

GReddy Turbo Kit

2003 Mazda RX-8 (13B-MSP)

T618Z 10cm² (Actuator Type)

2003 Mazda RX-8 (13B-MSP)T618Z 10cm² (Actuator Type)

Installation Manual

Please read the entire manual before installing this kit.

Application:

Make	Model	Chassis	Year
Mazda	RX-8	LA-SE3P	2003

- This **GReddy Turbo Kit** is designed only for the vehicles specified above.
- Premium grade gasoline (91 octane or higher) is required with this Kit.
- Make sure that the vehicle is not equipped with any ECU upgrade chips.
- This kit is designed for High Power 6 speed manual transmission Vehicle only.

Important

1. This installation should only be performed by a trained specialist who is very familiar with the automobile's mechanical, electrical and fuel management system.
2. If installed by an untrained person, it may cause damage to the kit as well as the vehicle.
3. GReddy Performance Products Inc. is not responsible for any damage to the vehicle's electrical system caused by improper installation.
4. Make sure to follow the instruction and pay attention to the "Important", "Warning!" and "Caution!" notice through out the instruction.
5. Improper installation can be **dangerous!** Please make sure to inspect the installation before operating the vehicle.
6. Call your GReddy Authorized dealer or GReddy Performance Products if there are any problems or questions regarding this product.

1. Parts List

1.	Turbocharger	T618Z 10cm ²	P380	1
2.	Exhaust Manifold	Ductile Iron Cast		1
3.	Downpipe Adapter	Ductile Iron Cast		1
4.	Intercooler	Tyoe 31C		1
5.	Intercooler Bracket	(Steel)		1
6.	Suction Pipe	S-1	(80 -60 Aluminum)	1
7.	"	S-2	(60 Aluminum with flange)	1
8.	Compression Pipe	C-1	(50 Aluminum flange elbow)	1
9.	"	C-2	(50 Aluminum)	1
10.	"	C-3	(50 Aluminum)	1
11.	"	C-4	(60 Aluminum elbow)	1
12.	"	C-5	(60 Aluminum)	1
13.	"	C-6	(80 Aluminum)	1
14.	Airflow meter adapter	X-4008	(Aluminum elbow)	1
15.	Airinx	AY-MB	(Blue)	1
16.	Airinx	Hose Adapter	80	1
17.	"	10	- M18 Fitting	1
18.	"	Hose band	#48	1
19.	Air Pump Pressure Hose			1
20.	Oil Pressure Hose	SUS	(800mm)	1
21.	Oil Pressure Copper Washer	10	(t=1.0mm)	1
22.	Oil Pressure Union Fitting	3-Way	1/8PT Fitting	1
23.	"	1/8PT	- 1/8 PT Straight	1
24.	"	1/8PT	- 1/8 PF Straight	1
25.	"	1/8PF	- M10 P1.25	1
26.	Oil Return Flange Tube	16		1
27.	Oil Return Fitting	16	- M14 P1.5	1
28.	Oil Return Copper Washer	14	(t=2.0mm)	1
29.	Oil Pan with welded Oil Return Pipe			1

30.	Vacuum Hose	5	x 2000mm	(Blue)	1
31.	Rubber Hose	9	x 800mm		1
32.	"	16	x 150mm		1
33.	Rubber Hose	50	x 70mm		2
34.	"	60	x 70mm		3
35.	"	80	x 60mm		1
36.	Silicone Hose	50	- 60	Reducer	1
37.	"	80	x 80	Reducer	1
38.	"	80	- 90	Reducer	1
39.	Hose Band	16	#10		2
40.	"	50	#32		5
41.	"	60	#36		8
42.	"	80	#48		4
43.	"	90	#56		1
44.	Gasket	Compressor Inlet		(Part # 14465-54C00)	1
45.	"	Compressor Outlet		(Part # 14465-05U11)	1
46.	"	Turbine Inlet			1
47.	"	Turbine Outlet			1
48.	"	Oil Return	TD Small		1
49.	"	Air Pump Tube Flange			1
50.	Thermo Cloth	100mm	x 250mm		1
51.	Thermo Barrier Tape	(14002)			1
52.	Wire Loom	13	x 500mm		1
53.	Wire Loom	19	x 250mm		1
54.	Zip Ties	100mm			10
55.	"	150mm			5
56.	"	200mm			5
57.	E-Manage	(US-RX8 6MT)			1
58.	"	Plug-In Harness			1
59.	"	Pressure Sensor			1

