LEECE-NEVILLE 6000 & 6200 (40 & 53 AMP.) SERIES

►CHANGES, CAUTIONS, CORRECTIONS

►*SERVICE PRECAUTIONS: When testing or servicing alternator or regulator, take the following precautions to avoid damage to components:*

Battery - Do not reverse battery connections. Negative terminal must be connected to ground. When charging battery, cables must be disconnected from battery before connecting charger. *DO NOT use charger as a booster for starting engine.* If a booster battery is used to start engine, negative cable of booster battery must be connected to car battery negative terminal.

Alternator - DO NOT ground field circuit between alternator and regulator nor operate alternator on an open circuit with field winding energized. *DO NOT ground output terminal. ALWAYS disconnect battery negative cable before removing wire from alternator output terminal.* Do not attempt to polarize alternator as polarization is not required and any attempt to polarize will damage voltage regulator and wiring harness.

DESCRIPTION

Three phase, self-rectifying type alternator using three negative and three positive rectifying diodes mounted in slip ring housing and internally connected to stator windings. The 6000 Series alternator has four terminals labelled F, GRD, N, B on slip ring housing. The 6200 Series alternator terminals are labeled F, N, B-, B+. Brushes are mounted in a sealed brush holder located on slip ring housing.

SPECIFICATIONS

Alternator Output - 40 or 53 amperes at 12 volts and 4000-4200 alternator RPM. *NOTE* - Rated capacity of alternator is stamped on unit.

Field (Rotor) Resistance - 3.8-4.2 ohms.

Field (Rotor) Current Draw - 2.8-3.3 amperes.

TESTING (ON CAR)

Alternator Output Test

Disconnect regulator F terminal lead and regulator B terminal lead. Connect a jumper wire from F to B lead, and ammeter positive lead to B lead. Start engine and let idle. While engine is idling, connect ammeter negative lead to battery positive post, then increase engine speed so alternator is at specified RPM. Note ammeter reading. Alternator output should reach or exceed alternator rating.

Field (Rotor) Circuit Test

Disconnect F lead from alternator and connect ammeter negative lead to alternator F terminal and ammeter positive lead to battery positive post. Current draw should be as specified. If there is little or no current, field has high resistance or is open. If current draw is very much higher than specified, rotor field windings are shorted or grounded.

OVERHAUL

Disassembly

Remove pulley, fan, key, and spacer. Remove through bolts and the brushes. Separate drive end housing and rotor assembly from stator and housing. Remove drive end housing from rotor shaft using suitable puller or arbor press. Slip rings can be replaced using suitable pullers and arbor press. Press bearings out of end housings. Stator and diodes can be removed from end housing by removing terminal nuts and washers.

Diode Test

Either Test 1 or Test 2 may be used after the diodes are disconnected from the stator.

Test 1 - Positive Diodes - Put ohmmeter negative prod on diode terminal post and positive prod on positive heat sink. There should be low resistance. Reverse the ohmmeter leads. There should be very high or inifinite resistance. Test all three positive diodes in turn.

Negative Diodes - With positive prod of ohmmeter on diode terminal post and negative prod on negative heat sink, there should be low resistance. With prods reversed, there should be very high or infinite resistance. Test all three negative diodes in turn.

