

## Tech Note

# WHAT'S GOING ON WITH DENSO HAIR-PIN VOLTAGE REGULATORS?

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In spite of its relatively small footprint, the Denso 126600-series regulator carries some high-powered and unique operational features.

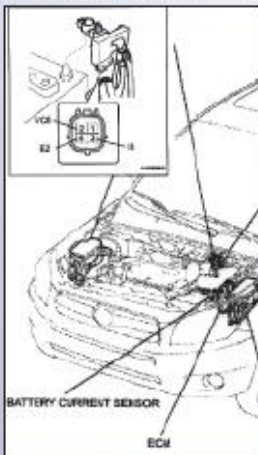
### What makes this Denso Hair-Pin Regulator Unique?

The RLO function is very similar to the RC control function found in the PCM controlled Ford 6G system, (i.e. F601HD), and GM RVC system, (i.e. D3587), etc.

When the ECM takes command of the regulator, via input to the RLO circuit, the alternator Voltage follows the PWM signal duty cycle; it ranges between 11.80 Volts and 14.99 Volts, as needed.

However, without inputs from the vehicle ECM, this RAV4 'RLO' regulator will operate like a normal M(FR)-IG-L regulator, having lamp functions and integral Voltage control. This is an Ignition turn-on regulator.

### Battery Temperature and Current Sensors Rule



When it comes to the RAV4 RLO charging system (2.4L or 3.5L, alike) the main inputs to the ECM for determining desired Voltage set points come from the Battery Temperature Sensor and the Battery Current Sensor.

When trouble shooting a charging system problem on RAV4 having the RLO unit, failure to check the operational status of the Battery Temperature Sensor and the Battery Current Sensor could possibly lead to an incorrect diagnosis.

### Multi-Step Temperature Compensation

Another unique feature of some Denso hair-pin regulators is their temperature compensation table. It is not the normal curve that we have become accustomed to, it has a multi-step TempCo that can be flat at temperature extremes but plot a conventional curve for the 'in-between' temperature ranges.

### Variable Load Response Control

The LRC ranges of Denso hair-pin regulators differ according to vehicle application. Some regulators have a medium delay, some have a long delay.

Most delays are full range, meaning they are functional immediately following soft-start and remain functional throughout maximum rotor RPM. Others have an LRC that drops off once medium rotor speed is reached.



The photo's depict the RAV4 unit having a terminal callout IG-RLO-L-M. Inside you may find a regulator marked GC2M 3020; (this equates to OE Denso regulator number 126600-3020).

## New! IN6302

### REGULATOR FOR DENSO ON RAV4

Replaces: 3020, 126600-3020

Units: 104210-4790;

Toyota 27060-28300

Lester: 11201, PIC 290-5281

Fits: 2006-08 Toyota RAV4, 2.4L

- B-Circuit, Volt Set 14.5V
- IG-RLO-L-M Terminals
- Ignition Activated • Full-Range LRC
- Multi-Step TempCo (unless in RLO mode)
- Transpo Exclusive 'Compliance Plus' Circuit Design

