



## Kiggly Racing 12-Tooth Crank Trigger Sensor

### Wiring:

The Kiggly Racing crank trigger sensor is designed to replace the Mitsubishi OEM crankshaft signal with a 12-pulse per engine revolution square wave signal. It utilizes an OEM-style 2g / Evo8 cam trigger sensor with our custom trigger wheel and mount system to generate this signal.

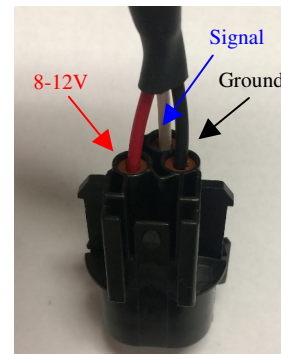
With the included harness, our system is a plug-and-play affair on an EVO or 2g DSM.

When using a 1g CAS to generate the cam signal, the crank signal pin needs to be removed from the CAS wiring and connected to the white wire on your new crank trigger sensor.



1g CAS Wiring

Cam Signal - KEEP  
Crank Signal - DISCONNECT  
Power  
Ground

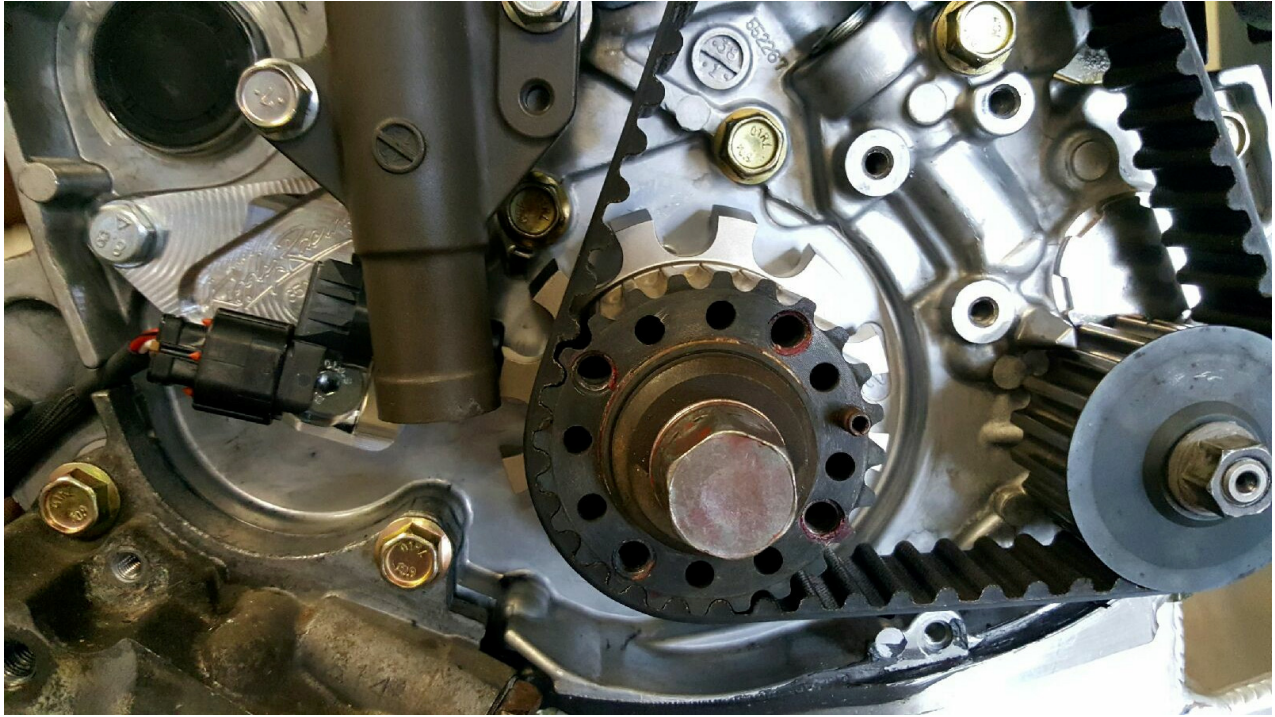


Triangle Connector Wiring

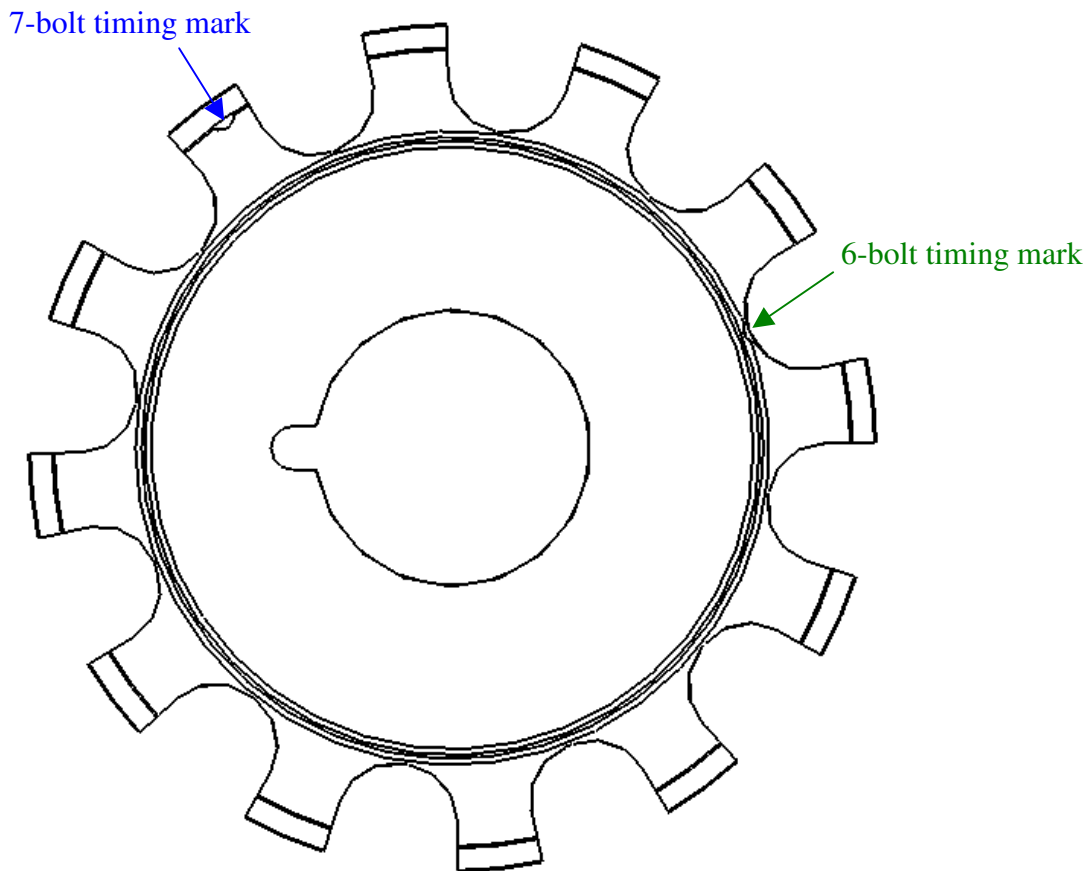
### Installation:

The bracket bolts beneath the balance shaft and the sensor is located underneath the timing belt tensioner on the 1g DSM, 2g DSM, and EVO timing covers. The same hardware fits all these applications. Shim between the sensor and the 12-tooth trigger wheel to achieve 0.025-0.035" gap (measure with a feeler gauge).

