Alternators & Regulators

CHRYSLER CORP. ALTERNATORS

Dodge, Plymouth

DESCRIPTION

The main components of the alternator are the stator, rotor, rectifiers, end shields and drive pulley. The built-in silicon rectifiers convert A.C. current (alternating current) into D.C. output current (direct current). The 117 amp. model has 12 silicon rectifiers while all other models have 6 rectifiers.

IDENTIFICATION

CHRYSLER CORP. ALTERNATOR IDENTIFICATION

Part No.	Tag Color	Rated Amp. Output
4091563	Violet	41
4111226	Yellow	60
4091460	Yellow	117

SPECIFICATIONS

CHRYSLER CORP. SPECIFICATIONS

Rated Amp. Output	[1] Minimum Amp. Output
41	40@15 Volts
60	57@15 Volts
117	72@13 Volts

[1] — At 900 engine RPM for 117 amp. alternator; 1250 RPM for all others. Voltage measured at the alternator.

OTHER SPECIFICATIONS

Rotation — Clockwise at drive end.
Field Coil Current Draw — 4.5-6.5 amps. at 12 volts while rotating by hand.
Capacitor Capacity — .50 mfd. plus or minus 20%.

Fig. 1: Charging Circuit Resistance Test Connections

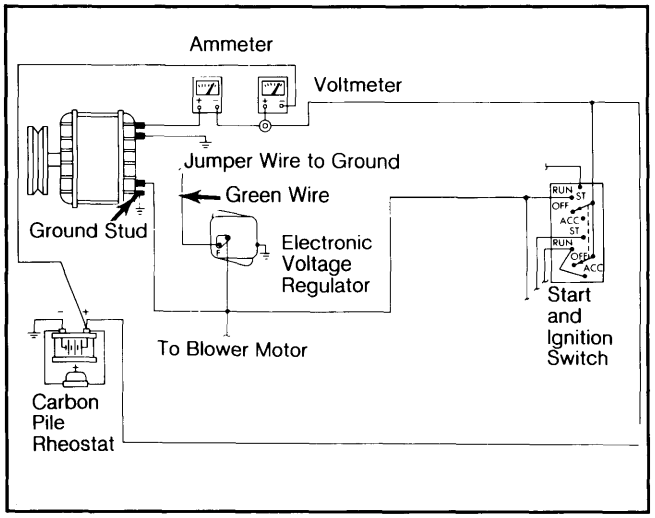


Diagram shows ammeter & voltmeter attaching points.

ON-VEHICLE TESTS

CHARGING CIRCUIT RESISTANCE

NOTE: Before making test connections, disconnect negative battery cable at battery to avoid accidental shorting of charging or field circuits.

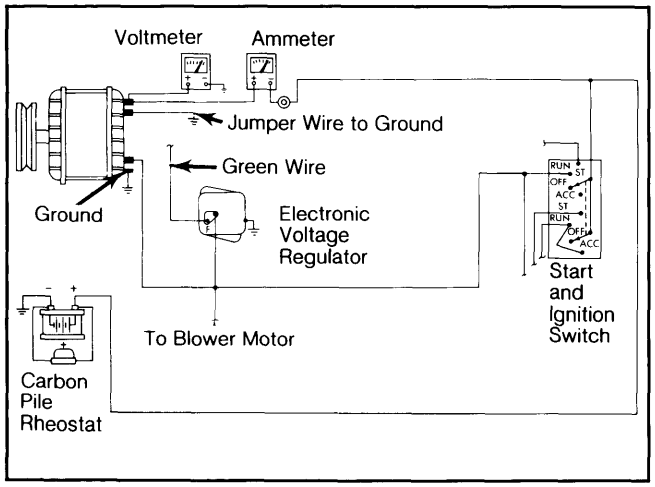
1) Disconnect "BAT" lead at alternator. Connect a 0-150 ampere scale D.C. ammeter in series between alternator "BAT" terminal and disconnected "BAT" lead wire. Connect positive lead of voltmeter to disconnected "BAT" lead wire. Connect negative lead of voltmeter to positive post on battery.

