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## 5-0 IGNITE 36-2+1 PRO CRANK TRIGGER INSTALLATION MANUAL

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This installation manual is applicable to the following engine;

- Honda B Series DOHC (B16A/B16B/B18C/B18B/B20B) VTEC and Non-VTEC. NOT compatible with B20A.

**Please read this installation guide carefully prior to installing the product.**



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5-0 Ignite will only respond to queries with its direct customers that have purchased the product(s) in regard to all matters unless otherwise agreed, such as involving 3rd party queries in such situations where technical assistance is required. All ECU-related settings must be addressed to your tuner or ECU manufacturer representative/ technical support.

If in doubt, seek professional help.

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## PREFACE

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Thank you for purchasing 5-0 Ignite crank trigger kit. We have done all the hard work to ensure that your installation is a breeze and clean. Your kit should include the following items;

- 1x Crank sprocket with integrated 36-2 tooth trigger wheel
- 1x Crank sprocket key (revised version only)
- 1x Cam angle sensor unit
- 1x Crank angle sensor unit
- 1x Wiring rail
- 1x Shim set for cam angle sensor unit key drive (0.1, 0.2, 0.3, 0.4 and 0.5mm)
- 1x M6x1 socket head cap 'long' bolt for crank sensor unit
- 1x M6x1 socket head cap 'short' bolt for wiring rail
- 4x Zip ties for wiring rail
- 2x M8 dress up washers for cam angle sensor unit
- 2x M8x1.25 socket head cap bolts for cam angle sensor unit
- 1x 3 pin male Duetsch DTM connector for crank angle sensor unit
- 1x 3 pin Delphi female connector for cam sensor (option 1) **OR** 1x 3 pin male Duetsch DTM connector for cam sensor (option 2)
- 1x Cam sensor cover (option 2 only)
- 2x Cam angle sensor unit shims (keep as spare)

Purchasable components **that are required**;

- Honda USDM OBD2 Type R B series oil pump (except ACL oil pump, fitment is not guaranteed on aftermarket OBD2 oil pump where certain parts of the casting may require grinding to clear the trigger tooth)
- Honda USDM OBD2 B Series lower timing cover
- Honda USDM OBD2 B Series lower timing cover seal
- Honda B Series oil pick up gasket
- Honda B Series oil pump O-ring
- Honda OBD1 B Series crank pulley 'short' square key (if your existing engine is USDM OBD2 with a long crank key, you may cut it down to 11mm long)
- Distributor drive key and pin (taken from your existing distributor)

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## INFORMATION AND LIMITATIONS

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Installation of this kit requires moderate to advance level of mechanical skills and experience due to the requirement of timing belt removal/installation and calibration of the vehicle's ECU.

This kit will require a modern/capable ECU (Haltech, Link, Motec, Emtron, AEM) that allows you to set the trigger type (missing tooth + home), trigger edge and trigger angle.

This kit will require a sound knowledge of automotive electrical wiring systems (sheathing, splicing, crimping and terminations).

Fastening of bolts (i.e timing belt tensioner, cam pulley bolt, crank pulley etc.) shall follow manufacturer's recommended specifications.

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## PROCEDURE

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1. Set the engine to TDC.
2. Disconnect/remove;
  - a. Ancillary belts
  - b. Crank pulley
  - c. Valve cover/timing covers
  - d. Distributor
3. Ensure the engine is on T.D.C by aligning the mark on the crank timing sprocket to the oil pump.
4. Remove timing belt. Clean lower timing/oil pump area. Replace oil pump seal/water pump if required.
5. If you have an OBD1 oil pump, you need to replace it with the OBD2 oil pump along with supporting parts as per the list on previous page. Refer to factory service manual on oil pan/pump removal and installation.
6. Install the supplied crank sprocket and crank sensor unit onto the oil pump as shown. The trigger tooth is closest to the oil pump. **The OBD1 OEM washer between the oil pump and crank sprocket IS NO LONGER USED.**



*Figure 1 - Install the supplied crank sprocket and crank sensor*

7. Using the supplied socket head cap bolts, dummy fit the wiring rail onto the assembly. Long bolt goes on the exhaust side, short bolt goes on the intake side. Place one zip tie over the wiring harness to retain its position.