# Kiggly Racing

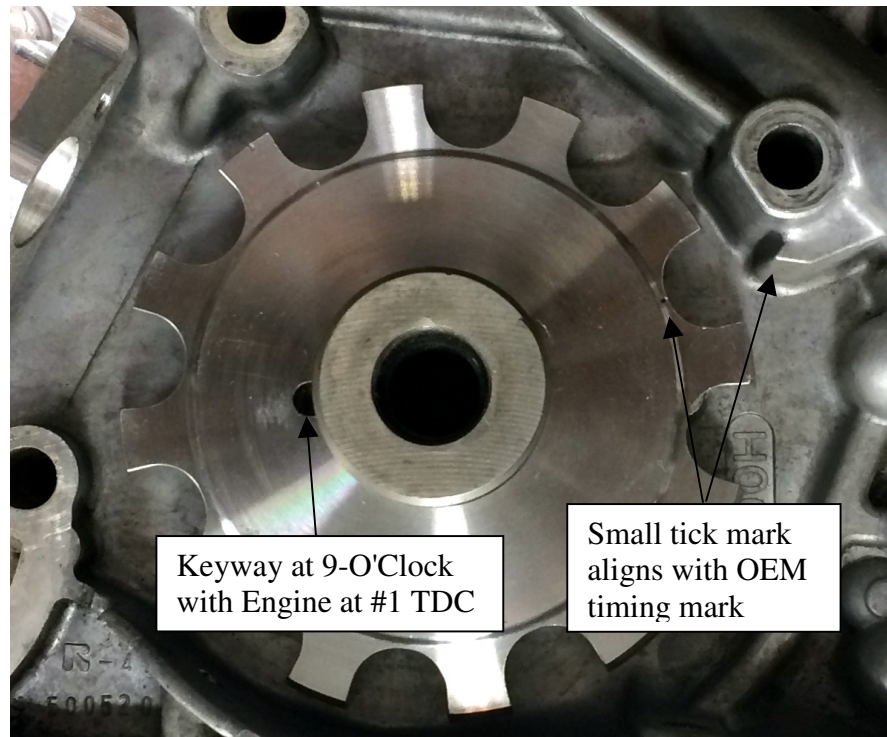


Timing mark locations on the trigger wheel:

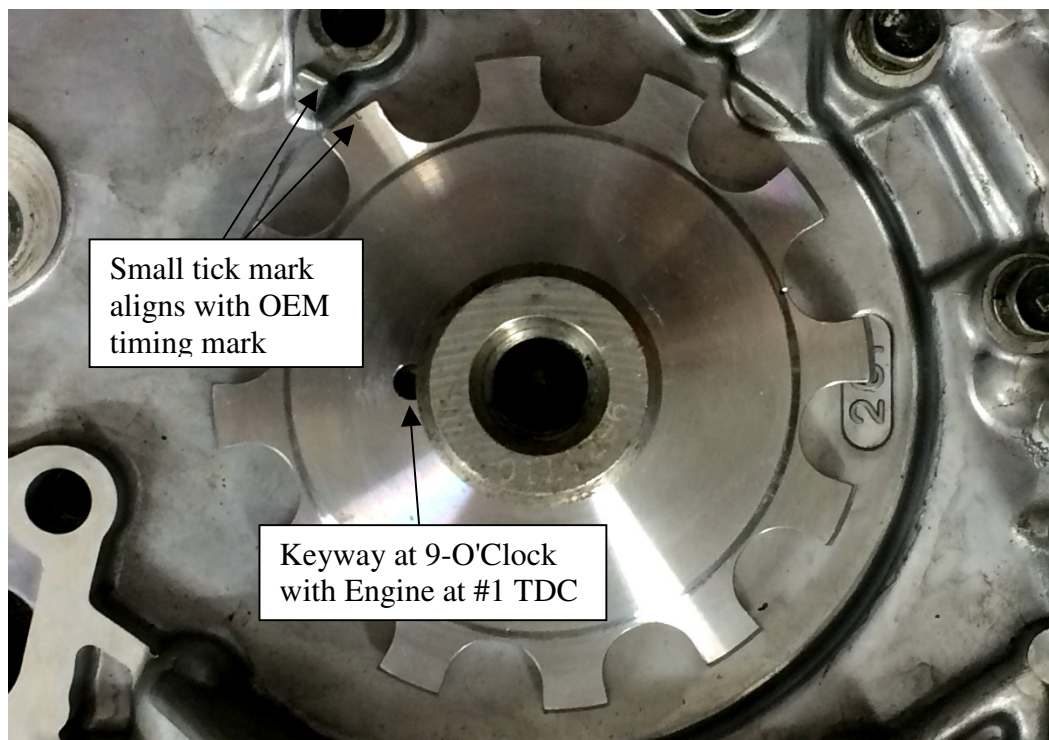


# Kiggly Racing

## 6-Bolt Timing Marks:



## 7-Bolt Timing Marks:



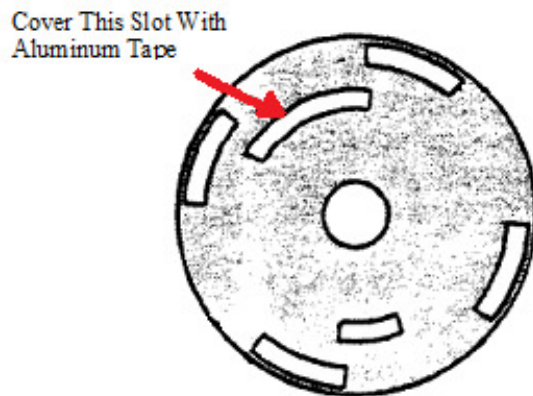




## Cam Angle Sensor Required Modification

The 12-tooth trigger setup requires modifying the cam angle sensor so it creates one pulse per revolution. The OEM 2 pulse per engine cycle only works with a 4-pulse per engine cycle (2-tooth) crank sensor.

