

1997 STARTING & CHARGING SYSTEMS**Generators & Regulators - Mitsubishi****DESCRIPTION & OPERATION**

The Mitsubishi generator uses 8 diodes to rectify current and 3 diodes to supply current to voltage regulator. Charging system voltage is controlled by a voltage regulator which is part of generator.

Charging system incorporates an Electric Load Detector (ELD) which measures load on the charging system. ELD sends signal to ECM which controls the voltage regulator. Adjusting voltage needs allows ECM to reduce mechanical load on engine for better fuel economy.

ADJUSTMENTS**BELT ADJUSTMENT****GENERATOR BELT TENSION SPECIFICATIONS**

Application	(1) Deflection - In. (mm)
New Belt	(2) 7/32-11/32 (6.0-9.0)
Used Belt	(3) 5/16-7/16 (8.0-11.0)

(1) Deflection is with 22 lbs. (10 kg) pressure applied midway on longest belt run.

(2) Adjust belt to specification. Run engine for 5 minutes, then readjust belt to specifications for used belt.

(3) Specification is for a used belt. Belt is considered used when it has been run for 5 minutes or more.

ON-VEHICLE TESTING**PRELIMINARY INSPECTION**

Check generator wiring harness connections and drive belt tension. Ensure battery is fully charged and has good cable connections. Check generator fuse(s) in underhood and instrument panel fuse/relay block. Replace as necessary.

CHARGE WARNING LIGHT CHECK

1. Turn ignition on. If CHARGE warning light illuminates, go to next step. If CHARGE warning light does not illuminate, check for blown fuse No. 15 (7.5-amp) in instrument panel fuse/relay block. Check for blown charging system light bulb. If fuse and light bulb are okay, repair open in White/Blue wire. See **WIRING DIAGRAMS**.
2. Start engine. If CHARGE warning light does not turn off, go to next step. If CHARGE warning light turns off, perform generator/regulator test. See **GENERATOR/REGULATOR TEST**.
3. Ensure ignition is on. Check voltage between generator 4-pin connector terminal No. 1 (Black/Yellow

wire) and ground. If battery voltage exists, go to next step. If battery voltage does not exist, repair open in Black/Yellow wire between generator and instrument panel fuse/relay block.

4. Turn ignition off. Disconnect generator 4-pin connector. Ground generator connector terminal No. 3 (White/Blue wire). Turn ignition on. If CHARGE warning light illuminates, go to next step. If CHARGE warning light does not illuminate, repair open in White/Blue wire between CHARGE warning light and instrument panel fuse/relay block.
5. Remove ground from generator connector terminal No. 3 (White/Blue wire). If CHARGE warning light turns off, test and repair generator components. If CHARGE warning light is still illuminated, repair short to ground in White/Blue wire. See **WIRING DIAGRAMS** .

GENERATOR CONTROL SYSTEM TEST

NOTE: **Ensure DTC P1297 for Electrical Load Detector (ELD) system does not exist. Diagnose DTC first, if present. See G - TESTS W/CODES article in the ENGINE PERFORMANCE section.**

1. Turn ignition off. Disconnect generator harness connector. Start engine and turn on headlights (high beam). Check voltage between generator harness connector terminal No. 2 (White/Green wire) and battery positive terminal. If voltage reading is one volt or less, go to next step. If voltage reading is greater than one volt, go to step 3).
2. Turn ignition and headlights off. Disconnect ECM 32-pin connector. Check continuity of White/Green wire between ECM harness connector terminal No. 19 and generator harness connector terminal No. 2. If continuity exists, perform generator/regulator test. See **GENERATOR/REGULATOR TEST** . If continuity does not exist, repair open in White/Green wire between generator and ECM.
3. Turn ignition and headlights off. Disconnect ECM 32-pin connector. Check continuity between ECM harness connector terminal No. 19 (White/Green wire) and body ground. If continuity does not exist, replace ECM with a known-good unit and repeat step 1). If continuity exists, repair short in White/Green wire between generator and ECM.

