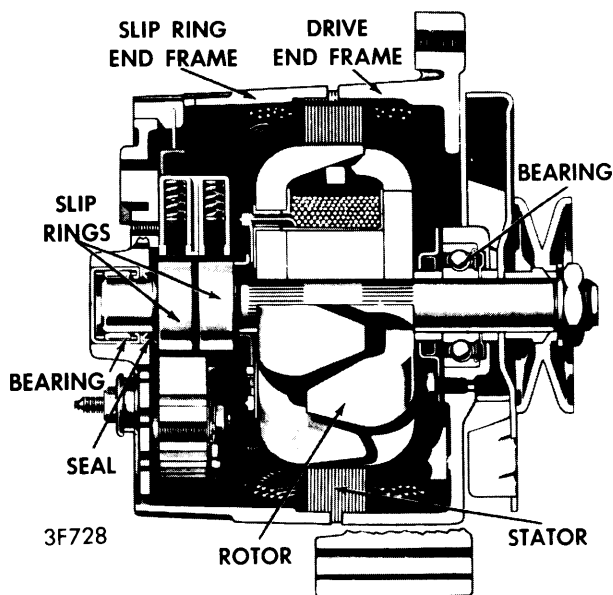


DELCO-REMY WITH INTEGRAL REGULATOR

American Motors
General Motors

DESCRIPTION

Delcotron integral alternator/regulator features a solid state regulator mounted inside generator. Models are available with different outputs at idle and different maximum outputs, but operating principles are the same. Delcotron consists primarily of two end frame assemblies, rotor, stator, brushes, slip rings and diodes. Rotor is supported in drive end frame by ball bearings and in slip ring end frame by roller bearings. Bearings contain enough lubricant to eliminate the need for periodic lubrication.



CROSS SECTION - DELCOTRON

OPERATION

Two brushes carry current through the slip rings to the field coil mounted on the rotor. The stator windings are assembled on the inside of a laminated core that forms part of the alternator frame. A rectifier bridge connected to the stator windings contains 6 diodes (three positive and three negative) molded into an assembly. This rectifier bridge changes stator a.c. voltage into d.c. voltage which appears at output terminal. The blocking action of the diodes prevents battery discharge back through the alternator. Because of this blocking action the need for a cutout relay is eliminated. Generator field current is supplied through a diode trio which is also connected to the stator windings. A capacitor is mounted in the end frame and protects rectifier bridge and diodes from high voltages.

ADJUSTMENTS

No periodic adjustments or maintenance of any kind is required on entire generator assembly. Regulator voltage is preset and no adjustment facility is provided.

CAUTION — Do not attempt to polarize alternator. Do not short or ground any terminals except as instructed. Never operate alternator with battery out of circuit or output terminal open. Alternator and battery must share same ground polarity.

TESTING

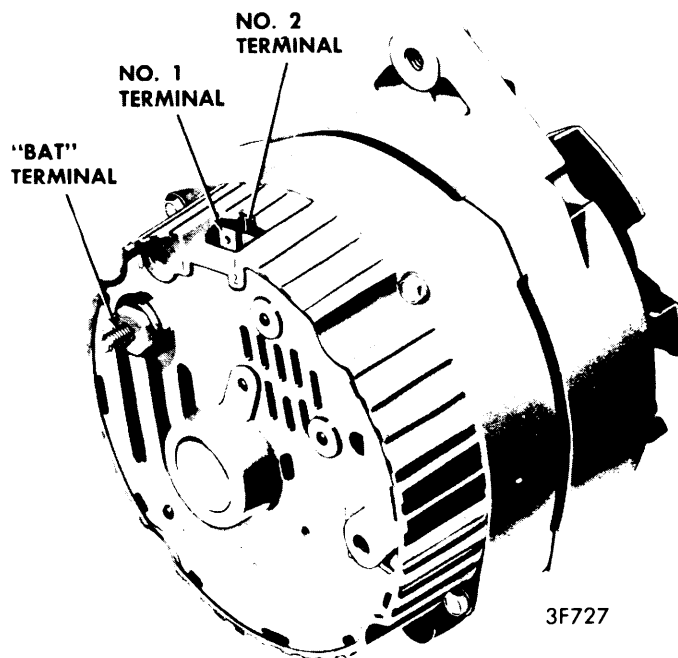
NOTE — Before making electrical checks, visually inspect all terminals for clean and tight connections. Check alternator mounting bolts and drive belt tension. Do not ground No. 2 lead wire. Battery must be in good condition to test charging system.

