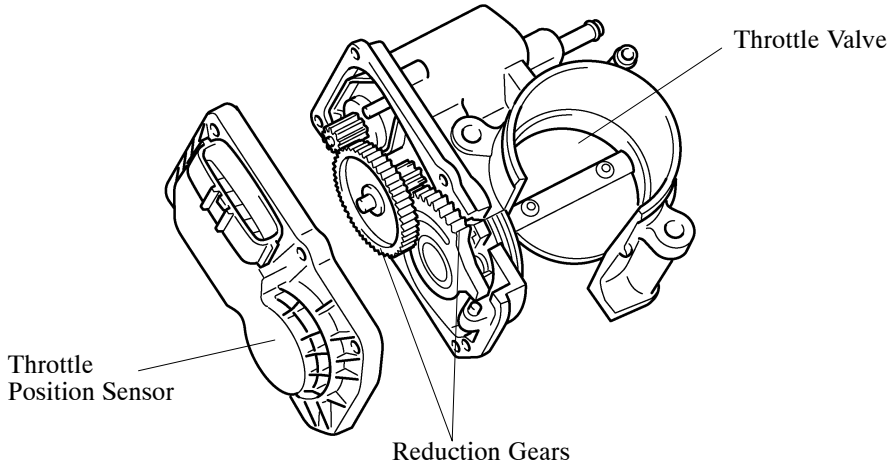
■ INTAKE AND EXHAUST SYSTEM

1. General

- A plastic intake manifold is used for weight reduction.
- The link-less type throttle body is used.
- A stainless steel exhaust manifold and exhaust pipe are used for weight reduction and improved rust resistance.
- Two TWCs (Three-Way Catalytic Converters) have been provided in the exhaust pipe of all unleaded gasoline models.
- The ETCS-i (Electronic Throttle Control System-intelligent) is used to ensure excellent throttle control in all operating ranges. For details of ETCS-i control, see page EG-47.
- An air injection system is used on the EURO III emission regulation compliant models to ensure the proper warm-up performance of the TWC when starting a cold engine. For details on the air injection system control, see page EG-56.

2. Throttle Body

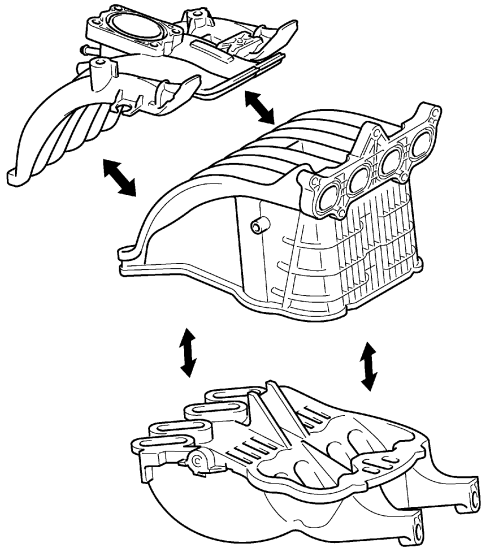
- A DC motor with excellent response and minimal power consumption is used for the throttle control motor. The engine ECU performs the duty ratio control of the direction and the amperage of the current that flows to the throttle control motor in order to regulate the opening angle of the throttle valve.
- The link-less type throttle body is used and it realizes excellent throttle control.



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3. Intake Manifold

- The intake manifold is made of plastic to reduce the weight and the amount of heat transferred from the cylinder head. As a result, it has become possible to reduce the intake air temperature and improve the intake volumetric efficiency.
- This intake manifold consists of three parts, which are integrated through vibration welding.

