

NISSAN TERRA D23 Power Balance Function

Tested Model: NISSAN TERRA D23 2024

Function Description:

1. This function sends control commands from the diagnostic tool to the engine control unit (ECU), instructing the ECU to temporarily disable each cylinder sequentially according to a preset order. By monitoring changes in engine speed and comparing the speed variations before and after disabling each cylinder, the function evaluates each cylinder's contribution to the engine's total power output. This helps determine whether the cylinders are operating in a balanced manner and assists in identifying malfunctioning cylinders.
2. This function can be used to perform a power balance test when the vehicle exhibits symptoms such as engine idle vibration, insufficient power, abnormal acceleration, or rough running, provided that basic issues (such as control system power supply or communication faults) have already been ruled out. The test helps pinpoint cylinders with abnormal power output and narrows down the scope of troubleshooting.
3. If the diagnostic results indicate abnormal power contribution from one or more cylinders, the root cause should be further confirmed by analyzing DTCs and inspecting related systems, such as the fuel injection system, ignition system, intake system, and the engine's mechanical condition. After repairs are completed, this function can be run again to verify that the power output of all cylinders has returned to normal.

Supported Equipment: Launch PRO or PAD series comprehensive diagnostic equipment

Attention:

1. Before performing the power balance test, ensure that the vehicle is parked, the engine is started and idling, and the engine coolant temperature and operating status meet the test requirements. It is also recommended to connect an external stabilized power supply to maintain stable battery voltage, preventing test failure or abnormal results caused by voltage fluctuations.
2. Do not turn off the ignition, disconnect the diagnostic tool, depress the

accelerator pedal, or alter the engine's operating state while the function is running; doing so may interrupt the test or lead to abnormal results. Fluctuations in engine speed during the test are normal.

3. After the test is completed, make a comprehensive assessment based on the test results, DTCs, and relevant data streams. If abnormal power output is detected in a cylinder, further inspect the fuel injection system, ignition system, and engine mechanical condition; avoid replacing components based solely on the test results. Before cylinder-related repairs, shut down the engine, set the vehicle ignition switch to OFF, and disconnect the diagnostic tool.
4. If the function fails to execute or the test results are abnormal, verify the vehicle status and the condition of relevant systems. Resolve any faults before attempting the function again.

Procedure:

1. On an X-431 PAD 5, follow the steps shown in Figure 1 to Figure 3. Choose [Local Diagnose], choose [NISSAN], and then click "OK" to enter the Nissan vehicle model menu interface (Figure 4).

