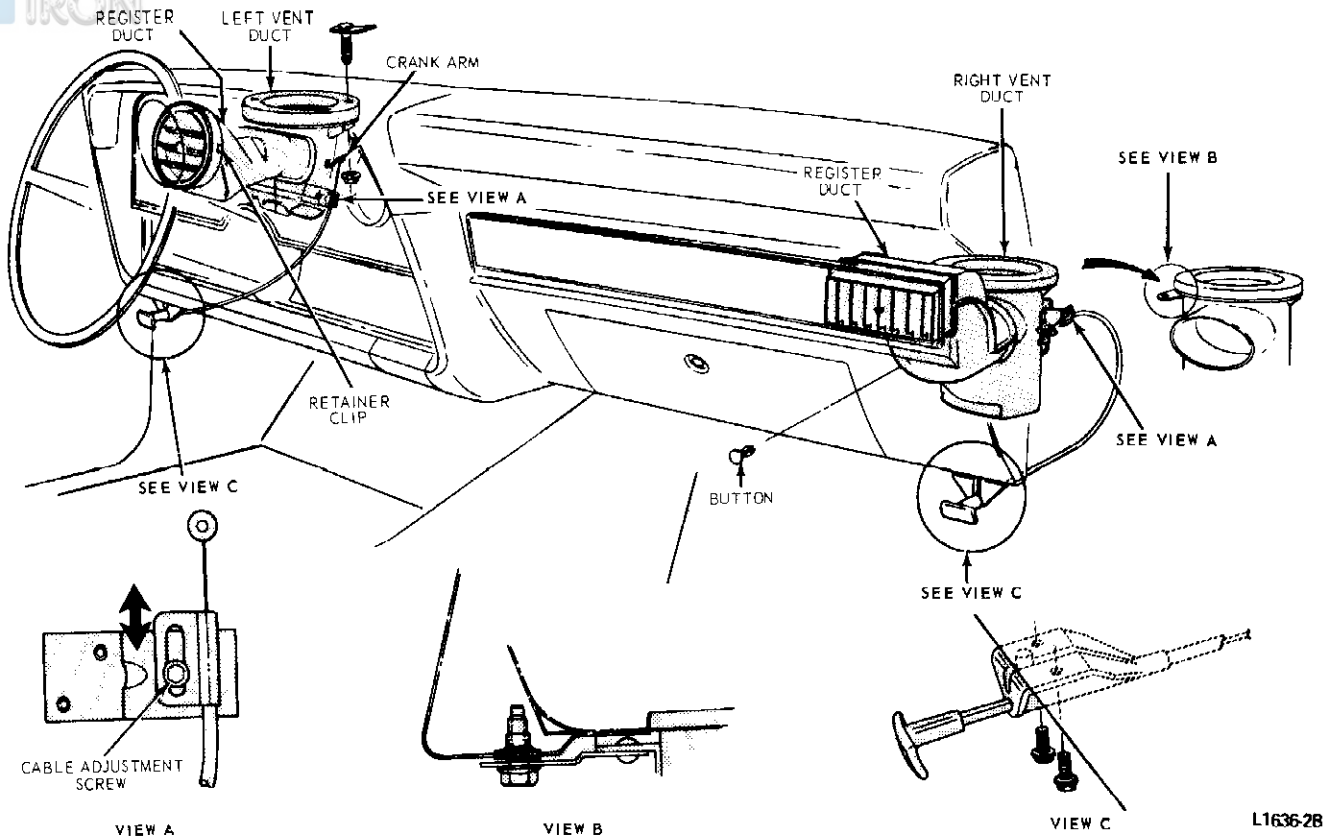


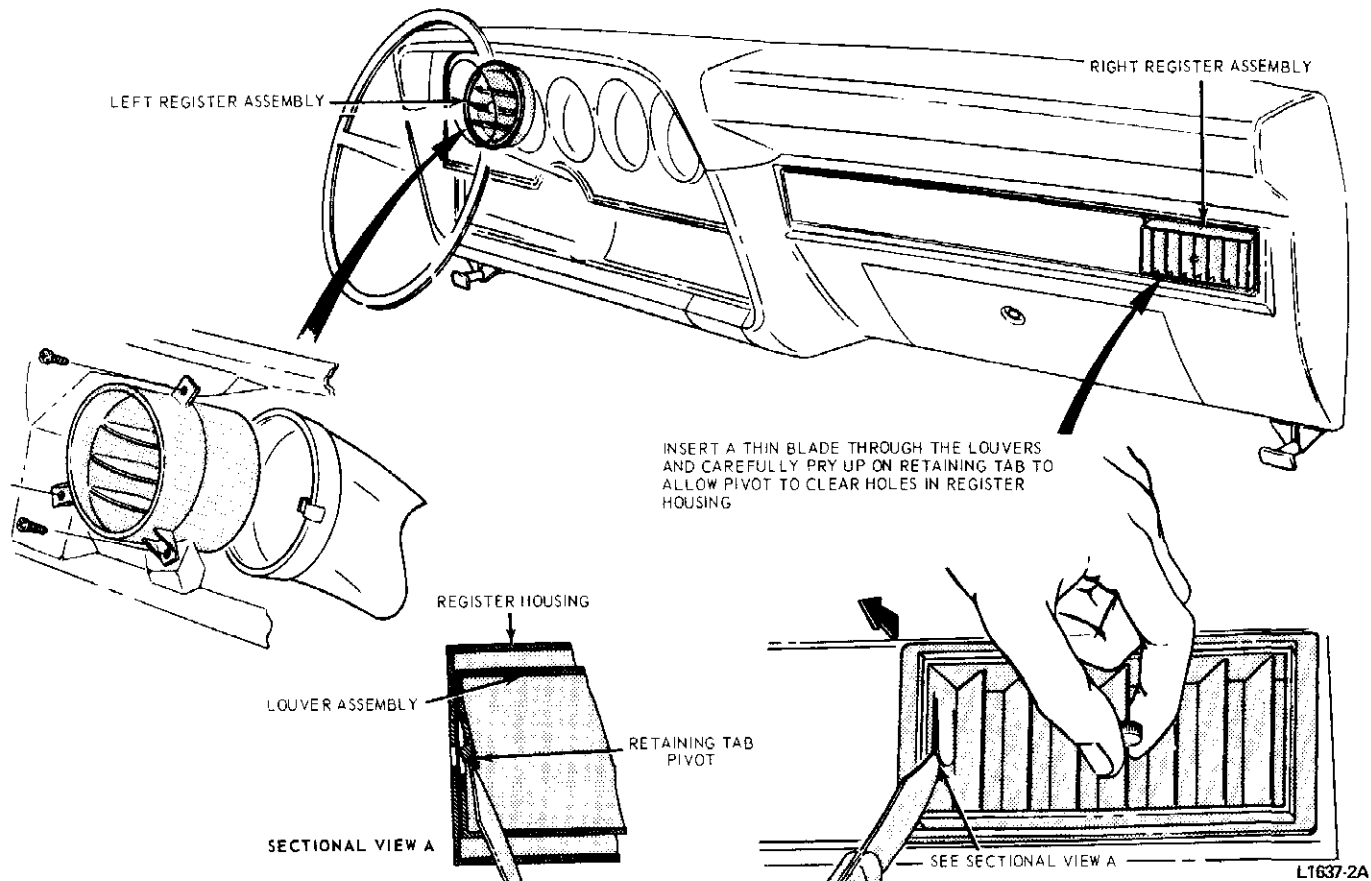
FIG. 1 Fresh Air Ventilation Ducts—Ford and Mercury

L1990-2D



