

# Instruction Manual



## Universal 8 Infinity Supported Application



### **STOP!**

**THIS PRODUCT HAS LEGAL RESTRICTIONS.**  
**READ THIS BEFORE INSTALLING/USING!**

THIS PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY, UNLESS PERMITTED BY SPECIFIC REGULATORY EXEMPTION. (VISIT THE "EMISSIONS" PAGE AT [HTTP://WWW.SEMASAN.COM/EMISSIONS](http://www.semasan.com/emissions) FOR STATE BY STATE DETAILS.)

IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IF THIS PRODUCT WAS PURCHASED IN ERROR, DO NOT INSTALL AND/OR USE IT. THE PURCHASER MUST ARRANGE TO RETURN THE PRODUCT FOR A FULL REFUND.

THIS POLICY ONLY APPLIES TO INSTALLERS AND/OR USERS WHO ARE LOCATED IN THE UNITED STATES; HOWEVER CUSTOMERS WHO RESIDE IN OTHER COUNTRIES SHOULD ACT IN ACCORDANCE WITH THEIR LOCAL LAWS AND REGULATIONS.

**WARNING:** This installation is not for the tuning novice! Use this system with **EXTREME** caution! The AEM Infinity Programmable EMS allows for total flexibility in engine tuning. Misuse or improper tuning of this product can destroy your engine! If you are not well versed in engine dynamics and the tuning of engine management systems **DO NOT** attempt the installation. Refer the installation to an AEM-trained tuning shop or call 800-423-0046 for technical assistance.

**NOTE:** All supplied AEM calibrations, Wizards and other tuning information are offered as potential starting points only. IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM IF THE CALIBRATION IS SAFE FOR ITS INTENDED USE. AEM holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

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## OVERVIEW

This document is intended to serve as a guide to help with the installation and setup of an AEM Infinity EMS onto a V8 engine using a universal wiring harness. Twelve combinations of different cam/crank triggers, sensors, and distributors were all individually tested and verified with the resulting base sessions made available for the end user. These session and configuration files are starting points only and will need to be tuned for your specific application. This manual lists the files available and suggested setup configurations to use on any one particular combination. **Please read this document in its entirety before attempting to start or run an engine.**

**\*\*IMPORTANT NOTE\*\*** As a supported application, base sessions have been provided which can and will start and run an engine. It is imperative that this guide be closely followed if the desired end result be that the engine easily start and run using one of the provided base sessions. All of the base sessions set up to use a modified mechanical advance MSD distributor as a cam signal have been configured such that the cam signal occurs 90° before TDC compression for cylinder #1. While it isn't imperative that your engine be set up in this exact manner, as the Infinity ECU will run with the cam signal occurring at any position relative to the crank, having it set up like this will allow you to use the provided base sessions more easily. The relationship between the cam signal and crank position will be touched on multiple times in this guide.

## GETTING STARTED

Refer to the **10-7100 for EMS 30-7100 Infinity Quick Start Guide** for additional information on getting the engine started with the Infinity EMS.

### **Install Infinity Tuner Software**

See Infinity Tuner: Install

### **Import Base Session**

See Infinity Tuner: Calibration Data

All universal V8 base sessions located in Libraries\Documents\AEM\Infinity Tuner\Sessions\Base Sessions

### **Review Setup Wizard (see below)**

See Infinity Tuner: Setup Wizard

### **Start Engine, Verify Ignition Sync**

See Setup: Ignition Sync

### **Tuning**

See Infinity Tuner: Basic Tuning Guide

See Infinity: USB Logging Feature

See Infinity: Fuel Injector Flowrate

See Infinity: Air and Fuel

See Infinity: Idle Tuning

## DOWNLOADABLE FILES

Files can be downloaded from [www.aeminfinity.com](http://www.aeminfinity.com). An experienced tuner must be available to configure and manipulate the data before driving can commence. The Quick Start Guide and Full Manual describe the steps for logging in and registering at [www.aeminfinity.com](http://www.aeminfinity.com). These documents are available for download in the Support section of the AEM Electronics website: <http://www.aemelectronics.com/products/support/instructions>

## OPTIONS

### **30-3805 Universal V8 Core Harness**

This harness is the base of the universal V8 “modular” wiring harness. Harness comes with main relay for proper power distribution, full length terminated legs for analog sensor inputs, and connectorized stub leads for all outputs (coils, injection, idle air control, etc.) and cam/crank inputs. Add in the following expansion harnesses as necessary for the particular application being used.

### **30-3805-00 GM Injector Adapter Harness**

Adapter harness that mates EV1 style injectors in standard GM cylinder order (odd cylinders on one bank, even cylinders on other) to 30-3805 Core Harness.

### **30-3805-01 Ford Injector Adapter Harness**

Adapter harness that mates EV1 style injectors in standard Ford cylinder order (cylinders 1–4 on one bank, cylinders 5–8 on other) to 30-3805 Core Harness.

### **30-3805-02 Single Channel Ignition Adapter Harness**

Adapter harness that mates AEM Single Channel Coil Driver (30-2841) to 30-3805 Core Harness. Coil driver takes 5V falling edge ignition trigger signal from Infinity and outputs a 12V rising edge signal. 12V rising edge signal can either be used to trigger an inductive coil directly or trigger a single channel CDI box (MSD 6A, etc.).

### **30-3805-03 VR Crank & VR Cam Adapter Harness**

Adapter harness that mates variable reluctance (VR) crank and cam sensors to 30-3805 Core Harness. Legs to each sensor are 48" long.

### **30-3805-04 VR Crank & Hall Cam Adapter Harness**

Adapter harness that mates variable reluctance (VR) crank sensor and Hall Effect cam sensor to 30-3805 Core Harness. Legs to each sensor are 48" long.

### **30-3805-05 Hall Crank & VR Cam Adapter Harness**

Adapter harness that mates Hall Effect crank sensor and variable reluctance (VR) cam sensor to 30-3805 Core Harness. Legs to each sensor are 48" long.

### **30-3805-06 Hall Crank & Hall Cam Adapter Harness**

Adapter harness that mates Hall Effect crank and cam sensors to 30-3805 Core Harness. Legs to each sensor are 48" long.

**30-3805-07 GM Stepper Idle Control Adapter Harness**

Adapter harness that mates GM stepper idle control valve to 30-3805 Core Harness. IAC connector is flat and meant for use with later model style control valves.

**30-3805-08 Universal PWM Idle Control Adapter Harness**

Flying lead to mate universal PWM idle control valve to 30-3805 Core Harness. Connector to connect to control valve must be provided by end user.

**30-3701 Plug & Pin Kit**

This kit includes mating connectors and terminals for the Infinity. It also includes a main relay kit which is necessary for proper power distribution. This kit is best suited for experienced installers who want to build their own harness.

**30-3702 Mini Harness with Flying Leads**

This harness includes a fused power distribution center with main relay. Pre-terminated connectors are available for the internal UEGO sensors and AEMNet. A bag of multi-color flying leads is included to simplify custom harness builds.

**30-3703 Mini Harness with Pins**

This harness includes a fused power distribution center with main relay. Pre-terminated connectors are available for the internal UEGO sensors and AEMNet. 100 pins and 30 sealing plugs are included.

**30-3600 O2 Sensor Extension Harness**

Extension harness to connect AEM UEGO Wideband O2 sensor to 6-pin Deutsch DTM in Infinity Mini Harnesses (30-3702/3703).

**30-3601 IP67 Comms Cable**

USB Mini-B comms cable; 39" long with right angled connector and bayonet style lock.

**30-3602 IP67 Logging Cable**

USB A-to-A extension cable: 39" long with right angled connector and bayonet style lock.

## APPLICATIONS

All of the different combinations of cam/crank triggers, sensors, and distributors were tested on a 350 Small Block Chevy (SBC). The information within this guide is specific to this engine and may not be applicable to other engine models. Configuration changes may be necessary if attempting to use the Infinity EMS on an application other than a SBC.

Test engine specs:

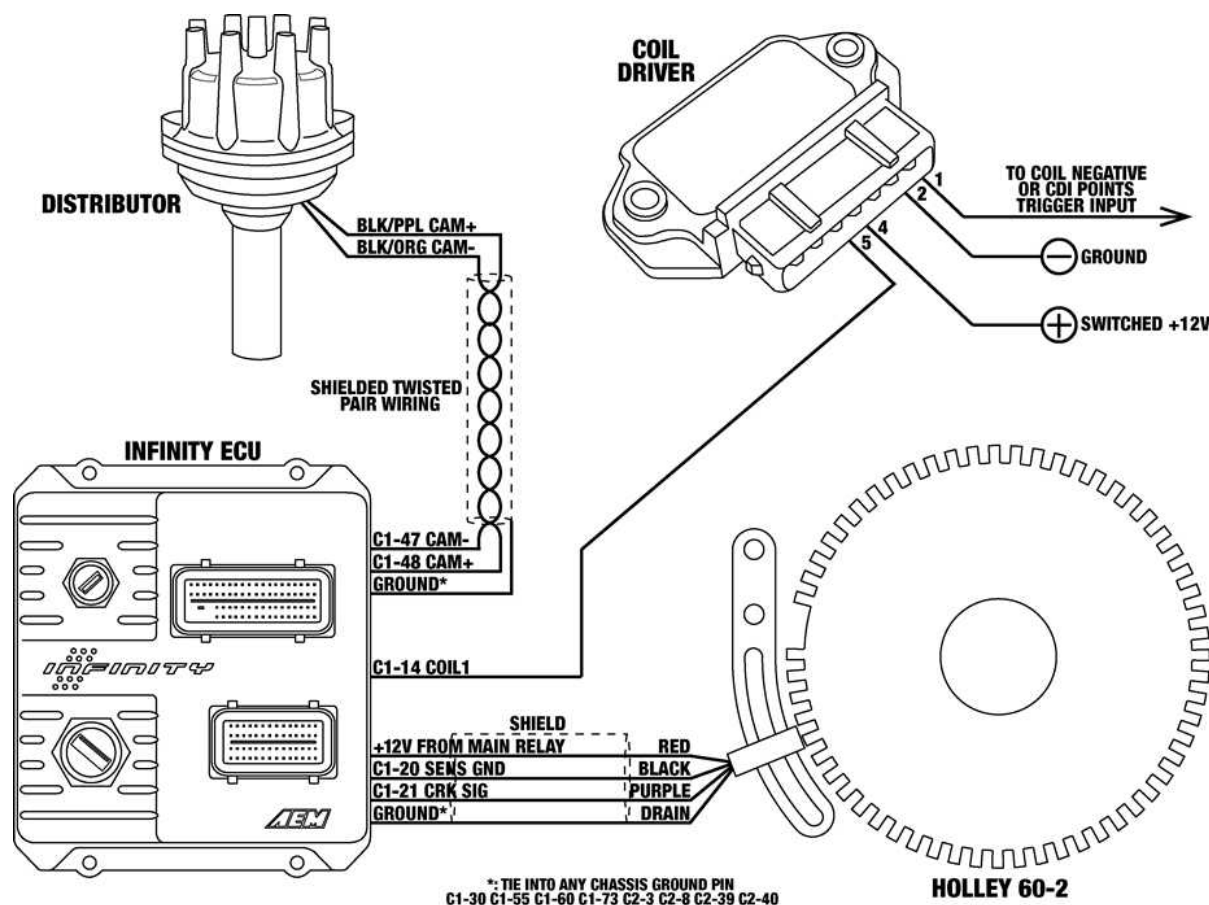
<b>Make</b>	Chevrolet
<b>Model</b>	1st Gen Small Block
<b>Disp</b>	350CID/5.7L
<b>Bore</b>	4.00"
<b>Stroke</b>	3.48"
<b>Cyl Heads</b>	Stock OEM iron
<b>Comp Ratio</b>	9.0:1
<b>Cam</b>	Stock
<b>Intake Manifold</b>	Edelbrock Victor "E"
<b>Throttle Body</b>	Edelbrock "E-Street" 4 Barrel – fuel injectors in TB not used
<b>Fuel Injectors</b>	Mopar 300cc/min from 2005 5.7L Hemi
<b>TPS Sensor</b>	Edelbrock "E-Street"
<b>MAP Sensor</b>	AEM 1Bar (30-2130-15)
<b>CLT Sensor</b>	AEM 1/8" PTF (30-2012)
<b>AIT Sensor</b>	AEM AIT (30-2010)
<b>Coil Driver</b>	AEM Single Channel Coil Driver (30-2841)
<b>Ign Amp</b>	MSD 7AL-2
<b>Coil</b>	MSD Blaster SS
<b>Exhaust</b>	Hedman Headers 68609
<b>Firing Order</b>	1-8-4-3-6-5-7-2
<b>Fuel</b>	CA 91 oct pump gas

## PARTS LIST

Description	Part Number	Details
<b>Stand-Alone Distributors</b>		
MSD Pro-Billet Cam Sync Distributor	2345	Crank: VR, 4 teeth/rev, 8 teeth/cycle; Cam: VR, 1 tooth/cycle
FAST Dual-Sync Billet Distributor	305005	Crank: Hall, 4 teeth/rev, 8 teeth/cycle; Cam: Hall, 1 tooth/cycle
<b>Cam Trigger Distributor</b>		
MSD Chevy V8 Pro-Billet Mech Adv Dist	85551	8 tooth reluctor w heel w ith VR pickup, must be modified to output 1 tooth/cycle
<b>Crank Triggers</b>		
Holley SBC Crank Trigger Kit	556-110	60-2 trigger w heel w ith Cherry Hall sensor
MSD SBC Crank Trigger Kit	8610	4 tooth trigger w heel (8 teeth/cycle) w ith magnet targets and non-magnetic VR sensor
ATI Flying Magnet Trigger Shell	916680TR	12 tooth trigger w heel (24 teeth/cycle) w ith magnet targets, uses 916040 Standard Steel SBC Hub, no sensor supplied
ATI AEM Infinity Crank Trigger	916360-10AEM	24 tooth trigger w heel (48 teeth/cycle) w ith integral hub, no sensor supplied
<b>Crank Trigger Sensors</b>		
MSD Magnetic Pickup Assembly	8505	Magnetic VR sensor, 3/4"x16 threaded body
MSD Non-Magnetic Pickup Assembly	8276	Non-magnetic VR sensor, 3/4"x16 threaded body, from 8610 kit
Honeywell GT101 Hall Effect Sensor	1GT101DC	Hall sensor, flange mount
Honeywell Hall Effect Speed Sensor	LCZ460	Hall sensor, 5/8"x18 threaded body
Honeywell VR Speed Sensor	3010S20	Magnetic VR sensor, 5/8"x18 threaded body
Honeywell VR Speed Sensor – High Output	3030S20	Magnetic VR sensor, high output, 5/8"x18 threaded body

