

GReddy Turbo Kit

2003 Mazda RX-8 (13B-MSP)

T618Z 10cm² (Actuator Type)

Emanage Ultimate

****IMPORTANT NOTE****

For GReddy turbochargers, GReddy Performance Products, Inc. recommends the use of **100% FULLY Synthetic Motor Oil made for turbochargers!**

The use of improper oils may cause damage and shorten the life of the turbocharger. GReddy Performance Products, Inc. will not be held responsible for damages due to the use of improper oil.

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	Type 31C		1
5.	Intercooler Bracket	(Steel)		1
6.	Suction Pipe	S-1	(80Ø-60Ø Aluminum)	1
7.	"	S-2	(60Ø Aluminum with flange)	1
8.	Compression Pipe	C-1	(50Ø Aluminum flange elbow)	1
9.	"	C-2	(50Ø Aluminum)	1
10.	"	C-3	(50Ø Aluminum)	1
11.	"	C-4	(60Ø Aluminum elbow)	1
12.	"	C-5	(60Ø Aluminum)	1
13.	"	C-6	(80Ø Aluminum)	1
14.	Airflow meter adapter X-4008	(Aluminum elbow)		1
15.	Airinx	AY-MB (Blue)		1
16.	Airinx	Hose Adapter 80Ø		1
17.	"	Hose band #48		1
18.	"	Bracket (Steel)		1
19.	Air Pump Pressure Hose			1
20.	Down Pipe Adapter Bracket			1
21.	Oil Pressure	Hose SUS	(800mm)	1
22.	Oil Pressure Copper Washer	10Ø (t=1.0mm)		1
23.	Oil Pressure Union Fitting	3-Way 1/8PT Fitting		1
24.	"	1/8PT – 1/8 PT Straight		1
25.	"	1/8PT – 1/8 PF Straight		1
26.	"	1/8PF – M10 P1.25		1
27.	Oil Return Flange Tube	16Ø		1
28.	Oil Return Fitting	16Ø - M14 P1.5		1
29.	Oil Return Copper Washer	14Ø (t=2.0mm)		1
30.	Vacuum Hose	5Ø x 2000mm	(Blue)	1
31.	Rubber Hose	9Ø x 450mm		1
32.	"	16Ø x 150mm		1
33.	Rubber Hose	50Ø x 70mm		2
34.	"	60Ø x 70mm		3
35.	"	80Ø x 60mm		1

36.	Silicone Hose 50Ø - 60Ø	Reducer							1
37.	"	80Ø x 80Ø	Reducer						1
38.	"	80Ø - 90Ø	Reducer						1
39.	Hose Band	16Ø #10							2
40.	"	50Ø #32							5
41.	"	60Ø #36							8
42.	"	80Ø #48							4
43.	"	90Ø #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.	Intake Manifold Blocking Plate								1
50.	Thermo Cloth	100mm x 250mm							1
51.	Thermo Barrier Tape (14002)								1
52.	Wire Loom	13Ø x 500mm							1
53.	Wire Loom	19Ø x 250mm							1
54.	Zip Ties	100mm							10
55.	"	150mm							5
56.	"	200mm							5
57.	E-Manage Ultimate	(US-RX8 6MT)							1
58.	"	Plug-In Harness							1
59.	"	Pressure Sensor							1
60.	"	Pressure sensor Harness							1
61.	Orifice Hose Fitting								1
62.	M4 x 10mm	Stainless	P=0.7		B				2
63.	M6 x 15mm	Stainless	P=1.0		B	S/W	F/W	-	4
64.	M8 x 20mm	Stainless	P=1.25		B	S/W	F/W	N	2
65.	M8 x 25mm	Stainless	P=1.25		B	S/W	F/W	-	4
66.	M8 x 30mm	Stainless Stud	P=1.25 – 1.25		B	S/W	-	N	9