61. Down Pipe Adapter Bracket					1
62. Fitting 5 to 5					1
63. Hose Adapter 10					1
64. M4 x 10mm	Stainless	P=0.7	B		2
65. M6 x 15mm	Stainless	P=1.0	B S/W	F/W -	4
66. M8 x 20mm	Stainless	P=1.25	B S/W	F/W N	2
67. M8 x 25mm	Stainless	P=1.25	B S/W	F/W -	4
68. M8 x 30mm	Stainless Stud	P=1.25 – 1.25	B S/W	- N	9

Part List



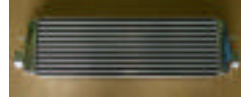
1



2



3



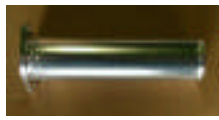
4



5



6



7



8



9



10



11



12



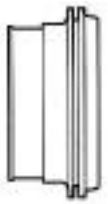
13



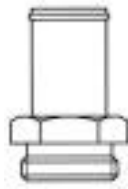
14



15



16



17



18



19



20



21



22



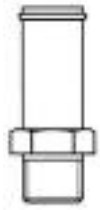
23



24~26



27



28



29



30~32



33~35



36~38



39~43



44



45



46



47



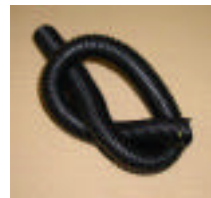
48



49



50, 51



52, 53



54~56



57



58



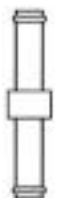
59



60



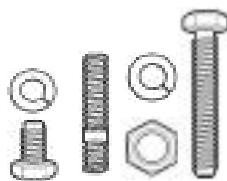
61



62



63



64~68

2. Factory Parts Removal

When removing the stock parts, please refer to the factory RX8 Workshop manual for proper procedures.

2-1 Factory Parts Removal

1. Remove the engine cover and the battery cover. Disconnect the negative terminal of the battery.
2. Remove the battery, battery box, and battery tray.
3. Drain the engine oil.
4. Remove the front strut bar, air cleaner box, air cleaner insulator and intake pipe.
(RX8 Workshop Manual pages 01-13-2 ~ 01-13-6)

5. Remove the engine under cover, front inner fender, and front bumper.
(RX8 Workshop Manual pages 09-10-7)

6. Remove the Front Stabilizer Bar.
7. Remove the AIR pump, AIR Control Valve, and AIR Control pipe.
(RX8 Workshop Manual pages 01-16-2, 01-16-2, 01-16-8)

8. Remove the Transverse Member.
(RX8 Workshop Manual pages 02-13-18)

9. Disconnect the rear o2 sensor and remove the Cross Member, and Catalytic Converter.
(RX8 Workshop Manual pages 01-15-2)

10. Disconnect the front O2 sensor and remove the Right Engine Mount Bracket, Right Engine Mount Rubber and exhaust manifold using the SST tool to hold the engine.
(RX8 Workshop Manual pages 01-15-2 ~ 01-15-4)

3. Turbo Kit Installation

3-1 Thermo Cloth Installation

1. Apply the provided Thermo Tape to the fire wall around the exhaust manifold. (To secure the Thermo Tape, Apply Aluminum tape on the edges)
2. Bend and push the heat shield on the chassis more against the body.

(Parts Used #51)

Caution!

It is very important to protect the parts surrounding the exhaust manifold and turbo from high temperature. Improper installation of the thermo barrier may cause damage and fire.



3-2 Oil Pressure Line Installation

1. Remove the factory oil pressure switch at the left side of the rear rotor housing and install the Oil pressure line using the provided 3 way fitting, and straight fitting. Route the line to the right side of the engine (over the transmission) to connect to the turbo in the later step.
- * Apply Teflon tape on the PT thread in and to not over tighten the fitting.
 - * Wrap the oil pressure line with the provided wire loom.



3-3 Turbocharger Install

1. Remove the e-clip and two bolts and remove the actuator off from the turbocharger.

(Parts Used #1)

2. Install the provided oil pressure fitting with copper washer and oil return gasket with one mounting bolt as shown.

(Parts Used #22, 26, 48, 65)

3. Install the provided stud bolts to the manifold and turbine as shown.

(Parts Used #2, 68)



- Place the turbocharger up by the engine, and while holding the turbo to the side, install the exhaust manifold to the engine.
*Use factory gasket



- Connect the oil pressure line that was installed in the step 3-2 to the turbocharger. Install the turbocharger to the manifold using the provided gasket and hardware.

