

## FIAT

Fiat 850 (1970-73)  
Fiat 124 (1968-73)

### ► CHANGES, CAUTIONS, CORRECTIONS

► **ELECTRICAL SYSTEM REPAIRING CAUTION** — Reversed polarity or excessive voltage will result in extensive damage to alternator system. Note the following to prevent damage:

**Battery Installation** — Negative battery terminal must be connected to ground (negative ground systems only), and positive terminal connected to starter. DO NOT reverse battery leads.

**Battery Charging** — If a Quick Charger is used, both battery cables must be disconnected from battery. DO NOT use a Quick Charger to provide starting voltage.

**Circuit Interruption** — The battery must never be disconnected while alternator is running.

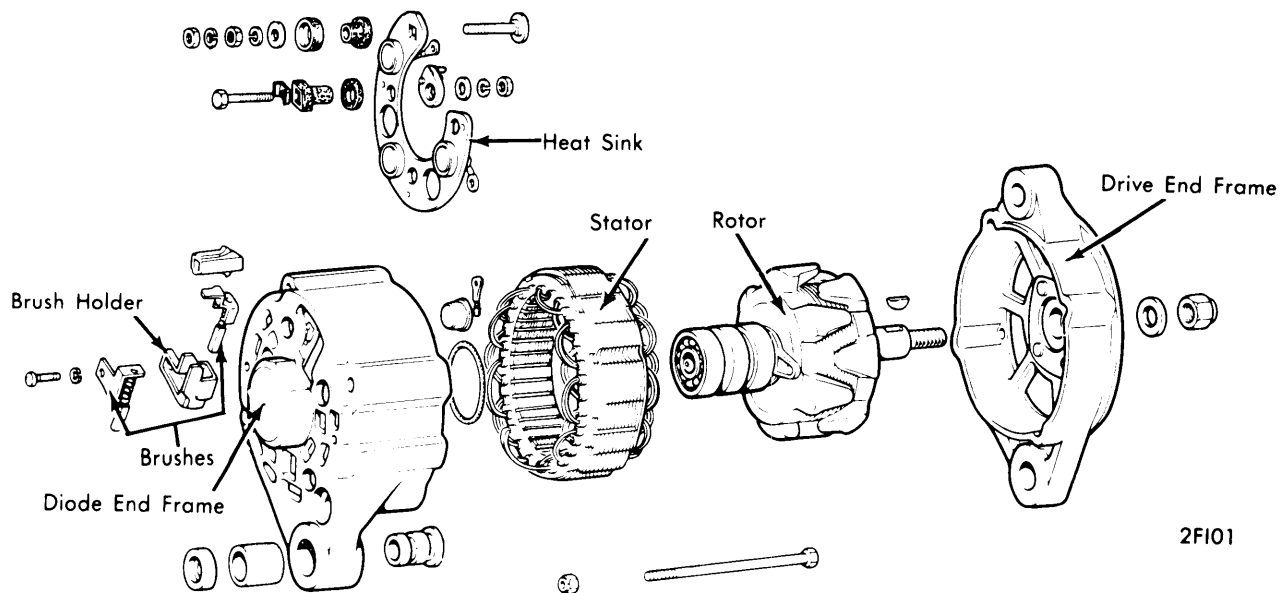
**Alternator Removal** — Always disconnect battery ground before alternator removal and replacement.

**High Voltage** — DO NOT use a high voltage source to test diodes.

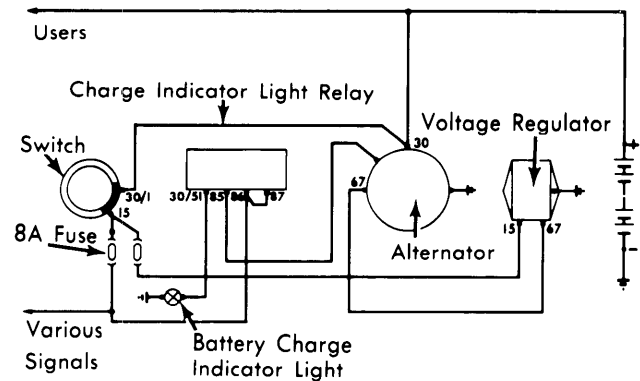
**Booster Battery (For Engine Start)** — Booster battery must be connected with negative lead to negative terminal and positive lead to positive terminal. DO NOT reverse battery leads.