## INSTALLATION

### MSD Distributor + Holley 60-2 Crank Trigger Kit



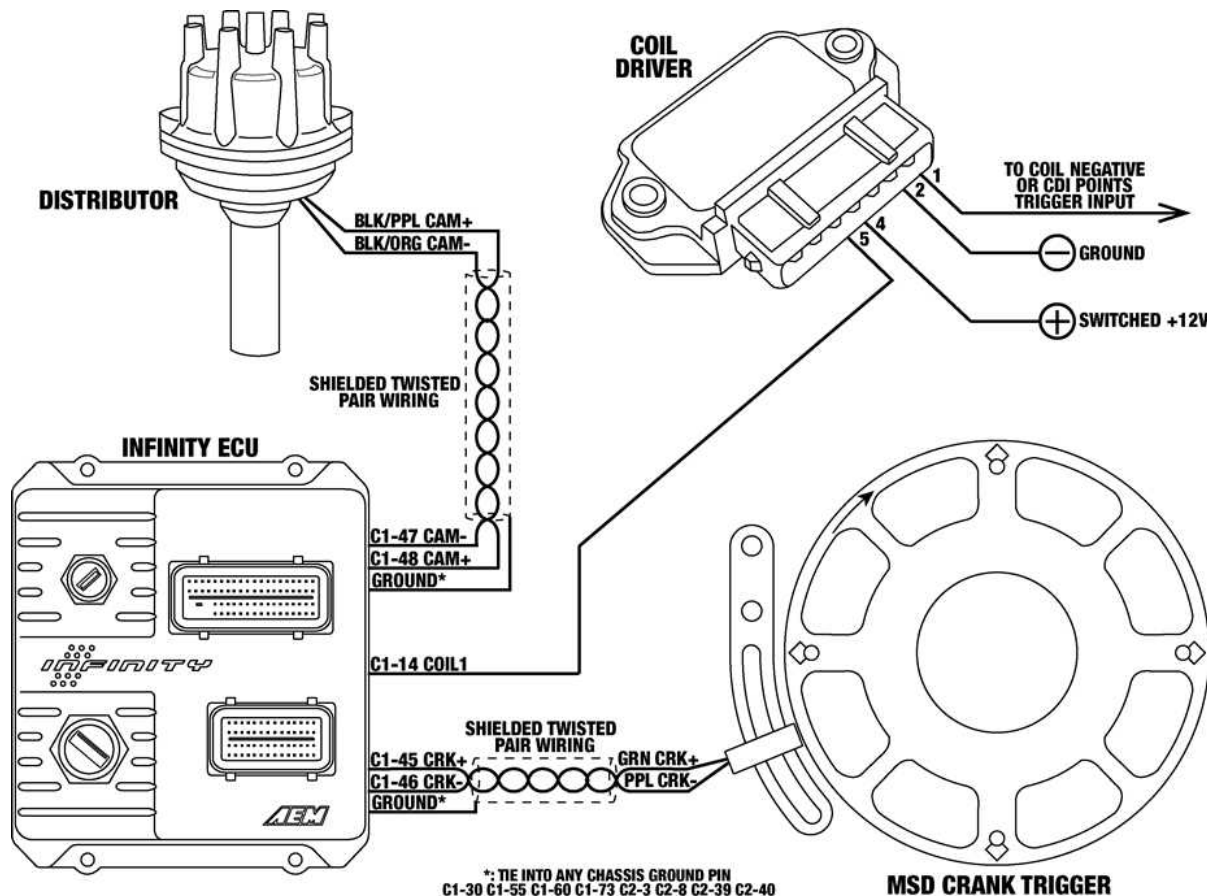
1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install Holley 60-2 crank trigger kit. Orientate crank trigger wheel such that the missing tooth section is at the 9 o'clock position with the engine at TDC. Position the crank sensor such that it's lined up with the leading edge of the 5<sup>th</sup> tooth after the missing tooth section with the engine at TDC. Set sensor air gap to .036".
3. Wiring:

Crank Sensor – Holley Hall Effect Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Red	+12V sensor power	Main relay power out	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Sensor ground	C1-20 Sensor Ground	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
Purple	Crank signal	C1-21 Crk Pos Sens Hall	<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		
Bare	Shield drain	Ground			
<b>Note: Use shielded wiring with drain to ground.</b>					

4. Load Holley 60-2 base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)



## MSD Distributor + MSD 4 Magnet Crank Trigger Kit

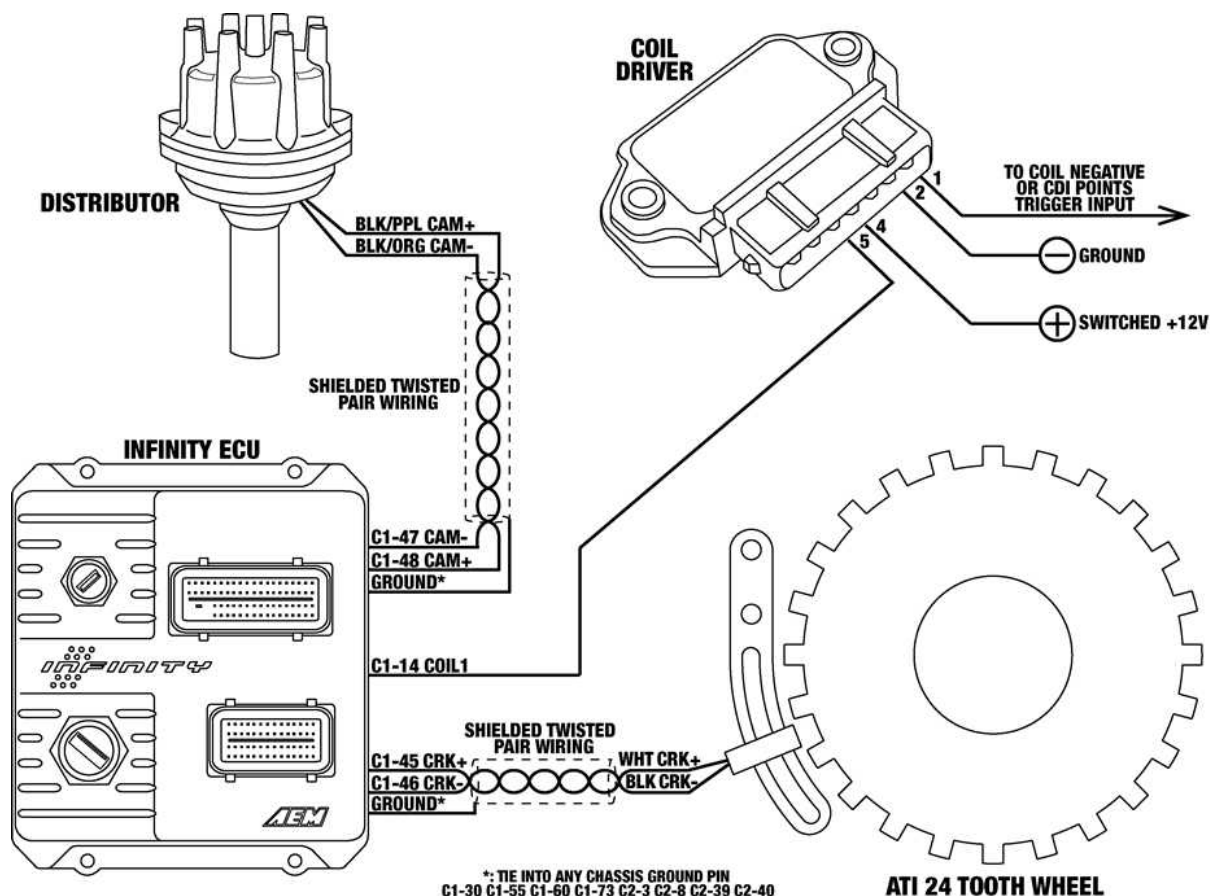


1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install MSD crank trigger kit. Orientate crank trigger wheel such that the arrow on the face of the trigger wheel is between the 10 o'clock and 11 o'clock position with the engine at TDC. Position the crank sensor such that it's approximately in the middle of the adjustment range. Set sensor air gap to .060".
3. Wiring – **\*\*NOTE\*\* Sensor wiring for Infinity may be different from what MSD instructions indicate.** The Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

Crank Sensor – MSD Non-Magnetic VR Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Green	Crank signal +	C1-45 Crk Pos Sens VR+	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Purple	Crank signal -	C1-46 Crk Pos Sens VR-	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

4. Load MSD Crank Trigger base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## MSD Distributor + ATI AEM 24 Tooth + Honeywell Std Output VR Sensor

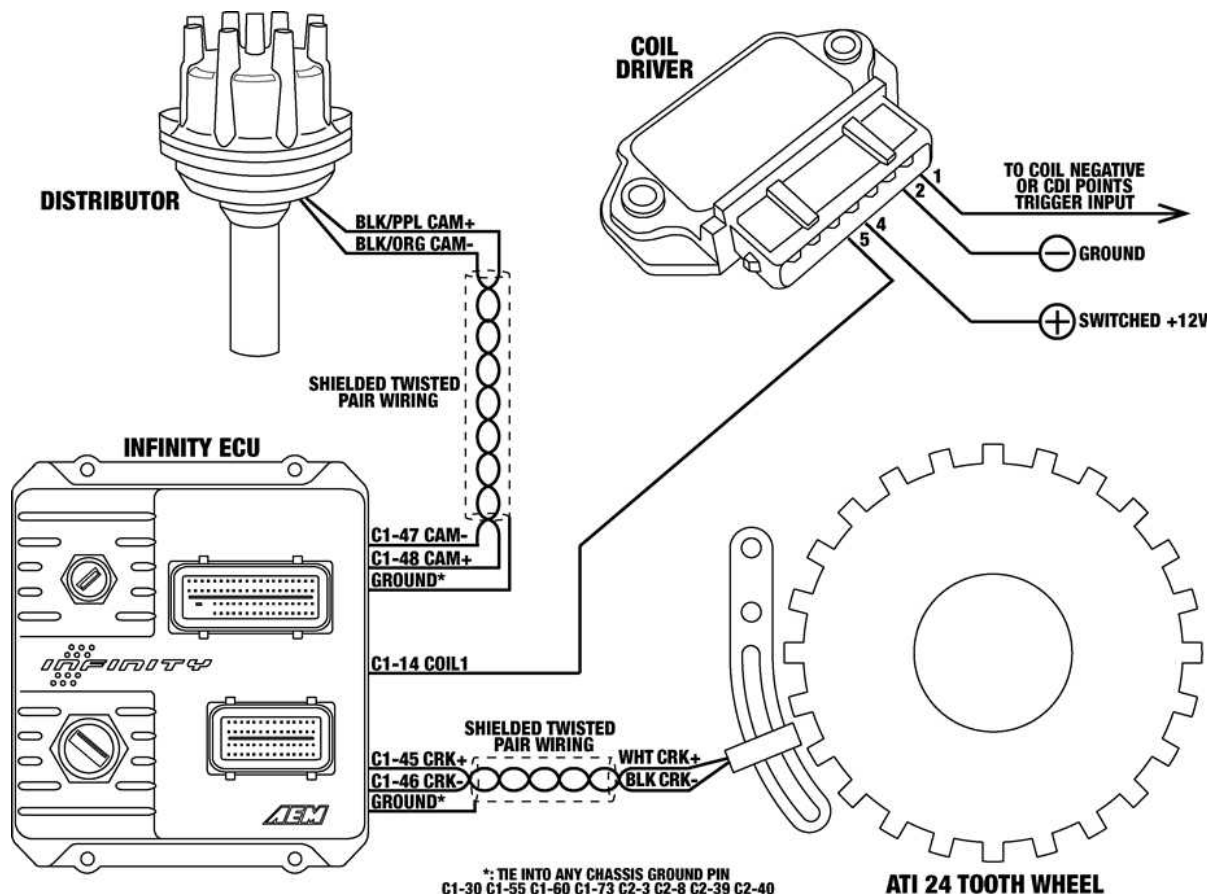


1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI AEM Infinity crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between crank teeth with the engine at TDC. Set sensor air gap to .011".
3. Wiring – note that the Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

Crank Sensor – Honeywell Std Output VR Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
White	Crank signal +	C1-45 Crk Pos Sens VR+	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Crank signal -	C1-46 Crk Pos Sens VR-	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

4. Load ATI 24 + Honeywell Std VR base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## MSD Distributor + ATI AEM 24 Tooth + Honeywell High Output VR Sensor



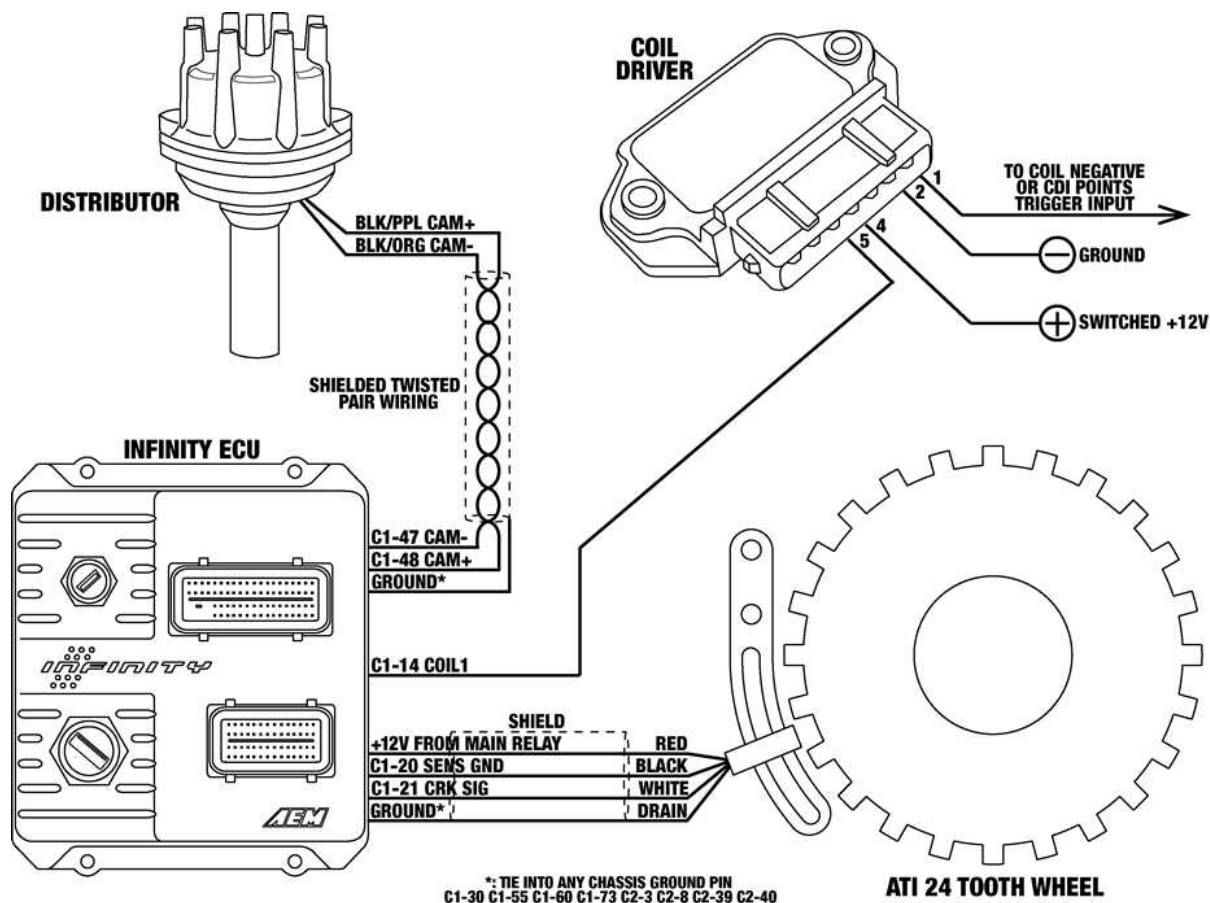
1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI AEM Infinity crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between crank teeth with the engine at TDC. Set sensor output to .011".
3. Wiring – note that the Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

