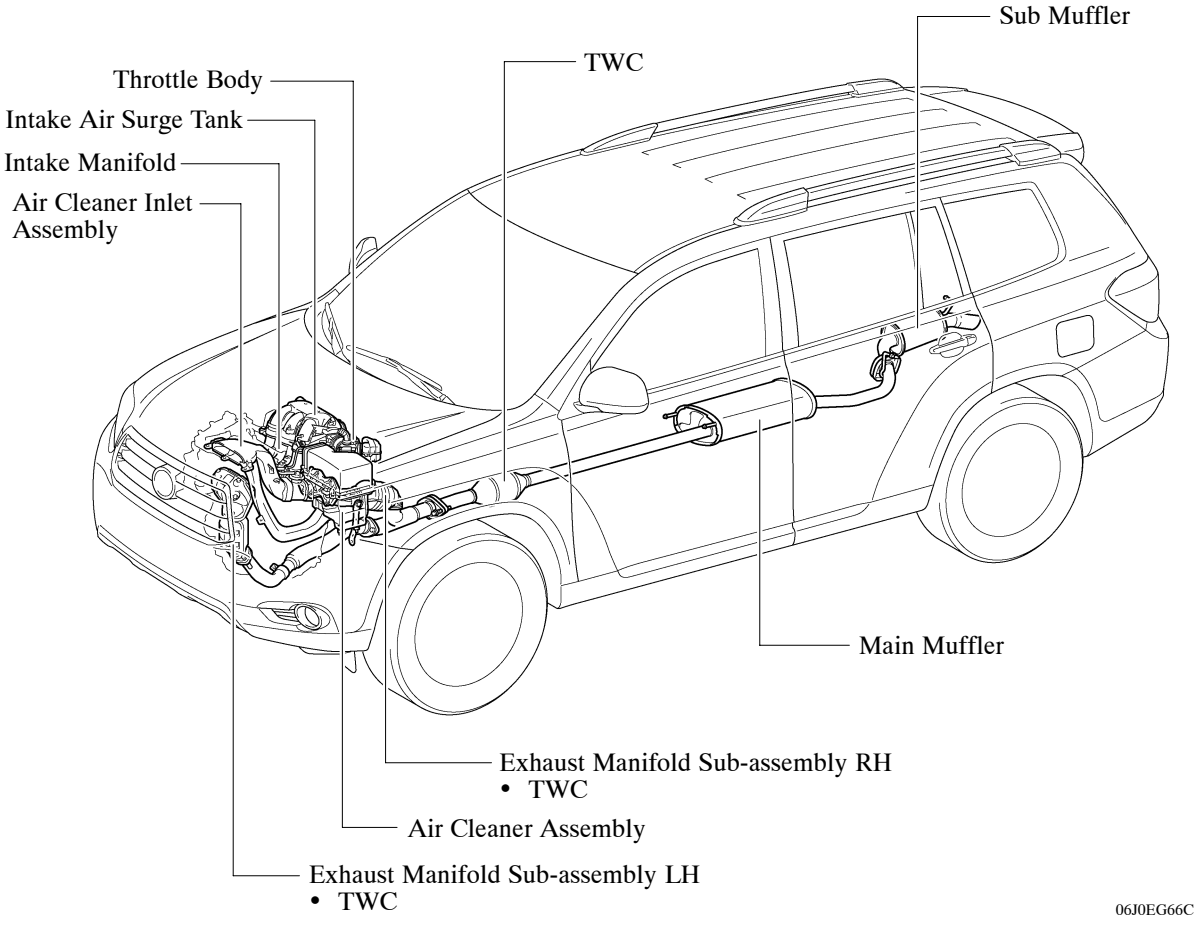
■INTAKE AND EXHAUST SYSTEM

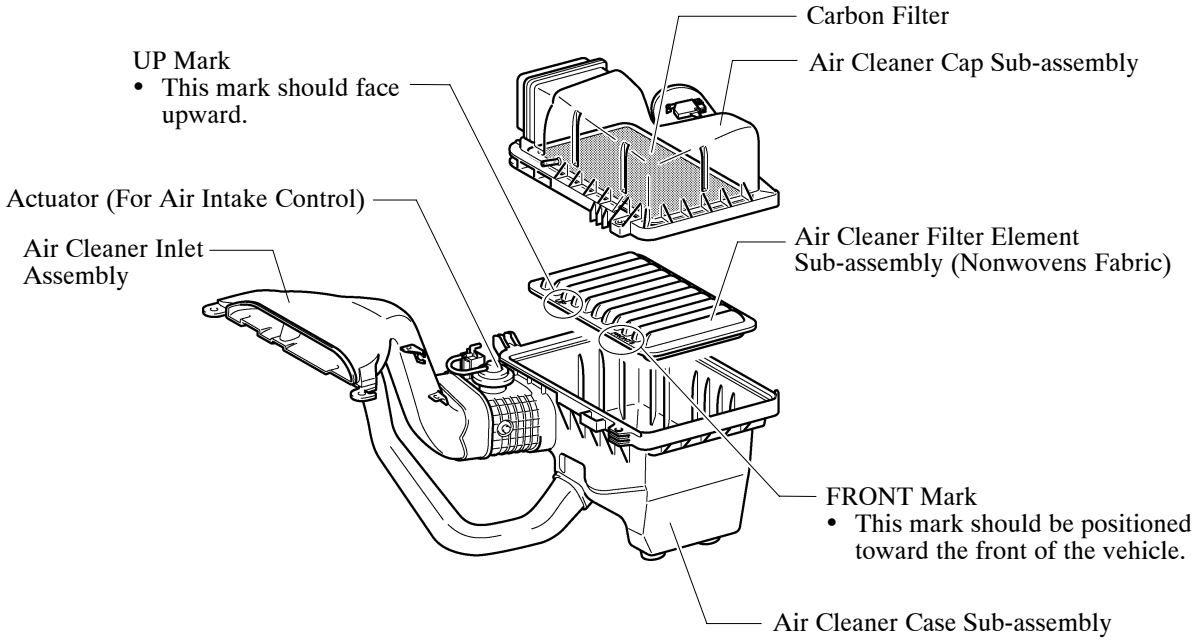
1. General

- A cable-less type throttle body is used which realizes excellent throttle control.
- The intake air surge tank made of plastic is used.
- Stainless steel exhaust manifold sub-assemblies (RH and LH) are used for weight reduction.
- The ETCS-i (Electronic Throttle Control System-intelligent) is used to ensure excellent throttle control in all operating ranges. For details, see page EG-65.
- The ACIS (Acoustic Control Induction System) is used to improve the engine performance in all speed ranges. For details, see page EG-76.
- An air intake control system is used to reduce engine noise. For details, see page EG-78.