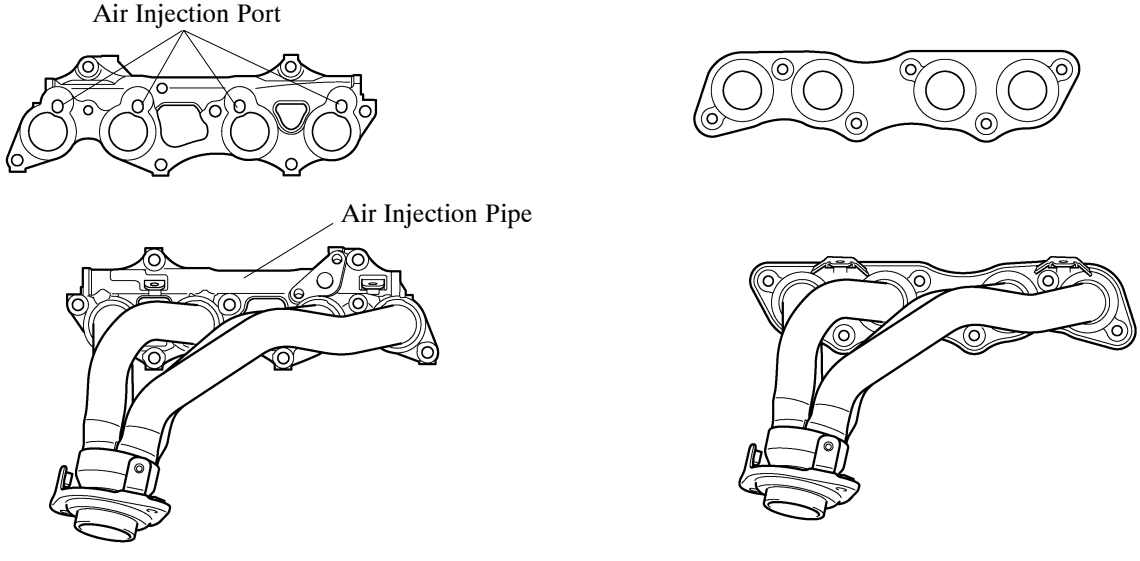


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*— **REFERENCE** —*
Vibration Welding:
Vibration welding is a type of friction welding. In this process, one part of the work to be welded remains stationary while vibration and pressure are applied to the other part, thus causing the joining surfaces to melt and become welded. This method creates a joint that is stronger than other joining methods, such as those using adhesives.

4. Exhaust Manifold

- A stainless steel exhaust manifold is used for weight reduction.
- An air injection pipe, which directs the air from an electric air pump to the air injection port on the cylinder head, has been provided on the models with the air injection system.



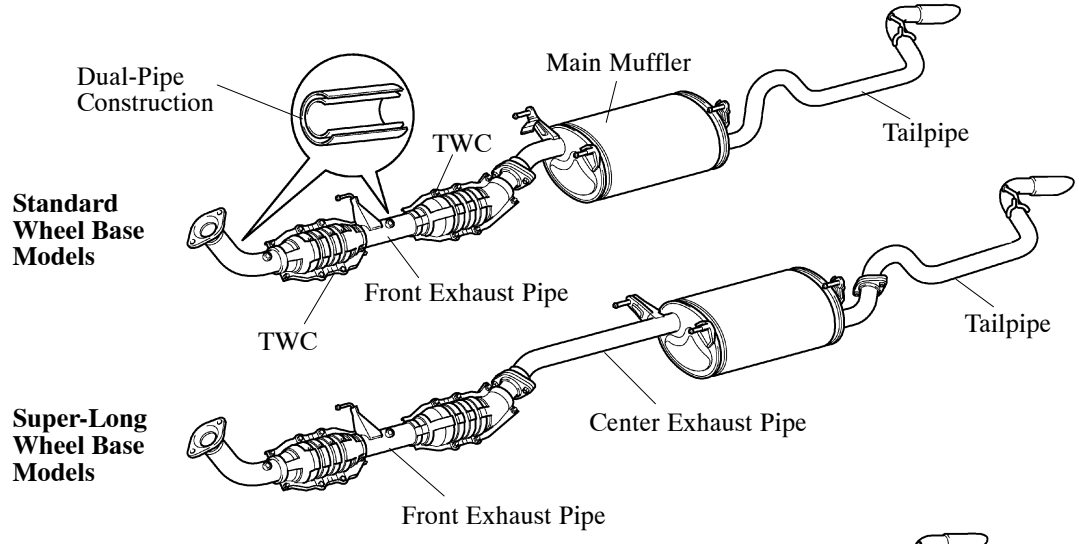
with Air Injection System **without Air Injection System**