### DESCRIPTION

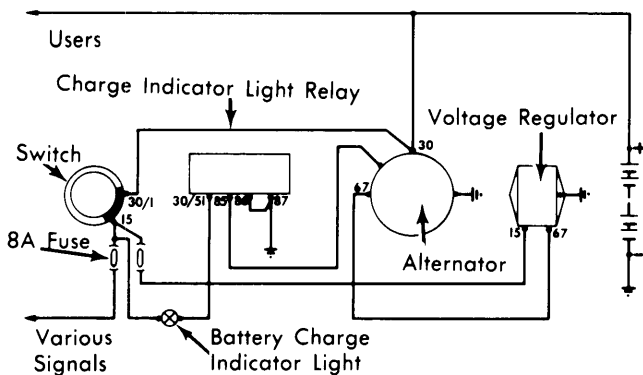
Fiat alternators are conventional three-phase, self-rectifying type alternators. Six silicon rectifier diodes are connected to form a full-wave, three-phase rectifying bridge. The three negative rectifier diodes (identified by black wording) are pressed directly in the end frame. Three positive diodes (identified by red wording) are located in a heat sink which is insulated from the end frame.



FIAT ALTERNATOR



CHARGING WITH INDICATOR LIGHT  
(ONE POLE GROUNDED)



CHARGING WITH INDICATOR LIGHT  
(BOTH POLES GROUNDED)

2FI01

# Alternators

## FIAT (Cont.)

### Application

850 ..... ① A 12 M 124/12/42M  
124 ..... ① A 12 M 124/12/42M

### Model No.

① — Alternators A 12 M 124/12/47 and A 12 M 124/12/60 are optional.

## TESTING

### BENCH TESTING

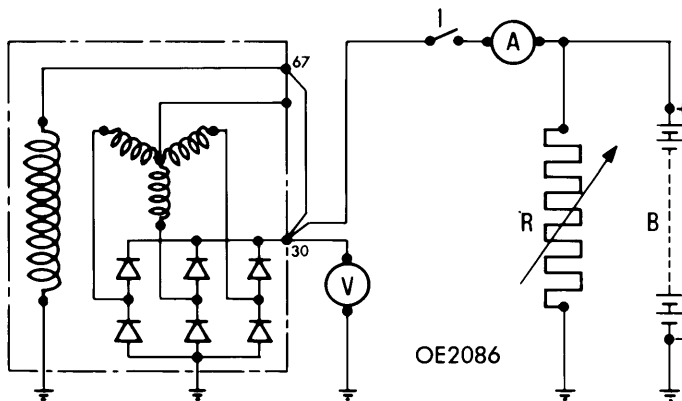
**Field Winding Resistance** — Resistance must be measured across terminal "67" and ground, by the volt-ampere method, at alternator speed of 500 RPM. At 68°F measured resistance must be as listed (see specifications).

**Output Test** — 1) Place alternator, complete with pulley and fan, on test bench equipped with gradual speed control. Wire as shown in illustration.

2) Run alternator for 30 minutes at 5000 RPM with output listed under Current Output (see specifications).

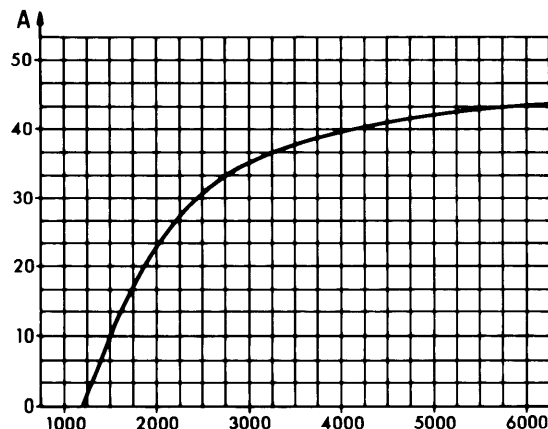
3) After thermal stabilization, determine the output curve at 14 volts. To determine the exact cut-in speed (see specifications) at 14 volts, it is first necessary to run alternator until obtaining a given output, then reducing its speed to an output current of one to two amps. At this point, disconnect the load rheostat and the battery by opening switch "I" (see illustration). Then bring the voltage up to 14 volts by adjusting the speed.

