HELICOPTER ENGINES

TURBOSHAFT

# ARRIUS 2
# F

# MAINTENANCE MANUAL

TROUBLE SHOOTING

**No. X 319 L6 301 2**

**Original issue: Jan. 22/1997**
**Update No. 49: Oct. 15/2023**

SAFRAN

64511 BORDES CEDEX - FRANCE - Tel.: +33 (0)5 59 12 50 00
www.safran-helicopter-engines.com

**LETTER**

This covering letter is not part of the MAINTENANCE MANUAL.
Do not keep it on the MAINTENANCE MANUAL.

**Bordes, Oct. 15/2023**

**Dear Sir / Madam,**

**The *ARRIUS 2 F MAINTENANCE MANUAL No. X 319 L6 301 2* has been subject to normal update No. 49 on Oct. 15/2023.**

**A description of the update (description, pages to be removed or inserted) is provided below.**

**We remain at your disposal for any further information you may require. Very truly yours**

**Technical Publications**

| Task Number | Description | Pages to be removed | Pages to be inserted |
|---|---|---|---|
| Title Page | Integration | ALL | 1 |
| LAP - 71 | Integration | ALL | 1 to 4 |
| 71-00-06-811-812-A01 | Integration | ALL | 101 to 104 |

# CHAPTER 71 - LIST OF EFFECTIVE PAGES

| Chapter Section Subject | Task | Title | Pages | Date |
|---|---|---|---|---|
| 71 | | LIST OF EFFECTIVE PAGES | * 1 - 4 | Oct. 15/2023 |
| 71 | | TABLE OF CONTENTS | 1 - 4 | Apr. 15/2023 |
| 71-00-06 | INT-801-A01 | TROUBLESHOOTING - INTRODUCTION | 1 - 2 | Apr. 15/2023 |
| 71-00-06 | RPU-801-A01 | FAILURES FOUND DURING OPERATION - LIST OF FAILURES OBSERVED DURING ENGINE OPERATION | 101 - 102 | Apr. 15/2023 |
| 71-00-06 | RPM-801-A01 | FAILURES FOUND DURING MAINTENANCE - LIST OF FAILURES OBSERVED DURING MAINTENANCE | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 811-801-A01 | "FUEL P" (LOW FUEL PRESSURE) NOT DISPLAYED AT POWER UP - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 811-802-A01 | "FUEL FLT" (FUEL FILTER PRE-BLOCKAGE) DISPLAYED AT POWER UP - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 811-803-A01 | "ENG P" (LOW OIL PRESSURE) NOT DISPLAYED AT POWER UP - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 811-806-A01 | UNJUSTIFIED FIRE SIGNAL - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 811-807-A01 | ABORTED START - FLAMES AT THE EXHAUST - TROUBLESHOOTING | 101 - 104 | Apr. 15/2022 |
| 71-00-06 | 811-808-A01 | ABORTED START - SLOW START OR STAGNATION - TROUBLESHOOTING | 101 - 110 | Apr. 15/2022 |
| 71-00-06 | 811-810-A01 | ABORTED START - ENGINE FLAME-OUT AFTER IGNITION - TROUBLESHOOTING | 101 - 104 | Oct. 15/2021 |
| 71-00-06 | 811-811-A01 | NO EXTINGUISHING OF THE LOW FUEL PRESSURE "FUEL P" DURING THE STARTING PHASE - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 811-812-A01 | NO EXTINGUISHING OF THE LOW OIL PRESSURE "ENG P" DURING THE STARTING PHASE - TROUBLESHOOTING | * 101 - 104 | Oct. 15/2023 |
| 71-00-06 | 812-801-A01 | ABORTED START - GAS GENERATOR NOT DRIVEN - TROUBLESHOOTING | 101 - 104 | Apr. 15/2020 |

* Page modified following update No. 49

| Chapter Section Subject | Task | Title | Pages | Date |
|---|---|---|---|---|
| 71-00-06 | 812-805-A01 | ABORTED START - T4.5 OVERTEMPERATURE DURING START - TROUBLESHOOTING | 101 - 106 | Apr. 15/2023 |
| 71-00-06 | 812-816-A01 | ABORTED START - NO IGNITION - TROUBLESHOOTING | 101 - 108 | Apr. 15/2022 |
| 71-00-06 | 813-801-A01 | MTOP RATING (MAXIMUM TAKE-OFF POWER) NOT REACHED - TROUBLESHOOTING | 101 - 102 | Apr. 15/2018 |
| 71-00-06 | 813-802-A01 | FLUCTUATION OF N1 AND T4.5 - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 813-803-A01 | NO TORQUE INDICATION - TROUBLESHOOTING | 101 - 102 | Oct. 15/2021 |
| 71-00-06 | 813-804-A01 | OIL TEMPERATURE TOO LOW ON THE DIAGRAM VALUES DISPLAY - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 813-805-A01 | OIL PRESSURE TOO LOW ON THE DIAGRAM VALUES DISPLAY - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 813-806-A01 | "ENG P" MESSAGE (LOW OIL PRESSURE) DURING ENGINE RUNNING - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 813-807-A01 | CONTROLLED ENGINE SHUTDOWN NOT POSSIBLE - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 813-808-A01 | NR DRIFT - TROUBLESHOOTING | 101 - 106 | Oct. 15/2019 |
| 71-00-06 | 813-810-A01 | POWER ASSURANCE CHECK - INCORRECT MARGIN - TROUBLESHOOTING | 101 - 108 | Apr. 15/2022 |
| 71-00-06 | 813-811-A01 | UNJUSTIFIED FIRE SIGNAL - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 813-812-A01 | ENGINE PARAMETER OSCILLATIONS: TORQUE, NG, NR - TROUBLESHOOTING | 101 - 104 | Oct. 15/2019 |
| 71-00-06 | 813-813-A01 | NONCOMPLIANT TEMPERATURE MARGIN - TROUBLESHOOTING | 101 - 108 | Apr. 15/2019 |
| 71-00-06 | 814-802-A01 | ABNORMAL NOISES - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 814-804-A01 | VIBRATIONS - TROUBLESHOOTING | 101 - 102 | Apr. 15/2018 |
| 71-00-06 | 814-806-A01 | SURGE - TROUBLESHOOTING | 101 - 104 | Apr. 15/2018 |

* Page modified following update No. 49

| Chapter Section Subject | Task | Title | Pages | Date |
|---|---|---|---|---|
| 71-00-06 | 814-807-A01 | SMELLS IN THE CABIN - TROUBLESHOOTING | 101 - 108 | Oct. 30/2018 |
| 71-00-06 | 814-808-A01 | N1 OVERSPEED - TROUBLESHOOTING | 101 - 102 | Feb. 28/2013 |
| 71-00-06 | 814-809-A01 | N2 OVERSPEED (FROM 104 % TO 110 %) - TROUBLESHOOTING | 101 - 104 | Feb. 28/2014 |
| 71-00-06 | 814-811-A01 | TORQUE LIMITATIONS EXCEEDED - TROUBLESHOOTING | 101 - 104 | Feb. 28/2013 |
| 71-00-06 | 814-812-A01 | T4.5 OVERTEMPERATURE DURING FLIGHT - TROUBLESHOOTING | 101 - 104 | Apr. 15/2023 |
| 71-00-06 | 814-813-A01 | “FUEL PRESS” MESSAGE (LOW FUEL PRESSURE) - TROUBLESHOOTING | 101 - 104 | Mar. 30/2017 |
| 71-00-06 | 814-814-A01 | “FUEL FILT” MESSAGE (PRE-BLOCKAGE OF THE FUEL FILTERING ELEMENT) - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |
| 71-00-06 | 814-816-A01 | NO N1 SPEED INDICATION - TROUBLESHOOTING | 101 - 102 | Feb. 28/2013 |
| 71-00-06 | 814-817-A01 | NO N2 SPEED INDICATION - TROUBLESHOOTING | 101 - 102 | Feb. 28/2013 |
| 71-00-06 | 814-818-A01 | NO T4.5 INDICATION - TROUBLESHOOTING | 101 - 102 | Feb. 28/2013 |
| 71-00-06 | 814-819-A01 | T4.5 INDICATION ERRONEOUS - TROUBLESHOOTING | 101 - 102 | Feb. 28/2013 |
| 71-00-06 | 814-820-A01 | TORQUE INDICATION ERRONEOUS - TROUBLESHOOTING | 101 - 104 | Oct. 15/2021 |
| 71-00-06 | 814-823-A01 | OIL OVERTEMPERATURE ON THE DIAGRAM VALUES DISPLAY - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 814-826-A01 | FLUCTUATING OIL PRESSURE - TROUBLESHOOTING | 101 - 104 | Aug. 30/2011 |
| 71-00-06 | 814-828-A01 | OIL PRESSURE TOO HIGH - TROUBLESHOOTING | 101 - 102 | Apr. 15/2018 |
| 71-00-06 | 814-829-A01 | "ENG CHIP" MESSAGE (MAGNETIC PARTICLES) - TROUBLESHOOTING | 101 - 104 | Oct. 15/2022 |
| 71-00-06 | 814-837-A01 | N2 OVERSPEED (OVER 110 %) - TROUBLESHOOTING | 101 - 102 | Feb. 28/2014 |
| 71-00-06 | 814-842-A01 | FIRE ALARM OR NO FIRE ALARM - TROUBLESHOOTING | 101 - 104 | Apr. 15/2020 |

* Page modified following update No. 49

| Chapter Section Subject | Task | Title | Pages | Date |
|---|---|---|---|---|
| 71-00-06 | 815-804-A01 | TESTING OF THE NOT COMPLIANT PREFERENCE INJECTOR - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 816-801-A01 | DEFECTIVE AUTOMATIC CYCLE COUNTING - TROUBLESHOOTING | 101 - 104 | Feb. 28/2013 |
| 71-00-06 | 816-802-A01 | EXHAUST FUMES AFTER ENGINE SHUTDOWN - TROUBLESHOOTING | 101 - 106 | Feb. 28/2012 |
| 71-00-06 | 816-805-A01 | POPPING OUT OF THE VISUAL BLOCKAGE INDICATOR OF THE FUEL FILTERING ELEMENT - TROUBLESHOOTING | 101 - 104 | Mar. 30/2017 |
| 71-00-06 | 816-806-A01 | LEAKAGE AT THE POWER-DRIVE DRAIN - TROUBLESHOOTING | 101 - 104 | Apr. 15/2023 |
| 71-00-06 | 816-806-B01 | LEAKAGE AT THE POWER-DRIVE DRAIN - TROUBLESHOOTING | 101 - 104 | Apr. 15/2023 |
| 71-00-06 | 816-807-A01 | POPPING OUT OF THE VISUAL BLOCKAGE INDICATOR OF THE OIL FILTERING ELEMENT - TROUBLESHOOTING | 101 - 104 | Aug. 30/2011 |
| 71-00-06 | 816-808-A01 | OIL LEAKAGE AT THE STARTER POWER DRIVE - TROUBLESHOOTING | 101 - 102 | Oct. 15/2019 |
| 71-00-06 | 816-811-A01 | OIL TRACES IN THE AIR INTAKE CASING - TROUBLESHOOTING | 101 - 104 | Apr. 15/2019 |
| 71-00-06 | 816-815-A01 | OIL CONSUMPTION MORE THAN 0.3 L/HR - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 816-816-A01 | EXTERNAL LEAKS AT ADJUSTED FUEL CONTROL UNIT ASSEMBLY - TROUBLESHOOTING | 101 - 102 | Aug. 30/2011 |
| 71-00-06 | 816-826-A01 | ABNORMAL VIBRATION, ABNORMAL NOISE OR ACCESSORY DAMAGE - TROUBLESHOOTING | 101 - 102 | Apr. 15/2022 |
| 71-00-06 | 816-827-A01 | INJECTION PROTECTION TEST NOT CONFORM - TROUBLESHOOTING | 101 - 102 | Oct. 15/2022 |

* Page modified following update No. 49

## CHAPTER 71 - TABLE OF CONTENTS

# TROUBLESHOOTING - INTRODUCTION

## 1. GENERAL

This document contains some data extracted from the ARRIUS, chapter 71-00-06 - Trouble Shooting.

It is devoted to the engine maintenance personnel for finding the failures.

To ease its use, this document is divided up into 6 sections:

– Section 1: list of effective pages and contents of the manual
– Section 2: introduction, this section gives the manual lay-out and the general
– Section 3: list of failures observed during use
– Section 4: list of failures observed during maintenance
– Section 5: list of CDS and CPDS failure codes
– Section 6: maintenance tasks from the above lists.

These lists are non-exhaustive and the trouble shootings will be corrected and completed as experience is gained all along the engine life.

**CAUTION: BEFORE THE REMOVAL OF THE ENGINE FROM THE AIRFRAME, REFER TO TASK "TREATMENT OF AN ENGINE/MODULE BEFORE RETURN TO A MAINTENANCE CENTER". (REFER TO TASK 71-02-01-940-802)**

PAGE LEFT BLANK INTENTIONALLY

# FAILURES FOUND DURING OPERATION

## 1. GENERAL

### A. At power up

| *DESIGNATION* | *TASK No.* |
|---|---|
| "ENG P" (low oil pressure) not displayed at power up | 71-00-06-811-803 |
| "FUEL P" (low fuel pressure) not displayed at power up | 71-00-06-811-801 |
| "FUEL FLT" (fuel filter pre-blockage) displayed at power up | 71-00-06-811-802 |
| Unjustified ″FIRE″ signal. | 71-00-06-811-806 |

### B. Starting

| *DESIGNATION* | *TASK No.* |
|---|---|
| Aborted start - Gas generator not driven. | 71-00-06-812-801 |
| Aborted start - Flames at the exhaust pipe. | 71-00-06-811-807 |
| Aborted start - No ignition. | 71-00-06-812-816 |
| Aborted start - Slow start or stagnation. | 71-00-06-811-808 |
| Aborted start - Engine flame-out after ignition. | 71-00-06-811-810 |
| Aborted start - T4.5 overtemperature during start. | 71-00-06-812-805 |
| No extinguishing of the low fuel pressure "FUEL P" during the starting phase | 71-00-06-811-811 |
| No extinguishing of the low oil pressure "ENG P" during the starting phase | 71-00-06-811-812 |

### C. Engine running

| *DESIGNATION* | *TASK No.* |
|---|---|
| No N1 speed indication. | 71-00-06-814-816 |
| No N2 speed indication. | 71-00-06-814-817 |
| N1 overspeed. | 71-00-06-814-808 |
| N2 overspeed. | 71-00-06-814-809 |
| N2 overspeed. | 71-00-06-814-837 |
| No max. N1 achieved. | 71-00-06-813-801 |
| Fluctuation of N1 and T4.5. | 71-00-06-813-802 |
| No torque indication. | 71-00-06-813-803 |
| Torque indication erroneous. | 71-00-06-814-820 |
| Torque limitations exceeded. | 71-00-06-814-811 |
| No T4.5 indication. | 71-00-06-814-818 |
| T4.5 indication erroneous. | 71-00-06-814-819 |
| T4.5 overtemperature during flight. | 71-00-06-814-812 |
| Oil overtemperature on the diagram values display. | 71-00-06-814-823 |
| Oil temperature too low on the diagram values display. | 71-00-06-813-804 |

| *DESIGNATION* | *TASK No.* |
|---|---|
| Oil pressure too low on the diagram values display. | 71-00-06-813-805 |
| Oil pressure too high. | 71-00-06-814-828 |
| Fluctuating oil pressure. | 71-00-06-814-826 |
| "ENG P" message (Low oil pressure) during engine running. | 71-00-06-813-806 |
| Oil smell in the helicopter air conditioning. | 71-00-06-814-807 |
| "ENG CHIP" message (magnetic particles). | 71-00-06-814-829 |
| "FUEL FILT" message (Pre-blockage of the fuel filtering element). | 71-00-06-814-814 |
| "FUEL PRESS" message (Low fuel pressure). | 71-00-06-814-813 |
| Surge. | 71-00-06-814-806 |
| Vibrations. | 71-00-06-814-804 |
| Controlled engine shutdown not possible. | 71-00-06-813-807 |
| NR drift. | 71-00-06-813-808 |
| Power assurance check - Incorrect margin | 71-00-06-813-810 |
| Unjustified ″FIRE″ signal. | 71-00-06-813-811 |

### D. Shutdown

| *DESIGNATION* | *TASK No.* |
|---|---|
| Abnormal noises. | 71-00-06-814-802 |

# FAILURES FOUND DURING MAINTENANCE

## 1. GENERAL

### A. Failures observed during maintenance

| *DESIGNATION* | *TASK No.* |
|---|---|
| Exhaust fumes after engine shutdown. | 71-00-06-816-802 |
| Oil traces in the air intake casing. | 71-00-06-816-811 |
| Oil consumption more than 0.3 l/hr. | 71-00-06-816-815 |
| Popping out of the visual blockage indicator of the oil filtering element. | 71-00-06-816-807 |
| Popping out of the visual blockage indicator of the fuel filtering element. | 71-00-06-816-805 |
| Leakage at the power-drive drain. | 71-00-06-816-806 |
| Oil leakage at the starter power drive. | 71-00-06-816-808 |
| Defective automatic cycle counting. | 71-00-06-816-801 |
| Abnormal vibration, abnormal noise or accessory damage | 71-00-06-816-826 |
| Injection protection test not conform | 71-00-06-816-827 |

PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-811-801-A01

# "FUEL P" (LOW FUEL PRESSURE) NOT DISPLAYED AT POWER UP TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

At power up

### B. GENERAL DESCRIPTION

The low fuel pressure switch is located at the fuel filter inlet.