2) Disconnect Green regulator field lead from alternator. Connect a jumper lead from alternator field terminal to ground. Connect a tachometer, and reattach battery ground cable. Connect a variable carbon pile to battery terminals (set in open or off position). *See Fig. 1.*

3) Start engine, and immediately reduce engine speed to idle. Adjust engine speed and set carbon pile to obtain 20 amps. flowing in circuit. Voltmeter reading should not exceed 0.7 volts. If a high voltage drop is indicated, inspect, clean and tighten all connections in charging circuit.

NOTE: If necessary, test voltage drop at each connection to locate connection with excessive resistance.

Fig. 2: Alternator Current Output Test Connections



Hookup ammeter & voltmeter as shown.

CURRENT OUTPUT

1) Disconnect "BAT" lead at alternator. Connect a 0-150 ampere scale D.C. ammeter in series between alternator "BAT" terminal and disconnected "BAT" lead wire. Connect positive lead of voltmeter to "BAT" terminal. Connect negative lead of voltmeter to a good ground. Disconnect Green field wire to alternator. *See Fig. 2.*

2) Connect a jumper wire from alternator field terminal to ground. Connect a tachometer to engine and reconnect negative battery cable. Connect a variable carbon pile between battery terminals (set in open or off position). *See Fig. 2.* Start engine, and operate at idle speed immediately after starting.

CHRYSLER CORP. ALTERNATORS (Cont.)

3) Adjust engine speed and carbon pile until a speed of 900 RPM (117 amp.) or 1250 RPM (all others) and a voltmeter reading of 13 volts (117 amp.) or 15 volts (all others) is obtained. Do not allow voltage to exceed 16 volts. Observe ammeter. Current output should be within specifications. If output is less than specified, remove the alternator from the vehicle and proceed to "BENCH TESTING".

BENCH TESTING

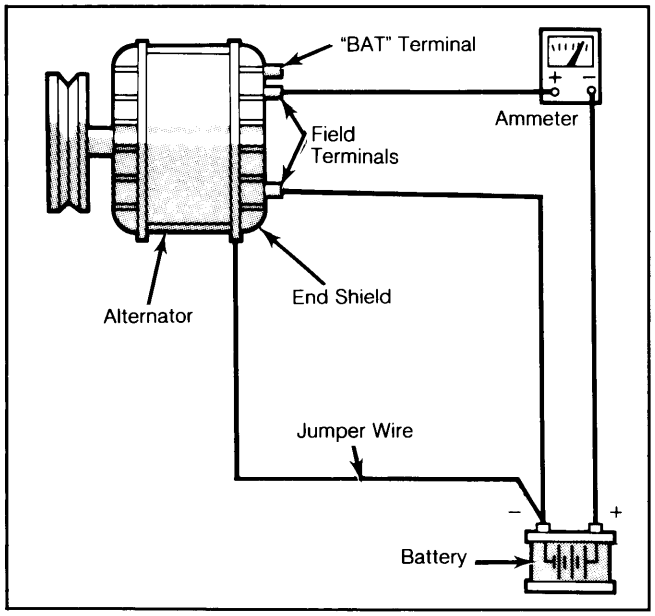
FIELD COIL CURRENT DRAW

1) Connect a jumper wire between 1 field terminal of alternator and negative terminal of a fully-charged battery. Connect ammeter positive lead to the other field terminal of alternator. Connect ammeter negative lead to battery positive terminal.

2) Connect a jumper wire from negative terminal of battery to alternator end shield. *See Fig. 3.* Slowly rotate alternator by hand. Observe ammeter reading. Field coil draw should be 4.5-6.5 amps. at 12 volts.

3) A low coil draw is an indication of high resistance in field coil (brushes, slip rings or rotor coil). A high coil draw indicates possible shorted rotor coil or grounded rotor. No reading indicates an open rotor or defective brushes.

