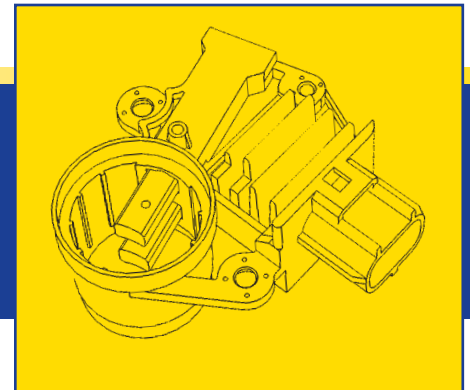




## WAI-Transpo Product Introduction

### Voltage Regulator for Ford F601HD



### Super Duty Regulator for Ford 6G PCM Controlled Alternators



<b>Basic Features:</b>	<ul style="list-style-type: none"> <li>• A-Circuit, Low Side Drive Regulator</li> <li>• Vset 14.03, Primary / Default Set Point</li> <li>• Computer and Stator Activated</li> <li>• Regulation Controlled by Vehicle PCM</li> </ul>	<ul style="list-style-type: none"> <li>• Shorted Field Circuit Protected</li> <li>• Thermal Load Protected</li> <li>• AS-RC-LI Terminal Functions</li> <li>• Field Rating 8-Amps</li> </ul>
<b>OE Regulator Ref. :</b>	<ul style="list-style-type: none"> <li>• VP4F1U-10C359-AA</li> <li>• VP4L3U-10C359-AA</li> <li>• XW4U-10C359-AB</li> </ul>	
<b>OE Alternator Ref. :</b>	<ul style="list-style-type: none"> <li>• 1L8U-10300-AB, -AC</li> <li>• 1L8Z-10346-AB</li> <li>• 1S41-10300-BB</li> <li>• 2F1U-10300-DA</li> <li>• 2F1Z-10346-DA</li> <li>• 3W1U-10300-BB</li> <li>• 3W1Z-10346-BA</li> <li>• 4L3Z-10346-BA</li> </ul>	<ul style="list-style-type: none"> <li>• 98AB-10300-EB, -FC</li> <li>• 98AZ-10346-EA, -FA</li> <li>• XF2U-10300-AB, -BC, -BD</li> <li>• XF2Z-10346-AA, -BA</li> <li>• XR8U-10300-AE, -AF, -CE</li> <li>• XR8Z-10346-AA, -CE</li> <li>• XW4U-10300-AA, -BA, -BB, -CC, -CD, -CE</li> <li>• XW4Z-10346-AA, -BA, -CC</li> </ul>
<b>Lester Unit Ref. :</b>	7788, 8253, 8255, 8256, 8260, 8261, 8268, 8315	
<b>Note :</b>	F601HD replaces both OE white w/ blue cover and OE white w/ black cover regulators	

**Time to Rediscover F601HD**

# Voltage Regulator for Ford F601HD

**Problem Solved ... As Promised!**

Continuous improvement, fine tuning and American ingenuity brings you the F601HD. The only aftermarket PCM controlled regulator that equals and surpasses OEM performance; (all at an economical, margin improving price)

## Exceptionally Robust Design

- Sophisticated micro based circuitry
- Shorted field circuit protection
- Extreme load dump protection
- T-Reg Thermal Protection\*
- Stator excite, default run mode
  - alternator functions 1-wire without external input

## Premium Materials Throughout

- High-Temp Housing
- Extended Life Brushes
- Thermally Conductive Adhesives
- Premium Dielectric and Potting Compounds

## Improved No-Load thru Full-Load Regulation Stability

- Variation - OE: 0.4V
- Variation - F601HD: 0.1V

## Exceptionally Cool Circuit Operation with High Amp 40A MOSFET Field Device

- V<sub>sat</sub> - OE: 1.08V
- Power dissipation (10A Load) - OE: 10.80 Watts
- V<sub>sat</sub> - F601HD: 0.18V
- Power dissipation (10A Load) - F601HD: 1.80 Watts

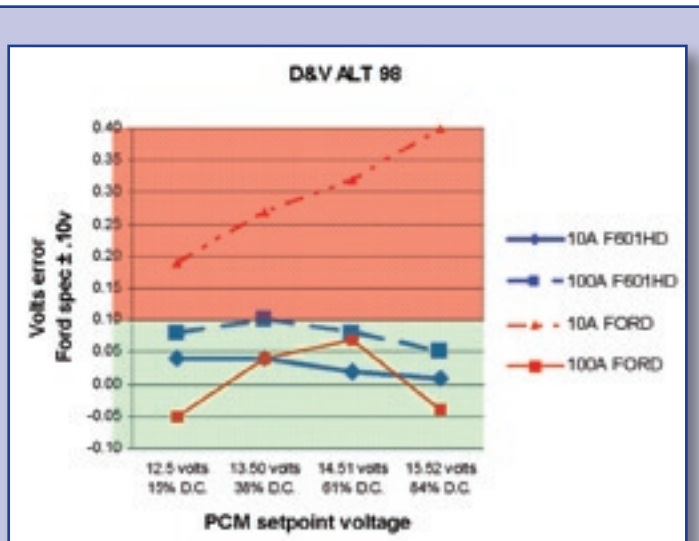
## Improved Low-RPM thru High-RPM Regulation Stability

