



GENUINE PARTS

Genuine parts number: H0010AG000
H0010AG100

Applicable models: LEGACY/OUTBACK Turbo Model
(2005 MY~)

Turbo Gauge Pack

Operation Manual
Installation Manual

For Customers

Thank you for purchasing the Subaru Genuine Turbo Gauge Pack.

Please read this operation manual thoroughly before using the product. Keep the manual on hand for future reference to ensure proper use and long service life.

To ensure proper results, have the installation performed by a designated Subaru dealer or sales agency specified by a designated Subaru dealer.

Notes included in this installation manual provide important safety information. They appear throughout the manual along with the following indications for avoiding risk of injury or death and property damage.

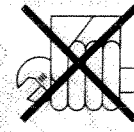
WARNING	Indicates a potentially hazardous situation that, if not avoided due to improper use of the product, could result in serious accident.
CAUTION	Indicates a potentially hazardous situation that, if not avoided due to improper use of the product, may result in injury of the user or other persons or property damage.
CHECK	Indicates things that you should always do.

Important

Read this manual before using the product to ensure proper use and handling. Keep the manual on hand for future reference.

WARNING

- This product is an electronic device. Do not drop it or expose it to water.
- The product should be installed only by the sales agency or dealer from which you purchased the product.
- Never disassemble or modify the product. Note that the warranty will not be applied to a disassembled or modified product.



Do not modify or disassemble.

Handling precautions

- Do not use any wires other than those provided with the product.
- Any parts and connectors that are temporarily removed or loosened during installation, as well as newly installed wires, should be properly assembled and secured.
- Do not apply excessive force to or hit or drop the product. Doing so may cause a failure.
- Do not apply more force than necessary to any terminal or other part of the product. Doing so may cause breakage.
- Be careful that wiring does not become caught in the vehicle body or threaded parts. This may cause a failure.
- Do not pull the cord with strong force.
- Wear gloves to prevent burning, cutting yourself or contaminating yourself.
- For some types of audio assemblies or clocks, removing the negative (minus) terminal of the battery may clear the setting data stored in the memory. After completing the work, enter the settings again following the instruction manual.

SUBARU

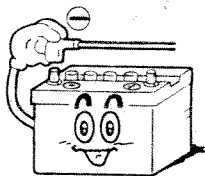
For Installers

This manual explains how to install and handle the Sports Gauge Pack. Always read the manual carefully before installing the product to ensure proper installation. After completing installation, be sure to hand over this manual to the customer.

⚠ CAUTION

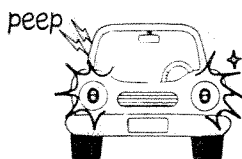
1. Be sure to remove the cable from the negative(-) terminal of the battery.

(Write down the setting data stored in the memory of the electronic equipment, including the preset radio tuning.)



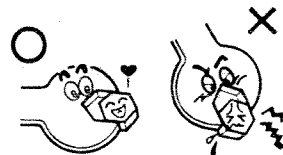
2. Make sure that lamps, horn, wipers, audio assembly and other on-vehicle electronic components function properly.

(Ensure that all electronic equipment items have been properly restored after installation.)



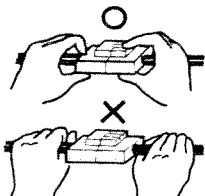
3. Use appropriate tools of suitable size to tighten bolts and nuts. Ensure reliable tightening.

(Always follow the torque requirement to tighten parts.)



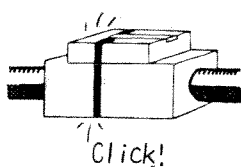
4. To disconnect a vehicle connector, hold the connector body and release the lock, instead of pulling the lead.

(Prevent breakdown of the harness.)

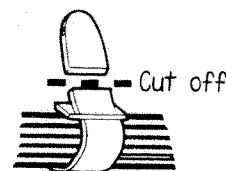


5. Make sure that connectors and terminals are securely connected.

(Prevent faulty connection.)

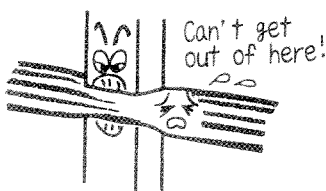


6. Make sure that the harness wires (wiring) are routed and bound together with the vehicle wiring harness or secured with clamps. Do not leave the wires loose.



7. When installing parts be careful not to snag or catch harness.

(Prevent breakdown of the harness.)



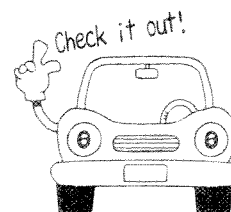
8. Do not pull the vehicle wiring harness with a lot of force.

(Prevent disconnection or breakdown of connectors.)

