

**MASTER TECHNICIANS  
SERVICE CONFERENCE**

**65-2**

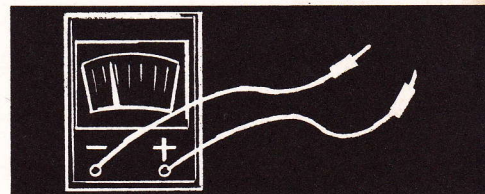
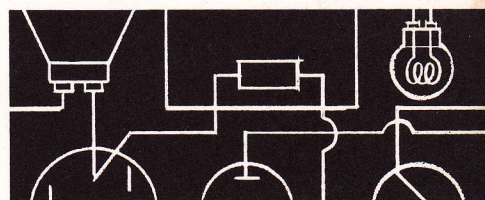
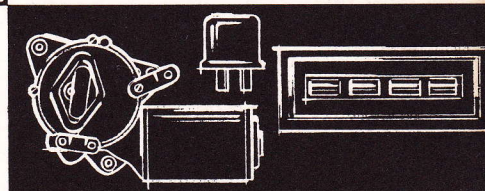
**MTSC REFERENCE BOOK**

**ELECTRICAL**

**ACCESSORIES**

**CIRCUITS**

**and SERVICE**



**CHRYSLER**  
MOTORS CORPORATION

PLYMOUTH • DODGE  
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remove the trim panel and loosen the two solenoid mounting screws. The holes in the solenoid mounting bracket are elongated to allow correct positioning.

### ELECTRICAL CHECKS

If none of the door lock solenoids operate when the front door buttons are pushed or pulled or when the doors are locked with the key, the trouble is either a bad relay, burned-

out circuit breaker or no current to the circuit breaker.

*TIP:* If the car is also equipped with electric window lifts, see if they operate. If they don't work either, the trouble area is narrowed down to the circuit breaker feed.

You can check individual switches by removing the trim panel and using a test light to see if there is current to the switch.

## WINDSHIELD WIPERS

On all Furies, Polaras, Custom 880's, Monacos and Chryslers, the wiper motor is mounted in the engine compartment. The wiper linkage is conveniently located inside the cowl ventilation panel. Single-speed wipers are standard on all these cars except Chrysler 300's and New Yorkers.

### SINGLE SPEED

The single-speed wiper motor mentioned above is a permanent-magnet-type motor. The single-speed wiper switch has a built-in circuit breaker to protect the motor and wiring. Current feed to the "B" terminal of the wiper switch comes from the ignition switch accessory terminal. The circuit breaker is be-

tween the "B" terminal and a double terminal marked "P<sub>1</sub>" and "B/U", so the double terminal is always hot when the ignition is turned on. A single wire connects the P<sub>1</sub> terminal to the parking switch in the motor. The B/U terminal is the feed connection for back-up lights.

When the switch is turned on, the P<sub>1</sub>-B/U terminal is connected to the "A" terminal, which is the feed terminal to the motor. The armature windings are grounded through the motor housing.

### PARKING

The parking switch, located in the wiper motor assembly, serves as a temporary con-

