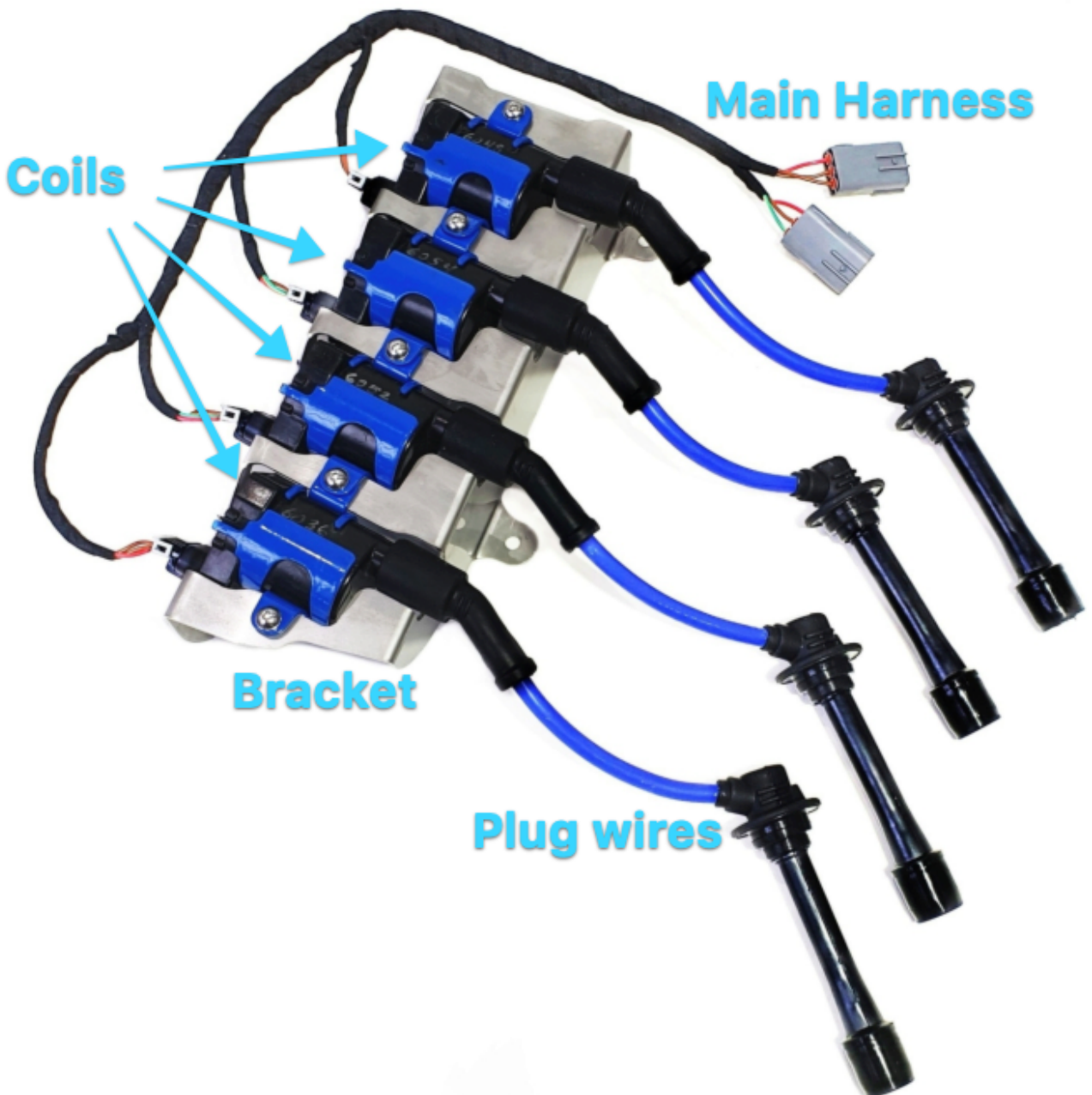


LS Coil Instructions

Note - we haven't completed the instructions for the R8 coil kit yet. It's basically the same, so just follow these instructions. Scroll to the very bottom for R8 coil notes.