- Variation - OE: 0.34V
- Variation - F601HD: 0.19V

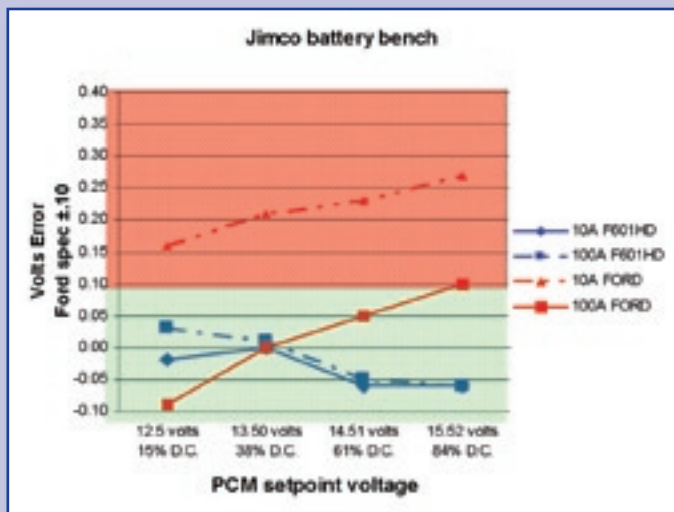
## Consistent Reliability

- Quality Controlled Materials, Processes, Production
- Computerized In-Process and Post Production Testing
- OE Compliant PPAP Documentation
- Alt98 Bench Test Compatible

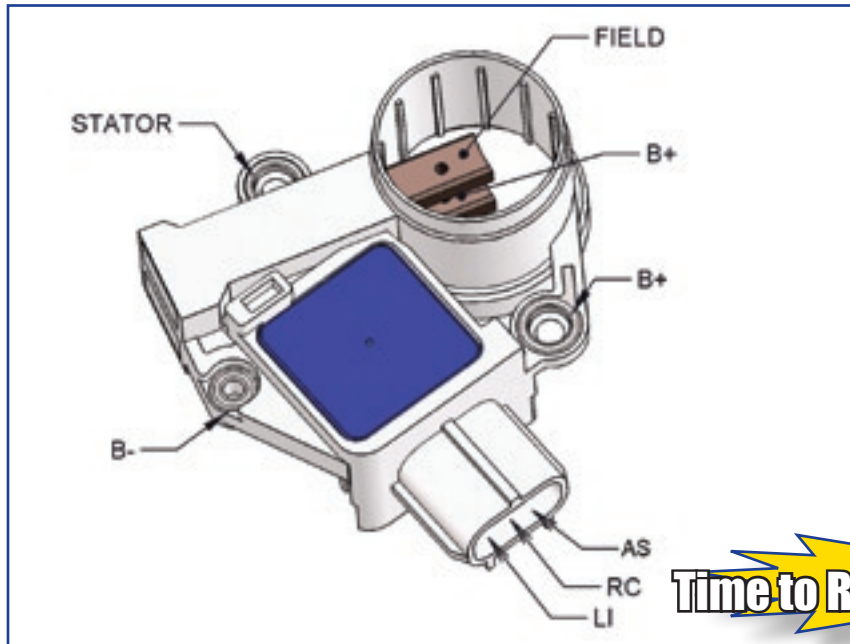
\*T-Reg is short for T-Regulation, a unique Transpo circuit design.



The charts provide a comparison of the OE 6G PCM controlled regulator to the WAI-Transpo 6G PCM controlled regulator 'F601HD'. The green shaded area indicates performance within factory Ford specifications - the red shaded area is outside Ford specifications. The graphs clearly indicate that the Ford/Visteon OE 6G PCM controlled regulator does not meet Ford's own specifications.



# Regulator Terminals, Connections, Functions:



**Time to Rediscover F601HD**

## AS - External Voltage Sense

- External sense is the charging system reference voltage applied to the regulator circuit.
- The regulator will function in its primary default voltage set point mode (14.03V) if only system reference voltage is present; (when no PCM generated control signal is provided).

## B+ - Battery

- Battery B+ power connection for regulation and field circuit control operation.

## B- - Ground

- Chassis ground connection for all regulator circuit requirements.

## FLD - Field

- The field hot brush is connected directly (internally) to the regulator B+ connection; this is the field circuit current supply.
- Field low-side current flow is controlled through a switched high amperage MOSFET power device.
- The field circuit control signal is PWM at a frequency of 125Hz.