**1g DSM Optical CAS (green top):** Remove the housing from your optical CAS and cover the large slot with aluminum tape. This tape can be purchased at hardware stores in the heating and cooling department. It is a thin, durable, high temperature tape that sticks well long-term.



## 1g DSM Hall Effect CAS (black top):

Remove the larger leg from the 2-tooth Cam sensor tone wheel.



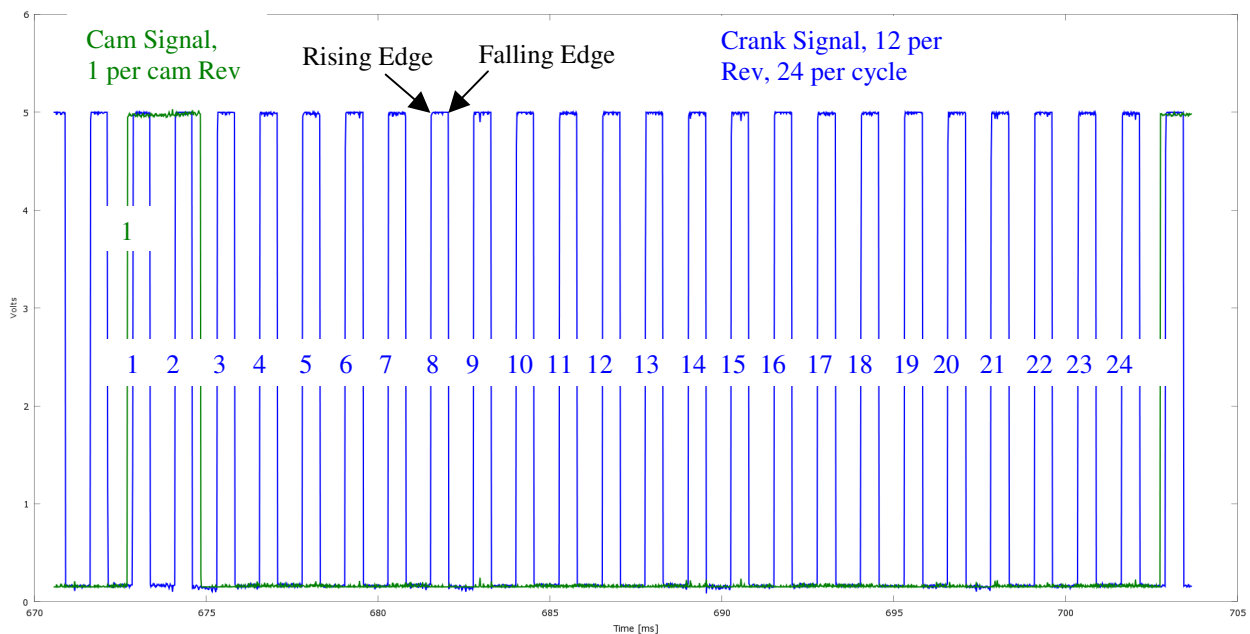


## 2g DSM and Evo 8 Hall Effect CAS:

Remove the larger leg from the 2-tooth Cam sensor tone wheel.



