

# Instructions and Installation



## Nissan COP Converter

Model: Bv1

### WARNING:

This installation is not for the electrically or mechanically challenged! Use this electrical part with EXTREME caution! If you are uncomfortable with anything about this, please refer the installation to a trained tuning shop or get technical assistance from the manufacturer.

The manufacturer holds no responsibility for any engine damage that results from the misuse of this product.

This product is legal for racing vehicles only and should never be used on public highways.

## What is this thing?

This module converts Nissan single coil and distributor ignition systems to an individual coil per cylinder system without changing the ECU. These can be “Coil On Plug” or “Coil Near Plug” type of coils. The coils must use a 5v “going high” trigger signal arrangement. Generally this is compatible with model year 88-02 KA, SR, or GA engines.

This is not used with aftermarket ECUs except in rare instances where you are stuck with a single ignition output. You cannot use launch control or anti-lag which cuts out the ignition or crank angle signal (like the BEE\*R Limiter). Timing delay and fuel cut limiters are okay.

This module is not compatible with waste-spark type of coils.

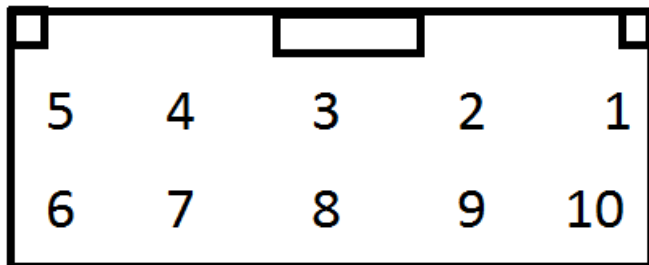
If you use this module with a coil that it is not pre-programmed for: You are responsible for understanding the proper dwell settings for your coil!

## Parts included:

1. COP converter module
2. Harness
3. Harness grommet

## Module Pinout:

(Terminal side of module connector)



Pin - Wire Color – Cable – Function:

1 - Green – ECU - TDC Position Signal	6 - Black – Coils - Cylinder1 Signal
2 - Brown – ECU - Crank Angle Position Signal	7 – Black – Coil Signal Ground (optional)
3 - Red – Coils - Cylinder2 Signal	8 - White – Stock Single Coil Signal
4 - White – Coils – Cylinder4 Signal	9 – Black – Power Ground
5 - Green – Coils – Cylinder3 Signal	10 – Red – Power Positive (7-18v)

