

Diagnostic Methods

Effective Diagnostic Techniques

NOTE: Do not use this document in place of Ford-prescribed Symptom Based Diagnostics or Workshop Manual diagnostics. Diagnostic Methods is intended to provide Ford vehicle diagnostic information only for support of Ford-prescribed diagnostics.

The following diagnostic process is critical for consistently successful diagnoses. Random methods work inconsistently and often lead to multiple repairs and the accompanying frustration.

- Understand and verify the **symptom**.
 - Understanding a symptom requires understanding normal operation.
 - Duplicate the concern. Recreate the same conditions that demonstrated the original concern (road testing may be necessary).
- Determine the responsible **system**.
 - Gather data, such as a visual inspection and an OASIS report.
 - Perform system tests, such as pressure tests or DTC retrieval.
- Identify the responsible **component**.
 - Test the suspect component and related parts.
- Determine the root **cause**.
 - Examine related components (wiring faults, misalignments, incorrect adjustments) that may be the actual cause or may have caused the component failure.
 - Repair all related faults to avoid repeat failures.
 - Verify the repair has corrected the concern (and not created any new ones) using the identical conditions that demonstrated the original concern.

Diagnostic Scan Tool Testing

Network Test

Performing a network test is always recommended for analysis of electronic system concerns. Always solve network issues before addressing individual symptoms or DTCs.

Recommended Practices: Refer to section 418-00 Module Communications Network, Diagnosis and Testing, to diagnose a network outage or no response from an individual module (or modules).

Diagnostic Trouble Code Retrieval

Generally, a good diagnostic strategy is to resolve all on-demand codes related to the system concern. Retrieving all continuous DTCs can also be beneficial to understand historic issues or issues outside of the suspect system that may be affecting your concern. On-demand testing should be done to ensure the fault represented by a continuous DTC is still present.

Continuous Memory Diagnostic Trouble Codes

Modules that produce diagnostic trouble codes have a program that evaluates system conditions, normally while the vehicle or system is in use. Module inputs can be checked for values indicating an electrical fault with the monitoring circuit or component. Module outputs can be monitored for correct function. Codes are stored when predefined limits are exceeded and retained even if the ignition is turned off (generally a DTC is retained for 40+ ignition cycles). Not all continuous codes have a matching on-demand code - and vice versa. This varies with different modules. For example, some network communication codes are continuous only. It is important to note that the presence of a continuous DTC does not guarantee that the fault currently exists.

Clearing Continuous Memory Diagnostic Trouble Codes

Continuous Memory DTCs caused by the issue being repaired or created during the diagnosis and repair must be cleared or they will confuse future diagnosis. NOTE: Do not clear DTCs from unresolved vehicle issues.

Ford On-Demand Diagnostic Trouble Codes

Ford Motor Company modules have a unique feature that performs a special diagnostic program at the request of the technician (using a diagnostic scan tool). This "On-demand" diagnostic program can exercise system outputs not normally running when the car is parked and record observed faults. These diagnostic codes are communicated to the scan tool, but are not recorded in module memory. An on-demand test is an effective tool for evaluating real input and output conditions during module activity - activity that might not normally be occurring during service bay conditions. For example, an air suspension module on-demand test can run the compressor, vent the system, and observe the report from the height sensor even when the car is already at correct trim height and not requiring height adjustment.