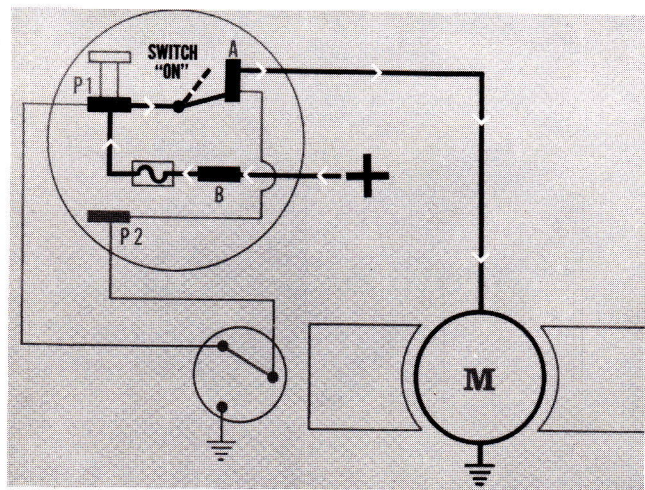


Fig. 15—Permanent-magnet wiper circuit

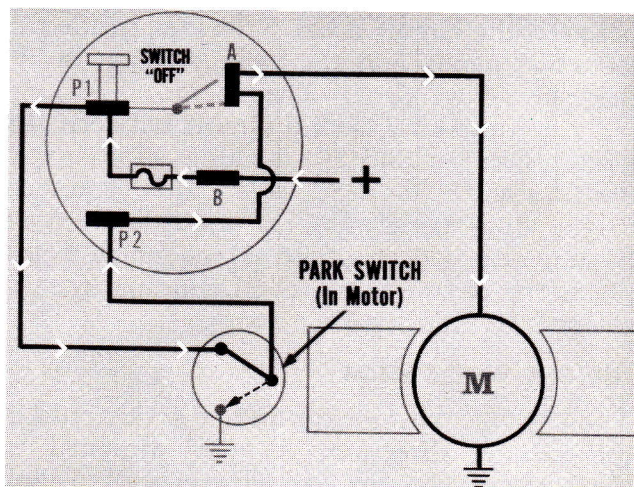


Fig. 16—Permanent-magnet parking circuit

nection between the hot P<sub>1</sub> terminal and the motor. When the instrument panel switch is turned off, the "A" terminal is disconnected from P<sub>1</sub> and connected to P<sub>2</sub>. The current flow is from P<sub>1</sub> to parking switch, back to P<sub>2</sub>, through the wiper switch to "A" and to the motor armature and ground. This temporary circuit carries the wipers to the parking position, at the right side of the wiping pattern.

### DOUBLE GROUND

As the blades reach the parking position, the parking switch disconnects the power supply from P<sub>1</sub> and connects P<sub>2</sub> to ground. Thus, the motor armature winding is grounded on both ends, stopping the motor immediately. Let's see why.

### MOTOR BECOMES GENERATOR

When the current to the motor is shut off, the armature has a tendency to coast. Since this is a permanent-magnet motor, the magnetic field is always present. The winding of the coasting armature cuts the magnetic lines in the field, so the motor then becomes a generator. If an electrical load is placed in the circuit, the load acts as a brake on the "motor-generator". With both ends of the armature winding grounded, there is a maximum load, in the form of a dead short in the armature circuit. This load on the "motor-generator" stops the armature immediately.

### WOUND FIELD MOTOR

The standard single-speed wiper motor on Valiants, Belvederes, Darts and Coronets is a

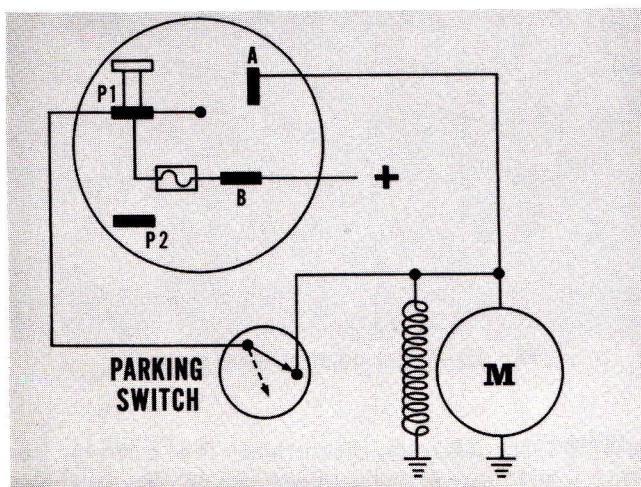


Fig. 17—Wound field single-speed motor

wound field-type motor, which simply means that the magnetic field is created by electromagnetic windings instead of by permanent magnets. These cars use the same wiper switch as those with the permanent-magnet motor, but the P<sub>2</sub> terminal of the switch is not connected to anything. The "A" terminal feeds both armature and field while the wipers are running. When the switch is turned off, the P<sub>1</sub> terminal feeds the field and armature through the parking switch in the motor. As the blades reach the right side of the wiping pattern, the parking switch opens the circuit and the motor stops.

