

Subaru EJ Phase 2 Coil Pack Conversion Honda K Series - Instructions



WARNING: This product should be installed and tuned by a professional. A machinist is highly recommended for the valve cover modifications. All supplied calibrations and information is to be used as a reference for a potential starting point only. It is the responsibility of the installer and tuner that this product is calibrated and used as intended. Ansix Auto holds no responsibility for any damage that results from the misuse or mistuning of this product. This product is intended for off-road use only.

Kit Contents

- 4 x coil adapter brackets
- 8 x M3 cap screws
- 4 x M6 button head cap screws
- 4 x M6 washers
- 4 x K-series harness plugs with pins/wires (optional)

Other needed Components

4 x Honda K-series Coils (DENSO Part # 6732301).

These can be found on a number of different Hondas and Acuras. Civic Si, RSX, Accord, CR-V, Element, and S2000 are the typical cars to find these on. Alternatively, they can be purchased new from places like Rockauto.

Wiring components. *This will depend on how you prefer to do your wiring. Details are given later in instruction manual.*

Silicone gasket maker - Fujibond/3 bond or similar.

New valve cover gasket kit (Beck/Arnley 0361595, FEL-PRO VS50561R)
(recommended, not needed)

Spark Plugs (optional) - BKR7E recommended for boosted applications

Zip ties

Recommended tools

Basic hand tools - All the 10mm wrenches, sockets, screwdrivers, etc...

M3 x 0.5 Tap

#39 or 2.5mm drill

Hand Drill

Basic wiring tools - crimpers, heat shrink, loom, tape

Small C-clamp or similar

Drip Pan and Parts Cleaner

Tape

Centerpunch

Cutting oil

Installation

Remove the valve covers and factory ignition system

It is recommended that you disconnect the battery before starting this job. Disconnect the plug wires, coil (three 10mm socket size bolts), and valve covers (5 10mm socket size bolts each). To aid in access to the valve covers, removing the induction system on the right side and the washer bottle/battery from the left.

Clean the valve covers thoroughly and remove the gasket and put aside for safekeeping if you're reusing it.

Installing the Coil Adaptor Brackets

With your clean valve covers, test fit the brackets on the valve cover and decide the orientation of your coils. This is to aid in the clearance of any components that may interfere with the coils. In most instances having the coil harness plugs facing upwards is good and is aesthetically pleasing (Figure 1).



FIGURE 1

With the orientation decided, hold the adapter against the valve cover and view it from the inside of the cover. Ensure that the center of the spark plug tube hole and the adapter are centered (Figure 2). And clamp the adapter in place with your c-clamp. It might be helpful to use the coil as a guide for this by wrapping the coil (with adapter installed on it) in tape to make it a snug fit in the valve cover. Marking and drilling your holes like this might be easier than using a clamp.



FIGURE 2

Mark and drill TWO of the bolt holes using your 2.5mm or #39 drill using the adapter as a guide. Centerpunching and cutting oil will help aid in making a nice straight hole. You should use the two bolt holes that line up closest with the 3 and 9 o'clock positions the adapter. The additional bolt holes can be used to rotate the adaptor if needed at a future date. You can use more than two bolts if you want, however it is unnecessary and gives additional places for oil leaks to occur later on. It is **IMPERATIVE** that these be as perpendicular to the valve cover and centered in the adapter. If you're using the tape method mentioned above as you're guide, I recommend drilling

and tapping one hole at a time. Wrapping the drill in tape can help with alignment of the drill (Figure 3). Drill the whole way through valve cover.

