737MAX 发动机控制状态信息的处理提示

当状态页面出现 ENG 1 CONTROL 或 ENG 2 CONTROL 状态信息后，放行需谨慎！放行飞机并非只需清除状态信息熄灭 MAINT 灯，熄灭 MAINT 灯并不代表故障已完成处理！

一、关于发动机控制状态信息的说明如下：

ENG 1 CONTROL Status Message Shows - Fault Isolation

[for fault code 732 101 51]

CORRECTIVE ACTION SUMMARY

- Erase Latched Status Messages
- Do Task for Correlated Inbound FDE Maintenance Message
- Do Task for Correlated Existing FDE Maintenance Message
- Do Task for Correlated Fault History Maintenance Message
- Do Task for Related Netword File Server Maintenance Message

A. Description

(1) The EEC will set this message when the EEC has detected a fault or combination of faults that result in a no dispatch condition. A critical sensor (N1, N2, P3, etc..) or control loop (FMV, VSV, VBV, etc..) required for thrust control has been lost in both EEC channels OR there is an engine actuator demand/positon disagree fault) OR a combination of faults from each EEC channel.

(2) The ENG 1 CONTROL status message will be latched when a fault occurs that results in a No Dispatch configuration.

(a) If Airplane power is removed while EEC MAINT POWER is set in the TEST mode, ENG 1 CONTROL status message will be set without a correlated maintenance message.

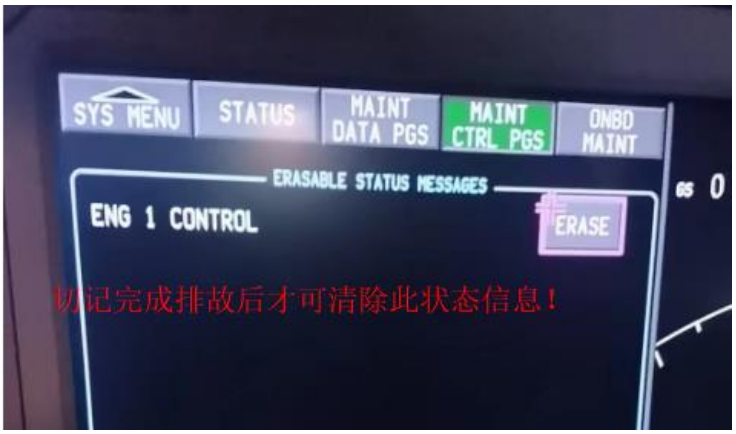
真实的发动机控制状态信息：当 EEC 探测一个故障或关联故障导致不可放行状态时，EEC 将产生此状态信息，如：