### VARIABLE SPEED

The variable-speed motor also has a wound field, plus an additional shunt winding to control motor speed. The current to the shunt winding, which determines the strength of its magnetic field, is regulated by a rheostat in the wiper switch. As the strength of the shunt winding is decreased, the motor speed increases. Thus, if a variable-speed motor over-speeds, or "runs away", you should look for an open in the shunt circuit.



### REVERSE TO PARK

When a variable-speed wiper is turned off, the current flow through the shunt and field windings is reversed, causing the motor to run backward. This backward rotation is a part of the depressed (off the glass) parking feature of variable-speed wipers.

### OVER-TRAVEL ASSEMBLY

The variable-speed wiper linkage is driven through a spring and cam assembly attached to the motor crank arm. The cam provides the necessary over-travel to position the blades in the parked position.

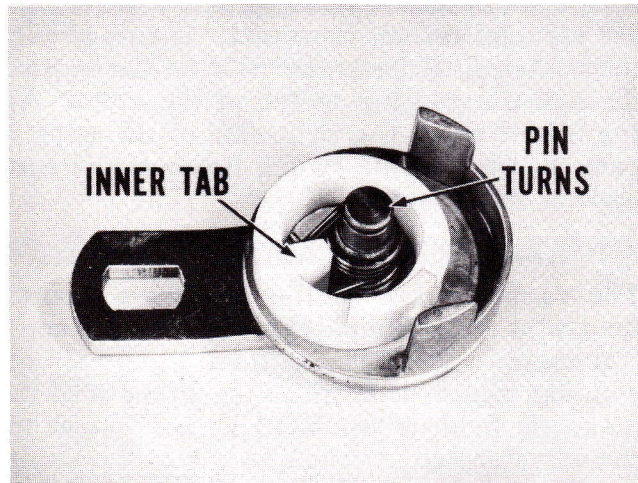


Fig. 18—Overtravel assembly—running position

When the motor is started, the spring is tightened on the spring pin, and carries the spring release ring around until the stop tab contacts the pivot connecting link. The release ring inner tab then releases spring tension, so the spring pin turns freely.

### CAM LENGTHENS LINK

Reversing the motor rotation moves the release ring stop tab away from the connecting link, and the spring again tightens on the pin.

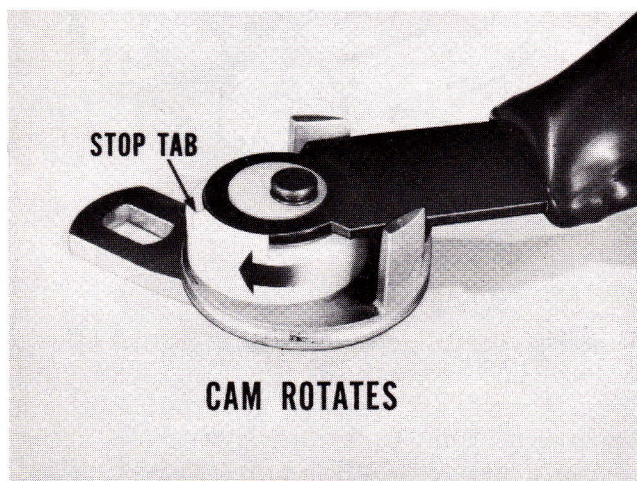


Fig. 19—Overtravel assembly—parking cycle

The spring, release ring and cam rotate 180 degrees in the housing. The cam rotation adds about one-quarter inch to the throw of the pivot linkage, forcing the wiper blades onto the lower windshield molding.

### LUBRICATION IS IMPORTANT

There is no definite lubrication schedule for the over-travel assembly, but if you have to remove it from the car, disassemble the unit, remove the spring from the pin, and wash all the old lube off with solvent. Use a pair of snap-ring pliers to spread the coils and dip the spring into Led-Plate lubricant. Then, while still holding the spring open, place it back on the pin and reassemble the cam, ring, connecting link, wave washer and clip.

