

Alternators & Regulators

NIPPONDENSO ALTERNATORS

Honda Accord, Civic, Prelude; Toyota Celica, Corolla, Cressida, Land Cruiser, Pickup, Starlet, Supra, Tercel

DESCRIPTION

Nippondenso alternators are conventional 3-phase alternators utilizing 6 diodes (3 positive and 3 negative) to rectify current. Charge control may be by either Integrated Circuit (IC) or conventional, externally-mounted, contact point type regulators.

TESTING

NOTE: Also see Nippondenso Regulators in this section.

TOYOTA ON-VEHICLE TESTS

Preliminary Inspection

Check alternator mounting and drive belt tension. Inspect turn signal and gauge fuses. Check alternator and regulator wire connections for tightness. Battery must be fully charged prior to beginning test.

No Load Test

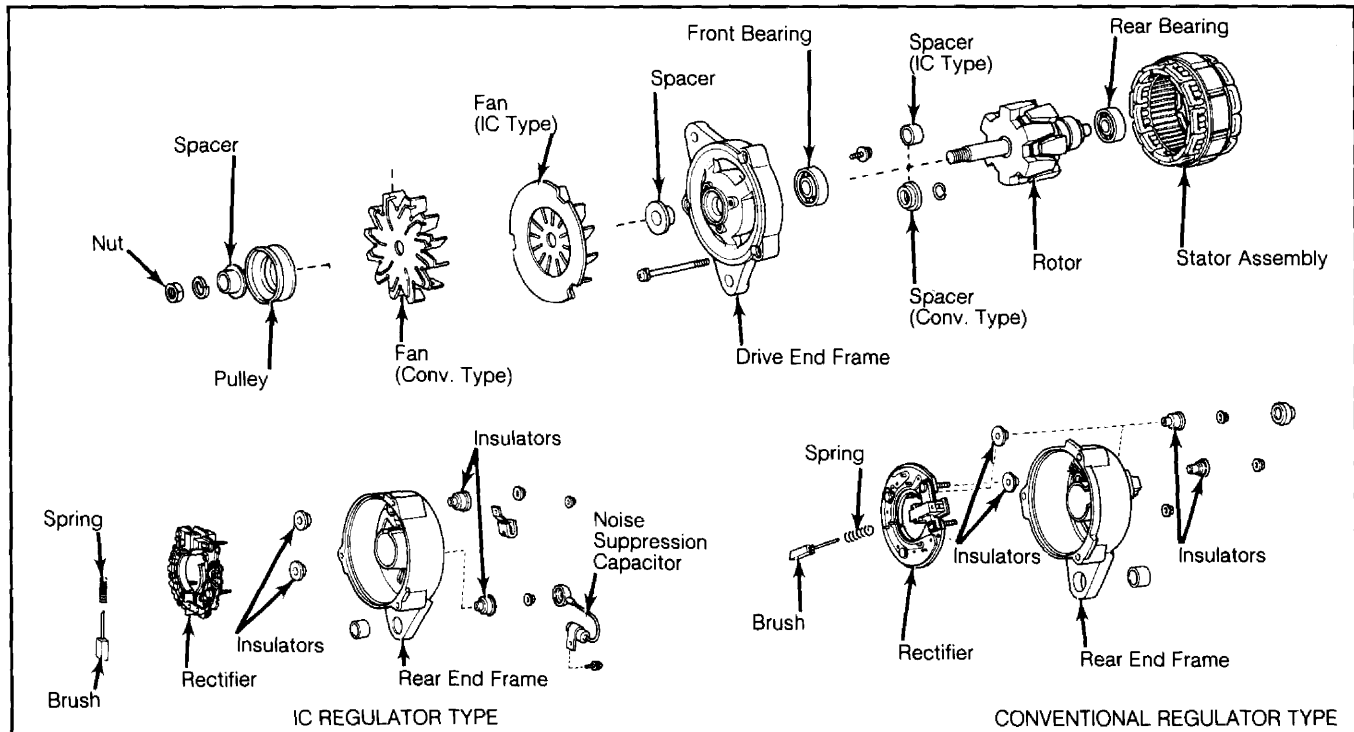
1) If a battery/alternator tester is available, connect tester to charging circuit, according to tester manufacturer's instructions. If tester is not available, connect a voltmeter and ammeter to charging circuit. See Fig. 2.

