HITACHI

Datsun 510
Datsun 521 Pickup
Datsun 520 Pickup
Datsun 240Z Sports
Subaru 1100
Subaru 1300

CHANGES, CAUTIONS & CORRECTIONS

►*BATTERY INSTALLATION, BATTERY CHARGING, OR USING A BOOSTER BATTERY TO START ENGINE 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.** Positive terminal must be connected to starter lead. *Do not reverse battery leads.*

Battery Charging – If a "Fast Charger" is used, both of the car's battery cables must be disconnected from battery. *Do not use "Fast Charger" to provide starting voltage.*

Booster Battery (Used To Start Engine) – Booster Battery must be connected with negative lead to negative terminal of battery and positive lead to positive terminal of battery. *Do not reverse battery leads.*

DESCRIPTION

Hitachi alternators are conventional three-phase, self-rectifying type alternators. Six diodes (three positive and three negative) are used to rectify current.

Application	Hitachi Part No.
Datsun	
520 (1966-67)	LT119-07
510 (1968-71)	LT130-41
521 (1969-71)	LT130-41
240Z (1970-71)	LT145-35
Subaru	
1100 (1971)	LT170-75
1300 (1971)	LT130-59

SPECIFICATIONS

At 2500 Alternator RPM

Alternator	Amps①	Volts
LT119-07	19.5	14
LT130-41	22	14
LT135-05	33	14
LT145-35	34	14
LT170-75 & 130-59	27	14

Nominal Output

Alternator	Volts	Amps
LT119-07	12	25
LT130-41	12	30
LT133-05	12	33
LT145-35	12	45
LT170-75 & 130-59	12	30

Rotation – Clockwise at drive end.

Field Coil Resistance – 4.47 Ohms measured at slip rings at normal ambient temperature.

Alternator	Min. Brush Length
LT130-41	.256" (6.5 mm)
LT133-05	.275" (7.0 mm)
LT145-35	.295" (7.5 mm)
LT170-75 & 130-59	.470" (12 mm)

Brush Spring Tension – Normal ..... .77 lb. (.35 kg.)
Minimum ..... .44 lb. (.2 kg.)

TESTING

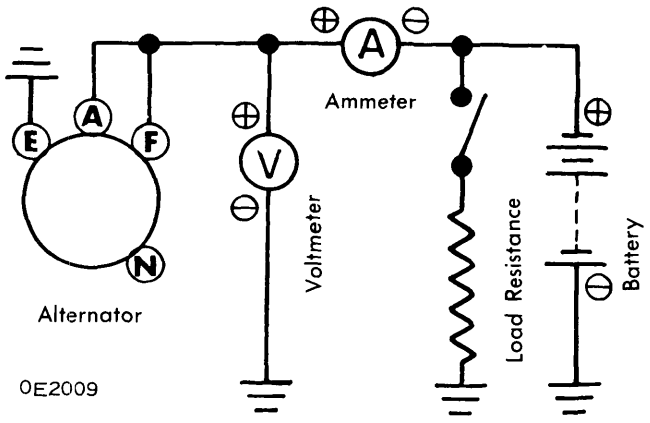
ON CAR TEST

Whenever battery is discharged and charging rate is low, following test should be performed to determine whether fault lies in alternator or regulator. First, place ammeter between "A" terminal of regulator and battery. Disconnect wire at "F" terminal of regulator and touch lead to "A" terminal of regulator. If charging current remains constant, alternator is defective. But if current increases greatly, then regulator is faulty.

ALTERNATOR OUTPUT

NOTE – Battery used for this test should be fully charged.

For output test, remove alternator from vehicle and connect wiring as shown in illustration. Drive alternator with a motor. Run alternator up to a speed where there is no reverse current flow to field coil. At this point alternator speed should be approximately 1000 RPM. Next, increase alternator RPM while at the same time increasing load resistance to prevent voltage output from becoming too high. If alternator is functioning correctly, output current should be close to specified value at specified RPM and voltage, see *specifications.*



CIRCUIT FOR ALTERNATOR OUTPUT TEST

DIODE ASSEMBLIES

Disconnect battery lead and field lead from alternator. Use a 12 volt test lamp and battery or an ohmmeter to check each diode assembly as follows:

Positive Diodes – Connect negative test probe to alternator "A" terminal or connector "A" terminal (white color) and other test probe to connector "N" terminal (yellow color). Test lamp should light or ohmmeter should show a low resistance. Now reverse connections, test lamp should not light or ohmmeter should show a high resistance.

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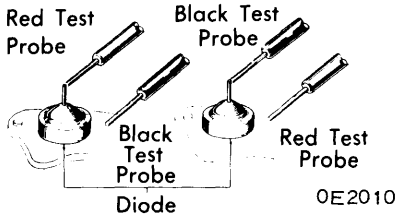
Negative Diodes – Connect negative test probe to connector "N" terminal (yellow color) and other test probe to alternator "E" terminal or connector "E" terminal (black color). Test lamp should light or ohmmeter should show a low resistance. Now reverse connections, test lamp should not light or ohmmeter should show a high resistance.

Test Conclusions – If test lamp lights or doesn't light in both directions, or if ohmmeter reading is high or low in both directions, when making above tests, one or more defective diodes is indicated. Alternator must be disassembled to test diodes individually.