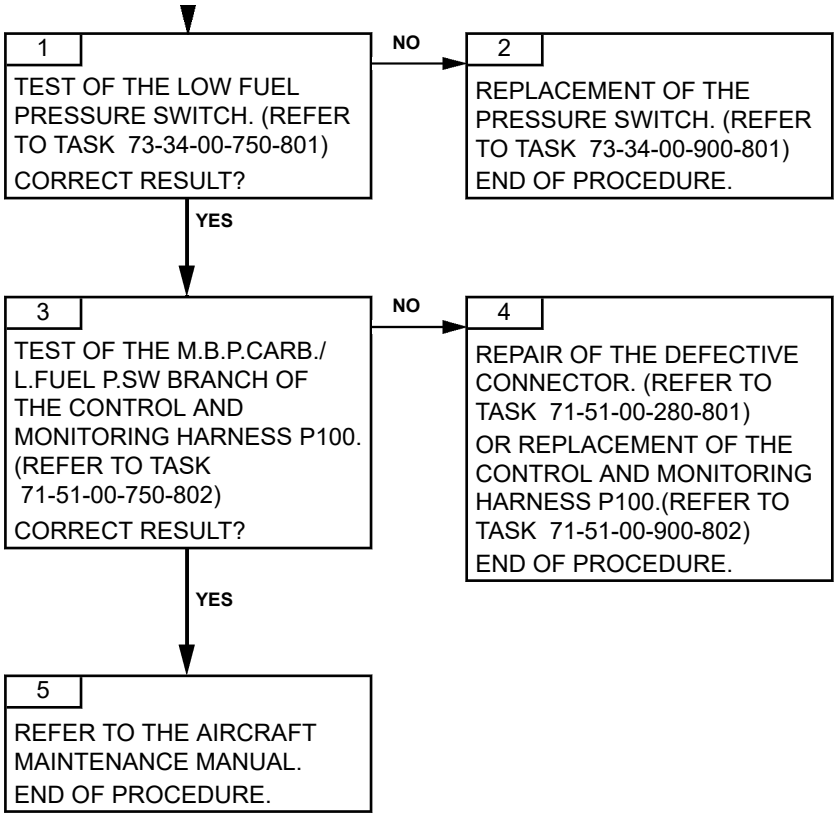
The low fuel pressure switch is connected to the aircraft.

The "FUEL-P" light must be ON during the power-up.

### C. POSSIBLE CAUSES

- Low fuel pressure switch
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-811-802-A01

# "FUEL FLT" (FUEL FILTER PRE-BLOCKAGE) DISPLAYED AT POWER UP TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

At power up

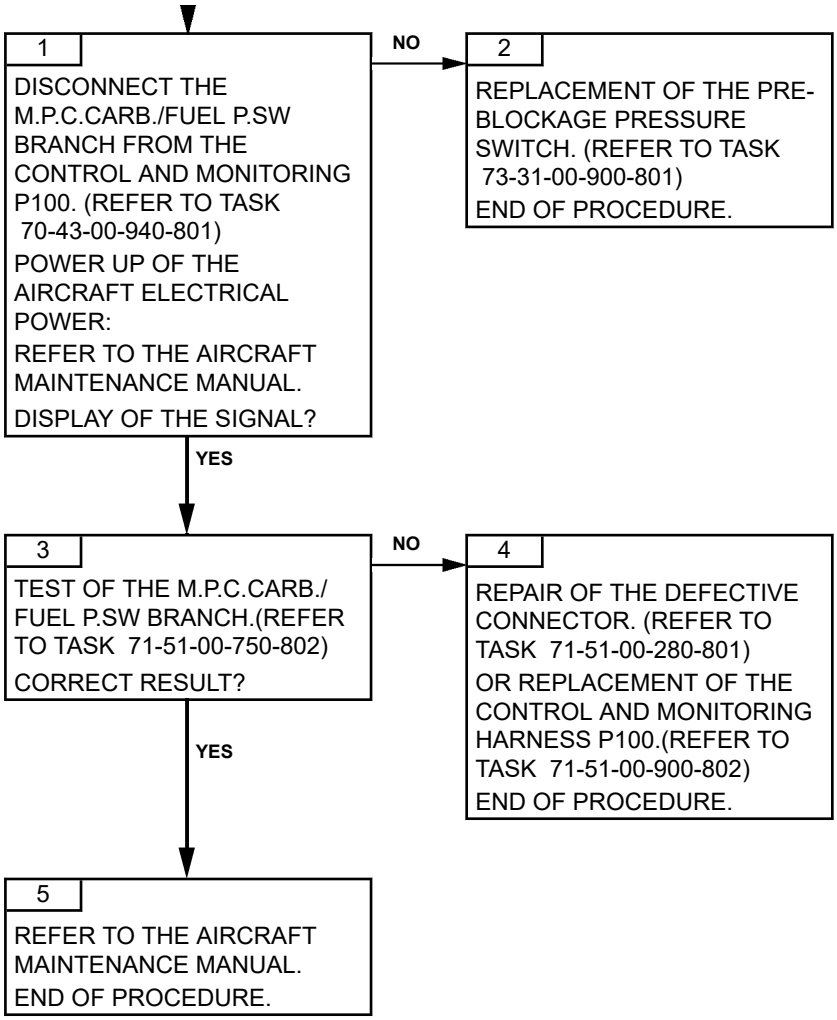
### B. GENERAL DESCRIPTION

The engine is equipped of a pre-blockage fuel filter switch.
The pre-blockage fuel filter switch is connected to the aircraft.
The message "FUEL FLT" is displayed when the fuel filter is preclogging.
This message must not be displayed at power up.

### C. POSSIBLE CAUSES

- Pre-blockage pressure switch
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-811-803-A01

# "ENG P" (LOW OIL PRESSURE) NOT DISPLAYED AT POWER UP TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

At power up

### B. GENERAL DESCRIPTION

The low oil pressure switch is located at the oil filter outlet.

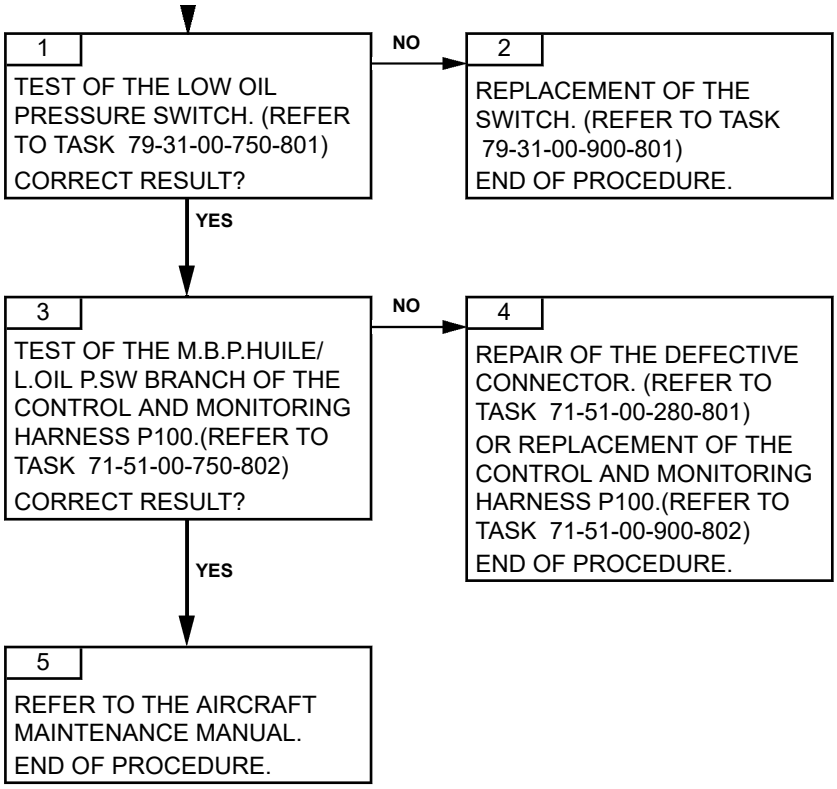
The low oil pressure switch is connected to the aircraft.

The "ENG-P" light must be ON during the power-up.

### C. POSSIBLE CAUSES

- Low oil pressure switch
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-811-806-A01

# UNJUSTIFIED FIRE SIGNAL TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

At power up

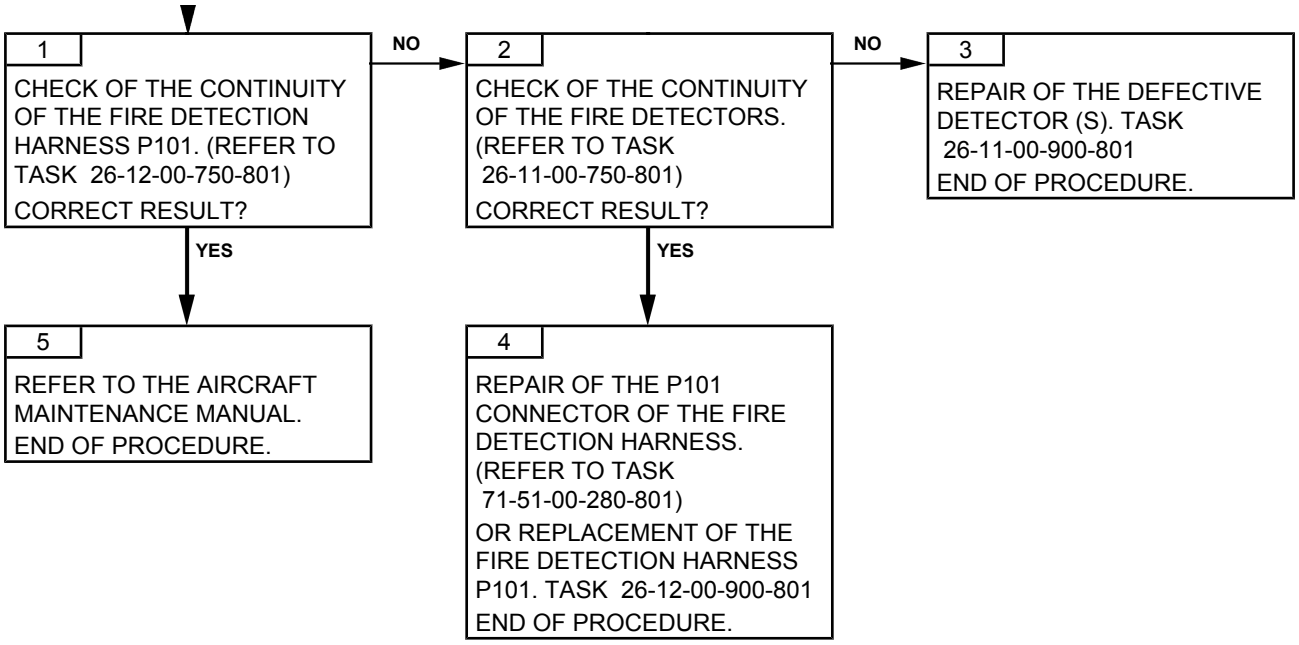
### B. REMINDER OF THE NORMAL OPERATING CONDITION

The signal must not be displayed.

### C. POSSIBLE CAUSES

– Fire detector
– Fire detection harness P101
– Aircraft

## 2. PROCEDURE



TASK 71-00-06-811-807-A01

# ABORTED START - FLAMES AT THE EXHAUST TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During starting.

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The normal operating condition is that the starter generator drives correctly the gas generator. The T4 increases from about 18 % N1. N1 and N2 grow up to either N2 idle or flight rate.

In troubleshooting book, there are different troubleshooting tasks concerning aborted start.

Titles are:

- **“Aborted start: gas generator not driven”**: Do this troubleshooting task if the gas generator is not driven at all (N1 = 0%) at the engine start selection or during cranking.
- **“Aborted start: no ignition”**: The pilot turns the principal selector STOP/IDLE/FLIGHT to IDLE or FLIGHT, then the gas generator is driven but no ignition of the combustion chamber (T4 not increase).
- **“Aborted start: slow start or stagnation”**: Do this troubleshooting task when the ignition in the combustion chamber is observed, but the N1 speed increases slower than usually, or the N1 speed stops to increase during start (and the pilot has to abort manually the starting sequence).
- **“Aborted start: flames at the exhaust pipe”**: Do this troubleshooting task when the starting sequence generates abnormal flames at the exhaust pipe.
- **“Aborted start: flame-out”**: Do this troubleshooting task when the ignition is observed but the combustion chamber flames out.
- **“T4.5 limitations exceeded”**: Do this troubleshooting task when there is a T4.5 overtemperature observed during engine running or during starting sequence.

### C. POSSIBLE CAUSES

- Start injectors
- Drain purge valve.

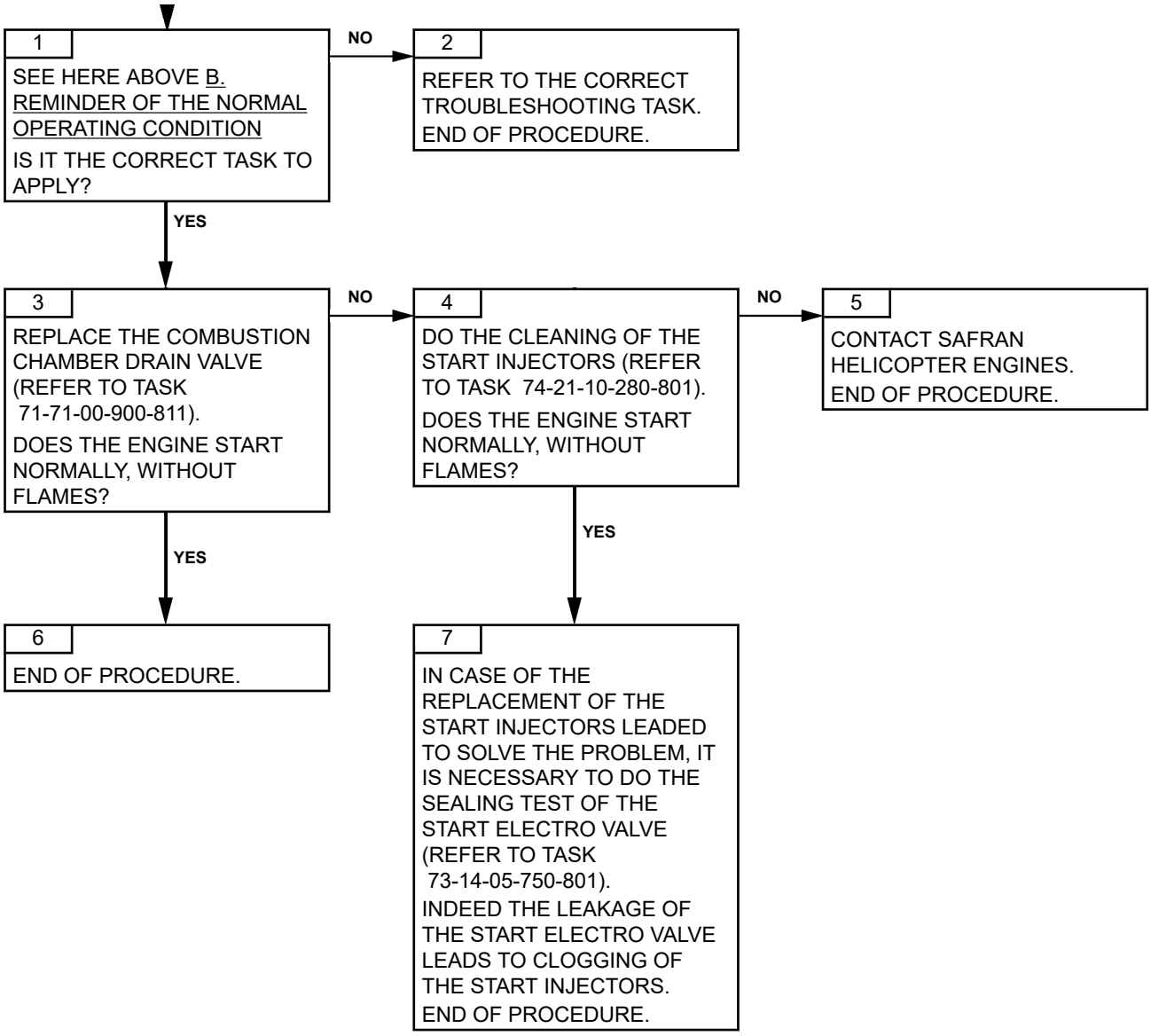
## 2. PROCEDURE

***NOTE:*** ***In case of a recent maintenance operation performed on this engine or on the aircraft starting system (starter, battery, fuse, selector, harness...), check firstly the sub assembly concerned by this maintenance operation. In particular the plug and connectors.***

***NOTE:*** ***It is possible to interchange equipment with the other engine.***

- ***If the engine start normally, both the equipment shall be reinstall in their original location in order to confirm the fault. If the fault is confirmed, then the faulty equipment has to be replaced***

– ***If the engine doesn't start normally, both the equipment shall be reinstall in their original location and you have to carry on the next step of the troubleshooting tree.***



PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-811-808-A01

# ABORTED START - SLOW START OR STAGNATION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During starting.

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The normal operating condition is that the starter generator drives correctly the gas generator. The T4 increases from about 18 % N1. N1 and N2 grow up to either N2 idle or flight rate.

In troubleshooting book, there are different troubleshooting tasks concerning aborted start.

Titles are:

- **“Aborted start: gas generator not driven”**: Do this troubleshooting task if the gas generator is not driven at all (N1 = 0%) at the engine start selection or during cranking.
- **“Aborted start: no ignition”**: The pilot turns the principal selector STOP/IDLE/FLIGHT to IDLE or FLIGHT, then the gas generator is driven but no ignition of the combustion chamber (T4 not increase).
- **“Aborted start: slow start or stagnation”**: Do this troubleshooting task when the ignition in the combustion chamber is observed, but the N1 speed increases slower than usually, or the N1 speed stops to increase during start (and the pilot has to abort manually the starting sequence).
- **“Aborted start: flames at the exhaust pipe”**: Do this troubleshooting task when the starting sequence generates abnormal flames at the exhaust pipe.
- **“Aborted start: flame-out”**: Do this troubleshooting task when the ignition is observed but the combustion chamber flames out.
- **“T4.5 limitations exceeded”**: Do this troubleshooting task when there is a T4.5 overtemperature observed during engine running or during starting sequence.