UNDERCHARGED BATTERY

1) With ignition switch ON connect a voltmeter from alternator "BAT" terminal to ground, then from No.1 terminal to ground, (see illustration) and No. 2 terminal to ground. A zero reading indicates an open between connection and battery. An open No. 2 lead will cause uncontrolled voltage. This may cause overcharge, and possible damage to accessories. Opens in this circuit may be between terminals at the crimp between harness wire and terminal, or in wire.

NOTE — If preceding test is satisfactory, continue to next step.

2) Disconnect battery ground cable. Connect an ammeter in the circuit at the "BAT" terminal of alternator. Reconnect battery ground cable. Turn on all available accessories. Connect a carbon pile across battery. Operate engine at moderate speed and adjust carbon pile as required to obtain maximum current output. If ampere output is within 10% of rated output as stamped on alternator frame, alternator is not defective. If output is not within 10% of rated output, ground the field winding by inserting a screwdriver into test hole (see illustration). **CAUTION** — Tab is within 3/4" of casting surface, do not force screwdriver deeper than one inch into end frame.

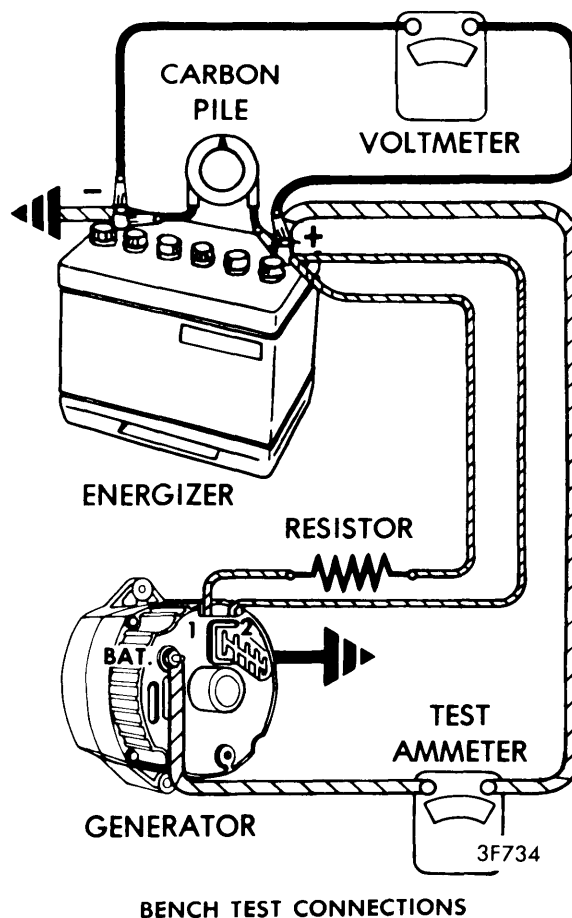
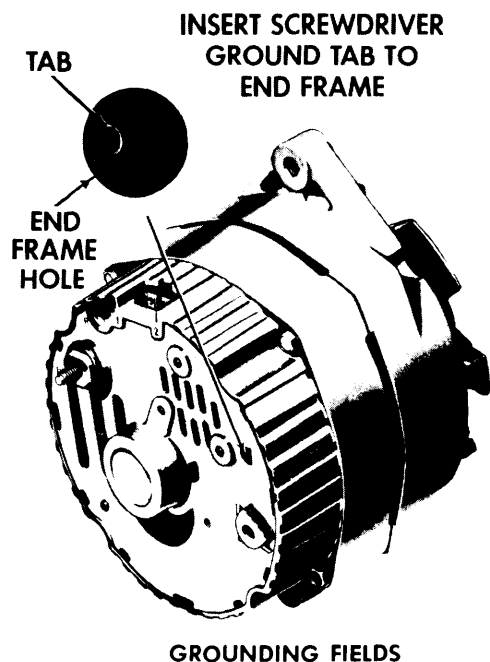


DELCOTRON TERMINAL LOCATIONS

Alternators & Regulators

DELCO-REMY WITH INTEGRAL REGULATOR (Cont.)