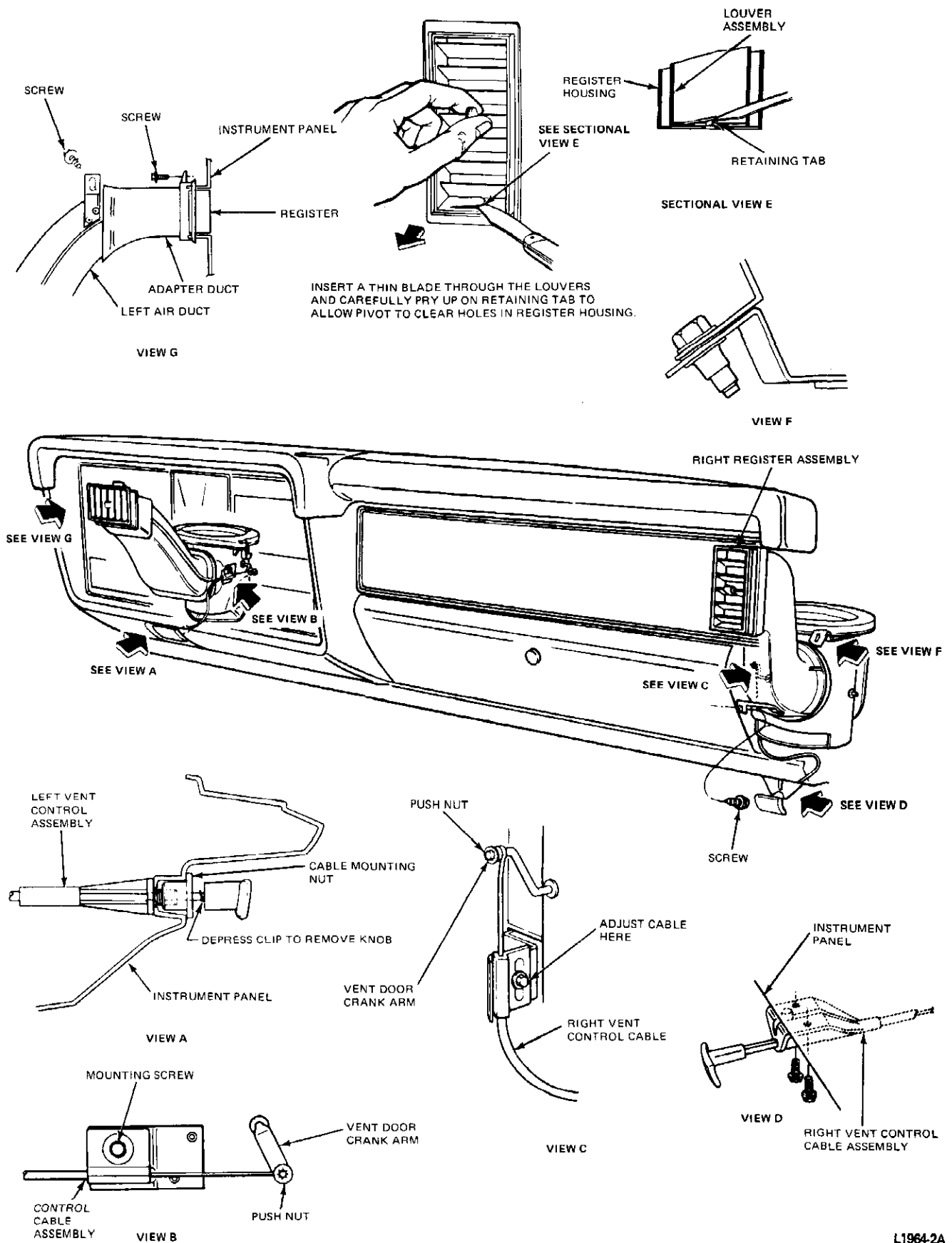
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FIG. 2 LTD II, Thunderbird and Cougar Hi-Lo Ventilation System