APPLICATION

Model	Amps.	1 Part No.
Honda		
Accord	60	31100-PC1-004
Civic	45	31100-PA6-014
Prelude	50	31100-PA6-901
Toyota		
Celica	55	27060-35040
	60	27020-35020
	65	27060-43030
Corolla	50	27020-26102
	55	27060-28030
Corona	55	27060-28030
	60	27060-35020
Cressida	65	27060-43030
Land Cruiser	40	27020-61100
	55	27020-61071
Pickup		
Diesel	55	27020-54080
Gas		
Conventional	40	27020-35040
IC Type	40	27020-35050
Starlet		
Conventional	45	27020-13130
IC Type	45	27060-13011
Supra	65	27060-43030
Tercel		
Conventional	50	27020-15040
IC Type	55	27060-15011

1 — Vehicle manufacturer's part number.

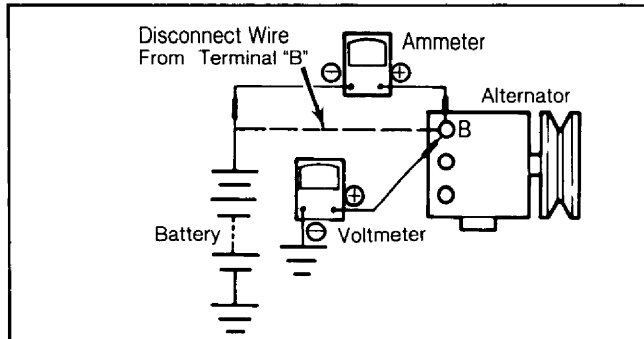
Fig. 1: Exploded View of Nippondenso Alternator for Toyota Pickup



Most Honda and Toyota alternators are similar. Some have integral IC regulators, others have remote regulators.

NIPPONDENSO ALTERNATORS (Cont.)

Fig. 2: Meter Hookups for Toyota No Load Test



When connecting voltmeter and ammeter, use care not to cause a shorted condition.

2) Disconnect wire from terminal "B" of alternator. Connect wire to negative terminal of ammeter. Connect test lead from positive terminal of ammeter to terminal "B" of alternator. Connect positive lead of voltmeter to terminal "B" of alternator. Connect voltmeter negative lead to ground.

3) Check amperage and voltage with engine running at 2000 RPM. On models with external voltage regulators, voltage should be 13.8-14.8 volts.

4) On models with IC type voltage regulators, voltage should be 14.0-14.7 volts on Corona, Land Cruiser and Pickups with gasoline engines. On all other Toyota models, voltage should be 13.8-14.4 volts. On all models, current draw should be less than 10 amps.

5) For further testing procedures for Celica and Tercel, proceed to step 6). To further test Corona models with integral IC regulator and Toyota Pickup models, proceed to Terminal "F" Voltage Test.

6) If voltage reading in step 4) was above the specified range, replace IC regulator. If voltage reading was less than specified range, run engine at 2000 RPM. Connect terminal "F" to ground.

7) If voltage reading now climbs to within specified range, replace IC regulator. If reading remains below specified range, replace alternator.

Terminal "F" Voltage Test

1) If voltage reading was above specified range in step 4) of No Load Test, replace IC regulator. If voltage reading is less than specified range, turn off engine. Disconnect connector from IC regulator. Turn ignition switch "ON".

2) Check voltage at the Red wire terminal (terminal "IG"). If there is no voltage, check engine fuse and/or ignition switch. Attach connector to voltage regulator. Check voltage at terminal "L" (Yellow wire).

3) If voltage is 1-2 volts, check alternator. If battery voltage, turn ignition switch "OFF" and disconnect connector from alternator. Check for continuity between alternator terminals "L" and "F". If there is continuity, replace IC regulator. If there is no continuity, check alternator.

Load Test

1) Start engine and turn headlights on high beam and heater control on "HI". Run engine at 2000 RPM and check amperage. On Celica, Corona, Land Cruiser and Tercel models, ammeter should read more than 30 amps.