3) Operate engine at moderate speed as required and adjust carbon pile for maximum output. If output is now within 10% of rated output with fields grounded, regulator is defective and requires replacement. If output is still not within 10% of rated output, check field winding, diode trio, rectifier bridge, and stator.



OVERHAUL

GENERATOR OUTPUT TEST

1) To bench check alternator proceed as follows: Make connections as shown in illustration, except leave carbon pile disconnected. Use a fully charged battery, and a 10 Ohm resistor rated at 6 watts or more between alternator No. 1 terminal and battery. Slowly increase alternator speed and observe voltage. If voltage is uncontrolled with speed and increases above 16 volts, check for a grounded brush lead clip. If brush lead clip is OK replace regulator.

2) Connect carbon pile. Operate alternator at moderate speed and adjust carbon pile to obtain maximum output. If output is within 10% of rated output as stamped on alternator frame, alternator is good. If not, ground generator field with a screwdriver. If output is now within 10% of rated output, regulator is defective.

OVERCHARGED BATTERY

Connect a voltmeter from alternator No. 2 terminal to ground. If reading is zero, No. 2 lead circuit is open. If No. 2 lead circuit checks out good, alternator will have to be disassembled for further checks (see OVERHAUL).

DISASSEMBLY

1) Hold alternator in a vise, clamping mounting flange lengthwise. Remove thru bolts and separate slip ring end frame and stator assembly from drive end and rotor assembly by prying apart with a screwdriver at stator slots.

2) Place a piece of tape over slip ring end frame bearing to prevent entry of dirt. At this point brushes may drop onto rotor shaft and become contaminated with bearing lubricant, clean brushes as soon as possible with a suitable cleaner (acetone) to keep them from becoming grease soaked.

3) Remove stator lead attaching nuts and separate stator from end frame. Remove screw attaching diode trio to brush holder and remove diode trio from end frame. Remove rectifier bridge attaching screw and "BAT" terminal screw, and disconnect capacitor lead. Remove rectifier bridge from end frame. Remove brush holder and regulator. Note that two insulators are assembled over top of brush retaining clips, and that the two screws have special insulating sleeves.

4) Remove capacitor from end frame. Remove slip ring end frame bearing if necessary. Remove pulley nut by holding shaft with an Allen wrench. Remove pulley. Remove rotor and spacers from drive end frame assembly. If necessary remove drive end frame bearing retainer plate, then gasket and bearing.

DELCO-REMY WITH INTEGRAL REGULATOR (Cont.)

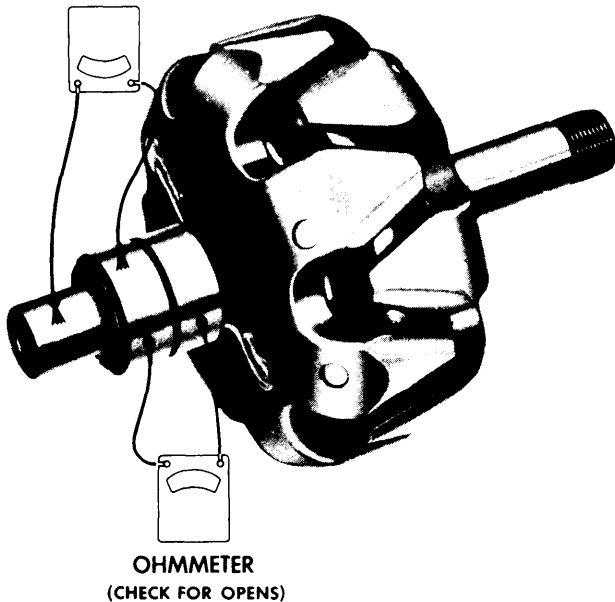
INSPECTION

Wash all metal parts except bearings and stator, and rotor. Inspect rotor slip rings, they may be cleaned with 400 grain polishing cloth. Slip rings may be lathe turned to a .001" indicator reading. Slip rings are not replaceable, excessive damage will require rotor replacement. Inspect brushes for wear, if they are worn halfway replace them.