### C. POSSIBLE CAUSES

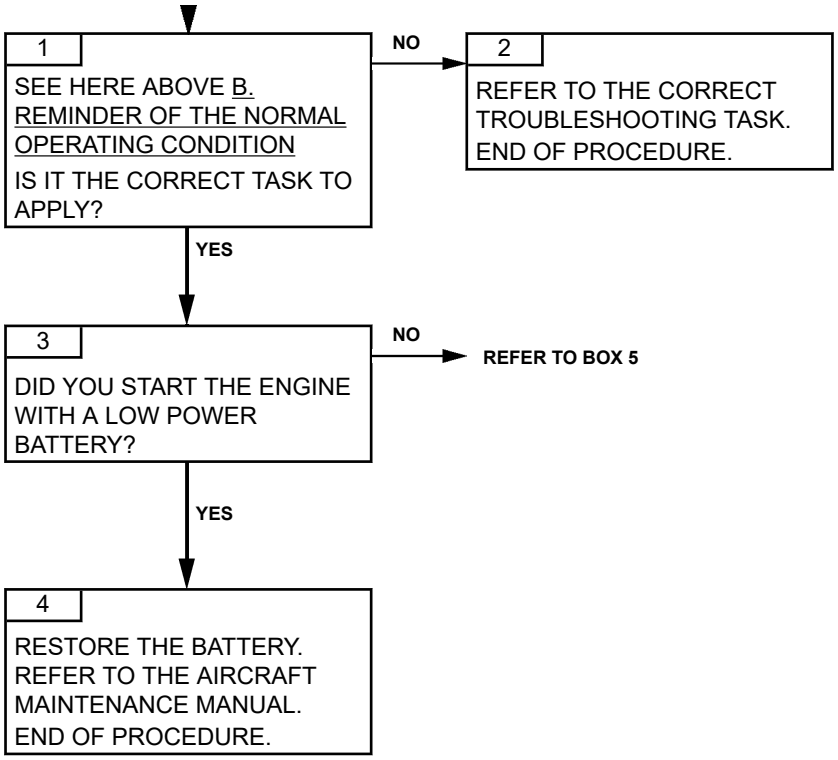
- Adjusted fuel valve assembly
- Adjusted fuel control unit
- Astatic valve
- Lubrication unit
- P3 air pipe
- Pyrometric harness
- T4.5 conformation box
- Control and monitoring harness
- Low battery
- Aircraft.

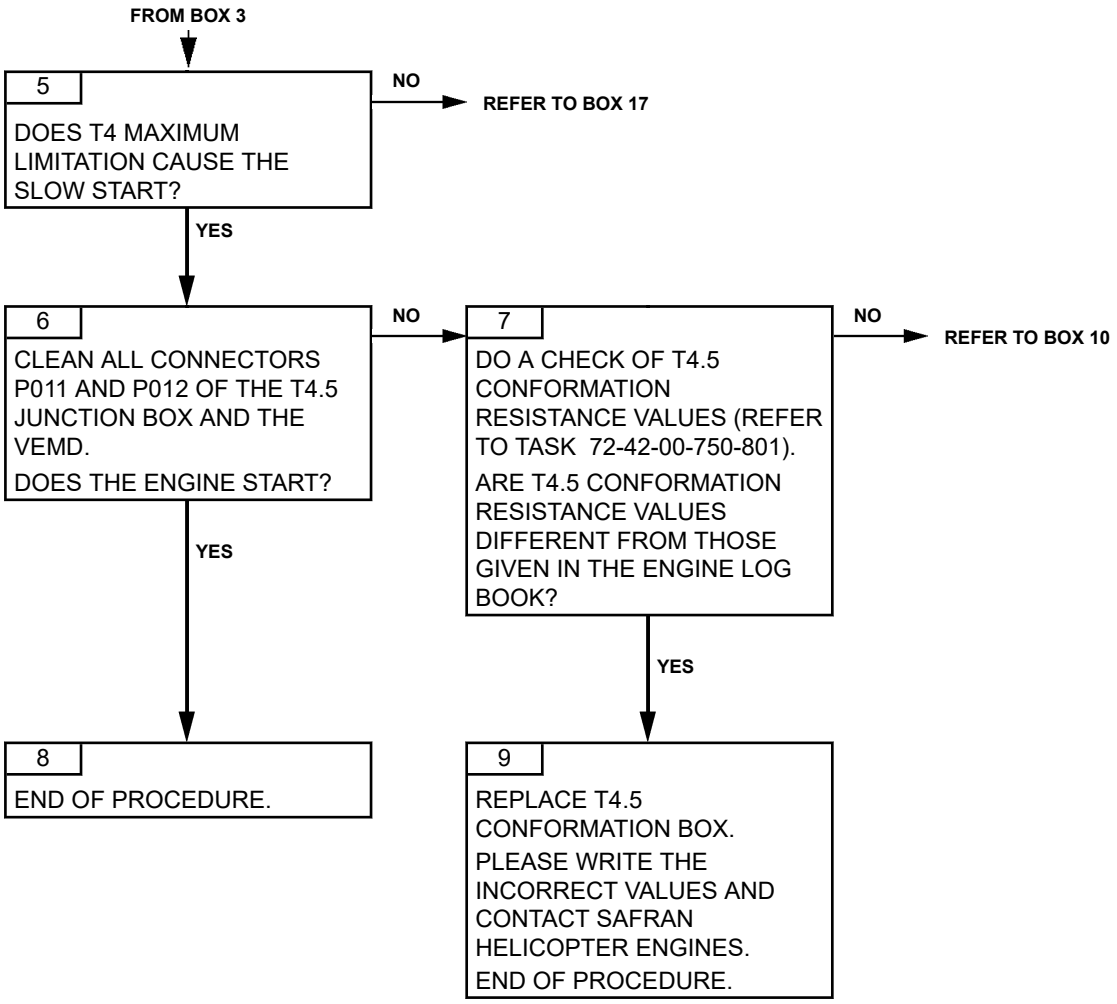
## 2. PROCEDURE

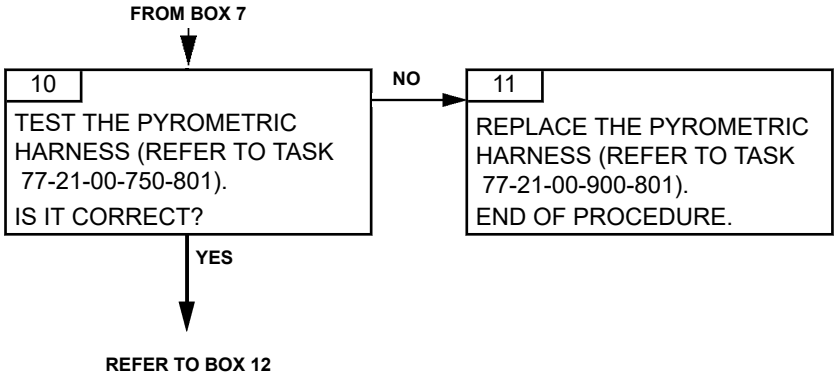
***NOTE:*** ***In case of a recent maintenance operation performed on this engine or on the aircraft starting system (starter, battery, fuse, selector, harness...), check firstly the sub assembly concerned by this maintenance operation. In particular the plug and connectors.***

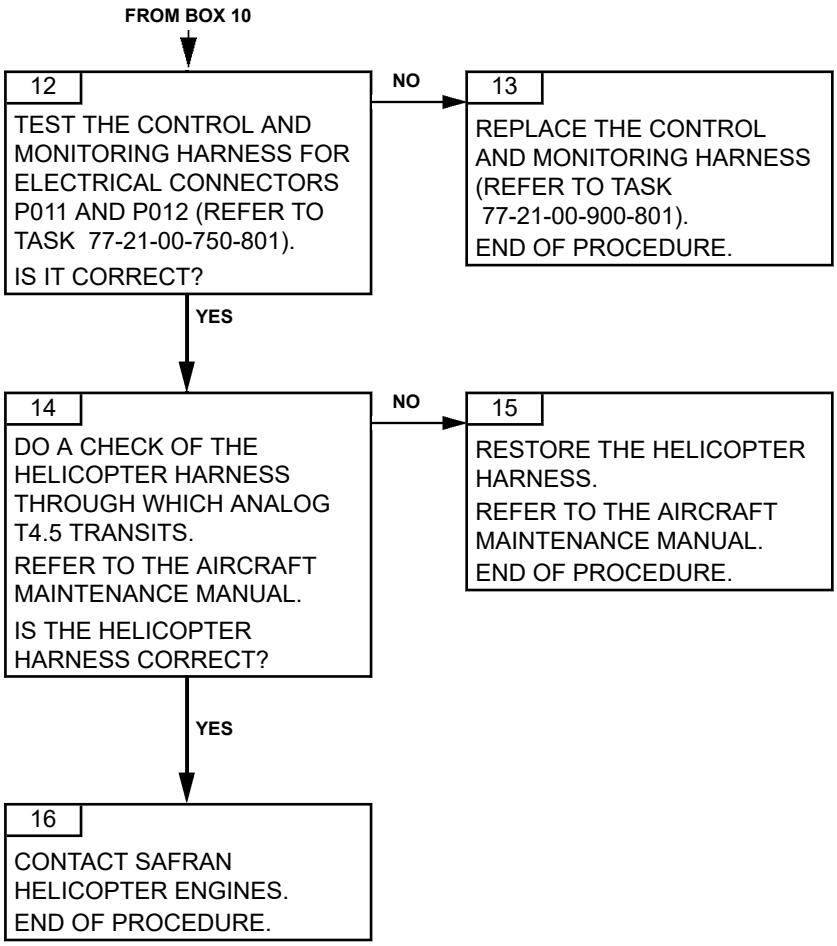
***NOTE:*** ***It is possible to interchange equipment with the other engine.***

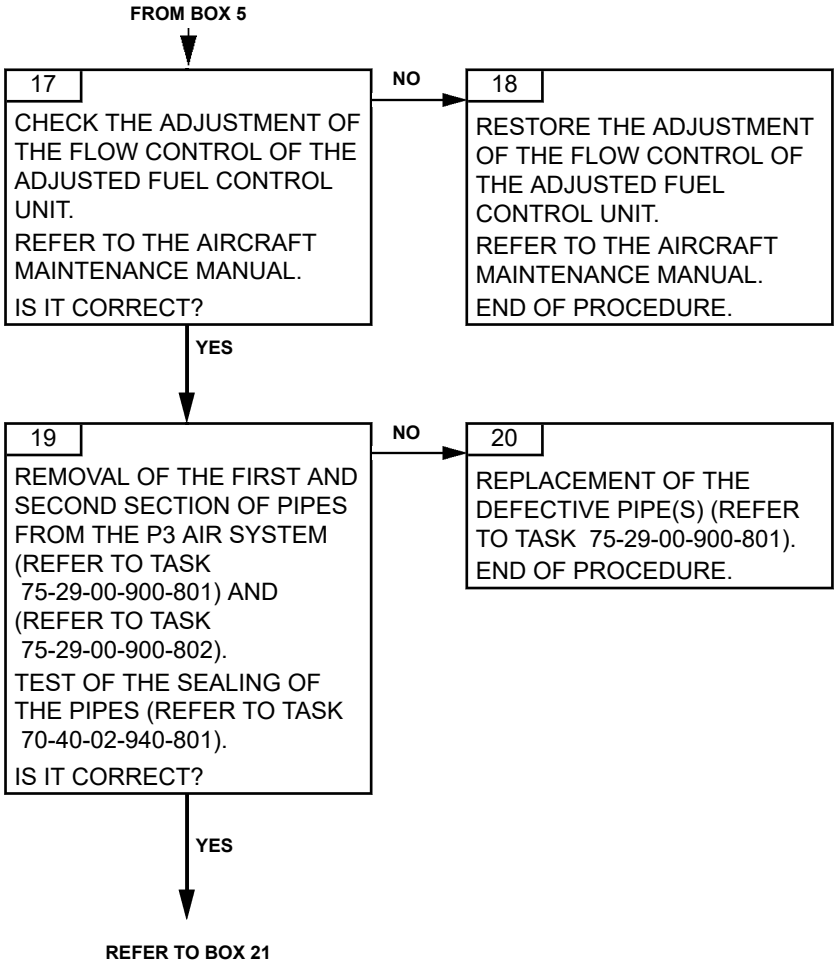
- ***If the engine start normally, both the equipment shall be reinstall in their original location in order to confirm the fault. If the fault is confirmed, then the faulty equipment has to be replaced***
- ***If the engine doesn't start normally, both the equipment shall be reinstall in their original location and you have to carry on the next step of the troubleshooting tree.***

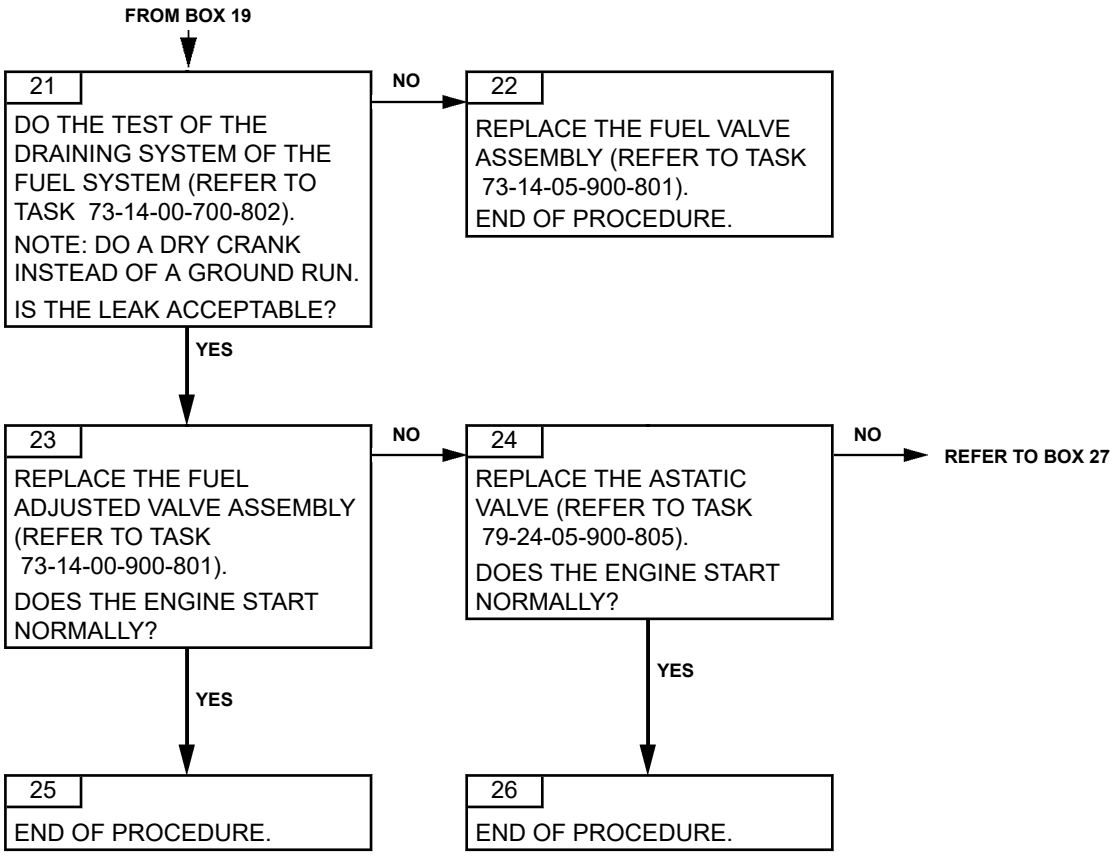


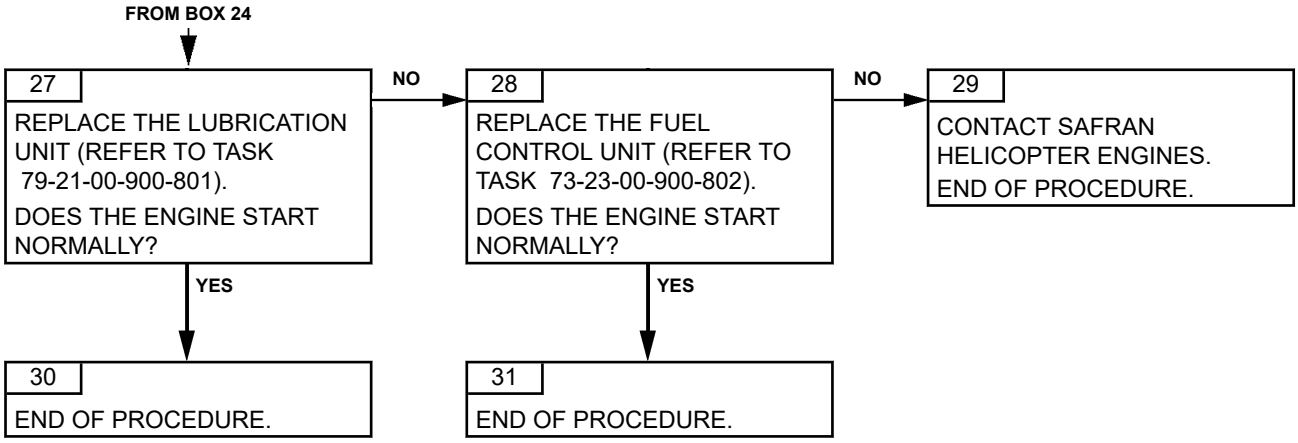












PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-811-810-A01

# ABORTED START - ENGINE FLAME-OUT AFTER IGNITION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During the start phase

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The low fuel pressure signal is off.

The fuel is in accordance with the standards.

During the start phase, the plugs make sparks, the start electro-valve opens and the fuel is ignited at the start injectors. The pressure of the fuel pump increases and supplies the preference injector and the main injectors.

In troubleshooting book, there are different troubleshooting tasks concerning aborted start.

