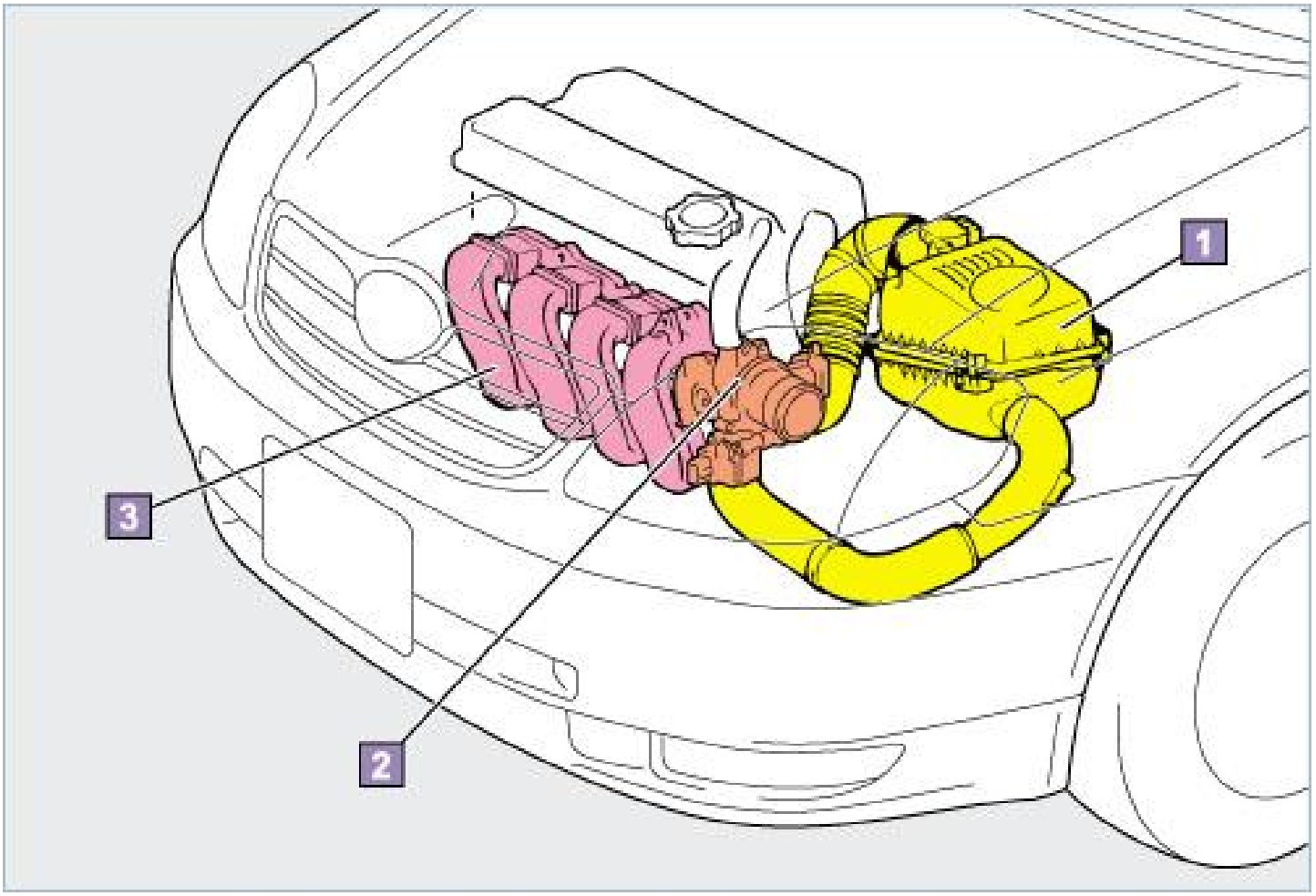
# 19.Intake System

## Intake System-

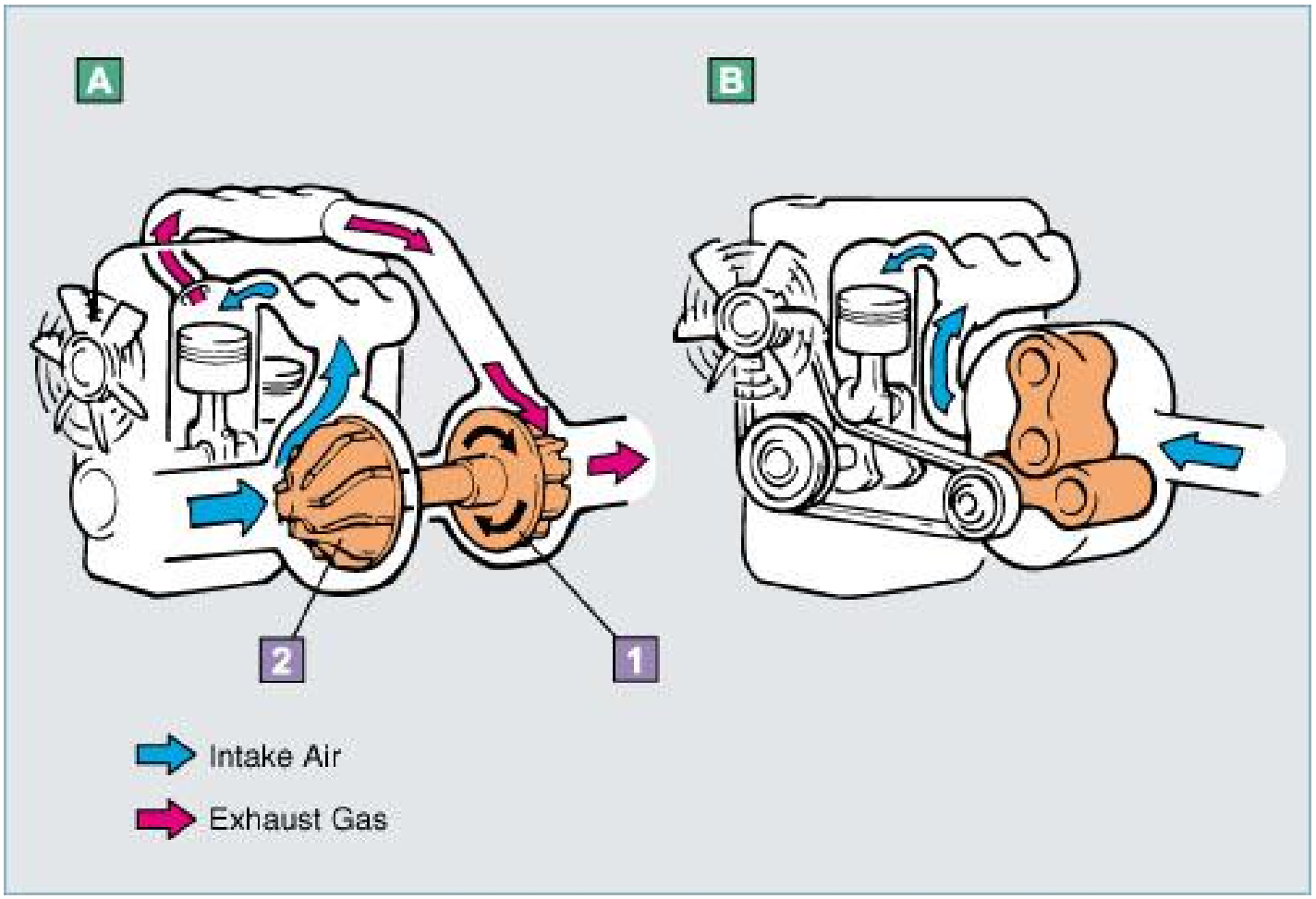
. The intake system provides the necessary volume of clean air to the engine.



## Turbo Charger

A turbo charger is the device to compress the intake air by the energy of exhaust gas and transmits the high-density mixture into the combustion chamber to increase the generating power. When the turbine wheel turns with the energy of the exhaust gas, the compressor wheel the connected with the shaft on the opposite side, transmits the compressed intake air to the engine.

There is also device called a "super charger", which drives the compressor through the crankshaft to the drive belt directly, and increases the volume of the intake air.



## Air Cleaner-

. The air cleaner contains an air cleaner element to remove dust and other particles from the air while introducing external air into the engine. An air cleaner element must be cleaned or replaced at regular intervals.

## Types of air cleaner element

**1.Paper type**

A type that is most widely used on automobiles.

**2.Fabric type**

A type that contains a washable element made of fabric.

**3.Oil bath type**

A wet type that contains an oil bath.

## Types of air cleaners

**1. Pre-air cleaner**

Uses the centrifugal force of the air that is generated by the rotational movement of the fins to separate the dust from the air.

The dust is then sent to the dust trap, and the air is sent to another air cleaner.