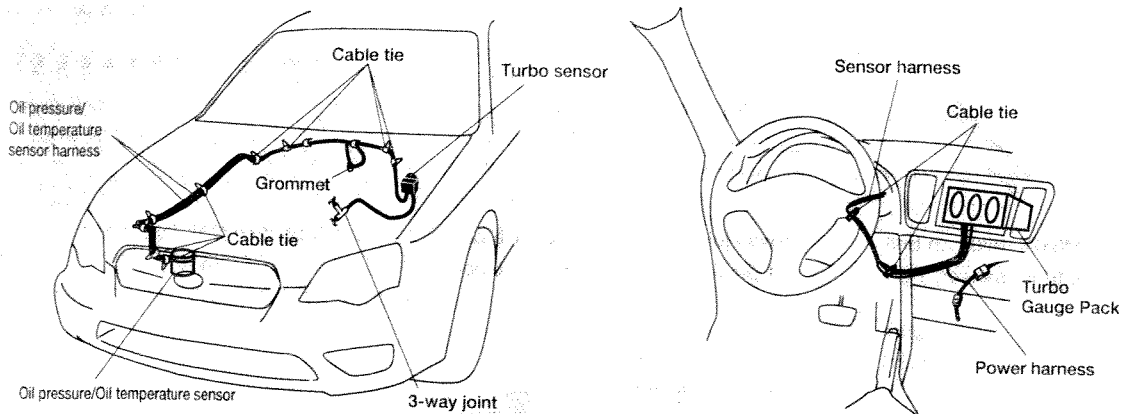


9. After the harness has been routed, check that the parts installed operate properly.

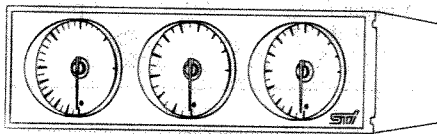
(Prevent improper operation.)



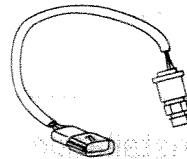
1. Routing overview



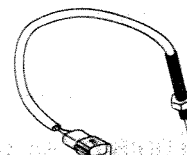
2. Component parts



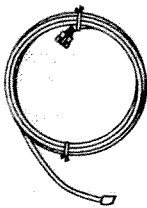
Turbo Gauge Pack
1 unit



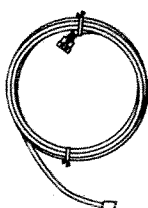
Pressure sensor
1 piece



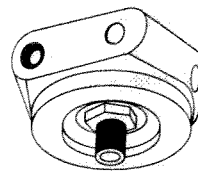
Temperature sensor
1 piece



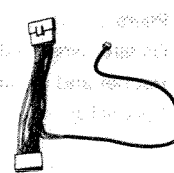
Pressure sensor harness
(3m) 1 piece



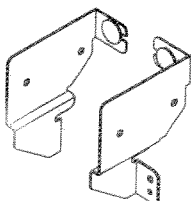
Temperature sensor harness
(3m) 1 piece



Sensor housing
and threaded adapter
2 pcs.



Power harness
(0.5m) 1 piece



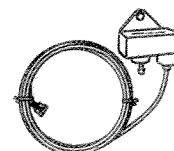
Mounting bracket (L, R)
1 piece each



M5x8 countersunk head screw
4 pcs.



M5x14 tapping screw
2 pcs.



Turbo sensor
(harness 2.5m) 1 piece

2. Component parts



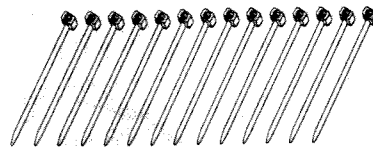
M6x20 hexagon bolt
(for turbo sensor) 1 piece



3-way joint
1 piece



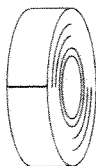
Rubber tube
(0.5 m) 1 piece



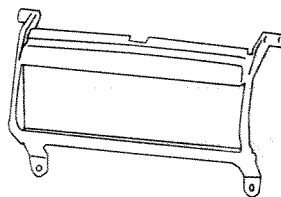
Cable ties (142 mm/Nylon 66)
14 pcs.



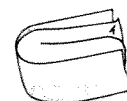
Protection sheet
1 piece



Sealing tape
1 reel



Face panel
1 piece



Butyl Rubber
1 piece

3. Tools required for installation

Phillips screwdriver

Box wrench (10 mm, 12 mm, 13 mm, 27 mm Long socket)

Knife

Wire cutters

Electrical tape

Pliers

Oil filter wrench (68 mm)

Ratchet and socket (14 mm, 17 mm)

Torx (#10)

4. Installation procedure (for installers)

⚠ WARNING

Before installation and handling of the product, carefully read this manual to ensure safe and proper installation. It is very dangerous to install the product in an incorrect place or improper manner. Doing so may cause the meter to drop or may damage the vehicle.