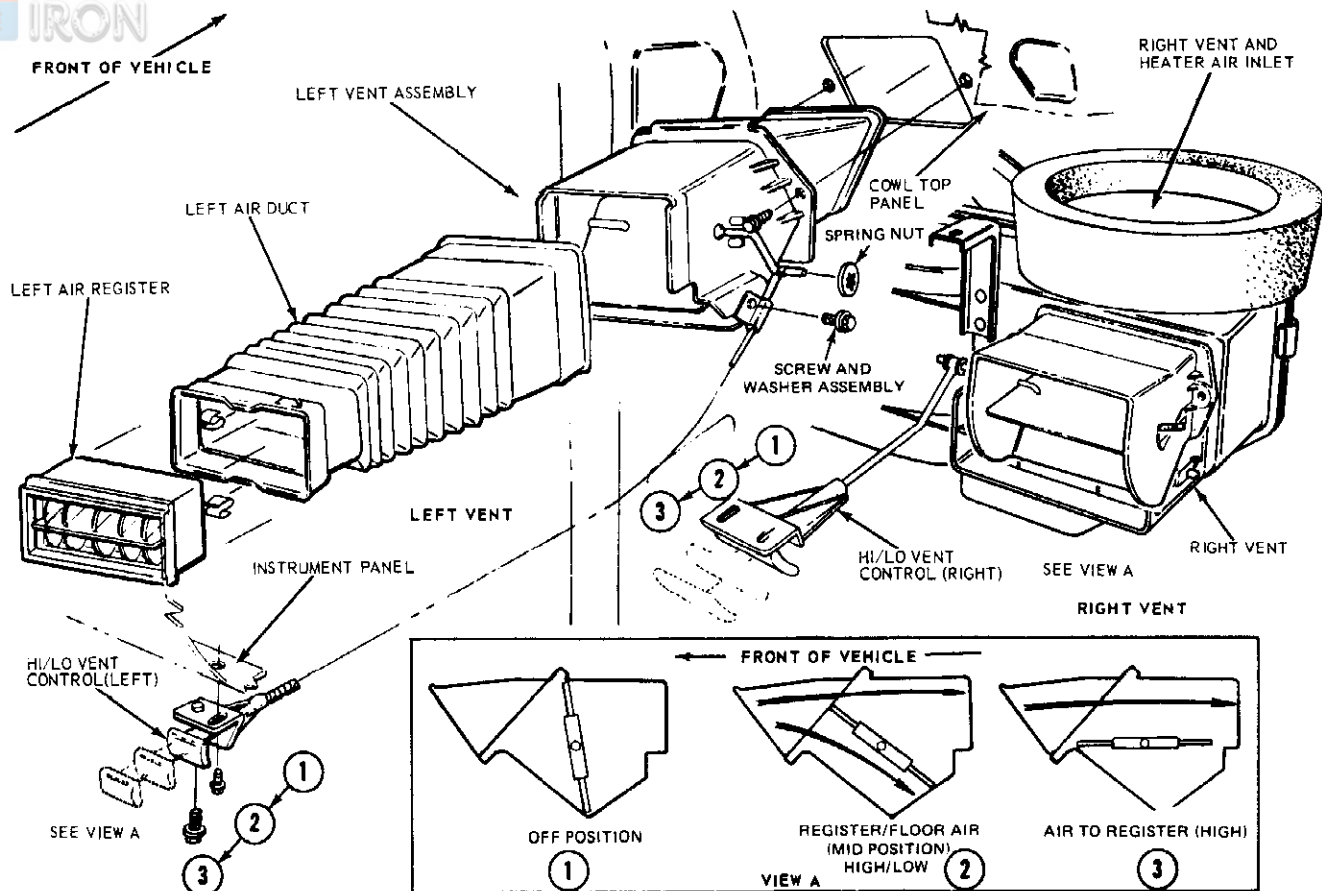
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FIG. 3 Vent Register Removal—LTD II, Thunderbird and Cougar



