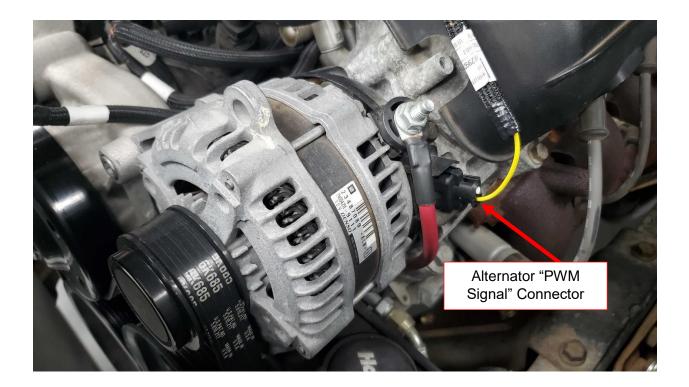


## **PWM Alternator Harness**

#### Part Numbers 558-475 & 558-476

This document explains how to control either a GM or Ford alternator that was factory ECU controlled with a PWM (*Pulse Width Modulation*) signal. This includes most 2007+ GM engines and most 2005+ Ford engines.



### Wiring:

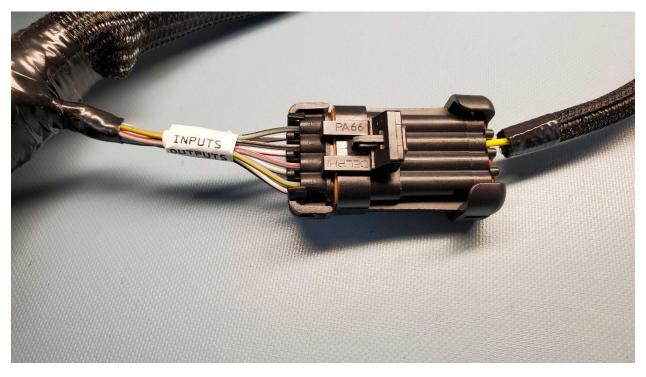
The PWM Alternator harnesses are designed to be used with a **(P-)** "**PWM** –" output from the I/O (8 Pin Connector), and "**5 Volt** (Pin C)" from the Power Tap (4 Pin Connector). Both located in most Holley/TerminatorX EFI harnesses.

(P-) "PWM – " – Used for ground Pulse Width Modulated Outputs

# I/O (8 Pin Connector):

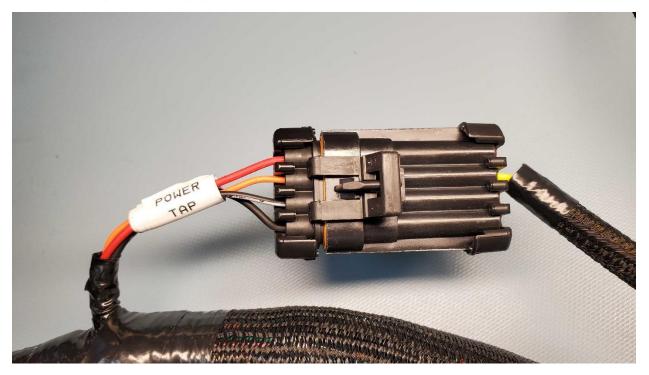
The I/O connector comes prepopulated to Pin G, (ECU Pin J1-B10, Output #3).

If this output Pin is already being used (*e.g., SRV actuator for Hemi*) the PWM Alternator pin can be moved to a different output pin that is configurable as a (**P-**) "**PWM** –" in the software Pin Map.



# Power Tap (4 Pin Connector):

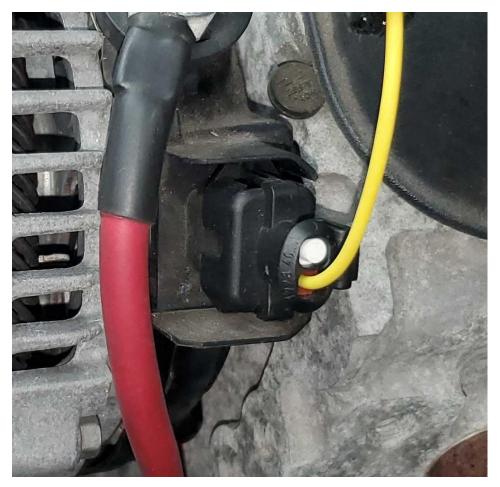
The Power Tap connector populated to (Pin C) 5 Volt.



# Alternator (2 Pin Connector):

<u>GM</u> PWM Alternator Harness (558-475, 271R1305a) has Pin Location (1) populated in that alternator connector.