CHECK

Be sure to cut out any excess of the cable tie.

1. Removing the battery cable

1. Write down in advance the setting data stored in the memory of the electronic equipment, including preset radio tuning.
2. Remove the negative (-) battery terminal.

2. Routing the turbo sensor tubing

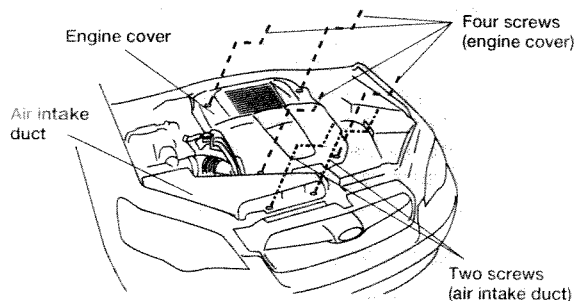


Figure 2-1

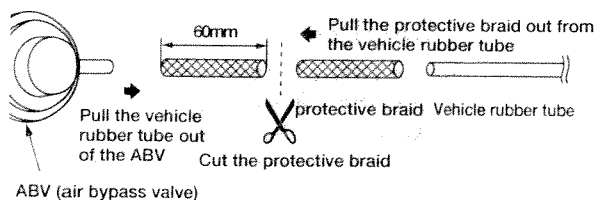


Figure 2-2

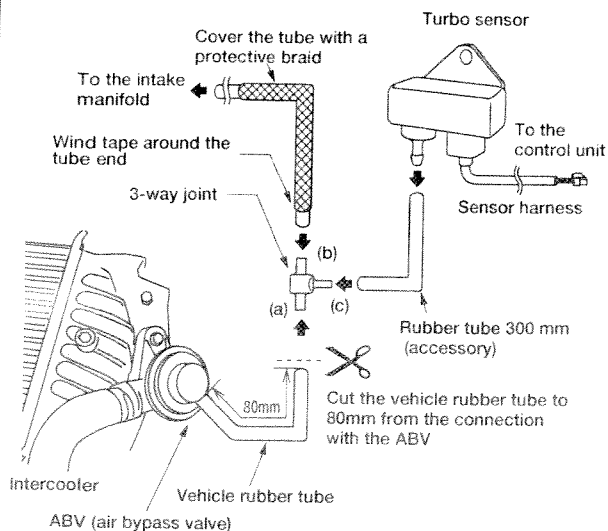


Figure 2-3

1. Remove the engine cover and the air intake duct. (Figure 2-1)

2. Remove the vehicle rubber tube connected to the ABV (air bypass valve) of the vehicle.
3. Push the protective braid down along the vehicle rubber tube and cut the tube connected to the ABV at a point 80mm from the connection with the ABV.
4. Pull the protective braid out from the tube. (Figure 2-2) Cut 60mm of the protective braid off.
5. Cover the tube at the protective braid as shown in Figure 2-3. Then, connect the tube sections to ports (a) and (b) of the 3-way joint.
6. Wrap electrical tape around the end of the protective braid at position (b).
7. Connect the vehicle rubber tube to the ABV.
8. Cut the rubber tube provided with the product to 300 mm.
9. Connect the 3-way joint (c) and the turbo sensor using the rubber tube provided with the product (300 mm).

4. Installation procedure (for installers)

2. Routing the turbo sensor tubing

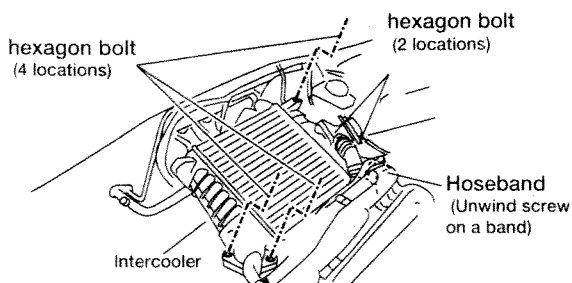


Figure 2-4

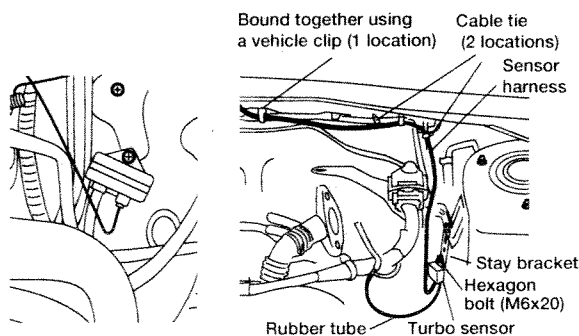


Figure 2-5

Figure 2-6

9. Remove the intercooler. (Figure 2-4)
10. Remove the screw (bottom) that secures the stay bracket. Secure the turbo sensor using the hexagon bolt (M6x20) provided with the product. (Tightening torque 6.4N·m (4.7ft-lb)) (Figure 2-5) Make sure that the sensor is secured in an orientation, in which the sensor harness extends downward. (Figure 2-6)
11. Route Harness towards firewall.
12. Attach the turbo sensor harness together with the vehicle wiring using cable ties (2 locations) and vehicle clips (2 locations). (Figure 2-6)

⚠ CAUTION

- The rubber tubes and the sensor harnesses should be bound together with the vehicle electrical harness.
- When passing the sensor harness through the grommet, be sure there is slack in the harness to prevent water inclusion. (See page 8).
- Be sure to waterproof the grommet.

