

CHRYSLER CORP. DIRECT DRIVE

DESCRIPTION

12 volt, 4 pole type with solenoid pinion shift (overrunning clutch). Drive unit is mounted directly on armature shaft. Field assembly consists of four series coils or three series coils and one shunt coil. Brushes and springs are mounted on a separate removable brush holder plate assembled between frame and commutator end head.

PERFORMANCE TESTS

Cranking Amperage Draw — Connect ammeter and carbon pile rheostat across battery with all resistance turned into circuit, connect a voltmeter across battery. Disconnect ignition coil primary lead to prevent engine starting. Crank engine and note voltmeter reading with starter operating. Without cranking engine, adjust carbon pile rheostat to load battery until exact same voltmeter reading is obtained, note ammeter reading which is cranking amperage. See Specifications. **NOTE** — Engine must be at operating temperature when making this test. Cold engine, heavy oil, or tight engine will increase current draw.

No Load (Bench) Test — With starter off engine, connect ammeter and carbon pile rheostat in series with battery positive post and starter terminal. Connect voltmeter across starter. Turn all resistance into circuit, then connect battery negative post to starter frame. Adjust rheostat to obtain proper voltage and note current draw and starter RPM. Current draw and RPM should be as specified. See Specification Table.

Locked Resistance Test — Mount starter in a test stand with drive shaft locked so that armature cannot turn (follow test equipment manufacturer's instructions). With battery voltage adjusted to specified figure, ampere reading should be as specified. See Specifications.

SPECIFICATIONS

Cranking Amperage Draw	① 180-220 Amp.
Brush Spring Tension	32-36 ozs.
Rotation	Counterclockwise at commutator end
Armature Shaft Endplay.....	.005" min.
Pinion-to-Housing Clearance.....	② 1/8" ± 1/32"

① — With engine at normal operating temperature.

② — Between pinion and pinion stop with solenoid plunger bottomed.

PARTS REPLACEMENT & TESTING

See *Overhaul* for disassembly required for access to these parts.

BRUSHES & BRUSH SPRINGS

NOTE — Brushes worn more than one-half length of new brush, or if oil-soaked, should be replaced.

1) Remove commutator end head, disengage brushes from brush holders and remove brush plate. Disconnect series coil and shunt coil terminal at solenoid connector. Remove ground brush terminal screw and carefully remove ground brush set using care to prevent breaking shunt coil lead, remove shunt coil lead from old brush set.

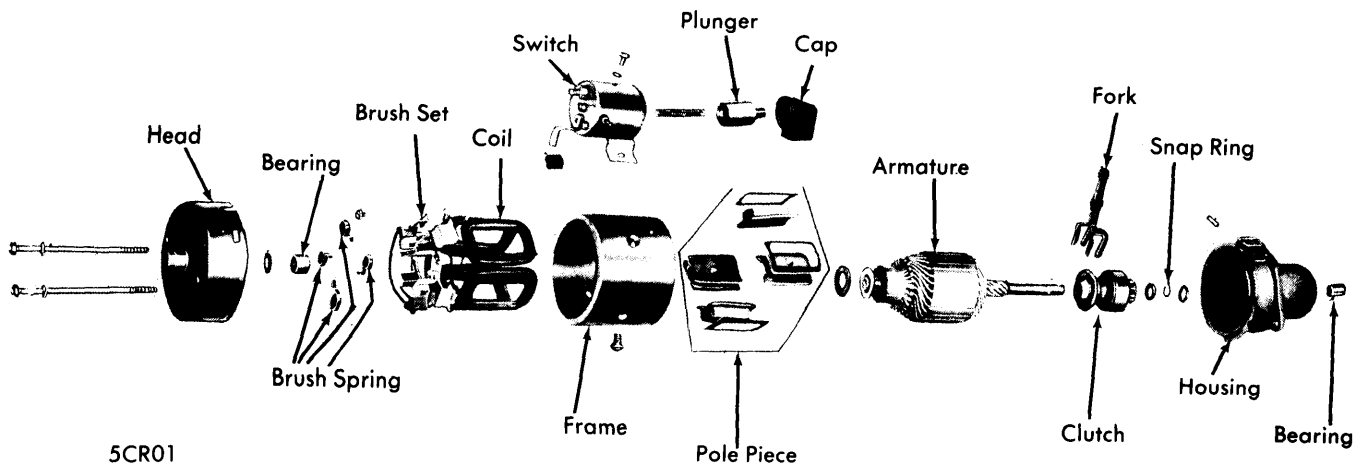
2) Remove field terminal plastic covering and remove old brushes using side cutters to break weld by rolling stranded wire off terminal. Drill a new .174"-.184" hole (No. 16 drill) in terminal at point 3/16" down from top of terminal. **CAUTION** — Use care not to damage field coil. Attach new insulated brush set to terminal using a No. 8 self-tapping screw and flat washer.

3) Attach shunt field coil lead to new ground brush set by looping lead around terminal and soldering with rosin core solder. Attach ground brush set to field frame by installing attaching screw, loop surplus shunt coil lead back along brush lead and secure with rubber tape.

4) With brushes assembled in brush holder and holder installed on starter, measure brush spring tension by hooking spring scale under spring at point near brush end. Pull scale on line parallel to edge of brush and note scale reading just as spring end leaves brush. If spring tension is not correct (see Specifications), replace springs. Springs can be removed by spreading the retainers and disengaging springs from retainer legs.