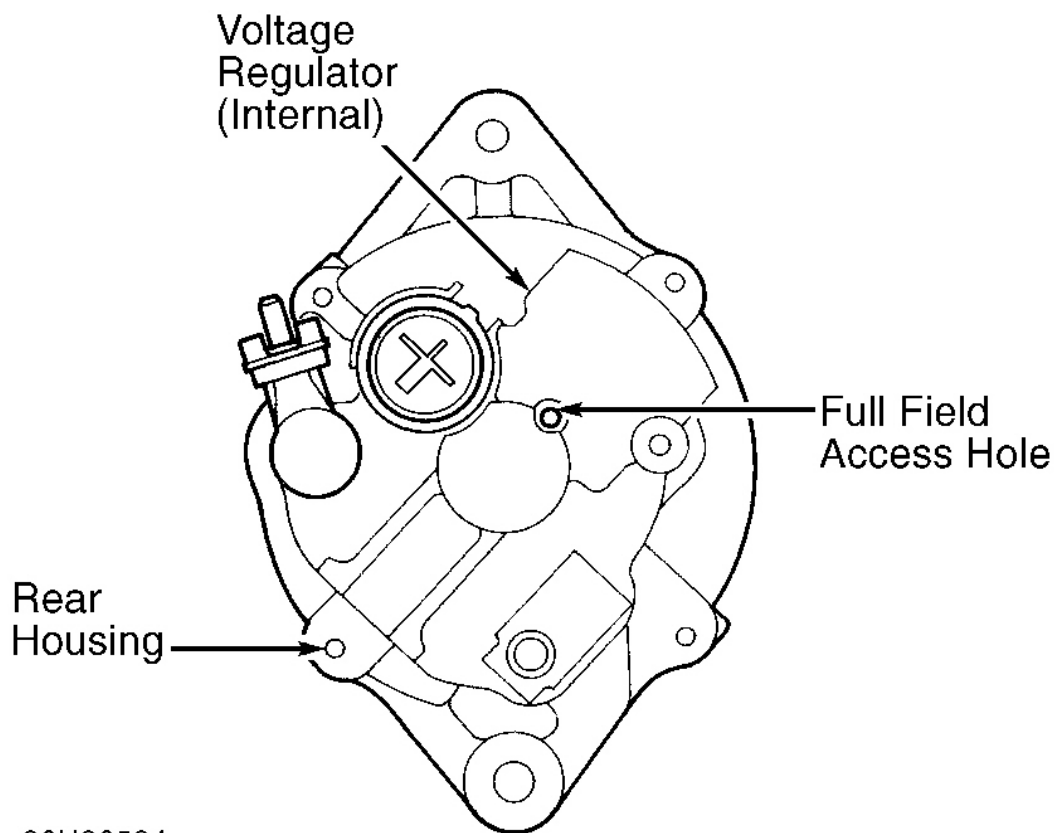
GENERATOR/REGULATOR TEST

NOTE: **Ensure battery is fully charged before testing generator output.**

1. Connect Generator Tester (Sun VAT-40). Set tester selector switch to position No. 1 (starting). Place transmission in Park (A/T) or Neutral (M/T). Ensure all accessories are off. Start engine. Operate engine at 3000 RPM until cooling fan comes on, then return to idle. Raise and hold engine speed to 2000 RPM. Check voltage reading on tester. If voltage reading is greater than 15.1 volts, replace voltage regulator. If voltage reading is 15.1 volts or less, go to next step.
2. Let engine idle. Ensure all accessories are off. Turn tester selector switch to position No. 2 (charging). Remove tester's inductive pick-up and zero the ammeter. Place inductive pick-up on battery ground cable with arrow pointing towards battery negative terminal. Raise and hold engine speed to 2000 RPM. If voltage reading is less than 13.5 volts, test and repair generator components. If voltage reading is 13.5 volts or greater, go to next step.
3. Apply load using generator tester until battery voltage drops between 12-13.5 volts. Check amperage reading on tester. If reading is 50 amps or greater, charging system is okay. If reading is less than 50

amps, go to next step.

- Maintain engine speed at 2000 RPM. Full field generator. See **Fig. 1** . If generator output is 50 amps or greater, replace voltage regulator. If generator output is less than 50 amps, test and repair generator components.



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Fig. 1: Identifying Full Field Access Hole
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

BENCH TESTING

BRUSHES

Remove brush holder from generator, and measure brush length. See **Fig. 2** . See **BRUSH LENGTH SPECIFICATIONS** table. If brush length is not as specified, replace brushes.