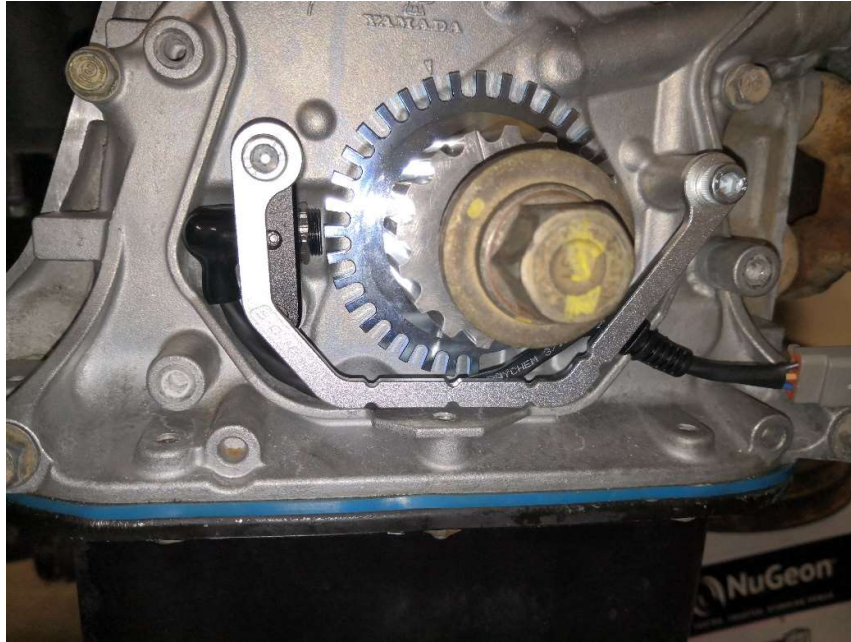


Figure 2 - Dummy fit the wiring rail and zip tie the wiring harness

8. Remove the wiring rail and zip tie the wiring harness at the remaining locations.

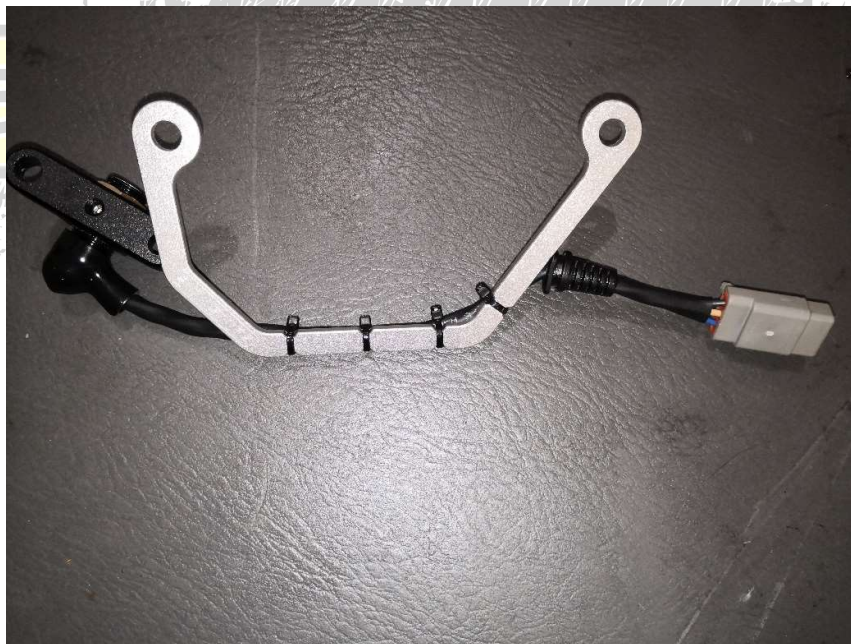


Figure 3 - Zip tie the wiring harness onto the wiring rail

9. Install the assembly back onto the oil pump and tighten the bolts to 9Nm (blue Loctite advised). Using a feeler gauge, check the gap between the trigger tooth and the sensor face. The gap is **SET** from us to be between 0.6mm to 0.9mm. If the gap is outside these values, **undo the nut and loosen the grub screw** in order to wind the sensor in/out. The crank sensor housing to the oil pump has a small amount of play that allows small adjustments of the sensor gap.