（1）关键的传感器（N1, N2, P3, 等），或者推力控制所需的控制环路（FMV、NSN、VBV 等）在两个 EEC 通道丢失；

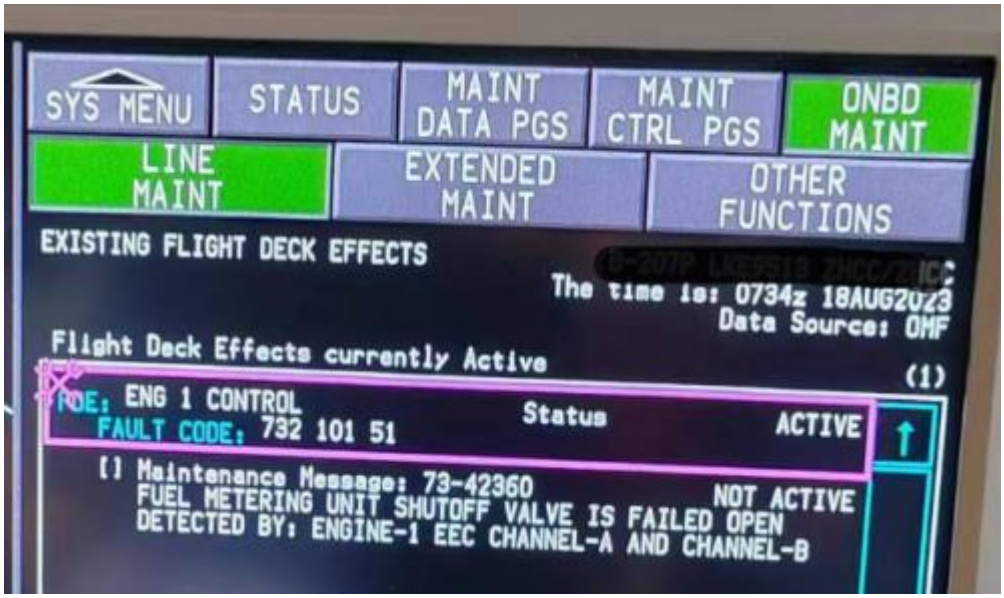
（2）或者者发动机作动器指令/位置不一致

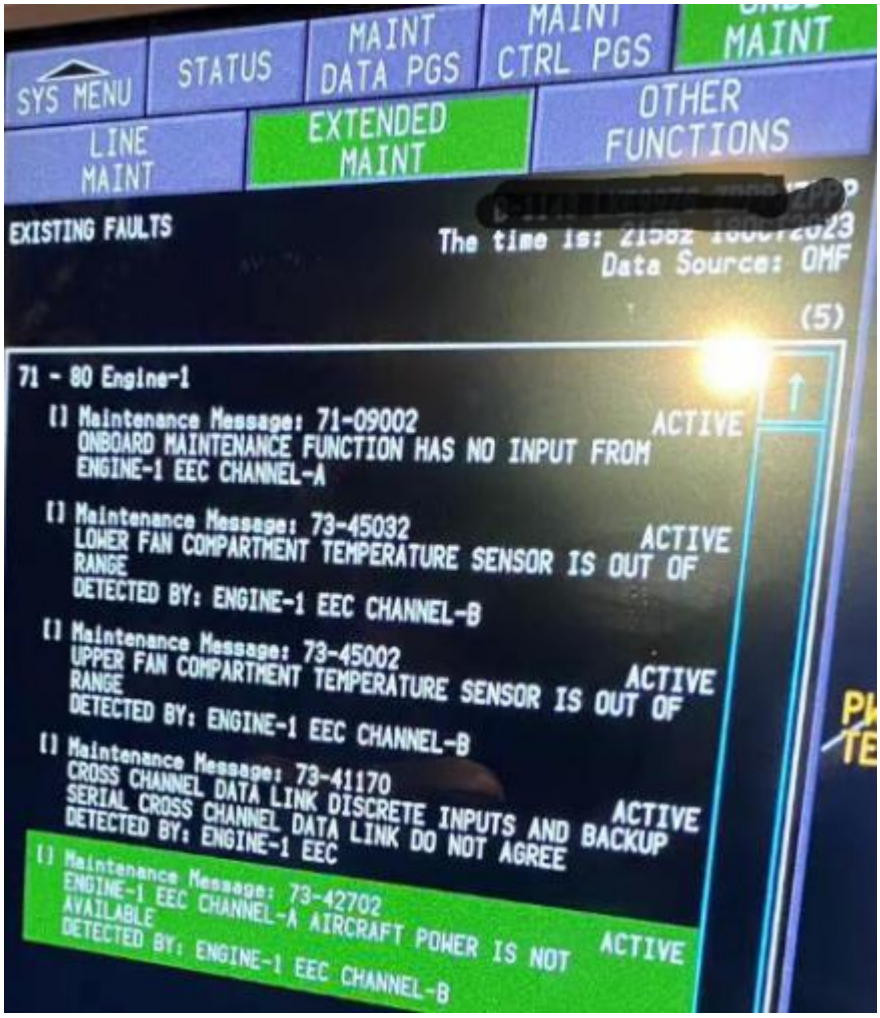
（3）或者来自每个 EEC 通道的一个关联故障（不可放行状态故障）

当有一个不可放行的故障时，发动机控制状态信息会被锁定，完成排故后才可选择清除 ENG X CONTROL 状态信息。



如下所示为真实的发动机控制状态信息对应的不同维护信息。





（2）虚假发动机控制状态信息：当 EEC MAINT POWER 选择在 TEST 模式，飞机交流电断电后，因只有左发 EEC A 有电瓶提供的备用汇流条供电，左发 EEC A 确定自己处于单通道工作状态，将触发 ENG 1 CONTROL 和 ENG 1 REVERSER 状态信息，电瓶供电状态下只有一个 DPC 有电，机载网络系统(ONS)将不会被供电，因此不会有维护信息，也就无需排故，将 EEC 电源选择 NORM 后恢复正常后。

因此需注意**只有 ENG 1 CONTROL 状态信息，没有维护信息时**，通常认为是在 MSC 页面 EEC 维护电源选择 TEST 后飞机断电导致的**虚假信息。**由于飞机断电后，EEC 测试通电选择 TEST 后并不会自动变回 NORM，完成 EEC 通电工作后，注意将 MSC 页面的 EEC MAINT POWER 设置到 NROM 位，可避免虚假信息的出现。

二、MAX 发动机故障等级分类和处理：

需注意，明确说明一些状态信息也指示一个不可放行状态

ENGINE FUEL AND CONTROL -- ENGINE CONTROL - TRAINING INFORMATION POINT - EEC BITE - INDICATIONS

Fault Information

When an engine electronic control (EEC) finds a fault, the EECs assign it a dispatch level. There are five dispatch levels:

- ENGINE CONTROL light
- ALTERNATE MODE light
- STATUS Message
- Scheduled maintenance task (SMT) Message
- Un-correlated maintenance message.

The EECs set a maintenance message for all detected faults. The onboard maintenance function (OMF) correlates maintenance messages with the appropriate flight deck effect (FDE). An FDE can be a MAX display system (MDS) message or a light in the flight compartment.

ENGINE CONTROL Light Faults

The ENGINE CONTROL light, MASTER CAUTION and ENG annunciator lights come on when an EEC finds a no-dispatch level fault.

Alternate (ALTN) Light Faults

The ALTN light, MASTER CAUTION and ENG annunciator lights come on when an EEC is in an alternate mode. The EECs go to an alternate mode when:

- The pressure total (PT) is not valid, or
- The EEC switch is in the alternate position.

Check the minimum equipment list (MEL)/ dispatch deviation guide (DDG) for requirements to dispatch with the ALTN light on.

Status Messages

The EECs set a status message when there is a fault in engine operation that may allow continued operation under the restrictions listed in the MEL/DDG. The amount of time allowed for continued operation and any impact on maintenance or flight operations is listed for each status message in the related MEL item. Some status messages may also indicate a no dispatch condition. Status messages show on the MDS status display.