3. Installing the oil pressure/temperature sensors

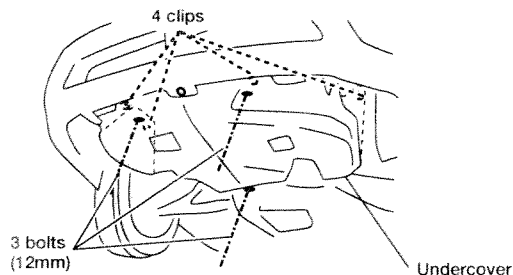


Figure 3-1 (Bottom of engine)

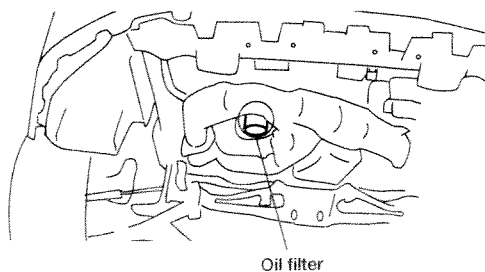


Figure 3-2 (Bottom of engine)

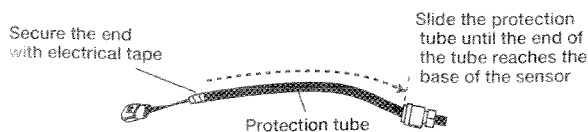


Figure 3-3

1. Secure and lift the vehicle up. Remove the under-cover. (Figure 3-1)

⚠ CAUTION

Observe all the precautions for lifting up the vehicle to ensure safe work.

2. Remove the oil filter located in the bottom of the engine. (Figure 3-2)

⚠ CAUTION

When the oil filter is removed, oil will flow out from the inside (approx. 300 cc). Always have an oil pan or other appropriate container on hand before removing the oil filter, to collect the oil. Do not reuse the oil collected. Dispose oil in accordance with all local, state and federal laws.

3. Slide the protection tube covering the harness of the oil pressure sensor until one end of the tube reaches the base of the sensor. Secure the protection tube by winding electrical tape around the other end of the tube. (Figure 3-3)
4. Repeat step3 for the oil temperature sensor.