Crank Sensor – Honeywell High Output VR Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
White	Crank signal +	C1-45 Crk Pos Sens VR +	Black/Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Crank signal -	C1-46 Crk Pos Sens VR-	Black/Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

4. Load ATI 24 + Honeywell HO VR base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)

5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## MSD Distributor + ATI AEM 24 Tooth + Honeywell Hall Effect Sensor



1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI AEM Infinity crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between crank teeth with the engine at TDC. Set sensor air gap to .020".
3. Wiring:

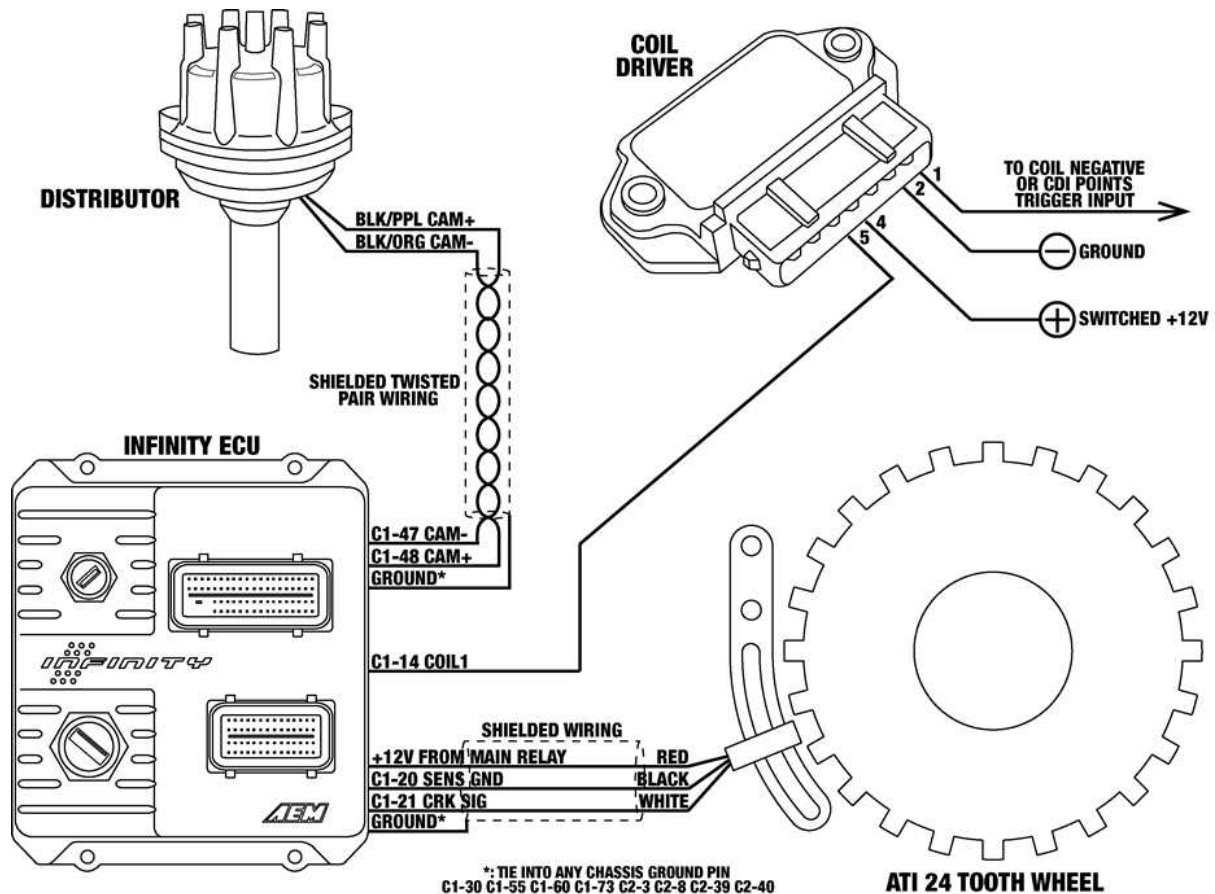
Crank Sensor – Honeywell Hall Effect Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Red	+12V sensor power	Main relay power out	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Sensor ground	C1-20 Sensor Ground	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
White	Crank signal	C1-21 Crk Pos Sens Hall	<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		
Bare	Shield drain	Ground			
<b>Note: Use shielded wiring with drain to ground.</b>					

4. Load ATI 24 + Honeywell Hall base session and review Setup Wizard. (See [Setup Wizard](#), in this

document.)

5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## MSD Distributor + ATI AEM 24 Tooth + Honeywell GT101 Sensor



1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI AEM Infinity crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between crank teeth with the engine at TDC. Set sensor air gap to .040".
3. Wiring:

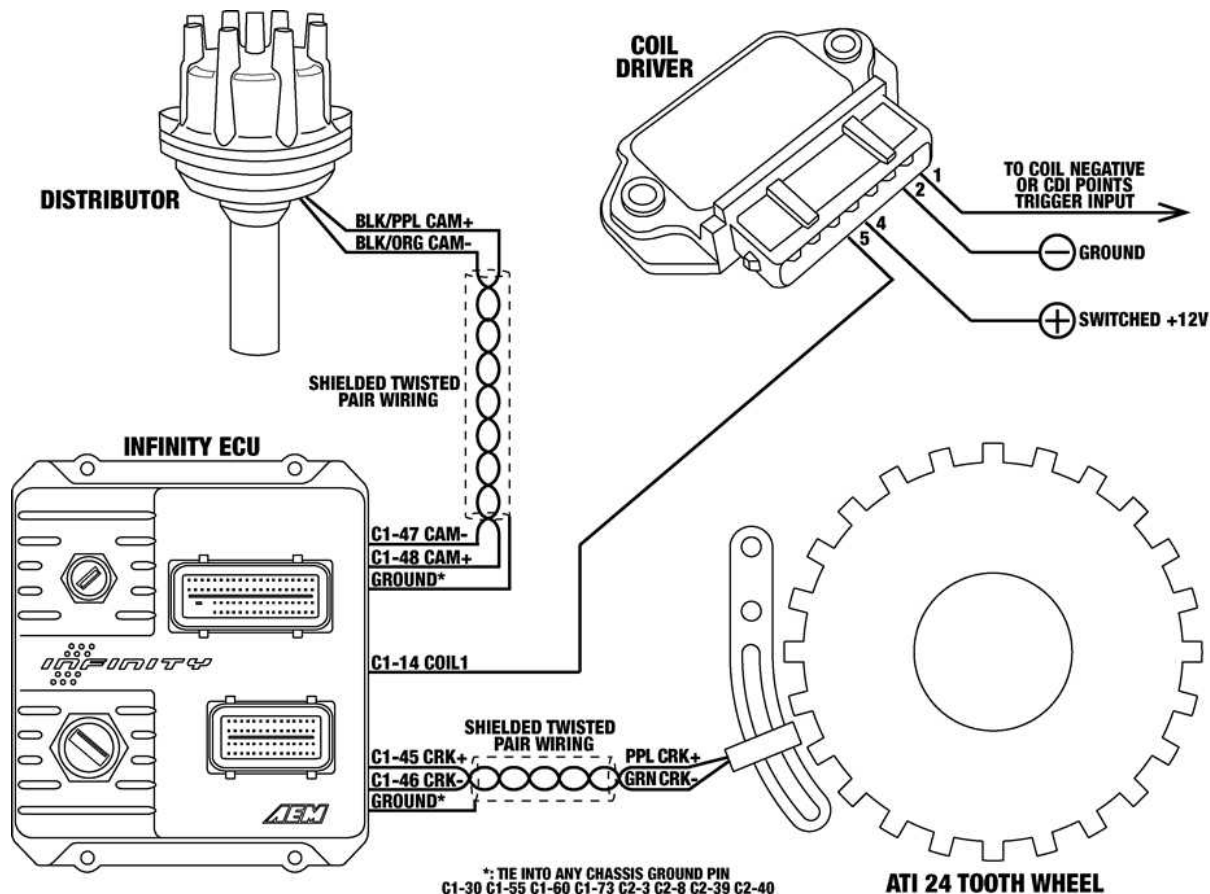
or Wiring:

Crank Sensor – Honeywell GT-101 Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Red	+12V sensor power	Main relay power out	Black/Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Sensor ground	C1-20 Sensor Ground	Black/Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
White	Crank signal	C1-21 Crk Pos Sens Hall	<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		
<b>Note: Use shielded wiring with drain to ground.</b>					

4. Load ATI 24 + GT101 base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)



## MSD Distributor + ATI AEM 24 Tooth + MSD Magnetic VR Sensor



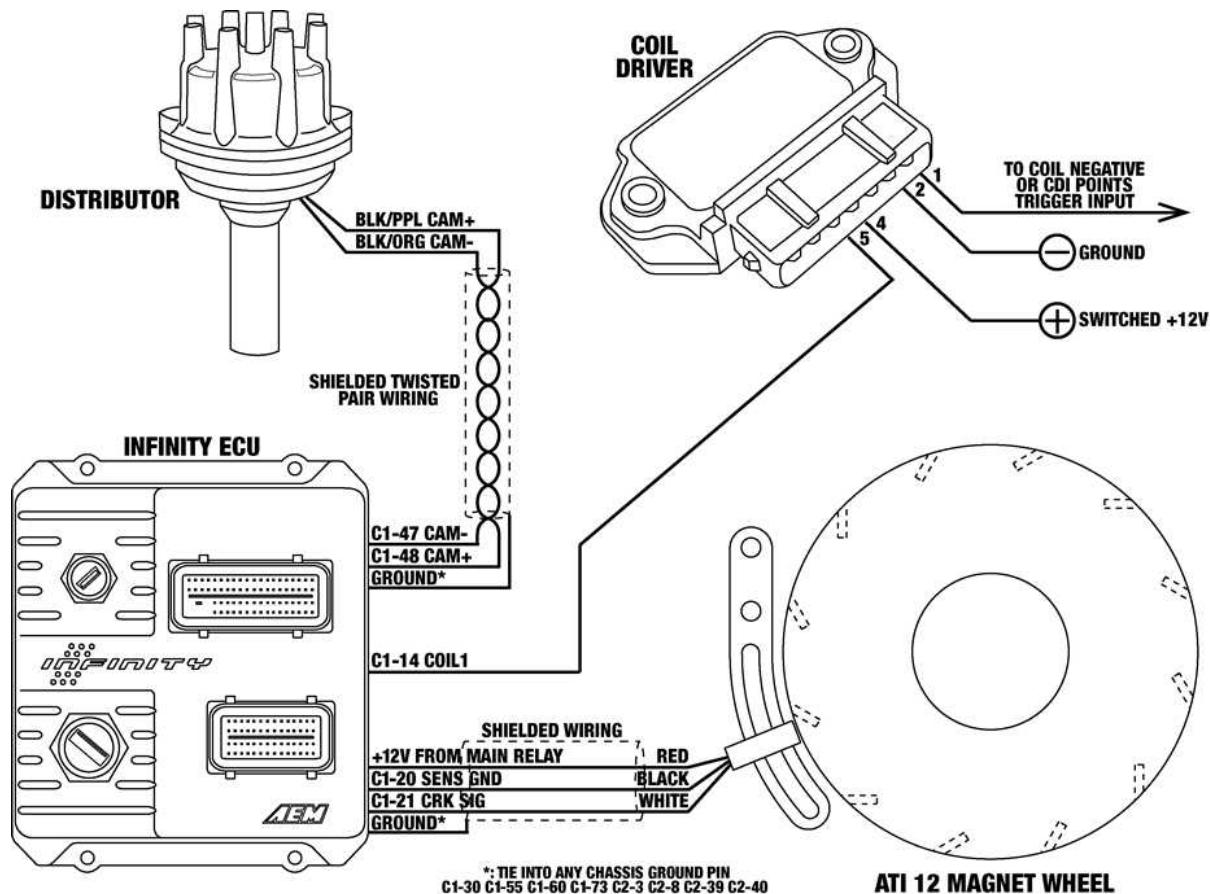
1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI AEM Infinity crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between crank teeth with the engine at TDC. Set sensor air gap to .022".
3. Wiring – **\*\*NOTE\*\* Sensor wiring for Infinity may be different from what MSD instructions indicate.** The Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

Crank Sensor – Honeywell High Output VR Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Purple	Crank signal +	C1-45 Crk Pos Sens VR+	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Green	Crank signal -	C1-46 Crk Pos Sens VR-	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