4) The output curve must be identical or slightly greater than the ones shown (according to alternator model).



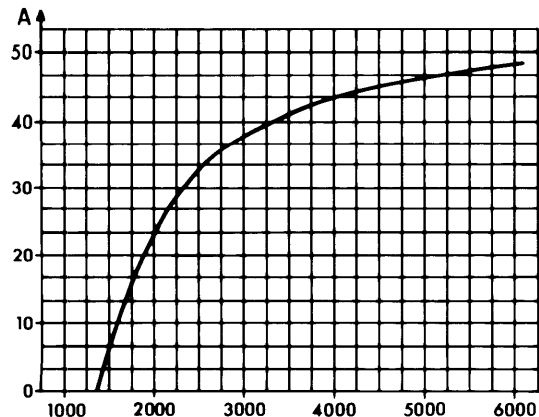
OE2086

### INTERNAL WIRING DIAGRAM AND TEST CIRCUIT



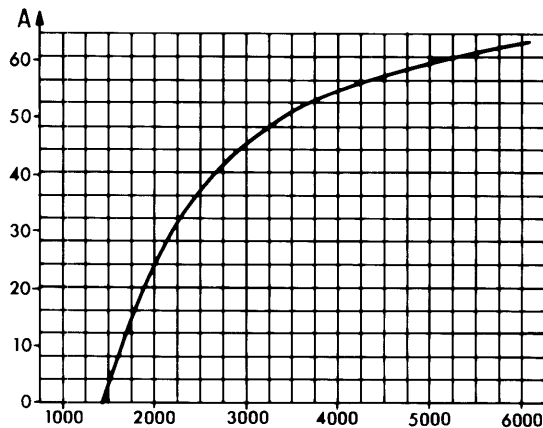
OE2087

### MINIMUM OUTPUT CURVE — 42 AMP. ALTERNATOR



OE2088

### MINIMUM OUTPUT CURVE — 47 AMP. ALTERNATOR



OE2089

### MINIMUM OUTPUT CURVE — 60 AMP. ALTERNATOR

## OVERHAUL

### DISASSEMBLY

- 1) Remove drive and ventilation components from rotor shaft. Remove brush holder (with brushes) by backing out its mounting screw on diode end head. Remove Woodruff key on shaft.
- 2) Unscrew nuts of the four through bolts, remove drive end frame and rotor. Before removing stator, unscrew from inside (of housing), three nuts securing stator winding phase ends to diode ends. Remove stator.
- 3) To disassemble diode end frame, unscrew the nut of terminal "30". The frame with negative diodes and the support with positive diodes will thus be separated.

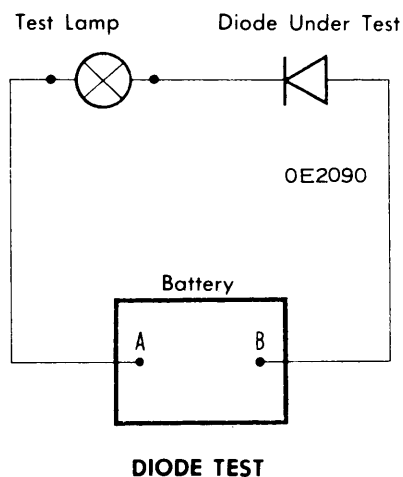
### TESTING

**Diode Assemblies** — Use a test lamp not exceeding 24 volts, or an ohmmeter. Always disconnect the diodes from the stator windings before individual testing commences. Due to the

## FIAT (Cont.)

three-phase bridge connection of rectifier, a faulty diode could not otherwise be detected. Connect test lamp in series to diode to be tested. The diode is efficient if lamp lights in only one of the two connection arrangements (reversing test leads). Diode is open if lamp does not light in either direction. Diode is shorted if lamp lights in both connection arrangements (see illustration).

**Stator Winding Resistance** — Resistance of the stator windings can be checked only after opening connector joining stator phase ends to rectifier ends. Resistance must be measured between the end of each phase and the center terminal by volt-ampere method. As resistance values are very small, it is essential to use a high-precision ammeter. The recorded values must be the same as listed (see specifications).