TESTING (ON BENCH)

Rotor Field Winding — Check rotor for grounds or an open circuit with a 110 volt test lamp or ohmmeter (see illustration). Test for grounds between slip ring and rotor shaft; no continuity should exist. Test for an open field by connecting test leads across slip rings, continuity should be obtained. Test for shorts by connecting a 12 volt battery and ammeter in series with both slip rings. Current draw should be 4-4.5 amps. (exc. 80 amp alternators which draw 4-4.9 amps.). Excessive amperage draw indicates shorted windings.

(CHECK FOR GROUNDS)
OHMMETER

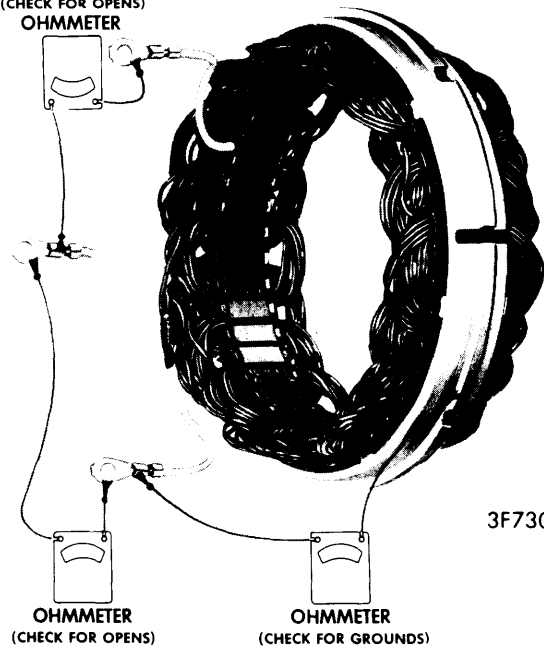


CHECKING ROTOR

3F729

Stator Checks — Grounds, connect a 110 volt test lamp or an Ohmmeter from any stator lead to stator frame. If test lamp lights or if Ohmmeter reads low, windings are grounded. Open Circuit, if lamp fails to light or if Ohmmeter reads high when successively connected between each pair of stator leads, the windings are open. Short Circuit, a short in stator windings is difficult to locate without special test equipment due to the low resistance of windings. However, if all other electrical checks are normal and generator fails to supply rated output, shorted stator windings are indicated, also look for heat discoloration on the windings.

(CHECK FOR OPENS)
OHMMETER

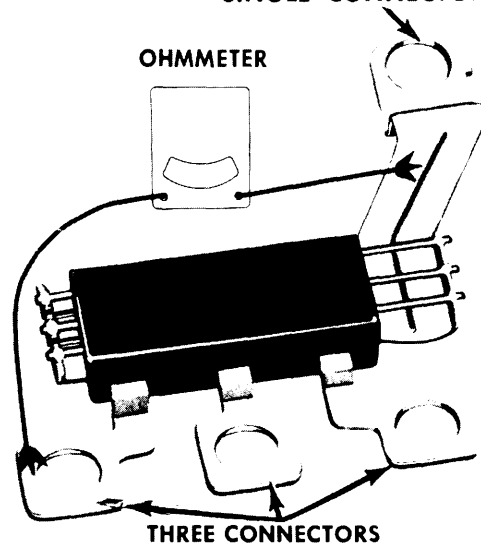


3F730

CHECKING STATOR

Diode Trio — With diode trio removed from end frame, connect an Ohmmeter to the single contact and one of the three connectors. Observe reading, then reverse leads on the same connectors. A good diode trio will give one high and one low reading. If both readings are the same, replace diode trio. Repeat test between single connector and each of the two other connections. Do not use high voltage such as a 110 volt test lamp to check diode trio.