4. Load ATI 24 + MSD VR base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)



## MSD Distributor + ATI Flying Magnet + Honeywell GT101 Sensor



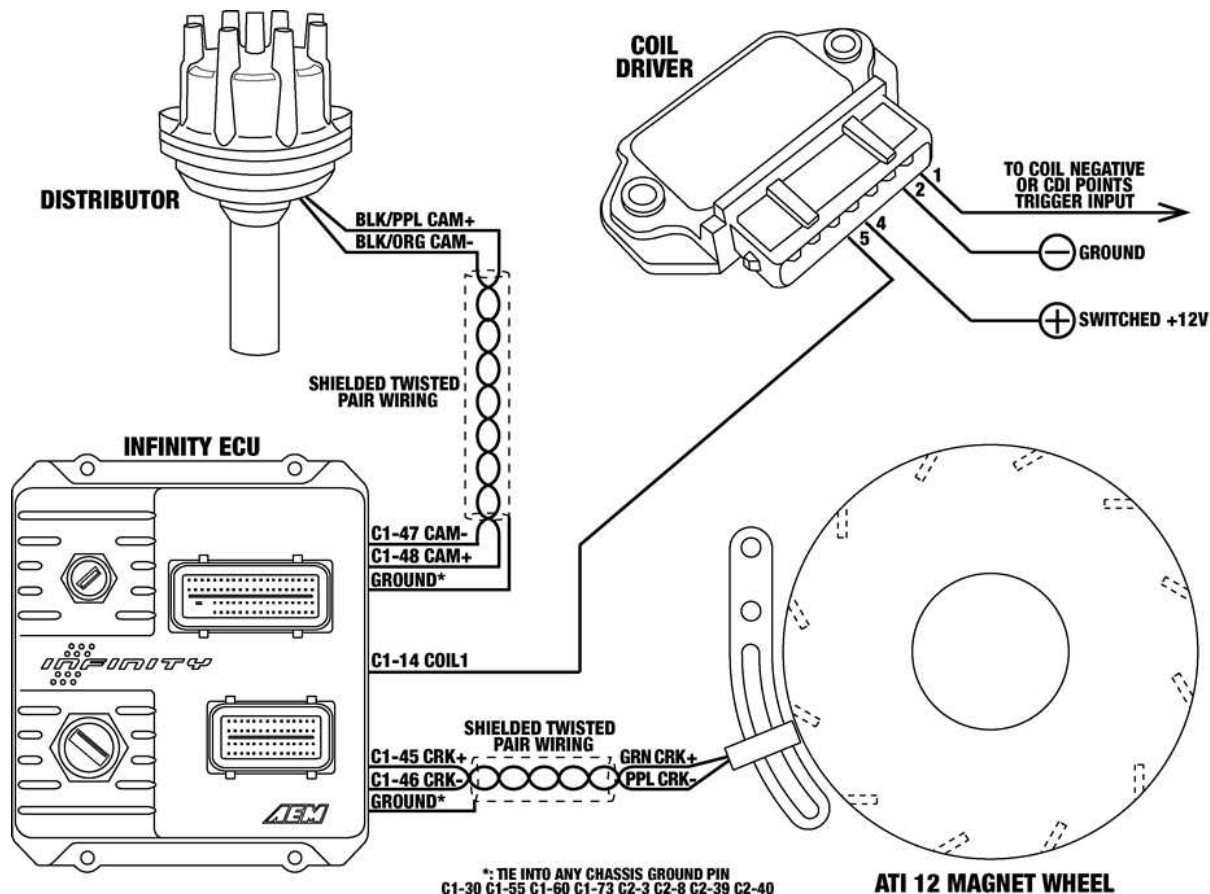
1. Modify and install mechanical distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI Flying Magnet crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between magnet targets with the engine at TDC. Set sensor air gap to .053".
3. Wiring:

Crank Sensor – Honeywell GT-101 Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Red	+12V sensor power	Main relay power out	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Black	Sensor ground	C1-20 Sensor Ground	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
White	Crank signal	C1-21 Crk Pos Sens Hall	<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		
<b>Note: Use shielded wiring with drain to ground.</b>					

4. Load ATI 12 + GT101 base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)



## MSD Distributor + ATI Flying Magnet + MSD Non-Magnetic VR Sensor

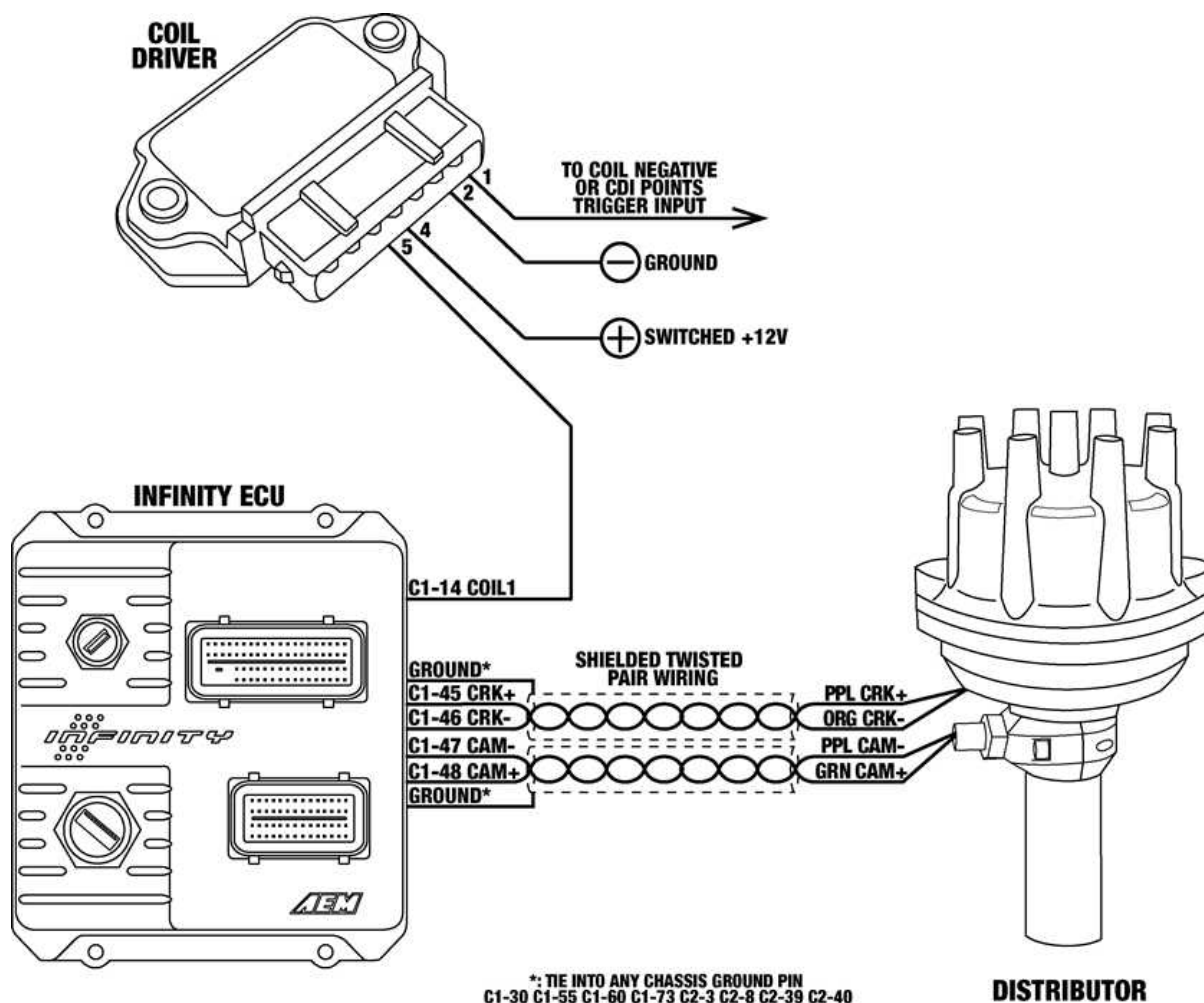


1. Modify and install mechanical advance distributor. (See [Modifying Mechanical Advance Distributor](#), in this document.)
2. Install ATI Flying Magnet crank trigger. (Note that an adjustable sensor mount is not provided with the ATI crank trigger.) Position the crank sensor to be near the middle of its adjustment range while being in between magnet targets with the engine at TDC. Set sensor air gap to .040".
3. Wiring – **\*\*NOTE\*\* Sensor wiring for Infinity may be different from what MSD instructions indicate.** The Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

Crank Sensor – MSD Non-Magnetic VR Sensor			Cam Sensor – Modified MSD Distributor		
Wire	Desc	Connect To	Wire	Desc	Connect To
Green	Crank signal +	C1-45 Crk Pos Sens VR+	Black/ Purple	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Purple	Crank signal -	C1-46 Crk Pos Sens VR-	Black/ Orange	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

4. Load ATI 12 + MSD Non-Mag base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
5. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## MSD 2345 Cam Sync Distributor



The MSD 2345 Cam Sync distributor outputs both an 8 tooth per cycle VR crank position signal and a single VR cam position signal. As the distributor comes assembled from the factory, a crank trigger tooth is being sensed at the same time that the cam trigger is being sensed. Ideally, the cam signal will occur with some "buffer" time before the next crank tooth is sensed by the crank sensor. The cam sensor mount on the MSD 2345 distributor is adjustable allowing the cam signal to be moved relative to the crank signal. The following instructional describes how to adjust the distributor for proper setup and assumes that the distributor will be installed into the engine so that the cap hold down hardware is crosswise with the engine with the cam and crank sensor wires exiting on the even-cylinders side of the engine. Terminal #1 will point toward cylinder #1.

**\*\*NOTE\*\*** AEM recommends thoroughly testing any "dual sync" style distributor to ensure that it offers acceptable ignition timing control.

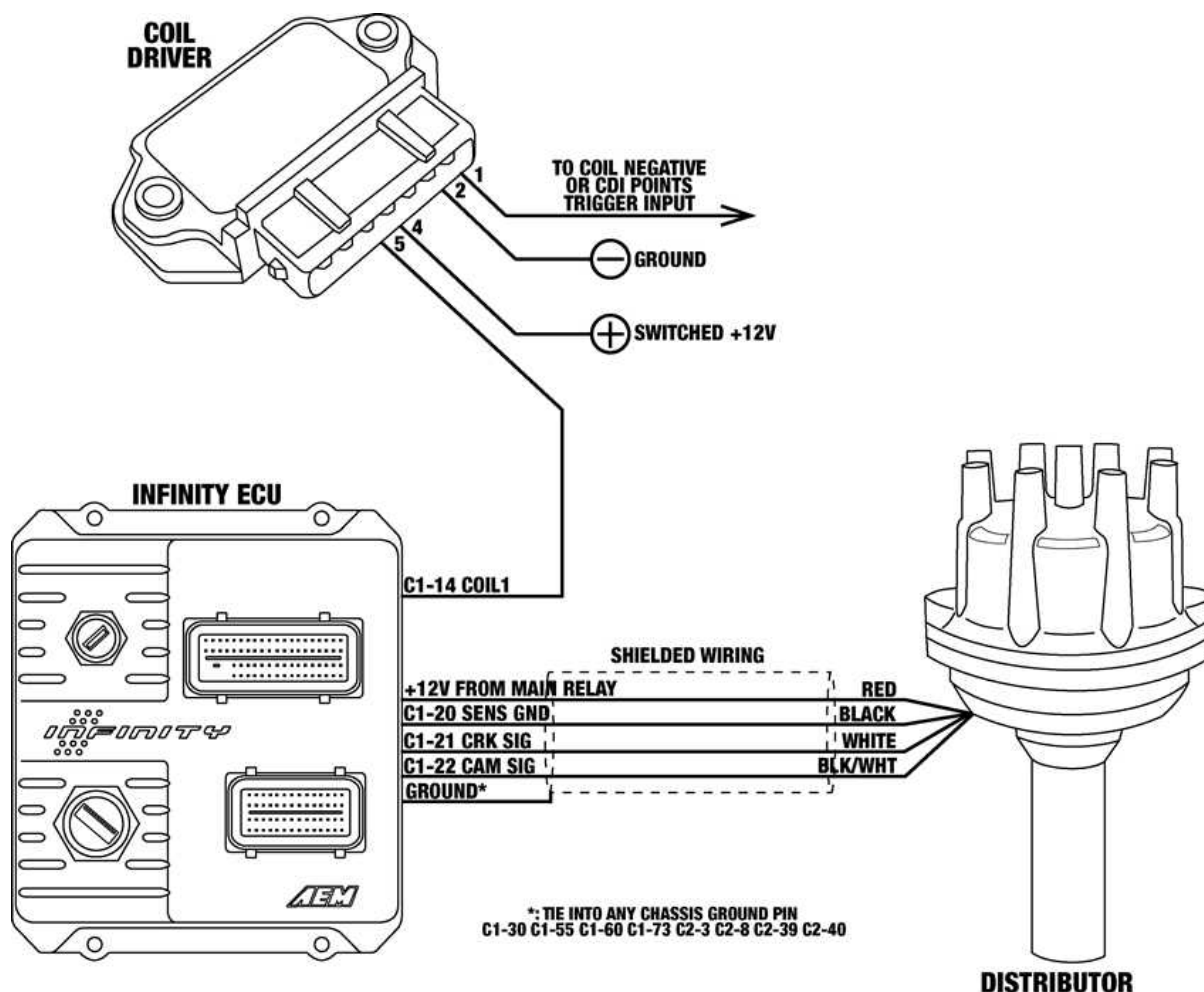
1. Mark distributor base with terminal #1 location and remove distributor cap.
2. Measure distance from back of cam sensor to sensor mount; record for future reference.
3. Back off cam sensor lock nut and remove cam sensor. Notice that the housing behind the cam sensor mount collar is "windowed" allowing for the cam sensor location to be adjusted.
4. Rotate distributor shaft in direction of normal rotation (CW for Chevy) until cam trigger magnet is visible in cam sensor hole. Notice that cam trigger magnet is inline with rotor when rotor is at center adjustment.

5. With cam trigger magnet in center of sensor hole, check the position of the crank trigger tooth that's nearest the crank sensor pickup. If crank trigger tooth is currently inline with crank sensor pickup, the cam sensor mount will need to be adjusted so that a crank trigger tooth is NOT being sensed by the crank sensor when the cam trigger is being sensed by the cam sensor.
6. Mark the position of the cam sensor mount collar relative to the distributor housing and then loosen the two screws securing the collar until it can be moved back and forth.
7. Rotate the distributor in the direction of normal rotation slightly until current crank tooth that was inline with crank sensor pickup is now beyond the sensor pickup. Continue to rotate the distributor shaft until the crank sensor pickup is evenly in between the two crank teeth.
8. Hold the distributor shaft in current position and then rotate cam sensor mount collar until cam trigger magnet is centered in sensor hole. Tighten the collar screws.
9. Rotate the distributor clockwise (from top) until cam trigger magnet is in center of sensor mounting hole. Cam and crank triggers are in properly relationship if when the cam trigger magnet is centered in the sensor mounting hole, that a crank trigger tooth is NOT inline with the crank sensor pickup. Ideally, the crank sensor pickup will be in between crank trigger teeth.
10. Re-install cam sensor to proper height and tighten lock nut.
11. Install distributor. (See [Installing Distributor](#), in this document.)
12. Wiring – **\*\*NOTE\*\* Sensor wiring for Infinity may be different from what MSD instructions indicate.** The Infinity ECU can only accept falling edge VR/mag wave forms. If in doubt, verify sensor signal with an oscilloscope.