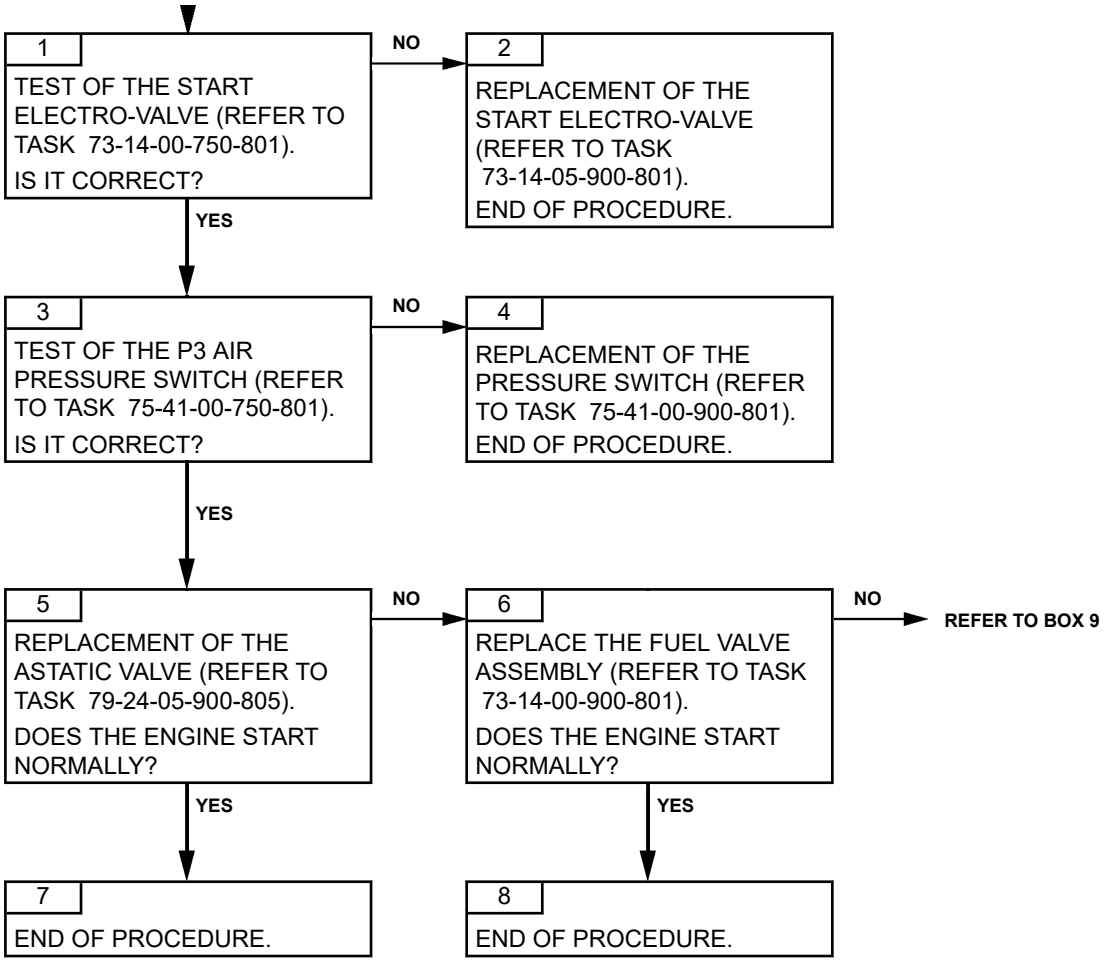
Titles are:

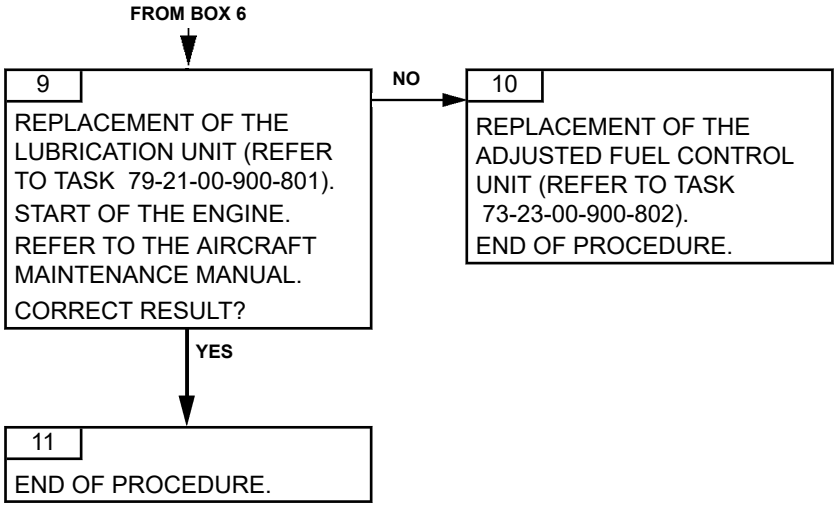
- **“Aborted start: gas generator not driven”**: Do this troubleshooting task if the gas generator is not driven at all (N1 = 0%) at the engine start selection or during cranking.
- **“Aborted start: no ignition”**: The pilot turns the principal selector STOP/IDLE/FLIGHT to IDLE or FLIGHT, then the gas generator is driven but no ignition of the combustion chamber (T4 not increase).
- **“Aborted start: slow start or stagnation”**: Do this troubleshooting task when the ignition in the combustion chamber is observed, but the N1 speed increases slower than usually, or the N1 speed stops to increase during start (and the pilot has to abort manually the starting sequence).
- **“Aborted start: flames at the exhaust pipe”**: Do this troubleshooting task when the starting sequence generates abnormal flames at the exhaust pipe.
- **“Aborted start: flame-out”**: Do this troubleshooting task when the ignition is observed but the combustion chamber flames out.
- **“T4.5 limitations exceeded”**: Do this troubleshooting task when there is a T4.5 overtemperature observed during engine running or during starting sequence.

### C. POSSIBLE CAUSES

- Start electro-valve
- P3 air pressure switch
- Astatic valve
- Lubrication unit
- Adjusted fuel control unit.

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-811-811-A01

# NO EXTINGUISHING OF THE LOW FUEL PRESSURE "FUEL P" DURING THE STARTING PHASE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During the start phase.

### B. GENERAL DESCRIPTION

The low fuel pressure switch is located at the fuel filter inlet.

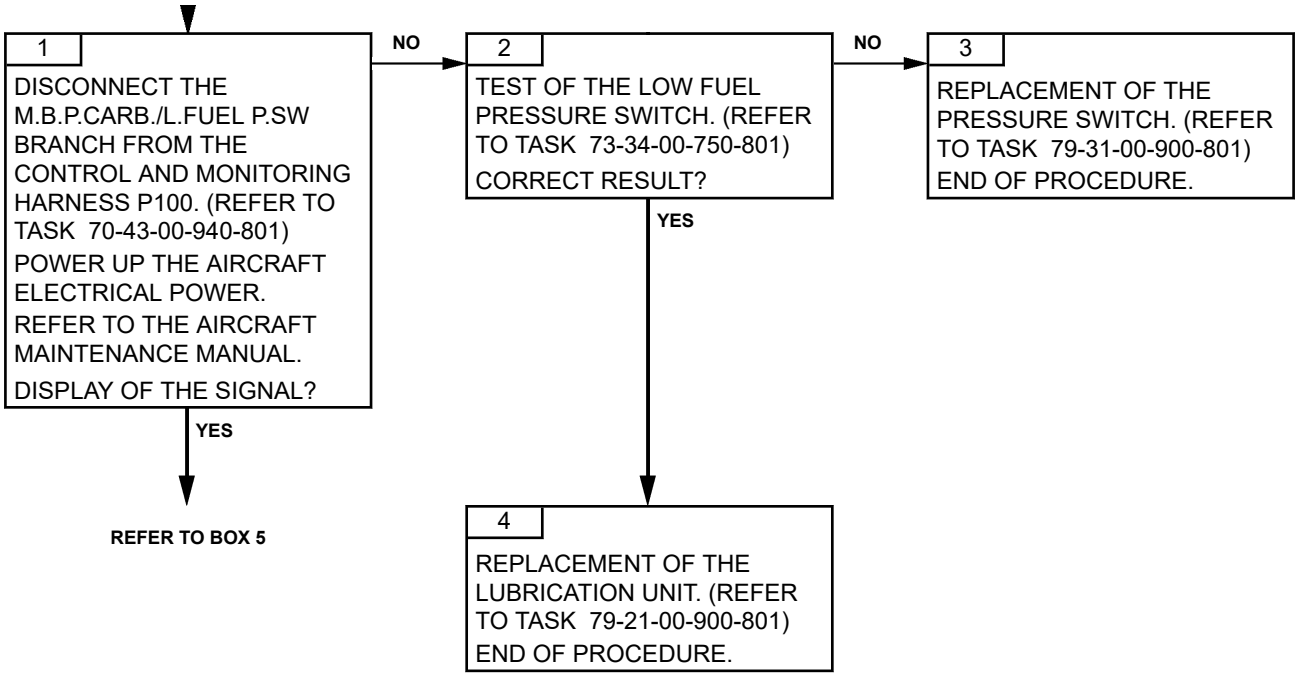
The low fuel pressure switch is connected to the aircraft.

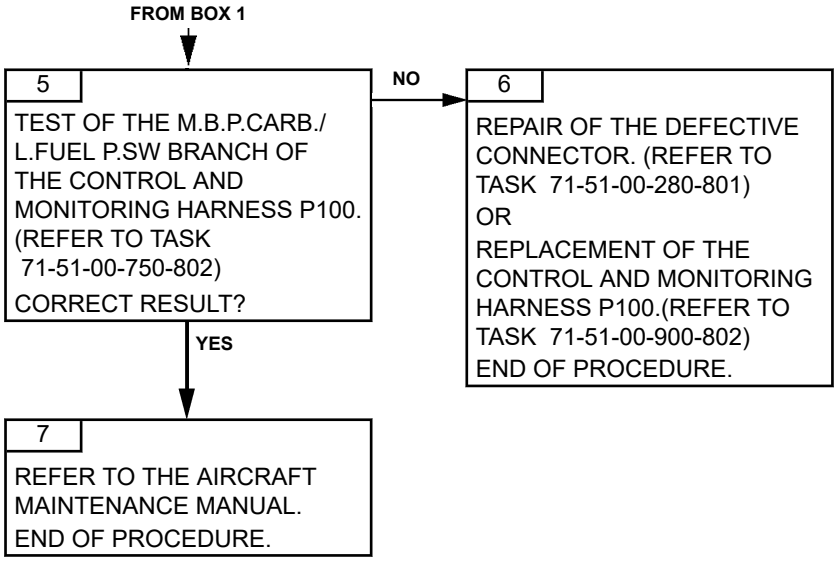
The low pressure fuel signal must be OFF when the booster pump operates.

### C. POSSIBLE CAUSES

- Low fuel pressure switch
- Lubrication unit (ejector)
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-811-812-A01

# NO EXTINGUISHING OF THE LOW OIL PRESSURE "ENG P" DURING THE STARTING PHASE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During the start phase.

### B. GENERAL DESCRIPTION

The tolerance criteria for oil pressure limitation are defined: (Refer to Task 71-00-02-940-801).

The low oil pressure switch is located at the oil filter outlet.

The low oil pressure switch is connected to the aircraft.

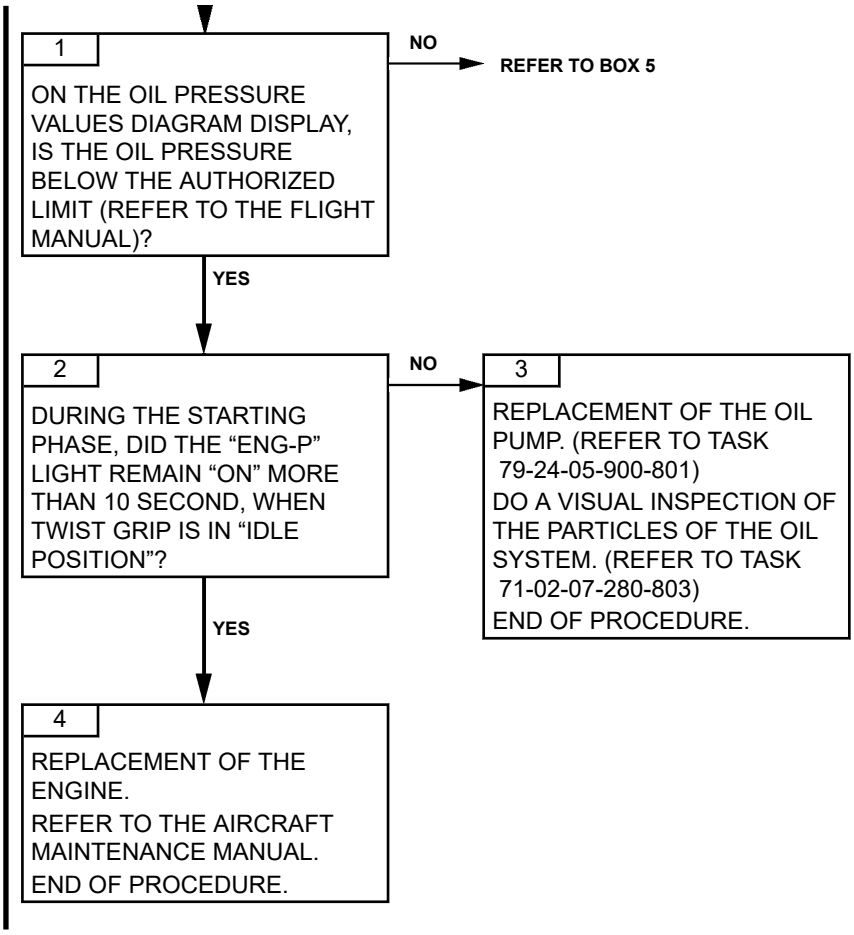
The "ENG-P" light is ON until the N1 speed reaches the extinction threshold.

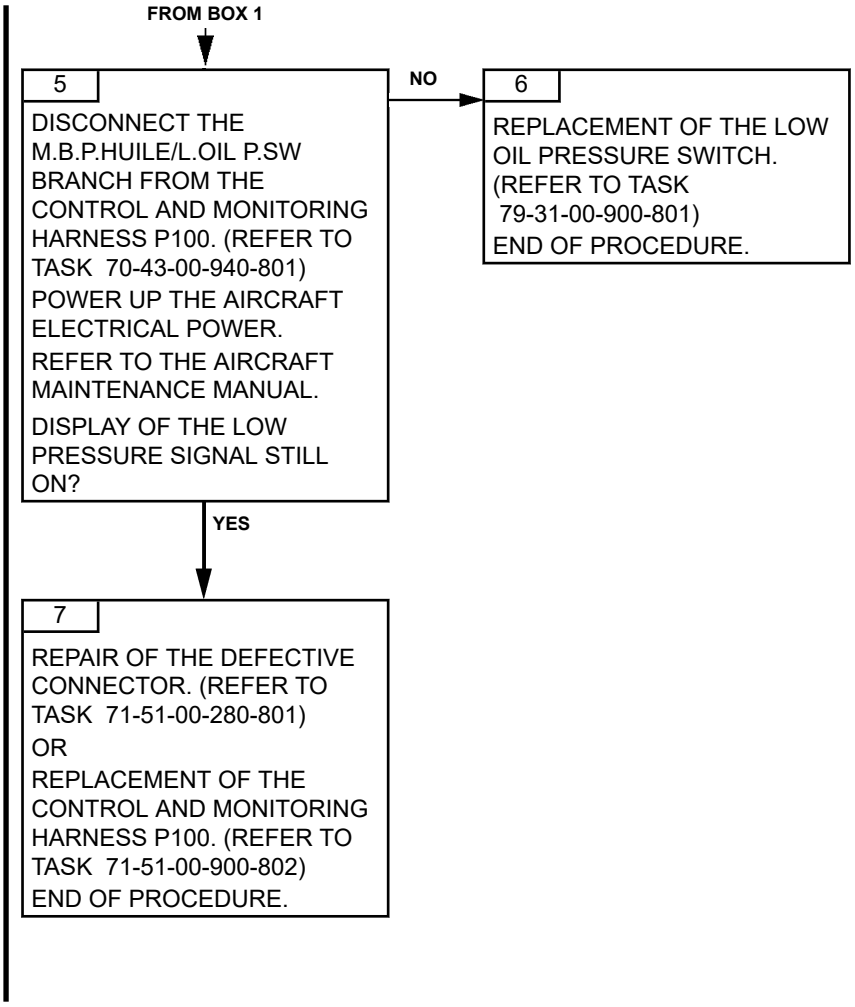
Apply the troubleshooting task if the "ENG P" light remains ON during the starting phase.

### C. POSSIBLE CAUSES

- Low oil pressure switch
- Oil pump
- Control and monitoring harness P100

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-812-801-A01

# ABORTED START - GAS GENERATOR NOT DRIVEN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During starting.

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The starter drives the gas-generator rotating assembly through the accessory drive train.