SINGLE CONNECTOR



THREE CONNECTORS

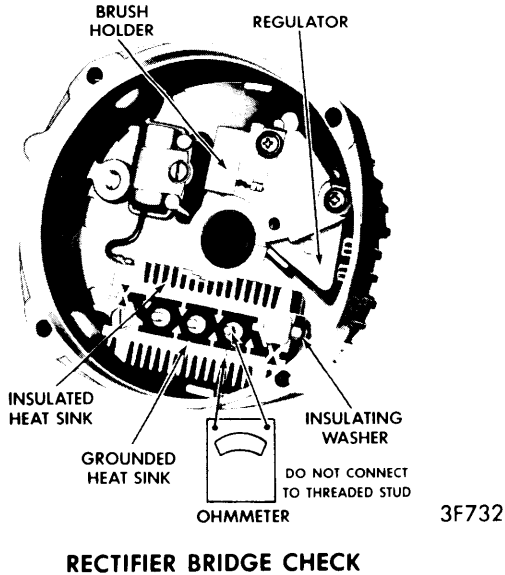
DIODE TRIO CHECK

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Alternators & Regulators

DELCO-REMY WITH INTEGRAL REGULATOR (Cont.)

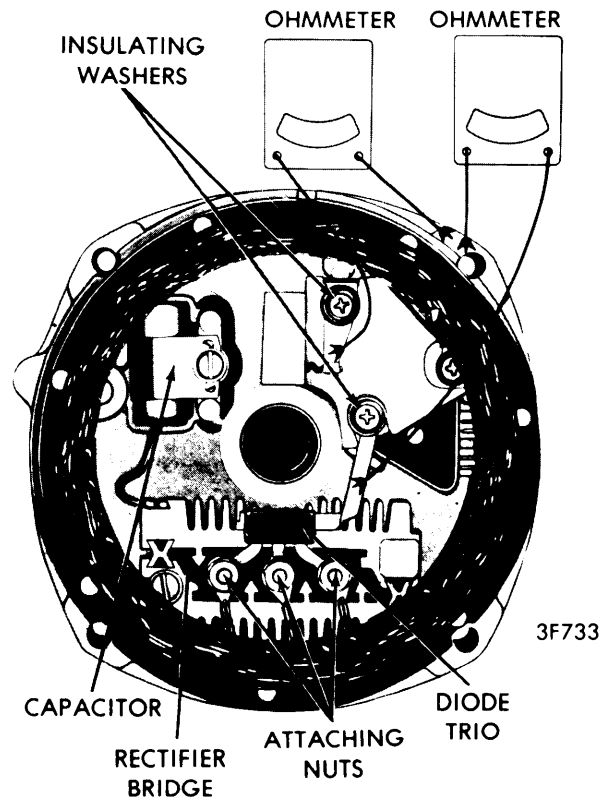
Rectifier Bridge Check – Connect an Ohmmeter to the grounded heat sink and one of the three terminals. Then reverse lead connections to heat sink and same terminal. If both readings are the same replace the bridge. A good rectifier bridge will give one high and one low reading. Repeat test on all terminals. When this is done you will have checked all six diodes with two readings taken for each diode. Do not use high voltage such as a 110 volt test lamp to check bridge.



Voltage Regulator Brush Lead Clip Check – Connect an Ohmmeter from brush lead clip to end frame (see illustration). Then reverse leads, if both readings are zero, either the brush lead clip is grounded or the regulator is defective. A grounded brush lead clip can result from omission of the insulating washer, insulating sleeve on screw, or a damaged insulating sleeve. Remove screw and inspect insulating sleeve if it is satisfactory, replace regulator unit.

over top of brush clips and special insulating sleeves over screw body above threads. Use wood or plastic toothpicks to retain brushes prior to installing slip ring end frame to drive end frame.