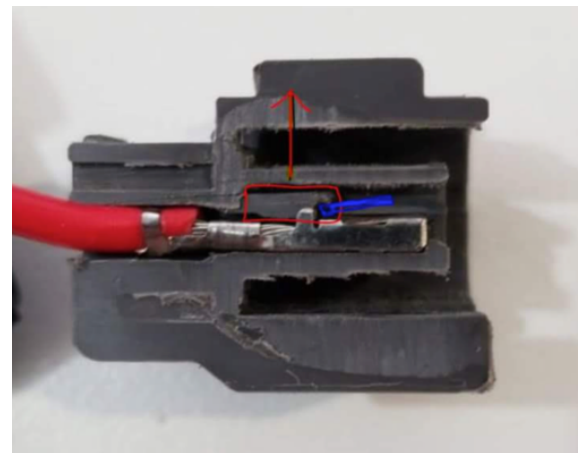
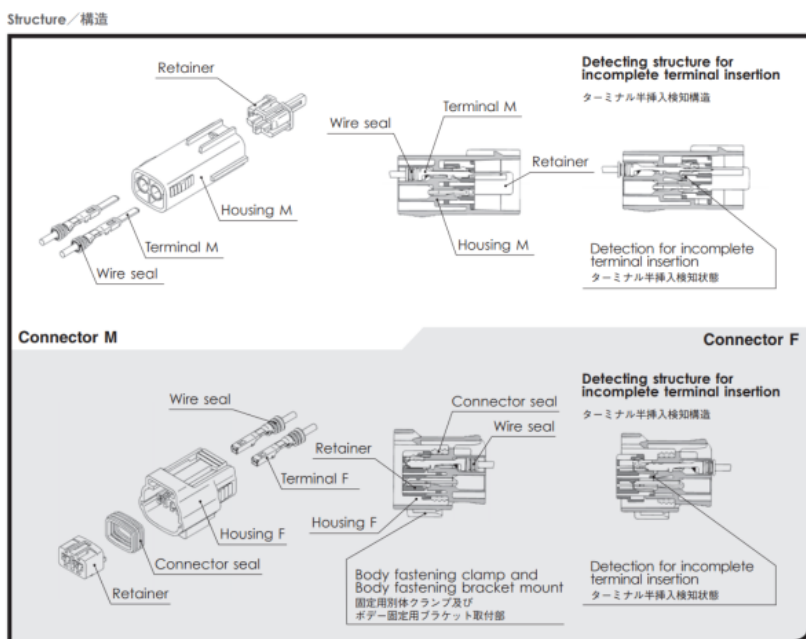
The complete kit comes with four main sets of components: a coil bracket that fits on the intake side of the valve cover, 4x LS2 truck coils, 4x spark plug wires, and wiring components.



Let's start with the mechanical installation of the bracket and coils. Remove the OEM coil packs (see the appropriate chassis year section for what to do with the connectors you remove). Install the LS2 coils onto the bracket with the supplied hardware - note that the latest version of the bracket comes with the coils pre-installed. De-torque all your valve cover bolts before removing the ones where the bracket goes. Connect the main harness to your coils. Mount the bracket to the intake side of your valve cover and then follow the torque specs and order in the service manual.

The spark plug wires are 3 different lengths. A shorter one, a middle one, and two longer ones. We designed them to be installed long, long, medium, short from front to back, however, you can install these however you want to be the most aesthetically pleasing. On 1990-2000 engines the plug wires should fit in without any fuss. Once the wire clicks onto the spark plug, you may need to press the top of the boot a bit to get it to seal nicely in place. 2001-2005 engines have slightly smaller plug boot holes, and also two of the spark plug holes are raised slightly. The plug wires should fit the lower holes with a slight gap. For the raised holes, a little trimming is required to slim down the boot.

For wiring, the instructions are different for 1990-93, 94-00, and 01+ chassis. Please follow the guide for your year of car. The instructions are the same regardless of which year engine you have. The following diagrams maybe be helpful for 1990-2000 chassis owners.



Cross section of connector. Insert small screwdriver where marked in blue. Lift the tab circled in red. The wire should then easily pull out the back of the connector.

1990-1990

For these early year cars, we are replacing the stock igniter, so it's a little more involved. Most issues arise when pinning the wires from the igniter connector to the supplied 3-pin connectors.