Ford PWM Alternator Harness (558-476, 271R1306a) has Pin Location (2) populated in that alternator connector.



# Software Setup:



l icon is not shown in the tool bar:

- 1. Go to "Toolbox".
- 2. Select "Add Individual Config".
- 3. Select the "IO" folder.
- 4. Double-click "Default.io" to add the I/O ICF to the tool bar.

In the Laptop Software (Terminator X / Holley EFI), in the I/O ICF enable an Output. Name this Output "Alternator" and set Type to: "**PWM –**"

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INPUTS/ OUTPUTS ^ X	OUTPUTS	ТҮРЕ	ECU PIN	ENABLE		
	#1 Alternator	PWM-	✓ NOT DEFINED	🗸 Enable	Configure	Where Used
Outputs	#2	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
Inputs/Outputs	#3	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#4	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#5	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#6	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#7	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#8	GROUND	V NOT DEFINED	Enable	Configure	Where Used
	#9	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#10	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#11	GROUND	V NOT DEFINED	Enable	Configure	Where Used
	#12	GROUND	V NOT DEFINED	Enable	Configure	Where Used
	#13	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#14	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#15	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#16	GROUND	V NOT DEFINED	Enable	Configure	Where Used
	#17	GROUND	V NOT DEFINED	Enable	Configure	Where Used
	#18	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#19	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used
	#20	GROUND	✓ NOT DEFINED	Enable	Configure	Where Used

Select "Configure" and set "Sensor Input Triggers" to active when engine is running, as shown below:

Alternator	Back	Input Trigger	B Linked (	Dutputs	Timer	PWM Setup	
SWITCHED INPUT TRIG	GERS						
Number () 🗸							
AND ~							
SENSOR INPUT TRIGGE	RS—						
Number 1 🗸							
This output will activate when	RPM	`	✓ is Above	~	500 RPM	▲ ▼	
Enable Secondary Deactivation	and de	activate at	200 RPM	÷ H	ysteresis	Mode	

Select "PWM Setup" and configure as shown below:

- 1. Type = Fixed
- 2. Frequency = 128
- 3. Table units = Duty Cycle (%)
- 4. The X and Y axis = RPM and MAP

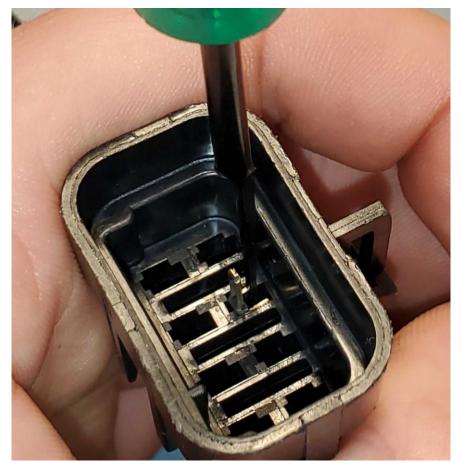
Fill the table with duty cycle values as shown below, *or* values that correspond with the desired charging voltage. There is some variation but for the most part 100% duty cycle is 11 volts and 10% is 15.5volts with the charging voltage being roughly linear with duty cycle between those points. This means that 14.6volts is roughly 25-30% duty cycle.

**NOTE:** Anything under 10% duty cycle is not recognized by the alternator and will result in the alternator shutting off until a valid duty cycle is seen.

Alt	erna	tor				B	ack	Input	Trigge	rs L	inked.	Output	s Ti	mer	PWM S	ietup	
PWM SETUP																	
		Туре	Fixed	Ч	~												
	Free	quency		128													
	Table	e Units	Duty Cycle (%) 🗸 🗸														
		X Axis	RPM	1		$\sim$											
		Y Axis	MAP ~														
	Grap	h															
	105	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	98	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	91	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	84	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	77	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	70	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
ទ	63	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
KP	56	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
MAP [kPa]	49	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
MA	42	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	35	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	28	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	21	100.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	14	100.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
	7	100.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
	0	100.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
		0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500
								RP	M [RP	M]							

## Note for De-Pinning METRI-PACK 150 Connectors:

The De-Pinning Tool for METRI-PACK 150 style connectors, like the I/O connector is available through Holley: Part Number (567-101)



Instructional Video on De-Pinning and Crimping can be found here: "HOW TO IDENTIFY, CRIMP, AND DE-PIN CONNECTORS ON A FORD COYOTE WIRING HARNESS"

<u>https://www.holley.com/blog/post/how\_to\_identify\_crimp\_and\_de-pin\_connectors\_on\_a\_ford\_coyote\_wiring\_harness/</u>

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