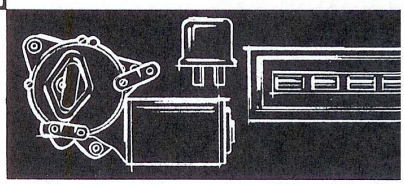
MASTER TECHNICIANS SERVICE CONFERENCE 65-2

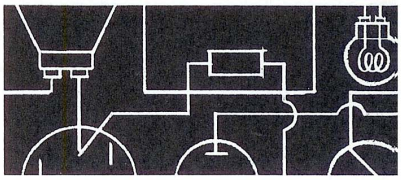
MTSC REFERENCE BOOK

ELECTRICAL

ACCESSORIES



CIRCUITS



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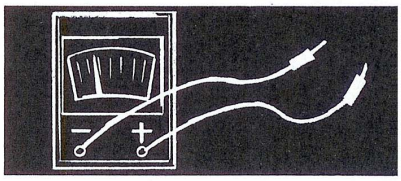

CHRYSLER MOTORS CORPORATION

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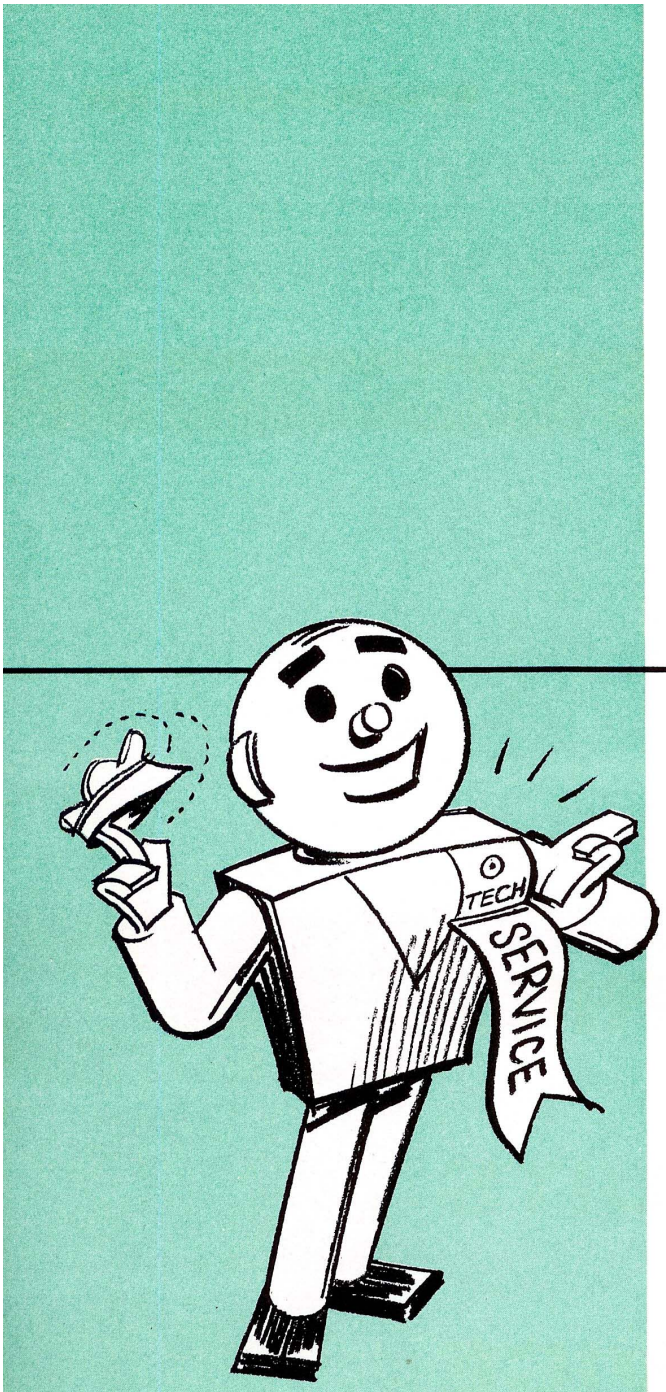


Tech sez:

The title of this session might sound a little misleading to some of you Technicians. Windshield wipers and turn signals are not really classified as accessories, but if we included the names of all the equipment covered in the title, we'd have to get a bigger book.

The main point is, the information in this session will be important to every Technician sooner or later. You'll find some brand-new accessories and circuits, as well as some review material on equipment carried over from previous models.

You've had a couple of months now to get acquainted with our lineup for 1965, and we're sure you agree that our cars get better every year. And, we're just as ready to agree that our customers are getting better service every year. This combination of first-rate cars and the best of service is a sure-fire formula for customer loyalty.

CONTENTS:

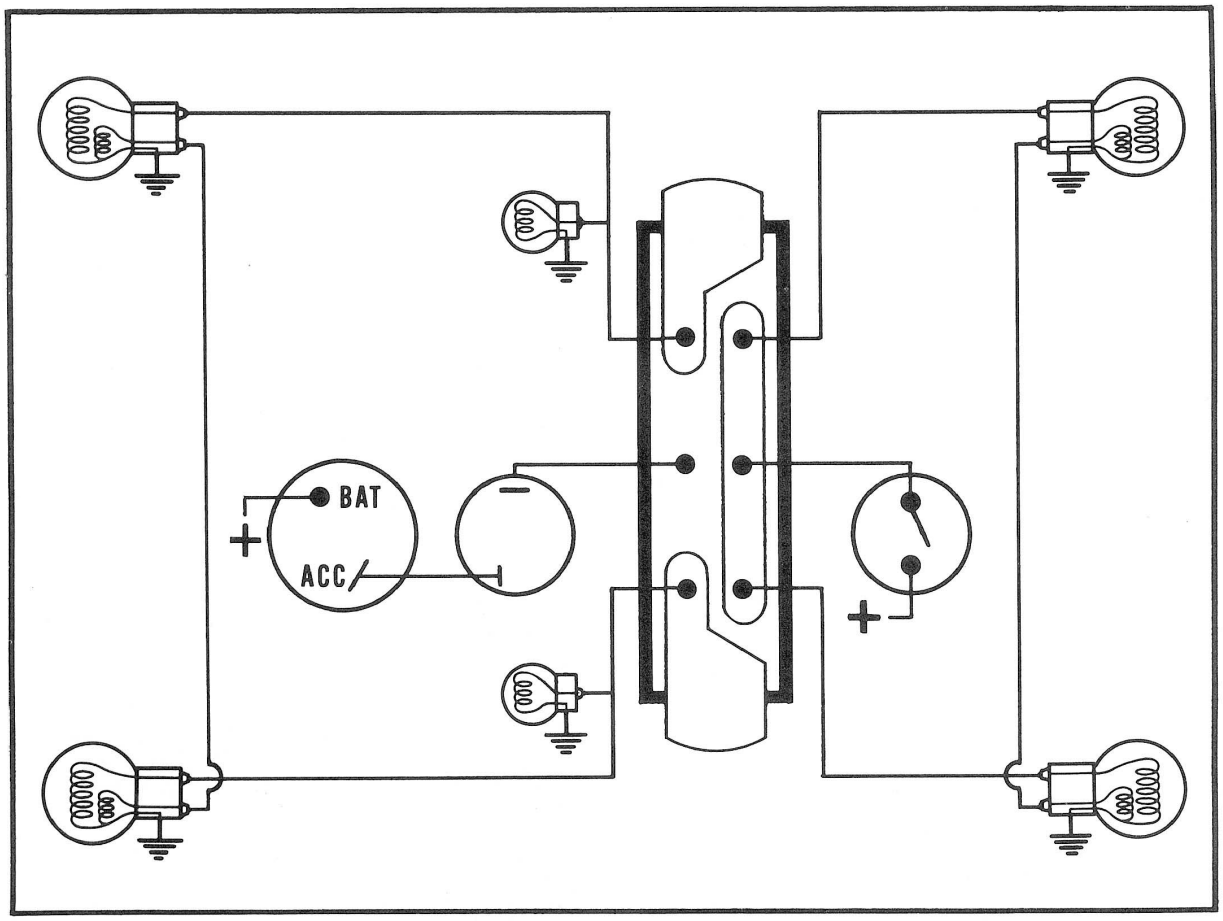


Fig. 1—Turn-signal circuit

The directional signal circuit may seem rather complex when viewed as a complete system. Adding to the complexity of the circuit is the fact that it is joined to other lighting circuits.

Tracing the circuits in sections and noting the relationships between the directional signals and the other circuits will help in gaining the understanding required for quick, correct diagnosis.

POWER SUPPLY

The source of current for the turn-signal system is the accessory terminal of the ignition switch. A single lead feeds the flasher unit, which supplies turn-signal current to the switch. A second source of current goes into the turn-signal switch from the stoplight switch. The reason for running the stoplight circuit through the turn-signal switch will become apparent as the circuits are traced.

STOP SIGNAL ONLY

When the stop-signal switch is closed, current is fed to the center terminal under the stoplight bar in the turn-signal switch. Since the turn-signal switch is in the neutral position, the stop-signal current is relayed to both stop-turn signal filaments. The stop-signal circuit is protected by the same 20-amp. fuse that protects dome lights and the tail-lamp feed to the headlamp switch.

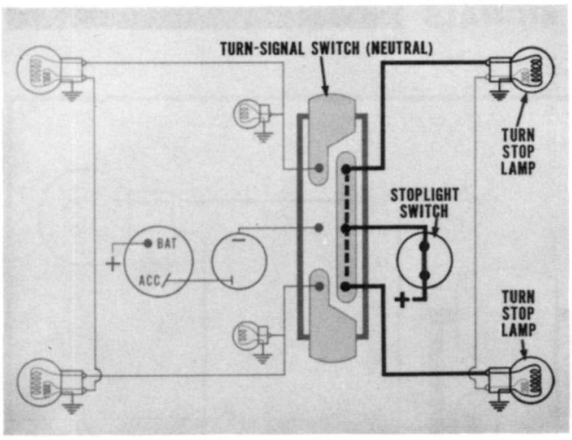


Fig. 2—Stop signal only

TURN AND STOP

Moving the turn-signal switch to either turn position connects the flasher to the signal bulbs and the indicator light. It also moves the stop-signal bar to connect the stop-signal switch to the rear lamp on the opposite side of the car. For example, in Figure 3, the turn-signal switch is in position for a left turn, so the right stop lamp is available for a stop signal.

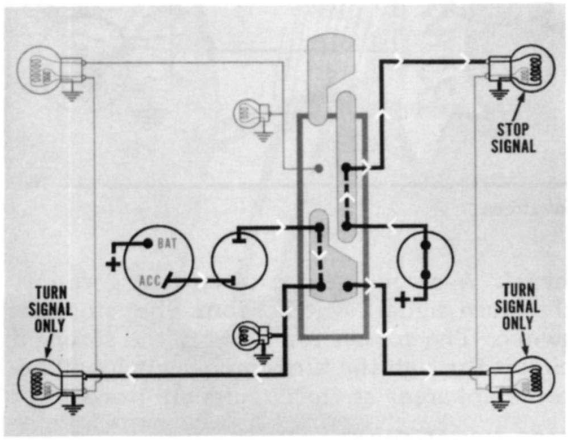


Fig. 3—Stop and turn signals

BULBS WIRED PARALLEL

In the turn-signal systems with two instrument panel indicators, each bulb is grounded individually through the case, providing a parallel circuit for each side. Thus, if one bulb should burn out, the others will still glow, but the flasher action will be slowed or stopped. Losing a park-turn bulb or a stop-turn bulb will usually stop the flasher action. The flasher, which is really a circuit breaker, operates according to the amount of current flowing through it. If one of the bulbs burns out, less current is required by the circuit. There is not enough current flowing through the flasher to open the circuit.