4. Installation procedure (for installers)

3. Installing the oil pressure/temperature sensors

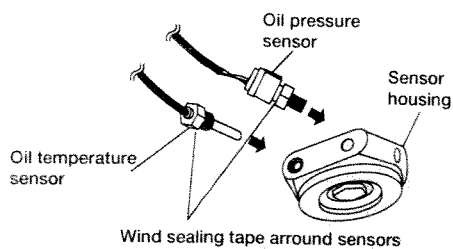


Figure 3-4

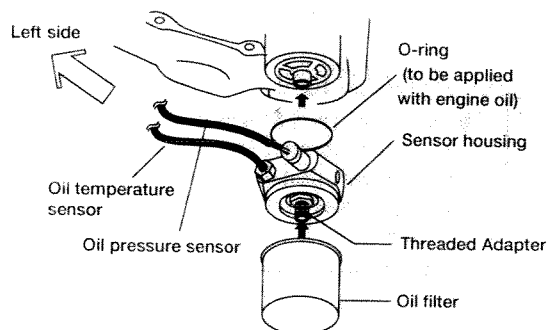


Figure 3-5

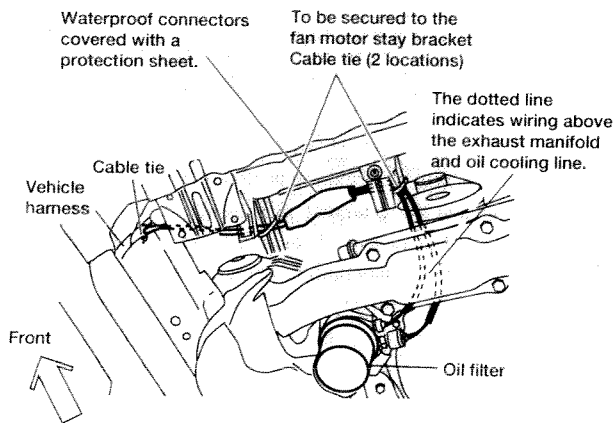


Figure 3-6

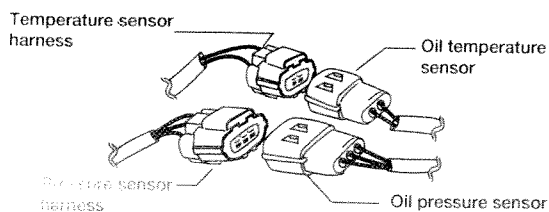


Figure 3-7

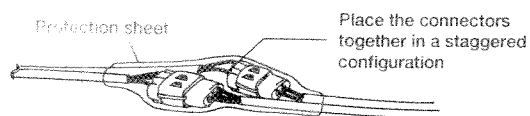


Figure 3-8

4. Wrap sealing tape around the entire section of threaded part of the oil pressure sensor and the oil temperature sensor, be sure not to cover pressure hole and end of sensor. Connect these sensors to the sensor housing. (Figure 3-4)

CAUTION

- Wrap about two turns of sealing tape around the threads of the sensors between the sensor housing and the oil pressure sensor and the oil temperature sensor to prevent oil leakage.
- Sensor base will not completely seat against sensor housing. Do not over tighten. Tighten only using hex of the sensor.

5. Lightly apply engine oil to the O-ring of the sensor housing. (Figure 3-5)
6. Insert the threaded adapter into the sensor housing and secure the sensor housing to the engine by tightening the threaded adapter (be sure sensors are facing the left side of the vehicle). (Tightening torque $20 \pm 5 \text{ N} \cdot \text{m}$ ($14.8 \pm 3.7 \text{ ft} \cdot \text{lb}$)). Then, reinstall the oil filter. (Figure 3-5) To reinstall the oil filter, first gently screw the oil filter into the sensor attachment using your hand. When you feel that the filter cannot be screwed in any more using the same force, further tighten up the filter by about one turn.
7. Route the sensor harness from the top of the exhaust manifold and over the oil cooling line toward the radiator. Tie the sensor harness together with the vehicle harness using cable ties (3 locations). (Figure 3-6)
8. Connect the sensors with each of their own sensor harnesses. (Figure 3-7)
9. Put the waterproof connectors together in a staggered configuration, not in layers. Wrap them with the protection sheet (to prevent possible interference with the vehicle). (Figure 3-8)
10. Reinstall under cover in reverse order of removal.

CAUTION

- Route the sensor harness so that there is sufficient distance between the harness and the exhaust manifold and fans.
- Sensor harness should be oriented to the left hand side of the vehicle.

4. Installation procedure (for installers)

3. Installing the oil pressure/temperature sensors

11. Set the vehicle down. Route the oil pressure harness and the oil temperature harness in the engine compartment towards the firewall.