Fig. 3: Connections for Field Coil Current Draw Test



RECTIFIER (DIODE) TESTS

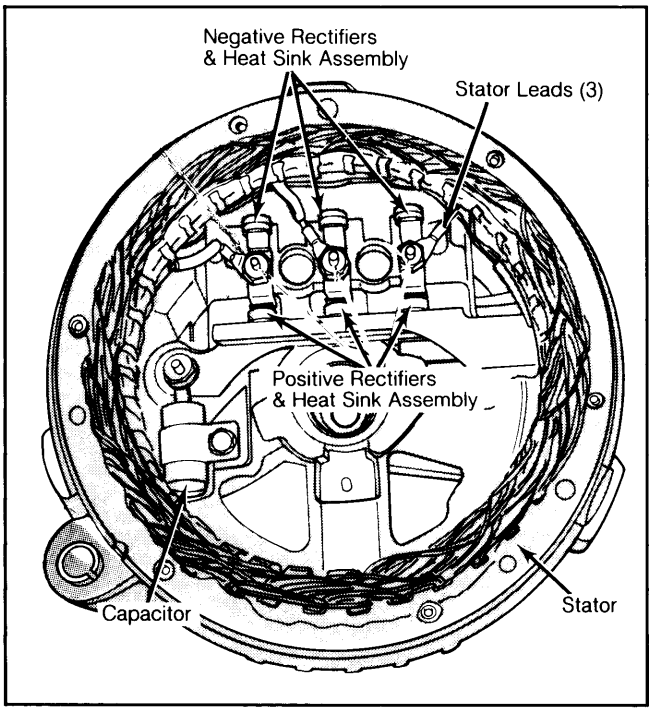
NOTE: Do not break plastic cases of diodes, as they protect against corrosion. Always touch test probe to metal strap nearest diode. Rectifier diodes may be tested with a test lamp or tester C-3829A.

Test Lamp Method

1) With rectifier end shield and stator assembly separated, test rectifiers with a 12V battery and suitable test lamp (No. 67 bulb, 4 candle power). Connect test lamp to battery positive terminal and to 1 test probe. Touch other test probe to negative battery terminal. Measure rectifier continuity with probes touching heat sink and rectifier top strap.

2) Now reverse probes. If lamp lights with current flow in one direction only, rectifier is satisfactory. If lamp lights with probes either way, rectifier is shorted. If lamp does not light at all, rectifier is open. Test each rectifier in both assemblies in same manner. Replace rectifier and heat sink assemblies, which have shorted or open rectifiers.

Fig. 4: View of Rectifier End Shield



Note location of rectifiers and heat sink assemblies.

Tool C-3829A Method (Positive Rectifiers)

1) Remove alternator brushes and through bolts. Separate rectifier end housing and stator from drive end housing and rotor. With alternator on an insulated surface, connect test lead clip to alternator "BAT" output terminal. Plug tool into 110 volt A.C. power supply.

2) Touch the metal strap of each positive rectifier with test probe. Reading for satisfactory rectifiers will be 1¾ amperes or more and should be approximately the same for each rectifier. When 2 rectifiers are good and 1 is shorted, reading taken at good rectifiers will be low and reading at shorted rectifier will be zero.

3) Disconnect lead to rectifier reading zero, and retest. Reading of good rectifiers will now be within satisfactory range. When 1 rectifier is open, it will read approximately 1 ampere, while the 2 good rectifiers will read within satisfactory range.

Tool C-3829A Method (Negative Rectifiers)

1) Remove alternator brushes and through bolts. Separate rectifier end housing and stator from drive end housing and rotor. Connect test lead clip to rectifier end housing. Touch metal strap of each negative rectifier with test probe.

2) Test specifications and results will be approximately the same as for positive rectifiers, except meter will read on opposite side of scale. If a negative

CHRYSLER CORP. ALTERNATORS (Cont.)

rectifier shows shorted condition, remove stator from rectifier end shield and retest. Stator winding could be grounded to stator laminations or rectifier end shield, indicating a shorted negative rectifier.