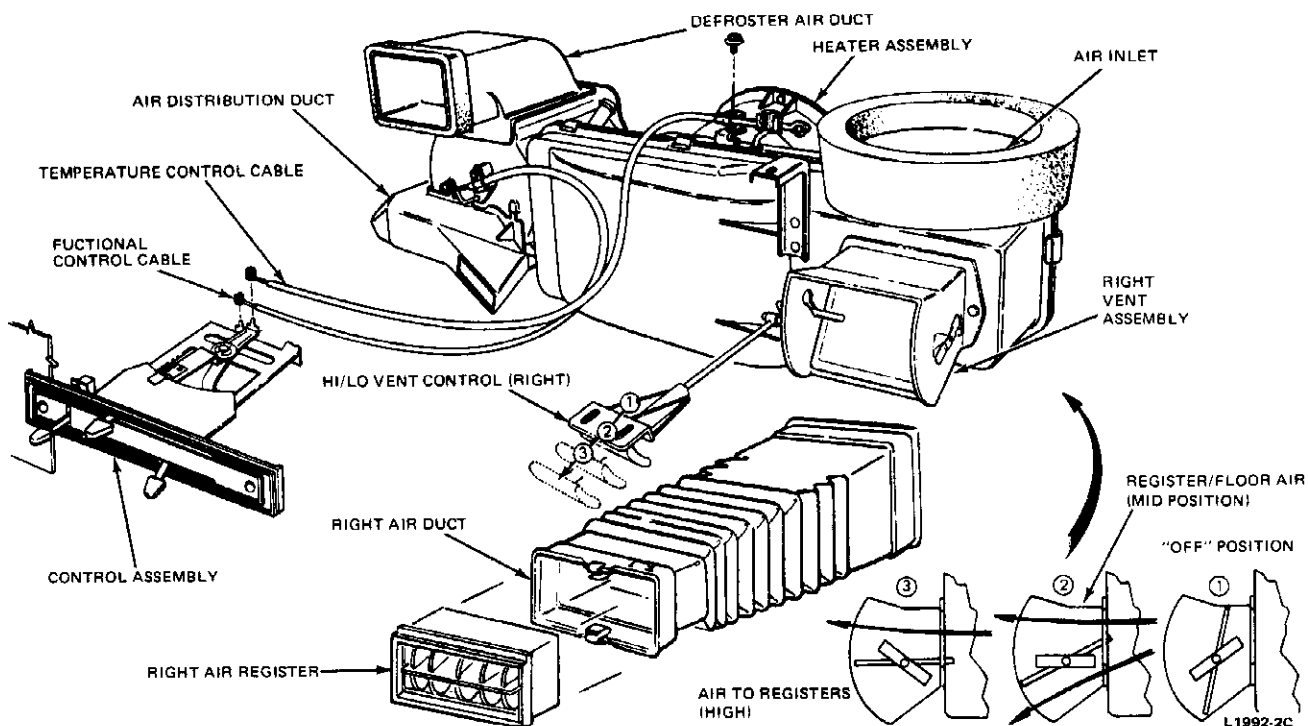
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FIG. 4 Hi-Lo Ventilation System—Granada, Monarch, Fairmont and Zephyr