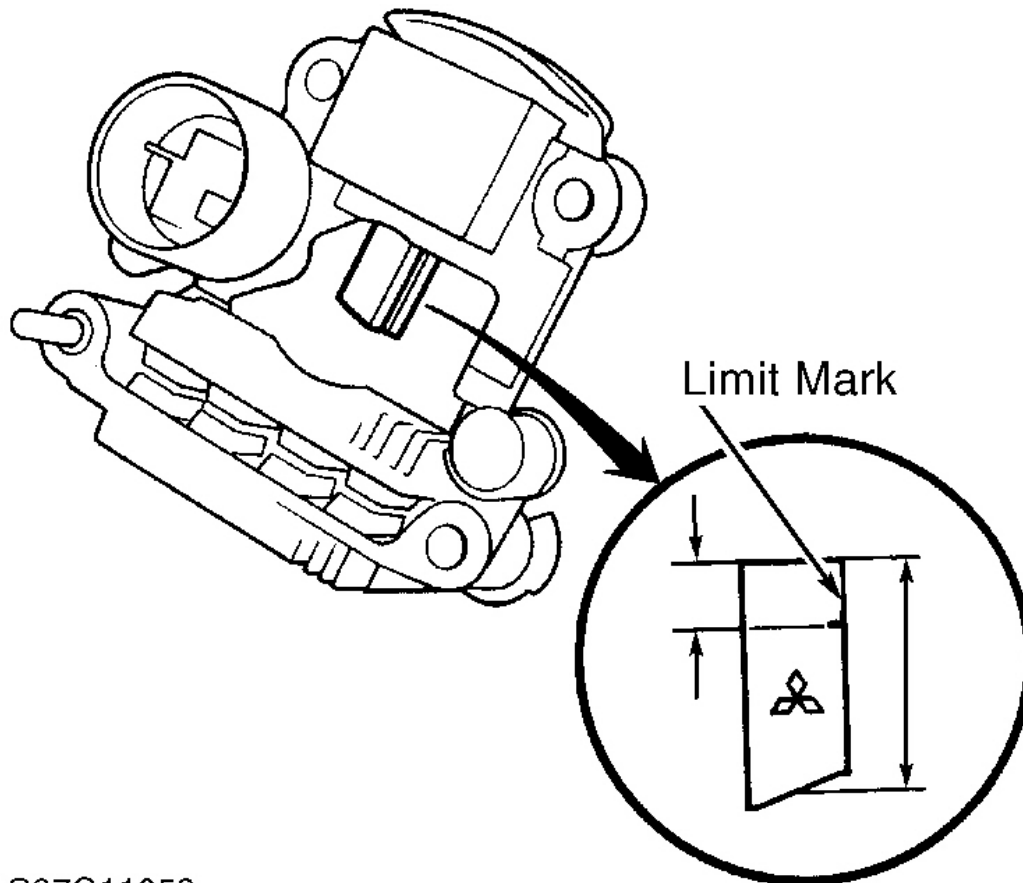
BRUSH LENGTH SPECIFICATIONS

Application	In. (mm)
Standard	.75 (19)

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Limit

.20 (5)

