MERCURY MerCruiser

Service Bulletin

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Procedure for Clearing Certain OBDM Faults

NOTICE
The information released in this service bulletin supersedes any previously published information regarding OBDM fault diagnostics.

Models Affected	Serial Number or Year
MerCruiser EC (Emissions Control) engines	All

Situation

OBDM faults result from continuous diagnostics performed within the PCM09. Previously published information does not address the unique concerns that must be considered when diagnosing, clearing, and validating the repair of the five faults listed below:

- 396 – Engine Misfire
- 319 – O2Control_ItermHighPort
- 320 – O2Control_ItermLowPort
- 321 – O2Control_ItermHighStbd
- 322 – O2Control_ItermLowStbd

The PCM simultaneously records engine speed and engine load when a fault occurs. Verifying the successful repair of each fault requires water-testing to duplicate the exact engine speed and load captured in the Freeze Frame buffer when the fault occurred.

A CDS G3 diagnostic tool is required to diagnose, clear, and verify repair of each fault. CDS G3 must be used to display and record the engine speed and load data stored in the Freeze Frame buffer of each fault. Water-testing may be necessary to establish root cause and must be performed to verify correction after repairs. Operate the boat in open water and duplicate the same conditions (engine speed and load) as recorded during the fault event.

IMPORTANT: Diagnostics and water testing performed at engine speeds and loads other than those at which the fault occurred will not verify a successful repair.

Correction

If you encounter any of these five OBDM faults, follow the basic outline below to correct the fault, clear the fault, and validate the repair.

1. When you have determined that fault 319, 320, 321, 322 or 396 has occurred, use the CDS G3 diagnostic tool to read and print the Freeze Frame buffer for each fault, noting the engine speed and engine load at which the engine was operating when the fault originally occurred.
2. Repair each fault using normal diagnostic and troubleshooting procedures. When the repair is completed, clear the Active Faults and Freeze Frame buffers using the CDS G3 diagnostic tool.
3. Arrange for water-testing in open water.
   IMPORTANT: Operating the engine using a flush device or in a test tank will not ensure that the problem has been corrected. Operate the boat in open water and duplicate the conditions (engine speed and engine load) that were present when the fault occurred. Maintain throttle setting after achieving desired speed and load to perform active diagnostics.
4. In open water, run the boat at the engine speed and engine load at which each fault occurred. Do not disturb the throttle during this process. After the required diagnostic conditions have been met, stop the boat and turn off the engine.
5. Wait at least one minute, restart the engine, and repeat step 4. After completing this second run cycle, check to see if any of the five faults have recurred.

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6. If the fault does not recur after the boat has been operated through two run cycles at the original engine speed and load at which the fault occurred, the repair is complete and the boat can be returned to service.
7. If the fault does recur, the fault was not diagnosed or repaired correctly. Additional troubleshooting and diagnosis must be performed to find the root cause of each fault that recurs, starting diagnostic process again at step 1.

Clearing Faults

This chart shows the specific conditions required to clear each of the five faults covered in this document. The engine must be operated through two complete run cycles without the fault recurring (while at the same engine speed and engine load percent at which the fault originally occurred). Both run cycles must meet or exceed the minimum time displayed in the Required Diagnostic Conditions column.

IMPORTANT: When the engine speed and engine load have been set to match the values in the Freeze Frame buffer, do not change the position of the throttle.

Fault #	Fault Text	Required Run Cycles	Required Diagnostic Conditions
396	Engine_Misfire	2	60 seconds at the same speed/load point
319	O2Control_ItermHighPort	2	40 seconds at the same speed/load point
320	O2Control_ItermLowPort	2	40 seconds at the same speed/load point
321	O2Control_ItermHighStbd	2	40 seconds at the same speed/load point
322	O2Control_ItermLowStbd	2	40 seconds at the same speed/load point

NOTE: *Required Run Cycles is the number of engine running events required to set the fault. An engine run cycle is a series of engine conditions starting with an engine start, followed by the engine exceeding its cranking RPM and entering run mode for a predetermined amount time and then turned off long enough for the PCM to fully shut down.*

NOTE: *Required Diagnostic Conditions is the minimum time for the PCM's diagnostic program to determine whether the fault has passed. The speed/load point refers to the engine RPM and engine load % as seen in the Freeze Frame buffer and engine data stream. The speed and load must be duplicated when validating the fault repair.*

Tool Required

CDS G3 Version 1.2 or newer Diagnostic Kit (including interface cable and software)

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