

IDLE AIR CONTROL (IAC) OPERATION [ZJ, Z6]

B3E014000140T09

Determination of IAC valve Energization Time

- The PCM determines the duty signal sent to the IAC valve that corresponds to the calculated intake air amount (IAC target air amount) necessary to regulate idle speed.
- The IAC valve receives the duty signal from the PCM which moves the plunger, and by adjusting the surface area of the opening, the idle speed is controlled to the target speed.
- When the engine is being cranked, the energization time of the IAC valve is set and the valve opens as much as the set valve.

IAC target airflow amount

- The target IAC airflow amount is the estimated value of intake air amount that does not pass through the IAC valve (amount flowing from the gap in the throttle valve) subtracted from the intake airflow amount required to regulate idling as calculated by the PCM (required mass).

Required volume airflow

- The required volume airflow is the calculated amount of intake airflow according to the change in intake airflow amount due to the difference in negative pressure that occurs before and after the throttle valve based on the target charging efficiency, and the change in intake air density occurring with the change in intake airflow temperature.

Target charging efficiency

- The target charging efficiency is the charging efficiency* required for the engine operation conditions.
 - The target charging efficiency is calculated by adding the corrections according to engine operation conditions to the basic charging efficiency determined by the engine coolant temperature.
- * : The charging efficiency is the ratio of the actual amount of intake air to the maximum air charging amount of the cylinder mass. This value increases proportionately to the increase in engine load.

Correction	Purpose	Conditions	Correction amount
A/C load correction	Prevents decrease in idle speed due to A/C operation.	A/C is operating.	During A/C operation→correction
P/S load correction	Prevents decrease in idle speed due to P/S operation	P/S on	During P/S operation→correction
Electrical load correction	Prevents decrease in idle speed due to electrical load operation.	E/L on	High electrical load→large correction
D-range correction	Prevents decrease in idle speed due to shifting into D-range	D-range signal is input.	Low idle speed when shifted to D range→large correction
Dashpot correction	Prevents decrease in idle speed due to insufficient intake air amount during deceleration.	Decelerated	High engine speed→large correction
Correction at engine start	Prevents decrease in idle speed after engine start.	After cranking and engine start	Low engine coolant temperature→large correction
		Just after cranking and engine	

Hot engine restart correction	Prevents decrease in idle speed due to hot engine restart.	start when the engine coolant temperature is 60°C {140°F} or more	High intake airflow temperature→large correction
Feedback correction A	Sets idle speed to target engine speed.	Idle speed during idling (vehicle stopped) is over or under the target engine speed (except during test mode when engine speed is 300 rpm or less).	Actual idle speed Target engine speed or less→volume increase correction Target engine speed or more→volume decrease correction
Feedback correction B	Sets to the target engine speed when the idle speed has decreased in the range not corrected by feedback correction A, and prevents a decrease in idle speed.	During deceleration at fully-closed throttle, the engine speed is the target engine speed or more and when feedback correction A is not performed (except during test mode).	Large difference between actual idle speed and target engine speed→large correction
Learning correction	Stores intake air volume changes based on differences between engines and changes due to aged deterioration, and feedback.	During feedback correction A when engine coolant temperature is 80°C {176°F} or less.	During idling→average value of feedback correction A

Target idle speed

- The target idle speed for various engine operation conditions are as follows:

Standard

Load status		Idle speed (rpm)			
		N, D position (ATX), Neutral position (MTX)			
		ATX		MTX	
		Z6		ZJ	Z6
		N range	D range		
No load		700-800	650-750	690-790	640-740
Electrical loads on*1	34-42 A	700-800	650-750	700-800	650-750
	Above 42 A	700-800	670-770	700-800	700-800
A/C on	Low load*2	700-800	650-750	700-800	650-750
	High load*3	700-800			
P/S on		700-800			

*1 : Generator generating current value

*2 : Refrigerant pressure switch (middle pressure switch) is off.

*3 : Refrigerant pressure switch (middle pressure switch) is on.

Inhibition conditions

- If the IAC valve is damaged (when DTC P0511 is detected), power to the IAC valve is cut (IAC valve closes) preventing a sudden increase in engine speed.