IGN-1A Coil Adapter Harness Install
Mazda RX-7 (FD3S)

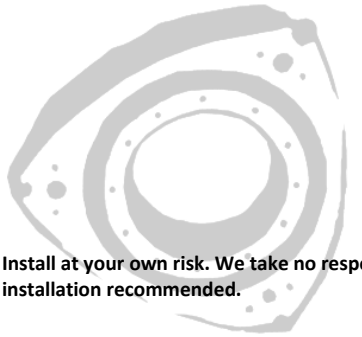
What's in the Box?

- IGN-1A coil adapter harness
- Sumitomo connector and plug
- Instruction manual
- Harness and coil labeling stickers

Required Tools

- ✓ 10mm open end wrench
- ✓ 12mm socket
- ✓ Three pins (safety, thumb, etc.)

Note:
Please read complete manual before beginning install process.



Install at your own risk. We take no responsibility for injury or damages incurred as a result of installing this product. Professional installation recommended.

Install Procedure:

Step 1 - Remove factory igniter

To install the coil adapter harness you must first remove the factory igniter; located next to the brake booster and below the cruise control module on LHD cars (see image 1 for reference).

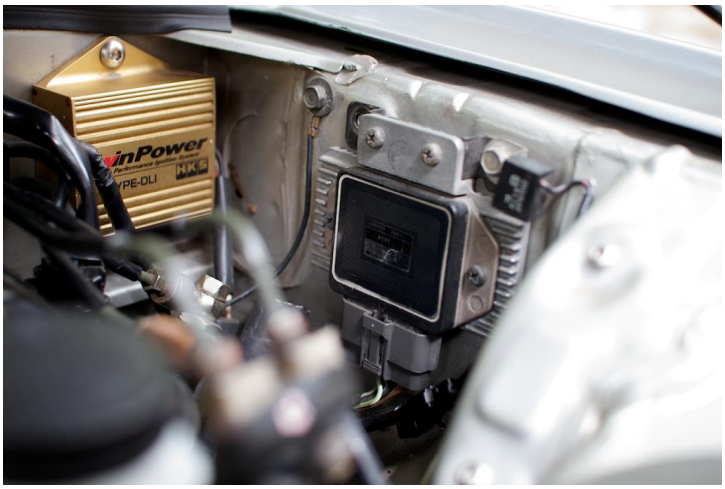


Image 1

Note:
Ignition amplifiers (such as an HKS TwinPower) should be removed at this step as well. The IGN-1A Coil & Harness Upgrade from SakeBomb Garage replaces the need for any ignition amplifiers. Thus, any ignition amplifier you currently have will not need to be re-installed.

Step 2 - De-pin OEM igniter connector

Once the factory igniter is removed you may now begin de-pinning the OEM Sumitomo connector. For instructions on how to de-pin this connector please visit the link below for video instructions. You'll also be shown how to re-pin the OEM wires in to the IGN-1A Harness Sumitomo connector that is included with your new harness.

Video URL: http://youtu.be/ei8QBpm90DM

Or Visit: https://www.youtube.com/SakeBombGarageLLC
and find the video titled:
"SakeBomb Garage IGN-1A Coil harness de pinning procedure FD3S (Sumitomo connector)"

OEM Sumitomo connector

IGN-1A Harness Sumitomo connector

Your package contains labeling stickers to identify the coil and harness leads for each connection. The large double sided stickers are used for the harness connectors, and the smaller stickers are for labeling the coils. This allows for easy identification, should you need to service your system. Use the chart below to identify the correct stickers for each connection (for example, wrap the T1 connector sticker around the connector wire that contains the pink signal wire).

Signal Carried:	OEM Sumitomo:	IGN-1A Harness:
Leading 1 (L1)	Light Green*	Green
Leading 2 (L2)	Light Green*	Blue
Trailing 1 (T1)	Brown	Pink
Trailing 2 (T2)	Brown/Black	Yellow
Relay Power	Black/White	Red

*OEM configuration shares the spark signal between L1 & L2 from a single Light Green wire. If you would like to set up "Direct Fire" then please see the next page.