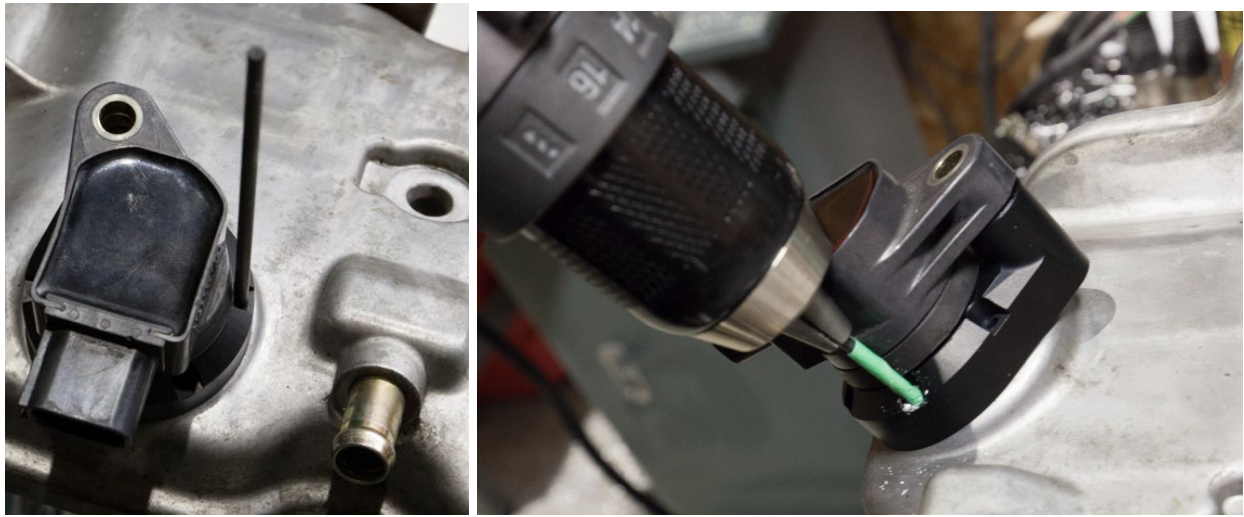


FIGURE 3

Tap the holes using your M3x0.5 tap. This is a very small tap and is delicate. It was sized this way to limit the potential for oil leaks. Take your time to ensure that the tap runs as straight and clean through the hole as possible to avoid breaking the tap and ruining the threads. Cutting oil should be used (Figure 4).

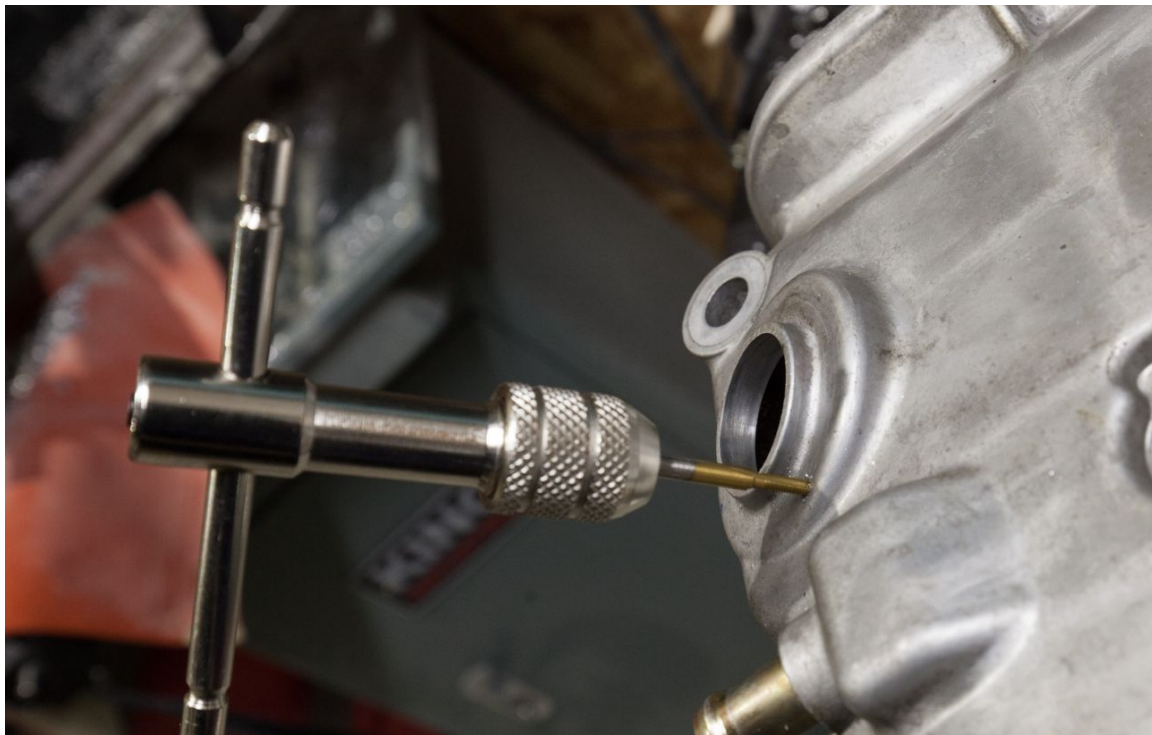


FIGURE 4

Test fit the brackets with the provided M3 bolts to the valve covers. Check the backside of the valve cover to make sure the bolts do not protrude past the inside face of the valve cover. Deburring might be needed as the sealing surface of the gasket should be flat. If the bolts protrude from the face of the valve cover, gently file the bolts down till they clear (Figure 5). BE VERY GENTLE TORQUING THESE FASTENERS. Snug with the allen key is all you need.