SMT Messages

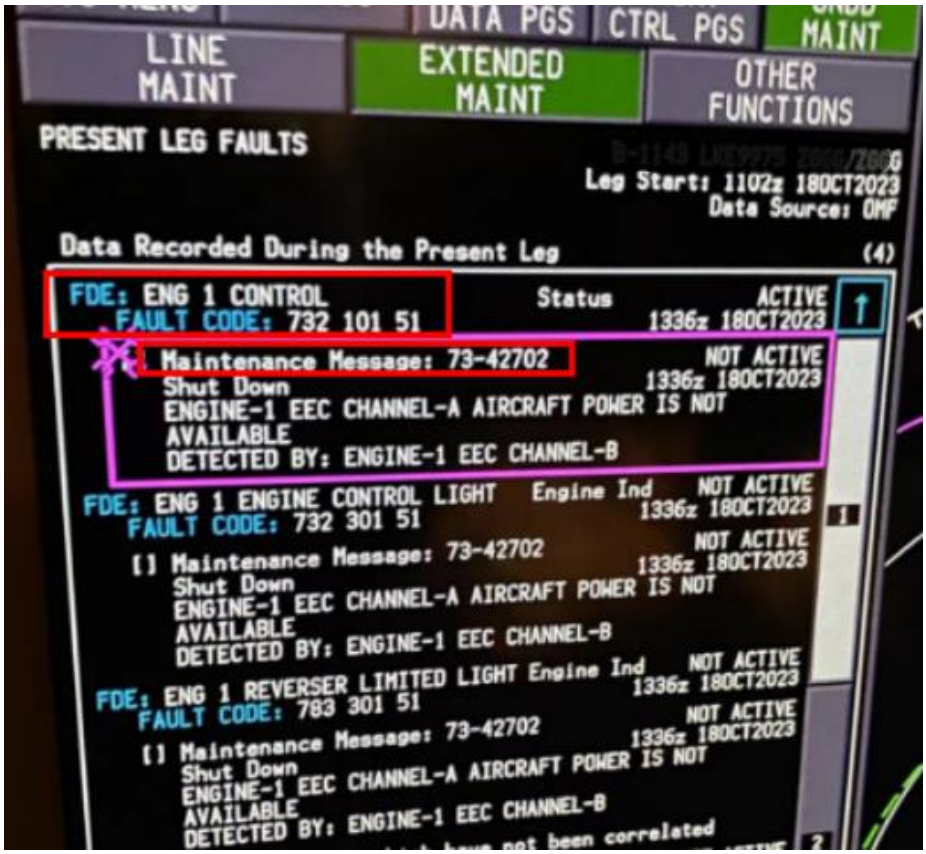
The EECs set an SMT message when there are faults in engine operation that may allow continued operation under the restrictions listed in the Maintenance Planning Document (MPD). The amount of time allowed for continued operation before a check for SMT messages is necessary is specified in the MPD. SMT messages show on the MDS latched message erase display, which is one of the miscellaneous system controls pages.

Maintenance Messages

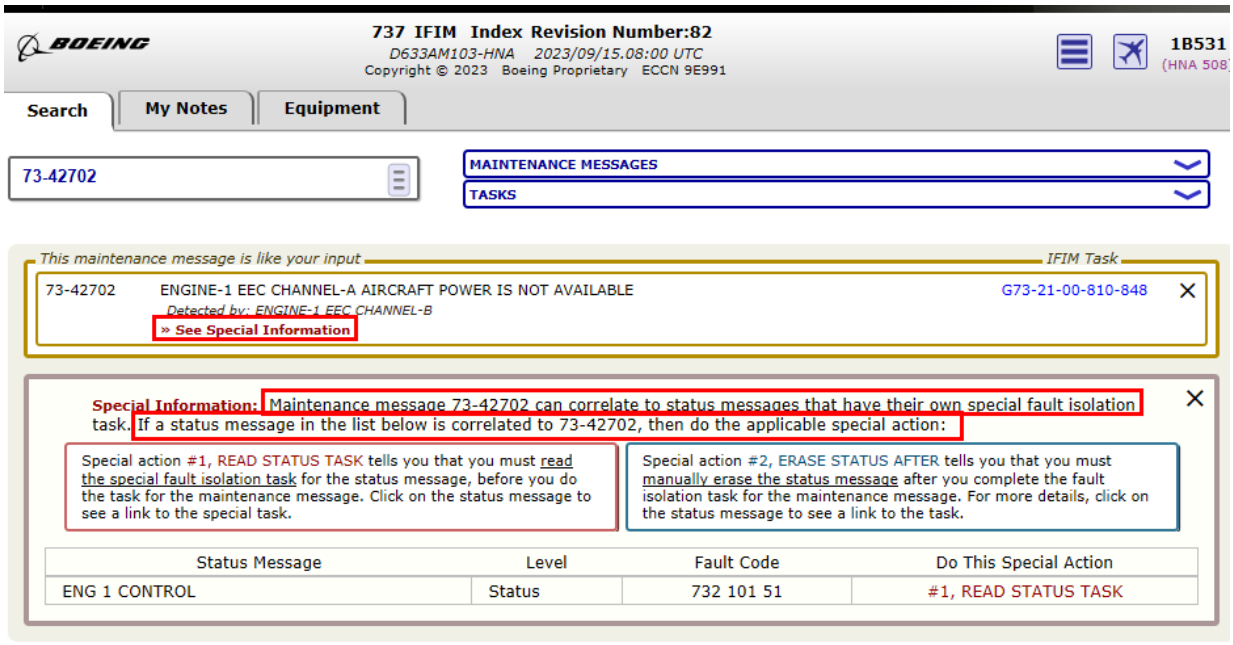
The EECs set only a maintenance message when there are faults that allow unrestricted continued operation of the engine. You can only see these un-correlated maintenance messages in the OMF present leg faults function. There are no other flight deck effects for these kinds of faults.