**Rotor Winding Resistance** — Rotor resistance can be checked with an ohmmeter. Connect leads across slip rings at 68°F (see specifications).

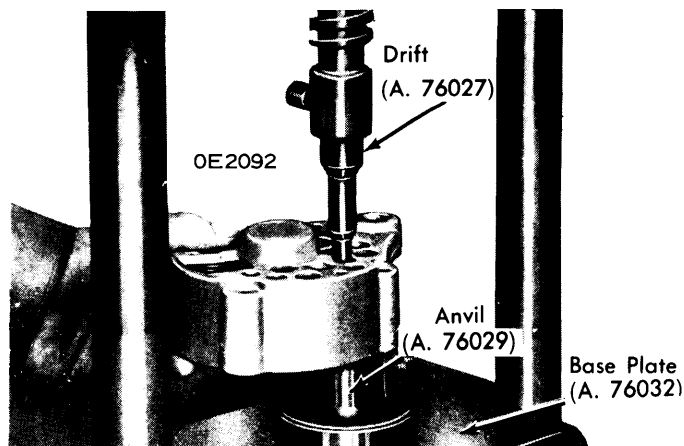
**Brushes** — The spring pressure on slip ring brushes should be about one pound (0.43 kg), with new brushes in operation position.

### PARTS REPLACEMENT

**Positive Diodes** — On the aluminum positive diode heat sink, replacement of positive diodes is not possible. In case one or more positive diodes is damaged, change heat sink plate complete with diodes.

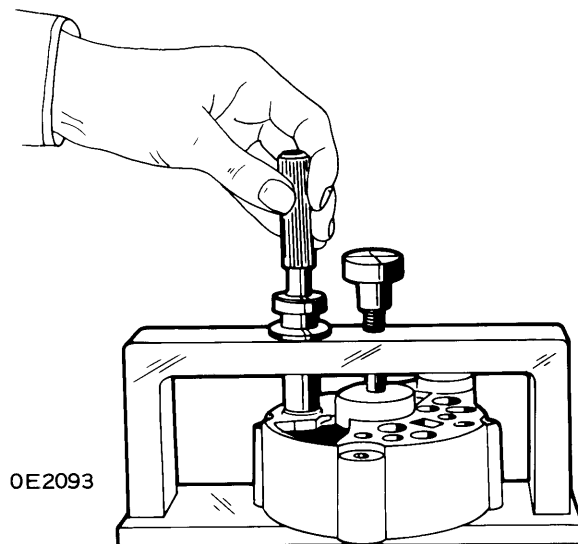
**Negative Diodes** — *NOTE* — The new diode must be of the type especially designed for replacements. Besides identification marks, spare diodes bear the letter "R" stamped on container shell. Also shell diameter in knurled area is oversize. The seat hole of the damaged diode that was removed must be re-bored to a larger diameter to ensure efficient operation of the replacement diode.

1) Removal should be performed using a suitable hand arbor press (see illustration).



### REMOVAL OF NEGATIVE DIODES

2) A drill press should be used to ream diode seats. Support end frame with suitable fixture (A. 76035). Center seat to be reamed to fixture bushing by inserting guide pin and then locking end frame to fixture.



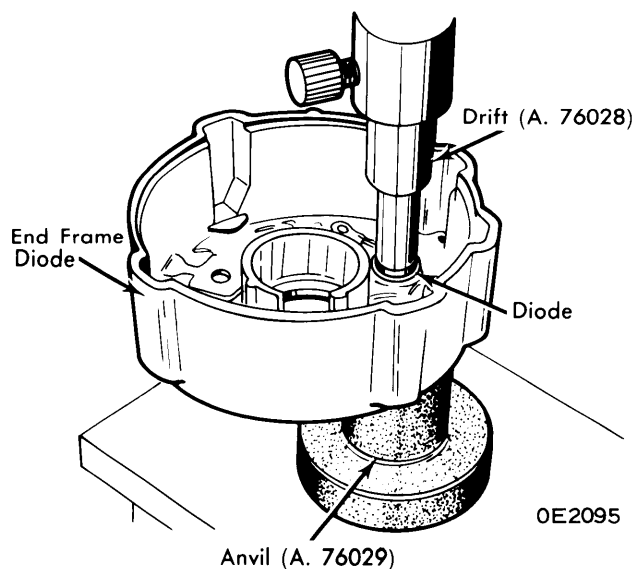
### CENTERING OF NEGATIVE DIODE SEATS

3) Re-bore diode seat using reamer (A. 90340) chucked in drill at about 1000 RPM. Reamer must be oiled continuously with kerosene during operation.