(Parts Used #46, 68)



- Reinstall the engine mount bracket and rubber, then remove the SST tool.

- Install the suction pipe S-3 to the turbo inlet using the provided gasket and hardware.

(Parts Used #7, 44, 67)



- Replace the oil drain plug with the provided oil return fitting and copper washer.

(Parts Used #28, 29)

- Install the oil return pipe to the turbo charger. Wrap the thermo cloth to the 16 hose and connect the oil return pipe to the oil pan.

(Parts Used #27, 32, 39, 50, 65)



10. Install the compression pipe C-1 to the turbo out let using the provided gasket and hardware.

(Parts Used #8, 45, 67)

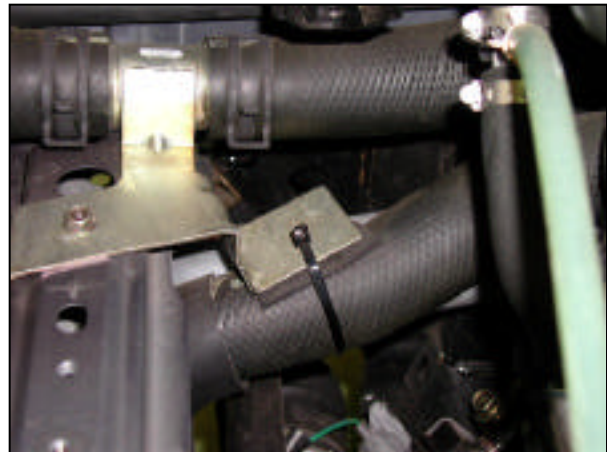
11. Re install the actuator back on to the turbocharger. Reinstall the e-clip back to the swing valve.



3-4 Intercooler Installation

1. Remove the auxiliary temp sensor on the bumper reinforcement, and rotate it 180°, then reinstall it back to the original mounting location.
2. Install the intercooler mounting bracket to the bumper reinforcement mounting bolt. Then install the intercooler to the bracket. *Adjust the bracket to mounting intercooler parallel.

(Parts Used #4, 5, 66)



3. Remove the plastic part between the lower radiator hose and bracket. Bend the bracket up and secure it with zip ties as shown.

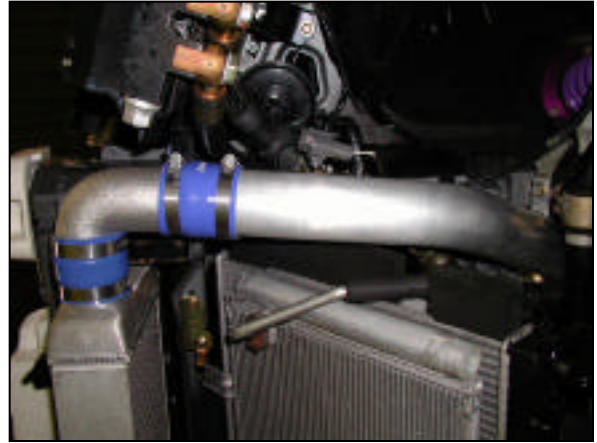


4. Install the compression pipe C-2 and C-3 between the C-1 to the intercooler with provided hose and hose band. Secure C-2 bracket to the speed sensor harness bracket (RH).

(Parts Used #9, 10, 33, 36, 40, 41)

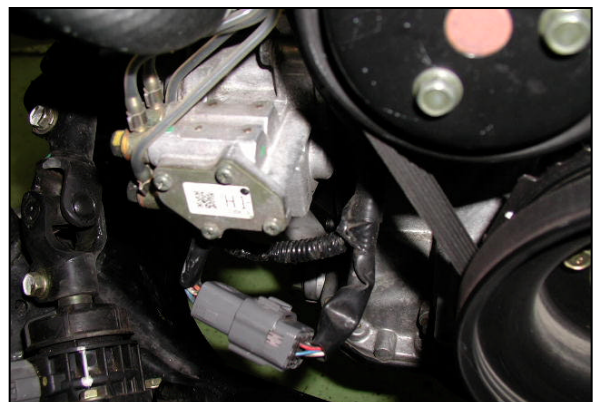


5. Install the compression pipe C-4, C-5, and C-6 between the intercooler and throttle using the provided hoses and hose bands.
Secure C-5 bracket to the speed sensor harness bracket (LH).
(Parts Used #11, 12,13, 34, 35, 37, 41, 42, 56)
6. Reinstall the front stabilizer bar.