**NOTE:** Led-Plate is the only approved lubricant for the over-travel assembly.

### CHECKING THE SPRING RELEASE

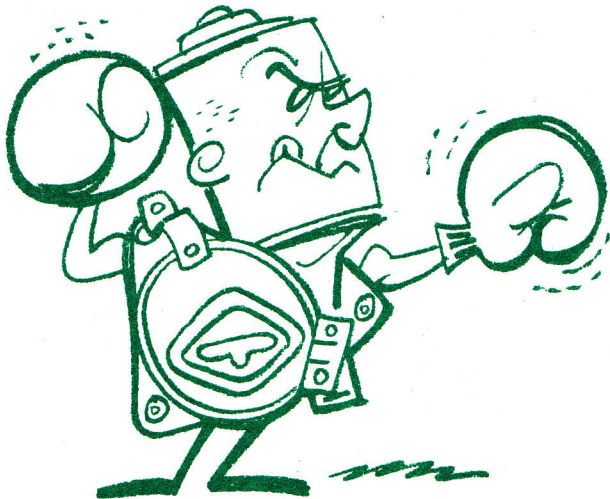
An improperly lubricated spring pin will wear rapidly, so that eventually the spring cannot tighten on the pin when the motor rotation is reversed. As a result, the wipers will not park properly. You can check the condition of the pin without removing the linkage from the car. Peel back the protective boot and see if the release ring is free to rotate slightly. If you can move it at least 1/32-inch, the spring and pin are in good shape.



Fig. 20—Checking overtravel assembly

**CAUTION:** Always disconnect the battery before working on the wiper linkage. If you move the linkage far enough to close the park switch,

and the ignition switch is on, the motor will go through a complete parking cycle. The motor is strong enough to cause serious injury to your fingers.



#### THE NEW LINKAGE

On all cars with the wiper motor mounted in the engine compartment, the linkage is located in the plenum chamber. It is easily accessible by removing the lower windshield molding and the cowl fresh-air grille panel.

#### MOLDING REMOVAL

The lower windshield molding is retained by wire spring clips, two retainers and two screws.



Fig. 21—Wiper arm tool C-3982

**NOTE:** The new wiper arms are held on the pivot shafts by spring tension. A new tool C-3982, is available for removing the arms.

Protect the paint near the molding by applying two or three layers of masking tape. Remove the two screws in the ends of the molding. Pull the ends of the molding away from the body far enough to slide the retaining clips from the end of the molding. Then, using a plastic trim stick, pry up the forward edge of the moldings to disengage the spring clips from the cowl fresh-air panel.

#### THE VENT PANEL

The cowl fresh-air grille panel is fastened by sheet-metal screws along the back and in the engine compartment. The two wiper pivot bezels snap into the panel, and can be removed by sliding a thin blade under them. When the bezels and screws have been removed, close the hood and lift the vent panel straight up.



Fig. 22—Cowl fresh-air grille panel

#### LINKAGE REMOVAL

The wiper linkage must be removed and installed as an assembly. Disconnect the battery and remove the crank arm from the motor. Remove the cap screws from the wiper pivots and slide the assembly toward the right side of the car. Then pull the linkage and pivots toward the left side through the plenum chamber opening.

There is no sealing required when the linkage, cowl fresh-air panel and molding are installed. Make sure all the molding spring clips are in good condition. To prevent distortion of the molding when the clips are forced into the panel, lay the plastic trim stick on the mold-

ing over each clip and drive the clip in with the palm of your hand.

### PARKING SWITCH TIMING

To determine whether the parking switch timing is off, watch the wiper blades when the wipers are turned on and off. If the blades go down slightly before moving up when the switch is turned on, the timing is early. If they park and then move up slightly when the switch is turned off, the timing is late.

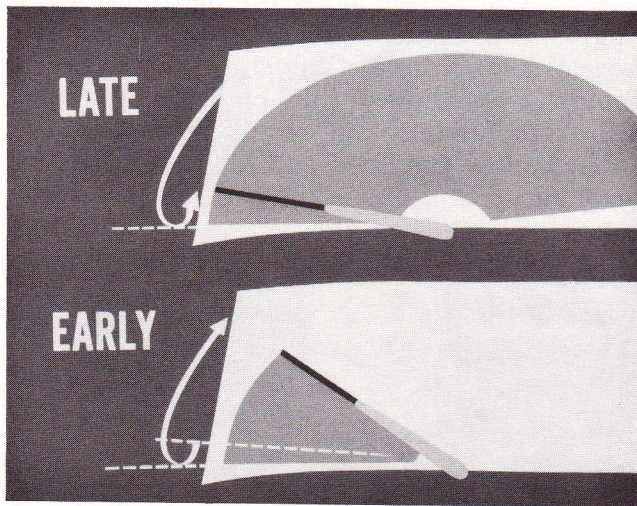


Fig. 23—Check the parking timing

### ADJUSTING THE TIMING

Parking timing on all single-speed wiper motors is the same. Loosen the five screws on the gear housing cover plate and turn the plate. Usually, only a small movement is re-

