HOW TO PERFORM IDLE AIR VOLUME LEARNING ON NISSAN

Function of idle air volume learning

It enables the adjustment on the air intake volume while idle, so as to keep the engine RPM within the specifications.

When to perform idle air volume learning

After replace IACV-AAC valve, throttle valve body or ECM
While idle speed or ignition timing is out of the specifications

Prerequisites

Confirm the vehicle as follows before performing learning. Otherwise, the learning can't be completed.
a) Battery voltage: ＞ 12.9V(at idle)

b) Engine coolant temperature: 70-99℃
c) PNP switch: ON
d) Electric load switch: OFF(i.e. AC, headlight, rear windscreen defogger)
e) For vehicle equipped with DRL(Day Running Light), the light switch should be at I stage, only the sidelight is ON.
Cooling fan motor: stop
Steering wheel: middle position(i.e. straight ahead position)
f) Vehicle speed: zero
g) Gearbox: warm up
h) (Tips: if with X431, click "A/T", then select "DATA MONITOR" mode to for "FLUID
i) TEMP SE" whose value should be less than 0.9V. If without X431, start the vehicle for 10minutes.)

LAUNCH

How to adjust idle air volume with X431

1) Accelerator pedal release position learning

Notes:
This operation enables the learning of accelerator pedal release position by monitoring the accelerator pedal position sensor signal. Perform this learning after disconnecting the harness connector of accelerator pedal position sensor or ECM.

STEPS:
1.1) Make sure that the accelerator pedal is fully released.
1.2) Turn ignition switch to ON, then wait at least 2 seconds.
1.3) Turn ignition switch to OFF, then wait at least 10 seconds.
1.4) Turn ignition switch to ON, then wait at least 2 seconds.
1.5) Turn ignition switch to OFF, then wait at least 10 seconds.

2) Throttle valve closed position learning

Notes:

This operation enables to learning throttle valve closed position by monitoring the TPS signal. Perform this learning after disconnecting the harness connector of throttle valve actuator or ECM.

STEPS:
2.1) Make sure that accelerator pedal is fully released..
2.2) Turn ignition switch to ON.
2.3) Turn ignition switch to OFF, then wait at least 10 seconds.
Tips: confirm the throttle valve moves over 10 seconds by its operating sound.

3) Warm the engine up to normal operating temperature

4) Confirm all testing requirements as Prerequisites listed.

5) Connect X431, and select "WORK SUPPORT" mode, then click "SELF-LEARNINGING CONT", which is used to clear self-learning value on the ECU.
6) Under "WORK SUPPORT" mode, select "IDLE AIR VOL LEARN".
7) Touch "START" button, then wait 20seconds.
8) If "CMPLT" appears on the X431 screen, which means the operation succeeds. On contrary, if "INCMP" appears, which indicates "IDLE AIR VOL LEARN" is failed. Please refer to the following diagnostic procedures to troubleshoot it.
9) Rev up the engine for 2-3 times; make sure that both idle speed and ignition timing can meet the specification below:

LAUNCH

Idle Speed and Ignition Timing specification
Idle speed:
M/T：625±50r/min
A/T：700±50r/min（at N or P position）

Ignition timing:
M/T：15°±2°BTDC
A/T：15°±2°BTDC（at N or P position）

How to adjust idle air volume without X431?

1) Accelerator pedal release position learning
Note:
This operation enables to learning accelerator pedal released position by monitoring the accelerator pedal position sensor signal. Perform this learning after disconnecting the harness connector of accelerator pedal position sensor or ECM.

STEP:
1.1) Make sure that the accelerator pedal is fully released
1.2) Turn ignition switch to ON, then wait at least 2 seconds.
1.3) Turn ignition switch to OFF, then wait at least 10 seconds.
1.4) Turn ignition switch to ON, then wait at least 2 seconds.
1.5) Turn ignition switch to OFF, then wait at least 10 seconds.

2) Throttle valve closed position learning

Note:
This operation enables to learning throttle closed position through monitoring the TPS signal. Perform this learning after disconnecting the harness connector of throttle actuator or ECM.

STEP:
2.1) Make sure that the accelerator pedal is fully released
2.2) Turn ignition switch to ON.
2.3) Turn ignition switch to OFF, then wait at least 10 seconds.
Tips: Confirm the throttle valve moves over 10 seconds by its operating sound.

3) Warm the engine up to normal operating temperature

4) Confirm all testing requirements as Prerequisites listed.

5) Turn ignition switch to OFF, then wait at least 10 seconds.
6) Make sure that the accelerator pedal is fully released, then turn ignition switch to ON and wait 3 seconds.
7) Repeat the following steps (7a and 7b) quickly five times within 5 seconds.
7a) Fully depress the accelerator pedal.
7b) Fully release the accelerator pedal.
8) Wait 7 seconds, then depress the accelerator pedal fully and hold on for 20 seconds till the MIL stop flashing, thereafter, the MIL will be lighted.
9) Release accelerator pedal fully for 3 seconds once MIL is lighted.
10) Start the engine and let it idle for a while.
11) Wait 20 seconds.
12) Rev up the engine for 2-3 times; make sure that both idle speed and ignition timing can meet the specifications below:

LAUNCH

Idle speed:
M/T：625±50r/min
A/T：700±50 r/min（at N or P position）

Ignition timing:
M/T：15°±2°BTDC
A/T：15°±2°BTDC（at N or P position）

Steps for the unsuccessful idle air volume learning

1) Confirm throttle valve is fully closed.
2) Confirm the throttle valve downstream has no air leakage.
3) Adjust close position for throttle valve switch, and reset memory.
4) If the above-mentioned are normal, the problem may be from engine parts and/or its installation, please check and troubleshoot it.

5) If any following situation occurs after engine starts, please troubleshoot it and perform "idle air vol learn" again.
A) Engine stalls
B) Idle error
C) The fuse related to IACV-AAC valve blows out.

Matching tips:
Special attention for Nissan, its idle learning shall be accomplished at idle. In order to realize it, the engine must start (sometimes, this will be ignored as some models do not start the engine before performing idle learning.)

Normally, the idle learning can be completed if operate per the above-mentioned steps. While, it can't be completed sometimes mainly due to the water temperature which exceeds 90 ℃.
For Nissan Idle learning, it has strict requirements on water temperature, i.e. it should not exceed 90 ℃, otherwise the idle learning can't be completed. There are two ways to lower the temperature.
1: In actuation test, select "electronic fan" to drive electronic fan at high speed, the water temperature will drop. When the temperature is lower than 90 ℃, the above-mentioned steps can be performed to complete idle learning.
2: Pour cold water to the engine block directly to lower the engine water temperature. When the temperature is lower than 90 ℃, the above-mentioned steps can be performed to complete idle learning.
If the water temperature is lower than 90 ℃, the idle learning can't be completed yet. Repeat this function when the engine is started and the brake pedal is depressed fully, and then the lever is pushed to R position (AT), or 1st position (MT). Touch [START] button and wait about 30 seconds to push the gear back to P position and release brake pedal. Although there is no prompt for learning completion, the idle will become stable. At that time, restart the engine, the idle learning will be completed.