FIGURE 5

Clean off all of the cutting oil and chips from the valve cover and apply a very thin layer of silicone gasket maker to the face of the valve cover around the newly tapped bolt holes and spark plug tube to keep moisture out(Figure 6). Using the supplied M3 bolts, install the adaptors on the valve covers. Medium Loctite is recommended for these fasteners.



FIGURE 6

It is recommended that you complete this entire process with one of the adaptors to ensure you've done it correctly, then complete the remaining three.

Reinstall the valve covers on the heads with new gaskets and spark plug tube seals if purchased. Apply a small amount of silicone gasket maker to the inside of the valve cover where your new bolt holes (Figure 7) are, and reinstall the valve covers following the OEM recommended torque sequence and spec.



FIGURE 7

Install the coils into the spark plug tubes using the provided M6 bolts. Be sure to press the coil down firmly to ensure it's full seated in the adaptor. There should be no space between the coil and the mounting hole on the adaptor (Figure 8). If you're replacing your spark plugs, do that before installing the coils.



FIGURE 8

Connect your wiring harness (more detail in the wiring section) and run it in a safe and secure manner around the intake manifold. Use Zip ties and the factory loom to secure this safely. I prefer to run it under the manifold for a clean look.

Congratulations! You've completed the coil adaptor install.

Wiring

This section is to be used as a guide only. There are many different ways to wire these coils depending on your ECU capabilities or limitations. Here are a couple versions of how you may complete the wiring.

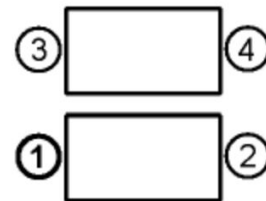
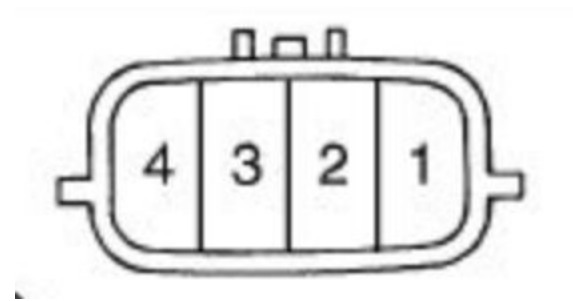
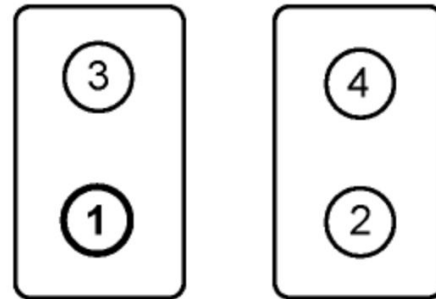
The factory coil plug is 4 wires. If you look at the connector **on the coil**, the pins are numbered.

- Pin 1 (red/green): +5v Ignition trigger channel 1
- Pin 2 (yellow/white): +12v
- Pin 3 (black): Ground
- Pin 4 (blue): +5v Ignition trigger channel 2

The channels are:

- Channel 1 : Cylinders 1 & 2
- Channel 2 : Cylinders 3 & 4

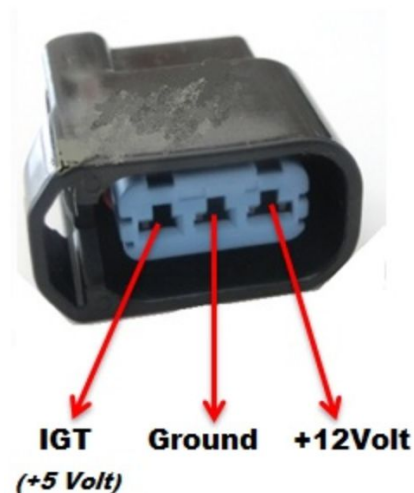
Firing Order : 1-3-2-4



Front of Vehicle

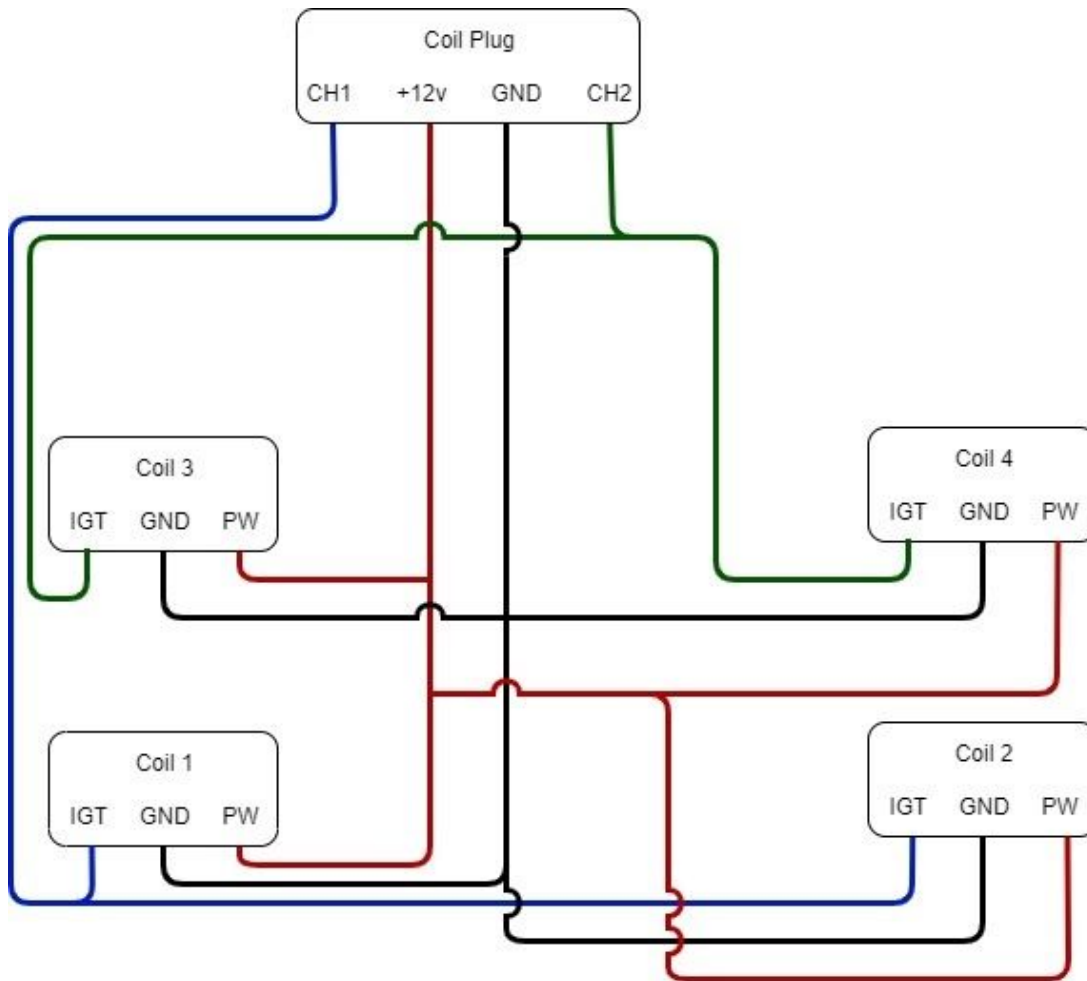
The honda K-series coils have three wires. Looking into the connector, the pins are as follows.

- Pin 1: +5v Ignition trigger
- Pin 2: Ground
- Pin 3: +12v



There are two methods for which these coils can be used. Wasted spark (same as OEM) or full sequential. Running full sequential requires an ECU that is capable of handling this and additional wires need to be run to the ECU to support it as there are only two channels supported by the OEM harness.