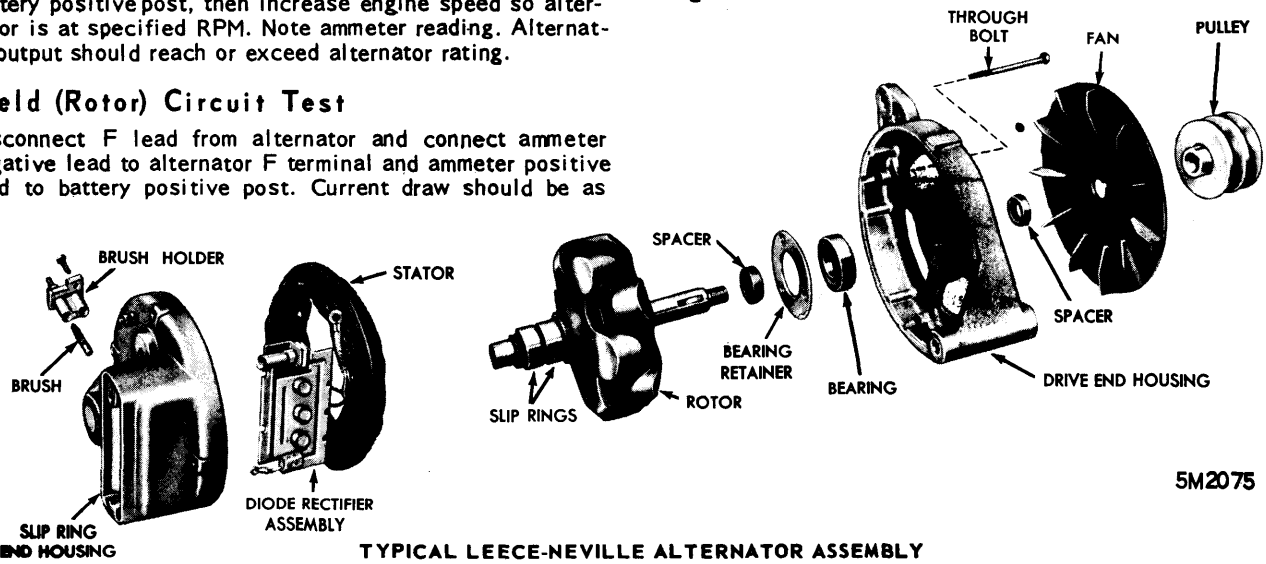
Conclusions - If any test is not as indicated, diode or diodes are faulty and must be replaced.

Test 2 - with a 24-volt light bulb and a 24-volt battery, make tests exactly as indicated in Test 1. If bulb lights in one direction only, diode is good. If bulb lights in both directions diode is shorted. If bulb does not light in either direction, diode is open.

Stator Tests

Ground Test - With stator leads disconnected from diodes, use a 110-volt test lamp to check between each stator lead and stator core or housing. If there is any current at any lead, stator is grounded.

Continuity Test - With stator leads disconnected from diodes, use a 110-volt test lamp to check between each stator lead and stator frame or housing. The lamp should light at each lead.



TYPICAL LEECE-NEVILLE ALTERNATOR ASSEMBLY

LEECE-NEVILLE 6000 & 6200 (40 & 53 AMP.) SERIES (Continued)

Rotor Resistance Test

Put the prods of an ohmmeter on each slip ring. Resistance should be as specified. If resistance is very little, coil may be shorted. If there is no resistance, coil may be open. If brush springs were collapsed coil windings are shorted.

Diode Replacement

When soldering leads, be careful not to overheat diodes or damage will result. Be sure diodes are a tight fit in heat sink. Coat diode mounting hole with a good waterproof sealing compound.

Reassembly

Reverse disassembly procedure and note the following: Drive end housing must be heated to 150-200°F for 15 minutes before installing bearing.

LEECE-NEVILLE 7000 (60 & 65 AMP.) SERIES

►CHANGES, CAUTIONS, CORRECTIONS

►*SERVICE PRECAUTIONS: When testing or servicing alternator or regulator, take the following precautions to avoid damage to components:*

Battery - Do not reverse battery connections. Negative terminal must be connected to ground. When charging battery, cables must be disconnected from battery before connecting charger. *DO NOT use charger as a booster for starting engine.* If a booster battery is used to start engine, negative cable of booster battery must be connected to car battery negative terminal.

Alternator - DO NOT ground field circuit between alternator and regulator nor operate alternator on an open circuit with field winding energized. *DO NOT ground output terminal. ALWAYS disconnect battery negative cable before removing wire from alternator output terminal.* Do not attempt to polarize alternator as polarization is not required and any attempt to polarize will damage voltage regulator and wiring harness.