- TWCs (Three-Way Catalytic converters) are provided in the exhaust manifold sub-assembly of each bank and also in the exhaust center pipe assembly.



2. Air Cleaner Assembly

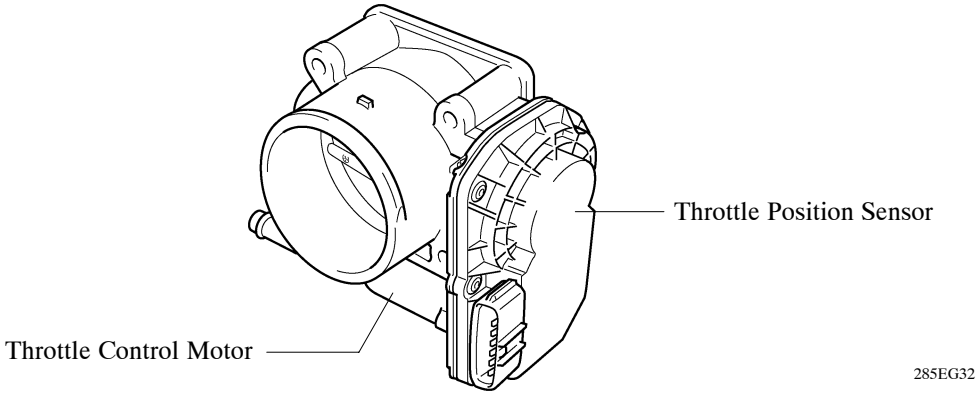
- A nonwoven, full-fabric type air cleaner filter element sub-assembly is used.
- A carbon filter, which adsorbs the HC that accumulates in the intake system when the engine is stopped, is used in the air cleaner cap sub-assembly in order to reduce evaporative emissions. This filter is maintenance-free.
- Along with the use of the air intake control system, an air intake control valve is provided on the air cleaner case sub-assembly. For details, see page EG-78.