三、发动机控制状态信息和对应维护信息在 IFIM 中的使用说明：

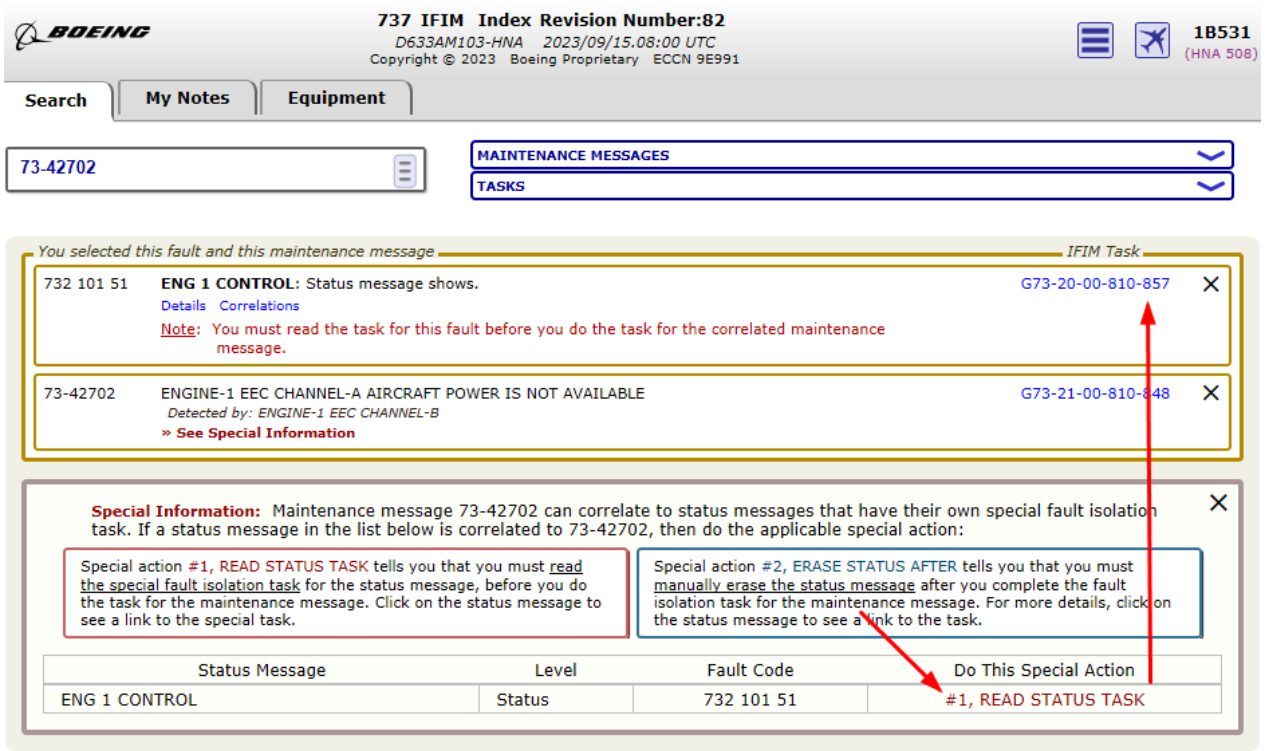
（1）如下，状态信息 ENG 1 CONTROL 对应的故障代码为 732 101 51 ，维护信息为 73-42702。



