

Starter

All passenger-car starters are much the same in general design and operation, differing mainly in the type of drive used.

When a starting motor fails to crank the engine properly, the trouble will most commonly be found not in the motor itself, but in the starter gear, or in the external circuits. If closing the starter switch puts the lights out, and releasing it causes them to come on again, the fault is likely to be a corroded or loose connection at the battery. You can tell by closing the switch for 20 sec. and then feeling the battery terminals. The faulty one will be very warm. The cure is to remove the terminal, scrape it bright and coat it with petroleum jelly.

If the lights merely dim when the switch is closed and brighten after release, the battery usually will be found partially discharged or in poor condition. But, should pressing the starter switch have no effect on the lights, there is an open circuit in the wiring.

Failure of the starter to make any effort to turn is frequently due to a bad contact within the switch. Removing the switch and filing the contact will generally correct such condition.

Should dimming of the lights result when the starter button is pressed and the battery is known to be fully charged, the trouble is likely caused by excessively heavy

oil on a very cold day, mechanic... jamming of the starter drive so that the starter cannot turn, or a ground or short within the starter or switch. A short or ground will generally reveal its location by smoking when the switch is held down for 20 sec. Trouble within the starter generally can be located by visual inspection. A charred brush lead indicates that it was grounded when squeezed under the commutator cover. Look at all insulation for charred conditions that would indicate "shorts" or grounds. A test light should be used to check armature, field and brush ring for grounds also.

It is not unusual for starters to be very weak and to draw too little current. This is commonly due to worn brushes, worn commutator and weak brush springs.

Probably the most common starter trouble is worn brushes. And when replacing brushes don't check for size alone. Be sure that the replacement brush is a real starter brush. Generator brushes are primarily carbon and have relatively high resistance. Starter brushes, however, contain a high percentage of copper or bronze, and when they are scraped lightly with a screwdriver they will show a coppery color.

The brushes should not bind and must rest on the commutator with sufficient tension to give good, firm contact. If brushes are worn down to half their original length, they should be replaced. New brushes should be grooved to fit the commutator.

Sectional view of a typical modern passenger-car starter. Purpose of the drive mechanism is to transmit cranking power to the engine flywheel and to disconnect starter from flywheel after the engine has started

