CHAPTER

ENGINE

(GE90-100 SERIES ENGINES)



CHAPTER 72 ENGINE

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 $A = Added, \ R = Revised, \ D = Deleted, \ O = Overflow, \ C = Customer \ Originated \ Change$

72-EFFECTIVE PAGES



These are the possible types of faults: YOU FIND A FAULT WITH 1. EICAS Message AN AIRPLANE SYSTEM 2. Observed Fault 3. Cabin Fault 4. Non-Correlated Maintenance Message If you have an EICAS message, go to the MAT to find its fault code USE THE MAT TO GET and the corresponding maintenance MORE INFORMATION message numbers. For details, see Figure 2 — Use the fault code or description to find the task in the FIM. There GO TO THE is a numerical list of fault codes in each chapter. There are lists FAULT ISOLATION of fault descriptions at the front TASK IN THE FIM of the FIM. For details, see Figure 3 → The fault isolation task explains how to find the cause of the fault. FOLLOW THE STEPS OF THE When the task says "You corrected FAULT ISOLATION TASK the fault" you know that the fault is gone. For details, see Figure 4 -

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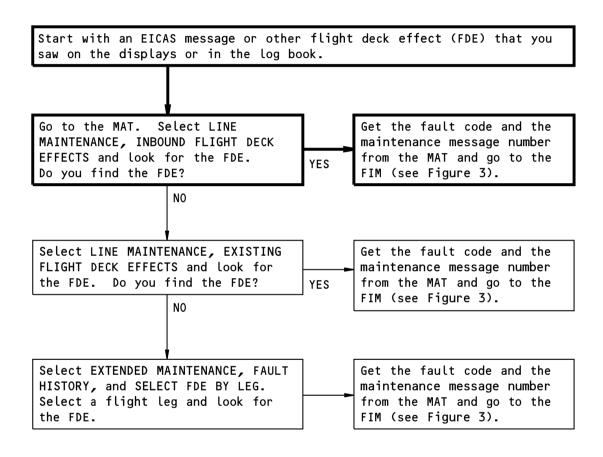
Basic Fault Isolation Process Figure 1

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NOTE: The bold lines show the most common path.

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Getting Fault Information from the MAT Figure 2

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IF YOU HAVE:

THEN DO THIS TO FIND THE TASK IN THE FIM:

FAULT CODE

with maintenance
message number
(if applicable)

- The first two digits of the fault code are the FIM chapter that you need. Go to the Fault Code Index in that chapter and find the fault code. If the fault code starts with a letter, then go to the Cabin Fault Code Index at the front of the FIM.
- 2. Find the maintenance message number (if there is one) to the right of the fault code.
- 3. Find the task number on the same line as the maintenance message number. Go to the task in the FIM and do the steps in the task (see Figure 4).

EICAS MESSAGE TEXT

with no fault code

 Go to the MAT. Find the fault code and the correlated maintenance message number (see Figure 2). Then do the FAULT CODE procedure above.

OBSERVED FAULT DESCRIPTION

or cabin fault description

- 1. Go to the Observed Fault List or Cabin Fault List at the front of the FIM and find the best description for the fault.
- 2. Find the task number on the same line as the fault description. Go to the task in the FIM and do the steps of the task (see Figure 4).

The first two digits of the maintenance message number are the FIM chapter you need. Go to the Maintenance Message Index in that chapter and find the maintenance message number.

2. Find the task number on the same line as the maintenance message number. Go to the task in the FIM and do the steps in the task (see Figure 4).

MAINTENANCE MESSAGE NUMBER

with no correlated EICAS message

NOTE: When you troubleshoot Non-correlated Maintenance Messages, you must plan for sufficient resources and the necessary time and parts to perform the applicable FIM Procedure from Start to Finish (or until the fault goes away). If you do not complete the procedure and clear the fault, in some cases additional faults can be set which could possibly cause unscheduled delays and/or Airplane-on-Ground (AOG) conditions.

