



5-0 IGNITE 24+1 CAM TRIGGER INSTALLATION MANUAL

This installation manual is applicable to the following engine;

- Nissan SR20 RWD VARIANTS

Please read this installation manual carefully prior to installing the product.



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If in doubt, seek professional help.

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PREFACE

Thank you for purchasing 5-0 Ignite SR20 cam 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 Cam Trigger Mounting with Integrated Sensor (**Pull-Up Resistor Built-In**)
- 1x 24+1 Tooth Cam Trigger Wheel
- 2x M8x1.25 – 20mm Grade 12.9 Socket Head Cap Bolts
- 2x M8 Flat Washers
- 1x M14x1.5 – 40mm Grade 10.9 Hex Head Bolt
- 1x M14 Heavy Duty Washer



INFORMATION AND LIMITATIONS

Installation of this kit requires basic to moderate level of mechanical skills and experience due to the requirement of timing component 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 (24 and 1 multitooth), trigger edge and trigger angle.

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

PROCEDURE

1. Remove ignition coils, valve cover and the OEM CAS.



Figure 1 - Remove Valve Cover, CAS and All Upper Components

2. Set the engine to TDC (guide can be found in google) and mark a position on the chain relative to the cam sprocket.

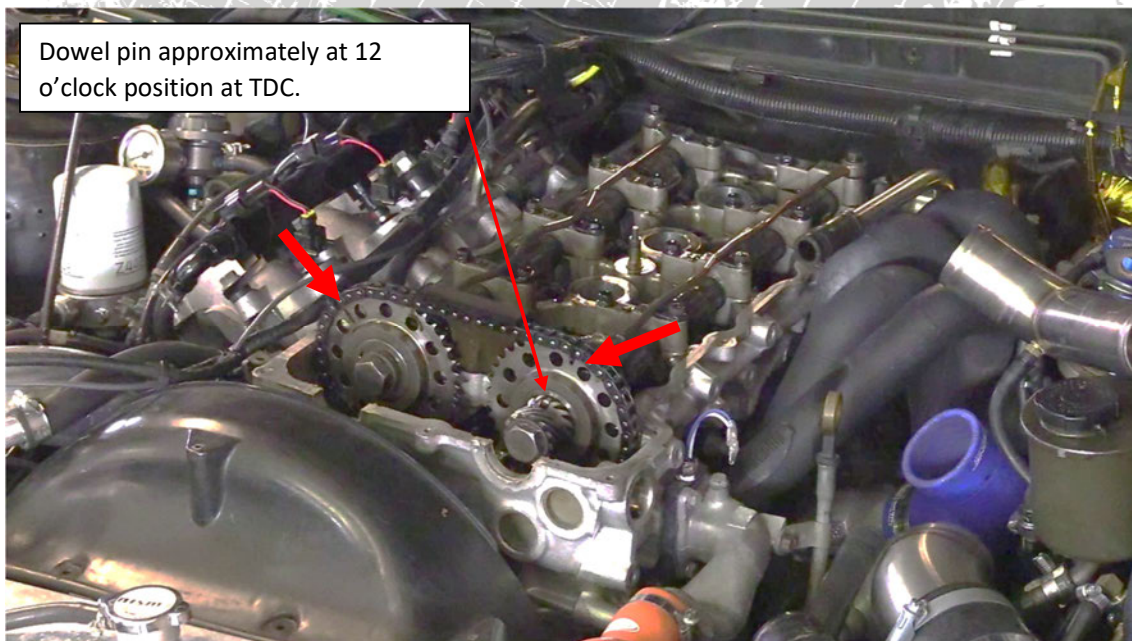


Figure 2 - Set the Engine to TDC

3. Turn the crank counter clockwise a small amount to release tension on the timing chain.

In this guide, we will be performing the short-cut method in removing the CAS gear with the help of a 2nd person. If you are uncomfortable with this method, proceed with removing the timing chain tensioner and the exhaust cam sprocket as per Nissan's FSM.

4. Using 1" spanner, 24mm socket and a breaker bar, loosen the exhaust cam sprocket bolt. **DO NOT USE** an impact wrench.