The instrument panel indicator bulb, which has a low current draw, has less effect on the flasher operation. If the indicator doesn't light, but you can still hear the flasher clicking, the bulb is either loose or burned out.

LOST GROUND

If one of the front turn signals should lose its ground, both parking lamp filaments will glow when a turn is signalled for the ungrounded side. Each of these filaments is grounded through the base of the bulb. So, in each bulb, the parking-lamp filament and the turn-signal filament share the same ground.

Fig. 4—Lost ground—filaments glow dimly

The parking-lamp filaments, which are also wired in parallel, are connected by the parking-lamp feed wire. This feed wire serves as a new path to ground for the current being fed to the turn-signal filament. The flow is through both filaments of the ungrounded bulb, across the parking-lamp feed wire to the other parking-lamp filament and to ground. The turn-signal filament in the ungrounded bulb doesn't glow because the voltage drop is reduced by the other two filaments in series with it. The parking-lamp filaments, with lower power requirements, will light dimly.

TRY PARKING LAMPS

To check for a "no-ground" condition, turn on the parking lamps. If one of the parking lamps doesn't light, but both lamps glow dimly when a turn is signalled for that side, the bulb is not properly grounded.

A similar condition exists in the stop-turn signal circuit, but the taillight filaments must share the available current and voltage with the license plate lamps, so none of the filaments light up.

SINGLE INDICATOR SYSTEMS

All Valiant models have a single instrument panel indicator lamp. In this system, the basic circuit is exactly the same as the double indicator circuit, except that the single indicator lamp is not grounded through the case. Instead, the bulb case and the contact are connected to the front turn-signal leads.

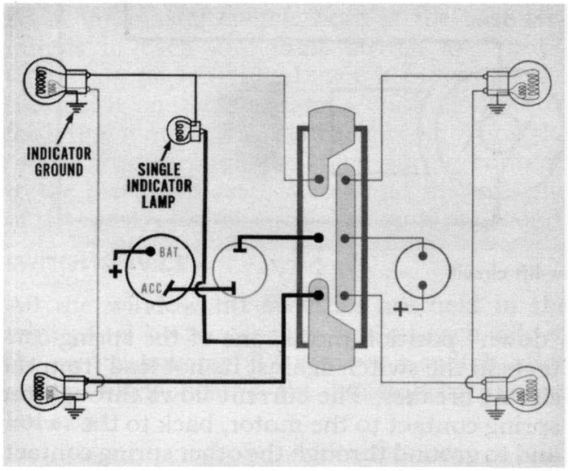


Fig. 5—Single indicator system

The single indicator is grounded through the front turn-signal filament on the side opposite the intended turn. Since the indicator reduces the voltage available to the grounding lamp, the grounding filament does not light.

FENDER-MOUNTED INDICATORS

Some 1965 models have turn-signal indicators mounted on the front fenders. The circuits and operation are identical with other double indicator systems. There are two different types of fender indicators. To replace a bulb on Dodge Monacos, remove the assembly from the car. Hold the lens in the assembly and remove the cap screw from the bottom. The lens, bulb and socket are spring-loaded in the assembly and will pop out when the screw is removed.

Chrysler models with the fender-mounted indicators have a spring-clip-type socket which pulls out of the housing from under the fender.

FLASHER DIAGNOSIS

The flasher unit has only two terminals, since it is located ahead of the selector switch in the circuit. So, a single set of points provides the flashing action for both left and right turns. If the turn signals operate in only one direction, the flasher is all right. Look for burned-out bulbs, bad grounds or loose connections.

TRY ACCESSORIES

Loss of turn signals on both sides usually means a bad flasher unit. But, before you take the time to change the flasher, try the radio, heater or air conditioner. If none of these accessories operate either, the problem is probably at the accessory feed from the ignition switch.

ELECTRIC WINDOW LIFTS

The electric window lifts available in Furies, Polaras, Custom 880's, Monacos and Chryslers are completely new for 1965. The window-lift motor is a permanent-magnet type, and is not case-grounded. The circuit is protected by a circuit breaker inside the left cowl panel.

All four windows can be controlled from a master control switch in the left front door trim panel and by an individual switch at each window. All motor circuits are grounded through a single ground terminal in the master control switch. Each door switch has an independent power supply from the circuit breaker.

A single hot terminal supplies power to all four switches in the master switch group.