** For high performance applications, please see the Advanced Install section for directions on how to properly ground your harness to a Sensor Ground/Reference Ground. For most other applications, it's fine to use the attached ring terminal to connect to a clean chassis ground.

You may now either leave the OEM 8 position connector and tuck it off to the side with the additional pins, or remove the pins and tape up each pin with electrical tape and tuck it off to the side. The additional pins in the OEM connector are not used, however electrical tape should be used to keep them isolated from each other.

Step 2 - Advanced Install

DIRECT FIRE Set-up

In OEM configuration, the RX-7 FD3S uses a single coil with 2 outputs for the Leading spark signal. This is referred to as “waste spark”.
The SakeBomb Garage IGN-1A Coil Kit uses 4 independent IGN-1A coils.
The SakeBomb Garage IGN-1A Harness is built to adapt the OEM waste spark signal to a 4-coil system. This is required if the system is being installed on a vehicle using the OEM ECU, PowerFC ECU, or another ECU which does not support “direct fire”. If you are using the OEM ECU, PowerFC, or other ECU that does not support “direct fire” then please move to Step 3.

For ECUs that support “direct fire” we have built 2 features into the IGN-1A Harness which allow the 4-coil system to be set-up for “direct fire”.

1. On the male side of the IGN-1A Harness Sumitomo connector, you will find a purple loop of wire (See image A). In default configuration, this purple wire jumpers the signal from the OEM waste spark wire to both L1 and L2 IGN-1A coils. For “direct fire” this purple loop of wire needs to be cut, so that independent signals can be fed to each L1 and L2 IGN-1A coil. Please cover the exposed ends you have cut with electrical tape to secure them.

2. On the female side of the IGN-1A Harness Sumitomo connector, you will find a Blue w/ Yellow Stripe wire pre-installed in Position 1 (Image B). This wire corresponds with the L2 signal wire on the IGN-1A Harness. After cutting the purple loop, the Light Green wire from the OEM harness that was used for waste spark is now used exclusively as the signal wire for the L1 IGN-1A Coil. You will need to extend the Blue w/ Yellow Stripe wire from the female Sumitomo connector directly to your ECU in the appropriate location. This is now your signal wire exclusively for the L2 IGN-1A Coil.
TIP: For ease of installation, you may choose to tap into an unused wire in the OEM harness. For example, if it is not utilized by your ECU, there is a signal wire located on top of the Power Steering Pump that sends a signal to the ECU. This is not often used by aftermarket ECUs, and you may be able to tap into this with a male bullet connector as your new L2 signal.

See photos on next page

Step 2 - Advanced Install

DIRECT FIRE Set-up (Continued)

Image A

Image B

Step 2 – Advanced Install

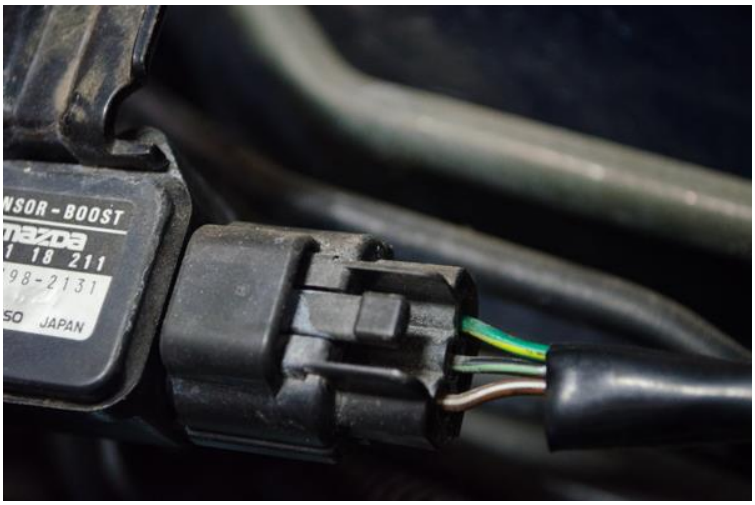
SENSOR GROUND Set-up

The ring terminal connected to the black wire on the igniter sub-harness connects to pin B on each coil connector. The coil uses this signal to reference ground. In unstable applications where battery voltage fluctuates or in high performance applications where consistent coil output is essential, it is advantageous to use the ECU-generated sensor ground signal to stabilize coil output. Utilizing the ECU generated sensor ground/reference ground will prevent under or overcharging the coil. The sensor ground/reference ground fluctuates in tandem with battery voltage to ensure a consistent differential between battery positive and "ground."