DESCRIPTION

Three phase, self-rectifying type alternator using three negative and three positive rectifying diodes mounted in slip ring housing and internally connected to stator windings. In addition to the two "F" and the positive and negative output terminals on slip ring housing, the three stator phase leads end in external terminals for attachment of a transformer if desired. Brushes are mounted in a sealed brush holder located on slip ring housing.

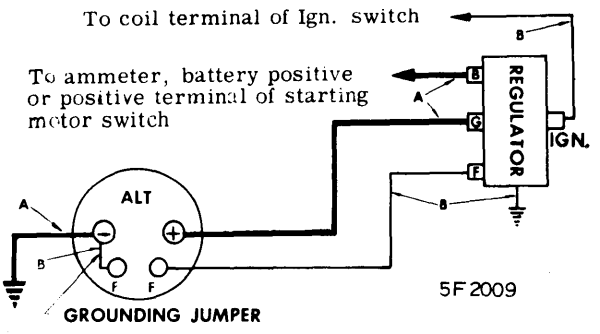
SPECIFICATIONS

Alternator Output (1966 & Earlier Models) - 60 amperes at 12 volts and 2000-2100 Engine RPM.
Alternator Output (1967-72) - 65 amperes at 15 volts and 1600-2000 Engine RPM.
Field (Rotor) Resistance (All) - 3.8-4.2 ohms.
Field (Rotor) Current Draw (All) - 2.9 amps.

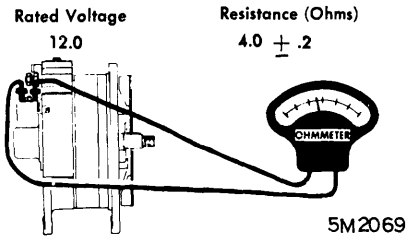
TESTING (ON CAR)

Field Resistance Test

Remove brush retainers and brushes and insert test prods of an ohmmeter into brush holder openings to make direct contact with each slip ring. Resistance should be as specified. If resistance is very little, coil may be shorted. If there is no resistance, coil may be open. If brush springs were collapsed coil windings are shorted.



SYSTEM WIRING CONNECTION (NEGATIVE GROUND)



FIELD (ROTOR) RESISTANCE TEST

Alternator Output Test

Types With 2-Unit Regulator - Disconnect battery ground cable and disconnect battery wire at regulator BAT terminal. Connect ammeter positive lead to regulator BAT terminal and negative lead to ground. *NOTE - Insulate disconnected field lead to prevent short circuit.* Disconnect field wire at alternator "F" terminal and connect a jumper wire between alternator "F" terminal and + output terminal of alternator. Reconnect battery. Bring alternator to specified speed and note ammeter and voltmeter readings. If not within specifications (see above), remove for bench testing and overhaul.

Types with 3-Unit Regulator - Disconnect battery ground cable and disconnect battery wire at regulator BAT terminal. Connect ammeter positive lead to regulator BAT terminal and negative lead to wire which was disconnected from regulator. Connect voltmeter positive lead to regulator BAT terminal and negative lead to ground. Connect a carbon pile rheostat across battery. Reconnect battery and bring alternator to specified RPM. Adjust rheostat so voltmeter reads below voltage regulator setting. Ammeter reading should be as specified. If not within specifications, stop engine, and increase or decrease current regulator spring tension as required.

TESTING (ON BENCH)

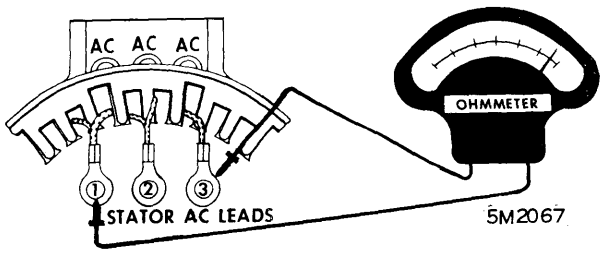
Stator Ground Test

Remove plate at top of slip ring end housing to expose the three AC terminal connections. Remove the terminals and let stator leads hang freely. With a 110-volt test lamp check between each stator lead and frame. If the is any current at any lead, stator is grounded.