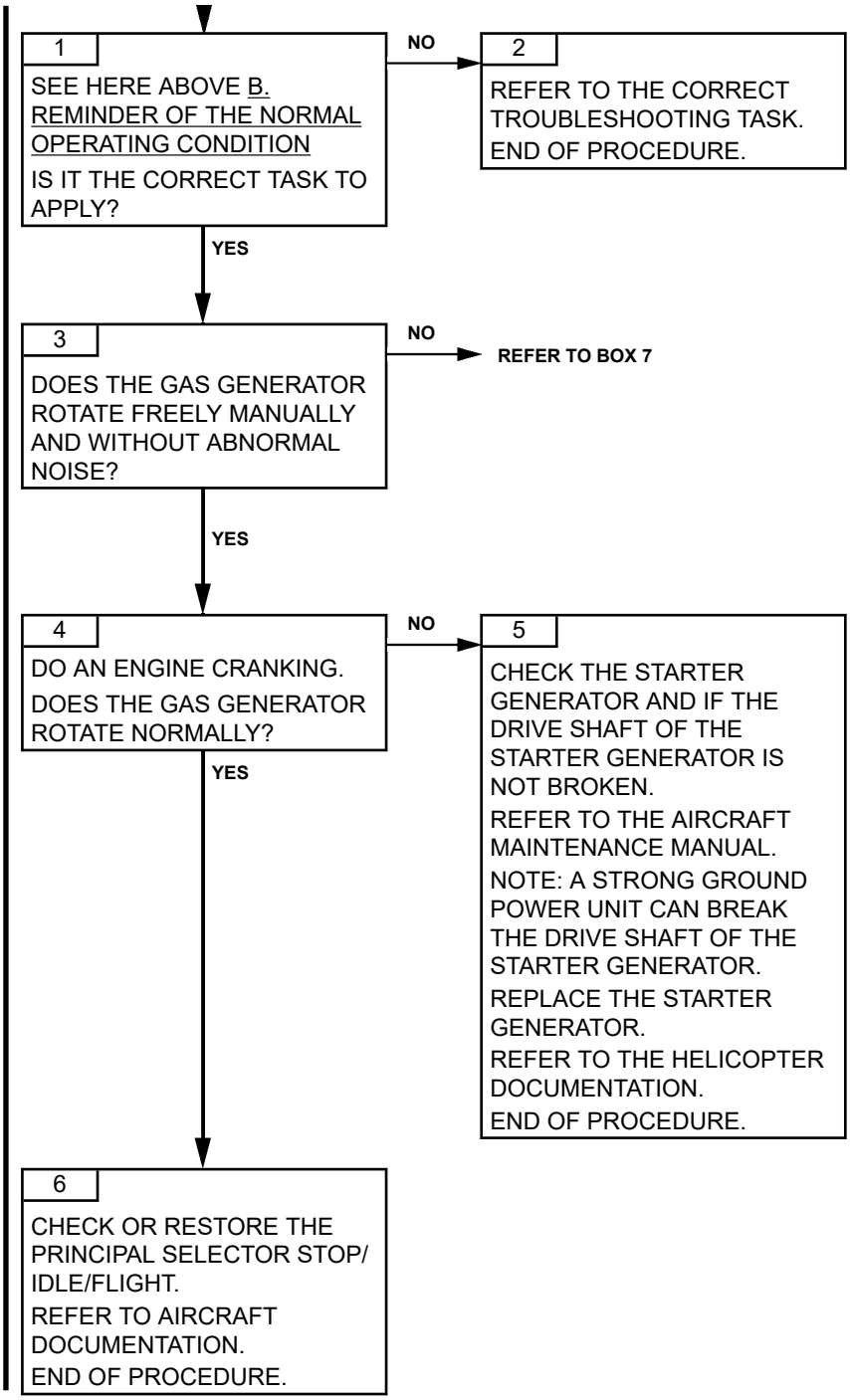
Titles are:

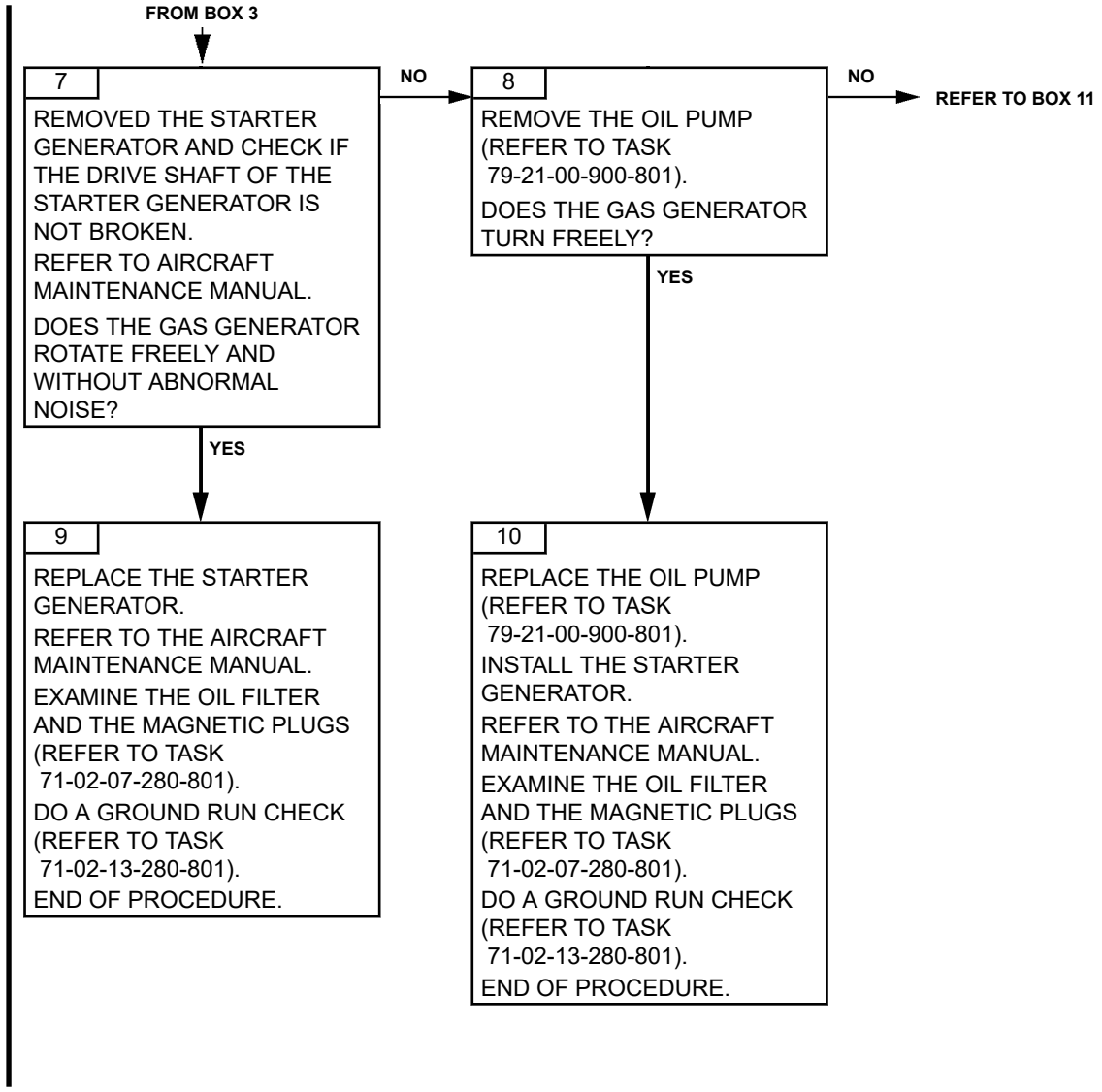
- **“Aborted start: gas generator not driven”**: Do this troubleshooting task if the gas generator is not driven at all (N1 = 0%) at the engine start selection or during cranking.
- **“Aborted start: no ignition”**: The pilot turns the principal selector STOP/IDLE/FLIGHT to IDLE or FLIGHT, then the gas generator is driven but no ignition of the combustion chamber (T4 not increase).
- **“Aborted start: slow start or stagnation”**: Do this troubleshooting task when the ignition in the combustion chamber is observed, but the N1 speed increases slower than usually, or the N1 speed stops to increase during start (and the pilot has to abort manually the starting sequence).
- **“Aborted start: flame-out”**: Do this troubleshooting task when the ignition is observed but the combustion chamber flames out.
- **“Aborted start: flames at the exhaust pipe”**: Do this troubleshooting task when the starting sequence generates abnormal flames at the exhaust pipe.
- **“T4.5 limitations exceeded”**: Do this troubleshooting task when there is a T4.5 overtemperature observed during engine running or during starting sequence.

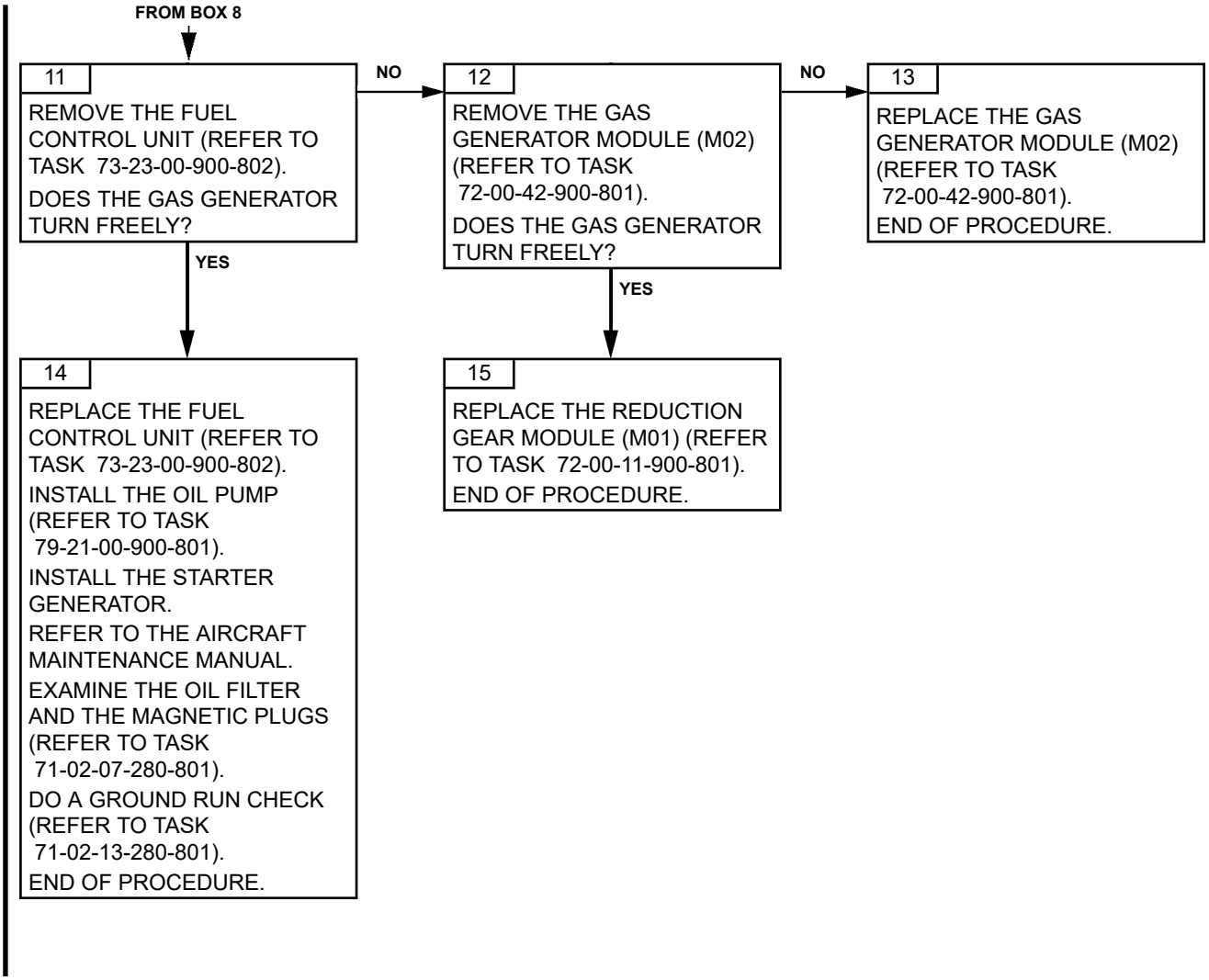
### C. POSSIBLE CAUSES

- Starter generator
- Reduction gear module (M01)
- Gas generator module (M02)
- Oil pump
- Fuel Control Unit
- Aircraft.

## 2. PROCEDURE







TASK 71-00-06-812-805-A01

# ABORTED START - T4.5 OVERTEMPERATURE DURING START TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During the start phase

### B. GENERAL DESCRIPTION

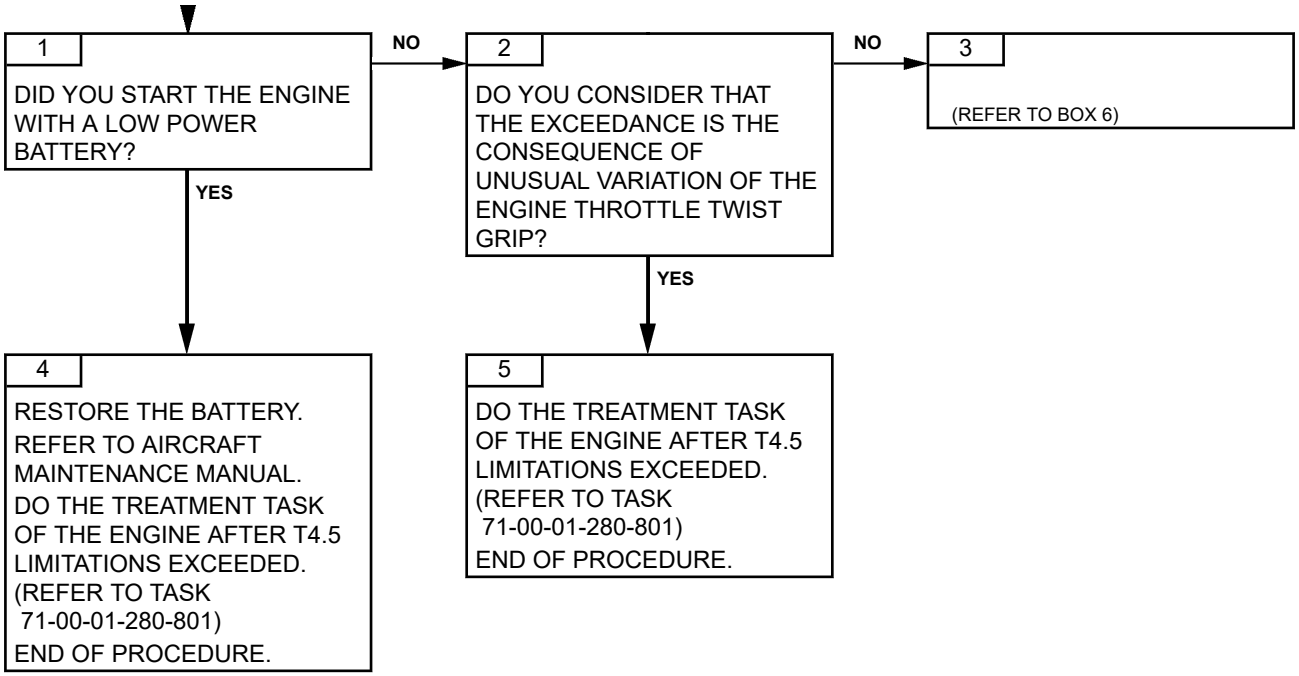
Refer to T4 limitations (Refer to Task 71-00-01-940-801). The 4 termocouple probes are connected to a junction box. The junction box is connected to the aircraft. The T4.5 conformation box is connected to the aircraft.

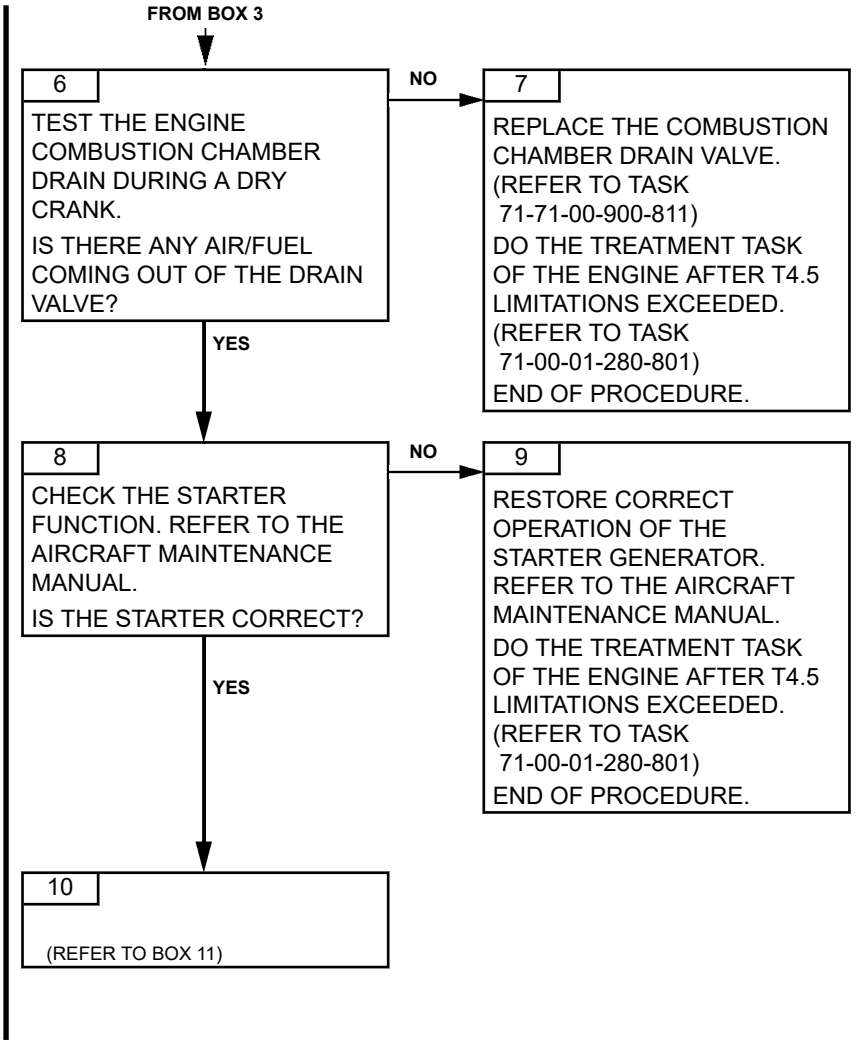
### C. POSSIBLE CAUSES

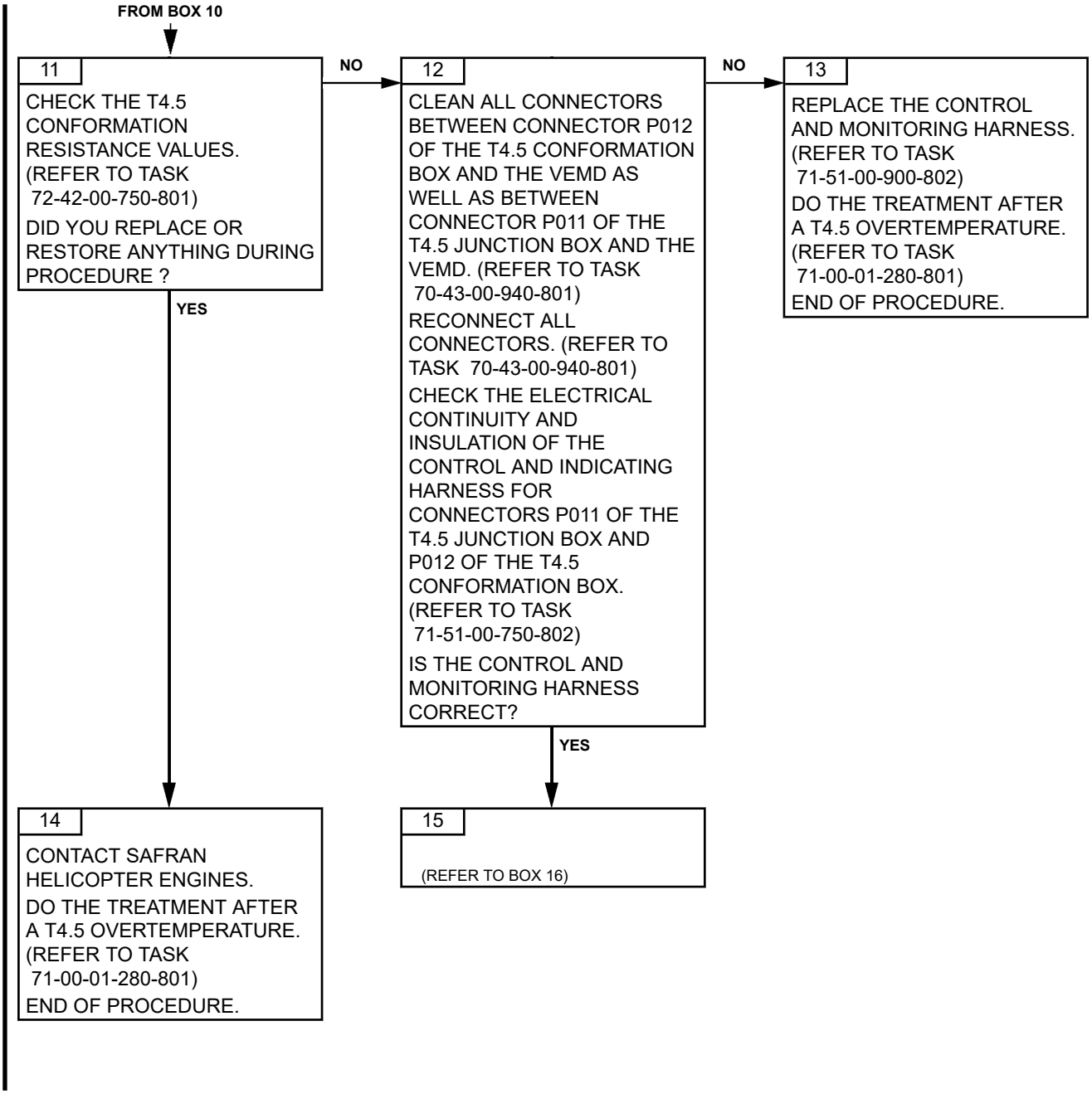
- Unusual variation of the engine throttle twist grip
- Pyrometric harness
- Control and monitoring harness P100
- Aircraft (indication harness, battery, starter)
- Start injectors
- Adjusted fuel valve assembly
- Adjusted fuel control unit
- Drain valve/Turbine casing assembly
- T4.5 conformation box