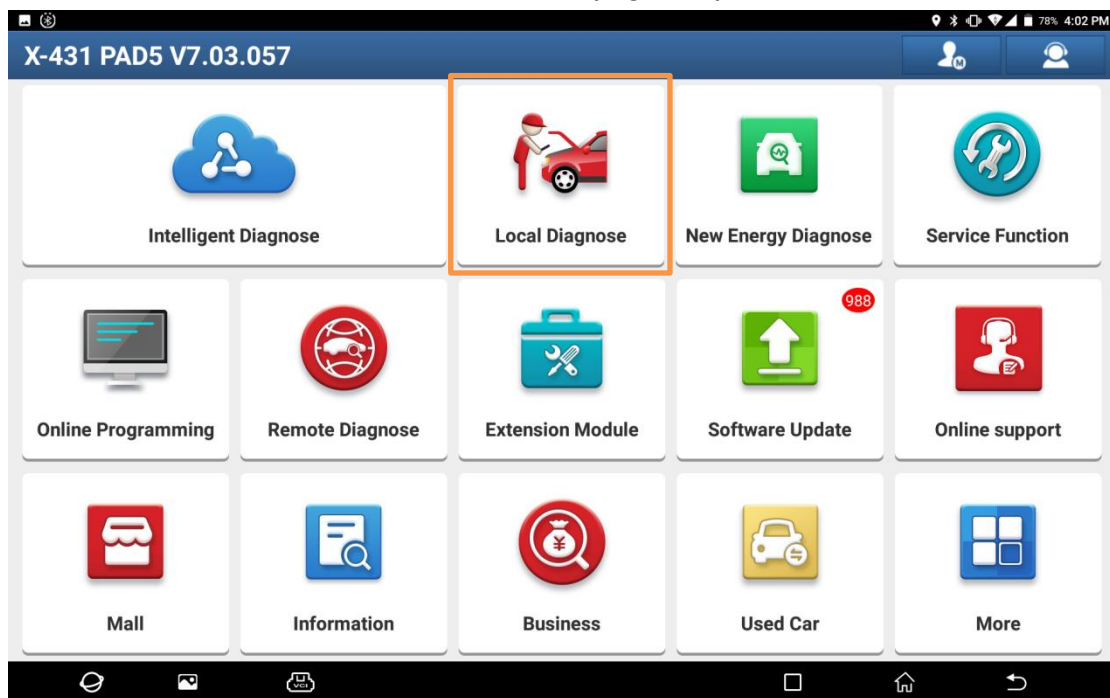


Figure 1

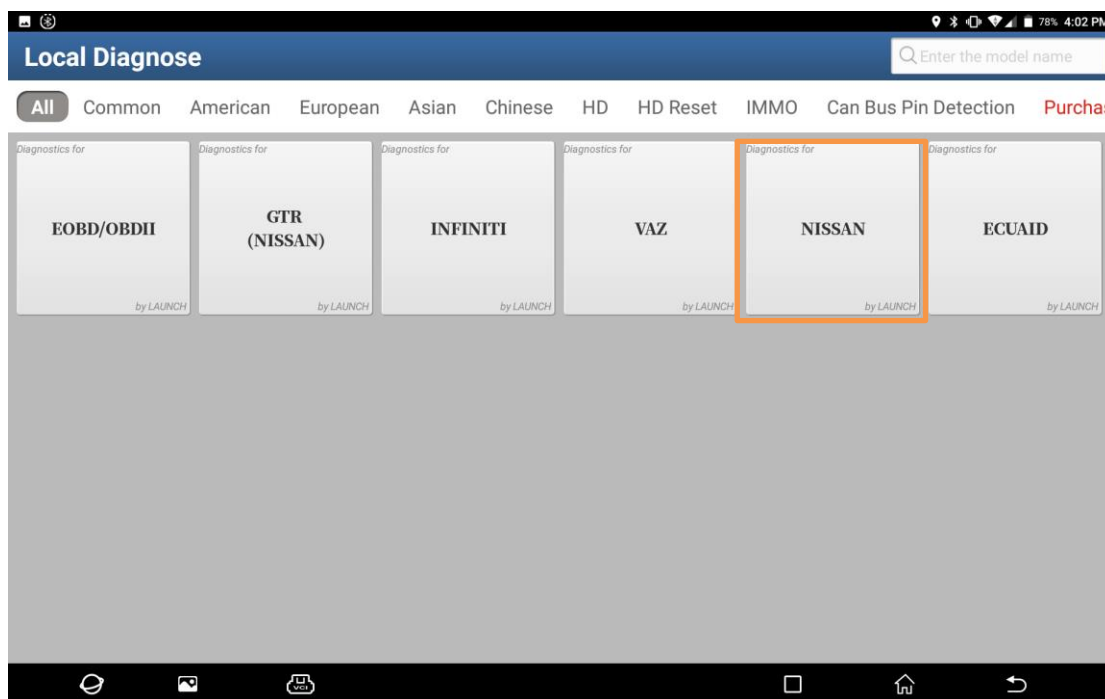


Figure 2

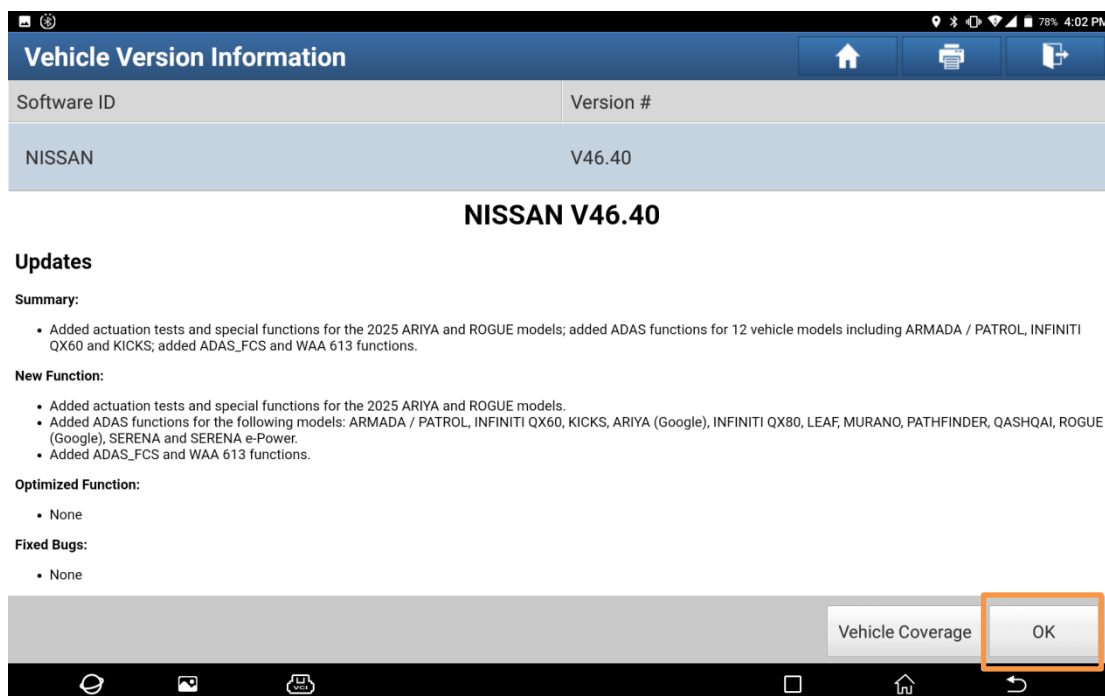


Figure 3

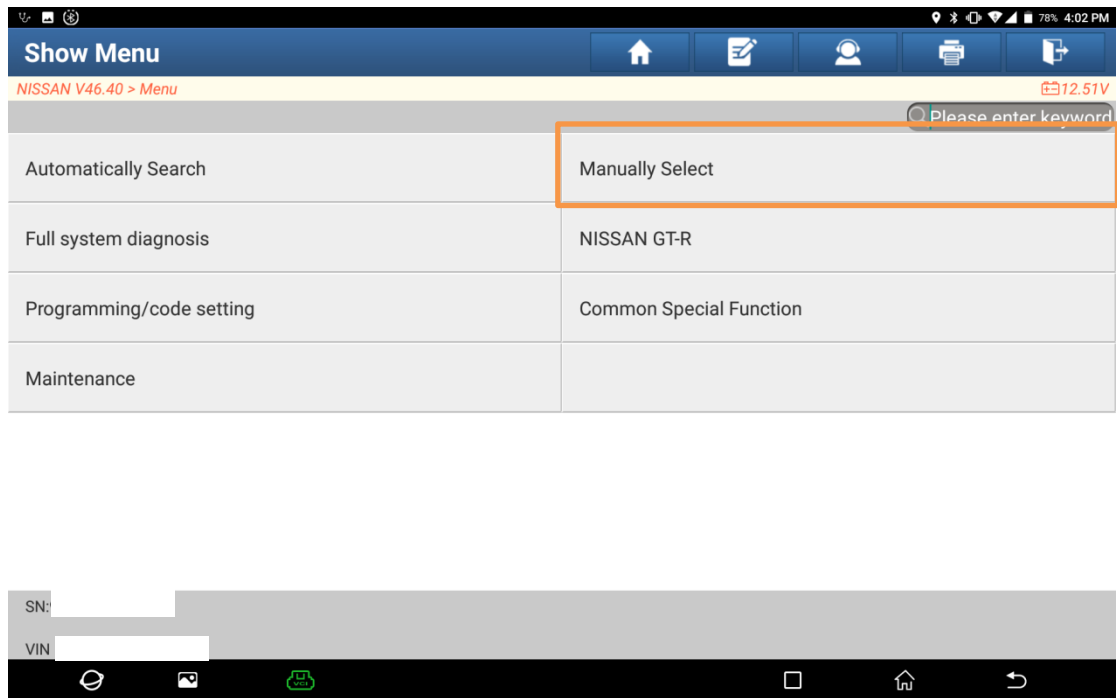


Figure 4

- Click [Manually Select], and then choose [Oceania] > [New Caledonia] > [TERRA] > [D23] > [12/2024] to enter the system interface for this vehicle model (Figure 5).