For applications where coils are not tuned to close to the limits of the coil, these slight fluctuations in coil output based on changing battery voltage are acceptable. This includes most street applications where conservative dwell time settings are used (such as our dwell time curve listed in this manual for the Power FC).

For performance applications where consistent coil output is of utmost importance, or where dwell time is close to the recommended limits of the coil, overcharging or undercharging the coils can become an issue and we recommend referencing sensor ground to counteract any voltage fluctuations.

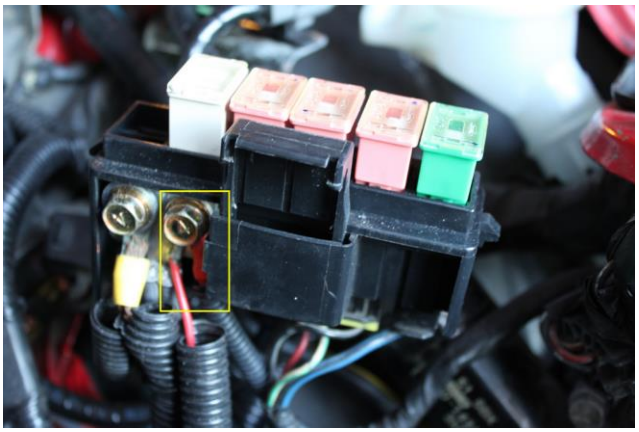
In order to convert your harness to use this sensor ground signal, you will need to cut off the ring terminal on the sub-harness. We recommend tapping into the MAP sensor reference-ground wire, which is the middle wire, colored black with a green stripe (see right). This can be done using a "vampire tap" or for a more secure connection, solder with heat-shrink tube.



Step 3 - Install adapter harness

Once the new connector has been pinned to the factory wiring it's time to connect the adapter harness; mount the relay and connect the power/ground wires. We recommend mounting the relay to the chassis slightly in front of the brake booster (see Image 2 for reference), but it can be mounted elsewhere if desired.

- The Batt + wire needs to be connected to the positive terminal on the battery (we recommend connecting to the main fuse box attached to the positive battery cable) or a constant power source.



    - If your battery positive wire is not within reach of the harness, you may also use the factory connection on the large gauge starter wire.
- The Batt – wire needs to be connected to the negative terminal on the battery. As a last resort (if a battery ground is unavailable) you may use a clean chassis ground.
- **Attach the engine ground wire to the rotor housing or any clean ground location on your engine/chassis**
  (We recommend using the factory harness grounding location located beneath the throttle body)
- The black ground wire on the short sub-harness may be connected to any clean chassis ground, but for high performance applications please see Step 2: Advanced Install for further directions.
- The OEM harness ground is accessible by removing the factory coils (Which are no longer used) See Image 3. We recommend removing the factory coils to aid in cooling under the upper intake manifold.

See photos on next page

Step 3 - Install adapter harness (Continued)

Image 2

Image 3: Recommended engine grounding location

Step 4 - Install coils and bracket

After you have the adapter harness routed you may now install the coils. If you have chosen our bolt on coil mount please continue reading, otherwise disregard this step, as your mounting solution will vary.

- If equipped, remove the cruise control module.
- Detach windshield nozzle elbow from the firewall (Image 4)
    - Accessible by moving the rainwater plenum at the base of the windshield (see image 5).
- Detach map sensor harness from firewall.
    - Accessible by moving the rainwater plenum at the base of the windshield.
- Remove plastic firewall clip from map sensor harness by unwrapping the electrical tape holding it on.
- Tuck the harness behind brake booster and under the brake lines to provide additional clearance for the IGN-1A coils.
- Assemble the coils onto the coil bracket. The coils must be assembled in the same orientation with the plug wire post facing the engine. Failing to do this will cause fitment issues. Use Image 6 for reference.
- With the coils assembled onto the mount, plug the adapter harness connectors to the bottom of each coil in the following order (starting at the front of the car): Leading 1, Trailing 1, Leading 2, and Trailing 2. Adhere the included marking tags to the top of the coils.
- Lower the coil mount into position, and bolt the mount and black condenser to the frame rail using the supplied M6 hardware. See Image 7 for reference (Condenser is circled in red).