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Finding the Fault Isolation Task in the FIM Figure 3

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ASSUMED CONDITIONS AT START OF TASK

- External electrical power is ON
- Hydraulic power and pneumatic power are OFF
- Engines are shut down
- No equipment in the system is deactivated

INITIAL EVALUATION PARAGRAPH

- The Initial Evaluation paragraph at the start of the task helps you determine whether you can detect the fault right now.
- If you cannot detect the fault right now, then the task cannot isolate the fault and the Initial Evaluation paragraph will say that there was an intermittent fault.
- If you have an intermittent fault, you must use your judgement (and follow your airline's policy) to decide which components to replace. Then monitor the airplane to see if the fault happens again on subsequent flights.

FAULT ISOLATION STEPS

- The FIM task steps are presented in a specified order. "The If... then" statements will guide you along a logical path. But if you do not plan to follow the FIM task exactly, make sure that you read it before you start to isolate the fault. Some FIM procedures start with important steps that have an effect on the other steps in the procedure.
- When you are at the endpoint of the path, the step says "You corrected the fault." Complete the step and exit the procedure.
- The Recommended Maintenance Action that shows on the MAT for the maintenance message gives a list of possible causes in order by probability of failure. In the FIM procedure, the possible causes can be in a different order from the MAT.

WIRING CHECKS

When a step says "Do a wiring check", do these three types of electrical checks for the specified contacts (pins):

- continuity from contact to contact
- shorts between the contacts
- shorts from each contact to ground

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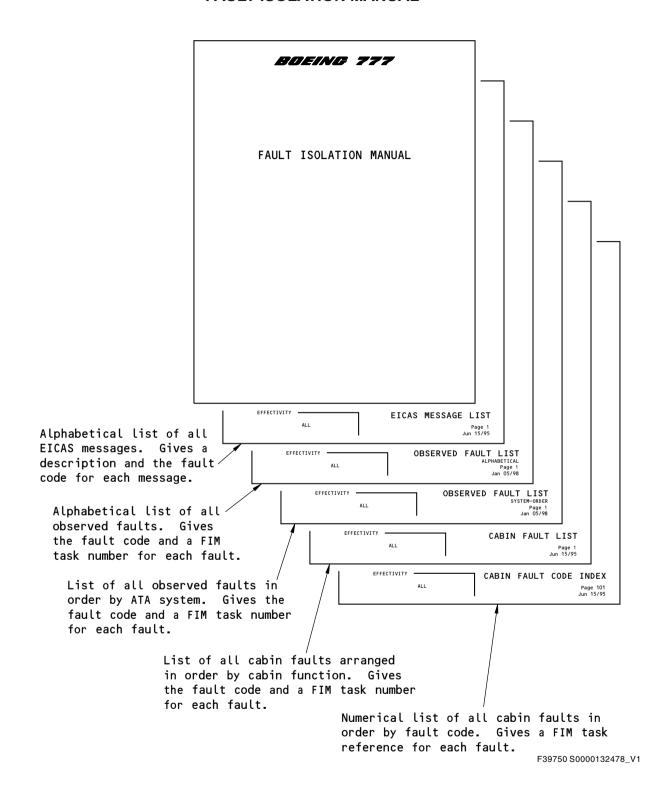
Doing the Fault Isolation Task Figure 4

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Subjects at Front of FIM Figure 5

Figure 5

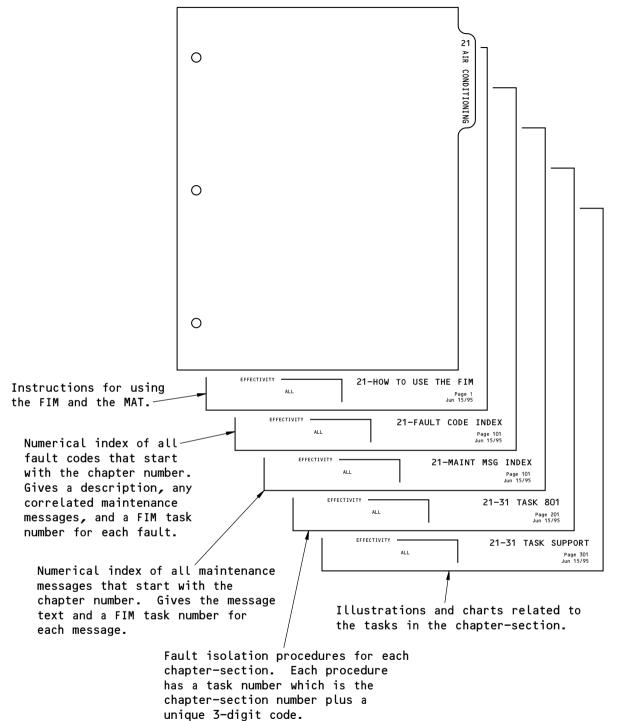
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Subjects in Each FIM Chapter Figure 6