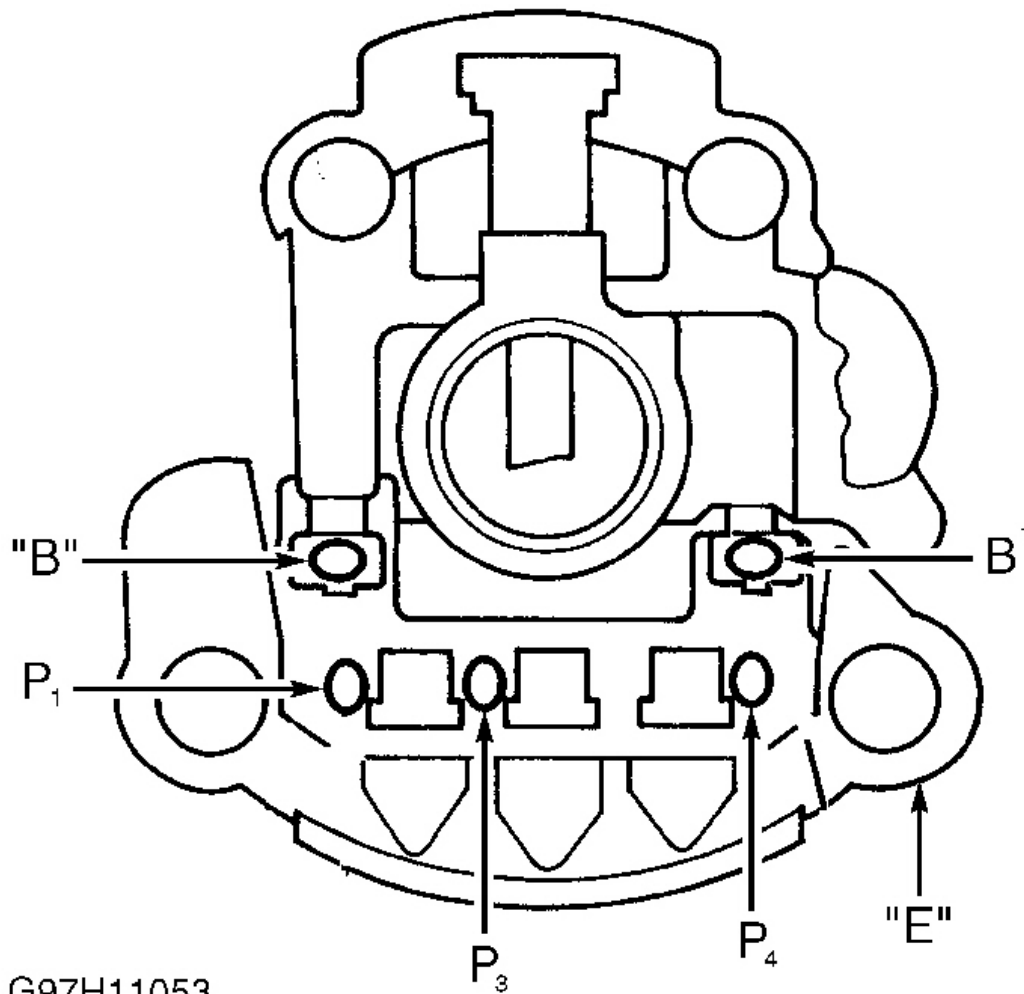


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Fig. 2: Measuring Generator Brush Length (Typical)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DIODE/RECTIFIER ASSEMBLY

1. Remove diode (rectifier) assembly from generator. Check continuity of each diode in both directions by reversing test probes between diode terminals. See **Fig. 3** . Perform continuity checks between terminal "B" and each "P" terminal, terminal "B(1)" and each "P" terminal, and terminal "E" and each "P" terminal.
2. All diodes should show continuity in one direction and no continuity in the opposite direction. If any diode does not test as specified, replace diode (rectifier) assembly.



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Fig. 3: Testing Diode (Rectifier) Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ROTOR

Using an ohmmeter, ensure continuity exists between rotor slip rings. See **Fig. 4**. If continuity does not exist, replace generator. Ensure continuity does not exist between slip rings and rotor, or between slip rings and rotor shaft. If continuity exists, replace generator.