2) Position rectifier bridge to end frame. Install attaching screw and "BAT" terminal screw. Connect capacitor lead to bridge. Position diode trio on rectifier bridge terminal and install screw attaching brush lead clip to brush holder. Insulating washer must be assembled over top of connector. Position stator in end frame. Connect stator leads to rectifier bridge terminals and install attaching nuts. Position slip ring end frame to drive end frame and install thru bolts.



REASSEMBLY

1) Install rotor in drive end frame and attach spacer, fan and pulley. Using an Allen wrench, hold shaft and tighten nut. Install capacitor in slip ring end frame. Position brush holder and regulator assemblies in end frame, install retaining screws. Note the screws retaining brush clips have insulating washers

DELCO-REMY DELCOTRON SPECIFICATIONS						
Delco-Remy Number	Rating (Amps.)	Test Specifications (At 14.0 Volts)				Field Current (Amps.) 12 Volts, 80 F
		Amps.	RPM	Amps.	RPM	
1100927	37	22	2000	33	5000	4.0-4.5
1100928	55	30	2000	51	5000	4.0-4.5
1101016	80	55	2000	76	5000	4.0-4.9
1101023	80	55	2000	76	5000	4.4-4.9
1101024	80	55	2000	80	5500	4.0-4.9
1102380	63	37	2000	60	5000	4.0-4.5
1102384	37	22	2000	33	5000	4.0-4.5
1102385	55	30	2000	51	5000	4.0-4.5

Alternators & Regulators

DELCO-REMY WITH INTEGRAL REGULATOR (Cont.)

DELCO-REMY DELCOTRON SPECIFICATIONS (Cont.)						
Delco-Remy Number	Rating (Amps.)	Test Specifications (At 14.0 Volts)				Field Current (Amps.) 12 Volts, 80 F
		Amps.	RPM	Amps.	RPM	
1102388	37	22	2000	33	5000	4.0-4.5
1102389	42	25	2000	42	5500	4.0-4.5
1102390	55	30	2000	51	5000	4.0-4.5
1102391	61	30	2000	61	5500	4.0-4.5
1102392	63	32	2000	63	5500	4.0-4.5
1102394	37	22	2000	33	5500	4.0-4.5
1102465	63	32	2000	60	5000	4.0-4.5
1102474	61	30	2000	57	5000	4.0-4.5
1102478	55	30	2000	55	5500	4.0-4.5
1102479	55	30	2000	51	5000	4.0-4.5
1102480	61	30	2000	57	5000	4.0-4.5
1102484	42	25	2000	38	5000	4.0-4.5
1102486	61	30	2000	57	5000	4.0-4.5
1102491	37	22	2000	33	5000	4.0-4.5
1102495	55	30	2000	55	5500	4.0-4.5
1102840	55	30	2000	51	5000	4.0-4.5
1102841	42	25	2000	38	5000	4.0-4.5
1102842	63	30	2000	60	5000	4.0-4.5
1102843	61	30	2000	57	5000	4.0-4.5
1102844	63	30	2000	60	5000	4.0-4.5
1102845	32	21	2000	31	5000	4.0-4.5
1102846	55	30	2000	51	5000	4.0-4.5
1102851	55	30	2000	51	5000	4.0-4.5
1102854	63	32	2000	60	5000	4.0-4.5
1102858	37	22	2000	33	5000	4.0-4.5
1102877	37	22	2000	33	5000	4.0-4.5
1102878	55	30	2000	51	5000	4.0-4.5
1102881	37	22	2000	33	5000	4.0-4.5
1102882	37	22	2000	33	5000	4.0-4.5
1102883	55	30	2000	51	5000	4.0-4.5
1102884	55	30	2000	51	5000	4.0-4.5
1102891	55	30	2000	51	5000	4.0-4.5
1102892	63	37	2000	60	5000	4.0-4.5
1102893	63	37	2000	60	5000	4.0-4.5
1102895	55	30	2000	51	5000	4.0-4.5
1102897	55	30	2000	51	5000	4.0-4.5
1102903	61	30	2000	57	5000	4.0-4.5
1102904	63	37	2000	60	5000	4.0-4.5