3-5 Airinx Installation

1. Install the suction pipe S-1 to the S-2 using the provided hose and hose band.
Secure the S-1 bracket with the ground wire mounted to the body.
(Parts Used #6, 34, 41, 50)



2. Trim the shaded area of the factory air cleaner insulator as shown.
3. Remove the top housing and the filter of the Airinx by removing the top screw off. Install the hose adapter and 10 -M18 fitting on to the Airinx. Make sure that the hose adapter is properly install on the Airinx frame.

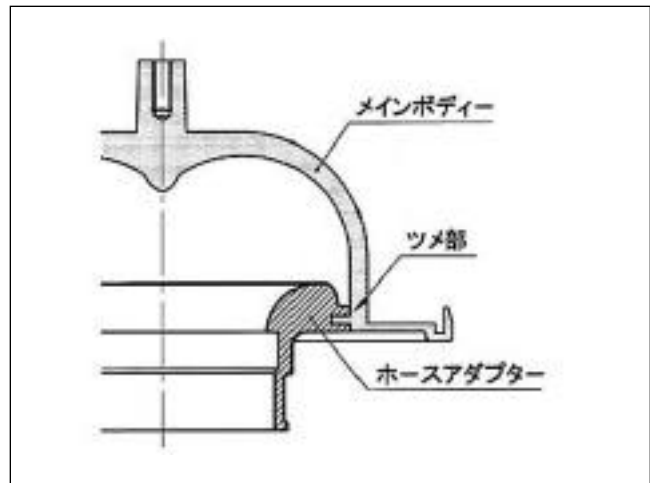
(Parts Used #15, 16, 17)



4. Assemble the Airinx back together and hand tight the top screw.
5. Remove the factory Airflow meter off from the air cleaner box and install the Airflow mete to the provided air flow meter adapter. Install the Airinx and the adapter to suction Pipe S-1.

* The O-ring on the Airflow meter will be reused. Apply some grease on the O-ring on the Airflow meter, and make sure not to damage when installing.

(Parts Used #14, 18, 38, 42, 43, 64)

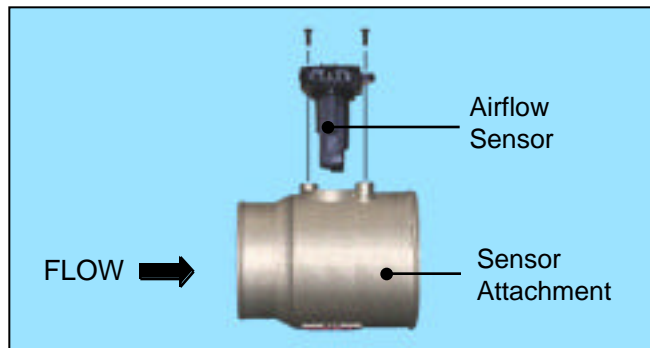


6. Secure the Airinx with the provided bracket and connect the Airflow meter connector.

(Parts Used #19)

7. Connect the air hose from the Metering Oil Pump to suction pipe S-1 and connect the Jet Air Fuel Mixing sir hose to the fitting on the Airinx using provided hose fitting and 9 hose

(Parts Used #31, 63)



8. Connect the Engine by pass hose on the Oil filler pipe to the suction pipe S-1

(Parts Used #31)



3-6 Air Pump and Exhaust Installation

1. Install the provided Air Pump Hose to the factory AIR control valve and install the valve back to the original location. And route the Air Pump Hose over the turbocharger.

*Use the factory gasket and bolts.

(Parts Used #20)



2. Install the O2 sensor to the down pipe adapter and install the adapter to the Turbo using the provided gasket and hardware. Connect the O2 sensor connector.

(Parts Used #3, 47, 68)



3. Connect the Air Pump hose to the down pipe adapter. Bend the hose so that it will no contact the turbine housing.

(Parts Used #49, 65)



4. Secure the Down Pipe Adapter to the transmission with the provided bracket.

(Parts Used #61)

5. Reinstall the Catalytic converter, exhaust system, and the cross member in the order they were removed using the factory gaskets.

6. Reinstall the transverse member.

7. Cover the Air pump hose with provided wire loom and connect the hose for the AIR control valve.

(Parts Used #53, 56)



8. Connect the AIR control valve hose and the connector.

3-7 e-manage installation and vacuum hose connection for the actuator.