Part List



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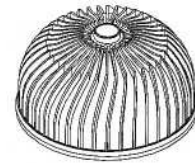
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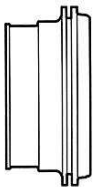
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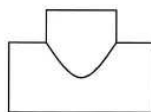
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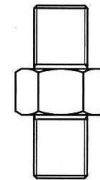
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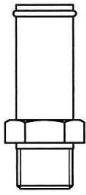
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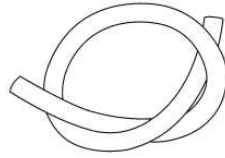
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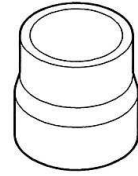
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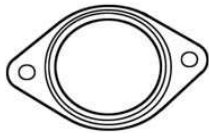
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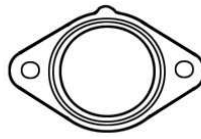
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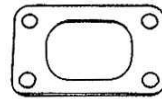
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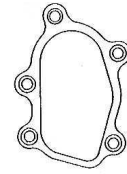
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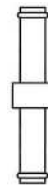
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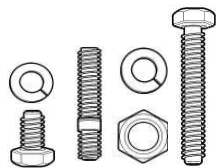
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62-66

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)

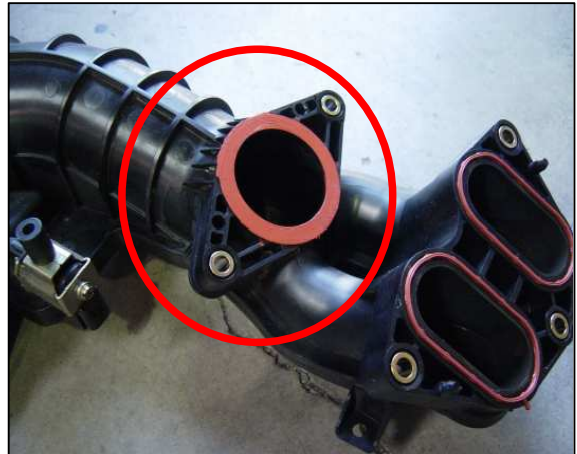
8. Remove the Transverse Member.
(RX8 Workshop Manual pages 02-13-18)

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 Intake Manifold Plate Installation

1. Remove the extension manifold (upper).
Please refer to RX8 workshop manual pages 01-13-4 to 01-13-11.
- * Make sure to prevent any dirt or objects from entering the intake manifold.
2. Install the Intake Manifold Blocking Plate onto the manifold as shown in the picture.
(Parts Used #49)
3. Apply silicone gasket to the manifold surface shown in the picture. Make sure the manifold is clean before installing. You do not need to apply silicone gasket to factory o rings. Replace O rings if necessary.
4. Install extension manifold back onto intake manifold. Refer to RX8 workshop manual.



3-2 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)

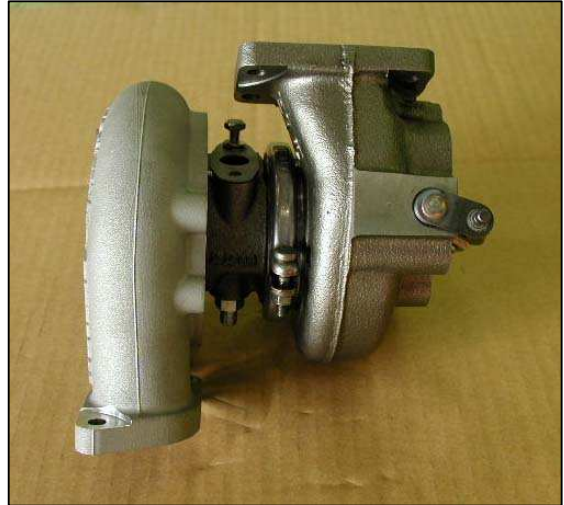
Caution!

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.



3-3 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.