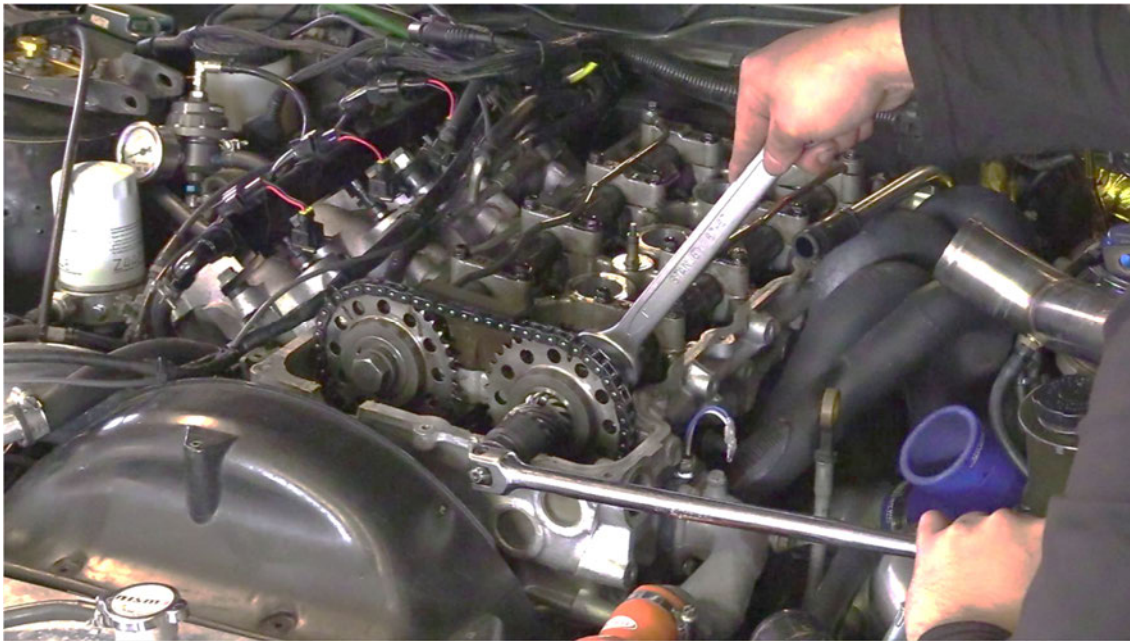


Figure 3 - Loosening the Exhaust Cam Sprocket Bolt

5. With the help of 2nd person, hold the exhaust cam sprocket in place FIRMLY whilst you remove the cam sprocket bolt.



Figure 4 - Remove the Exhaust Cam Sprocket Bolt

6. With the help of 2nd person in place holding the exhaust cam sprocket firmly, use a hammer and gently tap the CAS gear repeatedly at 9, 12 and 3 o'clock positions until it is removed from the cam sprocket.



Figure 5 - Removing the CAS Gear



Figure 6 - CAS Gear Removed, 2nd Person Holding the Sprocket Firmly

7. Using the supplied bolt and washer, install the trigger wheel. Using 21mm Socket and 1" spanner, torque this bolt to 140Nm. **Ensure that your timing mark has not moved!**

