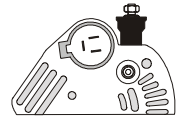


TECH BASICS 11

HONDA / TOYOTA CHARGING SYSTEMS



HONDA / TOYOTA - INTERNAL FAN ALTERNATORS - CHARGING DIAGNOSTICS

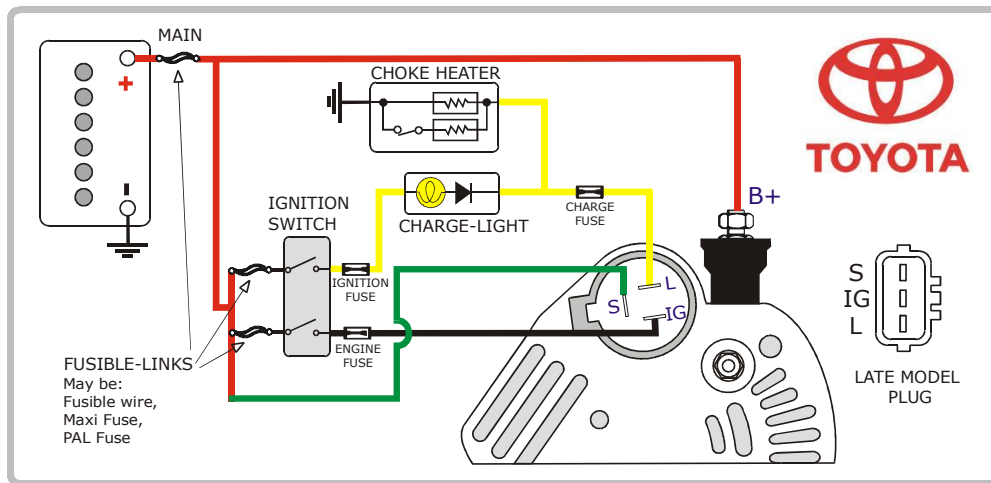


Figure 1 -- Typical Toyota Charging System

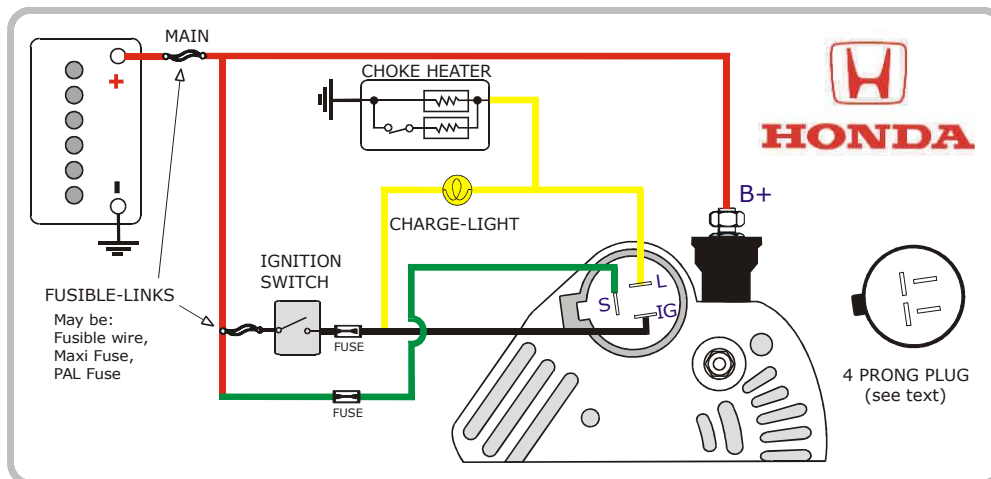


Figure 2 -- Typical Honda Charging System



Nippondenso Internal Fan alternators have been used on Hondas and Toyotas since the mid-eighties. Although there are many different mounting and pulley configurations, these alternators are virtually the same inside.

The round socket on the back of the alternator has three terminals. These are:

S - sense: The voltage regulator uses the *S* terminal to sense the battery voltage. It always has power whether Key-On or Key-Off

IG - ignition: The *IG* terminal goes on and off with the ignition switch. It is the power input for the alternator. The alternator will not charge without power to the *IG* terminal.

L - light: This terminal has several functions.