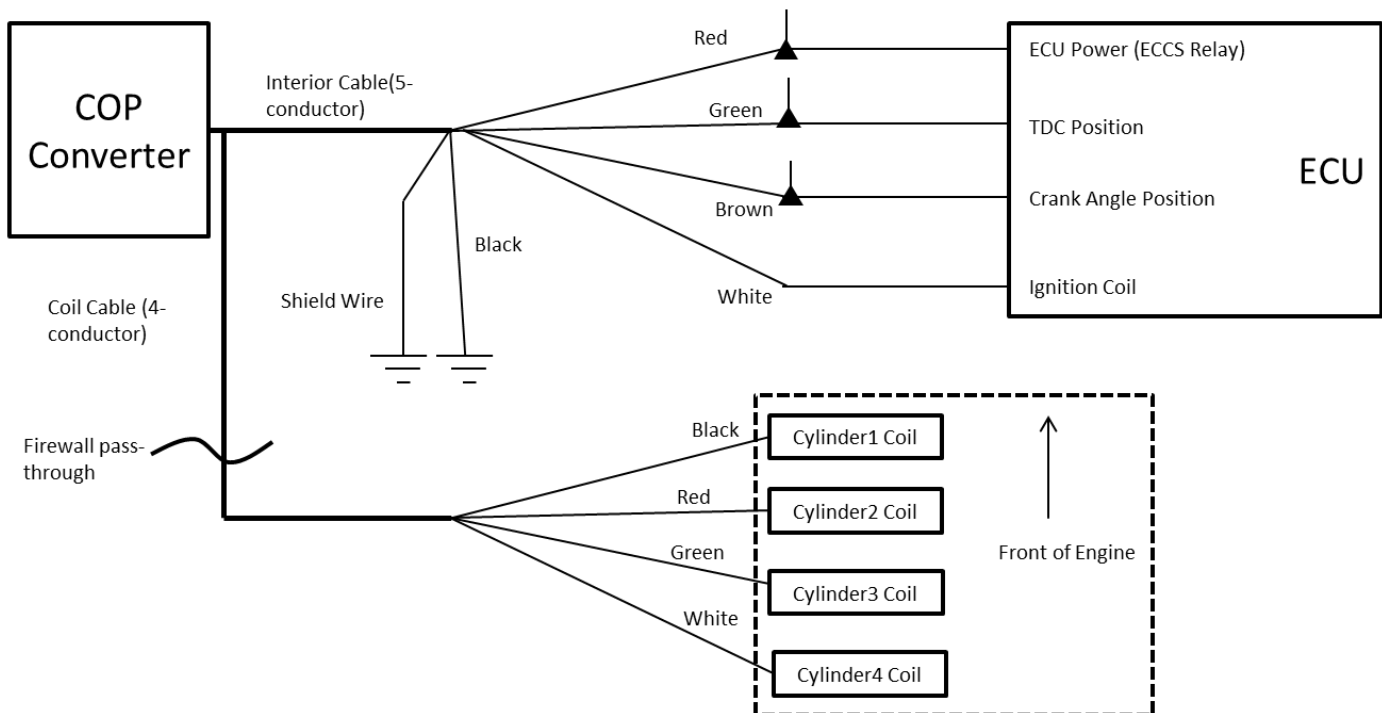
## Installation Overview

1. **Coil Power:** You should wire the power feed to the ignition coils straight from the battery positive terminal, through a 15 - 20A fuse, and through a 15+ amp relay. You can switch the relay on/off via the old ignition coil power wire, fuel pump, or something else that gets power only in run and start. Use only “smart” type of coils with internal transistor circuitry (3 or 4 pin connectors).
2. **Coil Ground:** This must be run directly to the engine or battery negative terminal.
3. **Coil Signal Cable Routing:** You will need to run the shielded coils signal cable from the cabin, through the firewall, and to the coil signal wires. This is either a 4 or 5 conductor cable (depends upon configuration). A pass-through grommet is provided if needed. Run the shielded cable up to the first coil you make a connection to. Running normal unshielded wires the rest of the way is okay. Bundle them with the other wires to prevent the signal wires from being strained. Keep the harness wires away from the ignition wires if using CNP coils.
  - Note: If you modify the harness by using a different cable to lengthen or replace part of the harness provided be sure to use shielded type cable and to join the shield wires between the old and new cable so that there is continuity between the wire shielding.
  - Note: The wire coming from the engine bay must be routed so that it goes lower than the COP converter module before reaching the module. This is to provide a “drip loop” and prevent any water from tracking along the harness and into the module.
  - Important: This module is not designed to handle any water exposure.
  - Important: Keep some slack in the wire from the firewall to the engine to allow for engine movement. When possible route along the engine harness from the firewall.
4. **Spliced Connections:** You will need to splice into both signals from the crank angle sensor and power at the ECU harness. Make the connection within a few inches of the connector to the ECU.
5. **Ground Connections:** You will need to provide a shield and power ground via connection to the body near the ECU. Suggested to use an eyelet type of connection via a M6 or sheet metal screw.
  - Important: The shield wire must only terminate to ground at this one point. DO NOT connect the engine side of the shielded cable to ground also. Both cable shields are already connected together at the module connector.