Example Wasted Spark Diagram



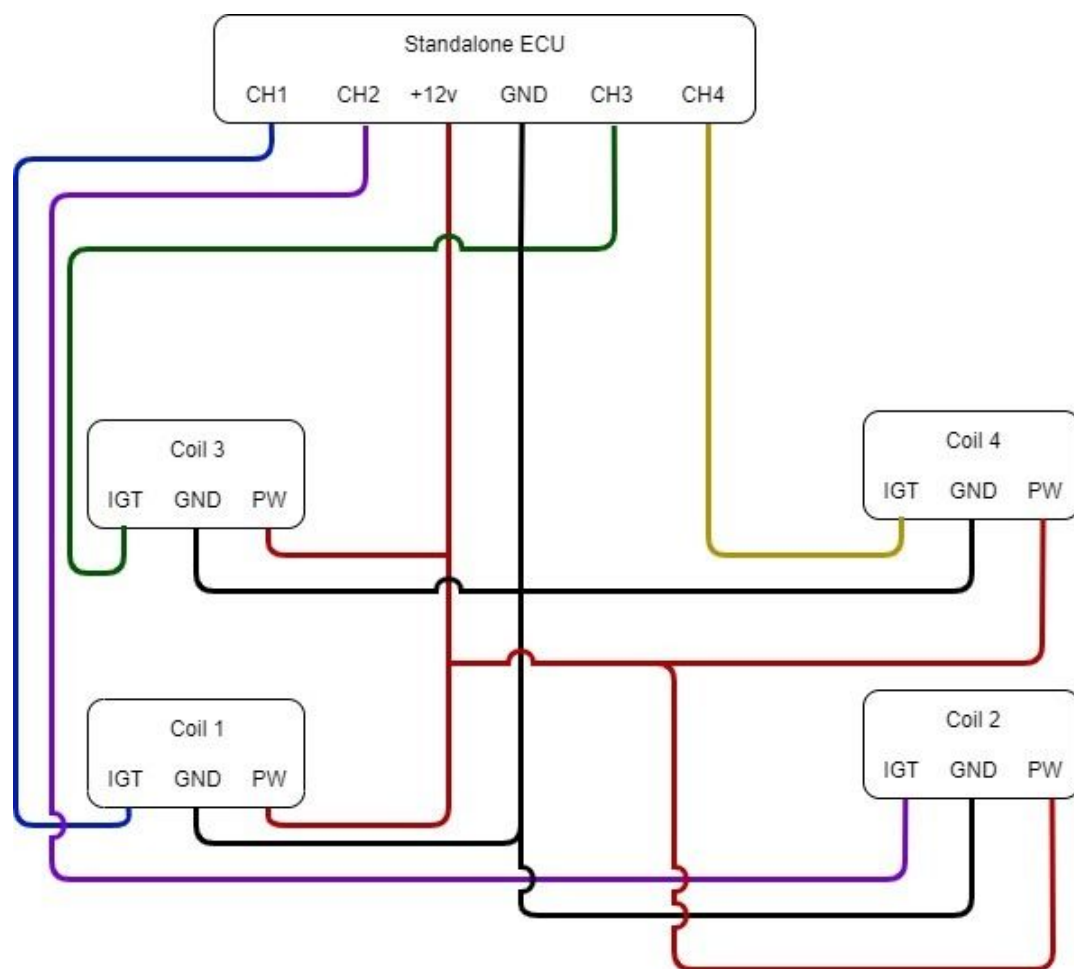
In the wasted spark configuration, you can see that Coil 1 & 2 are paired along with Coil 3 & 4 and their receiving their trigger signals from a shared channel.

Power upgrade for this system, running a separate power (not using the OEM coil source for power). It might be convenient to use the alternator power wire however you'll need a relay or similar to ensure the coils do not stay powered while the car is off. While there will be a performance benefit from this, how much is not yet known and is outside the scope of these instructions.

Another potential improvement would be in grounding. Running separate grounds for each coil to the intake manifold would theoretically improve coil performance. This would be fairly easy to implement and potentially simplify the harness.

The recommended method for tapping into the OEM coil harness is to cut off the OEM plug and replace it with a more common 4-pin DTM or weatherpack connector. These are readily available and are used extensively in motorsport. Unfortunately there is no option for using the OEM subaru connector at this time but please feel free to investigate this.

Example Sequential Ignition Diagram



When paired with a compatible standalone ECU, the coils can be controlled individually. This is the ideal method for using these coils and how it is factory installed by honda. Using the power and ground upgrades discussed in the wasted spark section would also prove beneficial but how much is not known at this time.

Tuning

This section is intended to help you get your new ignition system running however should be optimized for each car by the tuner. These settings have been pulled from a car running a Link G4+ or Vipecc ECU running wasted spark in the wiring configuration shown in the previous section. These settings should easily transfer over to other standalone systems from Haltech, motec, AEM, Speeduino, etc. For people running the stock ECU, it is recommended that you talk to Lambda Tuning about configuring it. There are a multitude of options and Mike along with us would be happy to discuss them.

In this setup the main improvements that can be made is in the Spark Duration. Refer to the directions with your ECU to learn more. Overheating the coils and shortened lifespan can result from going too far with your Spark Duration.

Ignition Mode	Wasted Spark
Spark Edge	Falling
Dwell Mode	ms
Ignition Delay	80 us
Spark Duration	1.0 ms
Maximum Advance	45.0 BTDC

Here is the Dwell Table used. If your ECU does not support a 3D dwell table, use the values closest to operating voltage. This is usually around 13.5-14volts. Like Spark Duration, Dwell can have a negative impact on coil life. As you can see, this is not fully optimized. Usually Dwell decreases with RPM.

[illegible]