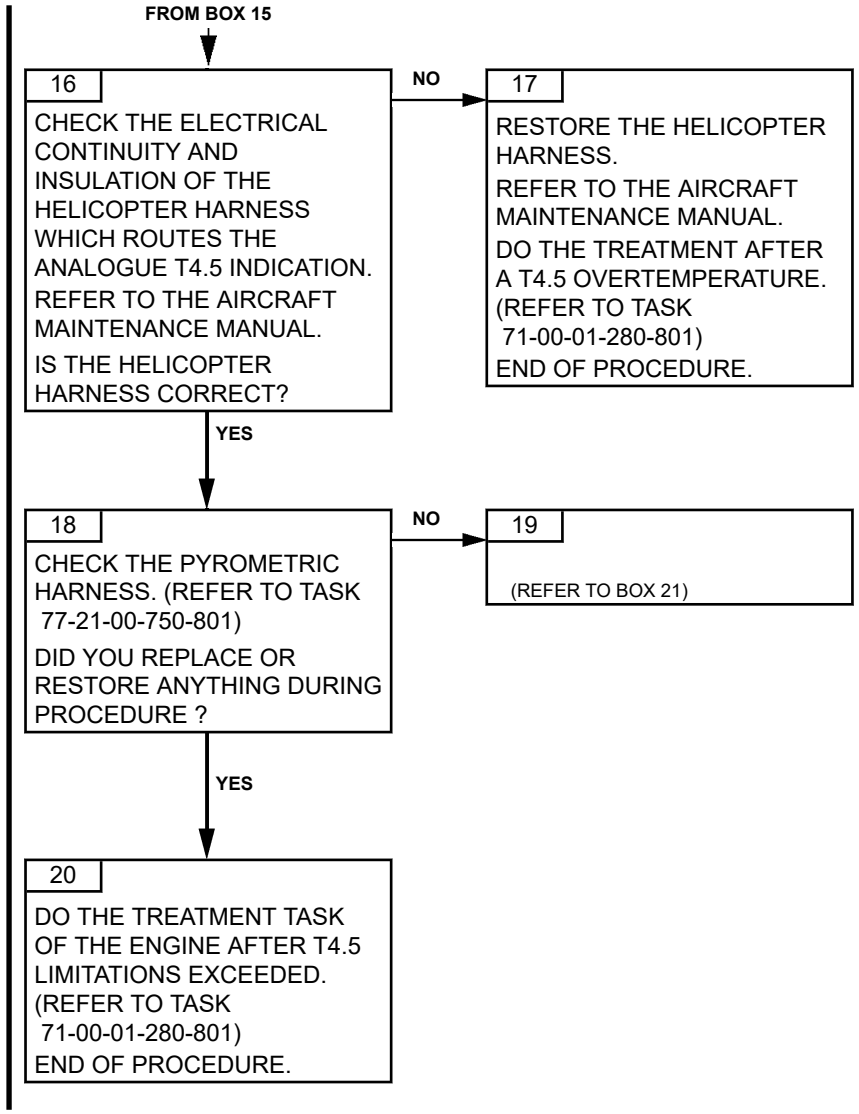
## 2. PROCEDURE

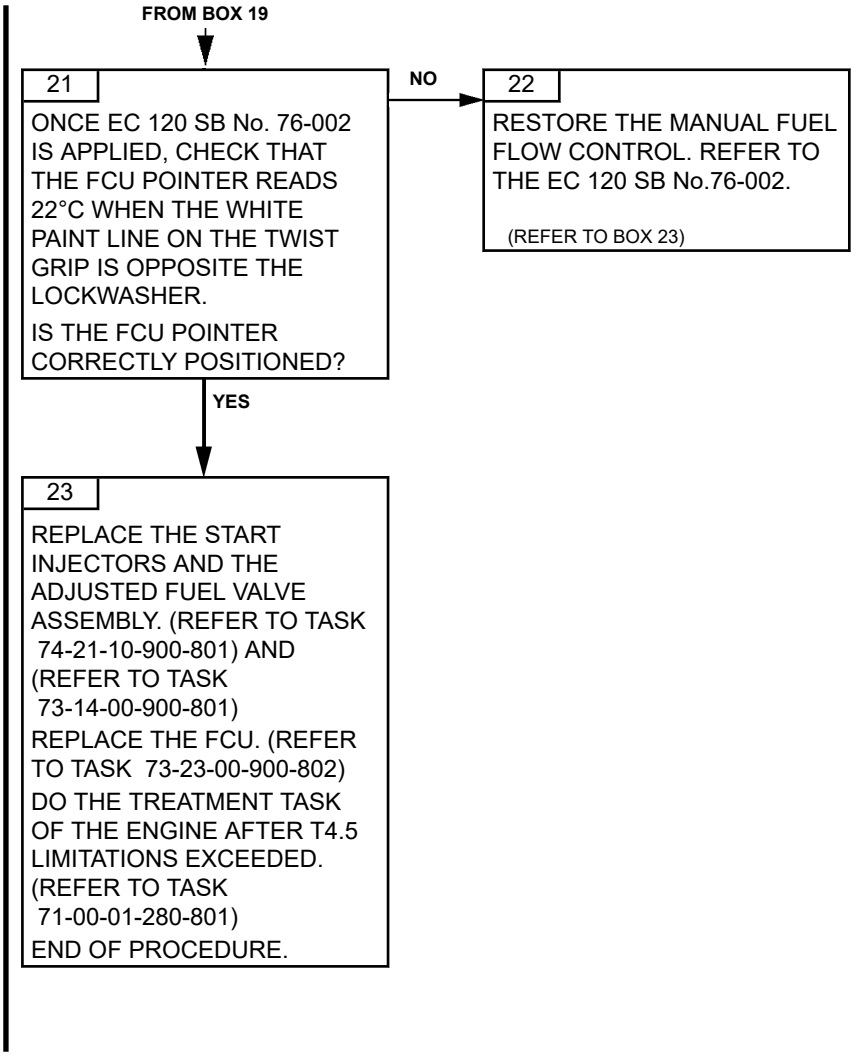
***NOTE:*** ***First, the fault isolation procedure helps you to find the root cause and to repair the engine part related to that root cause. After that, the troubleshooting procedure gives the checks and repairs of the event consequences on the engine (Refer to Task 71-00-01-280-801).***











TASK 71-00-06-812-816-A01

# ABORTED START - NO IGNITION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During starting

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The normal operating condition is that the starter drives correctly the gas generator.

When the engine reaches the self-sustaining speed, the start electro-valve of the adjusted valve assembly closes. The start injectors are then ventilated. The main injectors and the preference injector assembly are supplied with fuel.

In troubleshooting book, there are different troubleshooting tasks concerning aborted start.

Titles are:

- **“Aborted start: gas generator not driven”**: Do this troubleshooting task if the gas generator is not driven at all (N1 = 0%) at the engine start selection or during cranking.
- **“Aborted start: no ignition”**: The pilot turns the principal selector STOP/IDLE/FLIGHT to IDLE or FLIGHT, then the gas generator is driven but no ignition of the combustion chamber (T4 not increase).
- **“Aborted start: slow start or stagnation”**: Do this troubleshooting task when the ignition in the combustion chamber is observed, but the N1 speed increases slower than usually, or the N1 speed stops to increase during start (and the pilot has to abort manually the starting sequence).
- **“Aborted start: flames at the exhaust pipe”**: Do this troubleshooting task when the starting sequence generates abnormal flames at the exhaust pipe.
- **“Aborted start: flame-out”**: Do this troubleshooting task when the ignition is observed but the combustion chamber flames out.
- **“T4.5 limitations exceeded”**: Do this troubleshooting task when there is a T4.5 overtemperature observed during engine running or during starting sequence.

### C. POSSIBLE CAUSES

- Igniters plugs
- Ignition unit
- Ignition cable
- Fuel valve assembly
- Start injectors
- Control and monitoring harness
- Fuel control unit
- External condition (tail wind)
- Aircraft.

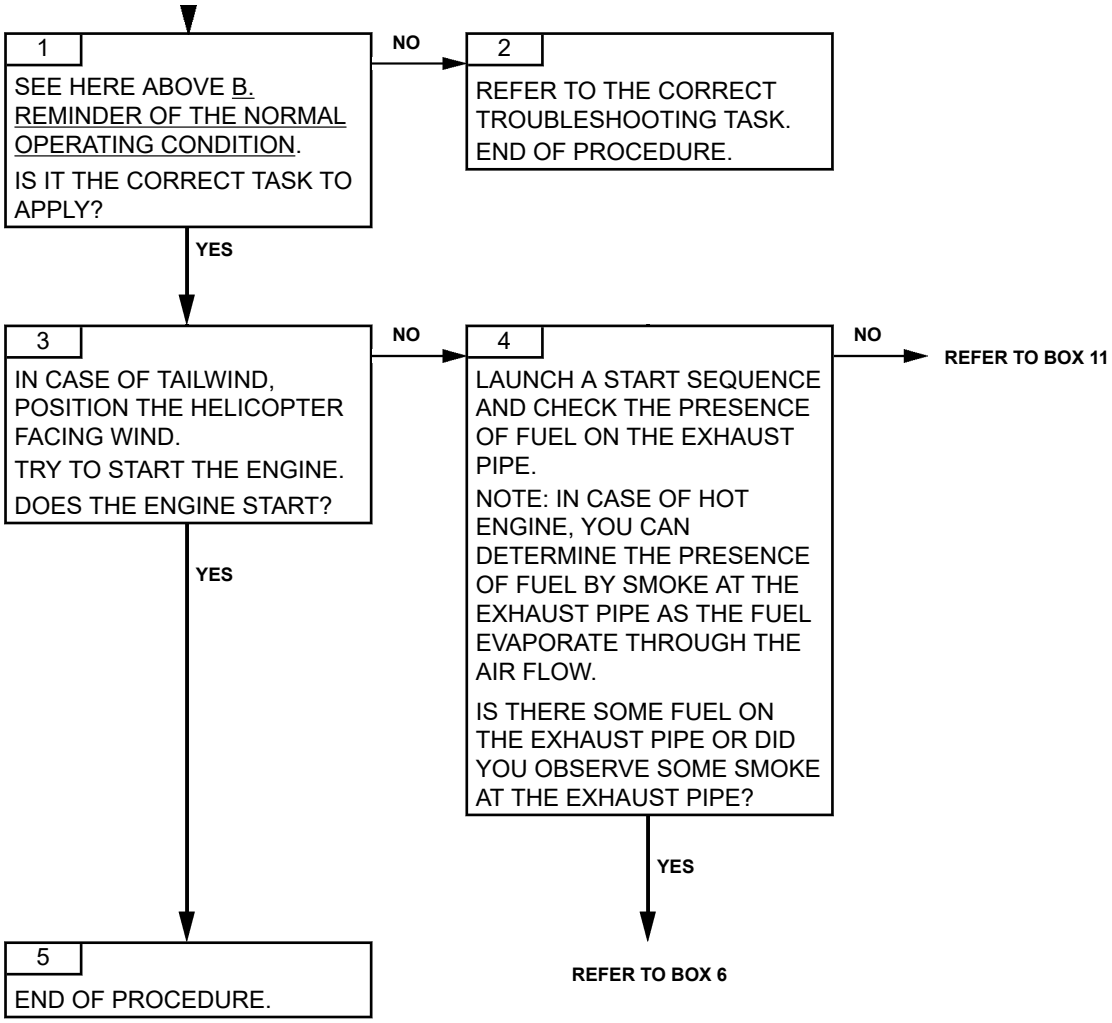
## 2. PROCEDURE

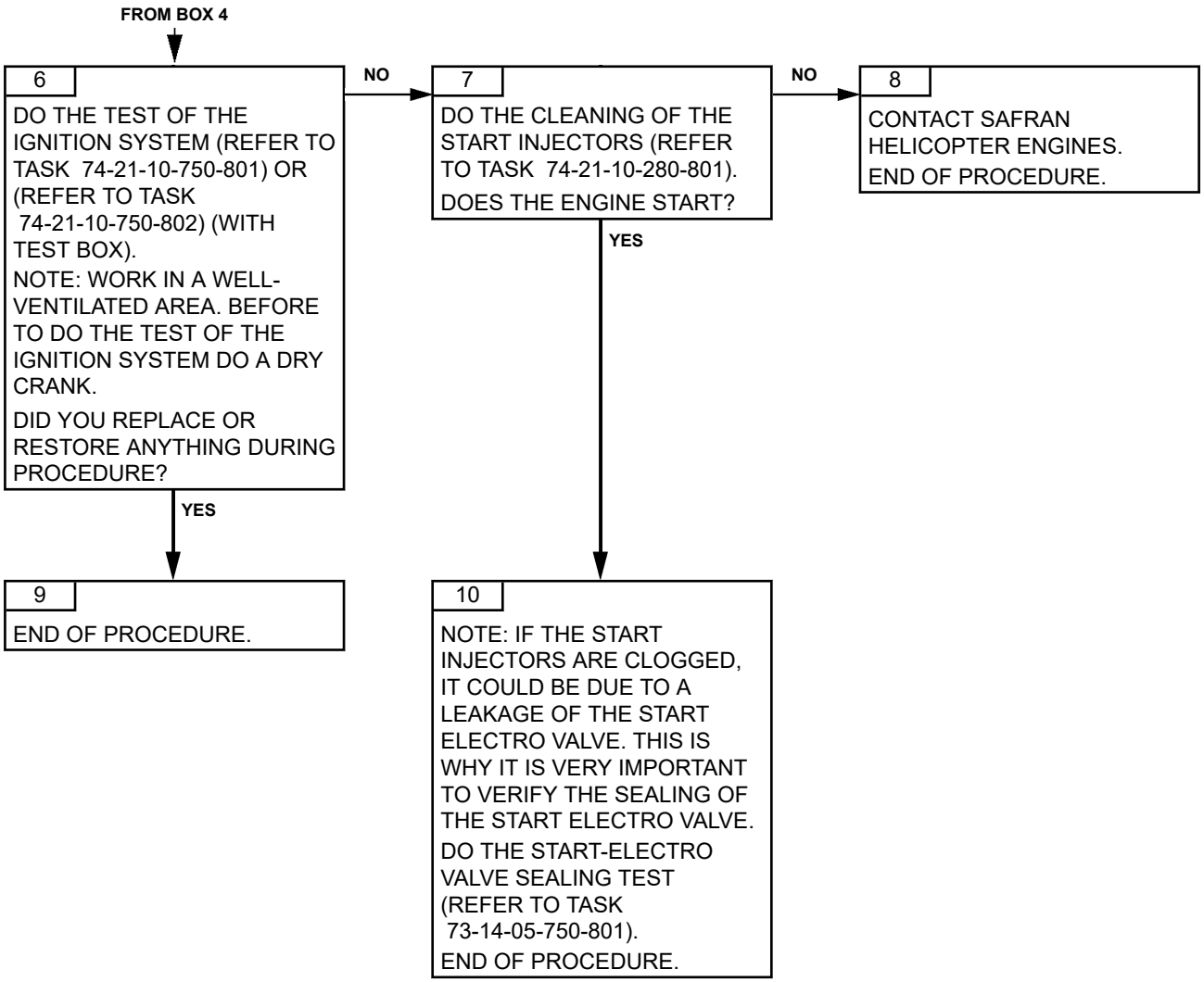
***NOTE:*** ***In case of a recent maintenance operation performed on this engine or on the aircraft starting system (starter, battery, fuse, selector, harness...), check firstly the sub***