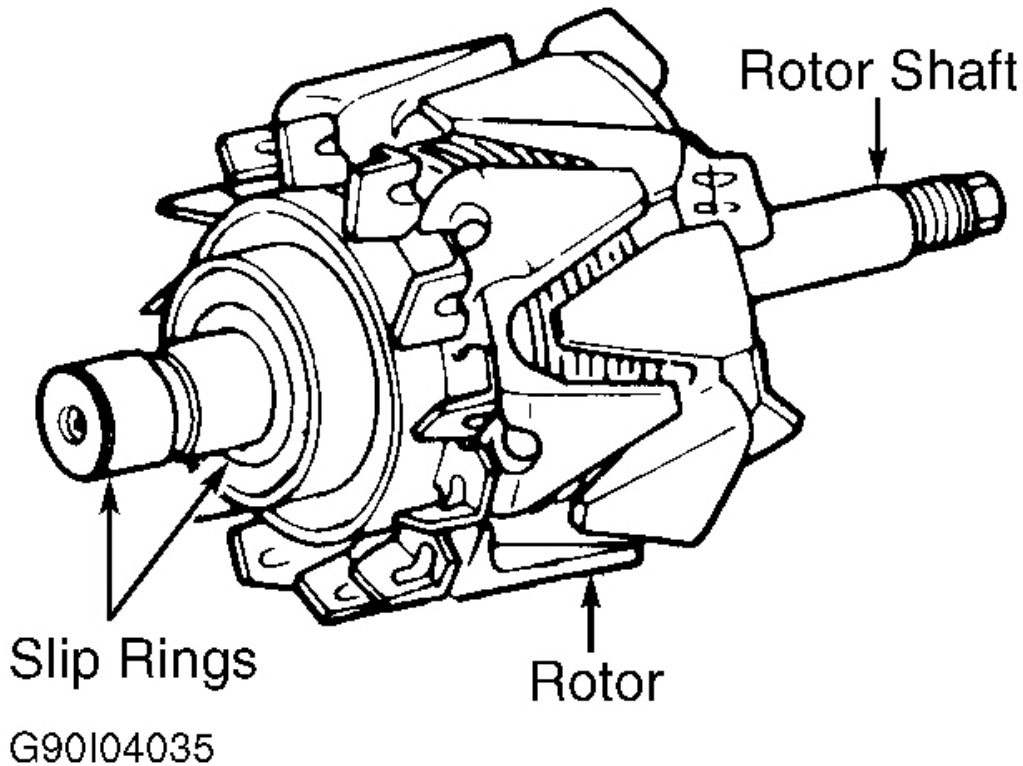


Fig. 4: Testing Rotor

Courtesy of AMERICAN HONDA MOTOR CO., INC.

STATOR

Ensure continuity exists between each pair of leads on stator winding. If continuity does not exist, replace generator. Ensure continuity does not exist between each stator winding lead and coil core. If continuity exists, replace generator.

TROUBLE SHOOTING

NOTE: See **TROUBLE SHOOTING - BASIC PROCEDURES** article in the **GENERAL TROUBLE SHOOTING** section.

REMOVAL & INSTALLATION

GENERATOR

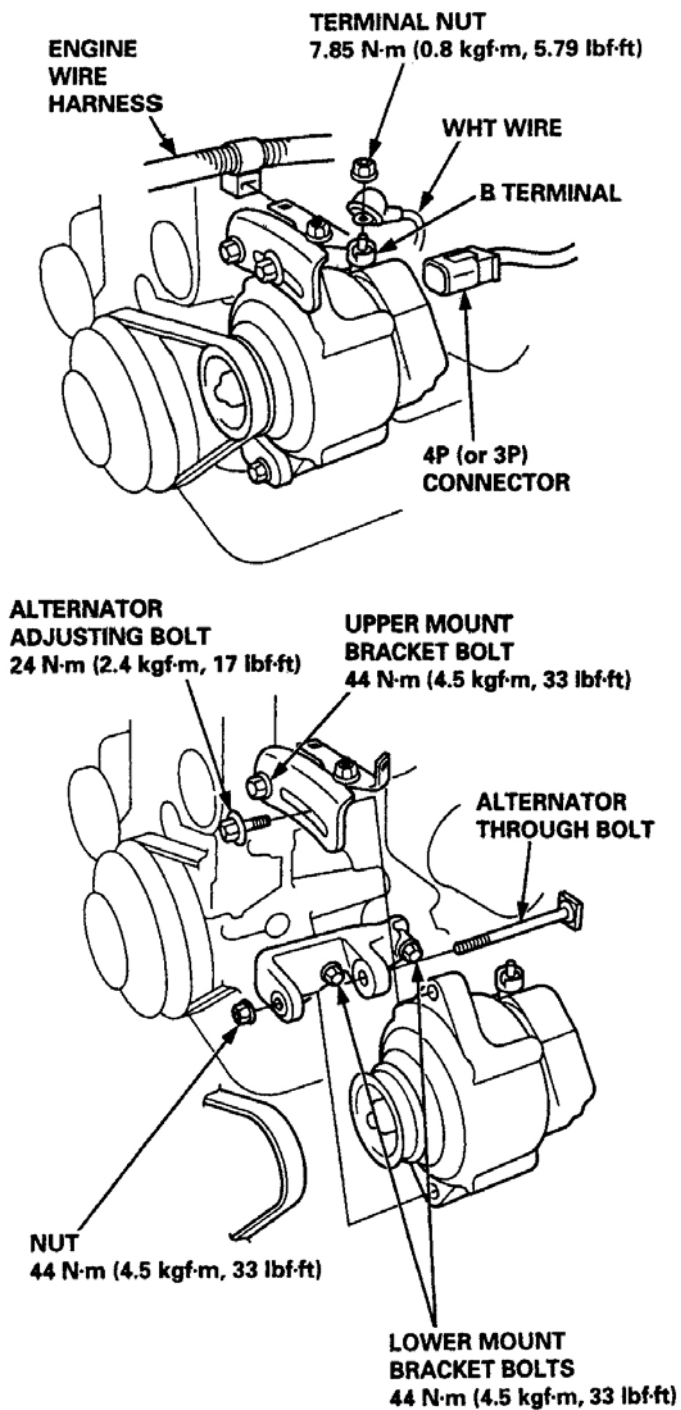


NOTE: Remove generator from below vehicle.