Normal Trigger Signals - Including Cam and Crank sensors:





## AEM V1 Settings

The 12-tooth signal requires changes to several AEM settings. The settings in the following image can be found under:

Setup > Sensors > Cam/Crank Sensor > Options – Cam/Crank Setup

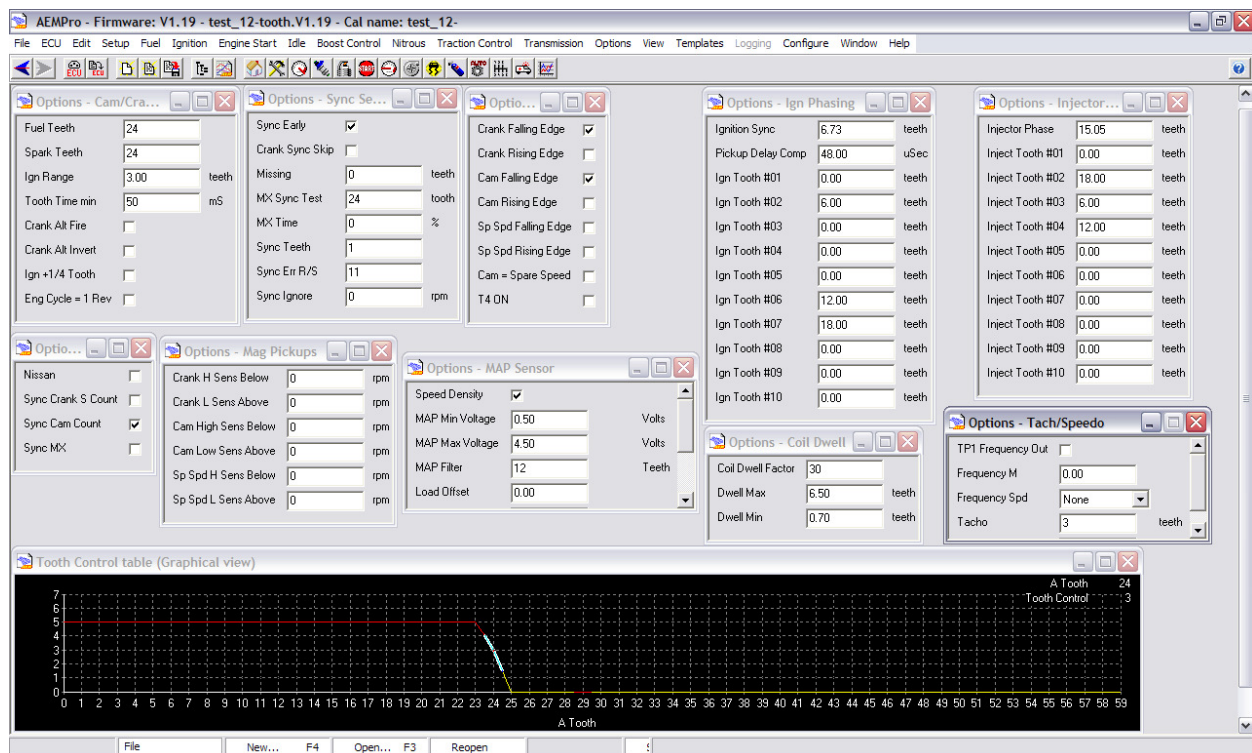
Setup > Sensors > Manifold Pressure Sensor > Options – MAP Sensor

Ignition > Advanced Ign > Ignition Phasing > Options – Ign Phasing

Ignition > Advanced Ign > Coil Dwell Setup > Options – Coil Dwell

Fuel > Advanced Fuel > Injector Phasing > Options – Injector Phasing

Setup > Advanced Setup > Tach/Speedo Control > Options – Tach/Speedo



The Tooth control table should have:

Positions 0-23 set as '5'

Position 24 set as '3'

Positions 25-59 set as '0'



## AEM V2 Settings - Waste Spark Setup:

AEMTuner v2.98 - C:\Users\Tina\Desktop\ECU Calibration\01V24.cal

File Edit Display Tabs ECU Logging Tools Wizards Live Tracing Help

Tuning Breakpoints Limiters Start Idle Fuel Trims Accel Ignition Ign Trims Boost Adv Boost Sensors Coils/Inj User PW Output

Channels - Coils/Inj

Name	Value	Unit
Engine Speed		rpm
Engine Load		PSIg
Throttle		%
Coolant Temp		C
O2 #1		AFR
Injector 1		
Injector 2		
Injector 3		
Injector 4		
Injector 5		
Injector 6		
Injector 7		
Injector 8		
Fuel Inj 1 Open		teeth
Fuel Inj 2 Open		teeth
Fuel Inj 3 Open		teeth
Fuel Inj 4 Open		teeth
Fuel Inj 5 Open		teeth
Fuel Inj 6 Open		teeth
Fuel Inj 7 Open		teeth
Fuel Inj 8 Open		teeth
Fuel Inj 9 Open		teeth
Fuel Inj 10 Open		teeth
Fuel Inj 11 Open		teeth