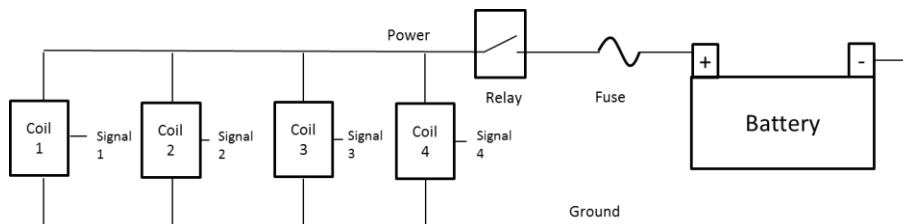
6. **Ignition Coil Signal:** The ignition coil wire from the ECU should run directly to the COP converter module. Make the connection within a few inches of the connector to the ECU.
- Important: DO NOT tee into this wire.
  - If leaving the original coil in the vehicle remove power to the coil. This is a 3-wire plug to the coil transistor (external coil models) or a 2-wire plug to the distributor on (internal coil models)
7. **Locating the Module:** It is suggested to locate the COP Converter module in the glovebox. Either the back or side walls work well. Provide strain relief a few inches from the connector so that when the glove box opens and closes no stress is placed on the connector. Leave enough slack so you can unplug the connector if you need to.
- If locating the module somewhere else make sure it is not close to any source of strong EMI such as an actuator, solenoid, cell phone, or blower motor. The module does not have shielding to prevent interference from these sources of EMI.
  - Be aware that loose objects can bang into the module and damage it. Take care with what goes into the glove box.

## Wiring diagram (Maxima coil)

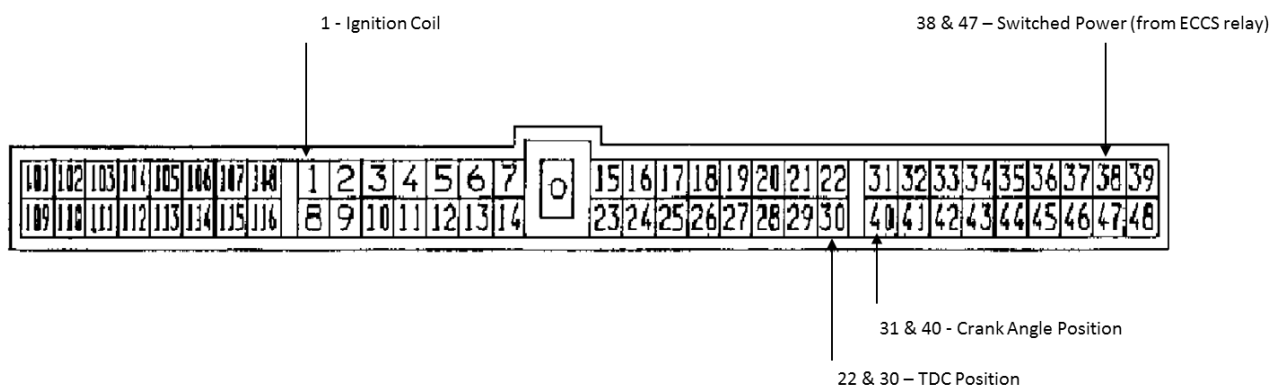
▲ Tee into harness with tap or butt connector



Coil wiring example:

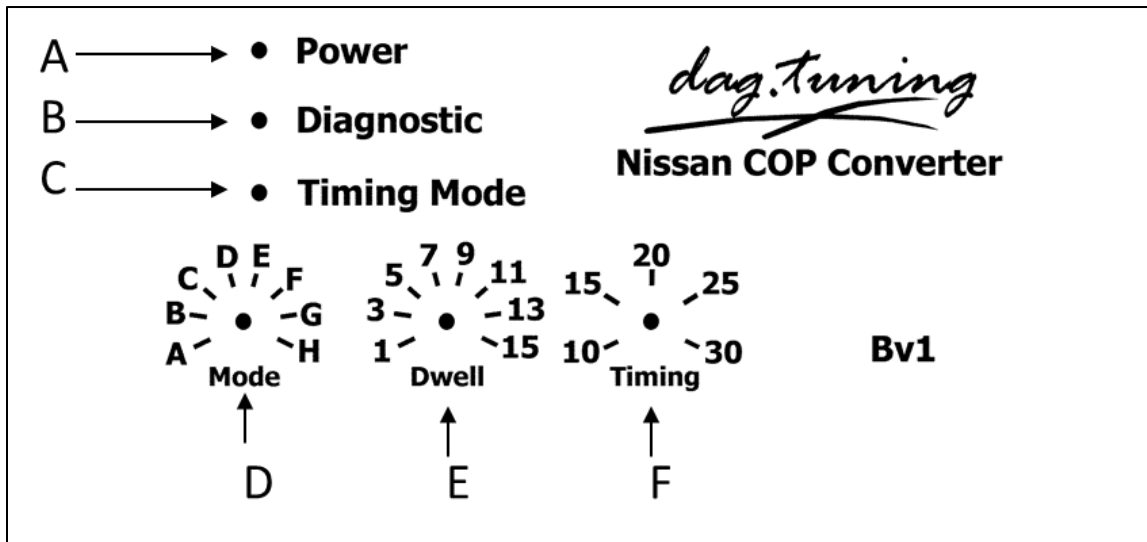


91-93 240sx ECU Pinout (back side of harness connector):



## Lights and Dials on the COP Converter Module

View of front cover:



- A. Power Indicator
  - a. Lit whenever power is present (should be on when ECU is on, ignition in run or start)
- B. Diagnostic Indicator (Diagnostic #1)
  - a. When power is first turned on it is lit to indicate an appropriate mode selection is made
  - b. When cranking it will blink to indicate TDC signal (should blink at same rate as ignition signal)
  - c. Under normal running this light should be off (no further diagnostics developed at this time)
- C. Timing Mode Indicator (Diagnostic #2)
  - a. When key is on and engine is not running the light will blink to correspond with the mode selection.
  - b. The light will be on-solid to indicate timing mode (when entering into or being in timing mode).
  - c. When cranking it will blink to indicate ignition signal (should blink at same rate as TDC signal)
- D. Mode Selection Dial
  - a. Setting depends on the coil you will be using (see next section).
  - b. You will use this to enter into timing mode (see next section).
- E. Dwell Setting Dial
  - a. Amount of dwell time for static dwell mode of operation (in milliseconds)
  - b. Since being printed this function has changed and values used are half (for example setting of 9 gives 4.5ms of dwell time)
  - c. Not used in mapped dwell modes
- F. Timing Setting Dial
  - a. Timing used when the engine is cranking (degrees before TDC).
  - b. Timing used when in timing mode (degrees before TDC).

## Operating the COP Converter Module

Set the dials to achieve the desired operation before going “key on” with the vehicle. Settings at power on will “stick” until the next key cycle even if the dials are manipulated. The key must cycle OFF to ON in order to reinitialize with the new settings.

After installing if you cannot get the vehicle to start monitor the LEDs while cranking:

Indicator Behavior	Dial Setting
No LEDs lit (including power)	Incorrect or insufficient power <ul style="list-style-type: none"><li>Power and ground is reversed</li><li>Power or ground is poor.</li><li>Power circuit inside module is faulty (unlikely).</li></ul>
Power LED is lit but no diagnostic indicators are lit.	Mode A or H is selected when powered on. Select a new dwell mode and cycle the key off/on.
Diagnostic indicators go out when cranking and don't blink.	No ignition or TDC signal present.
Diagnostic indicator #1 blinks but not #2	No ignition signal from ECU <ul style="list-style-type: none"><li>Bad connection to module</li><li>Bad connection on crank signals to the ECU (ECU does not see engine speed)</li></ul>
Diagnostic indicator #2 blinks but not #1	No TDC signal present.
Diagnostic indicators are the same when key on engine off and when attempting to start	No crank angle signal present
Diagnostic indicators #1 and #2 blink at different rates	Two or more signal wires are flipped: ignition, crank angle, or TDC.

Faults due to signals to the coils are not detectable at this time.

### Mode Dial:

The mode dial selects discrete modes. It is not continuously variable (there is no blending between mode B and C for example).

