

# Technical Bulletin



## Performance Curve Explanation

WAI alternators come with a performance curve in the box showing the performance of each individual unit.

WAI is frequently asked to explain what the print out actually means. Below are the most common items to look for and their respective descriptions.

**ALT-98 Computerized Test Report**

**WAI** P/N: **FD-WAI1888** **PASS** 11/8/2017 7:31

S/N: **1539**

Description: **12V, 130A, NEG**

This alternator has an internal voltage regulator. Plug Code **331**

Terminals / Application: **A,(D), 1 Ford 2G - Mitsubishi**

Test Results Table:		
Maximum Alternator Output:	Amps	153
Maximum Output Power:	Watts	1942
Voltage Set Point	Volts	14.46
Leakage Current	mAmps	0.67
Ripple Current	Amps	32
Alternator Turn On Speed	RPM	1078
Secondary Regulation	RPM	456
Tachometer Frequency	Volts	-
Tachometer Frequency	Hz	-
Stator Voltage	Volts	-
Field Current	Amps	-
Lamp Style	-	Inactive
Lamp Type	-	Standard
LRC Delay	Sec.	2.00
Feedback (Full Load)	Volts	-
Feedback (Minimum Load)	Volts	-
Maximum Vacuum Generated	Kps	0.00
Maximum Air Leakage	%	0.00
Regulator Voltage (at Computer Controlled Function Test)	Volts	-

Output Current Table:		
Output Current at 1500 RPM	Amps	77
Output Current at 1800 RPM	Amps	90
Output Current at 2000 RPM	Amps	100
Output Current at 2400 RPM	Amps	114
Output Current at 3500 RPM	Amps	138
Output Current at 5000 RPM	Amps	150
Output Current at 6000 RPM	Amps	153
Output Current at 0 RPM	Amps	0

Output tested @ 12.8 V

Alternator Performance Curve

Ripple Pattern

1. This is the result of the testing based upon the OEM comparison stored within the tester. This is the description of the plug code being used as well as the plug pin out description of the connections for the alternator.
2. Maximum Alternator Output describes the current output of the unit @ 6000 rpm, under a full load. This reading is directly related to the Output Current Table. Alternator rating output should be achieved @ 3000 rpm when the unit is in a cold state. Maximum output should not exceed 20% of rated output as a rule.
3. Voltage set point describes the regulation voltage under a no load condition @2500 rpm alternator speed. This end of the line test report is established when the unit is in a hot state.
4. Alternator Turn-on Speed is typically measured at alternator shaft rpm speed. Turn on is achieved when the regulator begins regulating voltage. Typical turn on speed maximum speed is around 1600 rpm.
5. Lamp Style is determined to be active if there is output on the lamp terminal once the lamp is turned off during the regulation cycle. This output is typically powering a relay or "choke" function. An inactive lamp style means there is no output on the lamp terminal after the light goes out during regulation. This term should not be confused with a lamp activated circuit. In a lamp activated regulator, the lamp required to complete the circuit for the regulator to charge.
6. The alternator performance curve shows the output of the alternator when under a load at a particular alternator speed. Alternator speed is measured at the pulley and is not the same as vehicle rpm.
7. Leakage current is also referred to as parasitic drain. Typical allowable leakage on an automotive regulator is 2mA. Heavy duty regulators may have a higher parasitic drain to help with lower turn on speed due to size and may be as high as 8mA-10mA. Parasitic drain is when there is a continuous discharge of power once the engine has been shut off. This is the result of a device that remains turned on or energized. It is common on newer vehicles to see up to 85mA of leakage as there are many memory type items that are maintained. Some of these would be memory seats, mirrors, radios, and GPS systems. The higher the drain, the more it adversely impacts battery lifespan.
8. LRC, which is the acronym for Load Response Control, is a function that is activated in order to eliminate speed fluctuations caused by a sudden electrical load during low speed. This function allows output current to increase slowly over a period of typically 2 to 13 seconds. LRC is available usually after the alternator has achieved a certain speed and after a time delay. Soft start, which is somewhat similar but somewhat confused with
9. LRC, is used to reduce the load on the regulator during initial start up condition.
10. The output current table is the duplication of Item #7 but in graph form.
11. Ripple pattern is used to show the balance of the phases during current output. An uneven pattern would show an unbalance between stator phases, or could reflect a bad diode within the circuit.



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