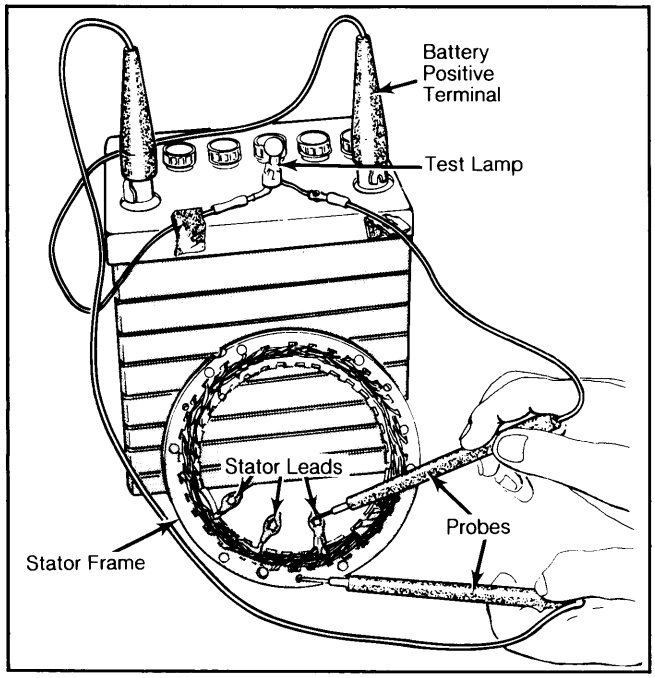
STATOR TEST

NOTE: On 117 amp. alternators, stator windings are "Delta" wound, and cannot be checked for opens and shorts with common shop equipment. If stator is not grounded, and all other components check correctly, suspect an open or a short in stator.

1) Separate stator from both end shields. Press test probe firmly onto any pin on stator frame. Be sure varnish has been removed so the pin is bare. Press test probe firmly to each of the 3 phase lead terminals, 1 at a time. *See Fig. 5.* If lamp lights, stator lead is grounded.

2) Now press test probe firmly on 1 phase lead, and contact each of the other 2 stator leads. Test lamp should light when probe contacts each of the terminals. If lamp does not light, stator is open. Install a new stator if it is open or grounded.

Fig. 5: Test Lamp Connections for Stator Ground Test



Touch test lamp probes to stator frame and stator leads.

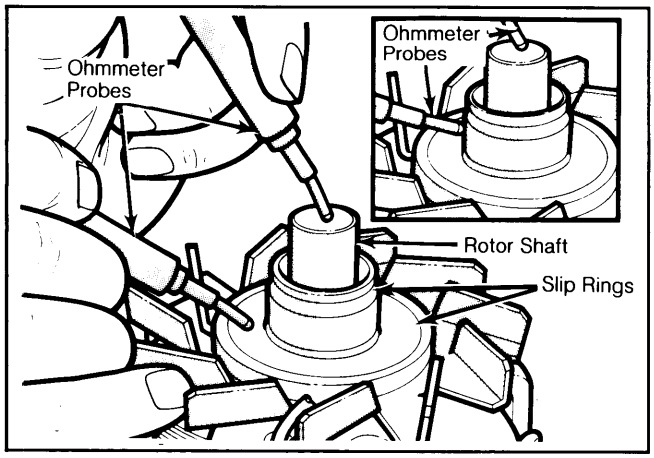
ROTOR TEST

1) Test rotor for grounded, open or shorted field coils, using an ohmmeter. *See Figs. 6 and 7.* Test for grounds between each slip ring and rotor shaft. No continuity should exist.

2) Check for open field by connecting ohmmeter leads across slip rings. Normal resistance reading with rotor at room temperature is 1.7-2.1 ohms for 117 amp. alternator and 1.5-2.0 ohms for all other models.