（2）参考维护信息代码查询 IFIM，故障搜索列表中有“See Special Information”提示，如下图 See Special Information：维护信息 73-42702 有关联的状态信息，状态信息有自己特定的 TASK 工卡，如果维护信息有关联的状态信息时，在对维护信息进行排故前必须先阅读状态信息对应的 IFIM 工卡。



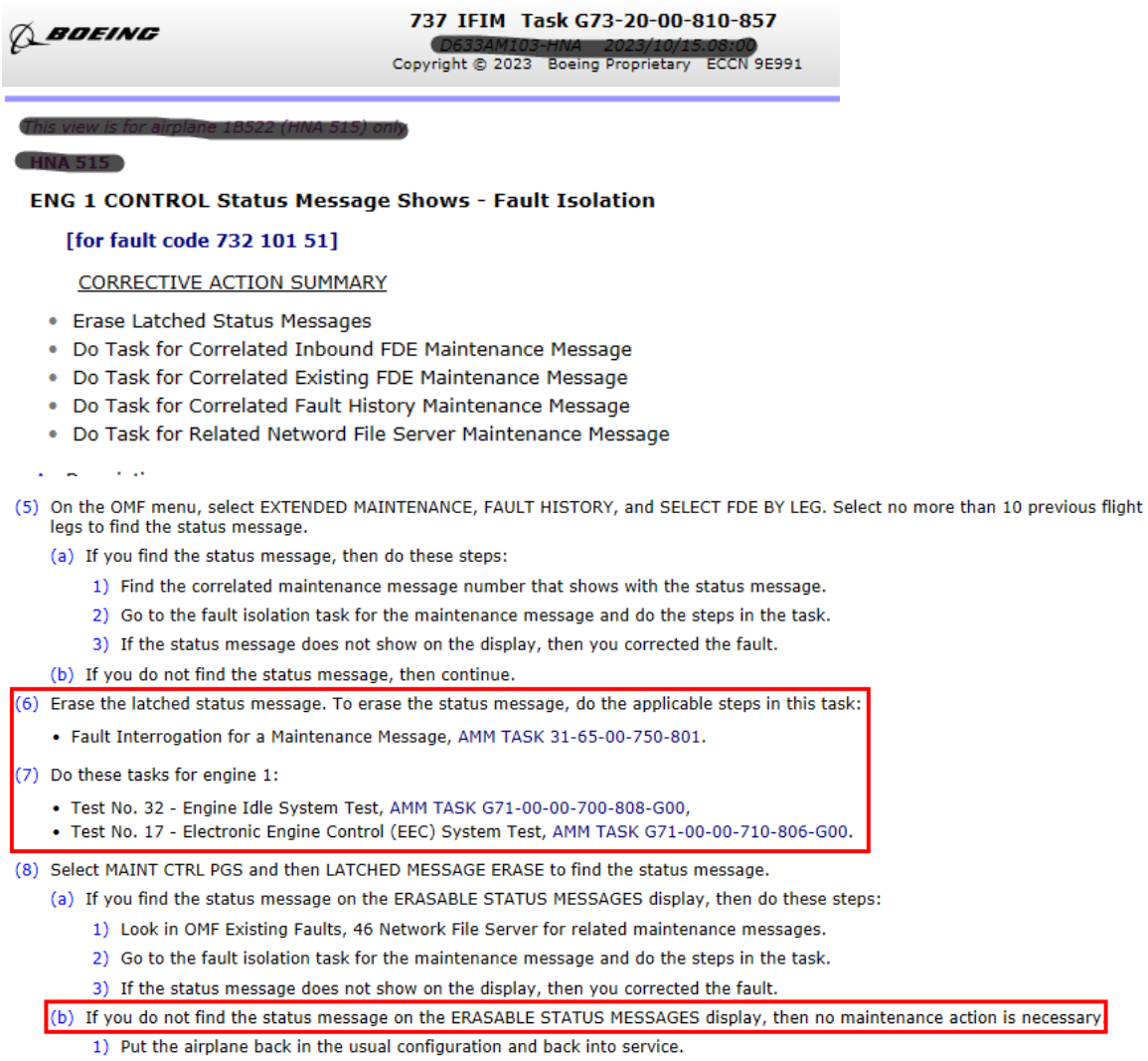
（3）列表也对维护信息完成相关排故工卡后必须人工清除锁定的状态信息做了说明。



（4）维护信息对应的 IFIM 工卡完成排故后可能没有试车要求，但是状态信息的

IFIM 工卡有试车要求,此时需完成试车验证排故步骤才算结束。

例如：维护信息 73-42702ENGINE-1 EEC CHANNEL-A AIRCRAFT POWER IS NOT AVAILABLE 的排故工卡排故结束后未要求试车，但 ENG 1 CONTROL 状态信息对应的 IFM G73-20-00-810-857 工卡有说明，完成维护信息对应的排故工卡，清除锁定的状态信息后，做 Test No. 32 - Engine Idle System Test，因此需要按状态信息的工卡要求进行试车，试车后再次检查没有状态信息，才证实故障已排除。



BOEING 737 IFIM Task G73-20-00-810-857

D633AM103-HNA 2023/10/15.08:00

This view is for airplane 18522 (HNA 515) only

HNA 515

ENG 1 CONTROL Status Message Shows - Fault Isolation

[for fault code 732 101 51]

CORRECTIVE ACTION SUMMARY

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(5) On the OMF menu, select EXTENDED MAINTENANCE, FAULT HISTORY, and SELECT FDE BY LEG. Select no more than 10 previous flight legs to find the status message.

(a) If you find the status message, then do these steps:

1) Find the correlated maintenance message number that shows with the status message.
2) Go to the fault isolation task for the maintenance message and do the steps in the task.
3) If the status message does not show on the display, then you corrected the fault.

(b) If you do not find the status message, then continue.

(6) Erase the latched status message. To erase the status message, do the applicable steps in this task:

- Fault Interrogation for a Maintenance Message, AMM TASK 31-65-00-750-801.

(7) Do these tasks for engine 1:

- Test No. 32 - Engine Idle System Test, AMM TASK G71-00-00-700-808-G00,
- Test No. 17 - Electronic Engine Control (EEC) System Test, AMM TASK G71-00-00-710-806-G00.

(8) Select MAINT CTRL PGS and then LATCHED MESSAGE ERASE to find the status message.

(a) If you find the status message on the ERASABLE STATUS MESSAGES display, then do these steps:

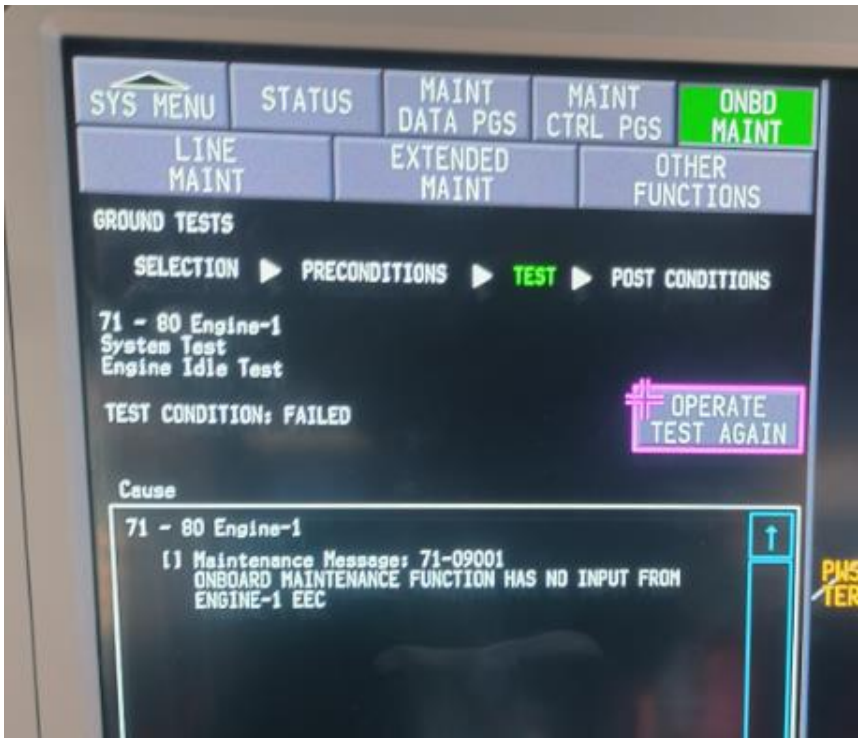
1) Look in OMF Existing Faults, 46 Network File Server for related maintenance messages.
2) Go to the fault isolation task for the maintenance message and do the steps in the task.
3) If the status message does not show on the display, then you corrected the fault.

(b) If you do not find the status message on the ERASABLE STATUS MESSAGES display, then no maintenance action is necessary

1) Put the airplane back in the usual configuration and back into service.

（5）在执行 TEST 32 慢车测试时注意 EEC 通电至少 30 S 后再执行后续测试，否则 EEC 自检

未完成，慢车测试步骤无法继续，将导致虚假的如下信息。



(f) Clean the areas that you examine with G00034 cotton wiper .

(g) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, for each line of the drain mast below the power plant.

SUBTASK 71-00-00-860-351-G00

(2) Select the left or right Multi-Function Display (MFD).

(a) Push the SYS button, on the P9 MFD control panel.

(b) Push the SEL button on SELECTOR knob, on the P9 MFD control panel.

SUBTASK 71-00-00-860-350-G00

(3) Set the applicable EEC MAINT POWER switch on the MISC SYSTEM CTRLS page on the MFD to the TEST position (TASK 73-21-00-800-801-G00).

NOTE: **The EEC will do a self-test when you set the EEC MAINT POWER switch to the TEST position. Wait for a minimum of 30 seconds to let the EEC complete the test.**

SUBTASK 71-00-00-860-352-G00

(4) Set the GND TESTS switch on the P61-4 maintenance bite panel to the ENABLE position.

SUBTASK 71-00-00-860-354-G00

(5) Set the applicable thrust lever to idle.

发动机控制状态信息的处理提示：

（1）真实的发动机控制状态信息属于一个不可放行故障，不能简单的对信息进行清除，熄

灭 MAINT 灯放行，此状态信息对应的维护信息通常还隐藏有发动机控制灯亮的故障，由于发动机控制灯短暂点亮，机组很可能来不及观察到灯亮，但通常可在维护信息中读取到发动机控制灯曾经点亮过。

（2）对排故后是否需要试车验证，不仅要满足维护信息对应的 TASK 要求，还需注意状态信息对应的 TASK 要求。

（3）对发动机控制状态信息排故时，需及时对 EPCS 的 4 个页面各参数拍照留存，便于故障的分析和验证，如下