L1510-2D

FIG. 5 High/Low Ventilation System—Pinto and Bobcat-Left Side



L1992-2C

FIG. 6 High/Low Ventilation System—Pinto and Bobcat-Right Side

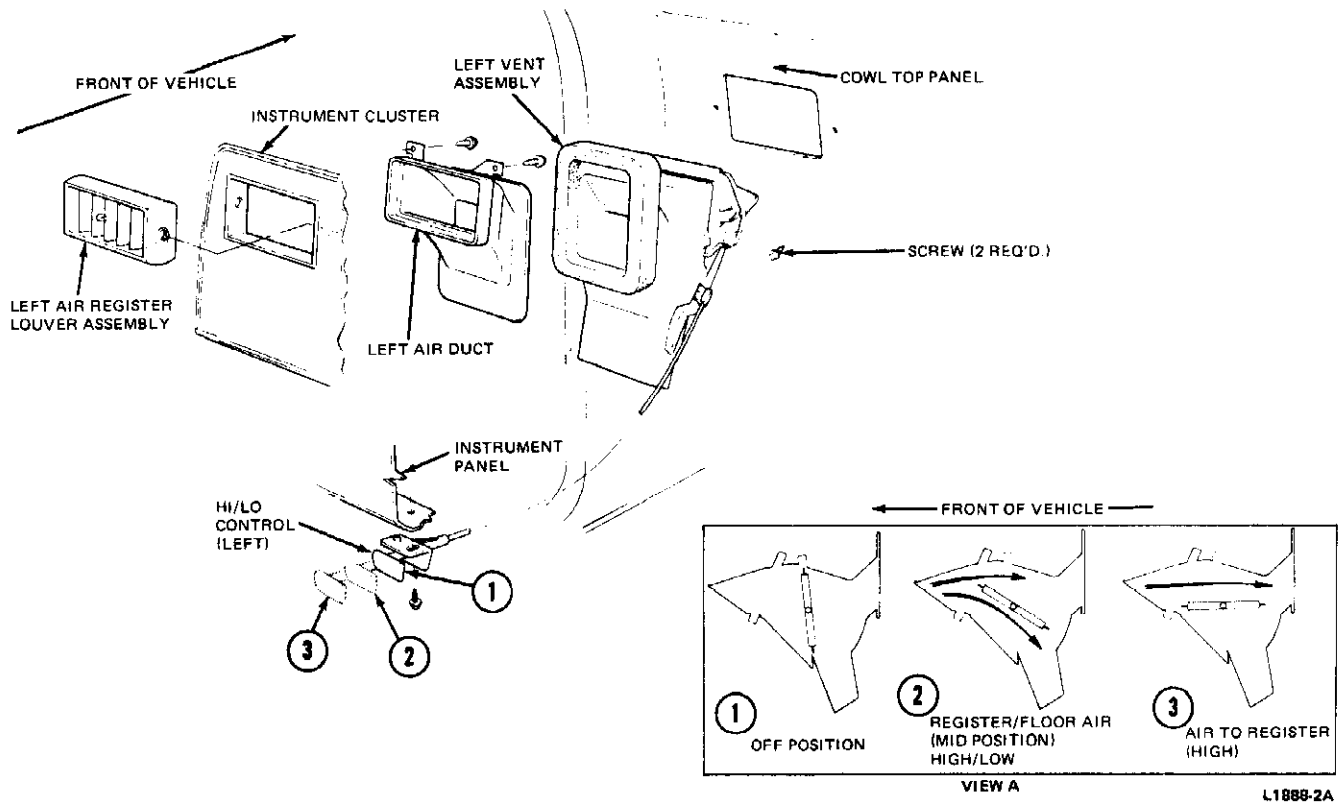


FIG. 7 High/Low Ventilation System—Mustang II—Left

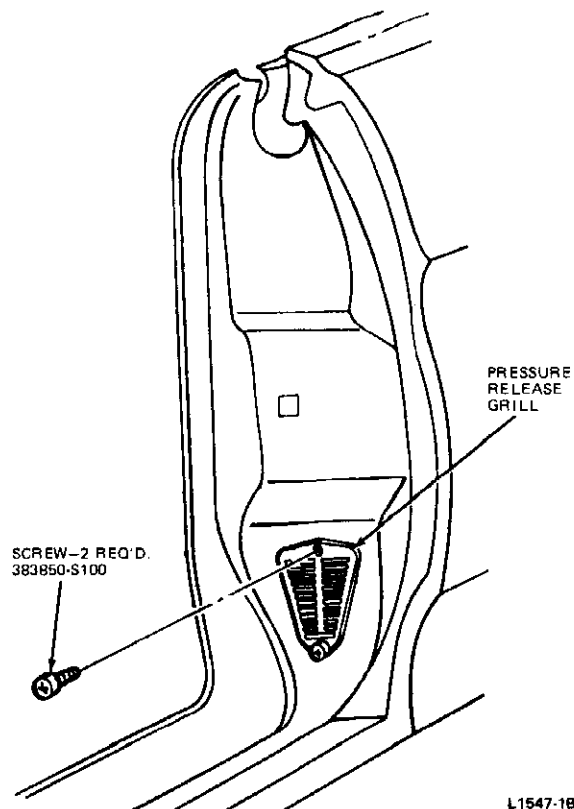
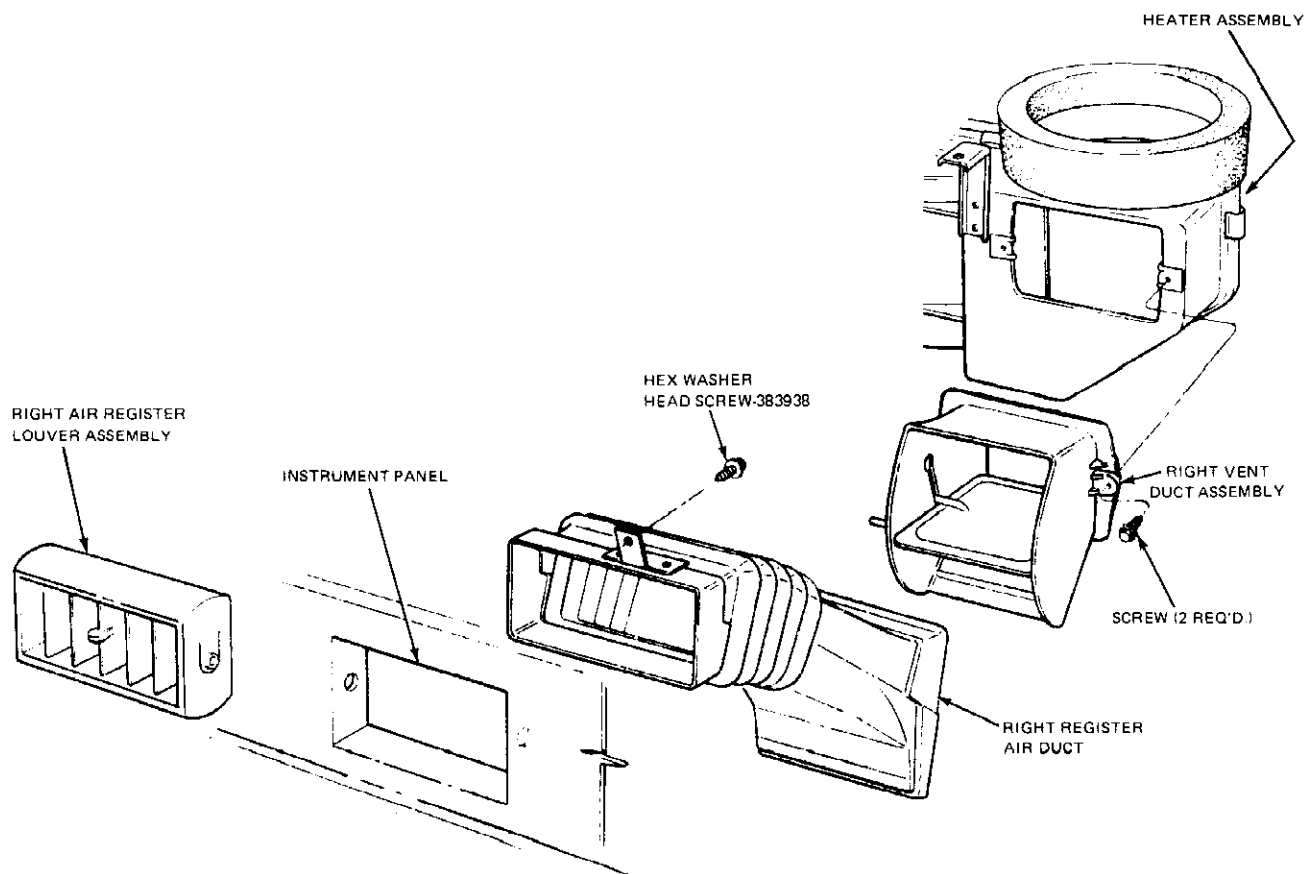


FIG. 8 Typical Pressure Release Grilles



L1890-2C

FIG. 9 High/Low Ventilation System—Mustang II—Right

ADJUSTMENTS

AIR VENT CABLE

LTD II, Thunderbird and Cougar

Loosen the Bowden cable housing retaining screw at the vent crank arm (View A, Fig. 2). Move the cable housing back and forth until the vent is closed when the control knob is $1/16$ to $1/8$ -inch from the pushed-in position; then, tighten the screw.

Mustang II

Loosen the high/low vent control mounting bracket screws. Move the cable bracket back and forth until the vent is closed when the control knob is $1/16$ " to $1/8$ " from pushed-in position; then, tighten the retaining screws (Figs. 7 and 9).

Pinto and Bobcat

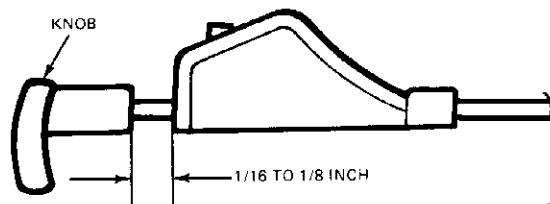
Loosen the high/low vent control mounting bracket screws, move the cable housing bracket back and forth until the vent is closed when the knob is $1/16$ to $1/8$ inch from the in-position, then tighten the retaining screws (Figs. 5 and 10).

Fairmont and Zephyr

The left and right vents are controlled in the same manner but, the cables are self-adjusting.

Granada and Monarch

The right vent cable is adjusted by shifting the cable housing in the mounting bracket located near the air



L1889-1A

FIG. 10 Air Vent Cable Adjustment—Pinto, Bobcat, Granada and Monarch

door crank arm. Loosen the mounting screw, hold the door in the full closed position and shift the cable until the operating knob is $1/16$ " to $1/8$ " from the bracket. Tighten screw. See Fig. 4.