Blinking Pattern	Dial Setting	Coil Dwell Type	Comments
None	A	Invalid (no start)	
1	B	GM LS2 Coil (Mapped)	GM can shape coils with and without heat sink. AC Delco D585 & D514.
2	C	GM LS1 Coil (Mapped)	AC Delco D580
3	D	Static dwell (uses dwell dial setting)	
4	E	Static dwell with compensation (uses dwell dial setting)	0.4ms dwell added to static dwell per volt below 14v.
5	F	Nissan 95-99 Maxima Coil (Mapped)	Nissan PN: 2244831U05
6	G	Nissan 00-01 Maxima Coil (Mapped)	Nissan PN: 224482Y00, 224482Y006, 224482Y007 Hitachi Part: IGC0024
None	H	Invalid (no start)	

## Timing Mode

The two purposes of Timing Mode:

1. Provide easier timing of engine (adjusting distributor/crank sensor)
2. Provide a means to check for timing drift (suggested to check this after first start up)

Timing mode remains in effect when the LED is lit solid. You can ONLY enter into timing mode with the key ON but engine OFF. You can exit out of timing mode at any time.

Re-entry into timing mode is only possible by cycling the key OFF then ON.

### To use Timing Mode:

1. Key OFF: Set dials as normal except for the timing dial in case you wish to use a different value. The timing will remain set to the initial value throughout this process (starting and running).
2. Key ON: Check that the diagnostic #2 indicator is blinking the correct pattern.
3. Turn mode dial fully clockwise to H. The diagnostic #2 indicator goes to solid ON.
4. Turn mode dial fully counter-clockwise to A within a few seconds. The diagnostic #2 light remains solid ON.
5. Key START: Start the engine. The diagnostic #2 (timing) indicator goes to solid ON.
6. Perform whatever checks you need with a timing light. To check for timing drift run the engine through the RPM band in neutral. Timing should remain the same at all RPMs.
7. If you move the mode dial off of A for a few seconds timing mode will be cancelled (normal operation resumes).
  - a. Best practice would be to move the dials to the normal settings at this time so you don't forget about them later.

Remember: No changes happen regardless of dial position after exiting Timing Mode until the key cycles OFF/ON.

## Dwell Dial

The dial is continuously variable between values on the face plate. At this time the dwell value is half the number on the face plate. Static dwell values available are 0.5ms to 7.5ms.

## Timing Dial

The dial selects discrete timing settings. It is not continuously variable. Timing values available are 10, 15, 20, and 25 degrees before top dead center (BTDC).

Generally most engines (from experience with KA and SR) will start with a setting of 15 but it can be changed depending on your situation:

- If you encounter hard starting in cold weather try increasing this value.
- If you encounter hard starting when the engine is hot try decreasing this value.

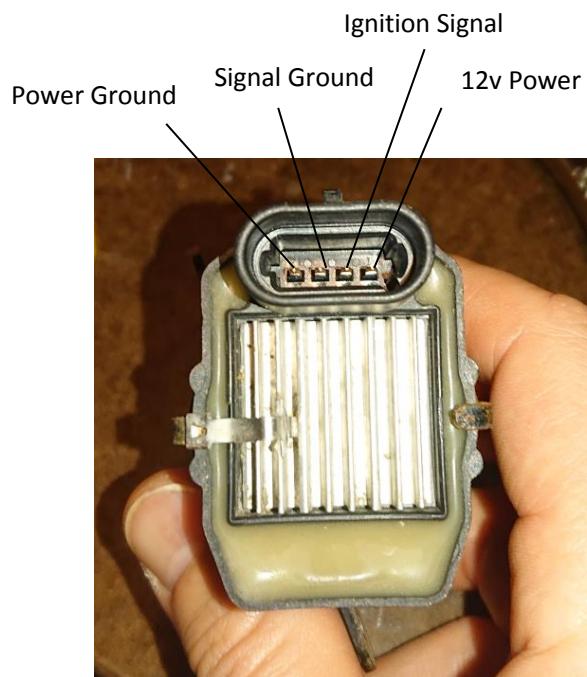


Example glove box mounting of converter module:



Side or front wall of glove box is easy to install to. Use small screws, Velcro, or double sided adhesive to mount to the surface.

D585 Coil: Use 5-conductor cable from COP converter  
(all coils share signal ground wire)



Stock Connector view (only ignition signal color will change)

Maxima Coil: Use 4-conductor cable from COP converter