MSD Cam Sync Distributor					
Wire	Desc	Connect To	Wire	Desc	Connect To
Purple	Crank signal +	C1-45 Crk Pos Sens VR+	Green	Cam signal +	C1-48 Cam Pos Sens 1 VR+
Orange	Crank signal -	C1-46 Crk Pos Sens VR-	Purple	Cam signal -	C1-47 Cam Pos Sens 1 VR-
<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>			<b>Note: Use shielded twisted pair wiring w/drain to ground.</b>		

13. Load MSD 2345 base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
14. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## FAST Dual-Sync Distributor



The FAST Dual-Sync distributor outputs both an 8 tooth per cycle Hall Effect crank position signal and a single Hall Effect cam position signal. The cam and crank sensor pickups inside the distributor are fixed thus no adjustment is necessary. **\*\*NOTE\*\*** During testing, this distributor exhibited degraded ignition timing accuracy. AEM recommends thoroughly testing any "dual sync" style distributor to ensure that it offers acceptable ignition timing control.

1. Install distributor. (See [Installing Distributor](#), in this document.) Final installed distributor should have rotor aligned with terminal #1 with engine at TDC for cylinder #1.
2. Wiring:

FAST Dual Sync Distributor					
Wire	Desc	Connect To	Wire	Desc	Connect To
Red	+12V sensor power	Main relay power out	White	Crank signal	C1-21 Crk Pos Sens Hall
Black	Sensor ground	C1-20 Sensor Ground	Blk/Wht	Cam signal	C1-22 Cam Pos Sens Hall
<b>Note: Use shielded wiring with drain to ground.</b>					

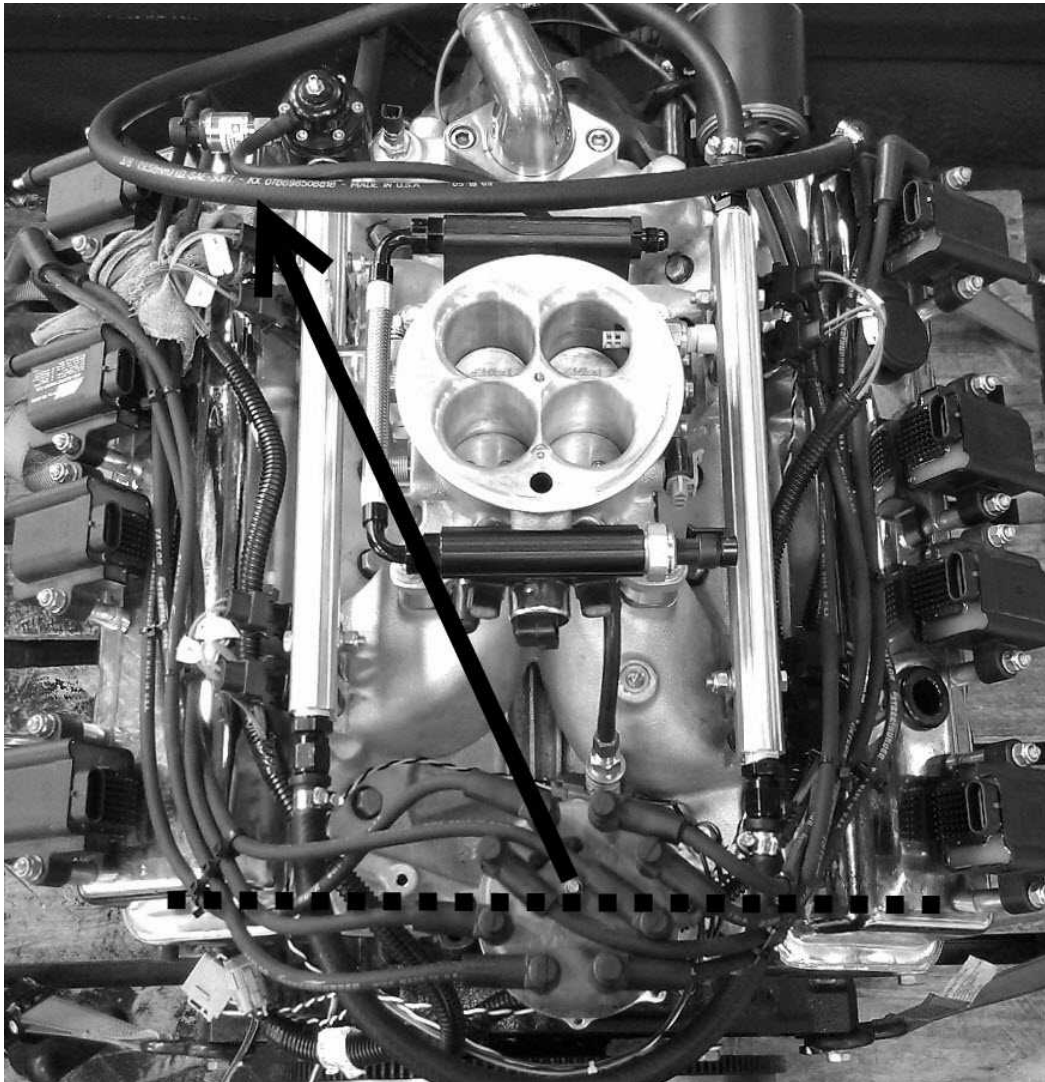
3. Load FAST base session and review Setup Wizard. (See [Setup Wizard](#), in this document.)
4. Sync ignition timing. (See [Syncing Ignition Timing](#), in this document.)

## Modifying Mechanical Advance Distributor

The following steps outline the necessary steps to modify a mechanical advance distributor for use with the AEM Infinity EMS. Of particular importance is identifying the correct tooth on the eight tooth reluctor wheel that is to become the single pulse cam trigger once all other teeth have been removed in order to achieve proper ignition sync and rotor phasing. The distributor will be set up in a way that the cam pulse occurs 90° before TDC for cylinder #1. These instructions must be closely followed if the supplied base sessions are to be used.

### Step 1

Identify terminal #1 on the distributor cap as if the distributor were installed in the engine. Distributor is to be installed into the engine so that the cap hold down hardware is crosswise with the engine (dashed lined) with the cam sensor wires exiting on the even-cylinders side of the engine. Terminal #1 is the terminal that points towards cylinder #1 (arrow).

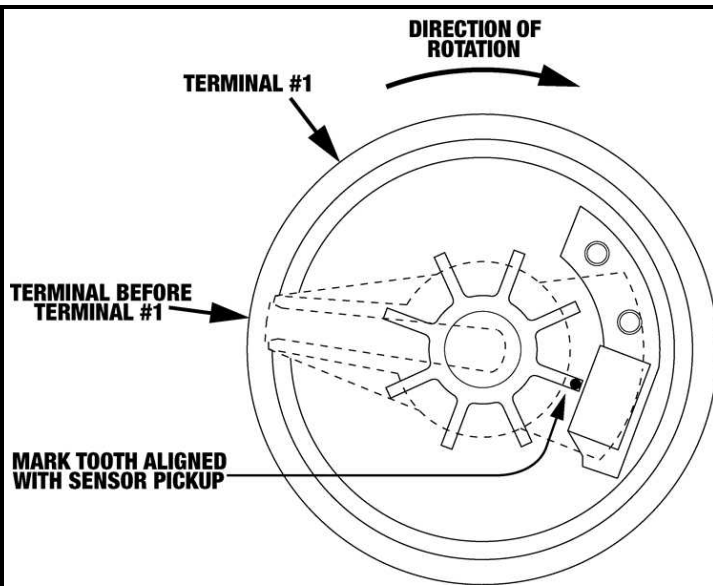


## Step 2

Once terminal #1 has been identified, mark the distributor base to indicate where terminal #1 is along with the terminal before terminal #1 (terminal #2 for Chevy). Apply masking tape to the housing first if you do not wish to permanently mark the distributor.

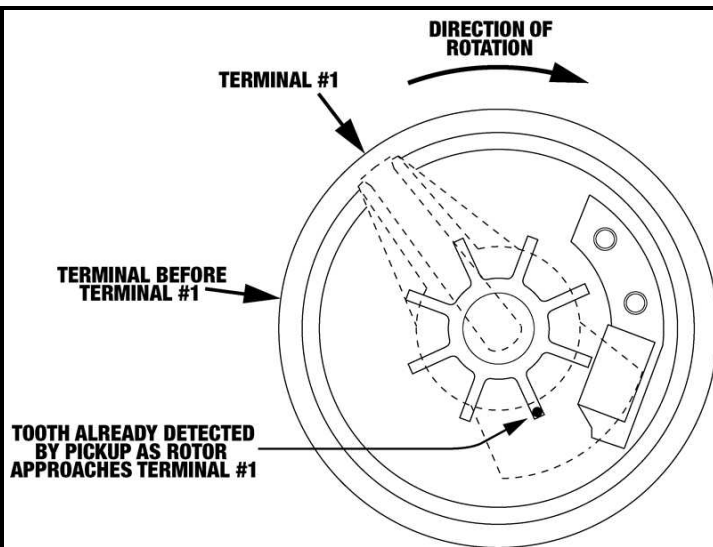
## Step 3

Remove distributor cap. Look under distributor rotor to see 8 tooth reluctor wheel and sensor pickup. Turn distributor shaft to position the rotor at the terminal **BEFORE** terminal #1 (#2 for Chevy). Note which tooth of the 8 tooth reluctor wheel is now aligned with the sensor pickup as this will become the single tooth target. Mark this tooth for reference.



## Step 4

Check that the proper tooth has been selected by turning distributor shaft in correct direction of rotation (clockwise from top for Chevy). When rotor is aligned with the terminal **BEFORE** terminal #1 (#2 for Chevy), the tooth that was selected in step 3 should be aligned with the sensor pickup. Continuing to rotate the distributor shaft to align the rotor with terminal #1 should mean that the selected tooth would have rotated past the sensor pickup. If this is true, the selected tooth is correct. If this is not true, repeat step 3 until the above condition is met.



### Step 5

Remove rotor and mechanical advance components (springs, weights, etc.) including small lock nut (circle) on the advance stop bushing pin from under advance mechanism.



### Step 6

Remove roll pin from drive gear and then remove gear from shaft. This is best completed using an arbor or hydraulic press so pressure can be applied in a slow and controlled manner. Trying to drive the pin out with a hammer and punch could potentially damage the drive gear or the distributor itself. Note that the roll pin does not need to be completely pressed out of the gear. It only needs to be pressed out far enough that the gear can be removed from the shaft.



### Step 7

Carefully remove the entire shaft assembly from the distributor housing. Be mindful of any shims and their proper location for reassembly.





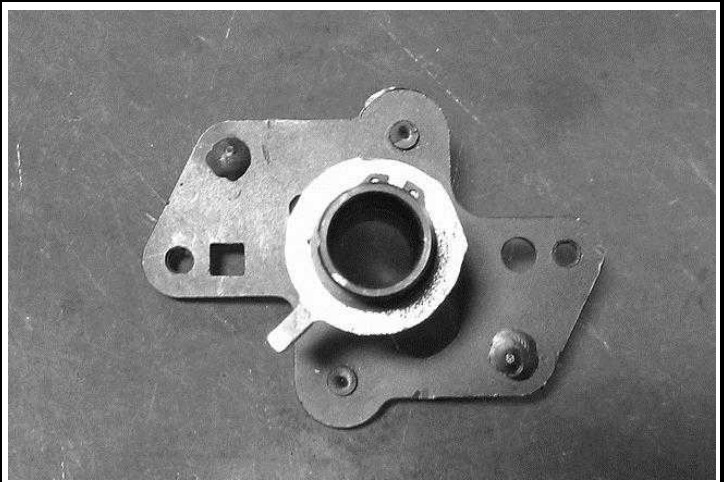
### Step 8

Remove the lower section of the advance mechanism that has the 8 tooth reluctor wheel on it by sliding it down and off the shaft.



### Step 9

Carefully remove the appropriate teeth leaving only the single tooth identified in step 3. An air grinder with cut off wheel followed by a sanding disc works well for this operation.



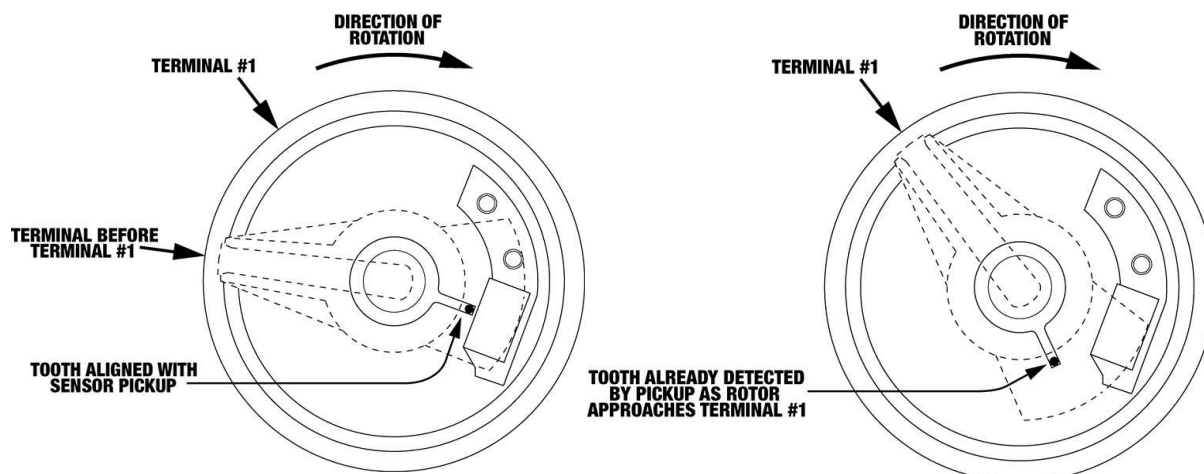
### Step 10

Re-assemble the advance mechanism by sliding the lower section back onto the shaft. Be sure to locate the advance stop bushing pin into the small hole in the lower section to lock the advance mechanism. Install the washer and lock nut onto the advance stop bushing pin.