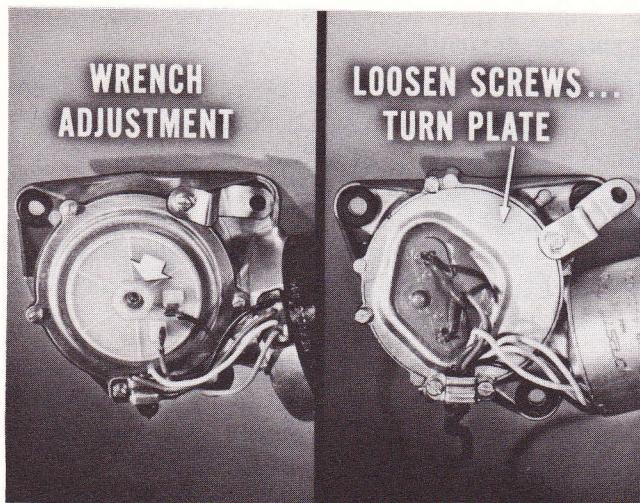
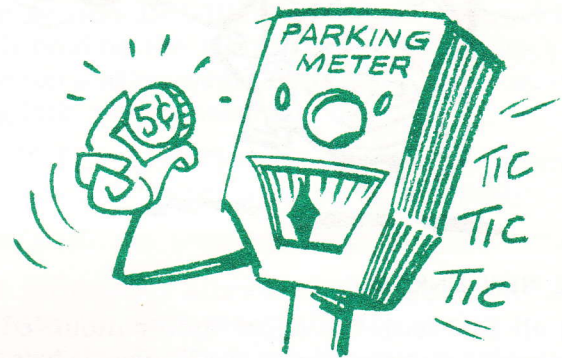


Fig. 24—Variable-speed timing adjustments

quired. To correct for late timing, turn the plate to your left as you face the rear of the car.

Because the variable-speed wiper motor is turning in reverse when it parks, the timing adjustments are opposite from single-speed motors. You'll find two different variable-speed motors. The only difference between them is in the method of adjusting the parking timing. One motor has the metal plate and five screws, similar to single-speed motors. The other has a nylon cover plate with a hex molded in the center to take a wrench.



### BLADE ADJUSTMENT

Parking switch timing may not be the complete reason for incorrect blade parking. The wiper arms may need to be relocated on the pivots. The new serrated pivots provide for very small changes in position. To check the arm positioning on variable-speed wipers, push the end of the wiper arm toward the top of the windshield with a force of about three pounds. The tip of the blade should not move more than three inches from the molding.