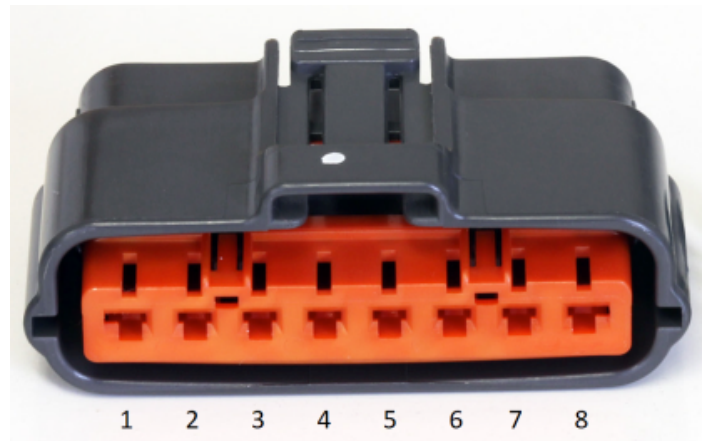
Unplug and remove the igniter (located near the fuse box).

Connect the extension harness to the main LS coil harness and route accordingly so that the other end sits near the 8-way igniter connector. Note that there are two versions of the main harness. V1 has brown wires, and with that version simply match up the colors of the wires to the 90-93 patch. V2, which began shipping in September 2019, does not have any brown wires. With the V2 harness, match up the red wires and the green wires to the 90-93 patch to ensure they are plugged correctly.

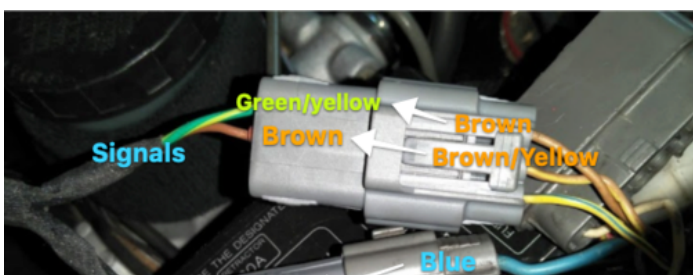
Carefully remove the orange secondary lock from the 8-way connector.



Using a very small jewelers flat head screwdriver or equivalent, lift the terminal retainer inside the connector and remove the number 2, 3, 6 and 7 terminals from the connector.



Insert the wires into the two provided 3-way connectors following the below tables to ensure the correct positions. There are two brown wires on the harness extension. We know this is confusing. Please look carefully at the image of the connectors to ensure the correct wire arrangement.



Note that in April 2020 we released the V2 NA6 patch with more intuitive wire colors. See the table below to identify the wiring of your version.



NA6

FF Patch V1....	FF Patch V2....	OEM Igniter Side
Green/Yellow (signal)....	Green	7 – Brown
Brown (signal)	Blue	2 – Brown/Yellow
Red (12V+)	Red	3 – Blue
Brown (ground)	Black	6 – Black

Fit the orange secondary locks to the connectors.



Connect the two 3-way connectors into the matching connectors on the LS coil harness. Look carefully at the labeled picture above to make sure they are correctly connected. Optionally mark one set of matching connectors with a permanent marker to prevent future mix up.

(Optional) Join the two circuits on pin 4 and 5 of the igniter connector (Yellow/Blue & Black/White) to connect your ECU directly to the gauge cluster tacho and allow the ECU to control the tach. The ECU will need a suitable output connected to pin 2l of the ECU connector to allow this.

1994-2000

The 4-pin connector used by this year-range is no-longer produced, however it only uses 3 pins anyway. In this install, you de-pin the 4-pin connectors and pin the wires into the same type of 3-pin connectors used by 2001+ cars. Alright then, let's get to it!

Take your 4-pin coil pack connectors and using a very small jewelers flat head screwdriver or equivalent, lift the terminal retainer inside the connector and pull the wires out of the rear of the connector housing. If the connector has an orange secondary lock, it will have to be carefully removed before removing the terminals.

Insert the wires into the two provided 3-way connectors following the below tables and diagram to ensure the correct positions.

In September 2019 we released V2 of our harness, which has more intuitive wire colors. Please note which version you have from the table below when matching up to your vehicle harness.

FF Coil Harness Side

94-97 OEM Harness Side

99-00 OEM Harness Side

Connector 1

Blue (Position 1 - signal)

Brown/Yellow

Brown/Yellow

Black (Position 2 - ground)

Black

Black

Red (Position 3 - 12V+)

Blue

Black/White

Connector 2

Green (Position 4 - signal)

Brown

Brown

Black (Position 5 - ground)

Black

Black

Red (Position 6 - 12V+)

Blue

Black/White





Early NA8 will have two spare black/white wires left over. Insulate them and tape them back to the harness.