**2. Oil bath type air cleaner**

Filters the air through an air cleaner element made of metallic wool, which is soaked with oil stored in the bottom of the air cleaner case.

**3. Cyclone type air cleaner**

Remove debris such as sand through the centrifugal force of the air swirl created by fins, and catches small dust particles through an air cleaner element made of paper.

## Throttle Body-

. The throttle valve uses a cable to operate in unison with the accelerator pedal located in the vehicle interior, in order to regulate the volume of air-fuel mixture that is draw into the cylinder.

When the accelerator pedal is depressed, the throttle valve opens to draw in a large volume of air and fuel, resulting in increased engine output.An ISCV (Idle Speed Control Valve) is also provided, in order to regulate the volume of air during idling or when the engine is cold.

## Parts of throttle body

Accelerator pedal

Throttle cable

Throttle valve

ISCV

## ETCS-i (Electronic Throttle Control System-intelligent)

The ETCS-i, which converts the accelerator pedal operation into electric signals, uses an ECU (Electronic Control Unit) to control the opening and closing of the throttle valve by actuating a motor in accordance with the driving conditions.

Therefore, there is no throttle cable to link the accelerator pedal with the throttle valve.

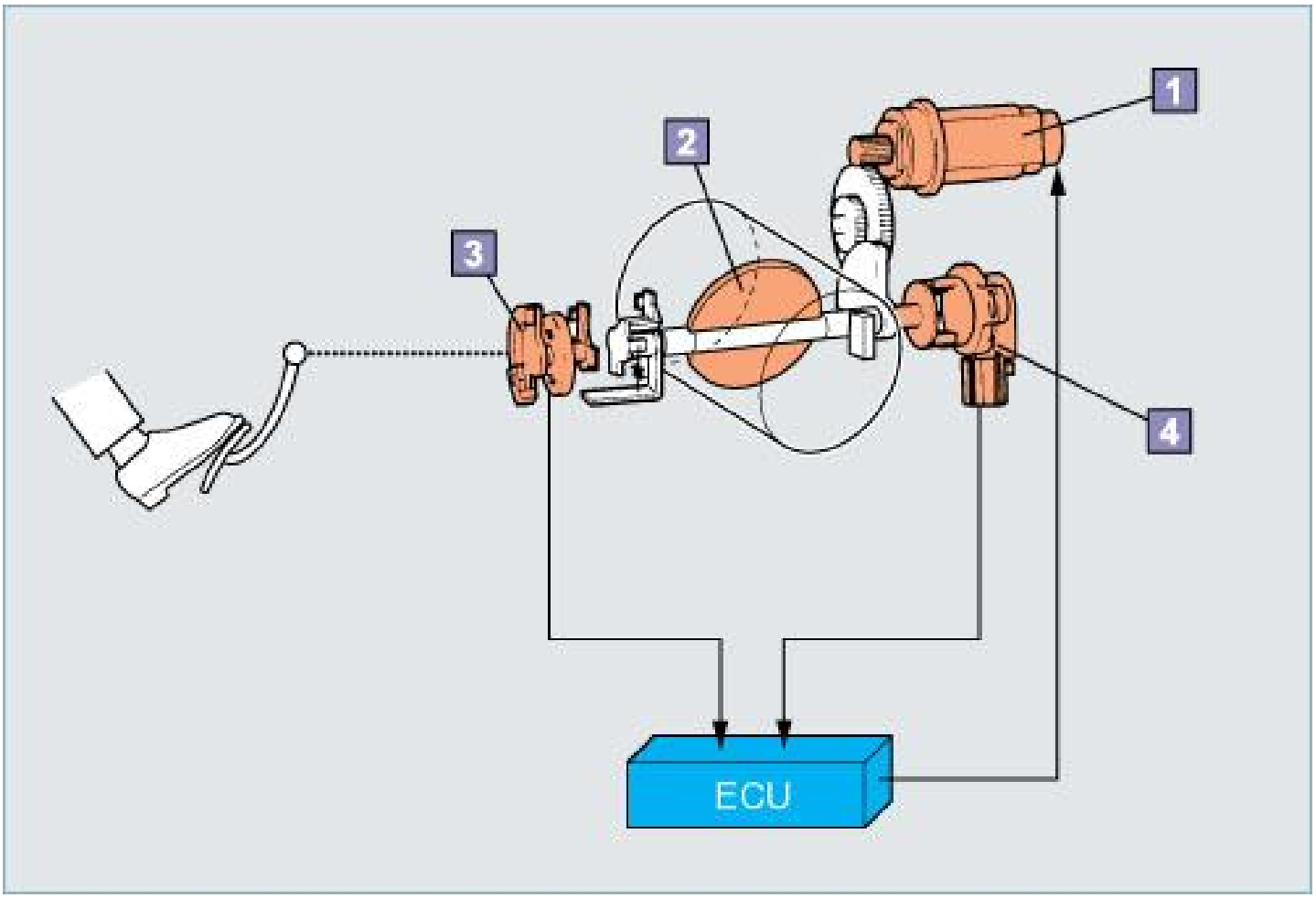
### Parts of ETCS-I

Throttle control motor

Throttle valve

Accelerator pedal position sensor

Throttle position sensor



## Idle Speed Control Valve(ISLV)

. The ISCV regulates the volume of air that flows through the bypass that is provided in the throttle valve, to constantly control the idling speed at an optimum level.