REMOVAL AND INSTALLATION

MUSTANG II

Vent Duct—Left

1. Disconnect the vent control from the instrument panel (Fig. 7).
2. Remove the two vent-to-cowl top panel mounting screws, separate the vent assembly from the air duct and remove the vent assembly.
3. To remove the air duct, remove the air duct-to-instrument panel retaining screws.
4. If the air duct was removed, place it in position and install the two air duct-to-instrument panel retaining screws. Position the vent assembly in place and install the two vent assembly-to-cowl top panel retaining screws.
5. Connect the vent control to the instrument panel.

Vent Duct—Right

1. Disconnect the right vent control from the instrument panel. Remove the air duct-to-instrument panel retaining screw and the vent duct-to-heater retaining screws (Fig. 9).
2. Compress the air duct and remove the vent and duct as an assembly. Separate the air duct from the vent.
3. To install the assembly, install the air duct on the vent duct assembly and place in position.
4. Install the air duct-to-instrument panel retaining screw and the vent duct-to-heater retaining screws.
5. Connect the right vent control to the instrument panel.

Louver Assembly

Pry on the end pivot with a thin blade to separate the pivot from the pivot hole and pull the barrel assembly out of the instrument panel as shown in Fig. 11.

The barrels can be installed in one way only because of the size of the two pivots and retaining holes.

LTD II, THUNDERBIRD AND COUGAR

Left Vent Assembly

1. Disconnect the left vent control cable from the crank arm.
2. Remove the three duct-to-upper cowl mounting stud nuts.
3. Separate the vent duct from the left register air duct and remove the vent duct.

Right Vent Assembly

1. Remove the glove box.
2. Remove the button that locks the register duct to the vent duct.
3. Remove the right register air duct.
4. Disconnect the right vent control cable from the instrument panel.
5. Remove one duct-to-heater attaching screw.
6. Remove the duct-to-upper cowl mounting screw. Slide the duct downward to disengage the S-clips and remove the vent duct.

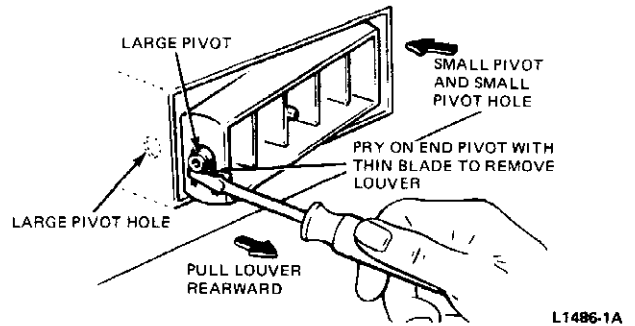


FIG. 11 Louver Assembly—Mustang II

Vent Registers

The left register can be removed from the instrument panel by first removing the cluster trim bezel. Remove three hex head screws and pull the register ball and housing rearward (Fig. 3).

The right outboard louver assemblies can be removed from the instrument panel as shown in Fig. 3. Insert a thin blade through the louvers and carefully pry upon the two retaining tabs to allow the pivoting retaining tabs to clear the holes in the panel. Then pull the louvers rearward.

PINTO AND BOBCAT

Vent Duct—Right

Disconnect the right vent control from the instrument panel, remove the glove box, collapse the duct and remove it. When installing, be sure to engage the duct properly in the S-clips (Fig. 6).

Vent Duct—Left

1. Disconnect the left vent control from the instrument panel (Fig. 5).
2. Remove the two left vent-to-cowl top panel mounting screws, compress the air duct, and remove the vent and duct as an assembly.
3. Separate the air duct from the vent.
4. When installing, be sure to position the S-clips properly between the duct and the register.

Registers—Left and Right

1. The register housing is secured to the instrument panel by three locking tabs, two on the upper and one on the lower side of the housing. Unlock the three tabs and pull the register out of the instrument panel as shown.
2. The louver assembly pivots on two retainers each, having two tabs that engage corresponding rectangular holes in the register housing (Fig. 12).

Unlock the four tabs by pushing each one down and inboard of the rectangular holes (Fig. 12).

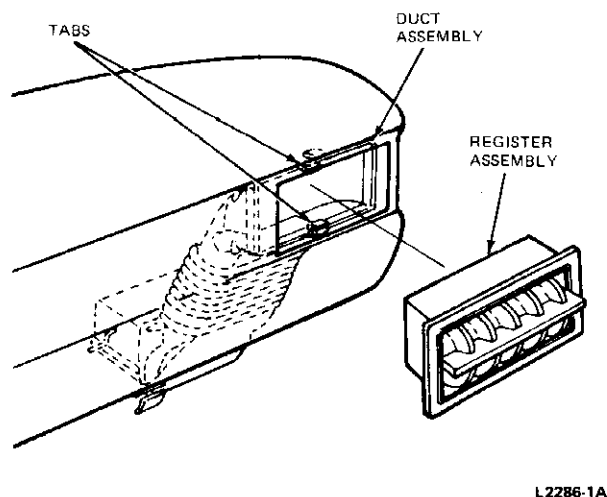


FIG. 12 Air Register Removal and Installation—Pinto and Bobcat

3. Carefully slide the two retainers and louver assembly out of the housing, and separate the retainers from the louver assembly. See Fig. 12.
4. When installing, be sure that the louvers are positioned as shown for proper air deflection. Install the retainers to the pivot pins on the louver assembly, and carefully slide the assembly into the housing, so that the retainer tabs seat firmly into the rectangular holes in the housing.