3. Throttle Body

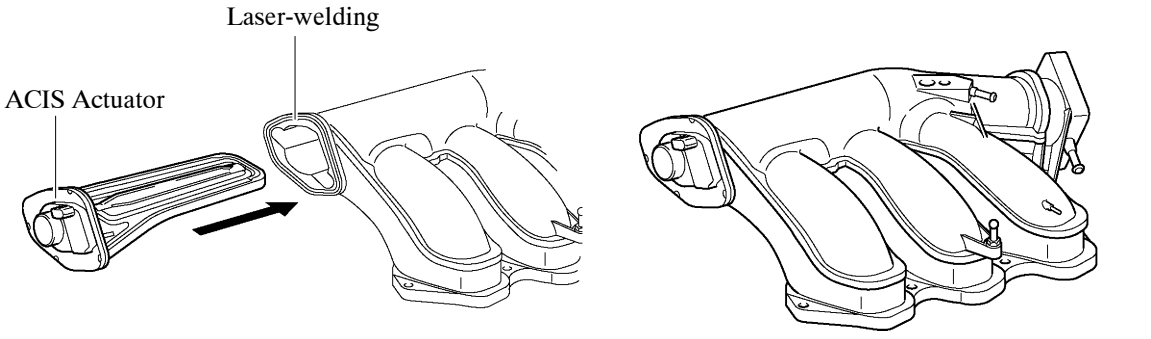
A cable-less type throttle body in which the throttle position sensor and the throttle control motor are integrated is used. It realizes excellent throttle valve control. For details, see page EG-65.

- The throttle control motor uses a DC motor with excellent response and minimal power consumption. The ECM performs duty ratio control of the direction and the amperage of the current that flows to the throttle control motor in order to regulate the throttle valve angle.



4. Intake Air Surge Tank

- The intake air surge tank is made of plastic to realize a lightweight construction.
- The intake air surge tank consists of an upper and lower section and contains an intake air control valve. This valve is activated by ACIS (Acoustic Control Induction System) and is used to alter the intake pipe length to improve the engine performance in all engine speed ranges. For details, see page EG-76.
- The ACIS actuator uses an electric actuator and is laser-welded onto the intake air surge tank. Many of the components are made of plastic for weight reduction.



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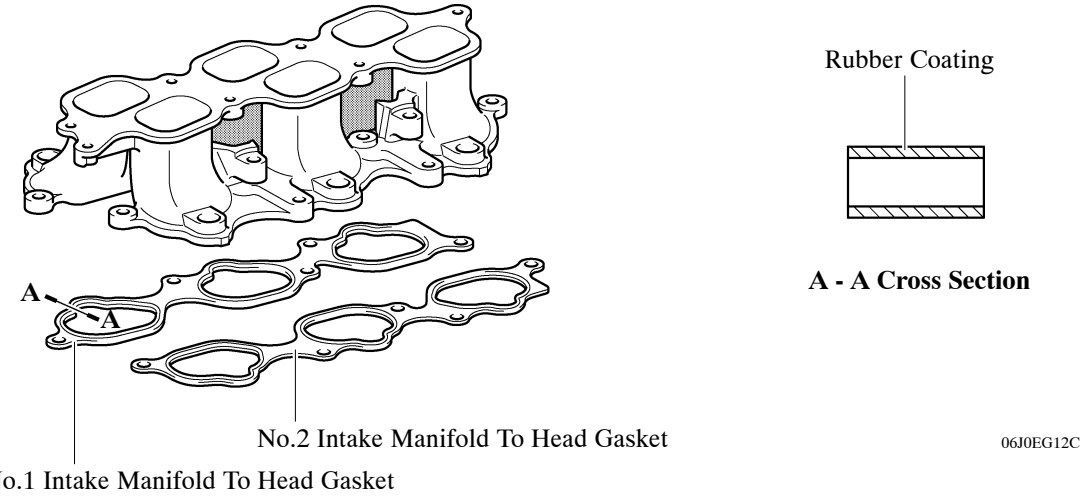
— REFERENCE —