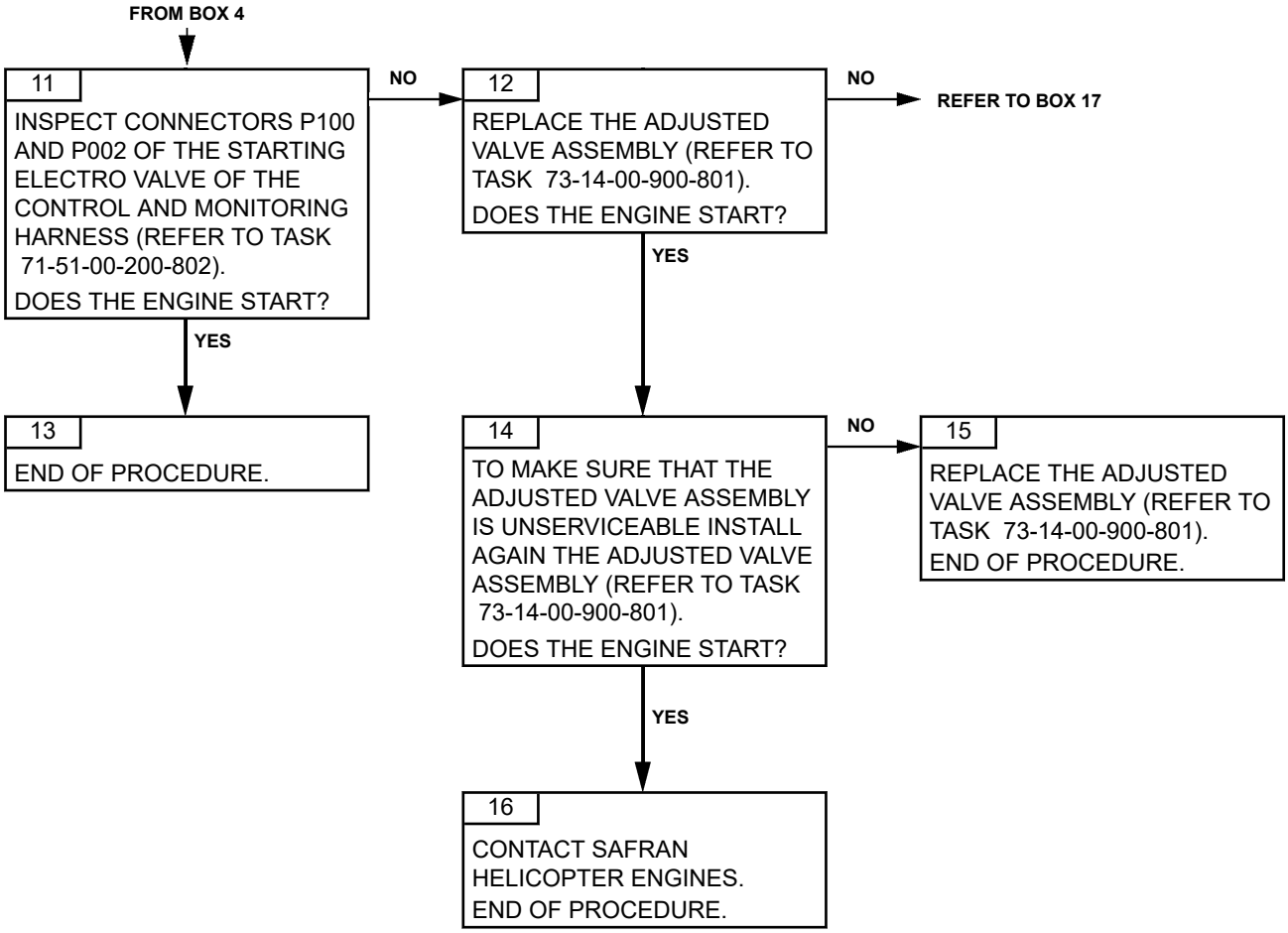
***assembly concerned by this maintenance operation. In particular the plug and connectors.***

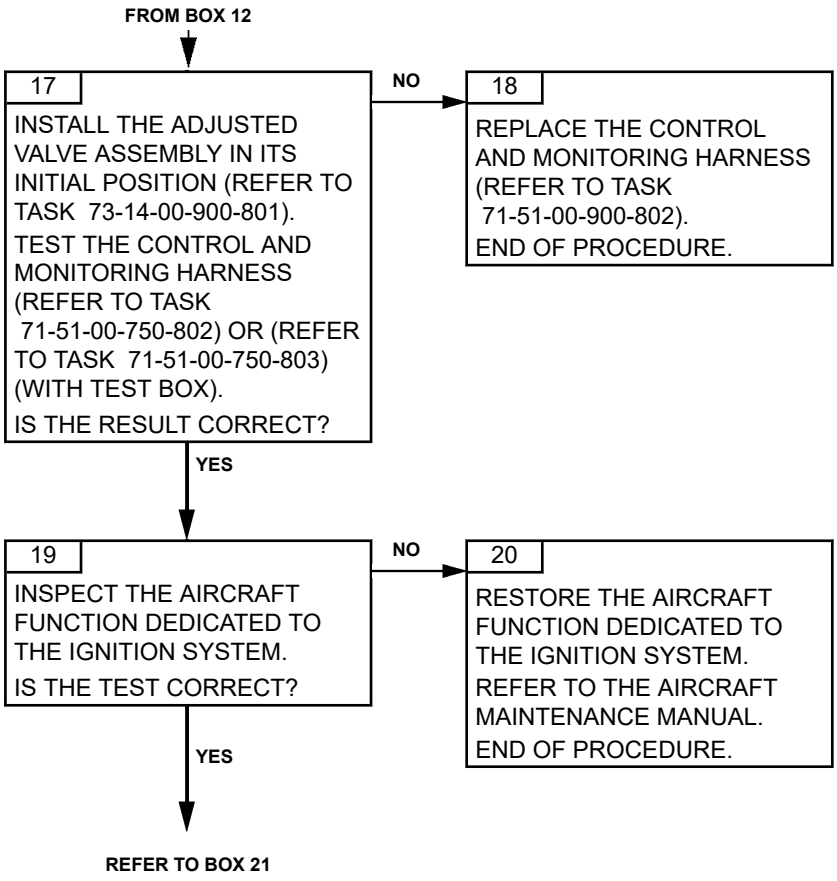
***NOTE:*** ***It is possible to interchange equipment with the other engine.***

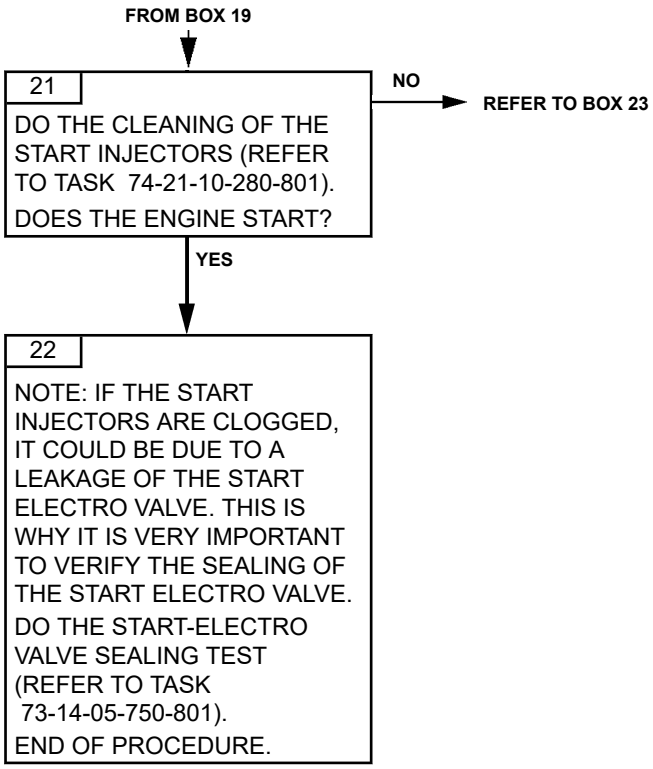
- ***If the engine start normally, both the equipment shall be reinstall in their original location in order to confirm the fault. If the fault is confirmed, then the faulty equipment has to be replaced***
- ***If the engine doesn't start normally, both the equipment shall be reinstall in their original location and you have to carry on the next step of the troubleshooting tree.***

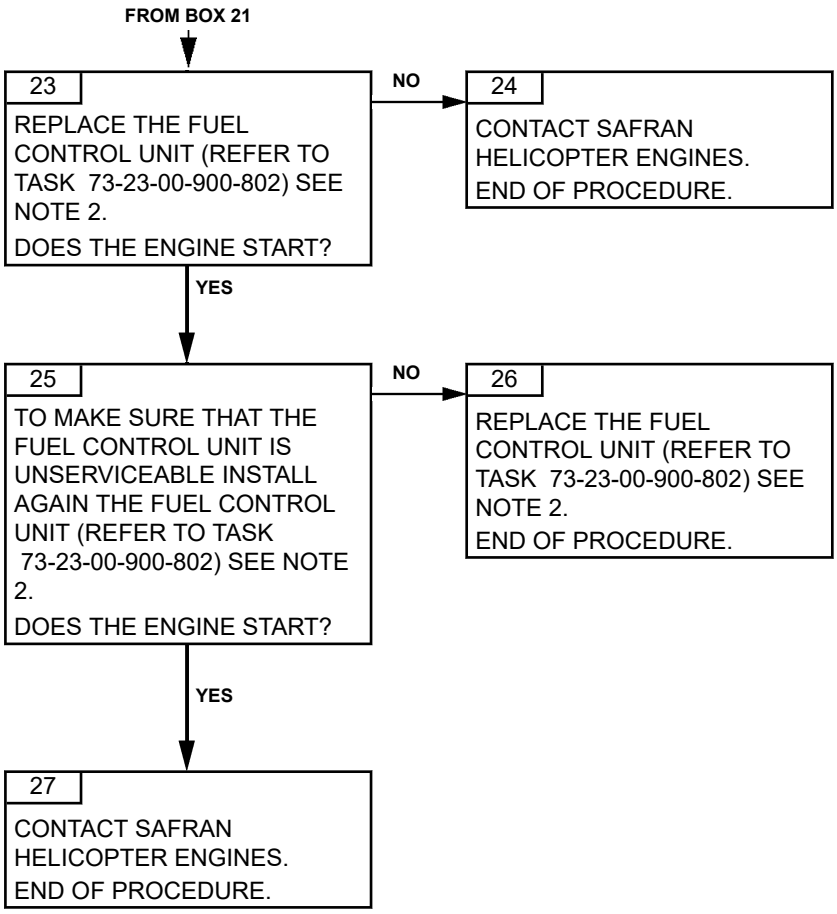












TASK 71-00-06-813-801-A01

# MTOP RATING (MAXIMUM TAKE-OFF POWER) NOT REACHED TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation or during the scheduled inspection of the MTOP (Max. Take-Off power).

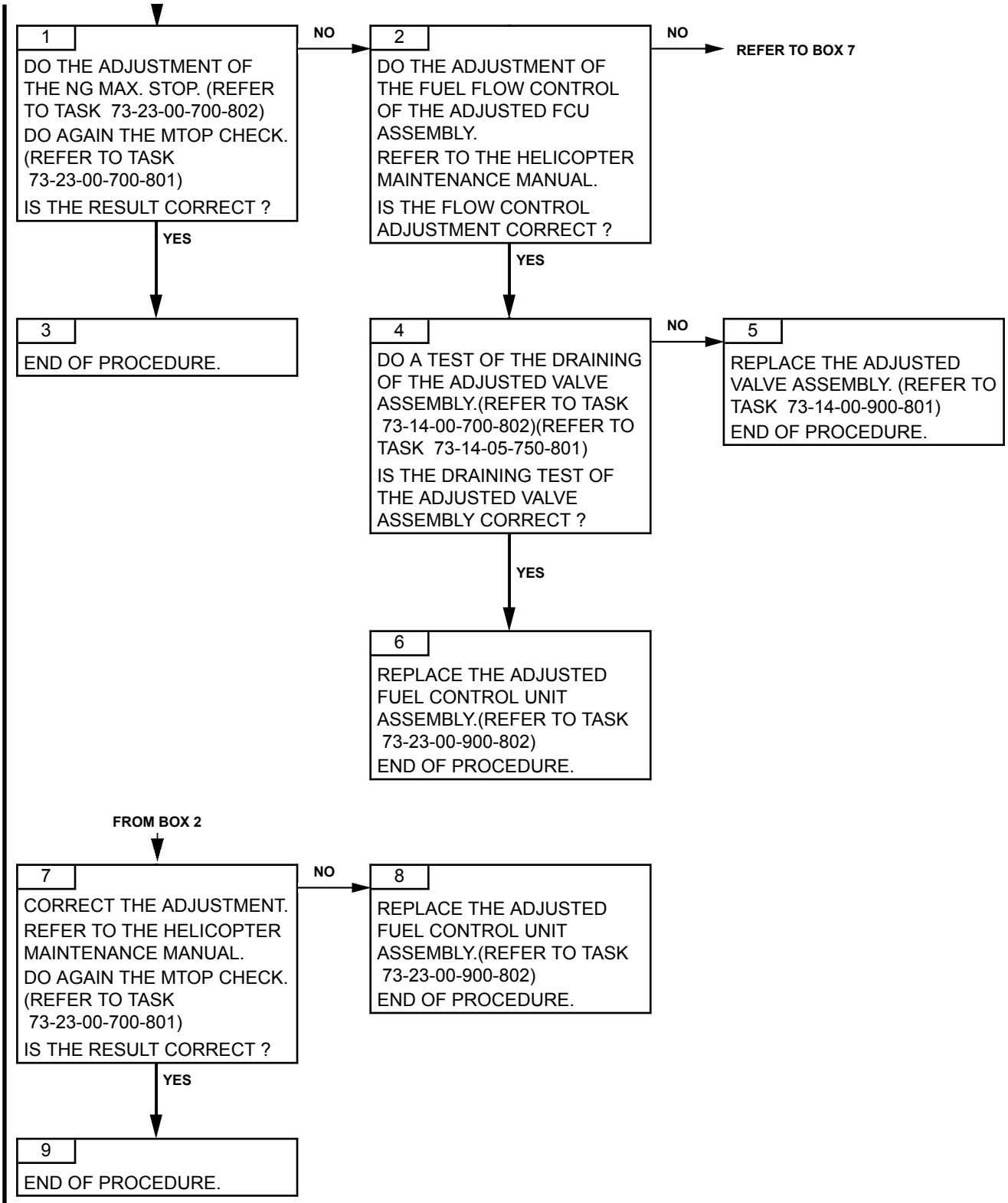
### B. REMINDER OF THE NORMAL OPERATING CONDITION

Refer to the Limitations task (Refer to Task 71-00-01-940-801).

### C. POSSIBLE CAUSES

ADJUSTED FUEL CONTROL UNIT ASSEMBLY
ADJUSTED VALVE ASSEMBLY
FUEL CONTROL
NG MAX. STOP

## 2. PROCEDURE


1
DO THE ADJUSTMENT OF THE NG MAX. STOP. (REFER TO TASK 73-23-00-700-802)
DO AGAIN THE MTOP CHECK. (REFER TO TASK 73-23-00-700-801)
IS THE RESULT CORRECT ?
NO
2
DO THE ADJUSTMENT OF THE FUEL FLOW CONTROL OF THE ADJUSTED FCU ASSEMBLY.
REFER TO THE HELICOPTER MAINTENANCE MANUAL.
IS THE FLOW CONTROL ADJUSTMENT CORRECT ?
NO
REFER TO BOX 7
YES
3
END OF PROCEDURE.
YES
4
DO A TEST OF THE DRAINING OF THE ADJUSTED VALVE ASSEMBLY.(REFER TO TASK 73-14-00-700-802)(REFER TO TASK 73-14-05-750-801)
IS THE DRAINING TEST OF THE ADJUSTED VALVE ASSEMBLY CORRECT ?
NO
5
REPLACE THE ADJUSTED VALVE ASSEMBLY. (REFER TO TASK 73-14-00-900-801)
END OF PROCEDURE.
YES
6
REPLACE THE ADJUSTED FUEL CONTROL UNIT ASSEMBLY.(REFER TO TASK 73-23-00-900-802)
END OF PROCEDURE.
FROM BOX 2
7
CORRECT THE ADJUSTMENT.
REFER TO THE HELICOPTER MAINTENANCE MANUAL.
DO AGAIN THE MTOP CHECK. (REFER TO TASK 73-23-00-700-801)
IS THE RESULT CORRECT ?
NO
8
REPLACE THE ADJUSTED FUEL CONTROL UNIT ASSEMBLY.(REFER TO TASK 73-23-00-900-802)
END OF PROCEDURE.
YES
9
END OF PROCEDURE.

TASK 71-00-06-813-802-A01

# FLUCTUATION OF N1 AND T4.5 TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

No air bleed at the fuel supply system of the engine.
During a stabilized flight, the engine parameters must be constant.

### C. POSSIBLE CAUSES

– Adjusted fuel control unit

## 2. PROCEDURE

1

REPLACEMENT OF THE ADJUSTED FUEL CONTROL UNIT. (REFER TO TASK 73-23-00-900-802)
END OF PROCEDURE.

TASK 71-00-06-813-803-A01

# NO TORQUE INDICATION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

N2 >0%.

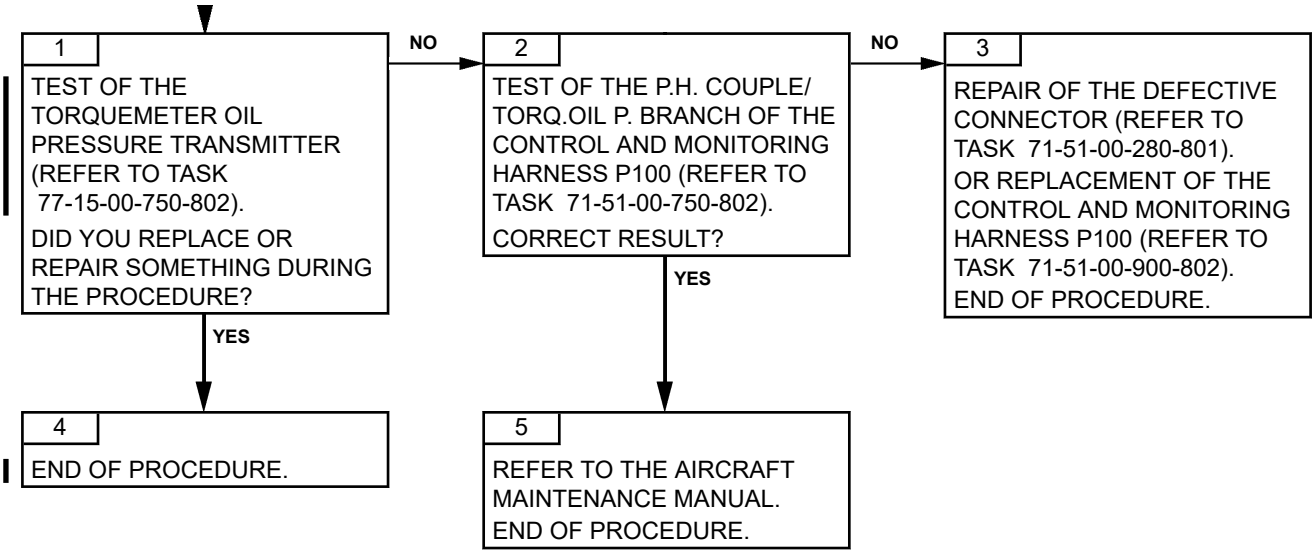
The oil pressure is correct at the oil pressure and temperature visual indicator.