Figure 4 - Check the gap between the crank sensor and trigger tooth

10. Install the timing belt and check timing after few engine rotations.



Figure 5 - Install the timing belt

11. Install the outer timing belt washer (note direction as per FSM).



*Figure 6 - Install the outer timing belt washer (note direction as per FSM)*

12. Install the lower timing belt cover.



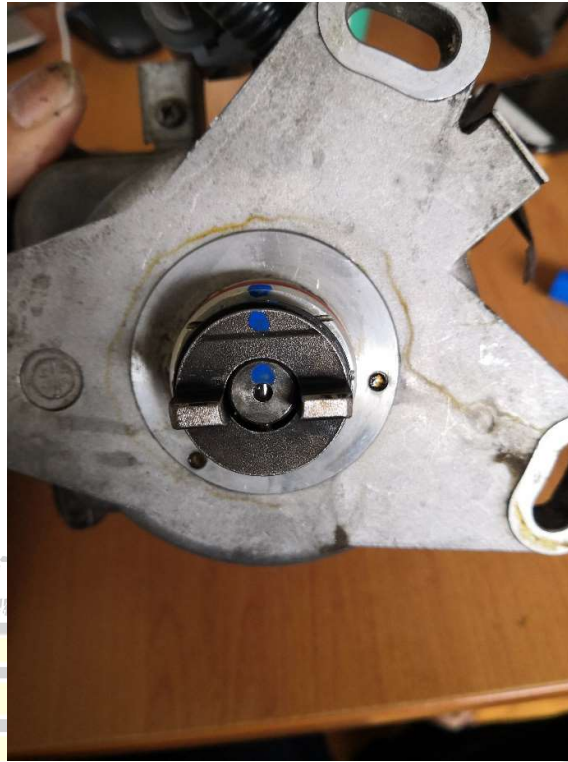
*Figure 7 - Install the lower timing belt cover*

Note: Lower timing cover is interchangeable across all B16, B18, B20 blocks. Height difference between B16 vs B18/20 is accounted on the upper timing cover.

13. Install crank pulley with the 'short' square key. If you're currently have the long USD M OBD2 crank key, you may cut it down to 11mm long.

**DISTRIBUTOR SIDE**

14. Mark alignment locations on the existing distributor as indicated for future reference.



*Figure 8 - Mark alignment locations for future reference*

15. Rotate the c-clip of the distributor drive key so that the split line is aligned with the pin hole.



*Figure 9 - Rotate c-clip to align with pin hole*

16. Using a pick, pry the c-clip towards the bottom and slide the pin out.



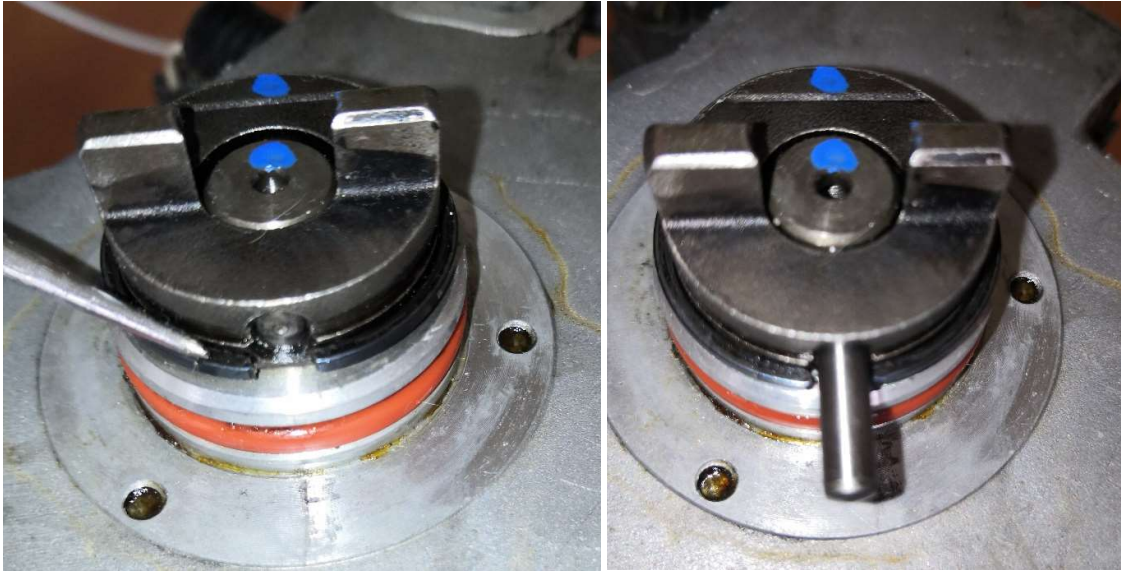


Figure 10 – Slide the pin out and remove the distributor drive key

17. On the cam sensor unit, rotate the shaft so the dot on the shaft is aligned to the alignment markers.



Figure 11 - Alignment marker on the shaft

18. Using the OEM drive key shim or the supplied shim set or a combination of either, install the drive key onto the new cam sensor unit. Reduce shim thickness if the pin is not able to slide in. Increase shim thickness if the drive key has excessive rocking. **Select the right combination of shims to minimise the rocking of the drive key.** Note the drive key alignment.