Laser-welding:

In laser-welding, a laser-absorbing material (for the intake air surge tank) is joined to a laser-transmitting material (for the ACIS actuator). Laser beams are then irradiated from the laser-transmitting side. The beams penetrate the laser-transmitting material to heat and melt the surface of the laser-absorbing material. Then, the heat of the laser-absorbing material melts the laser-transmitting material and causes both materials to become welded.

5. Intake Manifold

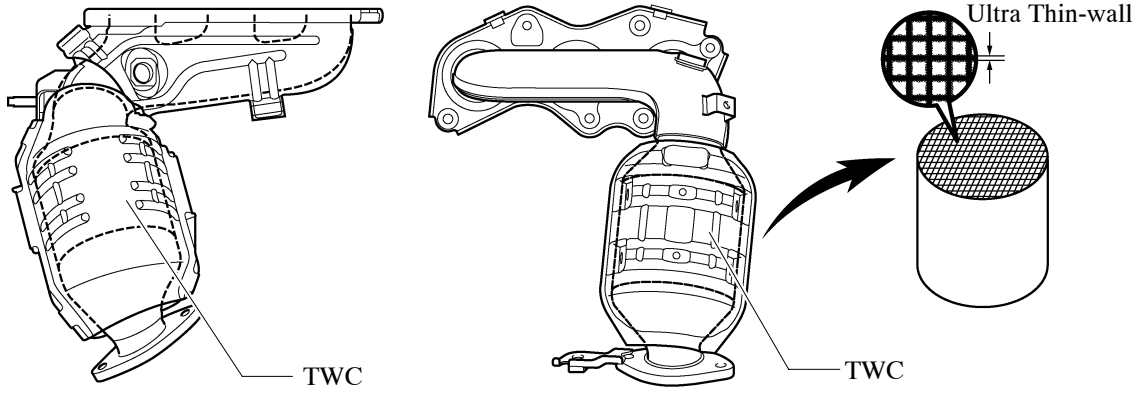
- A light weight aluminum alloy is used for the intake manifold.
- The No.1 and No.2 intake manifold to head gaskets have a rubber coating applied to their surfaces. They provide superior durability.



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6. Exhaust Manifold Sub-assemblies (RH and LH)