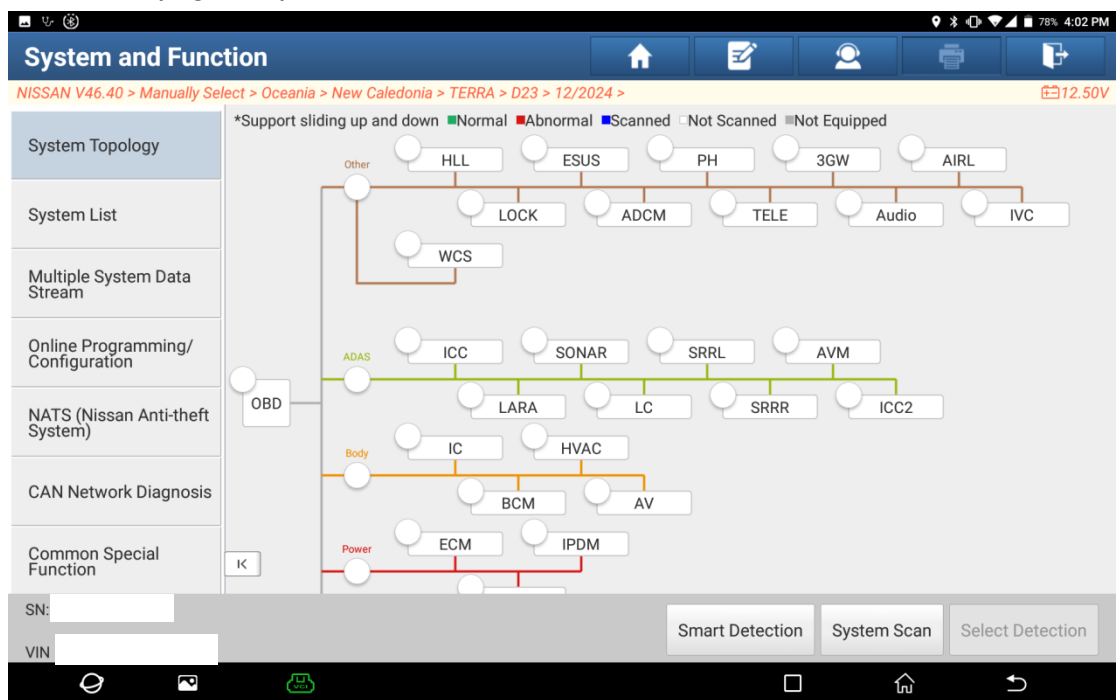


Figure 5

3. On the vehicle model system interface (Figure 6), click [Smart Detection].

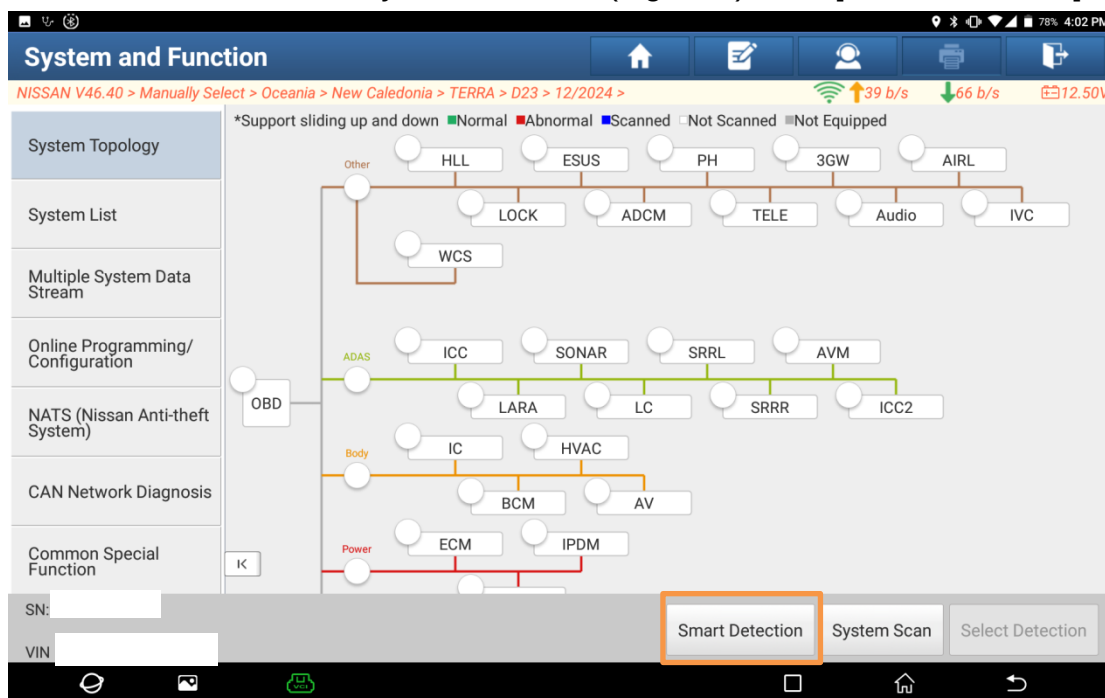


Figure 6

4. After the detection is completed, click [ECM] on the system topology (Figure 7) to display ECM DTC information (Figure 8 and Figure 9). When the diagnostic tool reads out a multi-cylinder misfire DTC, the power balance function can be executed to help pinpoint the cylinder with abnormal power output. This function can also be used when a single-cylinder misfire DTC is detected, in order to investigate the specific issue affecting that cylinder. Click "ENTER" to enter the ECM menu interface.