3-4 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, 63)
3. Install the provided stud bolts to the manifold and turbine as shown.
(Parts Used #2, 66)
4. 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



5. 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, 66)



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

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

(Parts Used #7, 44, 65)

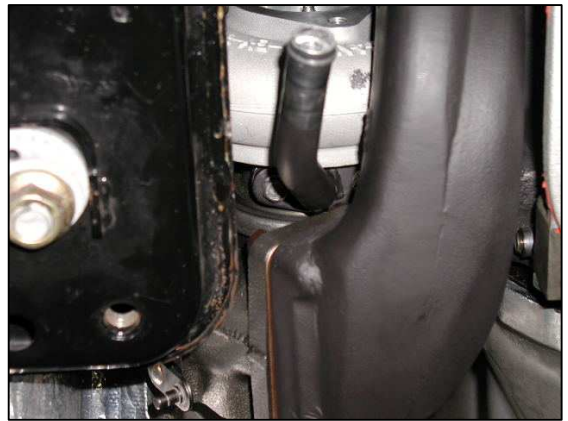


8. Replace the oil drain plug with the provided oil return fitting and copper washer.

(Parts Used #28, 29)

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

(Parts Used #27, 32, 39, 50, 63)



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

(Parts Used #8, 45, 65)

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



3-5 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.

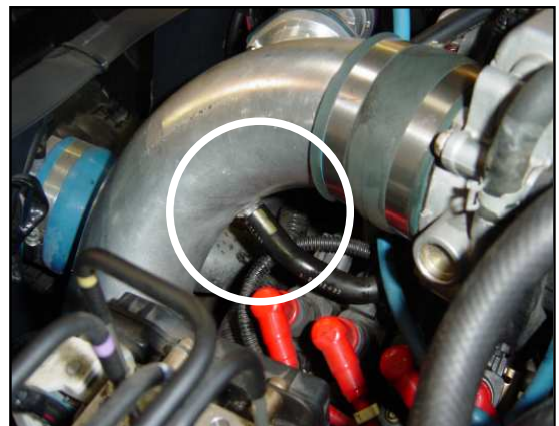
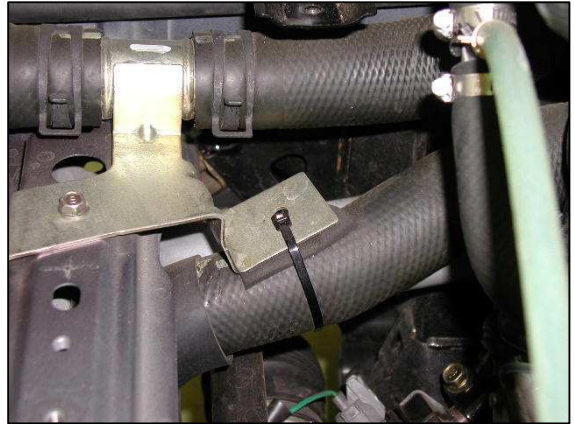
(Parts Used #4, 5, 64)

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)

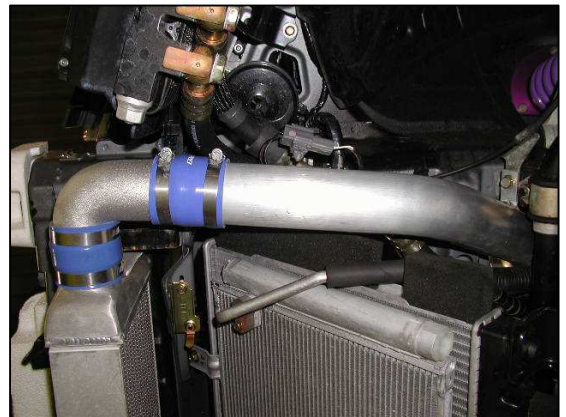
5. Install the compression pipe C-4, C-5, and C-6 between the intercooler and throttle using the provided hoses and hose bands. Connect the Jet Air Fuel Mixing sir hose to the fitting on the back of C-6 pipe. This hose has a large amount of suction when idling and is the top hose that routes behind the alternator. It is important to connect this hose properly to this location.



- Secure C-5 bracket to the speed sensor harness bracket (LH).
(Parts Used #11, 12, 13, 34, 35, 37, 41, 42, 56)



- Reinstall the front stabilizer bar.