## Step 11

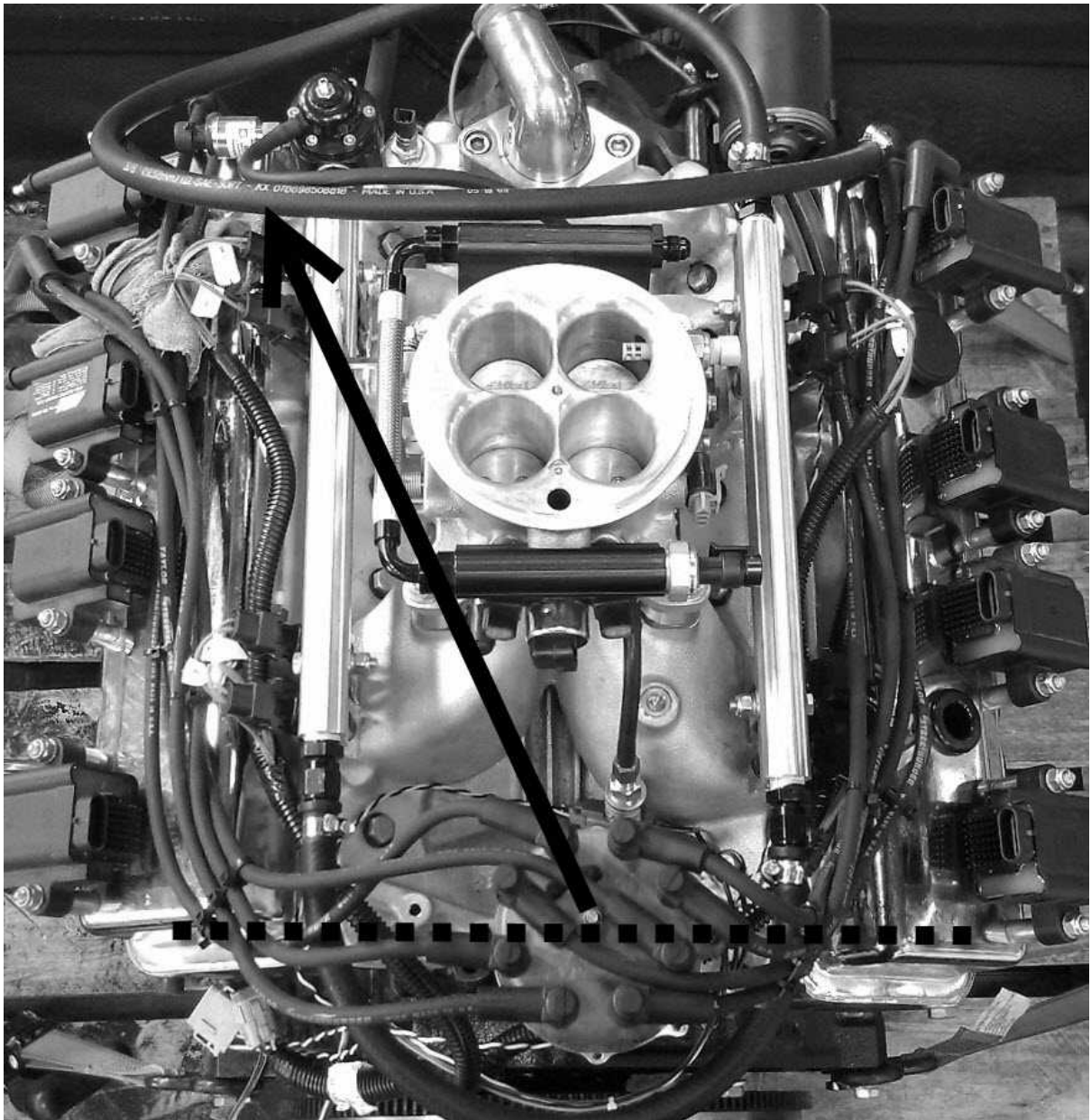
Re-assemble the distributor and perform final check of proper relationship between rotor, single tooth target, and sensor pickup. When rotor is aligned with the terminal **BEFORE** terminal #1 (#2 for Chew), the single tooth target should be aligned with the sensor pickup. Continuing to rotate the distributor shaft to align the rotor with terminal #1 should mean that the single tooth should have rotated past the sensor pickup.



## Installing Distributor

### Step 1

The distributor is going to be installed with the cap hold down hardware orientated across the engine (dashed line), terminal #1 is the terminal that points towards cylinder #1 (arrow) and wiring loom coming out of distributor is on the right.



## Step 2

Rotate engine to TDC compression for cylinder #1. Verify that engine is at TDC compression by checking that both the intake and exhaust valves for cylinder #1 are closed. Alternatively, the engine can be cranked over using the starter motor with the spark plug for cylinder #1 removed. Place your thumb over the spark plug hole and find where you feel the most pressure in correlation to when the crank balancer passes the TDC indication to determine that the engine is on the compression stroke.

## Step 3

When installing the distributor, the rotor will rotate approximately 45° clockwise as the distributor drive gear engages the cam gear. Because of this, the rotor must be rotated opposite the direction of normal rotation by one terminal position before being installed into the engine. With the rotor turned back one terminal position, check the orientation of the oil pump drive tang at the bottom of the distributor shaft.

## Step 5

Slowly lower the distributor into the engine. If distributor does not immediately drop into place, try rotating the rotor slightly in either direction in order to get the distributor drive gear to mesh with the cam gear. Additionally, the oil pump drive shaft may need to be adjusted further in order to get the distributor to drop completely down into the engine.

## Step 4

Check the orientation of the oil pump drive shaft in the engine and adjust it as necessary using a long screwdriver so that the oil pump drive tang on the distributor correctly engages the oil pump drive shaft as the distributor is installed into the engine.

## Step 6

Once distributor is fully installed into engine, verify that rotor is lined up with the cylinder #1 terminal position while the engine is still at TDC. If rotor is not lined up, the above process will need to be repeated until it is.

**\*\*NOTE\*\*** It is highly recommended that the distributor cap have a “window” put into it in order to check rotor phasing on terminal #1 once the engine is running.

## LOADING BASE SESSION

For each different combination of cam/crank triggers and distributors used, there is a provided base session that must be loaded into the Infinity ECU. Once the base session has been loaded, the setup wizards will need to be reviewed and the ignition timing will need to be synced using the **InfinityV8** layout.

1. Connect USB comms cable between ECU and PC.
2. Turn ignition switch on.
3. Open InfinityTuner; connection status should be green and indicate ECU type.



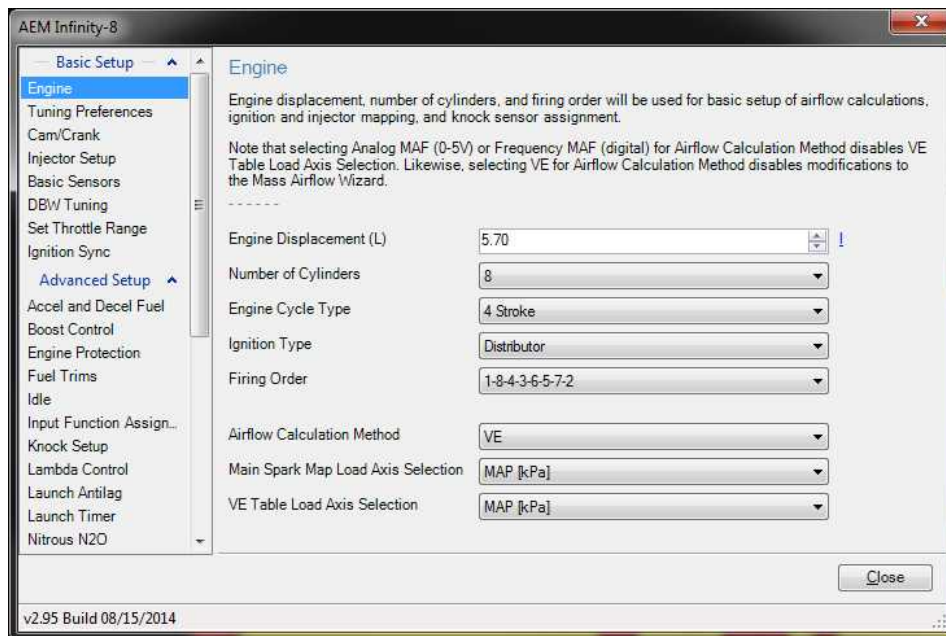
4. Open Infinity V8 layout: Layout>Open Layout. Layout is located in My Documents>AEM>Infinity Tuner>Layouts.
5. Upload base session: File>Import Calibration Data. Base session is located in My Documents>AEM>Infinity Tuner>Sessions.
6. After session has loaded, turn ignition switch off, wait for main relay to click off, and then turn ignition switch back on.
7. After comms have been reestablished, review Setup Wizard: Plug-ins>Wizard>Setup Wizard.

## SETUP WIZARD

The follow is an overview of the basic wizard settings that need to be checked before attempting to start and run an engine. Please refer to the main Infinity user guide for information about the advanced wizard settings.

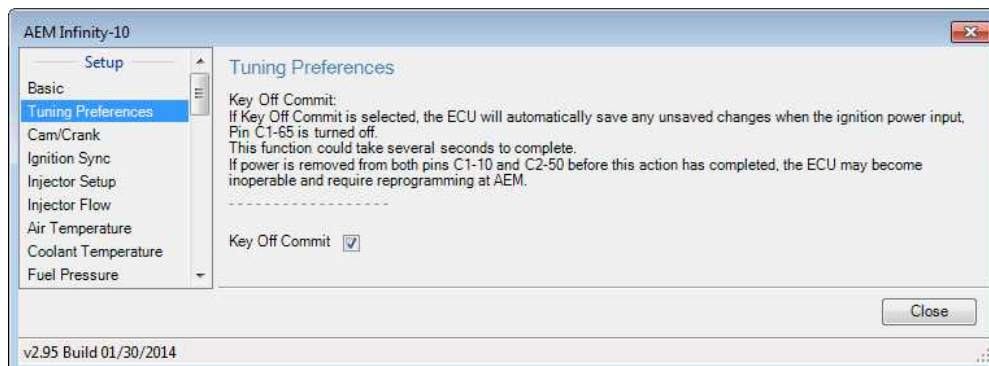
### Engine

Set engine displacement, number of cylinders, engine cycle type, ignition type, and firing order as necessary.



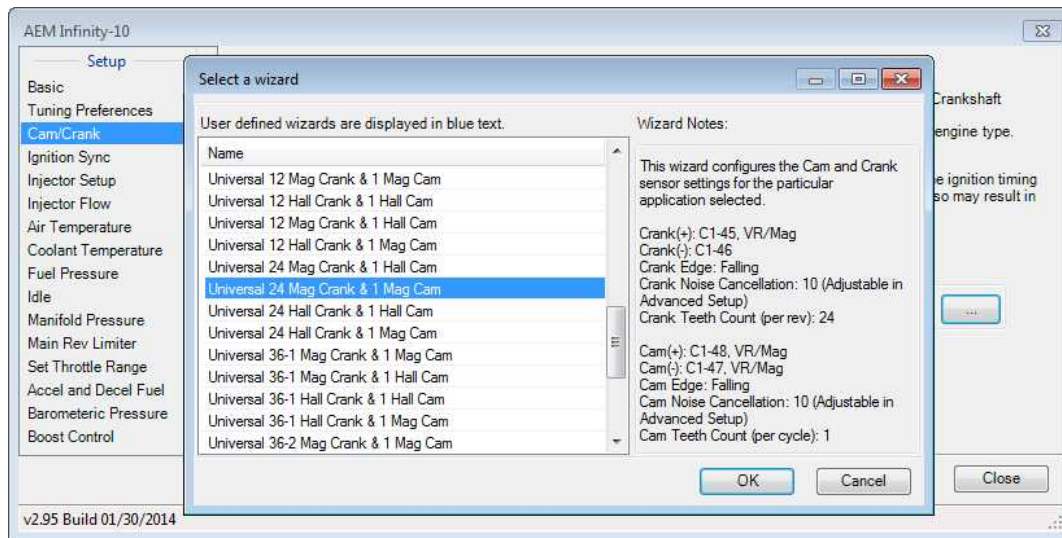
### Tuning Preferences

If Key Off Commit is selected, the ECU will automatically save any unsaved changes when the ignition power input (pin C1-65) is turned off. This function could take several seconds to complete. If battery permanent power (pins C1-10 and C2-50) is removed before this action has completed, the ECU may become inoperable and require reprogramming at AEM. It is generally recommend that Key Off Commit be used.



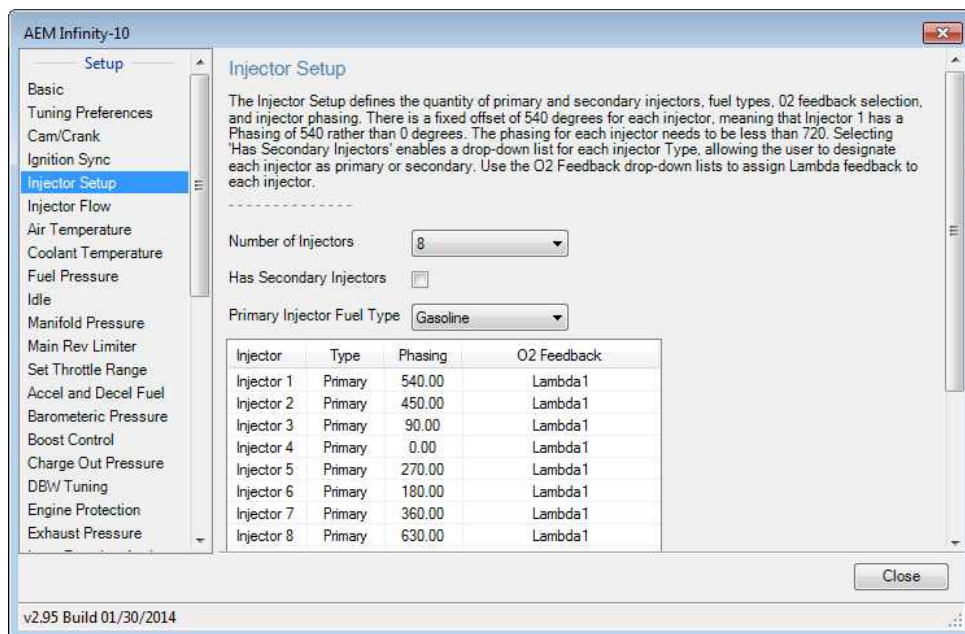
## Cam/Crank

The cam/crank wizard selects the sensor type, trigger pattern and noise filter settings. Note that “No wizard is selected or matched” may be indicated because the loaded base session has cam/crank setting values that have already been set for the specific combination that do not match the preset wizard values. Selecting a preset cam/crank wizard configuration will overwrite any cam/crank settings that may already exist in the base session. In other words, do not change these settings unless a different combination of parts is being used from what the base session was created for.