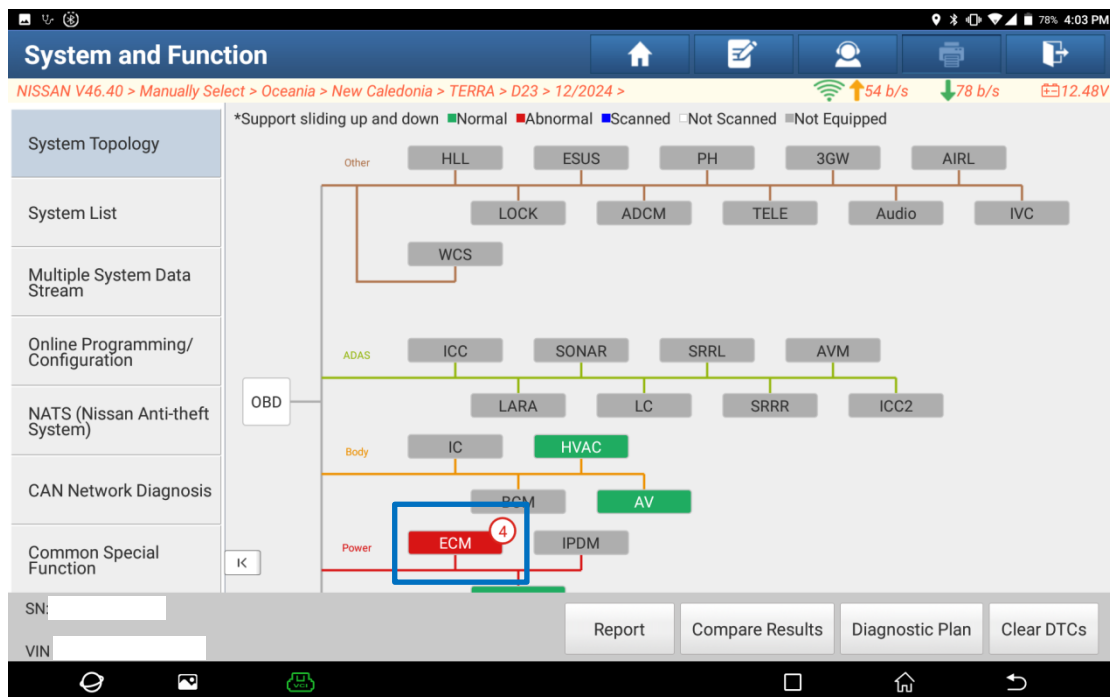


Figure 7

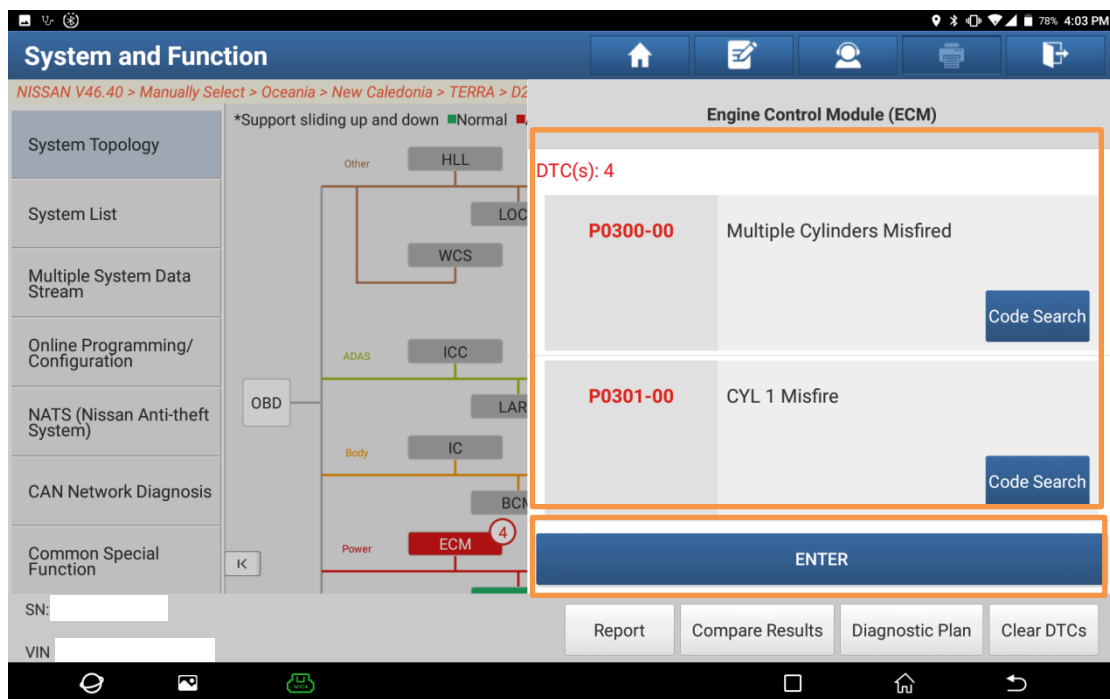


Figure 8

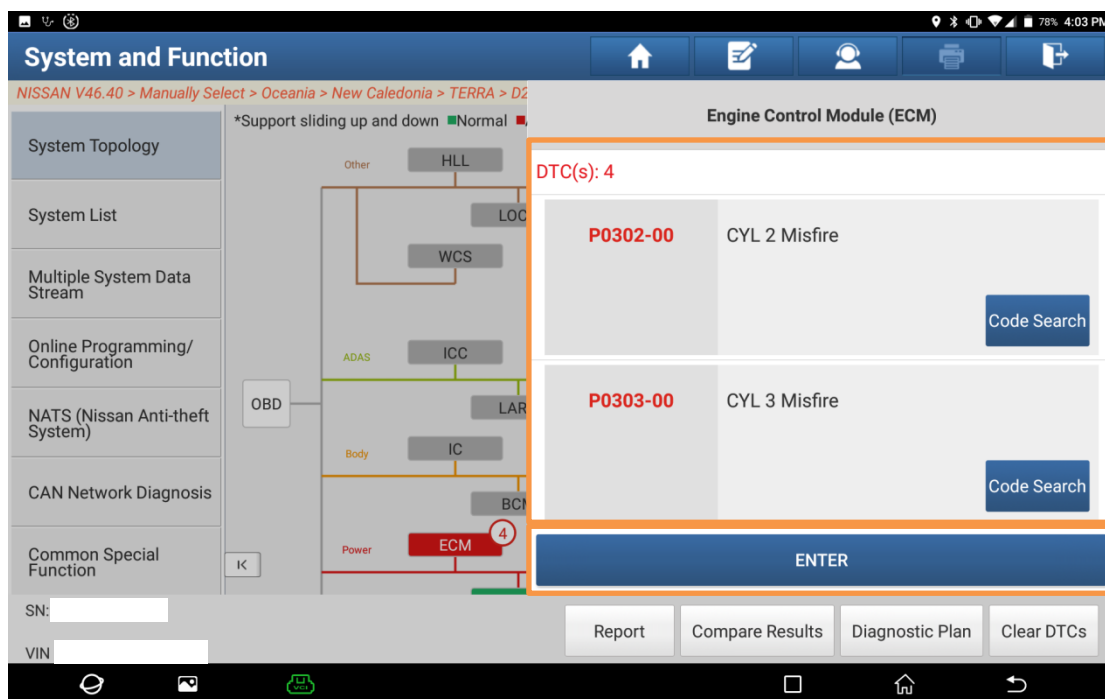


Figure 9

- On the ECM menu interface (Figure 10), choose [Actuation Test] to enter the ECM actuation test menu interface.