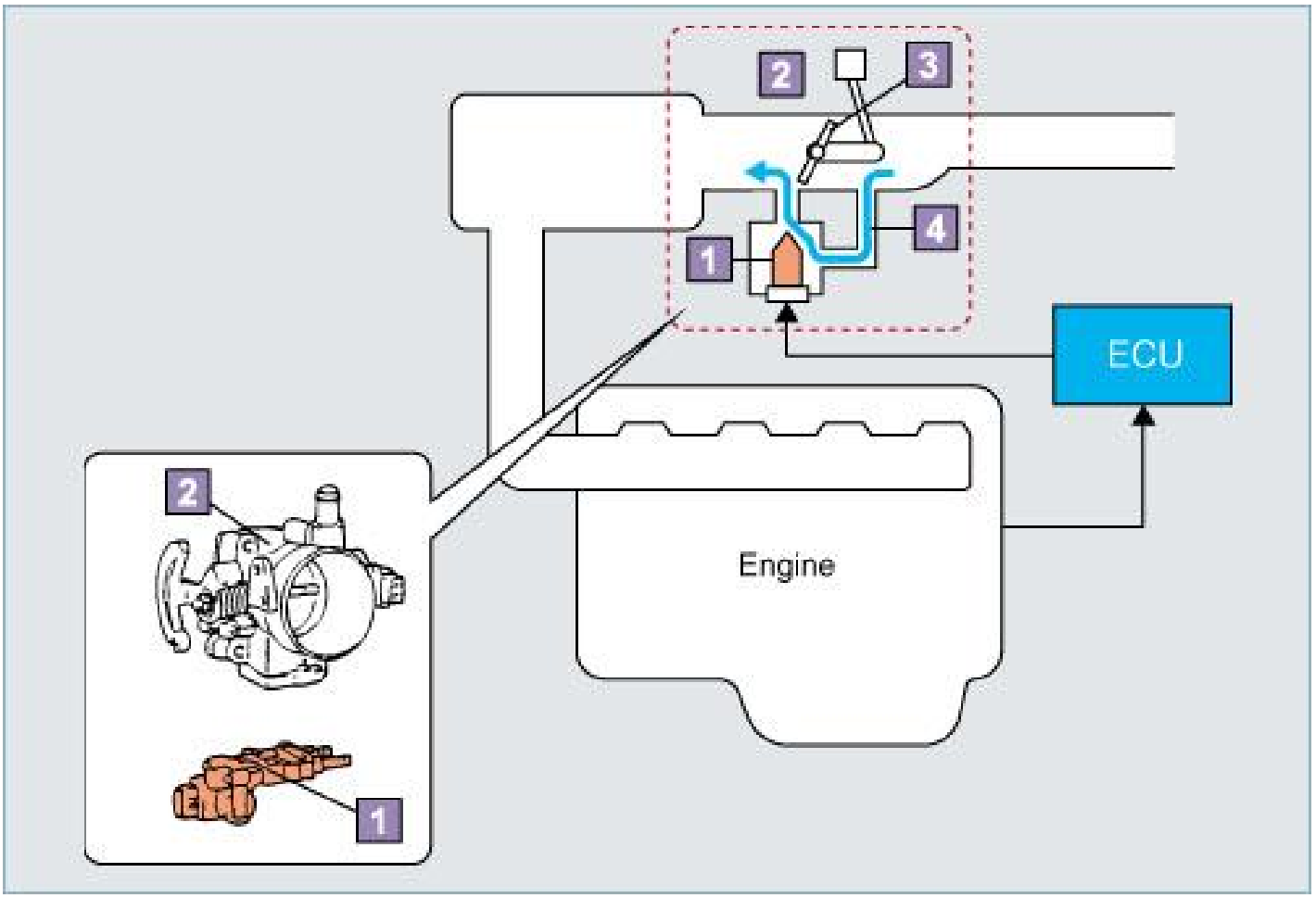
## Parts of ISLV

ISCV

Throttle body

Throttle valve

Bypass



## Types of ISCVs

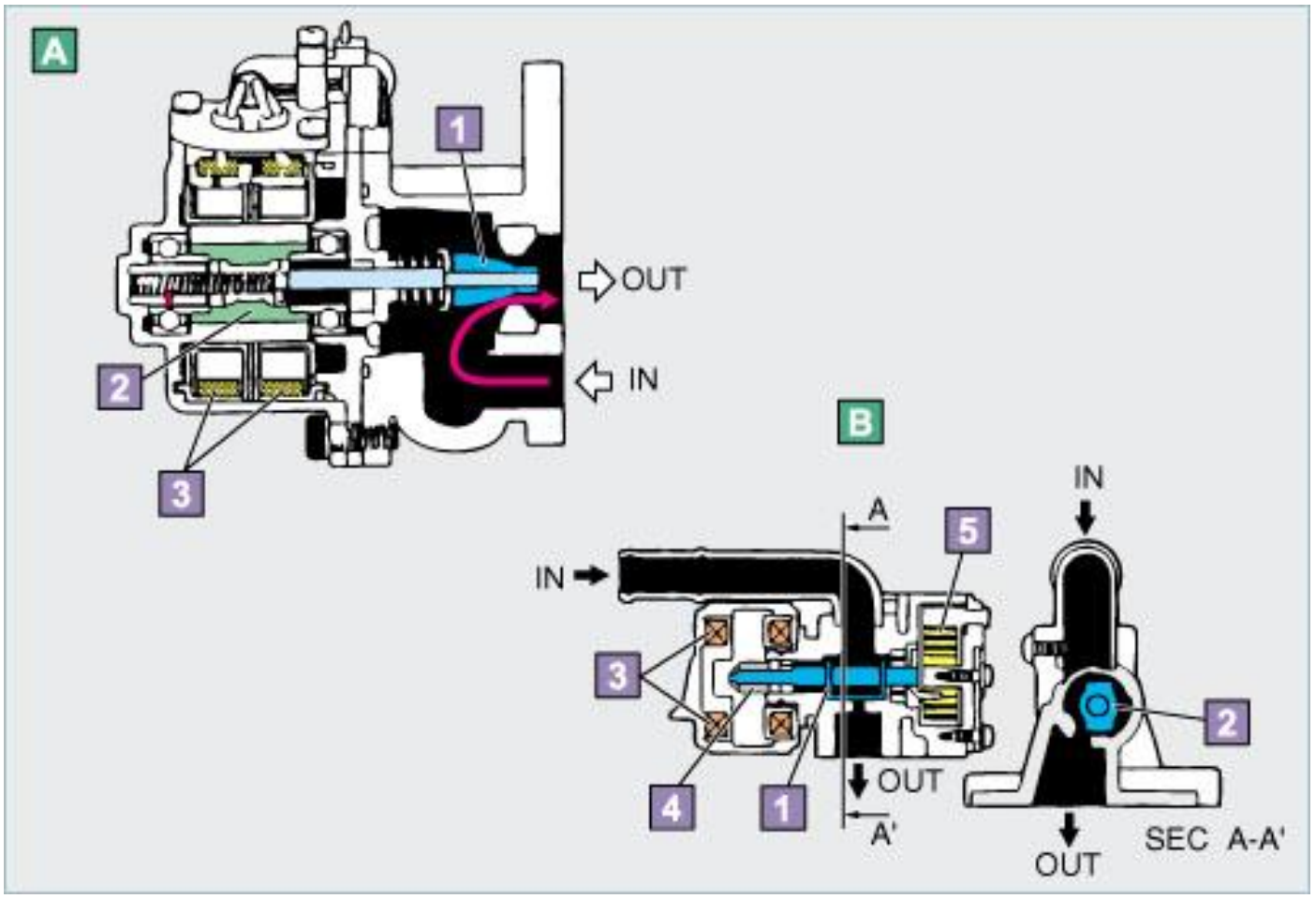
### 1.Step motor type

This valve regulates, the volume of air that flows through the bypass.

This is accomplished by a valve located at the end of the rotor, which is moved back and forth by the movement of the rotor.