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777-200/300 FAULT ISOLATION MANUAL

MAINT MESSAGE	MESSAGE TEXT	GO TO FIM TASK
72-33901	Left Engine start failed due to low fan speed.	72-21 TASK 802
72-33902	Right Engine start failed due to low fan speed.	72-21 TASK 802

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802. Locked Fan Rotor - Fault Isolation

A. Maintenance Messages

(1) This task is for maintenance messages: 72-33901, 72-33902.

B. Description

(1) This message can be set for a failed autostart sequence when the N1 speed is less than 150 rpm when N2 is 5500 rpm.

C. Fault Isolation Procedure

- (1) Set the applicable EEC MAINT POWER switch, on the Overhead Maintenance Panel, P61, to the TEST position.
 - (a) On the MAT, select FAULT HISTORY, ATA 71-80 and check for one or more of the maintenance messages below:
 - 1) 77-14601
 - 2) 77-24601
 - 3) 77-14602
 - 4) 77-24602
 - (b) If one or more of these maintenance messages shows in a previous flight leg, then do the fault isolation procedure for the message(s).
 - (c) Continue with the fault isolation steps below.
- (2) Do a visual check for both unwanted material and damage on the engine:
 - (a) Do this task: Inlet Cowl Inspection, AMM TASK 71-11-01-200-804-H00.
 - (b) Do this task: Turbine Exhaust System Visual Inspection, AMM TASK 78-11-00-210-801-H01.
 - (c) Do this task: Fan Rotor Spinner Inspection, AMM TASK 72-21-01-200-801-H01.
 - (d) Do this task: Fan Blade Platform Inspection, AMM TASK 72-21-03-220-801-H01.
 - (e) Do this task: Fan Booster Flowpath Spacer (Scheduled Maintenance Requirement) Inspection, AMM TASK 72-21-00-220-801-H01.
 - (f) Do the inspection on the fan blade leading edge tips, metal strips and trailing edge tip caps for damage (AMM TASK 72-21-02-200-801-H01).
 - (g) Do this task: Fan Stator Case Forward Outer Acoustic Liner Inspection, AMM TASK 72-24-01-200-801-H01.
 - (h) Do this task: Fan Stator Case Aft Outer Acoustic Liner Inspection, AMM TASK 72-24-01-200-802-H01.
- (3) Repair the problems that you find, and continue with this fault isolation procedure.
- (4) Examine the engine oil system (AMM TASK 79-00-00-700-801-H01).

D. Repair Confirmation

- Do this task: Engine Automatic Start, AMM TASK 71-00-00-800-805-H01.
 - (a) If no fan rotation is observed during the engine start, do these steps:
 - 1) Abort the start, and allow the engine to cool.

72-21 TASK 802

EFFECTIVITY



2) Turn the fan by hand to free the locked N1 rotor.

NOTE: If you are unable to turn the N1 rotor by hand, then wait for the engine to completely cool from the attempted start and try to turn the N1 rotor again. If you cannot turn the N1 rotor by hand after a total of 2 hours cooling time, continue with this repair confirmation.

- 3) If the N1 rotor can be turned freely by hand, attempt another start.
 - a) If the engine has a successful start, continue the engine in operation.
 - b) If the engine does not have a successful start, replace the engine.

These are the tasks:

Power Plant Removal, AMM TASK 71-00-02-000-811-H00 Power Plant Installation, AMM TASK 71-00-02-400-811-H00.

4) If the N1 rotor can not be turned freely by hand, replace the engine.

These are the tasks:

Power Plant Removal, AMM TASK 71-00-02-000-811-H00 Power Plant Installation, AMM TASK 71-00-02-400-811-H00.

——— END OF TASK ———

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72-21 TASK 802