Stator Continuity Test

With stator leads disconnected, connect an ohmmeter between each stator lead in turn. Each phase should show closed circuit or indicate a low resistance.

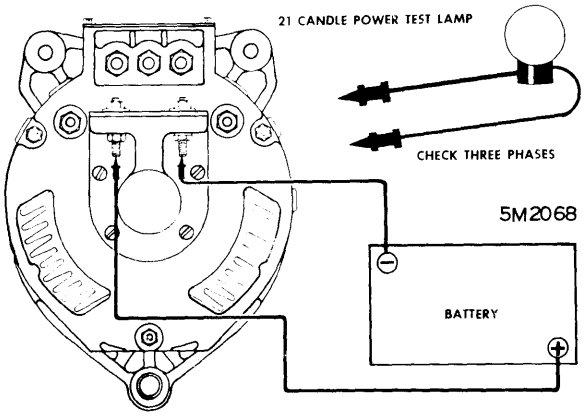
LEECE-NEVILLE 7000 (60 & 65 AMP.) SERIES (Cont.)



STATOR CONTINUITY TEST

Alternator Phase Test

Operate alternator at 1000 RPM on a test stand. *Do not exceed 1000 RPM or voltage will be high and damage unit.* Connect an AC voltmeter or test light of same voltage rating as system (sealed beam headlight with elements in parallel), across each AC terminal in turn. Voltage or lamp brightness should be the same across phases 1-2, 2-3, and 1-3. If there is pronounced difference in voltage or brightness, stator windings are shorted or grounded.



ALTERNATOR PHASE TEST

Field Current Draw

1) Connect ammeter from battery positive post to alternator insulated "F" terminal. Connect grounded field terminal to battery negative post. Rotate alternator slowly by hand and note reading. If below specifications, there is high resistance in slip rings or brushes. If above specifications, rotor coil is shorted.

2) Disconnect lead from negative field terminal. Put a 110-volt test lamp between either field terminal and alternator frame. If test lamp lights, rotor coil is grounded. *NOTE - One or both brush holders may also be grounded. Alternator must be disassembled to determine if brush holders or rotor is at fault.*

Diode Test

Either test 1 or Test 2 may be used.

Test 1 - Positive Diodes - Put ohmmeter negative prod on diode terminal post and positive prod on positive heat sink. There should be low resistance. Reverse the ohmmeter leads. There should be very high or infinite resistance. Test all three positive diodes in turn.

Negative Diodes - With positive prod of ohmmeter on diode terminal post and negative prod on negative heat sink, there should be low resistance. With prods reversed, there should be very high or infinite resistance.

Conclusions - If any test is not as indicated, diode or diodes are faulty and must be replaced.