4. Routing sensor harnesses

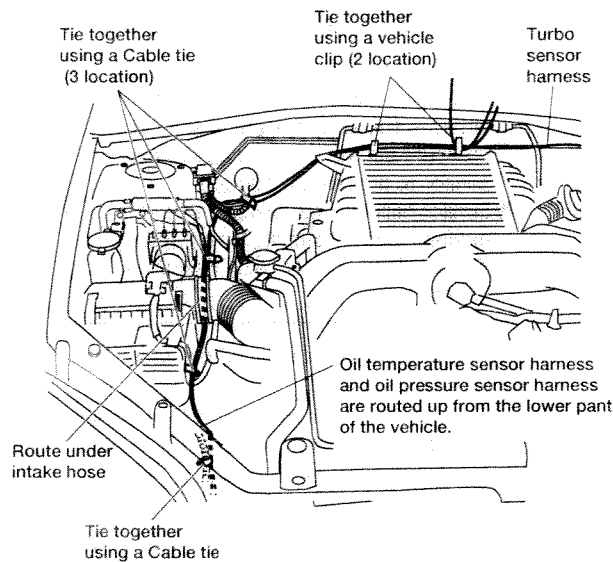


Figure 4-1

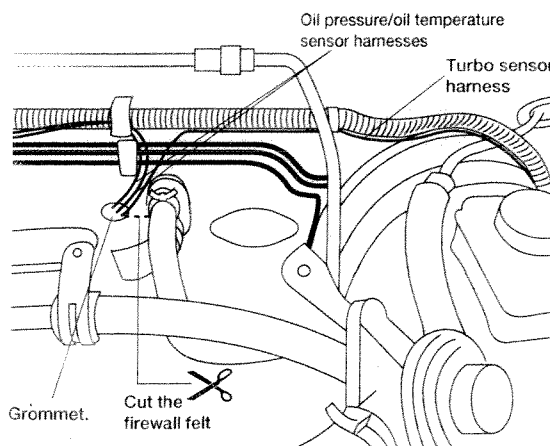


Figure 4-2

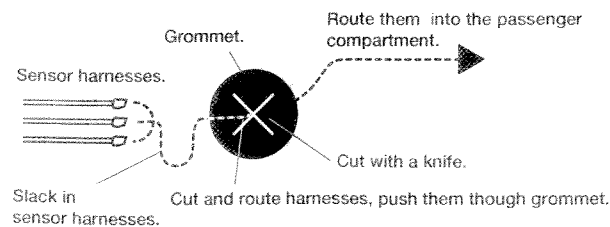


Figure 4-3

1. Tie the two sensor harnesses together with the vehicle harness using cable ties and route them around the engine compartment. Route them as shown in Figure 4-1 and tie them together using cable ties (4 locations). (Figure 4-1)

⚠ CAUTION

- Do not let any harness or joint come into contact with any vehicle part that may generate heat. Doing so may cause deformation or failure.

2. Cut the firewall felt away in the engine compartment at the position indicated in Figure 4-2 and remove the grommet. Slit the grommet using a knife. Put the two oil sensor harnesses along with the turbo sensor harness through the slit. Temporarily tape them together. Poke a hole in the noise insulation of the vehicle and route them into the passenger compartment. Use a suitable fishing tool. Reinstall the grommet. (Figure 4-3)
3. Be sure to waterproof the grommet using butyl rubber.
4. Reinstall the intercooler (tightening torque $16\text{N}\cdot\text{m}$ ($<11.6\text{ft}\cdot\text{lb}>$), the engine cover and the air intake duct in reverse order of removal.
5. Re-connect the vehicle rubber tube to the ABV.

4. Installation procedure (for installers)

5. Installing the face panel and mounting brackets

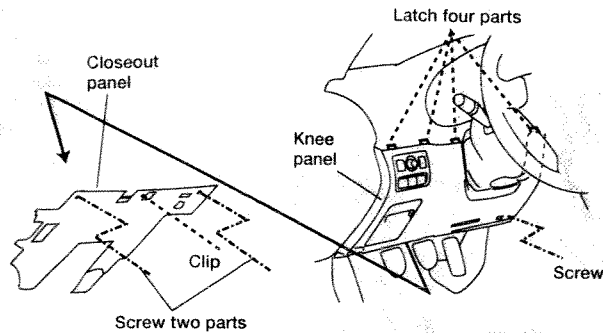


Figure 5-1

1. Lower the closeout panel and the knee panel. (Figure 5-1)

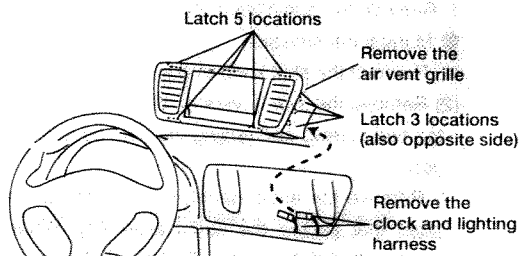


Figure 5-2

2. Remove the air vent grille assembly including the center pocket, pry at latch locations. (Figure 5-2)

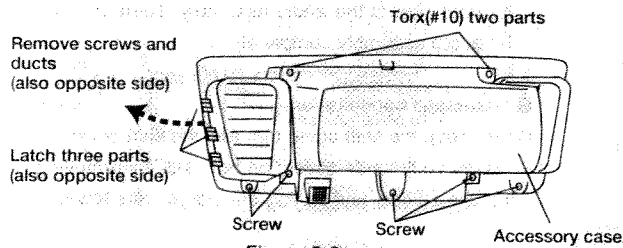


Figure 5-3

3. Remove the center pocket and discard, also remove clock and ducts from the air vent grille. (Figure 5-3)

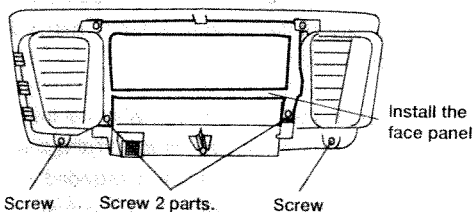


Figure 5-4

4. Place clock in place first then place face panel second then install ducts using previously removed screws, note locations of different screw types. (Figure 5-4)

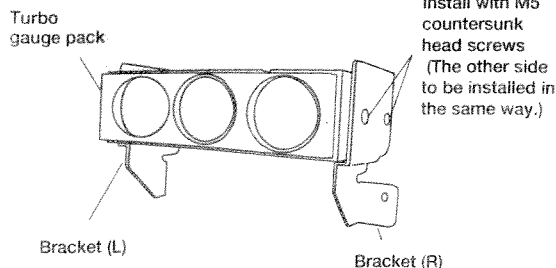


Figure 5-5

5. Install the brackets (L and R) to the Turbo Gauge Pack using the M5 countersunk head screws provided with the product. (Figure 5-5) Be careful not to confuse bracket L with bracket R. (Tightening torque $0.5 \pm 0.1 \text{ N} \cdot \text{m}$ ($0.37 \pm 0.07 \text{ ft} \cdot \text{lb}$)).