1. Remove the washer tank and drill a 1" hole on the fire wall. Make sure not to drill through any thing on the other side. There is a hump on the fire with a circle indentation behind the washer tank, which would be a perfect location to drill. Install a rubber grommet to protect the wire harness.
2. Remove the PCM cover and disconnect the Main harness from the PCM. Connect the provided plug-in harness between the Main harness and the PCM. Route the harness along the fender in to the passenger compartment through the hole that was cut. Connect the e-manage to the harness.

(Parts Used #54, 55, 57, 58)

3. Install a vacuum hose to the port on the intake manifold (right after the throttle) that was connected to the VFAD actuator (removed with the Air cleaner box) and connect it to the provided pressure sensor. Route the harness with the e-manage harness and connect it to the e-manage.

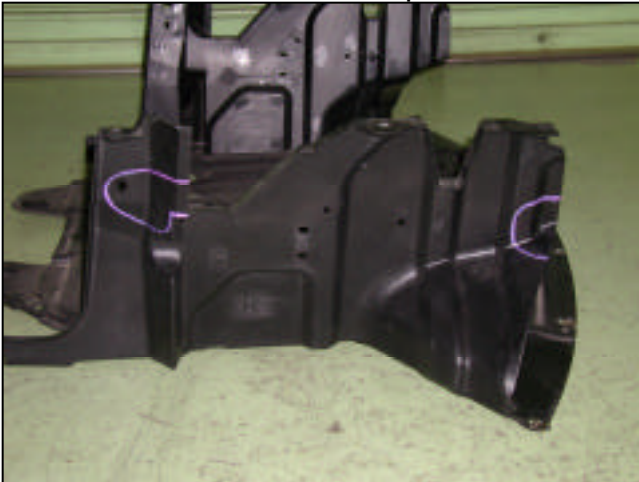
*secure the vacuum hose with the provided zip ties.

(Parts Used #30, 54, 59, 60, 62)

4. Stick the e-manage emblem on the e-manage unit and mount the unit.
*Avoid mounting the e-manage unit in a place where it can get wet or wet. Also, avoid exposing it to direct sun light.
5. Remove the rubber plug on the intake manifold and connect a vacuum hose from this port to the actuator on the turbo.

3-8 Bumper installation

1. Cut the under cover and the inner fender cover to clear the compression pipe.
2. Reinstall the front bumper.



Starting the Engine

1. Reinstall the battery tray, battery box, battery, and connect the positive terminal only.
2. Reinstall the front strut tower bar.
3. Refill the engine oil and inspect the hoses and wire connection, then connect the negative terminal of the battery.
4. Turn the ignition to "ON" position and confirm that the "ACTIVE" L.E.D. lights up GREEN.
5. Remove the ECM fuse and crank the engine to get oil pressure to the turbo. (Until the oil light on the dash turns off) Check for any oil leaks, then reinstall the fuse and start the engine.
6. While idling, check for any oil, coolant, or air leaks.
7. After inspection, reinstall the under cover and other stock parts that was removed.
8. On the initial run, be sure to have a boost gauge to check the turbo-actuator setting. This turbo kit is preset to boost between 0.4kg/cm^2 to 0.45kg/cm^2 .
It is very important that you monitor the boost pressure, and make sure not to over boost.
Over boosting can cause engine damage.

This completes the Turbo Kit installation.

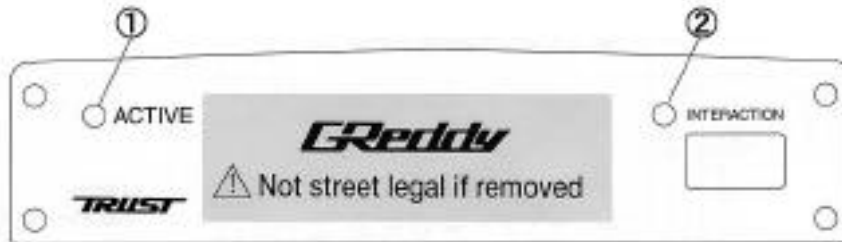
- **Important!**

- **It is very important that you monitor the boost pressure, and make sure not to over boost. Over boosting can cause engine damage.**
- **GReddy Performance Products, Inc. is not responsible for any engine damage caused by over boosting (increased boost), modification to the kit, and/or misuse of the product. NO WARRANTY is offered.**
- **Due to lack of control over proper installation and use of this product, NO WARRANTY is offered for this kit.**

e-manage Information

Important!