1. Disconnect negative battery cable. Disconnect positive battery cable. Disconnect 4P (or 3P) connector. See **Fig. 5** . Remove terminal nut and White wire from "B" terminal.
2. Remove generator adjusting bolt and through-bolt nut. Remove generator belt.
3. Remove generator through-bolt. Remove generator. If necessary, remove mount bracket bolts, then remove upper and lower mount brackets.
4. To install, reverse removal procedure. Adjust generator belt deflection to .31-.41 (8.0-10.5 mm) with 22 Lbs. (10 kg) pressure applied midway between generator pulley and crankshaft pulley.

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Fig. 5: Removing & Installing Generator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

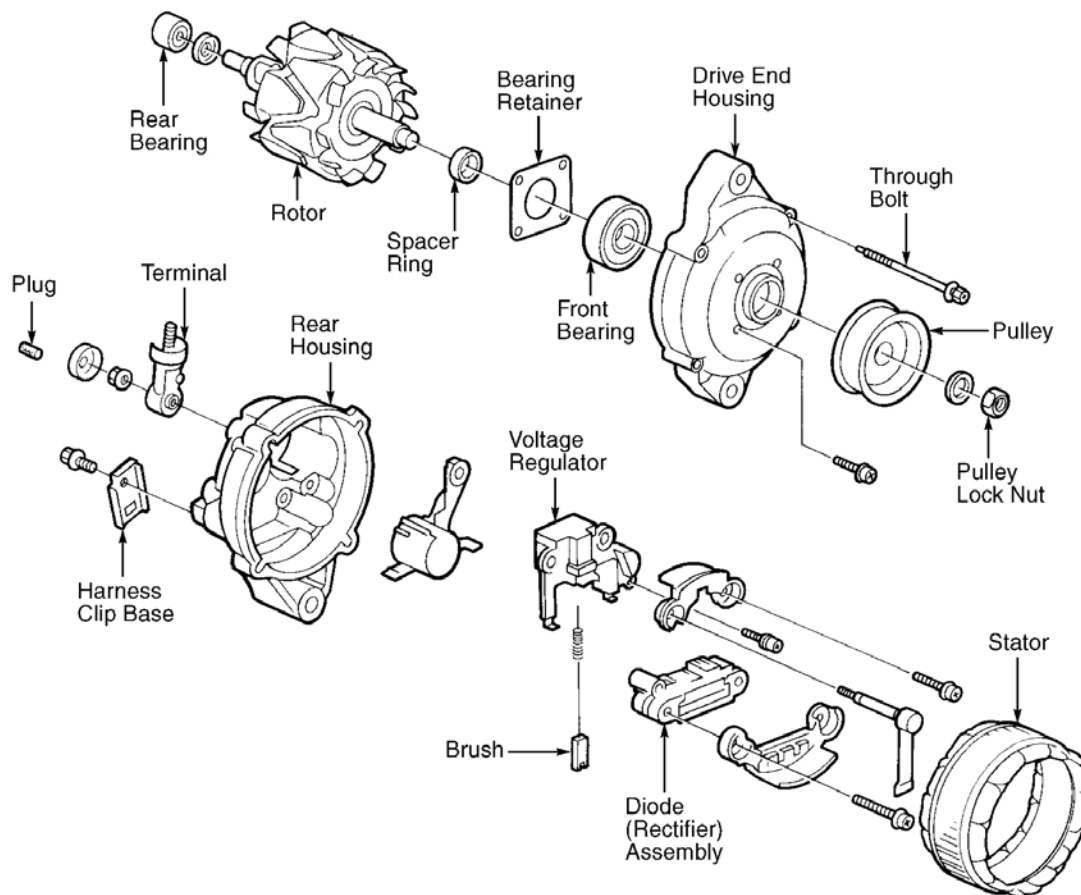
OVERHAUL



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NOTE: Use illustration for exploded view of generator. See Fig. 6 .



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Fig. 6: Exploded View Of Mitsubishi Generator
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Adjusting Bolt	17 (24)
Mounting Bolt Nut	33 (44)
Pulley Lock Nut	81 (110)

WIRING DIAGRAMS



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Fig. 7: Charging System Wiring Diagram



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ALTERNATOR & REGULATOR - MITSUBISHI

Fig. 7: Charging System Wiring Diagram