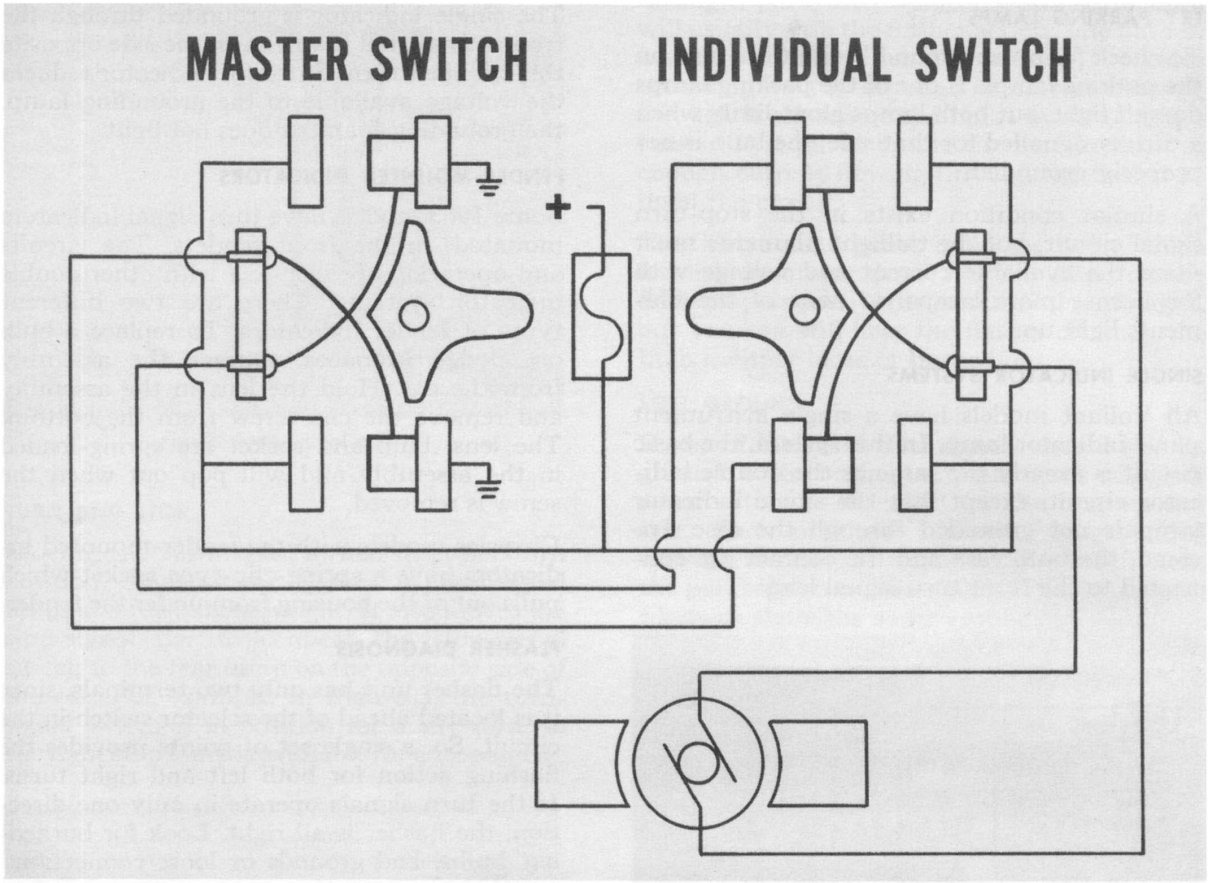


Fig. 6—New window-lift circuit

OPERATION—LEFT FRONT

Pressing the left front window control in the "down" position moves one of the spring contacts in the switch against its hot lead from the circuit breaker. The current flows through the spring contact to the motor, back to the switch and to ground through the other spring contact.

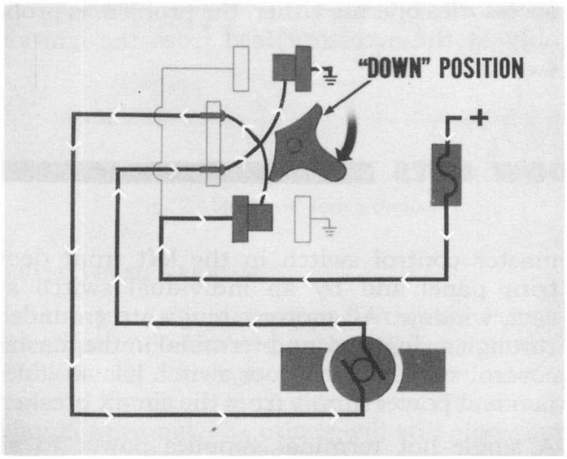


Fig. 7—Left front window—down

Lifting the switch to the "up" position reverses the positions of the two spring contacts, so the current flows through the motor in the opposite direction. This reverses the rotational direction of the motor.

MASTER CONTROL OF OTHER WINDOWS

To operate any other window from the driver's seat, the individual switch for that window must be in the neutral position. The current feed to the motor and the return to ground both travel through the individual switch, as well as through the driver's master switch. Current flow through the master switch is exactly the same as for the left front window.

INDIVIDUAL CONTROLS

Each of the individual window switches is fed by its own individual lead from the circuit breaker. But, the ground for the individual switches is still in the driver's master switch.

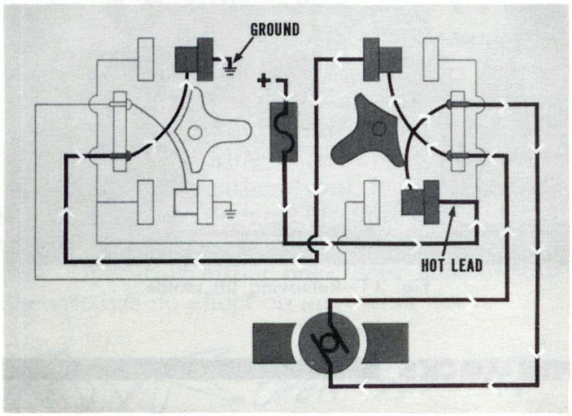


Fig. 8—Individual switch—down

As in the master switch, both of the base terminals in each individual switch are "hot". Operating an individual switch moves one of the spring contacts against a "hot" contact to feed the motor. The return circuit from the motor goes through the other spring contact, to the driver's master switch and through one of the master switch spring contacts to ground.