2) On Toyota Pickup and Starlet models, reading should be more than 20 amps. If reading is less, repair alternator.

NOTE: If reading is low due to a fully charged battery, it may be necessary to crank engine with coil disconnected for about 15 seconds to discharge battery.

HONDA ON-VEHICLE TESTS

Preliminary Inspection

Check alternator mounting and drive belt tension. Inspect turn signal and gauge fuses. Check alternator and regulator wire connections for tightness. Battery must be fully charged prior to beginning test.

Alternator Output Test

1) With engine off, disconnect wire from alternator terminal "B". See Fig. 2. Connect ammeter positive lead to terminal "B", and negative lead to wire just removed.

NOTE: On Civic and Prelude models, by-pass voltage regulator by disconnecting its connector. Connect jumper wire from battery positive terminal to Red/White wire at connector.

2) Start engine. Turn on bright beam of headlights, rear window defroster, and turn heater fan switch to highest setting.

3) Check alternator output. Ammeter should show approximately 60 amps for Accord, 45 for Civic, and 50 for Prelude. Check alternator if not to specifications.

OVERHAUL

DISASSEMBLY

NOTE: Alternators differ slightly with model application. The following procedures are only general in nature. The procedures can be used if attention is paid to the order of parts during disassembly.

1) Remove retaining screws and pry drive end frame from stator with screwdriver. If necessary, tap lightly on drive end frame with mallet.

2) Secure rotor core in padded vise, and remove pulley attaching nut. Remove pulley, fan and spacer. Press rotor from drive end frame. Remove bearing retainer from end frame. Remove bearing, felt cover and felt ring.

3) Remove rectifier holder securing nuts and brush holder attaching screws. Separate stator with rectifier holders and brush holders from rectifier end frame.

4) Remove brush lead terminal and stator coil "N" terminal from brush holder using a small screwdriver. When removing brush holder assembly, DO NOT cut "N" terminal lead or melt the solder.

TESTING

NOTE: Also see General Servicing in this section.

Rotor

1) Check the rotor for open field windings by using an ohmmeter across the slip rings. Coil resistance should be 3.9-4.1 ohms for external regulator models, and 2.8-3.0 ohms for IC regulator models.

2) Check smoothness of slip rings. Check bearing and replace if necessary.

Alternators & Regulators

NIPPONDENSO ALTERNATORS (Cont.)

Stator

1) Use ohmmeter to check stator coil for ground. To check for open circuit, stator leads must be disconnected from diode leads. To disconnect leads from diodes, unsolder as quickly as possible with a low watt iron.

2) Check 4 leads of stator coil for continuity between each lead. If no continuity or if resistance is noted, stator coil must be replaced.

Diode Test

1) With diode assembly on bench, contact diode plate with one probe and each of 3 diode leads with other probe. Note ohmmeter reading. Reverse probes and repeat test. Check both positive and negative diodes in this manner.

2) All diodes should show a low reading in one direction and NO reading in the opposite direction. If any rectifier (diode) is defective, replace holder assembly.

PARTS REPLACEMENT

Brushes

1) Check for cracks and minimum length of .22" (5.5 mm). If damaged or worn beyond limit, replace brushes. Brushes should slide smoothly in holders. Install new springs when replacing brushes. Solder brush wire.

2) New brush protrusion should be .650" (16.5 mm) for Celica, Supra and Tercel; .630" (26 mm) for Cressida; .650" (16.5 mm) for Corona; .787" (20 mm) for Pickup Diesel; .610" (15.5 mm) for Honda, and .492" (2.5 mm) for all other models.

REASSEMBLY

1) Press brushes into holder against spring tension. To prevent brushes from falling, insert a retaining wire through access hole in rectifier and frame and into brush holder. Remove wire after assembly to end frame is completed.

2) Pack multipurpose grease into rear bearing. Press bearing onto rotor shaft. Pack drive end bearing with grease, and install in drive end frame. Install felt ring, cover and bearing retainer.

3) Ensure that drive end frame with rotor and rectifier end frame with stator are assembled in original alignment. Tighten body screws and remove brush retaining wire.