Connect the two 3-way connectors into the matching connectors on the LS coil harness. Match the connectors according to the wire colours above. Mixing them up will result in cylinders firing in the wrong order. Optionally mark one set of matching connectors with a permanent marker to prevent future mix up.

2001-2005

NB2 cars have the most straight forward installation. All you are doing is connecting the OEM plugs to the FlowForce harness. Connect the longer OEM 3-way connector to the matching LS coil connector with a green wire. Connect the second shorter OEM 3-way connector to the matching LS coil connector with two brown wires. Mixing these connectors up will result in cylinders firing in the wrong order.

All Years

With the wiring done and the bracket, coils, and plug wires installed, it's time to set up your tune. The below is for Megasquirt 3, and other MS version and stand along ECUs should be similar.

Start by setting up your coil settings

Ignition Options / Wheel Decoder

File View Help

Ignition Options / Wheel Decoder

Spark Mode (Dizzy, EDIS, Wheel) Miata 36-2

Fixed Advance Use Table

Trigger Angle/Offset(deg) 0.0

Use Prediction 1st Deriv Prediction

Angle Between Main And Return(deg) 50.0

Timing for Fixed Advance(degrees) 10.0

Oddfire First Angle 90.0

Cranking Dwell(ms) 6.0

HEI/GMDIS, TFI, C3I Options Off

Cranking Advance(degrees) 6.0

Oddfire Phasing Alternate

Skip Pulses 3

Toyota Multiplex Off

Dwell type Standard Dwell

Ignition Input Capture Falling Edge

Use Dwell vs Rpm Curve Off

Spark Output Going High

Use Dwell Table On

Number Of Coils Wasted spark

Nominal Dwell(ms) 3.5

Spark Hardware In Use MS3X spark

Spark Duration(ms) 1.0

Cam Input (See tooltip) MS3X Cam in

Dwell Time(ms) 1.0

Dwell Duty(%) 50

Tertiary Tach Input MS3X Cam

Flip Polarity On Hi-Res Tach / Cam Normal

NOTE: Spark hardware latency should ONLY be used if you notice spark retard with increasing rpms.

Trigger Wheel Arrangement Single wheel with missing tooth

Spark Hardware Latency(usec) 0

Middle LED indicator Off

Trigger Wheel Teeth(teeth) 36

Spark Trim Off

Missing Teeth(teeth) 1

Kick-start crank delay Off

Tooth #1 Angle(deg BTDC) 80.0

Delay(ms) 1.000

Main Wheel Speed Crank wheel

Custom Oddfire Angles In Sequence From #1

Second Trigger Active On Falling edge

Level For Phase 1 Low

1st 60.0 2nd 60.0

Check At Tooth# 0

3rd 60.0 4th 60.0

And Every Rotation Of. Cam

Sets the type of tach input pattern decoder to be used.

Burn Close

Then set up your dwell table and battery correction.

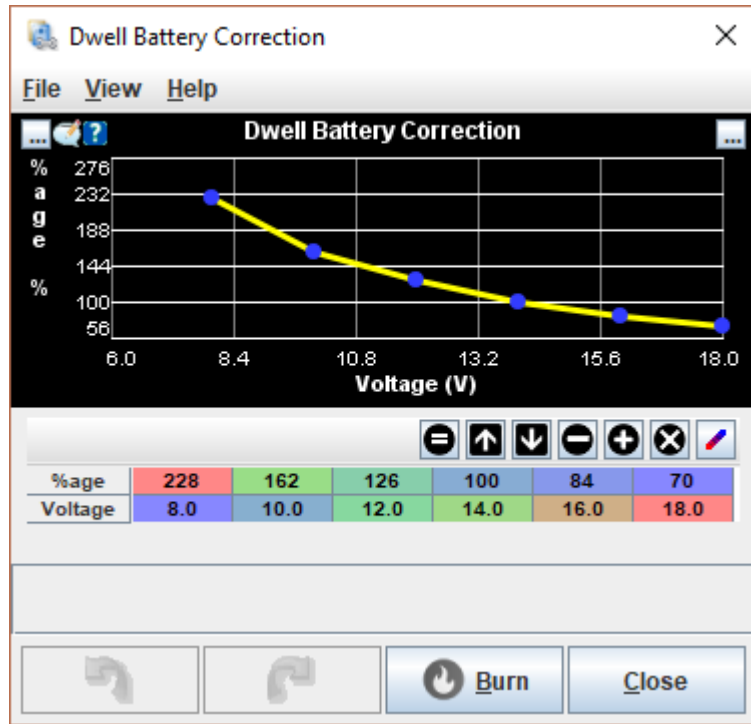
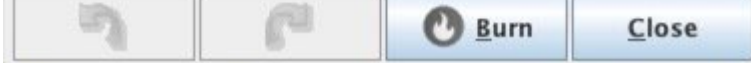
Dwell Table