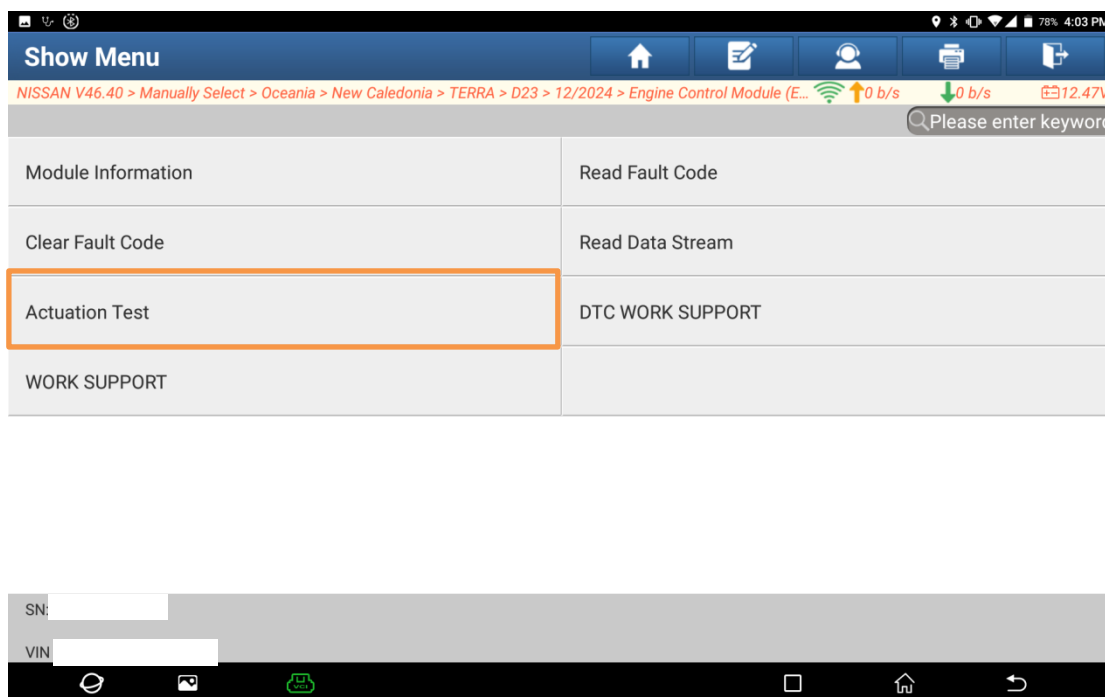


Figure 10

6. On the ECM actuation test menu interface, choose [Power Balance] (Figure 11).



Figure 11

7. Carefully read the prompt in the pop-up window (Figure 12), start the engine and let it idle, and then click "OK" to enter the power balance function interface.