4. Installation procedure (for installers)

6. Installing the meter and connecting the harnesses.

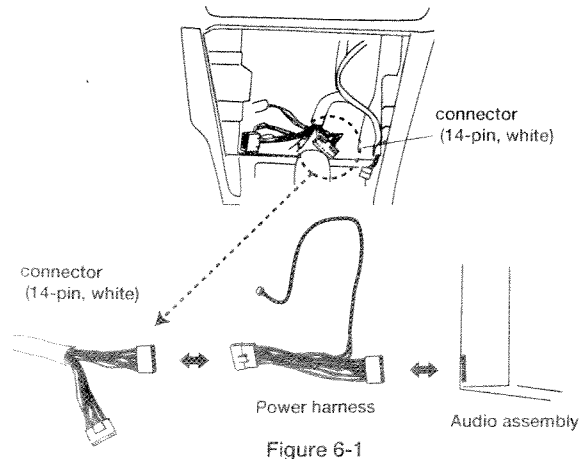
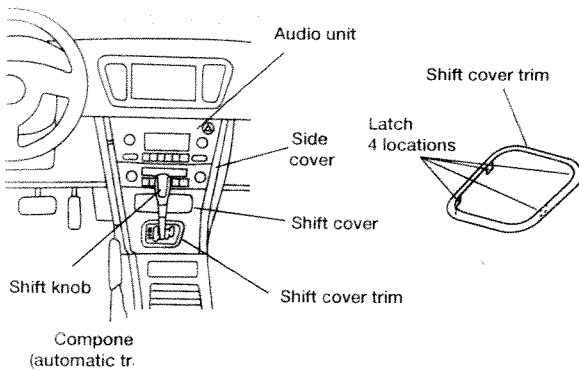
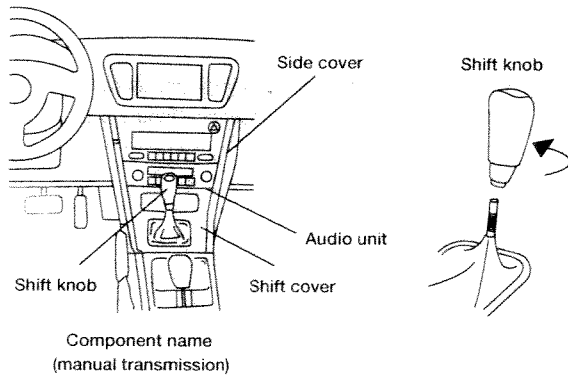
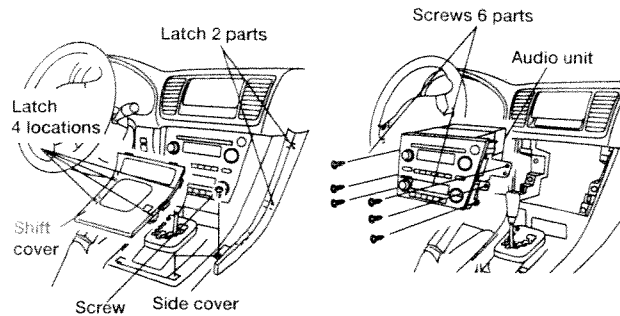


Figure 6-1

1. Remove the audio assembly.

● Manual transmission

- (1) Remove the shift knob and the shift cover.
- (2) Remove the side covers on both side by removing the two screws and pulling the side covers towards you.
- (3) Remove the audio panel. Remove the screws (6 pcs.) that secure the audio assembly. When you have pulled out about half of the entire audio assembly, remove the coupler of the hazard switch on the right side of the audio assembly. Then, pull out the audio assembly completely.

● Automatic transmission

- (1) Remove the shift cover trim and the shift cover.
- (2) Remove the side covers on both side by removing the two screws and pulling the side covers towards you.
- (3) Remove the audio panel. Remove the screws (6 pcs.) that secure the audio assembly. When you have pulled out about half of the entire audio assembly, remove the coupler of the hazard switch on the right side of the audio assembly. Then, pull out the audio assembly completely.