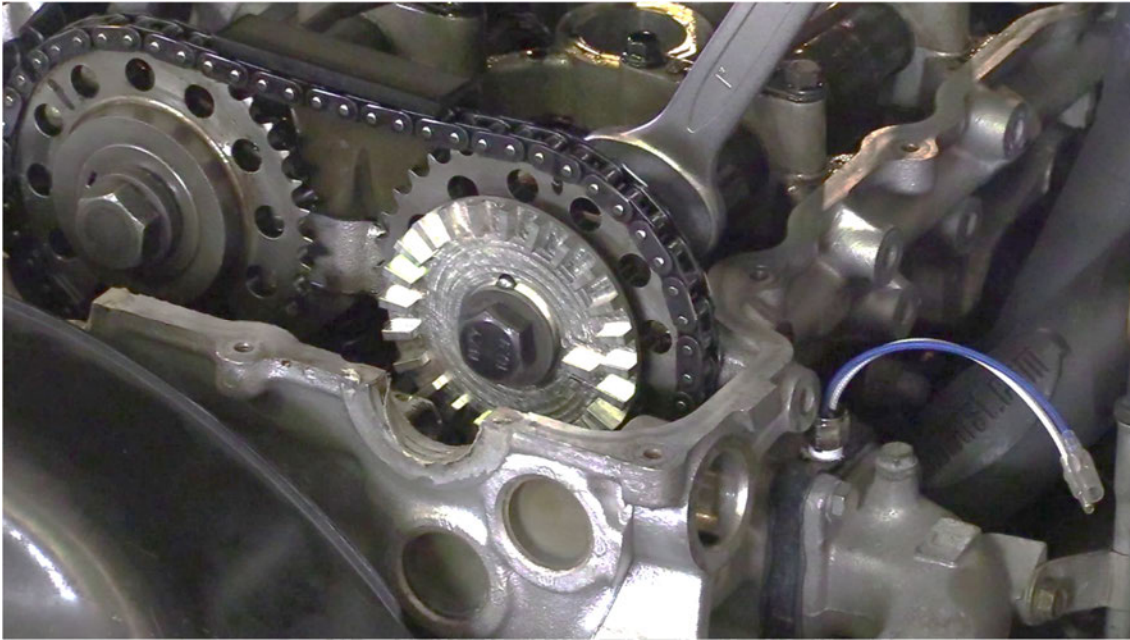


Figure 7 - Trigger Wheel Installed

Note: Check the clearance between the trigger tooth and the casting. Some cylinder heads may have excessive casting projection that were not fettled from factory. If clearancing is required, place a rag underneath and hand file to easily remove the 'fin'.

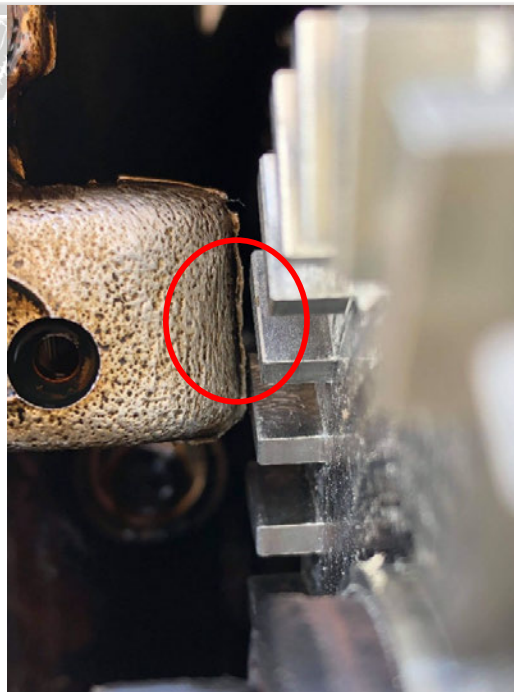


Figure 8 - Casting 'Fin' Clearance (Photo Depicts Sufficient Clearance)

8. Prepare the supplied sensor and mounting. Remove the 2x M5 bolts holding the sensor to the mount and slide the spacer off (Note the yellow marker/dots to be on the same side).



Figure 9 - Cam Sensor and Mounting

9. Lubricate the o-ring and slide the assembly in, sensor first. Using the two M8 socket head cap bolts supplied, tighten the sensor mount onto the cylinder head snug tight.

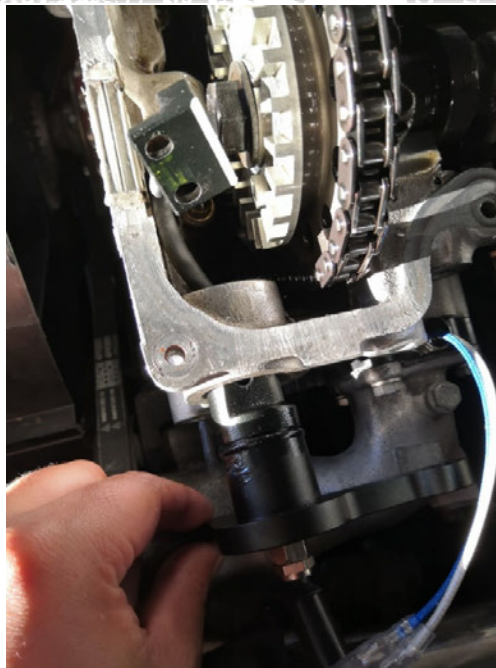


Figure 10 - Slide the Sensor and Mounting In

10. Slide the spacer onto the sensor, note the dot/yellow marker (as the spacer has a groove cut into one side).



Figure 11 - Slide the Sensor Spacer In

WARNING: THE 2X CAM SENSOR BOLTS ARE STAINLESS STEEL AND IS NOT MAGNETIC. IT IS HIGHLY ADVISED TO PLACE A RAG ON THE TIMING CHAIN VOID TO AVOID DROPPING THE FASTENER THROUGH THE ENGINE.