- The e-manage included in this kit is preprogrammed for this turbo kit.
- Do not attempt to adjust any of the setting in the e-manage.
- Any adjustments made can cause damage to the e-manage, engine and the factory ECU.



Important!

As of 12/30/04 this kit is not a street legal kit. Please ignore the label on the e-manage.

① ACTIVE L.E.D.

1. When the ignition is turned on, it will illuminate and flash GREEN.
2. When it reaches to the A.A.V. setting RPM range, it will illuminate and flash ORANGE.
3. When an error is detected it will flash RED.

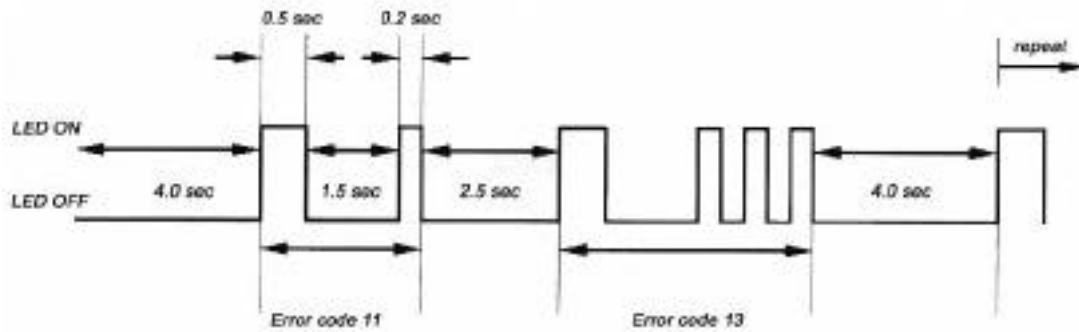
② INTERACTION L.E.D.

11. This will illuminate when there is a connection with PC.

Checking Error Codes

When the unit is powered up and if there are any errors, the ACTIVE L.E.D will turn "RED" from "GREEN", and begin to flash.

If this happens shut the engine off and turn the ignition switch to "ON" position to go to Self Troubleshooting Mode. While in the Self Troubleshooting Mode, the L.E.D. will show the error code. Turn off the ignition. Check the error code in the chart below and fix the problem. The error code will show until the error is corrected.



CODE	Error	Error description
11	Airflow Signal 1 input error	Incorrect wiring or disconnected Airflow Signal 1
15	Airflow voltage output error	Incorrect Airflow signal output wiring.
20	No Injector pulse from all	Not receiving an injector signal for Additional Injection Map
21	No Injector 1 pulse	Not receiving injector signal I/J CH-1 for Additional Injection Map
22	No Injector 2 pulse	Not receiving injector signal I/J CH-2 for Additional Injection Map
23	No Injector 3 pulse	Not receiving injector signal I/J CH-3 for Additional Injection Map
24	No Injector 4 pulse	Not receiving injector signal I/J CH-4 for Additional Injection Map
31	Incorrect Injector 1 pulse	Incorrect I/J CH-1 wire to e-Manage unit
32	Incorrect Injector 2 pulse	Incorrect I/J CH-2 wire to e-Manage unit
33	Incorrect Injector 3 pulse	Incorrect I/J CH-3 wire to e-Manage unit
34	Incorrect Injector 4 pulse	Incorrect I/J CH-4 wire to e-Manage unit
40	Improper order of Ignition input signal	Incorrect wiring order of the ignition signal wires.
41	No Ignition Signal 1 pulse	Not receiving the ignition signal to IG CH-1
42	No Ignition Signal 2 pulse	Not receiving the ignition signal to IG CH-2
43	No Ignition Signal 3 pulse	Not receiving the ignition signal to IG CH-3
44	No Ignition Signal 4 pulse	Not receiving the ignition signal to IG CH-4
49	No Ignition pulse	Not receiving the ignition signal to any of the channels
51	Incorrect Ignition 1 pulse	Incorrect IG CH-1 wire to e-Manage unit
52	Incorrect Ignition 2 pulse	Incorrect IG CH-2 wire to e-Manage unit
53	Incorrect Ignition 3 pulse	Incorrect IG CH-3 wire to e-Manage unit
54	Incorrect Ignition 4 pulse	Incorrect IG CH-4 wire to e-Manage unit
57	JP2 + 12V error	Incorrect Jumper setting (JP2)