SWITCH SERVICE

All the window lift switches are held in the trim panel by two spring clips on each side of the switch housing. To remove a switch, slide a thin blade behind the housing to depress the clips.

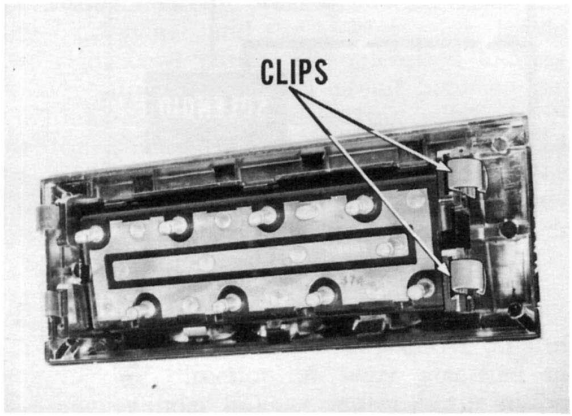


Fig. 9—Window-lift master switch

The terminals on the back of the switch plug into a receptacle inside the trim panel. This makes it possible to check the continuity of all wiring without removing the trim panels.

TESTING THE SYSTEM

If none of the windows will operate from either the driver's master switch or the individual switches, pull the master switch from the left front door. Find out whether there is current to the switch by connecting a test light between the "hot" socket and a good ground. If there is no current to the switch, remove the left cowl panel and use the test light again to see if there is current to the circuit breaker.

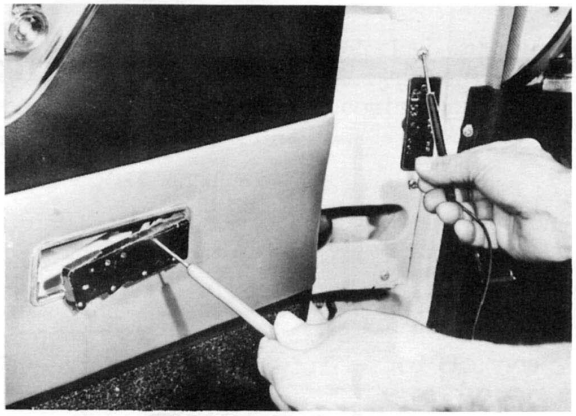


Fig. 10—Checking continuity

NOTE: If the car has electric door locks, there will be two circuit breakers connected by a bus bar. They are both fed by a single lead from the battery terminal of the ignition switch.

GROUND TEST

If the test light shows that there is current to the master switch, the other possibility for this condition is loss of ground. Connect a jumper wire between a good ground and one of the leads to an individual switch. If the window operates in one direction from the individual switch with the jumper in the circuit, you'll know the ground is bad.

OPERATES FROM MASTER ONLY

If a window operates using the driver's master switch, but not from the individual switch for that window, the trouble will usually be loss of power supply to the individual switch. You

can check this out by removing the switch housing and using a test light between the feed socket and a good ground.

MECHANICAL PROBLEMS

Electric window lift failure can also be caused by mechanical problems, such as bent linkage and pinched or bent channels. These problems are easy to identify, since there will always be at least a slight movement of the glass.

CAUTION: If you have to remove the motor from the linkage for any reason, clamp the linkage in a vise to lock it in place. Otherwise, when the motor is removed, the assist spring will drive the mounting bracket around on the lift pivot, possibly causing serious injury.