Figure 12 - Install the correct combination of shims behind the drive key (note the drive key alignment)

19. Measure distance 'A' on your engine (fit face to camshaft end) and measure distance 'B' on the cam angle sensor unit (fit face to key face). Distance 'A' must be greater than distance 'B' for clearance (i.e.  $A=18\text{mm}$  &  $B=17.5\text{mm}$  == OK). If distance 'B' is greater than distance 'A', **CONTACT US** for adjustment guidance.

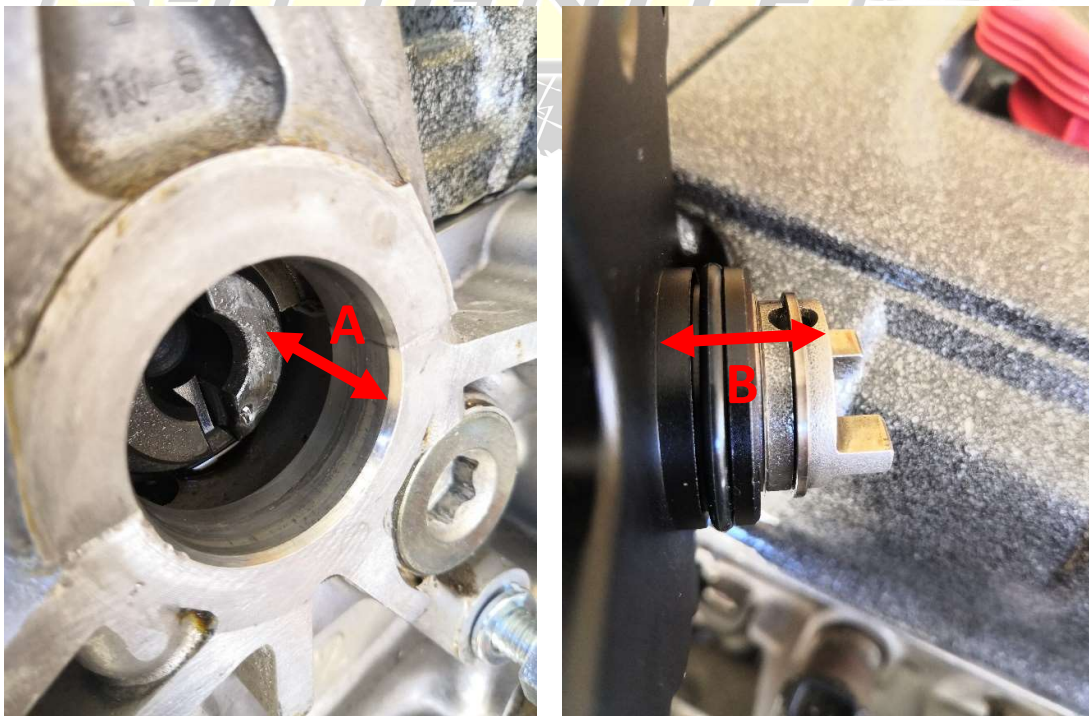


Figure 13 - Camshaft end to key drive clearance check

20. Install the cam sensor unit on the engine using the supplied bolt and washer, tighten to 24Nm.  
The drive key can only engage onto the camshaft one way.



Figure 14 - Install the cam sensor unit onto the engine

## 21. Configure the ECU trigger settings.

**Baseline Configuration for Haltech Elite ESP/NSP**

Main Setup - Elite 1500 ECU 2.43.0 - Release

Engine Functions Devices Datalog

Trigger Configuration

Trigger Type: Generic - Missing Tooth - Single Tooth Home

Trigger Signal Location: On Crank

Number Of Teeth: 36

Number Of Missing Teeth: 2

TDC Offset Angle: 455.0 °

☐ TDC Offset Angle Table Enable

RPM Filter Level: 1

Quick Start: Disable

Trigger Signal

Sensor Type: Hall Effect

Edge: Falling Edge

Filter Level: 0

Pull Up: Enabled

Ground Reference: Enable

Digital Reference: Disable

Signal Coupling: DC

Home Signal

Sensor Type: Hall Effect

Edge: Falling Edge

Filter Level: 0

Pull Up: Enabled

Ground Reference: Enable

Digital Reference: Disable

Signal Coupling: DC

Minimum RPM: 0 RPM

Synchronisation Mode: Always

Maximum RPM: 2000 RPM

Maximum Throttle Position: 0.5 %

**This is a ballpark figure to get the car started. IT IS A REQUIREMENT to use a timing light, adjust offset angle until the timing on the crank pulley matches the timing lock figure.**