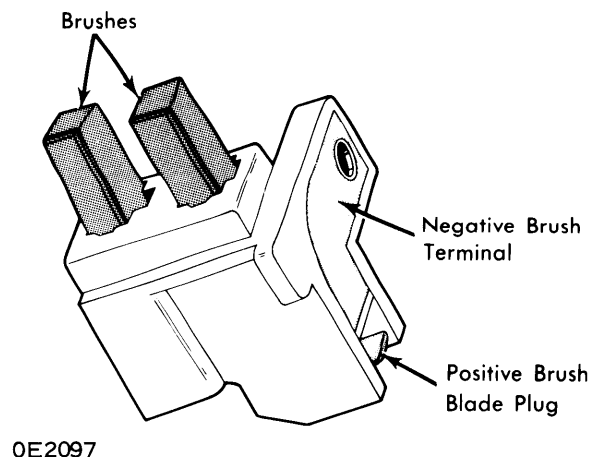
4) Install negative diodes using hand arbor press. Diode axis must always coincide with hole axis. Drift (A. 76028) used for installation of diode must apply its pressure exclusively on the container areas marked in illustration. Before pressing, be sure to prevent arbor rotation by securing lead screw in its vertical groove.

# Alternators

## FIAT (Cont.)



### PRESSING NEGATIVE DIODES



### BRUSH HOLDER ASSEMBLY

**Brushes** — To ensure best results, brushes should be replaced with a new brush holder as a complete assembly. Before installing holder assembly, clean all parts of grease and carbon dust, lubricate bearings with suitable grease (Fiat MR 3).

### REASSEMBLY

The alternator is reassembled by reversing the order of disassembly procedure.

## SPECIFICATIONS

| Alternator Test Data                                                | Alternator Model No. |                  |                  |
|---------------------------------------------------------------------|----------------------|------------------|------------------|
|                                                                     | A 12 M 124/12/42M    | A 12 M 124/12/47 | A 12 M 124/12/60 |
| Cut-in Speed at 12V (68°F) .....                                    | 1000 ± 50 RPM        | 1050 ± 50 RPM    | 1200 ± 50 RPM    |
| Current Output @ 14V @ Battery .....                                | 42A min.             | 47A min.         | 60A min.         |
| Max. Output Current (Approx.) .....                                 | 53 Amp.              | 58 Amp.          | 75 Amp.          |
| Max. Alternator Continuous RPM .....                                | 13,000               | 13,000           | 13,000           |
| Field Winding Resistance @ 68°F .....                               | 4.5 ± .1 Ohms        | 4.5 ± .1 Ohms    | 2.7 ± .05 Ohms   |
| Field Resistance Pin 67 and Ground<br>@ 500 RPM — Ohms @ 68°F ..... | 4.6 + .2, -.1        | 4.6 + .2, -.1    | 2.8 + .2, -.1    |
| Direction of Rotation .....                                         | Reversible           | Reversible       | Reversible       |
| Stator Winding (Single) Ohms @ 68°F .....                           | .11 ± .005           | .062 ± .003      | .28 ± .015       |
| <b>Diode Specifications</b>                                         |                      |                  |                  |
| Direct Current, Continuous (300°F) .....                            | 20 Amps. D.C.        |                  |                  |
| Direct Current, Peak (300°F) .....                                  | 25 Amps. D.C.        |                  |                  |
| Inverse Voltage .....                                               | 150V D.C. min.       |                  |                  |
| Max. Operation Temperature .....                                    | 414°F                |                  |                  |
| Voltage Drop — 25A D.C. @ 77°F .....                                | 1.2 volt max.        |                  |                  |
| Inverse Current — 25 volts D.C. @ 300°F .....                       | 2 mA                 |                  |                  |