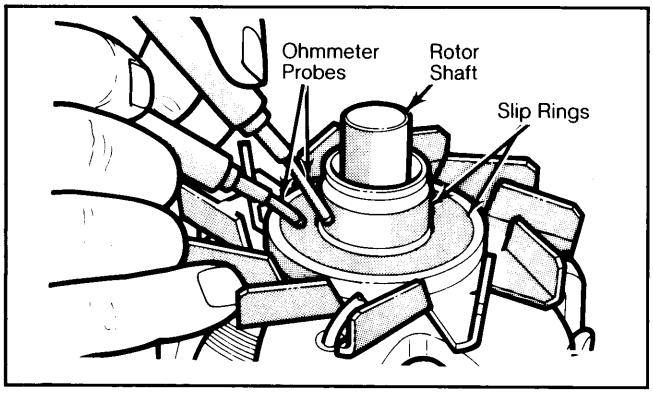
3) Readings between 2.5 and 3.0 ohms would result from rotors operating at high engine compartment temperatures. Readings above 3.5 ohms indicate high resistance, possibly requiring rotor replacement. If reading is below 1.7 ohms (117 amp. alternator) or 1.5 ohms (all other models), the field coil is shorted.

Fig 6: Ohmmeter Probe Connections for Rotor Ground Test



Touch one ohmmeter probe to shaft; touch other probe to each slip ring.

Fig. 7: Ohmmeter Probe Connections for Open or Short Tests



Touch ohmmeter probes to slip rings.

OVERHAUL

DISASSEMBLY

1) Remove brush screws and insulating washers, and lift brush assemblies from end shield.

CAUTION: Stator is laminated. Do not burr stator or end shield.

2) Remove through bolts, and pry between stator and drive end shield with blade of screwdriver, using slot provided. Carefully separate drive end shield, pulley and rotor assembly away from stator and rectifier end shield assembly. If negative heat sink diode straps are on top of positive heat sink straps, remove 4 hex head screws on negative rectifier and heat sink assembly. Remove heat sink assembly.

3) On all except 117 amp. alternators, remove nut, washer and insulator from output ("BAT") terminal on outside of end shield. Turn end shield over, and remove

CHRYSLER CORP. ALTERNATORS (Cont.)

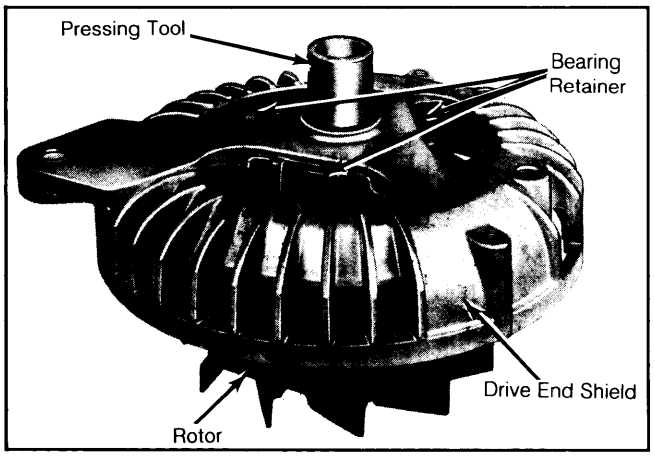
capacitor, insulated washer and positive heat sink assembly. Remove insulator from "BAT" terminal hole.

4) On 117 amp. alternators, reach inside end shield. Remove nut and insulator, attaching positive heat sink to end shield. Remove capacitor screw, capacitor and insulator.

5) From outside end shield, remove nut and insulator, attaching positive heat sink to end shield. Remove screws attaching negative heat sink to end shield. Remove positive and negative heat sink assemblies, noting location of insulators. Remove terminal block attaching screws and terminal block.

6) On all except 117 amp. alternators, remove mica insulator from end shield and loosen four hex head screws on negative rectifier and heat sink assembly. Remove two outer screws and remove heat sink assembly.

Fig. 8: Installing Drive End Shield Bearing



Support rotor shaft base, while pressing bearing into end shield.