**Disable if you've wired an external pull up resistor (recommended wiring)**

Figure 15 - Haltech Elite ESP/NSP Trigger Settings

- Enable timing lock (i.e. at 0°) and disable the injectors.
- With a timing light and coil on plug extension lead installed (such as DAT-Equipment TE010), crank the engine.
- Adjust the TDC offset angle until the ignition timing on the crank pulley matches the timing lock figure.
- Start the engine and idle.
- Verify the TDC offset angle.
- Once all parameters are set, disable timing lock.



Baseline Configuration for Link G4+/G4X PnP

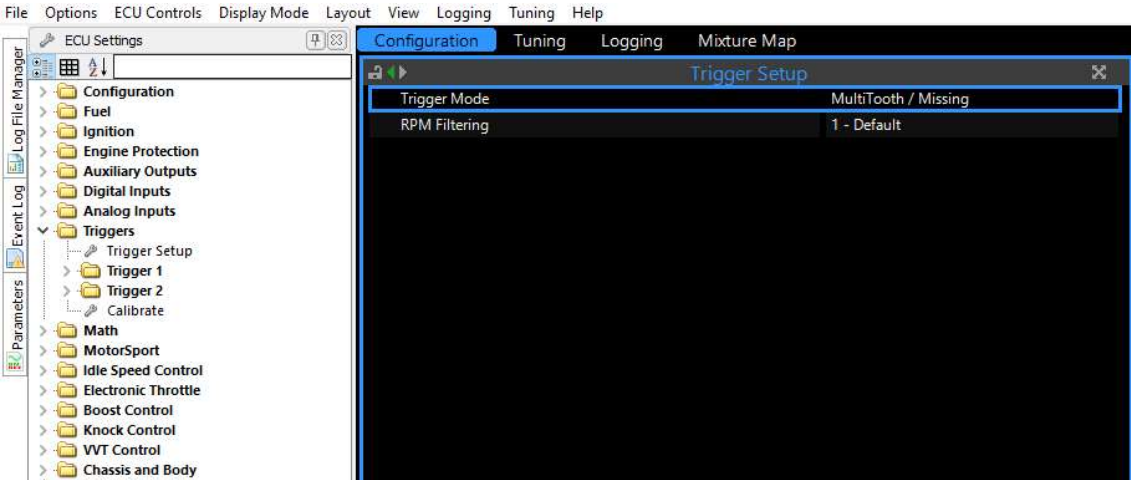


Figure 16 - Link Trigger Setup