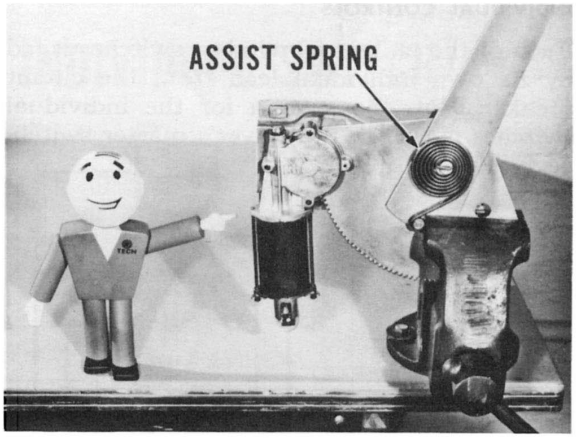


Fig. 11—Removing lift motor

AUTOMATIC DOOR LOCKS

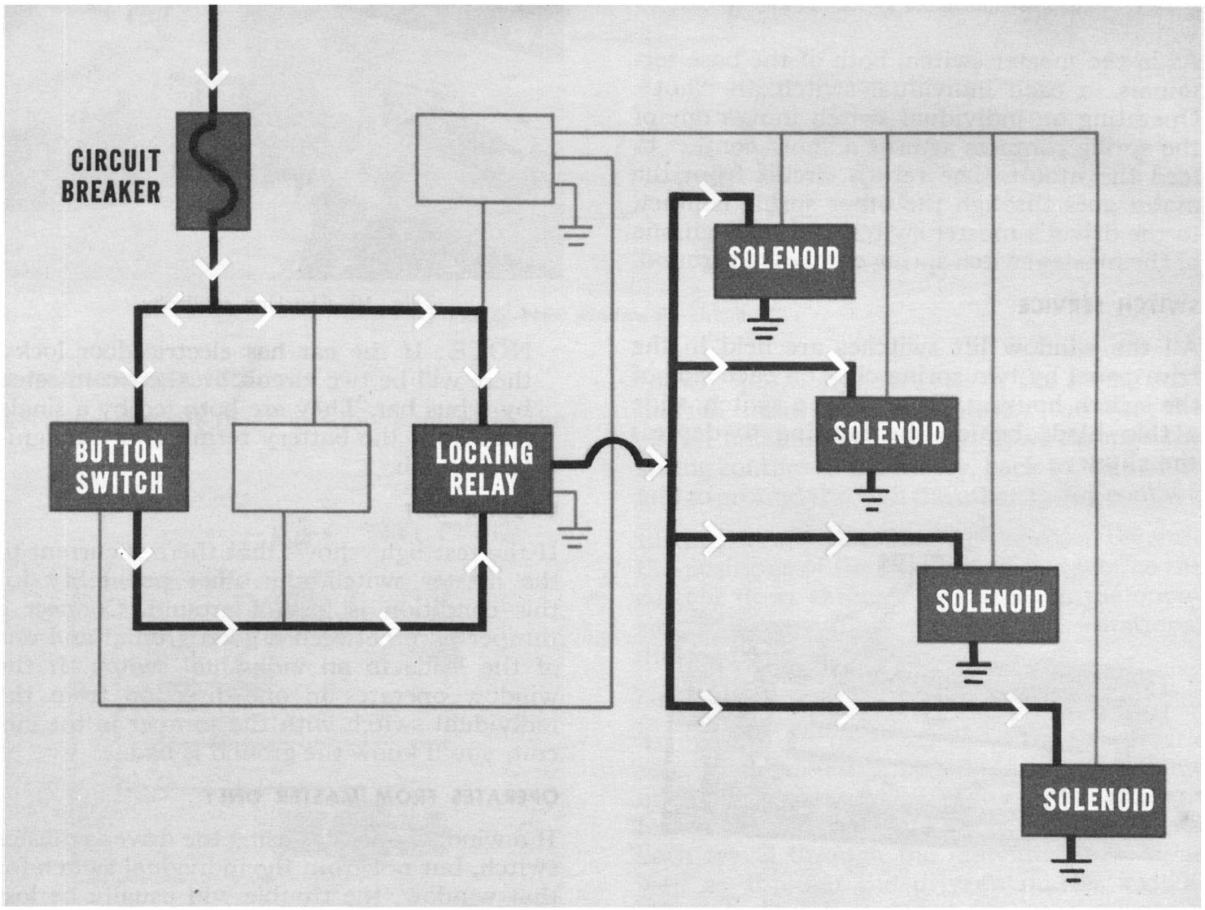
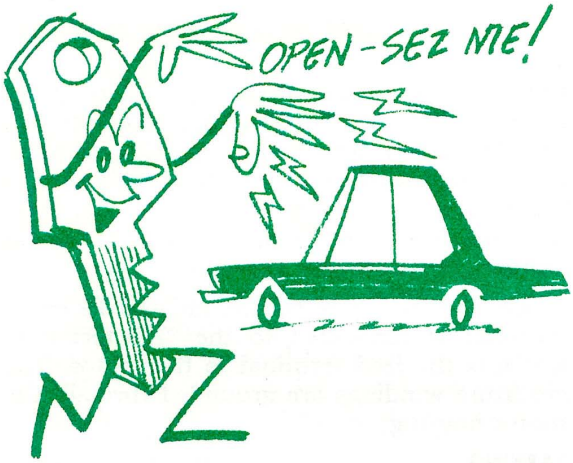


Fig. 12—Door-lock circuit

Electrically operated door locks are available on Furies, Polaras, Custom 880's, all Chryslers and Imperials. The Imperial system is the same as in 1964, but the electric locks on the other cars are completely new.

HOW THEY WORK

The new system consists of a double-acting solenoid in each door and two switches in each front door. All four doors can be locked at once by pushing down either front door lock button or by locking either front door with the key. Pulling either front lock button up unlocks all four doors, but unlocking a front door with the key has no effect on any other door. Operating either back door lock button likewise has no effect on any other door.



THE LOCK CIRCUITS

Locking one of the front doors either by button or key, momentarily closes the circuit between the circuit breaker, located inside the left cowl panel, and the locking relay, inside the right cowl panel. The energized locking relay completes a second circuit between the circuit breaker and the locking windings in the four solenoids. Each solenoid is grounded to the door panel. Pulling up a front door button energizes another relay, which completes the circuit to a second winding in each solenoid to unlock all the doors.

THE ONE-WAY SWITCH

The key-operated lock switch is active only in the locking direction. A lever attached to the key cylinder linkage depresses the nylon switch lever to energize the locking relay.

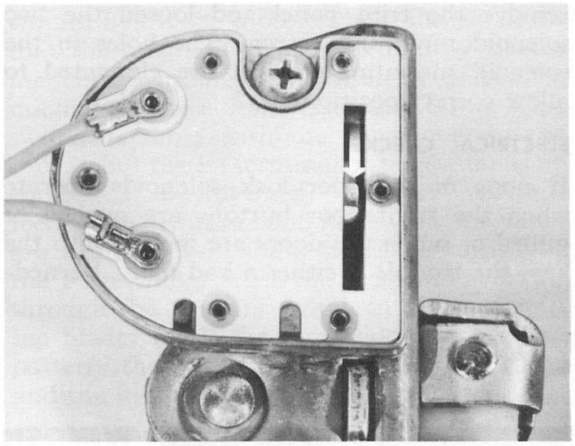


Fig. 13—Cylinder linkage closes switch

When the key cylinder is unlocked, the nylon lever is forced upward by the cylinder linkage, but there is no electrical contact inside the switch, so only that one door is affected.

REAR DOORS INDEPENDENT

Since the rear door lock buttons are not connected to electrical switches, they can be locked or unlocked without affecting any other door. The rear solenoids are attached to the regular lock linkage, so the rear door buttons move when the doors are locked electrically from the front.