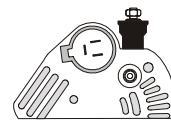
- It turns on the charge-indicator light when the key is in the “run” position. It supplies a path to ground for the charge-indicator light, making the bulb glow.

- After starting the engine, on carbureted cars, the *L* terminal becomes an output. It supplies power to the electric choke and creates the same voltage on both sides of the charge-indicator light. No electricity can flow through the filament and the bulb goes out.

- After starting the engine on fuel-injected cars, the *L* terminal simply goes “open”. Since the path to ground is gone the charge-indicator light turns off.

Quick test procedure

1. If carbureted, unplug the electric choke.
2. Remove the plug from the alternator.
3. Turn ignition key to “run” position. (engine off)
4. Use a test-light to test all three terminals in the car’s harness plug. **NOT THE TERMINALS ON THE ALTERNATOR!**
5. Use chart in **Figure 3** to troubleshoot.



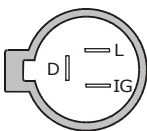
NO POWER TO	Check for HONDA	Check for TOYOTA
S	Main fusible link. Fuse in the "S" circuit	Main fusible link
IG	Main fusible link. Secondary fusible link. Fuse in the "IG" circuit	Main fusible link. Secondary fusible link. Fuse in the "IG" circuit (labeled "Engine")
L	Main fusible link. Secondary fusible link. Fuse in the "IG" circuit Bad charge-indicator bulb.	Main fusible link. Secondary fusible link. Fuse in the "L" circuit. (labeled "Ignition") Fuse in the "L" circuit. (labeled "Charge") Bad charge-indicator bulb
B+ STUD	Main fusible link	Main fusible link

Figure 3 -- Troubleshooting Chart

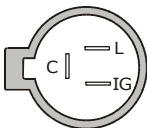
HONDA VARIATIONS

Honda has several variations of this charging system.

- **3 terminals with D terminal** - Some Civics have only **IG** and **L** terminals. The third is a **D** (dummy) terminal and is not connected to anything. Use the **Quick Test Procedure** to test only the **IG** and **L**.



- **3 terminals with C terminal** - Some Civics (1984-87 HF models) have a regulator where the **S** terminal has been replaced by a **C** terminal. This **C** terminal is used to vary alternator output.



The **C** terminal is controlled by a second computer mounted under the dash, near the fuse panel. To increase fuel economy, the computer will lower the charging voltage to as low as 12.5 volts.

If you get one of these Civic HF models in your shop, have an assistant step on the brake pedal while you test the charging system. The computer will sense the power draw from the brake lights and turn the voltage setting back up to 14.5 volts. The charging system will now test like any other. Read the **C terminal tips** at the end of this

section. Use the **Quick Test Procedure** to test only the **IG** and **L**.

- **4 terminals with S or C or D terminal** - Some Hondas have 4 terminals on the alternator. These terminals are:



FR - no testing is required.

L - test with **Quick Test Procedure**.

IG - test with **Quick Test Procedure**.

The fourth terminal can be **S**, **C** or **D**.

S - test with **Quick Test Procedure**.

D - this is a dummy terminal. No testing of **D** is required.

C - see the section on **C terminal tips**.

C-terminal Tips

The car's computer uses the **C** terminal to control the charging voltage. When the computer wants to reduce the load of the alternator on the engine, it grounds the **C** terminal. This drops the voltage regulator setting to about 12.5 volts. When the computer senses the need for more charging, it removes the **C** terminal from ground, and the voltage regulator goes back to 14.5 volts.

The main point to remember when checking for a charging problem is: **If the wire between the C terminal and the computer is grounded anywhere, the alternator will always test "bad"**. Look for wiring harness rub-through or pinched wires.

IMPORTANT: All references to terminals in this article assume that you are looking at the alternator socket. If you are looking at the plug on the car, the terminal positions will be a "mirror image" of the drawings!

Common wire colors	HONDA	TOYOTA
S	White/Green	White
IG	Black/Yellow	Black/Yellow
L	Yellow	Yellow
B+ STUD	White	White

This Tech Basics guide was written by Wesley S. Grueninger. Wes has been in the rebuilding industry since 1975, the year he started Auto Lab. Auto Lab specializes in remanufacturing import alternators and starters in addition to stocking a full line of domestic units. Many hours of research have gone into the Tech Basics series and we want to hear from you if you have any suggestions or comments.

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