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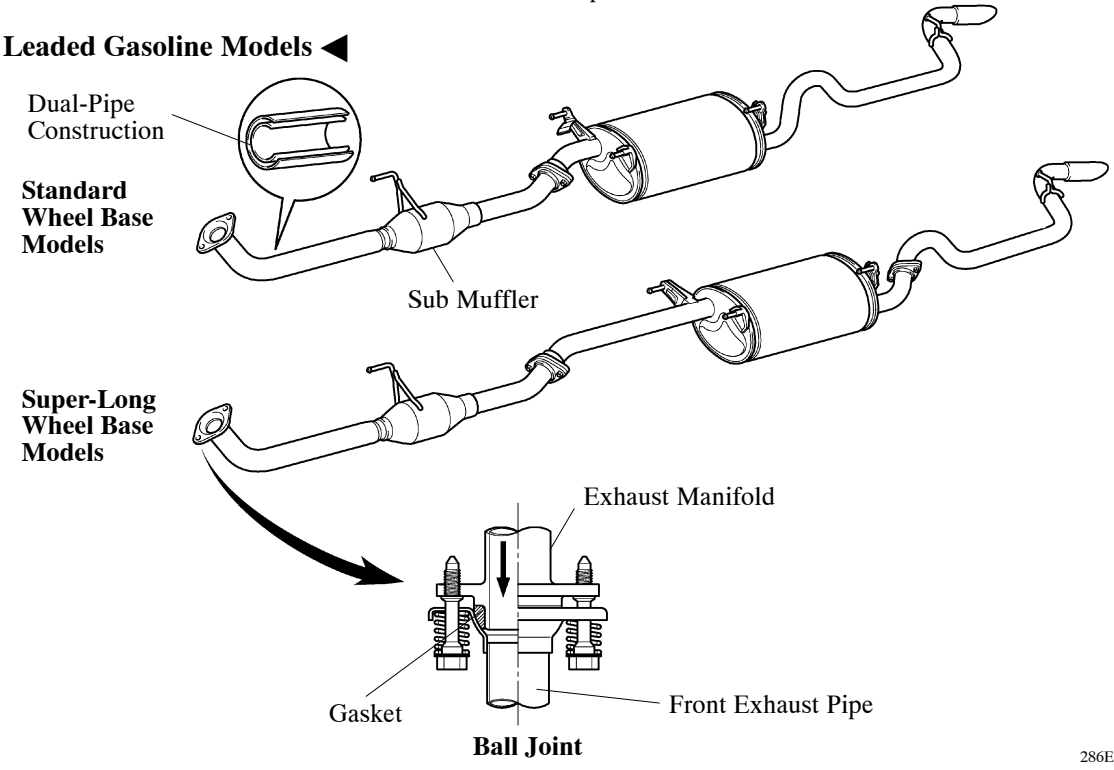
5. Exhaust Pipe

- Two TWCs of a ceramic type have been provided in the front exhaust pipe of all unleaded gasoline models. The exhaust emission performance of the engine is improved as a result of these TWCs. On the leaded gasoline models, a sub muffler has been provided in the exhaust front pipe.
- The exhaust pipe for standard wheel base models is comprised of the front exhaust pipe and the tailpipe. The exhaust pipe for super-long wheel base models is comprised of the front exhaust pipe, the center exhaust pipe, and the tailpipe.
- A ball joint is used to join the exhaust front pipe and exhaust manifold. As a result, a simple and reliable construction for reducing vibration has been realized.
- On the unleaded gasoline models, a dual-pipe construction is used for the pipe portions between the exhaust manifold and the rear side TWC. As a result, the exhaust gas temperature fall is suppressed and the exhaust manifold constructed of a dual pipe accelerates the warm-up of the catalyst immediately. Also, on the leaded gasoline models, a dual-pipe construction is used in the pipe portion forward of the sub muffler.

▶ Unleaded Gasoline Models ◀



▶ Leaded Gasoline Models ◀



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