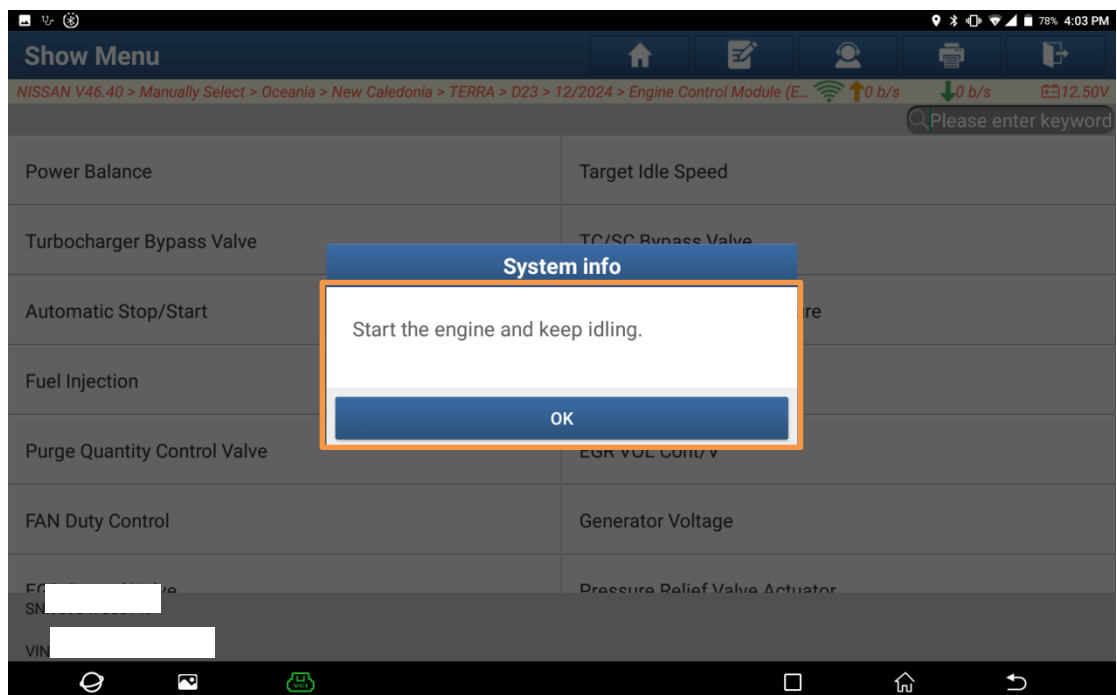


Figure 12

8. On the power balance function interface, click "Select Cylinder" (Figure 13).

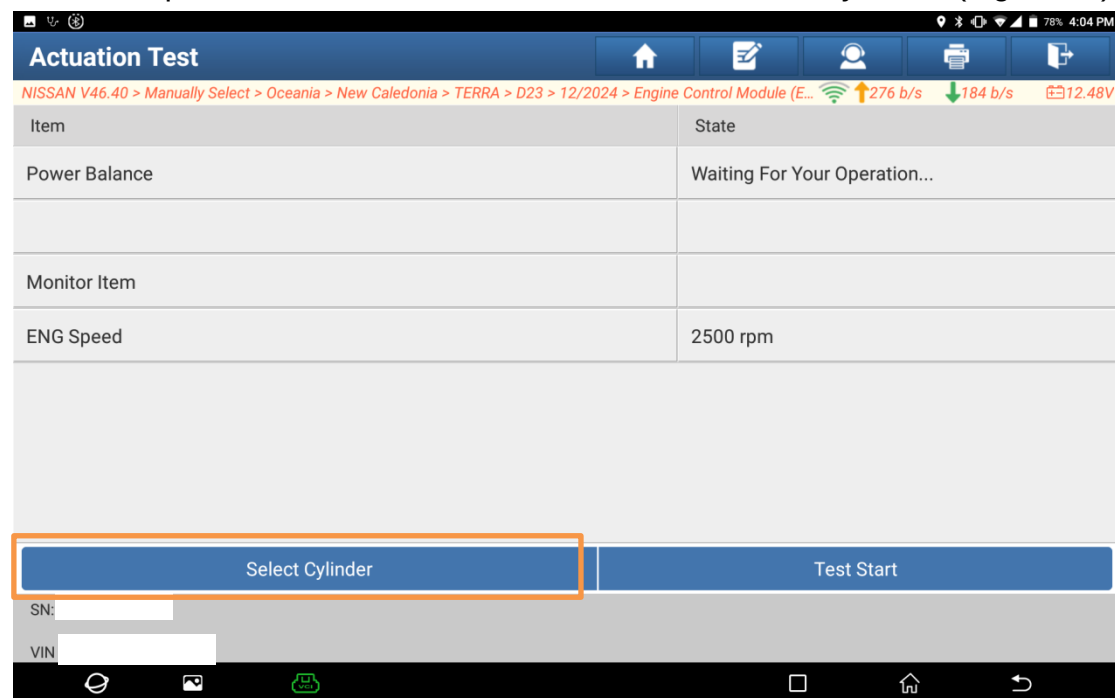


Figure 13

9. On the cylinder selection interface, select the cylinders to be tested based on actual requirements, and then click "Confirmed" to return to the power balance function interface (Figure 14).

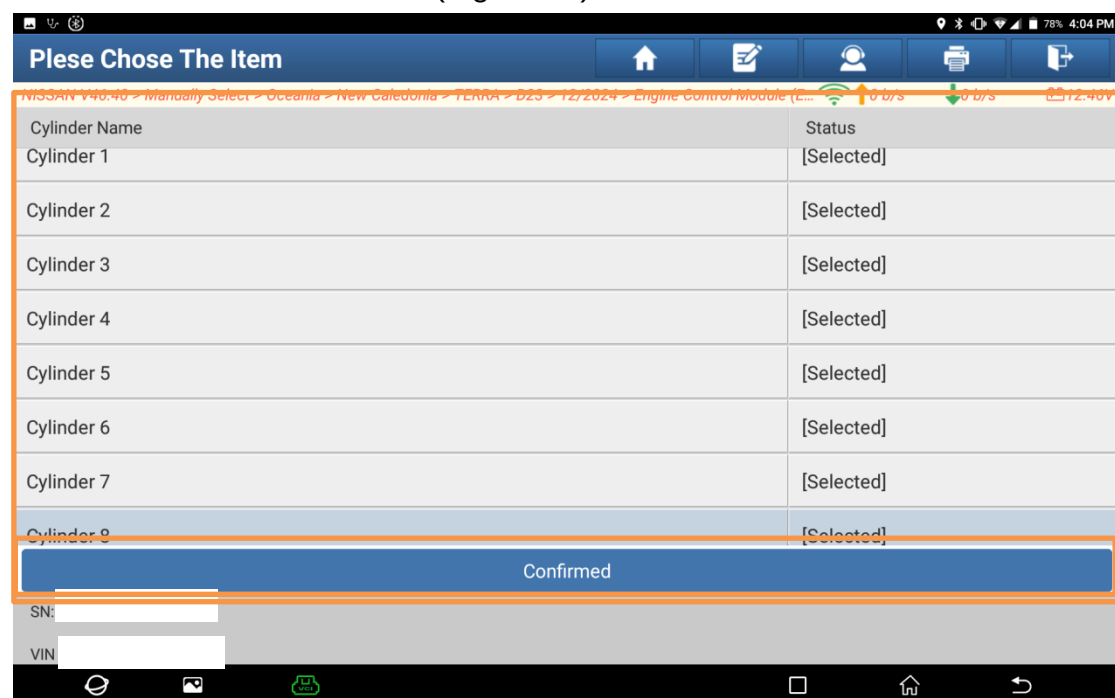


Figure 14

10. Before starting the test, observe and record the engine speed value read by the diagnostic tool, and then click "Test Start" to begin the power balance test (Figure 15).