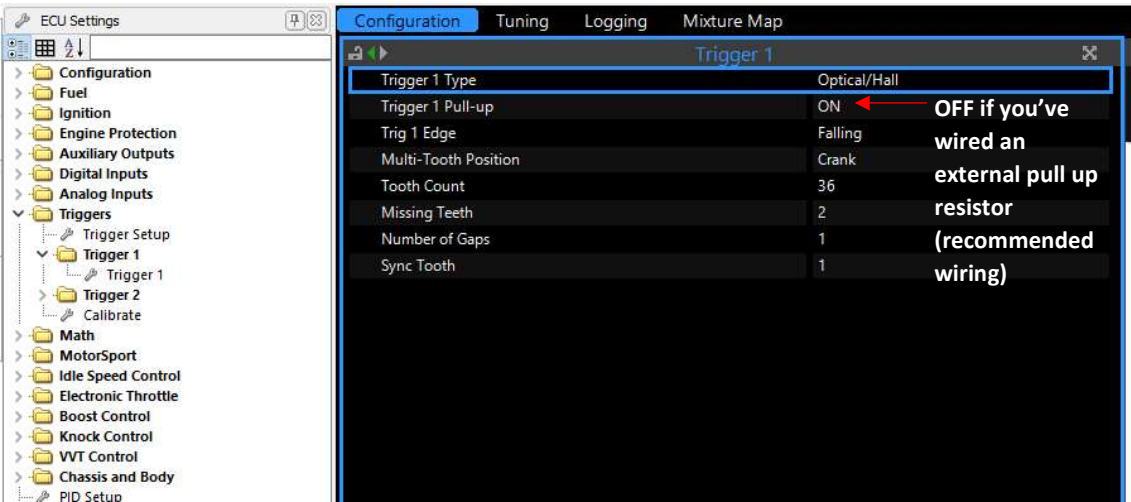


Figure 17 - Link Trigger 1 Setup

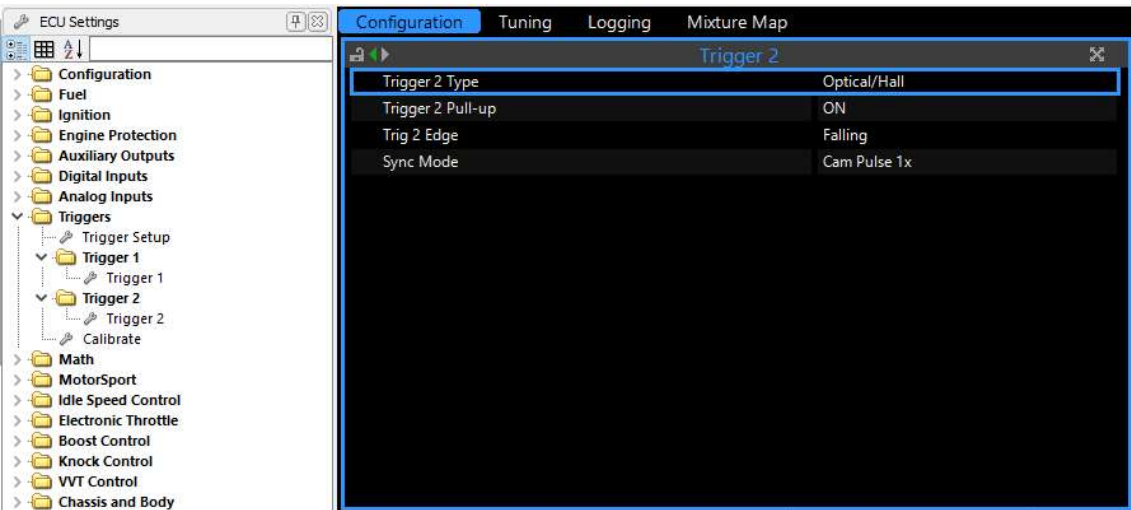


Figure 18 - Link Trigger 2 Setup

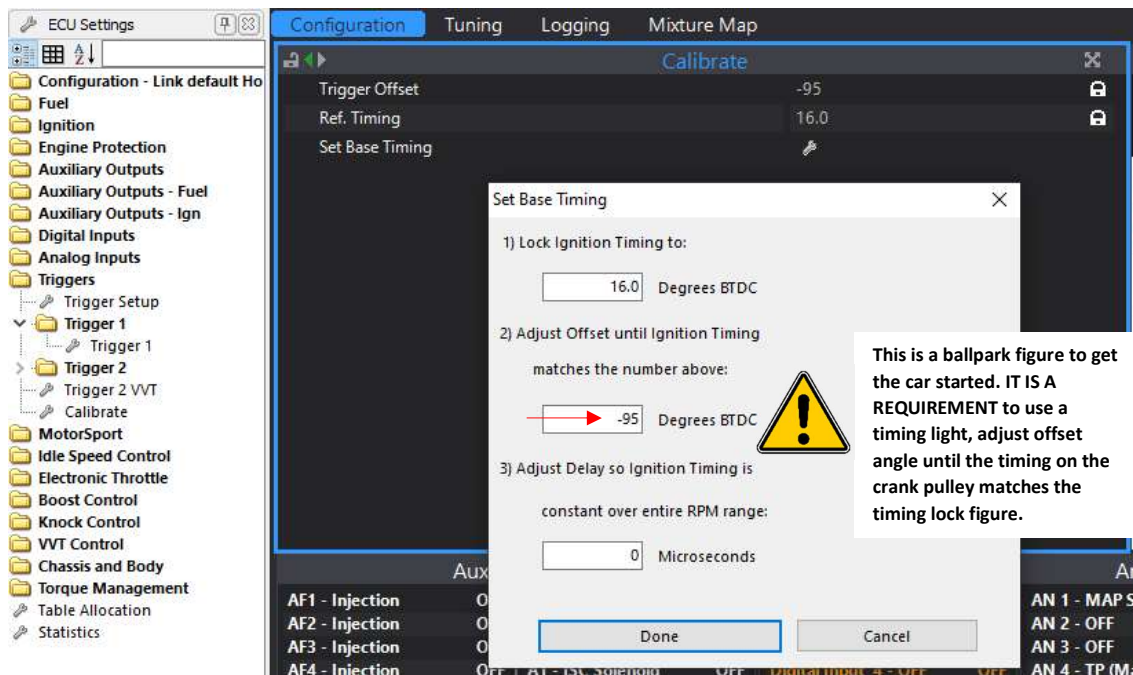


Figure 19 - Link Trigger Offset Angle Calibration

- Disable the injectors (Fuel -> Fuel Main -> Injection Mode=OFF).
- Back to Trigger Calibrations, enter 'Set Base Timing'.
- With a timing light and coil on plug extension lead installed (such as DAT-Equipment TE010), crank the engine.
- Adjust the Trigger Offset angle until the ignition timing on the crank pulley matches the timing lock figure.
- Enable the injectors and start the engine. Let it idle.
- Verify the TDC offset angle.