11. Install the bolts loosely. Using feeler gauge, set the air gap between the sensor to the trigger tooth between 0.5mm to 0.65mm. **Tighten the two M5 bolts to snug tight, DO NOT OVER TIGHTEN.** Rotate the engine two full rotation and check the air gap is consistent.

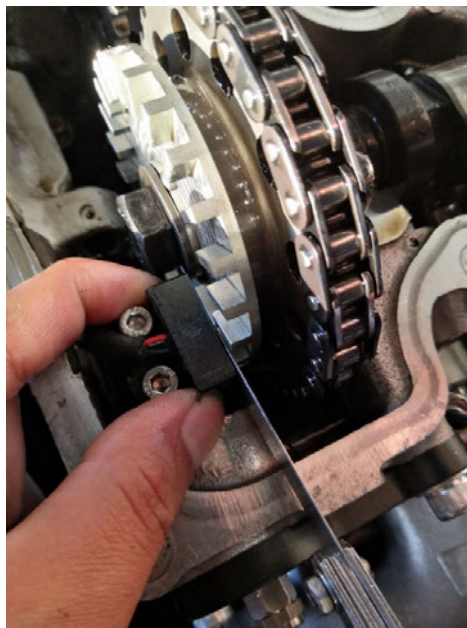


Figure 12 - Setting the Sensor to Tooth Gap

12. Installation of the cam sensor is now complete. Clean the valve cover mating surface and re-install what was removed in step 1.



Figure 13 - Installation of the Cam Trigger Kit is Now Complete

At this stage, you are now ready to configure your ECU.

13. Connect the ECU to your laptop and configure these settings;

- a. Trigger edge: Rising (the sensors pulls to ground when a tooth is present, selecting rising edge assist some ECUs for a quicker synchronisation during engine start-ups). Trigger edge setting is not available on Haltech platinum pro ECUs and the factory default edge setting is used.
- b. Pull up resistor: DISABLED (PULL-UP RESISTOR IS BUILT INTO THE SENSOR)**
- c. Trigger type: Multi-tooth crank, 1 tooth home
- d. Tooth on crank: 12 (set this to 24 and 1 multitooth on Haltech platinum pro)
- e. Tooth on cam: 1
- f. Crank sensor type: Hall Effect
- g. Cam sensor type: Hall Effect
- h. Trigger 'TDC' angle: 185° (For Haltech Platinum Pro, other ECU may vary, refer to step 14 to 18).
- i. Trigger filter: 0 or 1

NOTE: Some ECUs will require you to swap the two trigger wires to output the right signals into the ECU. See the troubleshooting section and figure 14.

The TDC angle above are for starting point only as it may be affected by head or block machining, head gasket thickness, camshafts or any other variable that may alter camshaft timing. **TDC angle must also be set higher than the maximum ignition timing that you intend to run.**

- 14. Enable timing lock (i.e. at 15°) and disable the injectors.
- 15. With a timing light connected at Cyl 1, crank the engine. Adjust the 'TDC' angle until the crank timing matches the timing lock figure. **Note that the TDC angle is set at compression stroke** (engine will not run if it is set at exhaust stroke even though the timing marker matches the timing lock figure, if so, you are 360 degrees out).
- 16. Once all parameters are satisfactorily configured, enable the injectors and start the engine.
- 17. With the engine idling and timing lock still enabled, double check that the timing is still synchronised with the timing lock. Re-adjustment is normal, where the TDC angle is previously set, was set at lower cranking speed.
- 18. **Once all set, disable the timing lock.**

TROUBLESHOOTING

PROBLEM	APPROACH
No signal output from the sensors.	<ul style="list-style-type: none">• Check if wiring is correct.• Ensure crank trigger sensor gap is set as per step 11.• Check for 12V and Ground to the sensor.
Sensors are outputting signal but engine does not start. Continuous miss counts.	<ul style="list-style-type: none">• Swap the 120° and the 1° sensor wiring on the 4-pin grey CAS connector (See figure 14).
Engine misfires intermittently	<ul style="list-style-type: none">• Check you exhaust camshaft axial play, if beyond factory allowance.