Figure 15

11. During the power balance test, the diagnostic tool sends control commands to the engine control unit to temporarily disable each cylinder in a specific sequence while monitoring engine speed in real time. By carefully observing the engine speed readings on the tool and comparing the changes in speed before and after disabling each cylinder, evaluate each cylinder's contribution to the engine's total power output, determine whether the cylinders are operating in a balanced manner, and identify any malfunctioning cylinders. Once the function completes, the [Power Balance] status bar will display a [Completed] message (Figure 16).

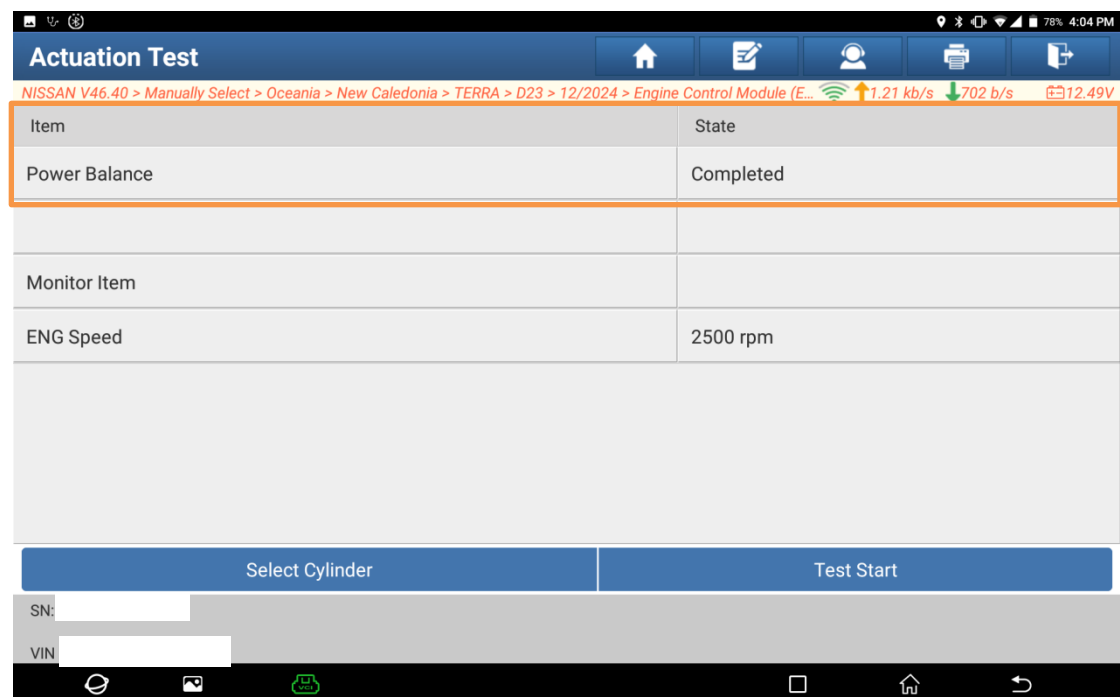


Figure 16

12. Turn off the vehicle ignition and engine, disconnect the diagnostic tool, and repair any malfunctioning cylinders based on the test results. After repairs, reconnect the diagnostic tool, set up the test environment, and run the [Power Balance] function again to verify that the power output of each engine cylinder has returned to normal. If all cylinders are functioning normally, return to the ECM menu interface, choose [Clear Fault Code], click "Yes", and then click "OK" to clear the DTC information (Figure 17).

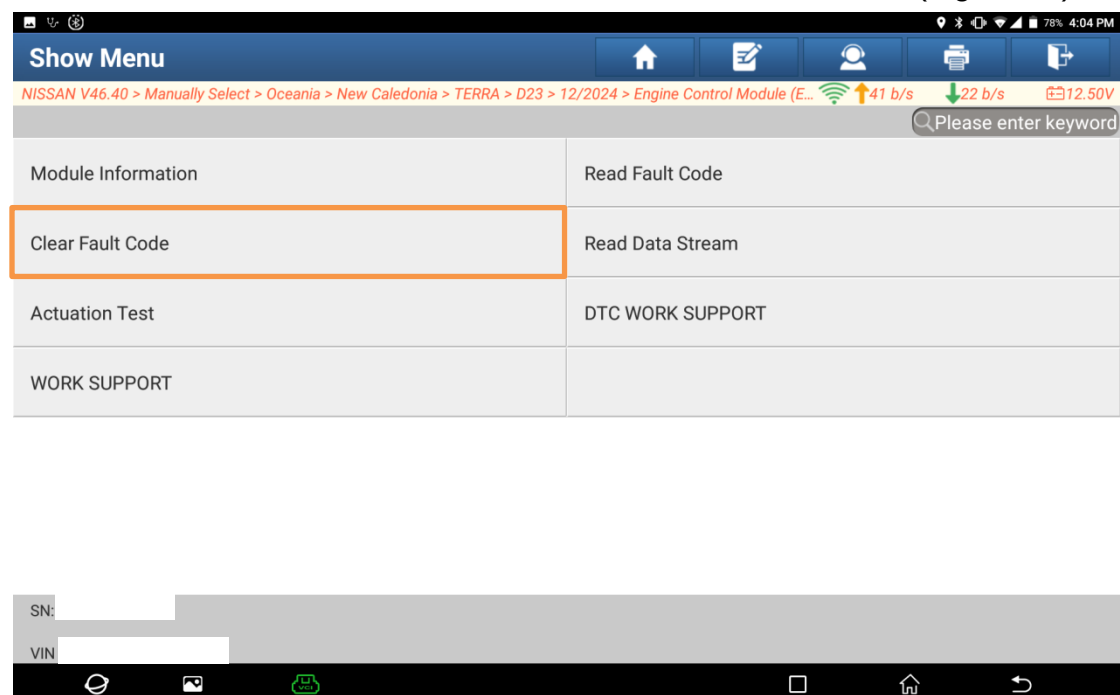


Figure 17

13. On the ECM menu interface, choose [Read Fault Code] (Figure 18) to read the ECM DTC information. No DTC is displayed (Figure 19), indicating that all cylinders are functioning normally. The function operations are now completed.