File View Help

Dwell Table 3D View

i	255.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
g	200.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
n	150.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
l	100.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
o	80.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
a	60.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
d	40.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
	20.0	4.0	4.0	3.7	3.6	3.5	3.3	3.2	3.0
p		500	4800	5600	6000	6400	6800	7200	8000

rpm

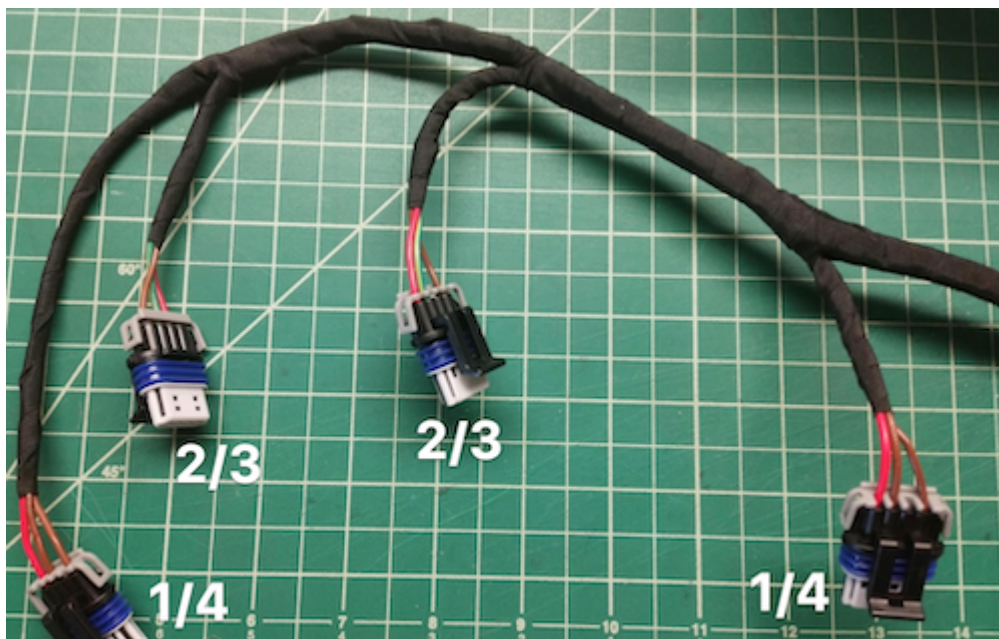


Note that MS2 doesn't have Dwell tables. Just set nominal dwell to 3.0 and send it.

Now it's time to drive your car! You will likely need to slightly tune much if not all of your fuel table. LS coils pack a meatier punch and will give you more complete combustion.

Sequential Add-On

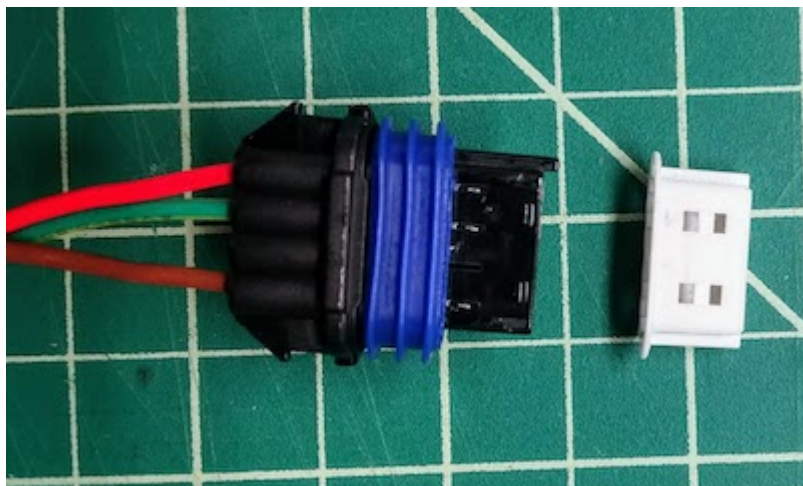
The FlowForce LS coil harness comes wired for wasted spark for plug and play ease, and is also upgradeable for sequential ignition. The switch to sequential is fully reversible, and the upgrade kit is available on this site.