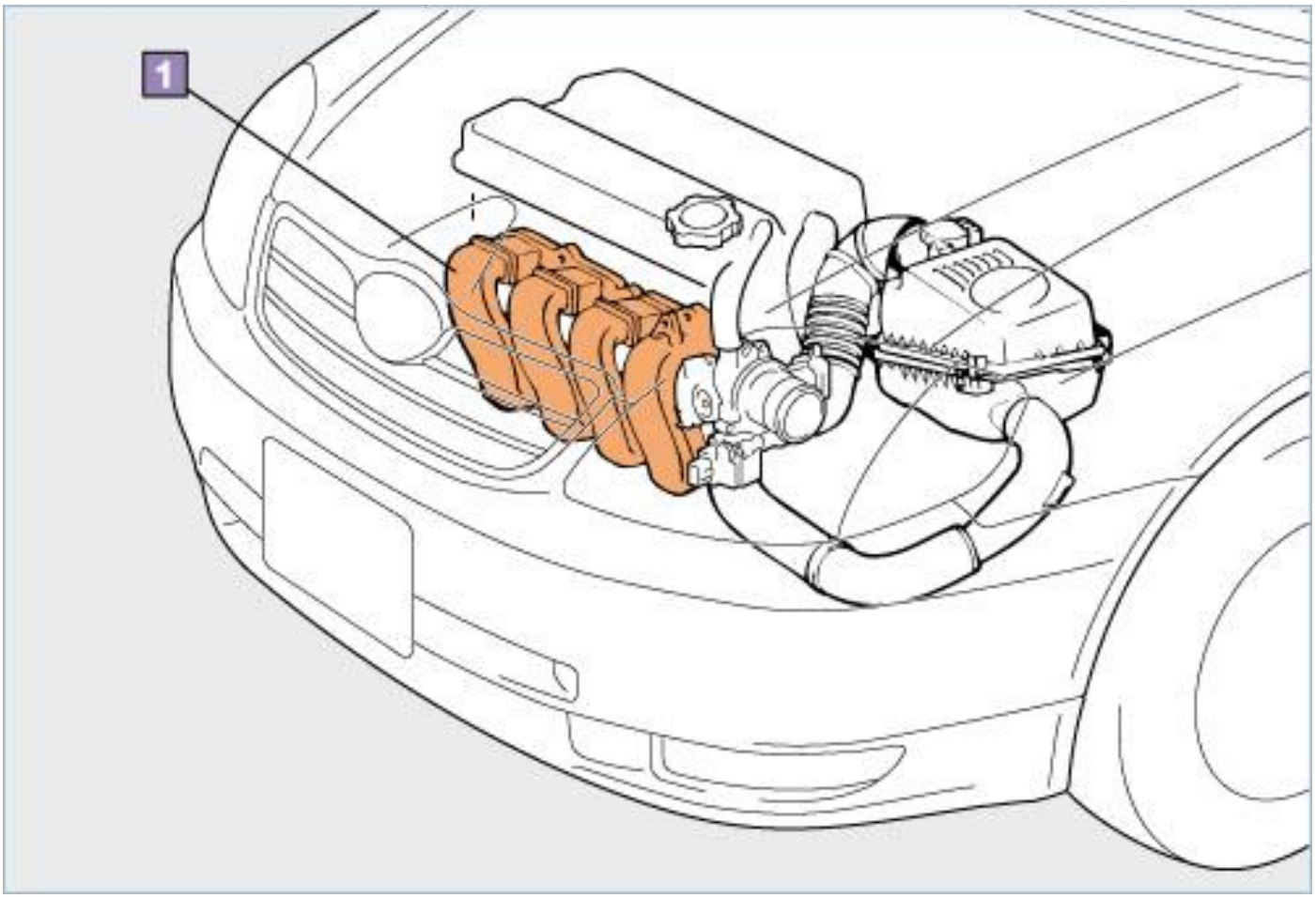
### 2.Rotary solenoid valve type

This valve regulates the intake air volume by varying the opening of the valve. This is accomplished by regulating the duration of the voltage that is applied to the 2 solenoids (coils).



## Intake System-

. An intake manifold consists of several pipes that supply air to each cylinders.



## ACIS (Acoustic Control Induction System)

The ACIS uses an ECU (Electronic Control Unit) to actuate a control valve that changes the effective length of the intake manifold.

By changing the length of the intake manifold, this system improves the intake efficiency of all engine speed ranges.