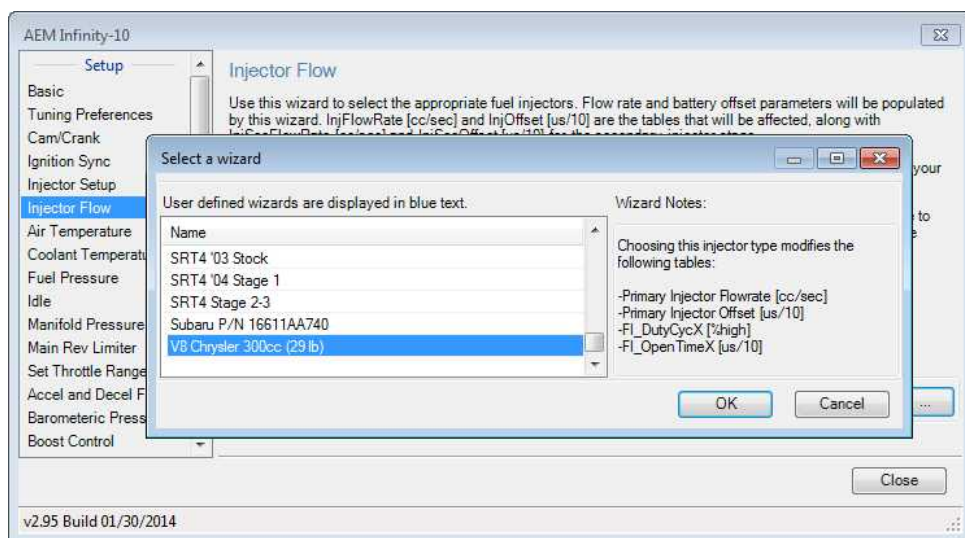
## Injector Setup

Verify number of injectors and select Primary Injector Fuel Type (gasoline, ethanol, methanol, E85, or flex fuel). Injector phasing values are automatically set based on the firing order selected in the Engine wizard and should not need adjusting.

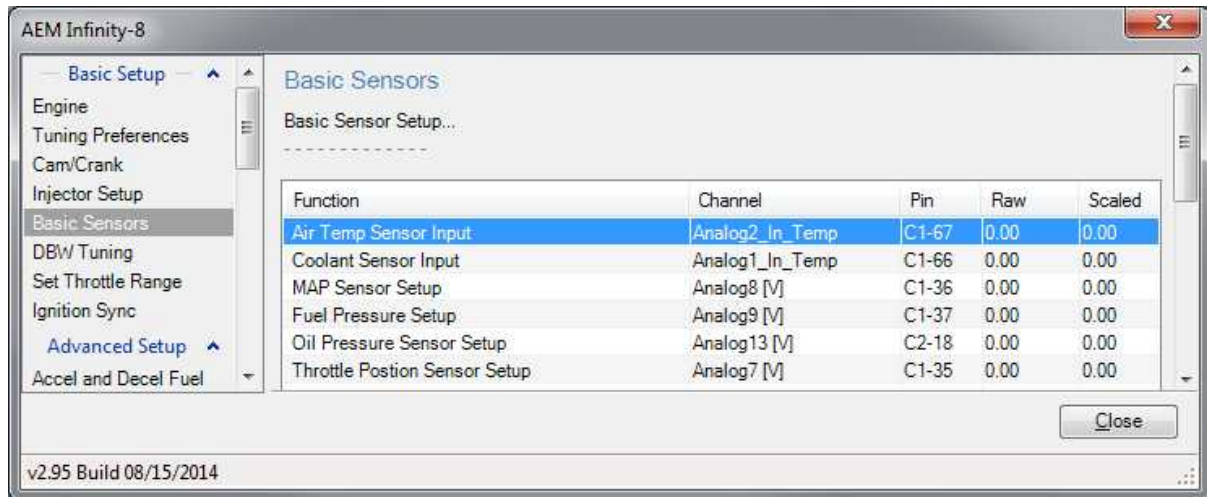


## Injector Flow

Select Primary Fuel Pressure Regulator Reference (manifold or atmospheric) and Primary Injector Flow Wizard.



## Basic Sensors



### Air/Coolant Temperature

Select the air and coolant temperature sensors being used.

### Fuel Pressure

Set the Static Fuel Pressure value. If using a fuel pressure sensor, check Calculate Fuel Pressure from Sensor and then browse to select the correct Fuel Pressure Sensor wizard setting. If not using a preselected pressure sensor, input sensor calibration values. If not using a fuel pressure sensor at all, uncheck Calculate Fuel Pressure from Sensor, check Fuel Pressure Sensor Failsafe On, and set Fuel Pressure Sensor Failsafe to your base fuel pressure value. Using a fuel pressure sensor is highly recommended, however it is not a requirement for the ECU to function correctly.

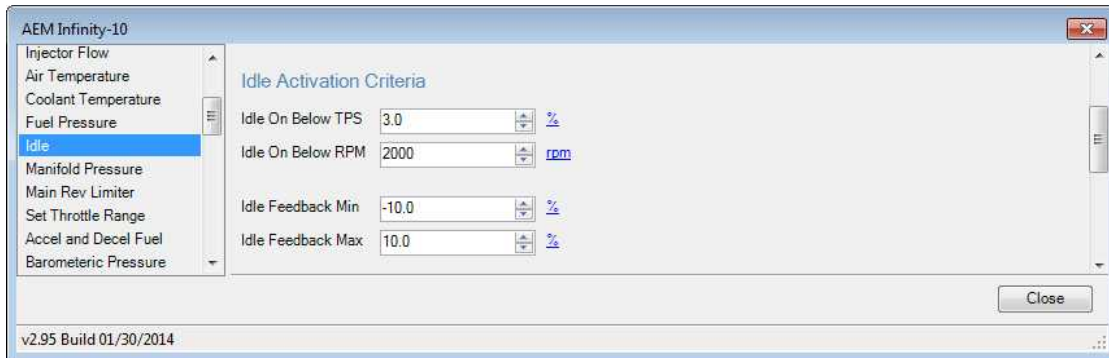
### Manifold Pressure

Select MAP Sensor Setup. If not using a preselected MAP sensor, enter in sensor calibration values.



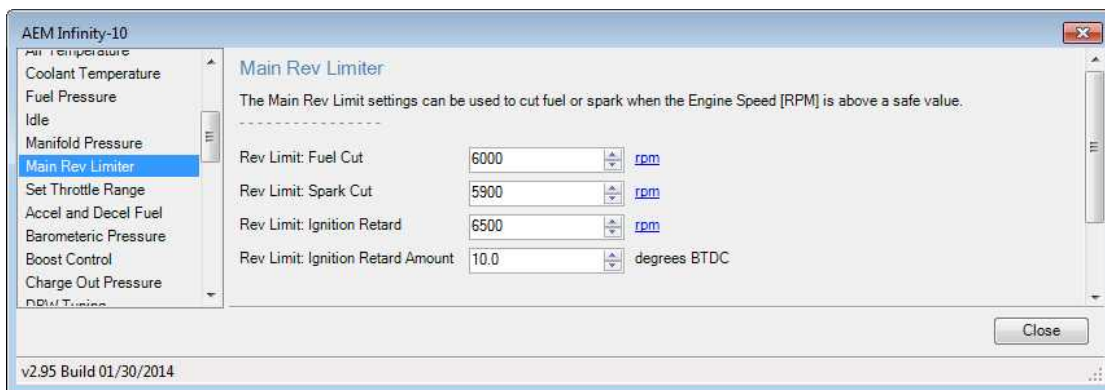
## Idle

Set the idle activation criteria.



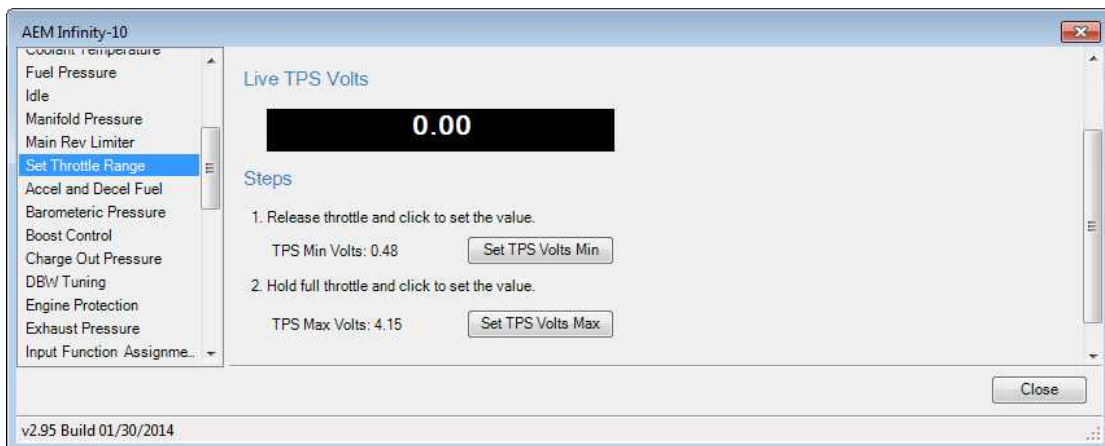
## Main Rev Limiter

Set desired main rev limiter settings.



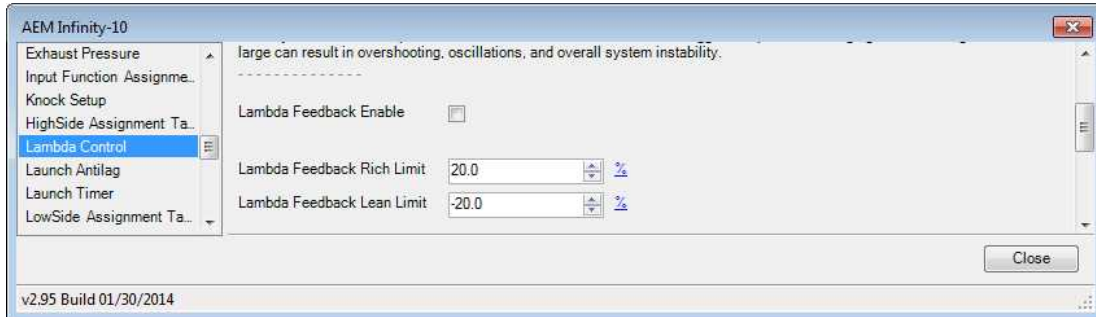
## Set Throttle Range

Follow the indicated steps to set the throttle range.



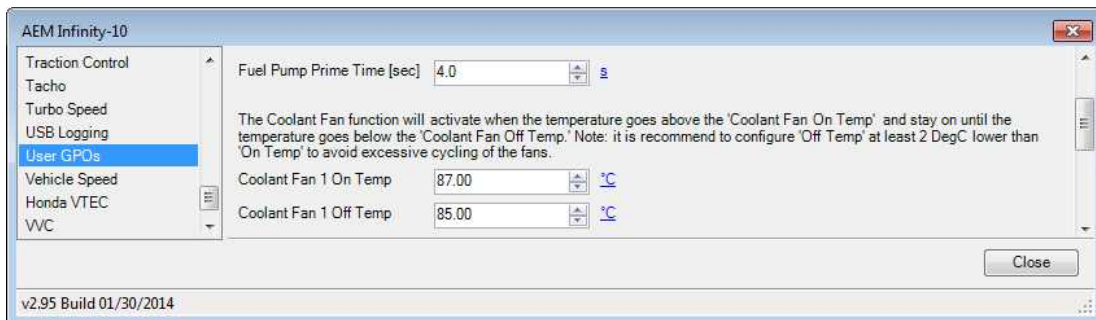
## Lambda Control

It is generally recommend that lambda feedback not be used during initial VE table tuning. Uncheck Lambda Feedback Enable.



## User GPOs

Set the Fuel Pump Prime Time and Coolant Fan 1/2 On/Off Temp (if used) values.



## SYNCING IGNITION TIMING

Syncing the ignition timing ensures that the indicated ignition timing in the software matches the actual ignition timing on the engine when checked with a timing light. Although the previous setup instructions may have been closely followed when configuring the cam and crank inputs, it should still be considered mandatory that the ignition timing be correctly synced before attempting to start and run the engine.

1. Unplug all fuel injectors or disable fuel pump to ensure that no fuel can be injected during cranking.
2. Open the Setup Wizard and select the Ignition Sync wizard.
3. Under Ignition Timing, check the lock ignition timing option and set the value to an ignition timing amount that can be easily verified (0° TDC, 10° BTDC, etc.) with a timing light. Locking the ignition timing ignores the ignition map and any other ignition trims and sets the timing to a fixed value.
4. Crank the engine and check the ignition timing using a timing light to verify that the timing at the crankshaft matches the locked ignition timing value. **\*\*NOTE\*\* The channel "Sync State" must go from 0 to 1 before the ECU will fire coils or injectors.**
5. If there is a deviation between the locked timing value and the actual ignition timing observed with the timing light, use the Sync Adjustment advance/retard buttons to adjust the timing until it matches the locked timing value. As the Sync Adjustment advance/retard buttons are used, the timing observed on the crankshaft will change while the locked timing value will remain the same.
6. After the ignition timing has been correctly synced, uncheck the lock ignition timing option. This puts the ignition map and any other ignition trims into effect.
7. Plug in all fuel injectors, re-enable fuel pump, and attempt to start engine if all other Setup Wizard options have been configured.
8. Once engine is running, verify ignition timing sync by repeating steps 2–6.

### TECH TIP: IGNITION PHASING, INJECTOR PHASING, AND DISTRIBUTORS

The AEM Infinity ECU bases both the ignition and injector phasing start points off of the sync event where the ECU recognizes where the engine cycle starts/stops. In a standard distributed ignition V8 application, the ECU triggers its single coil output 8 times per engine cycle. These ignition events occur every 90° of crank rotation. The terminals on the distributor cap are physically 45° apart which translates into 90° of crank rotation.

The ignition firing events can be offset 90° by adjusting the CamSyncAdjustment value (in crank teeth) and each time its offset the ignition timing will appear to be exactly the same as it was before because the 90° of crank rotation between distributor terminals "masks" any change. While changing the CamSyncAdjustment value to offset the ignition phasing by 90° will show no change in ignition timing, the injection events will however be offset by the same amount thereby changing when and where in the engine cycle that fuel is being injected.