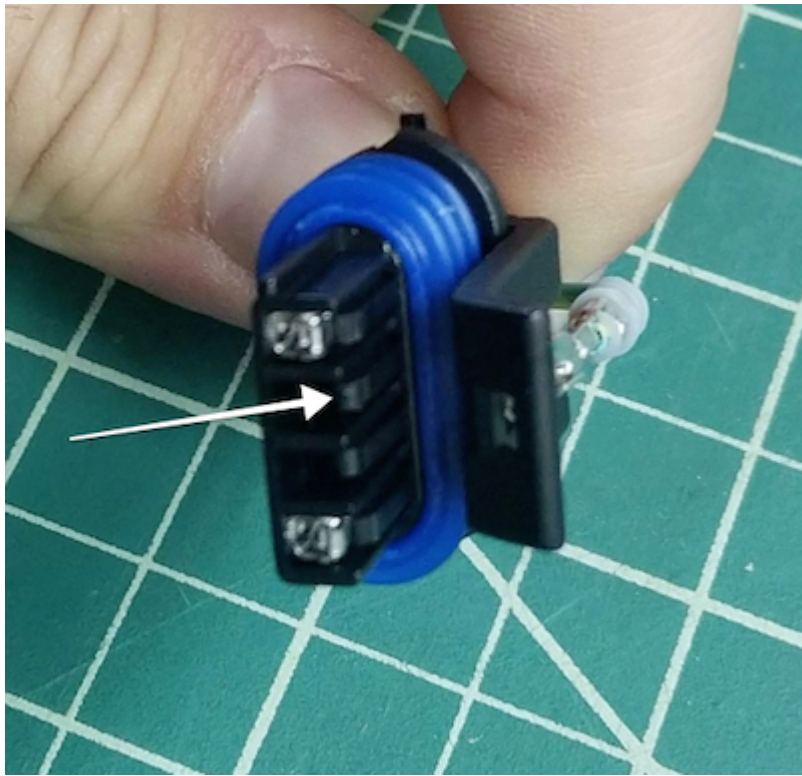
The middle connectors are for cylinders 2 and 3 and the outer connectors are for cylinders 1 and 4 in batch configuration. When switching to sequential, the signal wires that are in the harness already will fire cylinder 1 and 3, and you'll repin one 1/4 connector to your ECU to fire cylinder 4 and one 2/3 connector to cylinder 2. You can choose which connectors you re-pin based on the layout of your harness in your car, but this would typically be that the coil connector farthest from the harness plug would be 1. On each connector you repin for sequential, you need to remove the middle wire and replace it with the new sequential wire. To make the upgrade fully reversible, insulate and tape back the old middle wire.



Start by removing the wire guard



Then pull with firm careful pressure to remove the white cover



Use a small flat screwdriver or pick to pull up on the retainer clip, and pull out the middle wire.

Once the wiring is complete at the harness, run the two new sequential wires back to your ecu, and splice to your spare ignition signal wires. Make the appropriate adjustments in your tuning software to run sequential.

R8 Coil Notes

Complete instructions are coming soon, but please note the ECU requirements. These coils draw high current on the signal circuit, and are only confirmed to work with certain ECUs. Confirmed to work with: Any MS3Pro, the latest MSPNP2, FlowForce MS2, SpeedyEFI PNP, Current ME221 and ME442, and Haltech Elite. Other ECUs, including MS3 Basic, MS3x, early MS2, microsquirt and others, required an additional circuit. Please make sure you've done your research and know what you are doing if you use these with a non-confirmed ECU.

Ignition settings: use the same ignition settings as LS coils, except set cranking dwell to 4. Use the same dwell battery correction. These coils draw a lot of current, so note the lower dwell settings below.

	255.0	200.0	150.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
i	255.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9		
g	200.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9		
n	150.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9		

Load	100.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
	80.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
	60.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
	40.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
	20.0	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.9
rpm	500	1200	2000	3000	4000	5000	6000	7500	

R8 Coil Dwell Settings

If you have any questions, or have any feedback, please reach out to team@goflowforce.com

[INJECTOR INSTRUCTIONS \(/INSTRUCTIONS\)](#)

[LS COIL INSTRUCTIONS \(/LS-COIL-INSTRUCTIONS\)](#)

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