ELECTRIC LOCK SERVICE

There is only one simple adjustment on the electrical door locks. If you can hear the solenoid operating, but the door doesn't lock,

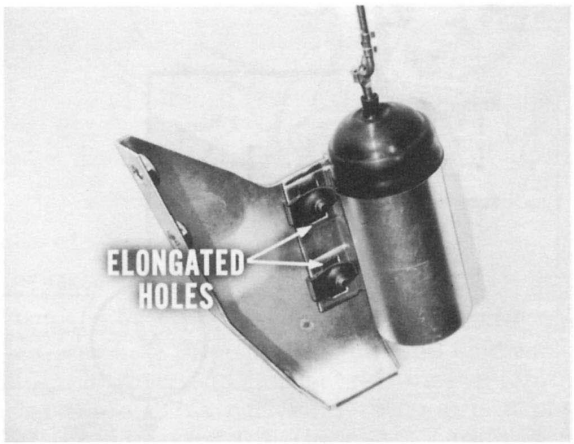


Fig. 14—Solenoid adjustment

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 between the "B" terminal and a double terminal marked "P_1" and "B/U", so the double terminal is always hot when the ignition is turned on. A single wire connects the P_1 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_1–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-

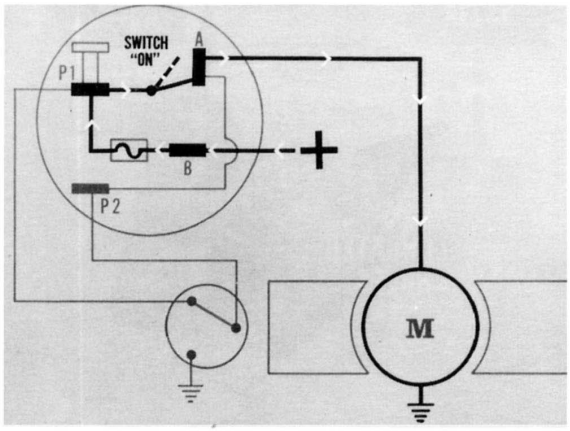


Fig. 15—Permanent-magnet wiper circuit

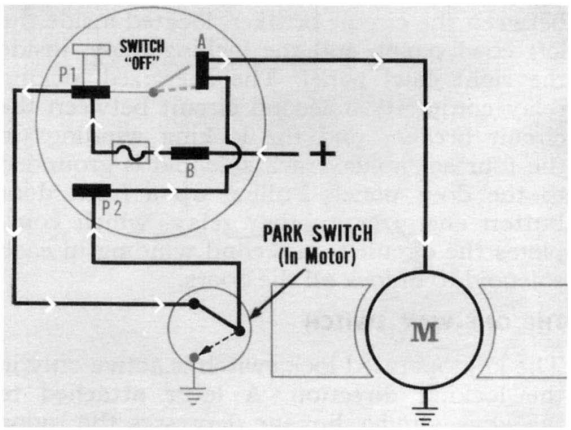


Fig. 16—Permanent-magnet parking circuit

nection between the hot P_1 terminal and the motor. When the instrument panel switch is turned off, the "A" terminal is disconnected from P_1 and connected to P_2. The current flow is from P_1 to parking switch, back to P_2, 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_1 and connects P_2 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 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_2 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_1 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.

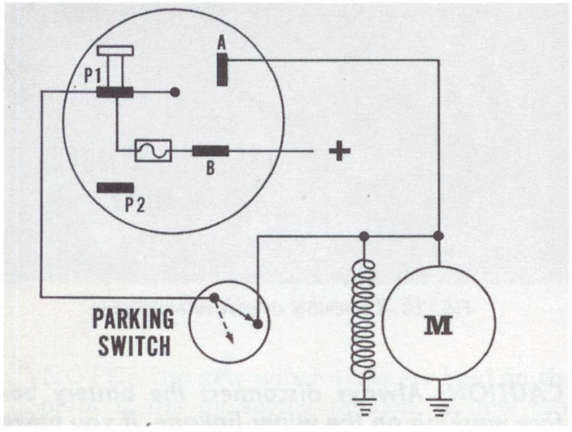


Fig. 17—Wound field single-speed motor

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 overspeeds, 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.

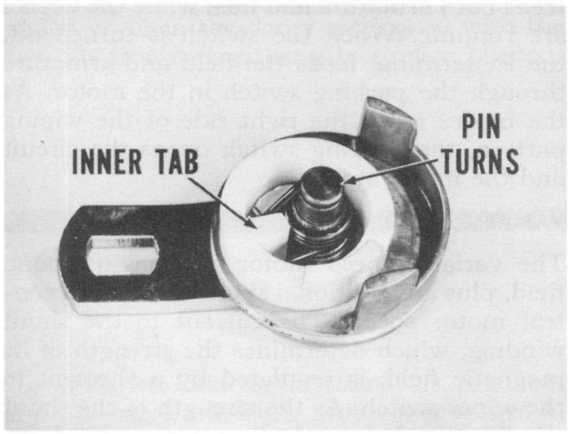


Fig. 18—Overtravel assembly—running position

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.

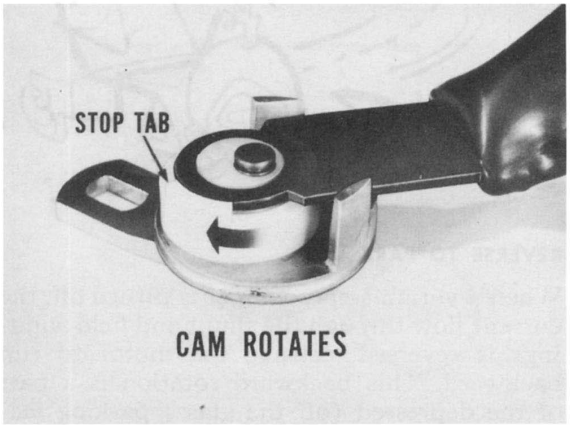


Fig. 19—Overtravel assembly—parking cycle

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.