Injectors

Name	Active	Knock Sensor #1	Knock Sensor #2	O2 Feedback	EGT Feedback	Injector Type	Injector Phasing
#1	ON	ON	OFF	O2 #1	EGT #1	Primary	0.000
#2	ON	ON	OFF	O2 #1	EGT #1	Primary	18.000
#3	ON	ON	OFF	O2 #1	EGT #1	Primary	6.000
#4	ON	ON	OFF	O2 #1	EGT #1	Primary	12.000
#5	ON	ON	OFF	O2 #1	EGT #1	Secondary	0.000
#6	ON	ON	OFF	O2 #1	EGT #1	Secondary	18.000
#7	ON	ON	OFF	O2 #1	EGT #1	Secondary	6.000
#8	ON	ON	OFF	O2 #1	EGT #1	Secondary	12.000
#9	OFF	OFF	OFF	O2 #1	EGT #1	Primary	0.000
#10	OFF	OFF	OFF	None	EGT #1	Primary	0.000
#11	OFF	OFF	OFF	None	EGT #1	Primary	0.000

Coils

Coil Name	Active	Knock Sensor #1	Knock Sensor #2	Coil Position	Coil Phasing
Coil #1	ON	ON	OFF	Leading	0.000
Coil #1B	ON	ON	OFF	Leading	12.000
Coil #2	ON	ON	OFF	Leading	6.000
Coil #2B	ON	ON	OFF	Leading	18.000
Coil #3	OFF	OFF	OFF	Leading	0.000
Coil #3B	OFF	OFF	OFF	Leading	0.000
Coil #4	OFF	OFF	OFF	Leading	0.000
Coil #4B	OFF	OFF	OFF	Leading	0.000
Coil #5	OFF	OFF	OFF	Leading	0.000
Coil #5B	OFF	OFF	OFF	Leading	0.000
Coil #6	OFF	OFF	OFF	Leading	0.000

Item Explanation

(Unit=RPM) Displays the current speed of the engine which is calculated from the crank sensor input

Function Explanation

Coils and Injectors

Injectors

To use an injector, it must be set to active. The injector must also be tied to a knock sensor and O2 Sensor. The AEM EMS supports multiple knock and O2 sensors and should respond to knock or O2 feedback requests from individual sensors only to those cylinders that would be detected by a particular sensor. Therefore, each injector needs to be tied only to the sensors that it will influence. The same is possible for the EGT sensors. The injector type should be set to Primary

Workspace \* Calibration \* ECU Not Connected Firmware: N/A ECU Logging PC Logging: Off

10:57 AM 3/31/2013



Haltech Elite setup:

Main Setup - Elite 2500 ECU 2.23.0 - Release

Engine  
Functions  
Devices  
Datalog

Ignition - Generic 1 Correction  
Main Trigger Fuel  
Ignition - Generic 2 Correction  
Fuel - Generic 1 Correction Fuel - Generic 2 Correction  
Ignition - Generic 4 Correction  
Ignition

**Trigger Configuration**

Trigger Type: Generic - Multi-tooth - Single Tooth Home  
Trigger Signal Location: On Crank  
Number Of Teeth: 12  
Number Of Missing Teeth: 2  
TDC Offset Angle: 70.0 °  
☒ TDC Offset Angle Table Enable  
RPM Filter Level: 1  
Quick Start: Enable

**Trigger Signal**

Sensor Type: Hall Effect  
Edge: Falling Edge  
Filter Level: 1  
Pull Up: Strong  
Ground Reference: Disable  
Digital Reference: Disable  
Signal Coupling: DC  
Edge Rejection Ratio Enable: Enable  
Edge Rejection Ratio: 20.0 %

**Home Signal**

Sensor Type: Hall Effect  
Edge: Falling Edge  
Filter Level: 1  
Pull Up: Strong  
Ground Reference: Disable  
Digital Reference: Disable  
Signal Coupling: DC  
Minimum RPM: 1000 RPM

Profile: ELITE DEFAULT

View I/O Report... OK Cancel Apply

Use the TDC Offset angle table to adjust for zero timing drift when revving with a timing light.  
Start here:

TDC Offset Angle Table °		
RPM RPM		
1000	10000	15000
0.0	-5.8	-9.0