2. Remove the connector (14-pin, white) of the power harness connected at the rear side of the audio assembly. Place the power harness provided with the product between the power harness connector and the audio assembly connector. (Figure 6-1)

4. Installation procedure (for installers)

6. Installing the meter and connecting the harnesses.

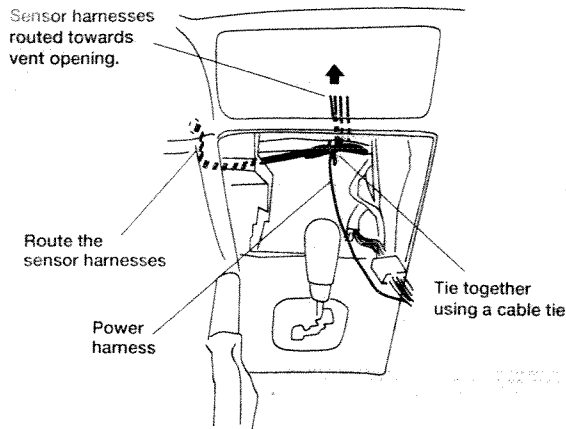


Figure 6-2

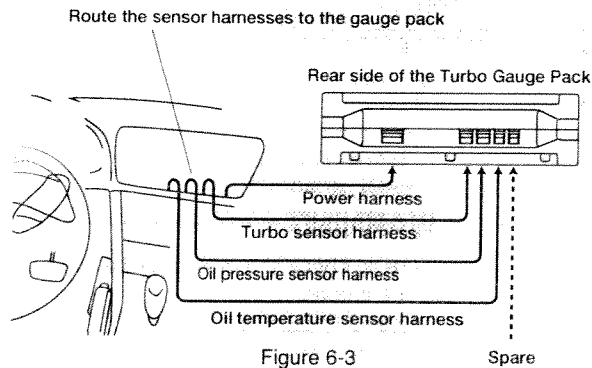


Figure 6-3

3. Tie the sensor harnesses previously routed from the engine compartment together with the vehicle wiring using a cable tie (1 location). Run these harnesses through the mounting hole of the air vent grille together with the power harness installed in Step 2. Gather all loose harnesses nearby and bind them together. (Figure 6-2)
Route the harnesses from the engine compartment area up towards the air vent grille. Make sure harnesses do not come in contact with any moving parts, (i.e.-pedals, heater controls.) Remove tape which was temporarily placed on harnesses.

4. Connect the sensor harnesses and the power harness as shown in the figure. (Figure 6-3)
(Secure the storage box light harness which is no longer used to harness using electrical tape.) They are color coded, match the connector colors. Attach the Turbo Gauge Pack assembly to the inner dash using clips on brackets and with two screws provided.
5. Reattach clock to harness.
6. Reinstall the air vent grille.
7. Reinstall the all trim.
8. Reinstall the audio panels and the shift panel for both manual and automatic transmissions.

7. Operation check

1. Make sure that the tubing you have just installed is securely connected and that there are no incorrectly connected wires, improper wiring, or intake air leak.
2. Double-check that the harnesses are securely fixed so as not to interfere with driving.
3. Double-check that the vehicle trim and harnesses that were removed during meter installation have been reinstalled.
4. check for oil leaks.

4. Installation procedure (for installers)

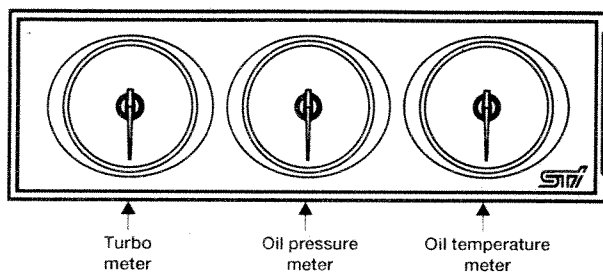
7. Operation check

4. Securely install the negative (-) battery terminal so that it cannot come off. Install the battery cover and securely close the hood.
5. When the installation procedure has been completed, turn the ignition key to the ACC position to allow all the meters to start their operation. Then, check that the needle of the turbo meter indicates almost 0 kPa. (Do not run the engine.) If not, check the sensor harnesses connection again.

5. Operation (for customers)

* Read the following precautions thoroughly to become familiar with the operation procedure before using the product.

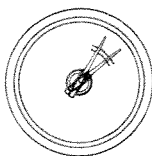
1. Components



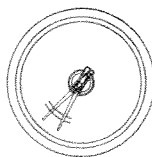
2. Check feature

⚠ WARNING

Be sure to check the meters while running the engine.



- Indicates the presence of open, disconnected, or improper wiring.



- Indicates the presence of a short-circuit.

Open Wire Check

The Open Wire Check detects any open, disconnected, or improper wiring and alerts the driver to the danger. The needle of the meter should swing between 250° and 260° at the rate of traveling to-and-fro in 2 seconds.

- * The Open Wire Check is not available for the power harness.

Short-Circuit Check

The Short Circuit Check detects short-circuiting that has occurred somewhere in the sensor or the sensor harness and alerts the driver to the danger. The needle of the meter should swing between 10° and 20° at the rate of traveling to-and-fro in 2 seconds.

- * The Short-Circuit Check is not available for the power harness.