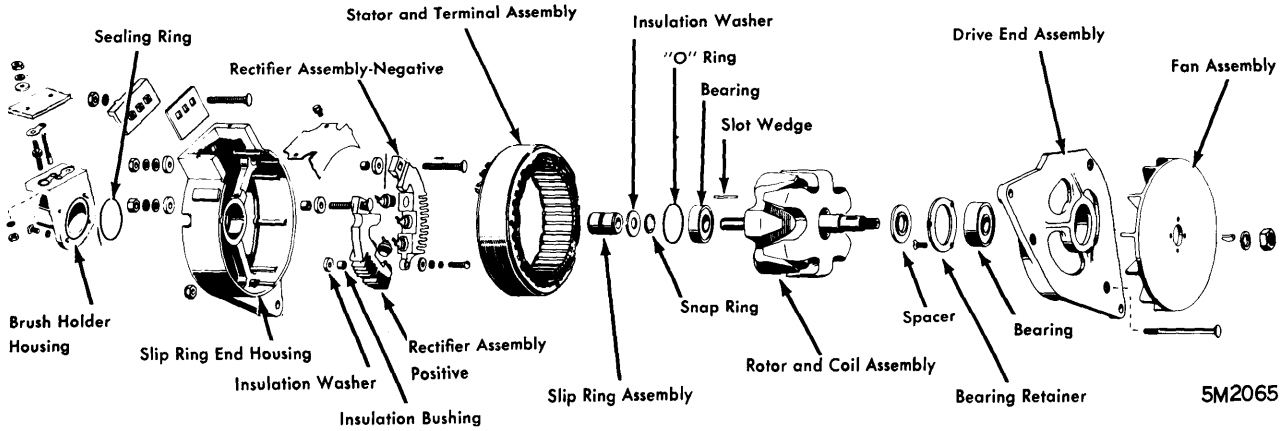
Test 2 - With a No. 57 bulb and a 12-volt battery, make tests exactly as indicated in Test 1. If bulb lights in one direction only, diode is good. If bulb lights in both directions diode is shorted. If bulb does not light in either direction, diode is open.

OVERHAUL

Disassembly

1) Remove fan, pulley, key, and spacer. Remove brush holder housing from slip ring end housing. Remove three through bolts and elastic stop nuts, and tap a brass rod gently against rotor shaft to remove slip ring end housing and stator from rotor and drive end housing. Remove cover from terminal block, disconnect AC terminal leads, and separate stator from slip ring end housing.

2) Use an arbor press or suitable puller to separate drive drive end housing from rotor and shaft. Remove bearings from each end housing.



LEECE-NEVILLE 7000 SERIES ALTERNATOR ASSEMBLY

LEECE-NEVILLE 7000 (60 & 65 AMP.) SERIES (Cont.)

Rotor Repairs

Slip rings can be replaced with an arbor press or suitable puller after snap ring has been removed. When installing slip ring, be sure slots are aligned where wires come from rotor coil, then press slip ring assembly onto shaft until they bottom on shaft shoulder. Slip ring bearing surfaces concentricity with rotor shaft should be within .002" total indicator reading.

Brush Replacement

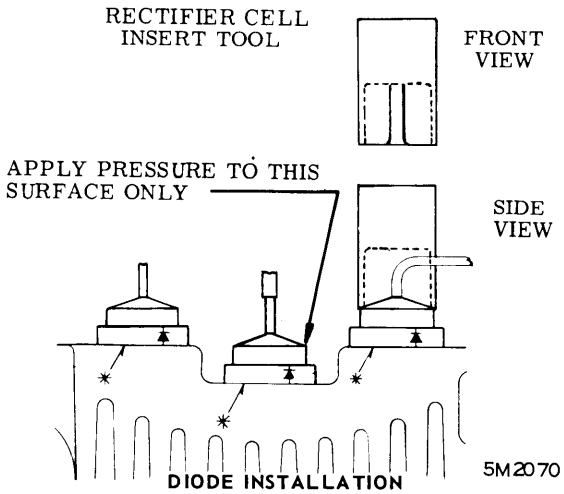
To replace brushes, two U-shaped tools must be made from sheet metal to hold down jumpers.

Diode Replacement

If center diode is to be replaced, remove heat sink fin. Drill a 1/8" hole into diode from fin side of heat sink and tap out diode. Before installing new diode, coat surfaces of cell and heat sink with electrical joint compound to prevent corrosion. To install a diode, make a tubular tool slotted or countersunk to accommodate diode lead, and place tool over diode so it can be tapped evenly into place. Diode must be firmly seated in heat sink.

Reassembly

Reverse disassembly procedures, make sure there is a circuit through rotor coil and through brushes to slip rings. Make sure rotor turns freely.



DIODE INSTALLATION