7) Using a puller (C-4068 or C-4333; C-4467 on 117 amp. models), remove drive pulley from shaft. Remove screws attaching bearing retainer to drive end shield on 117 amp. alternators. Separate bearing retainer from end shield. Support end shield and tap rotor shaft with plastic hammer to separate rotor from end shield.

8) Using suitable puller, remove drive end ball bearing. If needle roller bearing in rectifier end shield must be replaced, it can be pressed out of end shield using an end shield support tool (C-3925) and press tool (C-3770A).

SLIP RING REPLACEMENT

NOTE: Slip rings are not serviced as a separate item, only as part of the rotor assembly.

REASSEMBLY

EXCEPT 117 AMP. ALTERNATOR

1) Place grease retainer on rotor shaft, and press retainer onto shaft with installer tool (C-3921). Press until grease retainer bottoms on rotor shaft. Position rectifier end shield bearing on base of needle bearing installer tool (C-4201-1). Place end shield on top of bearing so it is properly aligned. With top part of bearing press tool (C-4201-2) placed on end shield, press into place until it bottoms.

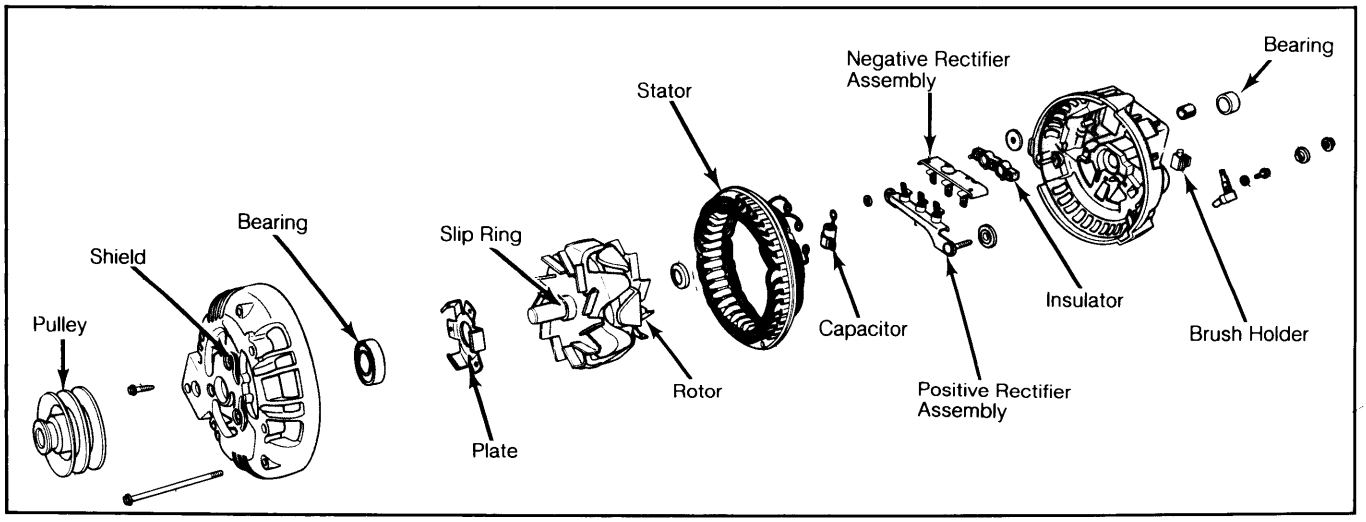
NOTE: New bearings are pre-lubricated and should require no additional lubrication.

2) Insert drive end bearing in drive end shield. Install retainer plate to hold bearing in place. A metal spacer is supplied with replacement rotors and ball bearings (but is not a part of original alternator assembly). Place spacer on pulley end of rotor shaft first. Position bearing and drive end shield on rotor shaft. Support base of rotor shaft. Press bearing end shield into position on rotor shaft with an arbor press and adapter (C-3858).

CAUTION: Ensure bearing is installed squarely to avoid damage to bearing and rotor shaft.