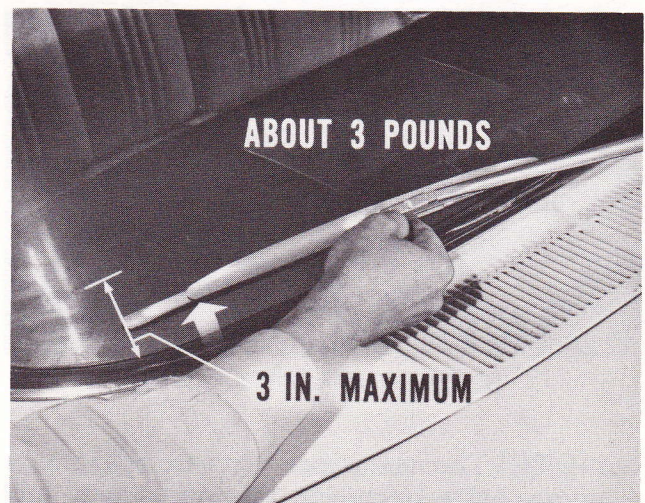


Fig. 25—Variable-speed blade check

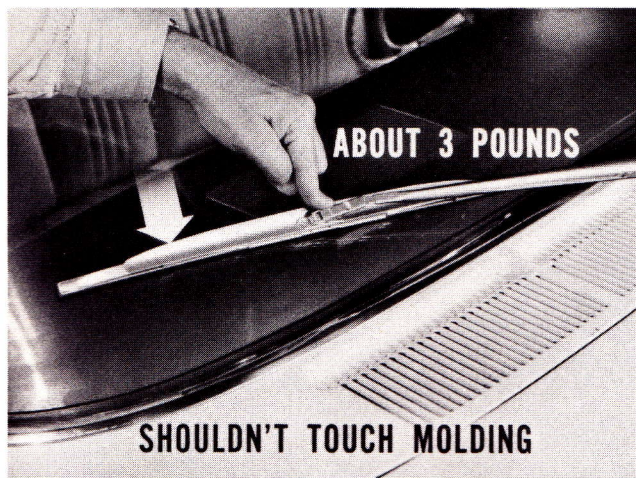


Fig. 26—Single-speed blade check

Single-speed wipers park on the glass, at the end of the wiping pattern. Push the end of the arm toward the bottom of the windshield with about three pounds force. The blade shouldn't touch the molding.

#### THERE'S A LEFT AND RIGHT

Although the two wiper arms appear to be identical, you'll find that they're stamped L and R. The left arm has a slightly sharper angle at the blade end. Also, you'll find that the blades are replaceable separate from the arms on 1965 models. Just press the small locking clip and pull the blade off.

## CIRCUIT PROTECTION

All of our 1965 models are equipped with fusible link protection, consisting of a special fuse-type wire with a new Hypalon insulation. Valiants, Darts, Belvederes and Coronets have a single link between the battery terminal of the starter relay and the ammeter connection in the bulkhead disconnect. On Furies, Polaras, Custom 880's, Monacos and all Chryslers, there is a second fusible link between the starter relay and the horn relay. Imperial

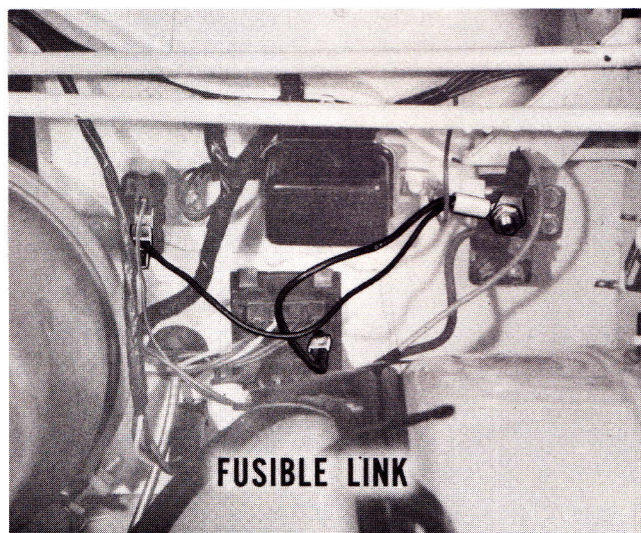


Fig. 27—Fusible link circuit protection

fusible links are between the starter relay and the alternator regulator terminal block and from the starter relay to a connector leading to the horn relay.

#### TROUBLE SIGNALS

If the main feed circuits should become shorted, the fusible link will quickly begin to heat up the special Hypalon insulation. As it heats up, the insulation begins to swell, giving off a quantity of smoke, until it finally bursts. You'll be able to hear the bursting; about like a very small firecracker. The special wire will burn out at about the same time. When it does, all the electrical circuits are dead.

#### CHECK IT OUT

If a fusible link should burn out, don't replace it until you've made a thorough visual inspection of all exposed wiring. Check out the charging system first, including all leads to the instrument panel. All other circuits are fused, and these fuses will blow before the fusible link.

**CAUTION:** Don't use a jumper wire between the starter relay and the ammeter circuit to check the circuits. It takes only a few seconds for a shorted 12-volt system to start a fire.