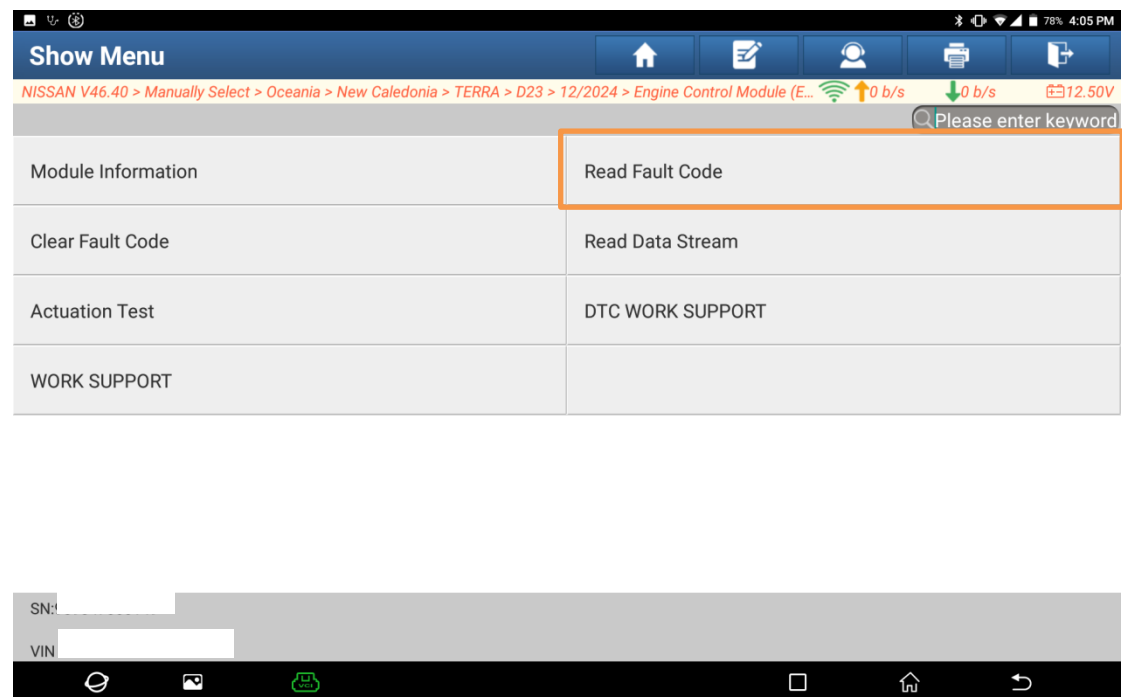


Figure 18

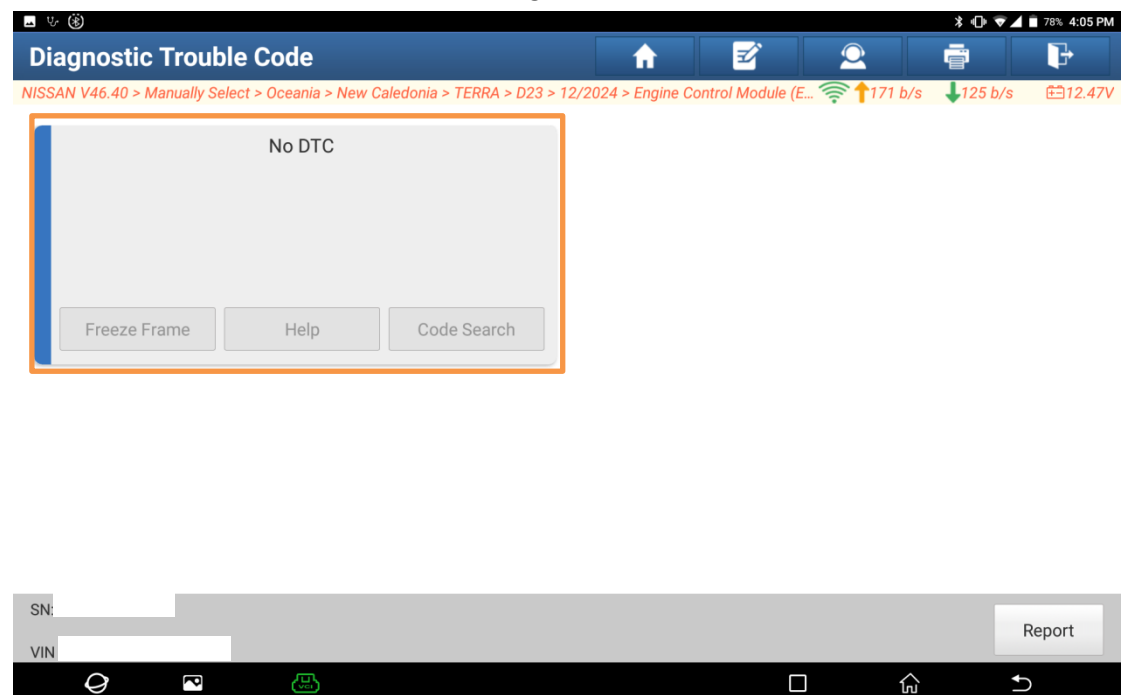


Figure 19

Statement:

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