3) Install pulley on rotor shaft. Shaft of rotor must be supported, so all pressing force is on pulley hub and rotor shaft, (not on bearings). Do not hammer pulley on or apply more than 6800 lbs. (3084 kg).

Fig. 9: Exploded View of Typical Chrysler Corp. Alternator



Alternators & Regulators

CHRYSLER CORP. ALTERNATORS (Cont.)

4) If removed, install output terminal stud and insulator through end shield. Be sure mica insulators are in place and undamaged. Install positive heat sink assembly over studs. Guide rectifier straps over studs on terminal block. Install capacitor. Slide negative rectifier and heat sink assembly into place. Position straps and install screws.

5) Position stator over rectifier end shield, and install winding terminals on terminal block. Press stator pins into each end shield. Route leads so they cannot contact rotor or sharp edge of negative heat sink. Position rotor and drive end shield over stator and rectifier end shield. Install through bolts. Compress both ends, and tighten through bolts evenly.

6) Install field brushes in insulated holders. Position vertical and horizontal field brushes properly in rectifier end shield. Place an insulating washer on each field brush terminal. Install lock washers. Be sure brushes are not grounded. Rotate pulley slowly by hand to ensure rotor blades do not hit stator leads.

117 AMP. ALTERNATOR ONLY

1) Position rectifier end shield bearing on base of support tool (C-4330-1). Place end shield on top of bearing, so that it is properly aligned. With bearing installer tool (C-4330-2) placed on end shield, press into place until end shield touches base of press.

NOTE: New bearings are prelubricated and require no additional lubrication.

2) Insert drive end bearing in end shield. Position retainer, and tighten mounting screws, ensuring rotor spacer is in position. Place bearing and drive end shield on rotor shaft. Press end shield into position with arbor press and tool C-3858.

3) Install pulley on rotor shaft. Support shaft so that pressing force is on pulley hub. Press pulley on shaft until it contacts inner race of drive end bearing. Do not hammer pulley on or exceed 6800 lbs. (3084 kg) of force. Position insulator and capacitor on positive heat sink mounting stub, and tighten attaching screw.

4) Position terminal block in rectifier end shield, and tighten screws. Position negative heat sink in end shield, ensuring that metal straps are placed over studs on terminal block. Install mounting screws and tighten.

5) Install insulator on positive heat sink stud, and place assembly into end shield. Ensure metal straps are properly positioned over studs on terminal block. From inside end shield, install insulator on positive heat sink stud and tighten nut.

6) From outside of end shield, install insulator on stud, and tighten mounting bolt. Position stator over end shield, and install terminals on terminal block. Route leads so they cannot contact rotor or sharp edges of negative heat sink.

7) Position rotor and drive end shield over end shield assembly, and align through bolts. Compress stator and both end shields manually. Install and tighten through bolts. Install field brushes in brush holder, with long terminal on bottom and short terminal on top. Install insulators and mounting screw.

8) Position brush holder assembly to end shield, making sure it is properly seated, and tighten mounting screw. Rotate pulley by hand to ensure rotor poles do not hit stator winding leads.

TIGHTENING SPECIFICATIONS

Application	INCH Lbs. (N.m)
Capacitor Bracket Screws	30-40 (3.4-4.5)
End Bearing Mount Screws	
117 Amp.	19-29 (2.1-3.3)
Field Brush Screws	
All Exc. 117 Amp.	15-35 (1.7-4.0)
117 Amp.	30-40 (3.4-4.5)
Negative Heat Sink Mount Screw	
All Exc. 117 Amp.	19-29 (2.1-3.3)
117 Amp.	30-40 (3.4-4.5)
Plastic Insulator Nut	30-50 (3.4-5.6)
Positive Heat Sink Stud Nut	20-30 (2.3-3.4)
Terminal Block Mount Screws	
117 Amp. Only	30-40 (3.4-4.5)
Through Bolts	
All Exc. 117 Amp.	25-55 (2.8-6.2)
117 Amp.	40-60 (4.5-6.8)
Winding Terminal Nut	11-17 (1.2-1.9)