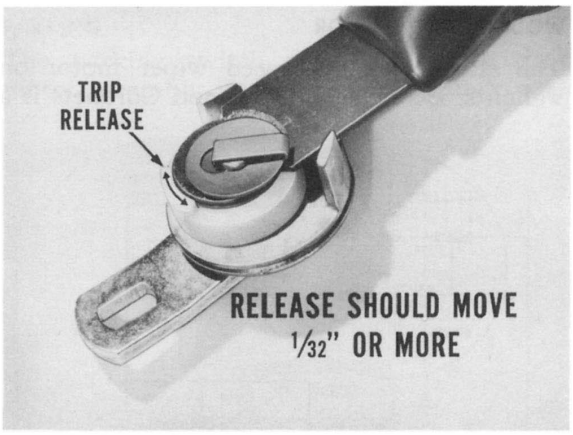


Fig. 20—Checking overtravel assembly

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.

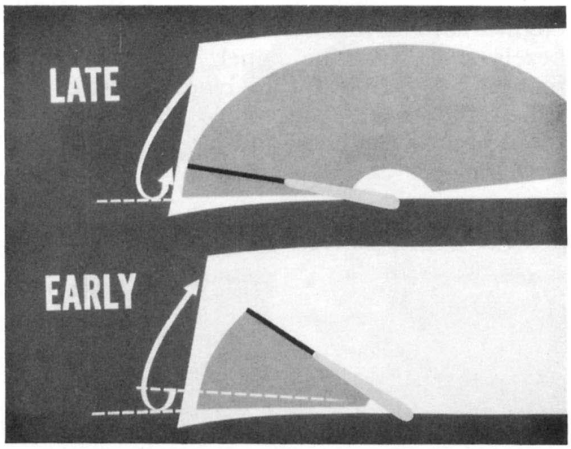


Fig. 23—Check the parking timing

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 required. 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.

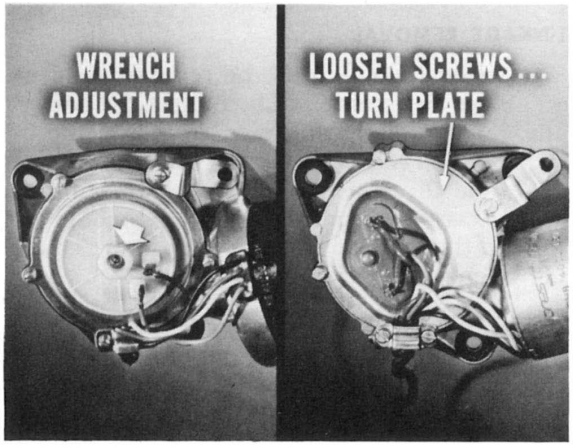


Fig. 24—Variable-speed timing adjustments

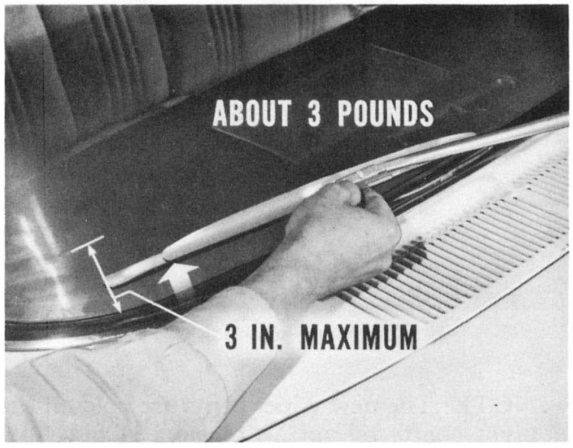


Fig. 25—Variable-speed blade check

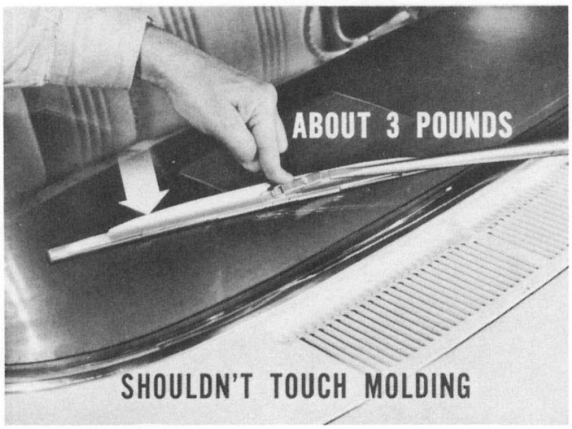


Fig. 26—Single-speed blade check

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 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.

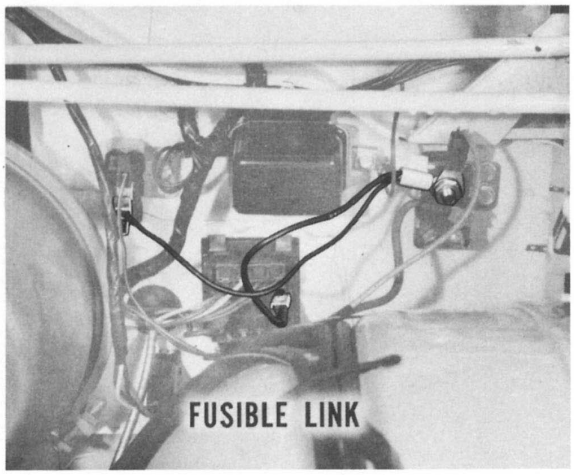


Fig. 27—Fusible link circuit protection

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.

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