## TROUBLESHOOTING

PROBLEM	APPROACH
No signal output from the sensors.	<ul style="list-style-type: none"> <li>• Check if wiring is correct.</li> <li>• Ensure the crank sensor gap is set correctly.</li> <li>• Check the 12V and ground connection to the sensor.</li> <li>• Make sure pull up resistor is enabled or wired externally.</li> </ul>
Sensors are outputting signal but engine does not start. Continuous miss counts.	<ul style="list-style-type: none"> <li>• Verify crank and cam sensor wiring is correct to the ECU.</li> <li>• Verify crank and cam trigger settings are correct on the ECU.</li> </ul>
Engine misfires when clutch is pressed in.	<ul style="list-style-type: none"> <li>• Your engine has a severely worn thrust bearing causing excessive crankshaft axial movement, placing trigger teeth outside the sensor's range.</li> </ul>



## CONCLUSION

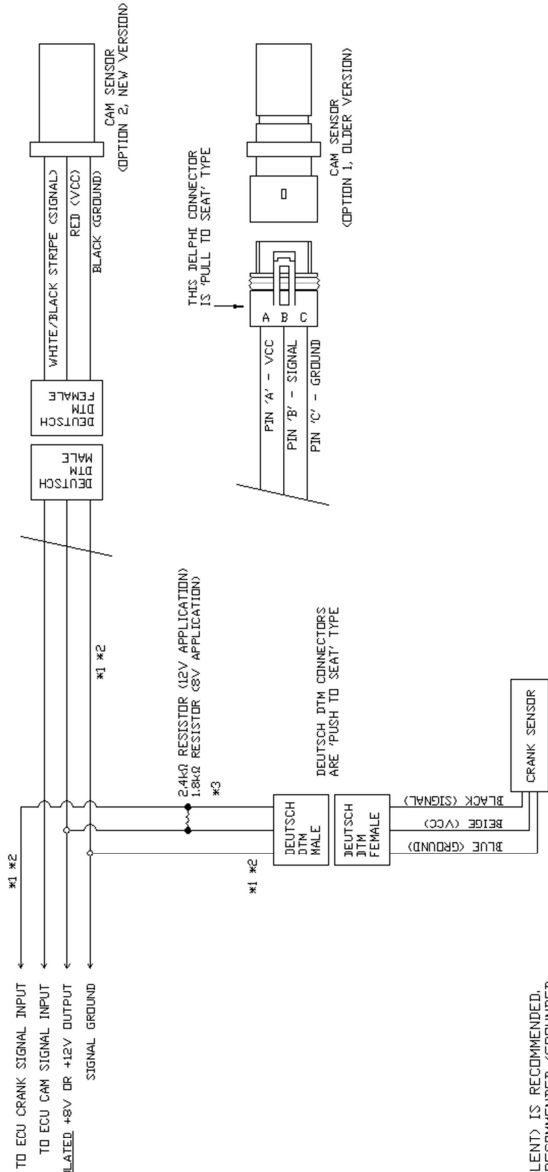
Installation is now complete. 5-0 Ignite Honda B series pro crank trigger eliminates ignition timing drift in comparison to the inferior distributor or any systems reliant on the camshaft based only. Benefits includes tuner's confidence in maximising ignition timing whilst keeping consistent engine safety margin.