Image 4

Image 5

See photos on next page

Step 4 - Install coils and bracket (Continued)

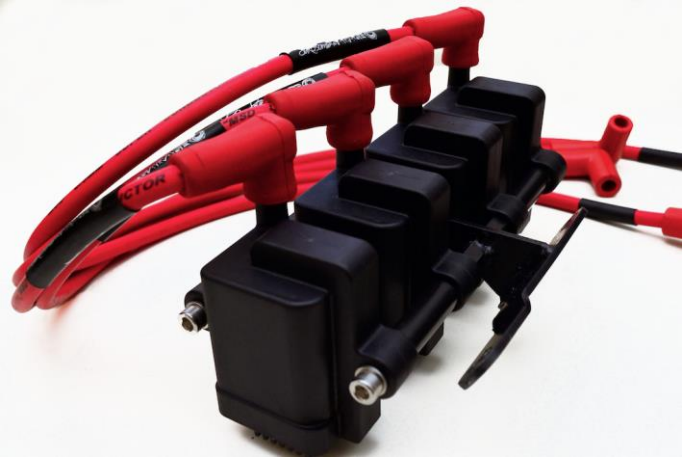


Image 6 Note coil post orientation.

Image 7: Condenser circled in red

Step 5 - Spark plug wire install

If you followed the instructions in step 3 your coils should be connected in the following order (starting at the front of the car): Leading 1, Trailing 1, Leading 2, and Trailing 2. Connect each spark plug wire to the correlating coil. The plug wires need to be connected to the engine in the order pictured (Image 8).

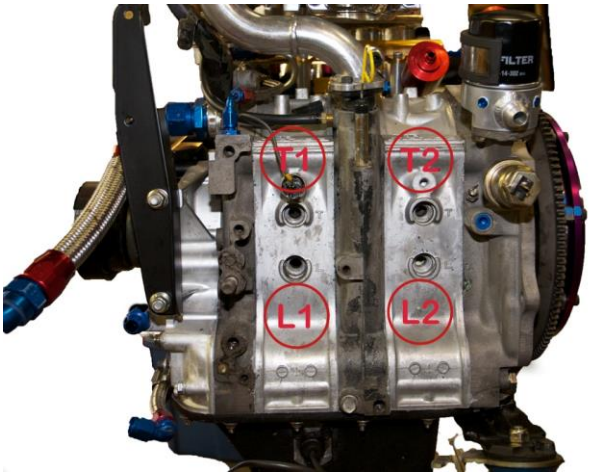
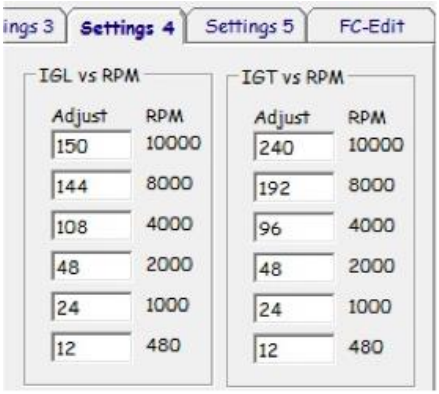


Image 8

Recommended Dwell Settings

The dwell settings in the ECU will need to be modified if you want to get the most out of your new coil package. Depending on the ECU your entry method will vary. The Apex PowerFC is the most commonly used aftermarket ECU for the RX-7. A FC-datalogit is required to make the appropriate changes to the ECU. Below is a screen shot with the settings we recommend.



Your install is now complete! Thank you for choosing us and for your continued support. We realize you have multiple options when shopping for parts, which is why we strive to produce new and innovative products. If you have any questions please feel free to contact us!

Contact:

sakebombgarage.com

info@sakebombgarage.com

facebook.com/sakebombgarage