Typically, the ignition and injection events occur roughly 360° apart with both events occurring when the piston for any one cylinder is near TDC; TDC compression for ignition and TDC exhaust for injection. Proper injector phasing can be easily verified by checking the injection event for cylinder #1 with a timing light. Place the timing lights inductive clamp around one wire of the #1 fuel injector and first check the injection event against the crank. Pointing the timing light at the crank should indicate that the injector is firing near TDC. To check that the injection event is occurring on the correct stroke, point the timing light at the window in the distributor cap used to check rotor phasing. The injection event should occur 180 rotor degrees (360 crank degrees) after the ignition event thus the back side of the rotor will be illuminated by the timing light when injector phasing is correct.

If ignition timing is properly synced but injector phasing is incorrect, the CamSyncAdjustment (initial) value can be offset by an increment of 90° to properly phase the injectors. To do this, change the CamSyncAdjustment (initial) value by however many crank teeth (ignoring missing teeth) occur in 90° of crank rotation. For a 60-2 crank wheel this is 15; for a 12 tooth trigger wheel this is 3; for a 4 tooth trigger wheel this is 1.

If all the previous configuration procedures have been closely followed and if one of the supplied base sessions is being used, it should not be necessary to check for proper injector phasing as all the supplied base sessions have been properly set. If using a one-off combination of parts not covered by this manual, it's highly recommended that the injector phasing be checked and adjusted as necessary.

# PINOUTS

## Infinity Pinout

Dedicated	Dedicated and not reconfigurable
Assigned	Assigned but reconfigurable
Available	Available for user setup
Not Applicable	Not used in this configuration
Required	Required for proper function

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C1-1	LowsideSwitch_4*	LS4	Lowside switch, 4A max, NO internal flyback diode.	Normally used as A/C Relay Control output. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-2	LowsideSwitch_5	LS5	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS5_Duty [%]" for activation.
C1-3	LowsideSwitch_6	LS6	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS6_Duty [%]" for activation.
C1-4	UEGO 1 Heat	UEGO 1 Heat	Bosch UEGO controller	Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be power by a fused/switched 12V supply.
C1-5	UEGO 1 IA	UEGO 1 IA		Trim Current signal. Connect to pin 2 of Bosch UEGO sensor.
C1-6	UEGO 1 IP	UEGO 1 IP		Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor.
C1-7	UEGO 1 UN	UEGO 1 UN		Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor.
C1-8	UEGO 1 VM	UEGO 1 VM		Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.
C1-9	Flash_Enable	Flash Enable	10K pulldown	Not usually needed for automatic firmware updates through Infinity Tuner. If connection errors occur during update, connect 12 volts to this pin before proceeding with upgrade. Disconnect the 12 volts signal after the update.
C1-10	+12V_R8C_CPU	Battery Perm Power	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered. (See C1-65.)
C1-11	Coil 4	Coil 4	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C1-12	Coil 3	Coil 3	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-13	Coil 2	Coil 2	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-14	Coil 1	Coil 1	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-15	Coil 6	Coil 6	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-16	Coil 5	Coil 5	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-17	LowsideSwitch_2	Coolant Fan 1 Control	Lowside switch, 4A max, NO internal flyback diode.	See "LowSide Assignment Tables" for output assignment.
C1-18	LowsideSwitch_3	LS3	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	Normally used as MIL output. See Wizard page "LowSide Assignment Tables" for output assignment.
C1-19	AGND_1	Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-20	AGND_1	Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
C1-21	Crankshaft Position Sensor Hall	Crankshaft Position Sensor Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-22	Camshaft Position Sensor 1 Hall	Camshaft Position Sensor 1 Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-23	Digital_In_2*	Camshaft Position Sensor 2 Hall	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-24	Digital_In_3*	Turbo Speed Hz	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Input Function Assignment for calibration constant. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-25	Digital_In_4	Vehicle Speed Sensor	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Input Function Assignment for calibration constant.
C1-26	Digital_In_5	Flex Fuel	10K pullup to 12V. Will work with ground or floating switches.	See channel FlexDigitalIn [Hz] for raw frequency input data.
C1-27	Knock Sensor 1*	Knock Sensor 1	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-28	Knock Sensor 2*	Knock Sensor 2	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options. *Pin not populated in 30-3805 Universal V8 Base harness.

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C1-29	+12V_Relay_Control	+12V Relay Control	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
C1-30	Power Ground	Ground	Power Ground	Connect directly to battery ground.
C1-31	CANL_Aout	AEMNet CANL	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-32	CANH_Aout	AEMNet CANH	Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-33	LowsideSwitch_1	Boost Control	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Setup Wizard page Boost Control for options. Monitor BoostControl [%] channel for output state.
C1-34	LowsideSwitch_0	Fuel Pump	Lowside switch, 4A max, NO internal flyback diode.	Switched ground. Will prime for 2 seconds at key on and activate if RPM > 0.
C1-35	Analog_In_7	Throttle Position Sensor	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Set Throttle Range page for automatic min/max calibration.
C1-36	Analog_In_8	MAP Sensor	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Set Manifold Pressure page for setup and calibration.
C1-37	Analog_In_9	Fuel Pressure	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Fuel Pressure page for setup and calibration.
C1-38	Analog_In_10	Baro Sensor	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Barometric Pressure page for setup and calibration.
C1-39	Analog_In_11	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as Shift Switch input.
C1-40	Analog_In_12	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as Mode Switch input.

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C1-41	+5V_Out_1	+5V Out	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-42	+5V_Out_1	+5V Out	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-43	HighsideSwitch_1*	HS1 (switched 12V)	0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assignment Tables' for configuration options. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-44	HighsideSwitch_0*	HS0 (switched 12V)	0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assignment Tables' for configuration options. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-45	Crankshaft Position Sensor VR+	Crankshaft Position Sensor VR+	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-46	Crankshaft Position Sensor VR-	Crankshaft Position Sensor VR-		See Setup Wizard page Cam/Crank for options.
C1-47	Camshaft Position Sensor 1 VR-	Camshaft Position Sensor 1 VR-	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-48	Camshaft Position Sensor 1 VR+	Camshaft Position Sensor 1 VR+		See Setup Wizard page Cam/Crank for options.
C1-49	VR+_In_2*	Non Driven Left Wheel Speed Sensor +	Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-50	VR-_In_2*	Non Driven Left Wheel Speed Sensor -		
C1-51	VR-_In_3*	Driven Left Wheel Speed Sensor -	Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-52	VR+_In_3*	Driven Left Wheel Speed Sensor +		
C1-53	DBW1 Motor -*	DBW Motor Control Close	5.0A max Throttle Control Hbridge Drive	+12V to close. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-54	DBW1 Motor +*	DBW Motor Control Open	5.0A max Throttle Control Hbridge Drive	+12V to open. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-55	Power Ground	Ground	Power Ground	Connect directly to battery ground.
C1-56	Injector 6	Injector 6	Saturated or peak and hold, 3A max continuous	Injector 6
C1-57	Injector 5	Injector 5	Saturated or peak and hold, 3A max continuous	Injector 5
C1-58	Injector 4	Injector 4	Saturated or peak and hold, 3A max continuous	Injector 4
C1-59	Injector 3	Injector 3	Saturated or peak and hold, 3A max continuous	Injector 3
C1-60	Power Ground	Ground	Power Ground	Connect directly to battery ground.



Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C1-61	+12V	+12V In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C1-62	Injector 2	Injector 2	Saturated or peak and hold, 3A max continuous	Injector 2
C1-63	Injector 1	Injector 1	Saturated or peak and hold, 3A max continuous	Injector 1
C1-64	+12V	+12V In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal pin C1-29 above.
C1-65	+12V_SW	Ignition Switch	10K pulldown	Full time battery power must be available at C1-10 before this input is triggered.
C1-66	Analog_In_Temp_1	Coolant Temp Sensor	12 bit A/D, 2.49K pullup to 5V	See "Coolant Temperature" Setup Wizard for selection.
C1-67	Analog_In_Temp_2	Intake Air Temperature	12 bit A/D, 2.49K pullup to 5V	See "Air Temperature" Setup Wizard for selection.
C1-68	Analog_In_Temp_3*	Spare Temp Input	12 bit A/D, 2.49K pullup to 5V	Normally used for Oil Temp input. *Pin not populated in 30-3805 Universal V8 Base harness.
C1-69	Stepper_2A	Stepper 2A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-70	Stepper_1A	Stepper 1A	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-71	Stepper_2B	Stepper 2B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-72	Stepper_1B	Stepper 1B	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-73	Power Ground	Ground	Power Ground	Connect directly to battery ground
C2-1	DBW2 Motor +*	DBW Motor Control Open	5.0A max Throttle Control Hbridge Drive	+12V to open. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-2	DBW2 Motor -*	DBW Motor Control Close	5.0A max Throttle Control Hbridge Drive	+12V to close. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-3	Power Ground	Ground	Power Ground	Connect directly to battery ground
C2-4	Injector 7	Injector 7	Saturated or peak and hold, 3A max continuous	Injector 7
C2-5	Injector 8	Injector 8	Saturated or peak and hold, 3A max continuous	Injector 8
C2-6	Injector 9*	Injector 9	Saturated or peak and hold, 3A max continuous	Injector 9. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-7	Injector 10*	Injector 10	Saturated or peak and hold, 3A max continuous	Injector 10. *Pin not populated in 30-3805 Universal V8 Base harness.

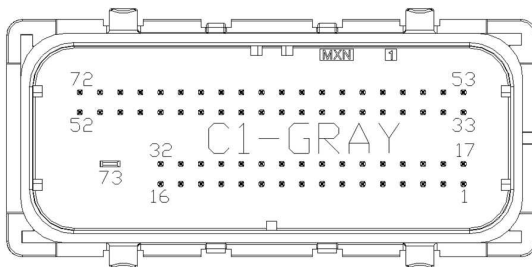
Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C2-8	Power Ground*	Ground	Power Ground	Connect directly to battery ground. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-9	+12V	+12V In	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C2-10	Injector 11	Injector 11	Saturated or peak and hold, 3A max continuous	Not used
C2-11	Injector 12	Injector 12	Saturated or peak and hold, 3A max continuous	Not used
C2-12	Analog_In_17	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as A/C Analog Request input.
C2-13	Analog_In_18*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as DBW APP1. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-14	Analog_In_19*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as DBW APP2. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-15	Analog_In_Temp_4*	Spare Temp Input	12 bit A/D, 2.49K pullup to 5V	Normally used as Charge Out Temperature input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-16	Analog_In_Temp_5*	Spare Temp Input	12 bit A/D, 2.49K pullup to 5V	Normally used as Airbox Temperature input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-17	Analog_In_Temp_6*	Spare Temp Input	12 bit A/D, 2.49K pullup to 5V	Normally used as Fuel Temperature input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-18	Analog_In_13	Oil Pressure	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Oil Pressure page for setup options. See OilPressure [psig] for channel data.
C2-19	Analog_In_14	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C2-20	Analog_In_15*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as Exhaust Back Pressure input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-21	Analog_In_16*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as DBW1_TPSB input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-22	+5V_Out_2	+5V Out	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-23	+5V_Out_2	+5V Out	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-24	+5V_Out_2	+5V Out	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-25	VR+_In_5	Driven Right Wheel Speed Sensor +	Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C2-26	VR-_In_5	Driven Right Wheel Speed Sensor -		
C2-27	VR-_In_4	Non Driven Right Wheel Speed Sensor -	Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C2-28	VR+_In_4	Non Driven Right Wheel Speed Sensor +		
C2-29	LowsideSwitch_9	Tachometer	Lowside switch, 4A max with internal flyback diode, 2.2K 12V pullup. Inductive load should NOT have full time power.	See Setup Wizard page Tacho for configuration options.
C2-30	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
C2-31	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
C2-32	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
C2-33	Analog_In_20*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-34	Analog_In_21	3 Step Enable Switch	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as 3 Step Enable Switch input.

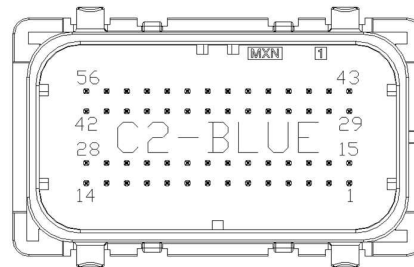
Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C2-35	Analog_In_22*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as USB Logging Request input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-36	Analog_In_23*	Spare Analog Input	12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. Normally used as Charge Out Pressure input. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-37	Digital_In_6*	Spare Digital Input	No pullup. Will work with TTL signals.	Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-38	Digital_In_7	Clutch Switch	No pullup. Will work with TTL signals.	See ClutchSwitch 1-axis table for setup options. Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-39	Power Ground	Ground	Power Ground	Connect directly to battery ground.
C2-40	Power Ground	Ground	Power Ground	Connect directly to battery ground.
C2-41	CanH_Bout	CANH	Dedicated High Speed CAN Transceiver	Not used
C2-42	CanL_Bout	CANL	Dedicated High Speed CAN Transceiver	Not used
C2-43	LowsideSwitch_8	Engine Protect Warning Out	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	Activates if any of the following flags are true: OilPressProtectOut, LeanProtectOut, CoolantProtect. Output can be assigned to other functions. See Setup Wizard page LowSide Assignment Tables for additional options.
C2-44	LowsideSwitch_7*	LS7	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	Normally used as Spare GPO1 output. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-45	UEGO 2 VM	UEGO 2 VM	Bosch UEGO Controller	Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.
C2-46	UEGO 2 UN	UEGO 2 UN		Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor.
C2-47	UEGO 2 IP	UEGO 2 IP		Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor.
C2-48	UEGO 2 IA	UEGO 2 IA		Trim Current signal. Connect to pin 2 of Bosch UEGO sensor.
C2-49	UEGO 2 HEAT	UEGO 2 HEAT		Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be powered by a fused/switched 12V supply.
C2-50	+12V_R8C_CPU	Battery Perm Power	Dedicated power management CPU	Optional full time battery power. MUST be powered before the ignition switch input is triggered. (See C1-65.)

Infinity Pin	Hardware Ref.	7100-XXXX-62 7101-XXXX-63 Function	Hardware Specification	Notes
C2-51	Coil 7	Coil 7	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-52	Coil 8	Coil 8	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-53	Coil 9*	Coil 9	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-54	Coil 10*	Coil 10	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-55	Highside Fuel Pump Switch*	Fuel Pump	Highside switch, 0.7A max, Solid State Relay, NO internal flyback diode.	+12V High Side Drive. Will prime for 2 seconds at key on and activate if RPM > 0. *Pin not populated in 30-3805 Universal V8 Base harness.
C2-56	Not used	Not used	Not used	Not used

## AEM Infinity Pin Numbering



Viewed From Wire Side



## 12 MONTH LIMITED WARRANTY

Advanced Engine Management Inc. warrants to the consumer that all AEM High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at AEM's option, when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by AEM within 30 days of the date the RMA is issued.

Please note that before AEM can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the EMS tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.