GRANADA, MONARCH, FAIRMONT AND ZEPHYR

Left Vent Assembly (Fig. 4)

1. Remove the screws locking the left register air connector duct and the vent duct together.
2. Disconnect the left vent control cable from the air door crank arm. Remove the wiring harness from the clip on the inboard side of the duct.

3. Remove the three (3) duct-to-upper-cowl mounting stud nuts.
4. Separate the vent duct from the left register air duct and remove the vent duct assembly.
5. Install the assembly by reversing the above procedure.

Right Vent Assembly (Fig. 4)

1. Remove the glove box.
2. Remove one screw securing the register duct bracket to the lower instrument panel rail.
3. Remove one screw securing the register duct to the instrument panel register housing.
4. Remove right register air duct.
5. Disconnect the right vent control cable from the air door crank arm.
6. Remove one duct-to-heater attaching screw.
7. Remove duct-to-upper-cowl mounting screw.
8. Slide the vent duct out of the clips on the heater assembly and remove the vent duct.
9. To install, reverse the above procedure.
10. Adjust right vent cable.

Vent Registers (Fig. 4)

1. Insert a thin blade through the louvers and carefully pry upon the two retaining tabs to allow pivots to clear holes in panel, then pull louvers rearward. Install by snapping back into position. See View E, Fig. 4.

REGISTERS (LUXURY TRIM)

On vehicles equipped with luxury trim, the air registers are the same as those used with air conditioning. See the air conditioning section for the specific vehicle.

PRESSURE RELEASE GRILLES

The pressure release grilles used on some vehicles are retained to the quarter pillar either by two screws or by two retaining tabs at the top and one screw at the bottom (Fig. 8).

Heating System General Service

PART
36-10

SUBJECT	PAGE	SUBJECT	PAGE
GENERAL INFORMATION		TESTING (Cont'd.)	
Heater Cores	10-1	Blower Switch Test	10-5
Heating Systems and Control Doors	10-1	Heater Blower Motor Current Draw Test	10-5
Safety Precautions	10-1	Heater Core Tests	10-6
DIAGNOSIS	10-2	Heater Water Valve Tests	10-5
TESTING		Loose Blower Test	10-5
Bleeding Air From Heater Core	10-5	Open Circuit Test	10-5
		Plugged Heater Core Test	10-5

CL2335-2B

GENERAL INFORMATION

HEATING SYSTEMS AND CONTROL DOORS

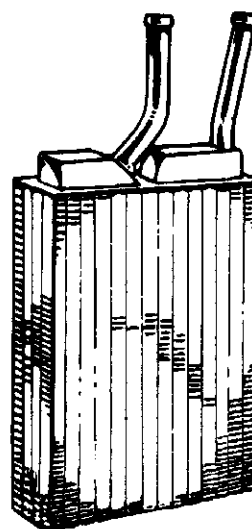
Outside air comes through an opening at the upper cowl and into the right duct of the heater assembly. All heater assemblies contain a heater core, through which flows hot water from the engine, and a blower. The air (forced by blower or ram effect) passes through and/or around the heater core and discharges through various outlets.

Several doors determine the amount of air that goes through the heater core and the particular outlet(s) through which it discharges. The number of doors used and the manner in which they are actuated differ according to the particular vehicle model. Some models have as many as five doors and one water valve; some have only two doors. Some doors are actuated by a vacuum motor; some by a cable. In all cases, the cables and motors are controlled by either one or two control levers (functional or temperature).

Each door or valve and the vacuum motor or cable that controls it has been assigned a code number which relates directly to its function in the system. These code numbers are used in illustrations and procedures throughout this group.

HEATER CORES (Fig. 1)

The heater core in current use consists of a number of flat, hollow, metal ribbons that are corrugated to take maximum advantage of engine coolant flow. Its size and location vary with vehicle application. On some vehicles, it will be found in the evaporator case in the engine compartment. In others, under the instrument panel adjacent to the plenum chamber.



L2324-1A

FIG. 1 Heater Core—Typical

SAFETY PRECAUTIONS

Whenever components in the engine compartment or instrument panel areas are being serviced, the battery ground cable must be disconnected to eliminate the possibility of electrical shorts, burned-up wiring, and dangerous fires. Extreme care must be exercised when performing electrical tests where the battery must be connected to operate the system.

Carbon monoxide is colorless, odorless and dangerous. If it is necessary to operate the engine with the car in a closed area such as a garage, always use an exhaust collector to vent the exhaust gasses outside the closed area.