FIELD COIL ASSEMBLY

Armature — With armature removed from starter, check for shorted coils in a growler. Check for grounded coils by touching one test light prod to armature shaft and other test prod to each commutator segment in turn. Lamp should not light. If lamp lights, armature coils are grounded and should be replaced. Commutator should be smooth and clean, runout



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must not exceed .003". If runout is excessive, reface commutator in a lathe, remove only sufficient material to provide smooth even surface.

Armature Shaft Bushings – Inspect armature shaft bearing surfaces and bushings for wear by checking sideplay. Replace commutator end head if bushing is worn. Drive end bushing can be replaced as follows: Use suitable tool to remove and install bushing. Soak new bushing in SAE 30 engine oil before installing, then press bushing into housing until flush with inner side of housing. Bushing is pre-sized and does not require finishing.

Overrunning Clutch & Drive Pinion Assembly – With unit installed on armature shaft, rotate pinion while holding armature stationary. Pinion should rotate smoothly in one direction (not necessarily easily) and should lock in the opposite direction. If unit does not function correctly, or if pinion teeth are worn or burred, replace assembly.

Solenoid Assembly – For adjustment and testing, see *Chrysler Starter Controls*.

OVERHAUL

DISASSEMBLY

With starter on bench, remove through bolts at commutator end and pull head from frame. Remove thrust washers from armature shaft, then lift brush holder spring and remove brushes. Remove brush holder plate. Disconnect field coil leads at solenoid connector, then remove solenoid attaching screws and remove solenoid and boot assembly. Drive out overrunning shift fork pivot pin at upper side of pinion housing, then remove drive end pinion housing and spacer washer. Note position of shifter fork on starter drive and remove shifter fork.

Slide overrunning clutch pinion gear toward commutator end of armature. Drive stop retainer toward pinion gear to expose snap ring and remove snap ring. Remove overrunning clutch drive from armature shaft. **NOTE** – If it is necessary to remove field coils, remove ground brush terminal attaching screw and raise brushes with terminal and shunt wires up and away from field frame. Remove pole shoe screws with special impact screwdriver tool.

CLEANING

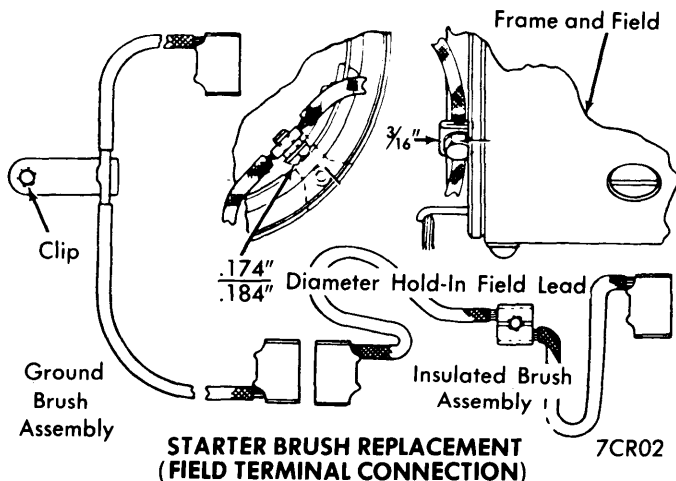
Do not immerse starter parts in cleaning solvent. Wipe field frame, coil assembly, and armature with a clean cloth only. Clean drive unit with a brush moistened in cleaning solvent.

REASSEMBLY

Clean armature shaft and splines, lubricate with SAE 10 engine oil or 30-W rust preventive oil, then install starter drive, stop collar (retainer), lock ring and spacer washer. **NOTE** – Small diameter end of spacer washer should be in contact with lock ring inside collar. Install shifting fork over starter drive spring retainer washer with narrow leg of fork toward commutator. **CAUTION** – If fork is not properly positioned, it will restrict starter gear travel, causing a lockup in clutch. Install drive end pinion housing on armature shaft, indexing shifter fork with slot in housing, then install shifter fork pivot pin. Install solenoid and boot assembly on field frame and tighten screws to 60-70 inch pounds. Install pinion housing and armature assembly into field frame so slot in housing indexes with locating tab projecting from solenoid base. **NOTE** – Make sure shifting fork lever is inserted in solenoid plunger link. Connect field coil leads at solenoid connector, then connect ground brushes and shunt wire terminal to field frame. Install brush holder ring assembly, indexing tang on ring to hole in field frame. Install brushes in brush holders. **CAUTION** – Make sure field coil lead wires are properly enclosed behind brush holder ring and do not interfere with brush operation. Install thrust washers on end of armature shaft as required for correct endplay (see Specifications), then install commutator end head and tighten through bolts to 40-50 inch pounds torque. Check starter drive gear pinion clearance.

STARTER DRIVE GEAR PINION CLEARANCE

For checking and adjustment, see *Chrysler Starter Controls*.



CHRYSLER CORP. STARTER SPECIFICATIONS				
Chrysler Number	No Load Test (At 11.0 Volts)		Lock Test	
	RPM	Amps. Max.	Amps.	Volts
1889100	3800	78	310-445	4.0
2642692	3800	78	310-445	4.0