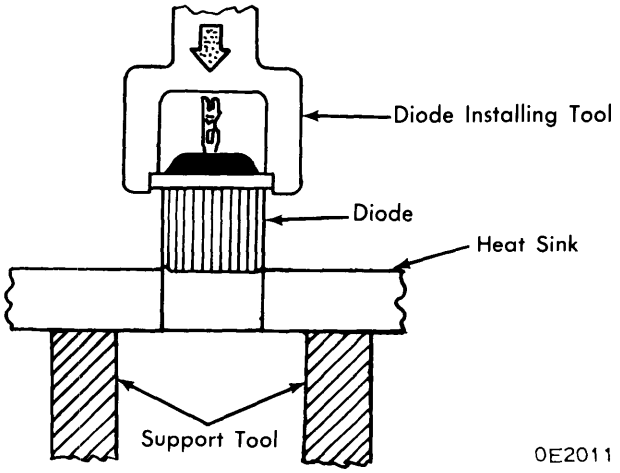


CHECKING DIODES

Brushes & Brush Spring Tension – Check movement of brush in brush holder. If movement is not smooth, clean and inspect brush holder. Replace brushes if worn to minimum brush length or less, *see specifications*. Check brush spring tension and replace springs if not as specified, *see specifications*.

PARTS REPLACEMENT

Diodes – To remove diode, use a suitable tool to support heat sink and remove diode by use of a suitable press. Press out carefully to avoid damaging mounting bore of heat sink. *CAUTION – Do not strike diode as shock may damage other diodes.* To install diode, support heat sink with a suitable tool, select correct type diode (Positive diodes have RED markings, Negative diodes have BLACK markings) and press diode into heat sink using a suitable diode installation tool which fits over outer edge of diode (see illustration). Press down diode completely into heat sink. New diode should not be removeable with a force smaller than 33 lb. (15 kg).



INSTALLING DIODES

Drive End Bearing – Remove bearing retainer by unscrewing set screws and press out bearing using a suitable press.

Rear Bearing – Remove rear bearing from housing using a suitable press or bearing puller.

REASSEMBLY

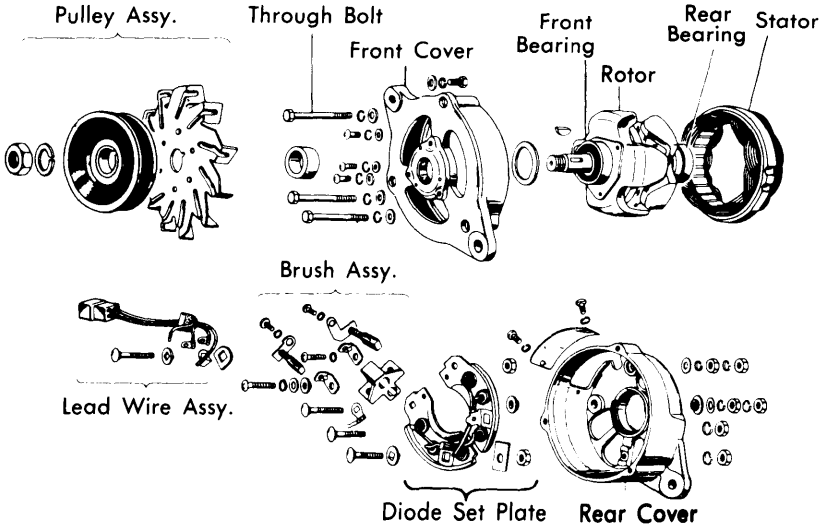
Reassemble alternator by reversing disassembly procedure. During assembly, always make sure that polarity of diodes is correct.

OVERHAUL

DISASSEMBLY

1) Unscrew and remove through bolts. Separate diode end housing from drive end housing assembly by hitting front bracket lightly with a soft mallet.

2) Place rotor shaft carefully into vice so as not to damage rotor shaft. Remove pulley nut, pulley, fan and spacer. Now, remove rotor from drive end housing assembly by lightly hitting drive end housing with a soft mallet.



HITACHI ALTERNATOR ASSEMBLY

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3) To separate stator from diode end housing assembly, melt solder from three negative diode leads and from each wire between diodes and disconnect leads. *CAUTION – If internal temperature of a diode rises over 300° F (150° C), diode will be destroyed. Therefore, use a electric solder iron of 100-200 watt capacity for approximately two seconds to safely unsolder connections.* Remove brush cover by unscrewing setscrews. Unsolder "N" terminal (yellow color) lead wire, then separate diode end housing and stator.

4) Remove heat sink and brush holder from rear cover by removing setscrews. Disassemble brush holder. Unsolder lead wire "F" (black/white), lead wire "E" (black color) and brush holder wires (negative and positive).

TESTING

Rotor – To test for open circuit, connect an ohmmeter between rotor slip rings. If ohmmeter reading is high, windings are open. A good rotor should have a resistance of approximately 4.47 ohms at normal ambient temperature. To test for grounded coils, connect an ohmmeter between either slip ring and rotor core or shaft. If ohmmeter reading is low, field windings are grounded. Check eccentricity of rotor, using a dial indicator. If eccentricity of rotor exceeds .0039 in. (.10 mm), it must be either repaired or replaced.

Stator – To test for open circuit, connect an ohmmeter successively between neutral lead wire (yellow color) and three stator leads. If ohmmeter reading is high, stator windings are open. To test for grounded coil, connect an ohmmeter from any stator lead to stator frame. If ohmmeter reading is low, windings are grounded. Repair or replace stator as necessary.

Diodes – With diodes disconnected from stator leads, check each diode with ohmmeter as follows: Connect one ohmmeter lead to diode lead and connect other ohmmeter lead to heat sink and note reading. Reverse ohmmeter leads and note reading. If both readings are very low or very high, diode is defective and must be replaced. A good diode will give one low and one high reading.