3-6 Airinx Installation

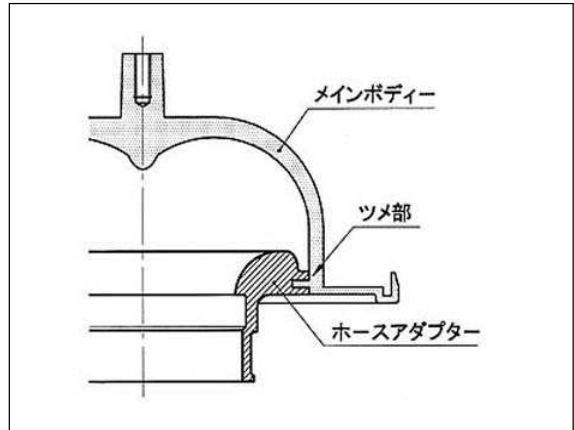
- Install the suction pipe S-1 to the S-2 using the provided hose and hose band.
Secure the S-1 bracket with the ground wire mounted to the body.
(Parts Used #6, 34, 41, 50)



- Trim the shaded area of the factory air cleaner insulator as shown.
- Remove the top housing and the filter of the Airinx by removing the top screw off. Install the hose adapter and 10Ø-M18 fitting on to the Airinx. Make sure that the hose adapter is properly install on the Airinx frame.
(Parts Used #15, 16)



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, 17, 38, 42, 43, 62)

6. Secure the Airinx with the provided bracket and connect the Airflow meter connector.
(Parts Used #18)
7. Connect the air hose from the Metering Oil Pump to suction pipe S-1.

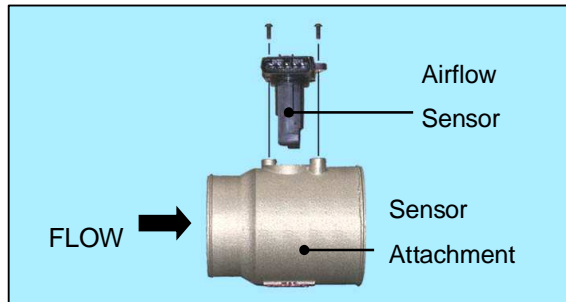
(Parts Used #31)

Do not mistake this for the Jet Air Fuel Mixing hose.

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

(Parts Used #31)

Do not mistake this for the Jet Air Fuel Mixing hose.



3-7 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 provided gasket and hardware. Connect the O2 sensor connector.

(Parts Used #3, 47, 66)



3. Connect the Air Pump hose to the down pipe adapter. Bend the hose so that it will not contact the turbine housing. Re-use the stock gasket.

(Parts Used #63)

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

(Parts Used #20)



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.



3-8 e-manage Ultimate installation and vacuum hose connection for the actuator.

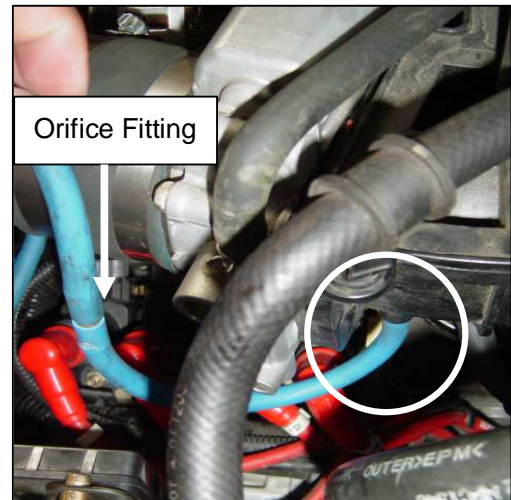
1. Remove the washer tank and drill a 1" hole on the fire wall. Make sure not to drill through any thing on the other side. There is a hump on the fire with a circle indentation behind the washer tank, which would be a perfect location to drill. Install a rubber grommet to protect the wire harness.
2. 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 Ultimate 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 with the provided orifice hose fitting in line. Install the fitting with the orifice facing toward the manifold. Route the harness with the e-manage harness and connect it to the e-manage Ultimate Option Port #1.

***You may have engine damage if the pressure sensor is not connected properly to Option Port 1.**

*secure vacuum hose with provided zip ties.



(Parts Used #30, 54, 59, 60, 61)

4. Stick the e-manage emblem on the e-manage Ultimate 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.

3-9 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.**
- **Please ensure that the vehicle is in proper working order before installing this kit. This kit will not operate properly if the vehicle is not in optimum operating condition.**
- **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 Ultimate Information

- **Important!**

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