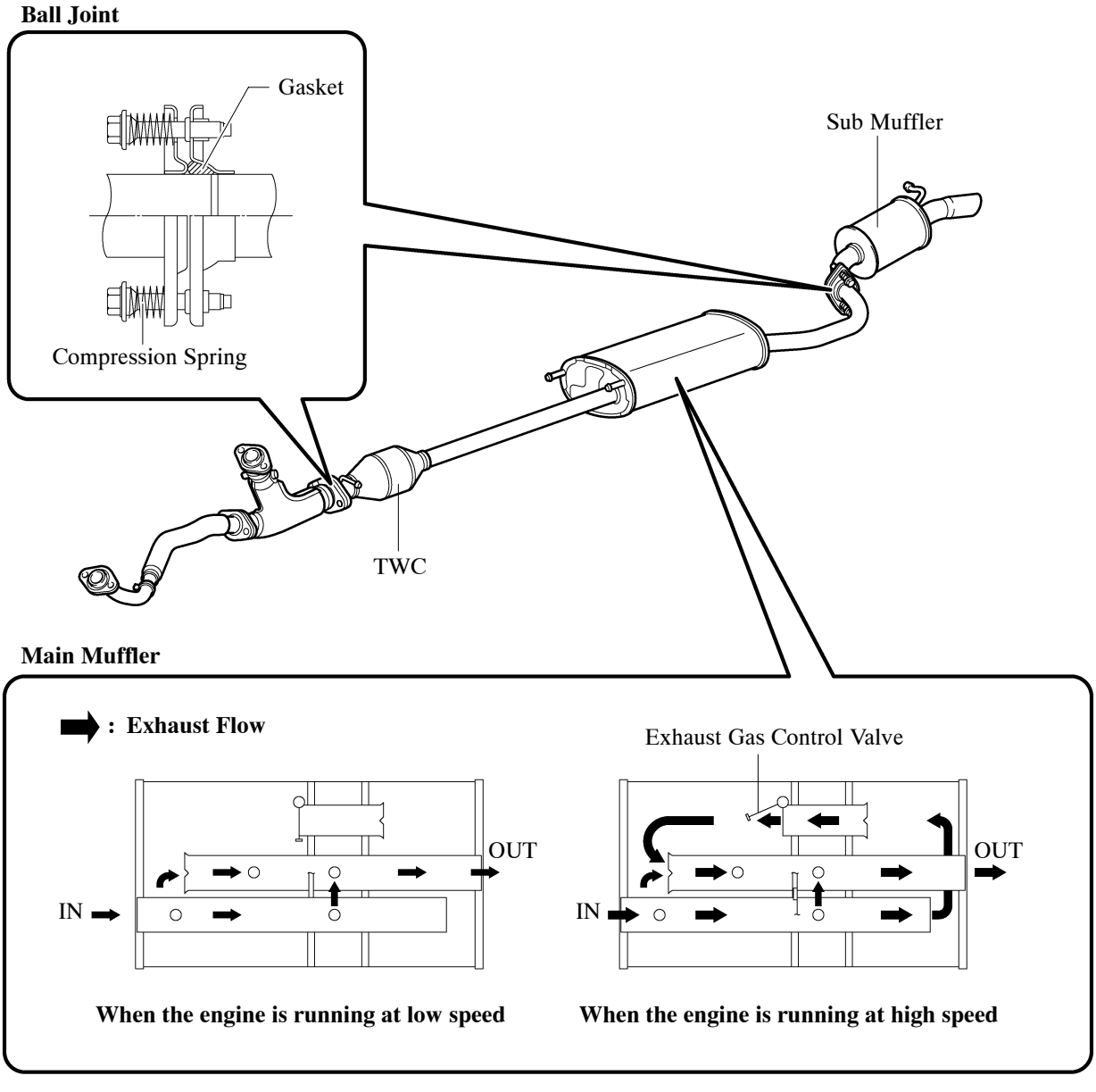
- A stainless steel exhaust manifold sub-assembly with an integrated TWC (Three-Way Catalytic converter) is used for warm-up of the TWC and for weight reduction.
- An ultra thin-wall, high-cell density, ceramic type TWC is used. One of this type of TWC is incorporated into the exhaust manifold sub-assembly for each of the right and left banks.
- This TWC enables an improvement in the reduction of exhaust emissions by optimizing the cell density and the cell wall thickness.



For Right Bank **For Left Bank**

7. Exhaust Pipe

- The exhaust pipes are made of stainless steel for improved rust resistance.
- A thin-wall, ceramic type TWC is used.
- A main muffler is used to ensure engine performance and reduce exhaust noise.
- A ball joint is used to join the exhaust front pipe assembly, exhaust center pipe assembly and exhaust tail pipe assembly. As a result, in-vehicle sound has been muffled, vibration has been minimized, and weight reduction has been realized.
- An exhaust gas control valve is built into the main muffler to control the exhaust gas according to engine speed. This reduces noise when the engine is running at low speed as well as reducing exhaust back pressure when the engine is running at high speed.



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