

DELCO-REMY ENCLOSED HOUSING

Opel

SPECIFICATIONS

DESCRIPTION

Starting motor is a 12 volt unit with enclosed solenoid, shift lever and overrunning clutch drive. The commutator end frame and drive housing carry the pole shoes and the field coils. The armature shaft is supported by bronze bushings at the commutator end frame and drive end housing.

TESTING

LOCK TEST

With battery in fully charged state, engage parking brake and position transmission in 4th gear. Connect a volt-ampere starter tester according to manufacturer's instructions. Engage starter, read voltage and current draw, then compare with specifications. If voltage is low, then there is a voltage loss in the starter circuit or battery is poor. If current is high, there is a short circuit in starter and overhaul is required. If current is low, then commutator is dirty, brushes are worn, solenoid switch contacts are defective or there is an open circuit in starter. Overhaul starter motor.

CURRENT DRAW

With engine at normal operating temperature, stop engine and disconnect coil wire from distributor. Ground coil wire to prevent excessive coil voltage build-up. Connect a volt-ampere starter tester according to manufacturer's instructions. With transmission in neutral, crank engine over until voltage stabilizes. Current draw should be 90-130 amperes.

NO LOAD TEST

To perform test, connect starter as shown in Fig. 1. Adjust carbon pile to obtain voltage given in specifications. Read current draw and armature speed, then compare readings with specifications. **CAUTION** - Do not apply voltage greater than specified as excessive voltage may cause armature to throw windings because of excessive speed.

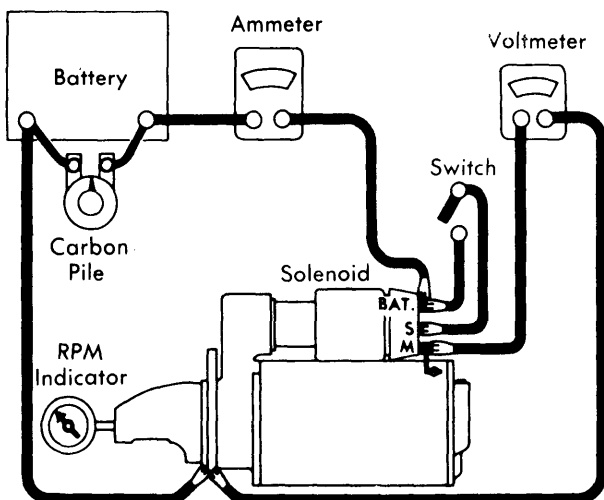


Fig. 1 Connections for No Load Test

Application

Data

Lock Test	
Volts	6 min.
Amperes	280-320
No Load Test	
Volts	10.6
Amperes	30-50
RPM	7300-8500

OVERHAUL

DISASSEMBLY

1) Hold starter in a soft-jawed vise, then scribe marks on end frame and field frame to ensure correct alignment upon reassembly. Remove two through bolts and field coil connector bolt. Remove end frame from field frame and carefully pull both insulating tubes from field frame.

2) Position a 29 mm socket over the commutator to prevent brushes from coming out when removing field frame. Carefully lift field frame up. Remove two solenoid attaching screws, then remove solenoid and spring. Remove shift lever shaft, then lift armature and shift lever assembly from starter.



Fig. 2 Holding Brushes in Position While Removing Field Frame

3) Drive retaining ring back on armature shaft. Remove locking ring, retaining ring, and overrunning clutch and pinion from armature shaft.

CLEANING

Clean all components by wiping with clean cloths. Do not clean armature, field coils, or drive assembly in any type grease dissolving solvent as this will damage insulation and wash lubricant from drive assembly.

DELCO-REMY ENCLOSED HOUSING (Cont.)

PARTS REPLACEMENT & TESTING

Armature — Test armature for shorted coils with a growler. Check for grounded coils using a 110 volt test lamp. Place one test lead on armature core or shaft, and other test lead on commutator. Lamp should not light. If lamp lights, armature is grounded and should be replaced. Inspect commutator and if necessary, turn commutator in a lathe. **CAUTION** — If commutator diameter is less than $1\frac{1}{32}$ " (37.31 mm) after turning, then replace armature. Undercut insulation .020" (.51 mm) deep and square across entire width, sand commutator lightly with 00 sandpaper and clean out slots carefully.

Field Coils — Check field coils for ground using a 110 volt test lamp. Place one test lead on field coil terminal strap, touch other test lead to frame housing and test lamp should not light. If test lamp lights, replace grounded field coil. If field coils require replacement mark locations of pole shoes to ensure installation into original location. Align pole shoes exactly parallel with armature shaft before tightening attaching bolts.

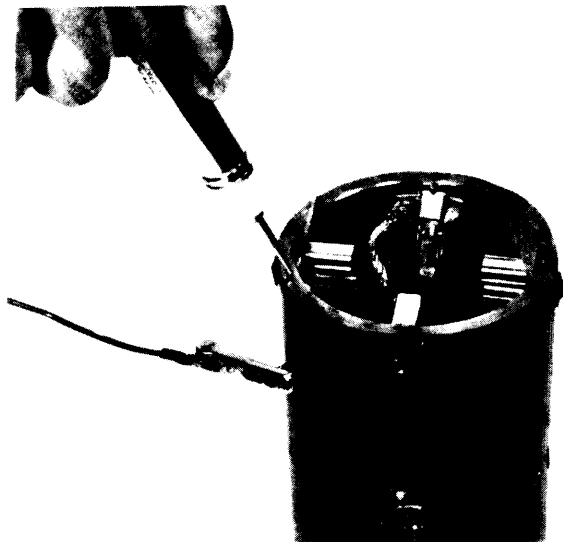


Fig. 3 Checking Field Coils for Ground

Brushes — Check both positive brushes for ground using a test lamp. Connect one lead to brush and other lead to field frame. Lamp should not light. If lamp lights, replace positive brushes. If necessary to replace negative brushes, the complete brush holder with the welded brush must be replaced. **NOTE** — Align brush holder at right angles to field frame before riveting holder to frame. Replace all brushes if worn to .28" (7.1 mm) or less. Brush spring pressure should be 40-46 ozs.

REASSEMBLY

1) Lubricate armature shaft. Install drive assembly on shaft, then install retainer with cupped side out or away from pinion. Install snap ring on shaft and into shaft groove. Install thrust collar with shoulder against snap ring. Position retainer on snap ring by using two pliers at opposite points to squeeze retainer and thrust collar together against snap ring.

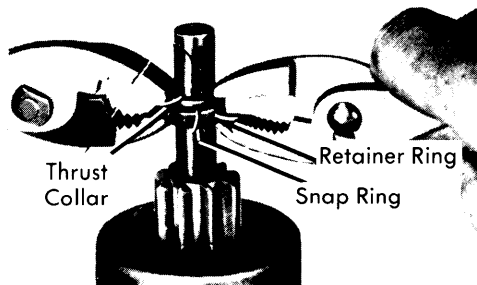


Fig. 4 Securing Retainer Ring over Snap Ring

2) Lubricate drive housing bushing, then install armature and drive assembly into drive housing with shift lever engaged in drive collar. Install shift lever pin, solenoid thrust spring, and solenoid. Seal area between solenoid and frame. Install solenoid attaching screws.

3) Hold brushes and springs in position using a 29 mm socket, then slide frame assembly into position. Install insulating sleeves in field frame. Install end frame, align marks and install through bolts. Install field coil connector bolt.