## LI - Load Indication

- Load indication is a regulator output signal sent to the vehicle PCM to provide the status of alternator voltage, load and other operational functions; to include faults.

- The load indication signal is PWM having amplitude of 14 volts and frequency of 125 Hz.
- The load indication PWM signal represents the field current signal but will appear inverted when viewed on an oscilloscope.
- The regulator load indication circuit has no direct control of the vehicle charge indicator lamp function; charge indicator lamp function is solely controlled by the vehicle PCM.

## RC - Regulation Control

- Regulation control is derived from a vehicle PCM generated PWM signal sent to the regulator's voltage control circuit.
- The regulator voltage control circuit reacts to the PCM generated signal by adjusting the voltage set point.
- The regulation control PWM signal duty cycle rate, (5% through 95%), denotes specific voltage settings; charging voltage is controlled in 0.045V increments (approximately).

## STA - Stator

- Regulator circuit connection to stator AC.
- Alternator stator pulses are detected and monitored by the regulator.
- When stator pulses disappear, the regulator informs the vehicle PCM of a fault via the regulator LI circuit; (voltage regulation continues without interruption).

# Voltage Regulator for Ford F601HD

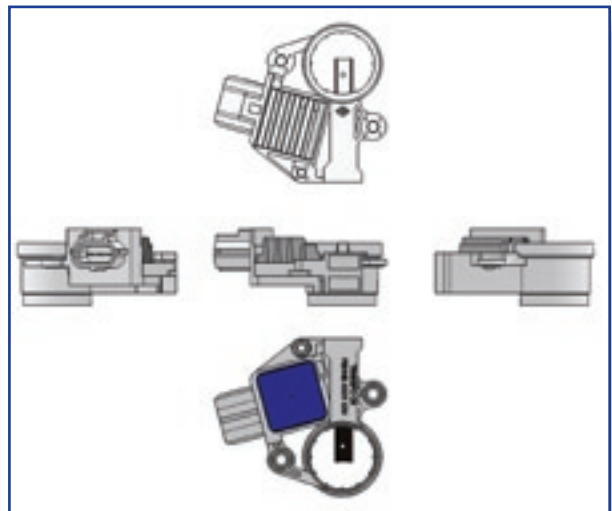
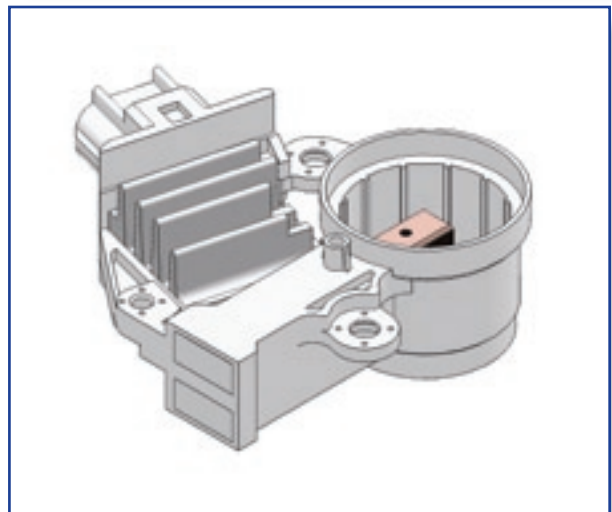
## PCM Controlled 6G Voltage Regulators

Many late model Ford charging systems are directly monitored and controlled by the vehicle's on-board computer. The electrical design of the alternator regulator must support the demands of the vehicle PCM to ensure smooth and responsive output throughout all operating conditions. Improper charging system operation will generate trouble codes within the vehicle's diagnostics system.

The WAI-Transpo F601HD regulator is precisely engineered to meet or exceed all requirements demanded by the vehicle charging system.

### Regulator Basics:

- During alternator operation, the voltage regulator load indication circuit (LI circuit) provides a precise PWM signal (pulse width modulation signal) to the vehicle's on-board computer (ECU/PCM). The data provides the PCM with the status of the alternator charging system; this includes possible circuit fault conditions such as under voltage, over voltage, loss of stator, regulation control error, etc.
- Based upon the parameters of the load indication signal, the vehicle PCM returns a PWM signal back to the voltage regulator regulation control circuit (RC circuit).
- The regulation control circuit responds to the PCM signal by establishing a charging voltage set point based upon the parameters of the PCM signal.
- It should be noted that the vehicle PCM receives additional load indication input from other vehicle peripheral systems such as AC, transmission, etc., and alters the PWM signal provided to the regulator control circuit, accordingly.
- The vehicle's charge indicator lamp function is directly controlled by the vehicle PCM; it is not a function of the alternator regulator.



**TRANSPO** 

*WAI-Transpo . . . Rebuilding Confidence*

*Where Quality is the First Detail . . . Yesterday – Today – Everyday!*