As with all other 24+1 trigger setup, it does require a full cranking cycle of the engine to start for the ECU to sync.

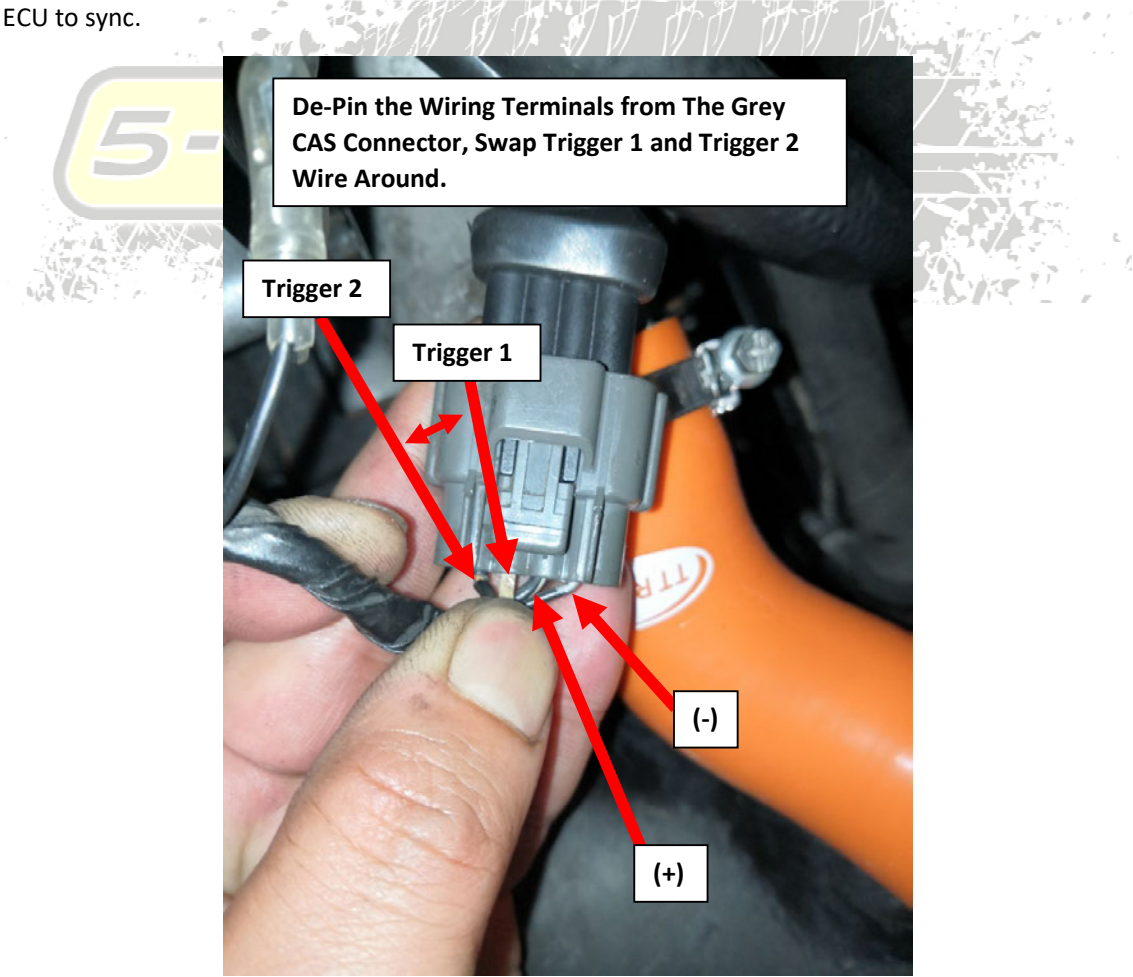


Figure 14 - Swapping Trigger Wires Around (Required on Some ECUs)

CONCLUSION

Installation is now complete. Cam trigger kit on SR20 reduces ignition timing drift by significant amount in comparison to OEM CAS or any trigger disc replacement. Touchless sensor allows backlash of the OEM cam gear to be removed and not affected by CAS condition or Optical Sensor to Disc read performance. Benefits includes tuner's confidence in maximising ignition timing whilst keeping consistent safety margin.