WIRING DIAGRAM

HONDA B SERIES PRO CRANK TRIGGER WIRING DIAGRAM  
(RECOMMENDED DIRECT TO ECU NEW WIRING)

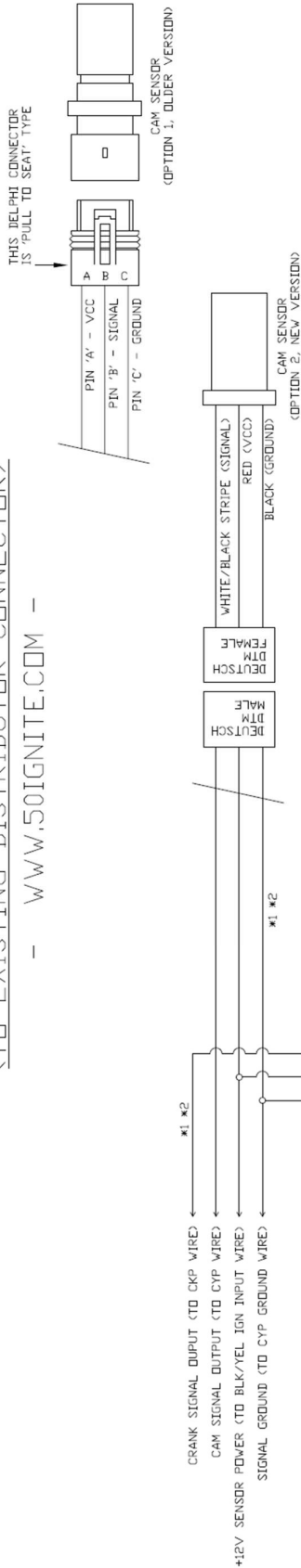
- WWW.50IGNITE.COM -



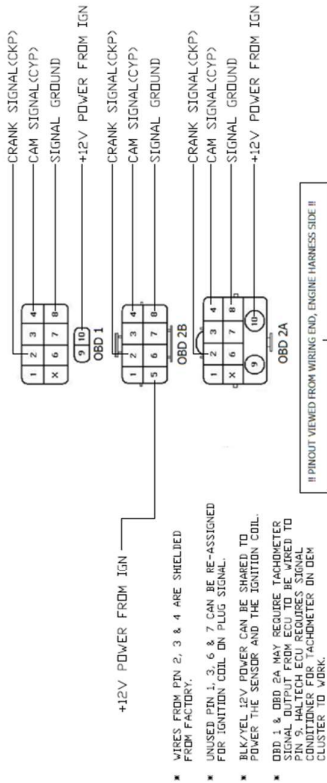
- NOTES:
- #1 - RECOMMENDED WIRE SIZE 20 OR 22 AWG
  - #2 - CABLE SHEATHING (RAYCHEM IR25 OR EQUIVALENT) IS RECOMMENDED. SHIELDING BY METAL WIRE SLEEVE IS ALSO RECOMMENDED (GROUNDED ON ONE END)
  - #3 - INSTALL 0.5W EXTERNAL PULL UP RESISTOR BETWEEN POWER AND SIGNAL WIRE FOR CRANK SENSOR (RECOMMENDED). YOU MUST DISABLE INTERNAL PULL UP RESISTOR ON ECU SETTING FOR CRANK SENSOR.

HONDA B SERIES PRO CRANK TRIGGER WIRING DIAGRAM  
(TO EXISTING DISTRIBUTOR CONNECTOR)

- WWW.50IGNITE.COM -



B SERIES DISTRIBUTOR WIRING PINOUT VIEWED FROM ENGINE HARNESS WIRING SIDE



MAKE SURE THE CRANK, CAM AND GROUND WIRE ABOVE CORRESPONDS TO THESE PINS ON THE ECU OF NOT, RE-PIN ON ECU HEADERS

HALTECH ELITE PINOUT	LINK G4+/G4X CIVICLINK(95) PINOUT OBD1	LINK G4+/G4X CIVICLINK(98) PINOUT OBD2
SIGNAL GROUND: PIN B15	SIGNAL GROUND: PIN B11 OR B15	SIGNAL GROUND: PIN C2 OR C4
CRANK SIGNAL INPUT: PIN B1	CRANK SIGNAL INPUT: PIN B16	CRANK SIGNAL INPUT: PIN C12
CAM SIGNAL INPUT: PIN B2	CAM SIGNAL INPUT: PIN B12	CAM SIGNAL INPUT: PIN C14

NOTES:

- \*1 - RECOMMENDED WIRE SIZE 20 OR 22 AWG
- \*2 - CABLE SHEATHING (RAYCHEM DR25 OR EQUIVALENT) IS RECOMMENDED. SHIELDING BY METAL WIRE SLEEVE IS ALSO RECOMMENDED (GROUNDED ON ONE END)
- \*3 - INSTALL 0.5W EXTERNAL PULL UP RESISTOR BETWEEN POWER AND SIGNAL WIRE FOR CRANK SENSOR (RECOMMENDED). YOU MUST DISABLE INTERNAL PULL UP RESISTOR ON ECU SETTING FOR CRANK SENSOR.