When N2 is more than 0% steady display of the torque visual indicator.

### C. POSSIBLE CAUSES

- Torquemeter oil pressure transmitter
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-813-804-A01

# OIL TEMPERATURE TOO LOW ON THE DIAGRAM VALUES DISPLAY TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. GENERAL DESCRIPTION

The tolerance criteria for oil temperature limitation are defined:
(Refer to Task 71-00-02-940-801).

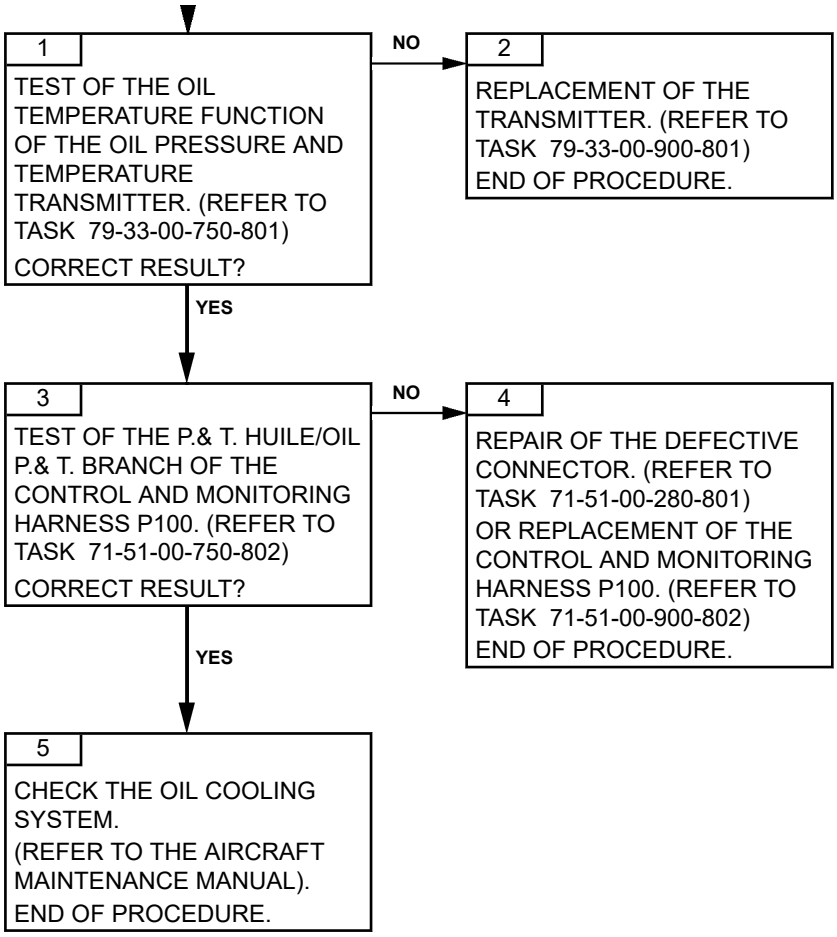
The oil temperature is monitored by the oil pressure and temperature transmitter, connected to the aircraft.

The oil pressure and temperature transmitter is located at the oil filter outlet.

### C. POSSIBLE CAUSES

- Oil pressure and temperature transmitter
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-813-805-A01

# OIL PRESSURE TOO LOW ON THE DIAGRAM VALUES DISPLAY TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. GENERAL DESCRIPTION

The tolerance criteria for oil temperature limitation are defined:
(Refer to Task 71-00-02-940-801).

The oil level must be correct and the pre-blockage visual indicator of the oil filtering element not popped out.

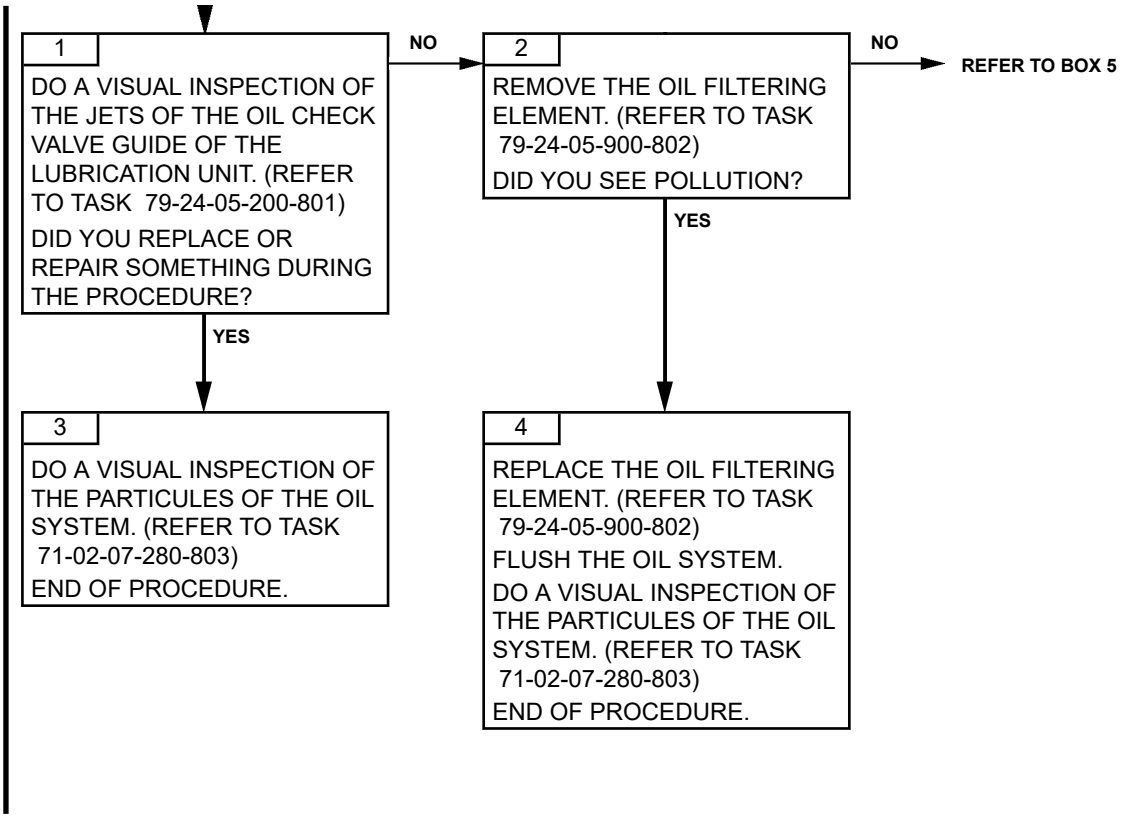
The oil pressure is monitored by the oil pressure and temperature transmitter, connected to the aircraft.

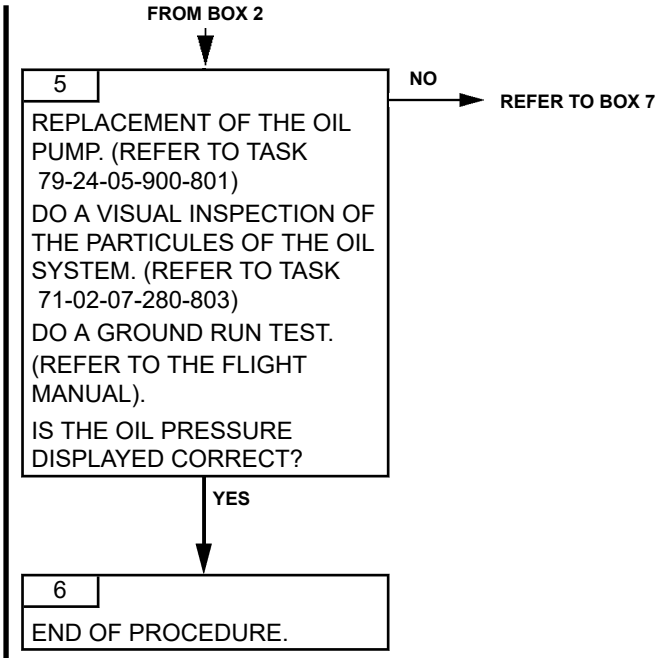
The oil pressure and temperature transmitter is located at the oil filter outlet.

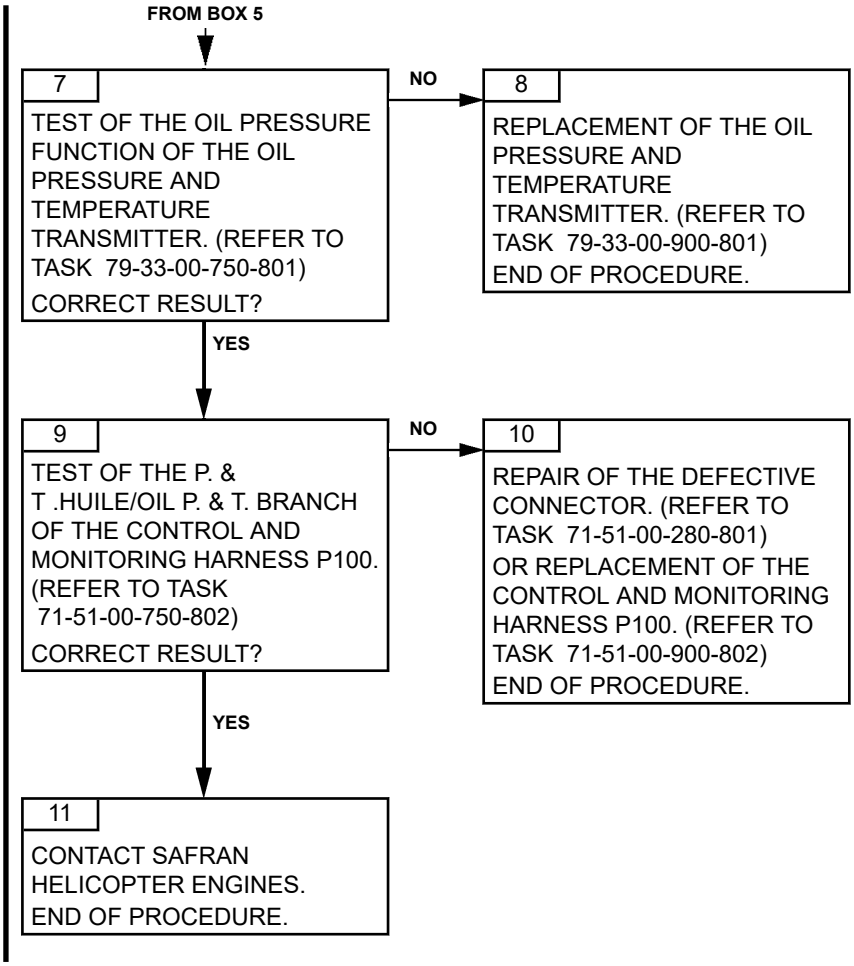
### C. POSSIBLE CAUSES

- Oil pressure and temperature transmitter
- Oil pump
- Oil system contamination
- Control and monitoring harness P100

## 2. PROCEDURE




FROM BOX 2
5
REPLACEMENT OF THE OIL PUMP. (REFER TO TASK 79-24-05-900-801)
DO A VISUAL INSPECTION OF THE PARTICULES OF THE OIL SYSTEM. (REFER TO TASK 71-02-07-280-803)
DO A GROUND RUN TEST. (REFER TO THE FLIGHT MANUAL).
IS THE OIL PRESSURE DISPLAYED CORRECT?
NO
REFER TO BOX 7
YES
6
END OF PROCEDURE.



TASK 71-00-06-813-806-A01

# "ENG P" MESSAGE (LOW OIL PRESSURE) DURING ENGINE RUNNING TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. GENERAL DESCRIPTION

The tolerance criteria for oil pressure limitation are defined: (Refer to Task 71-00-02-940-801).

The low oil pressure switch is located at the oil filter outlet.

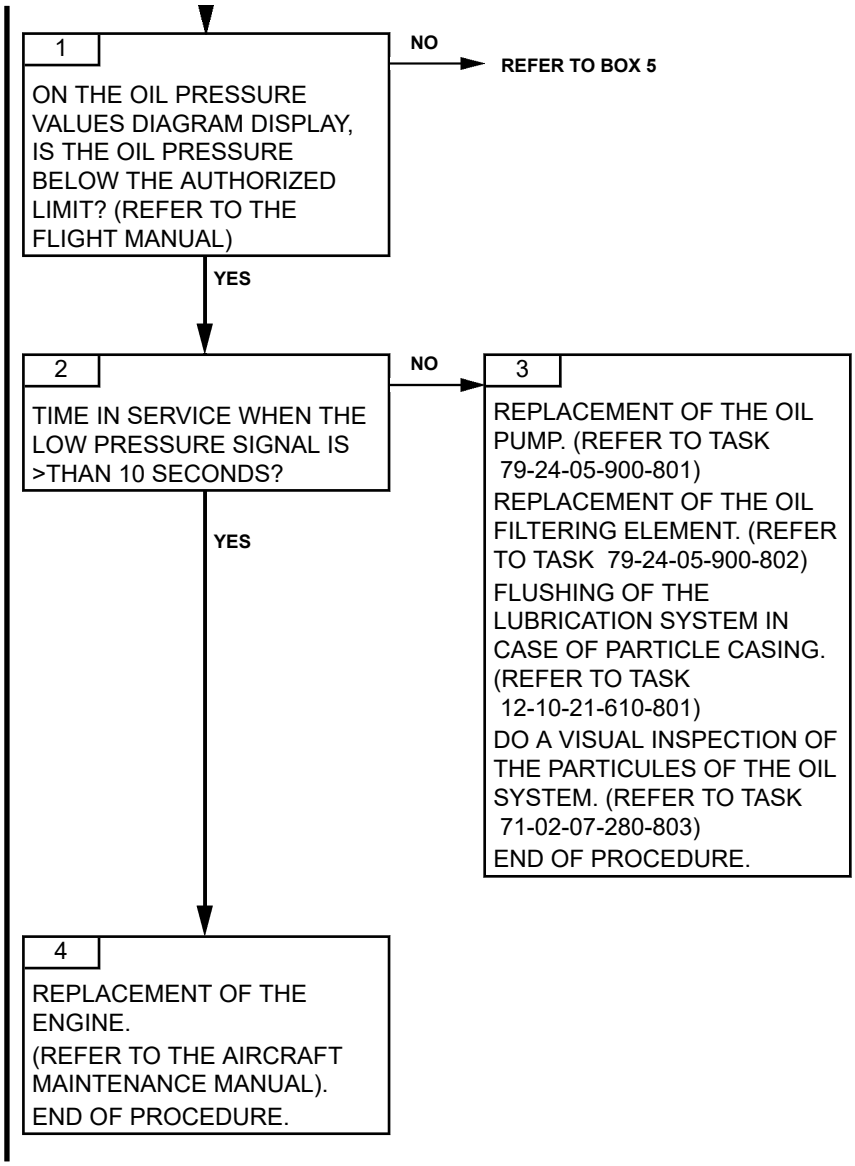
The low oil pressure switch is connected to the aircraft.

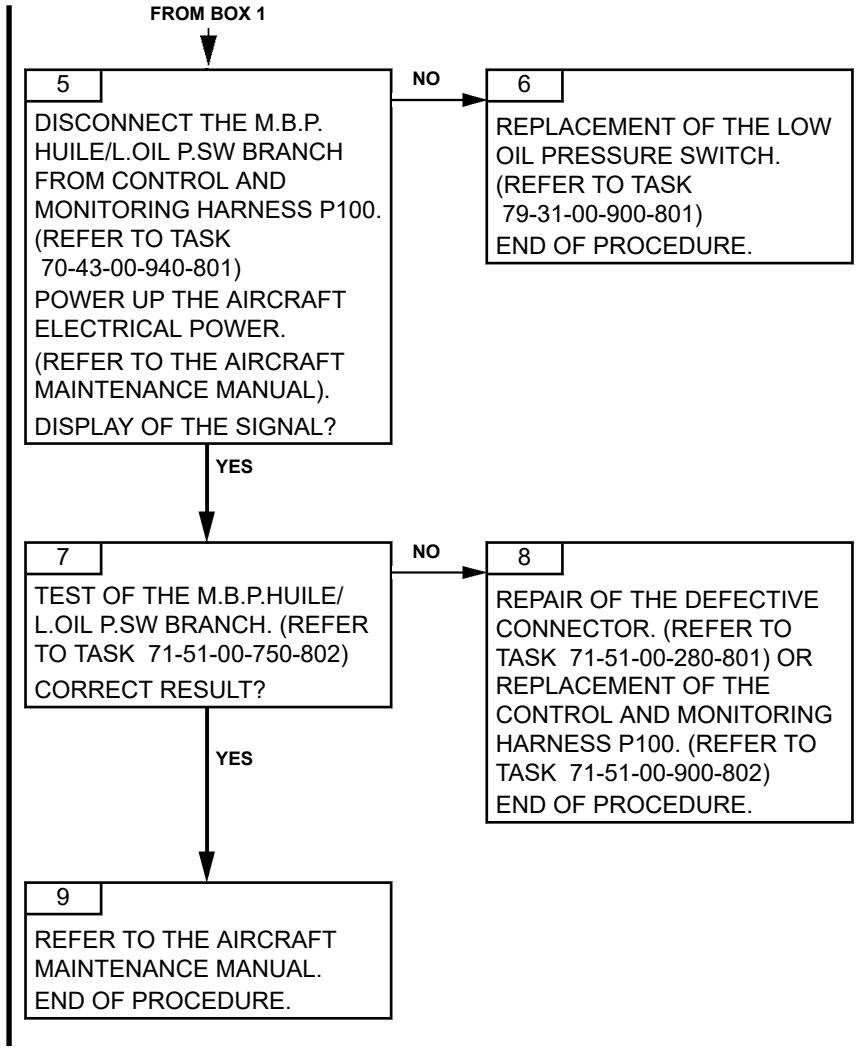
The "ENG-P" light must be OFF during the engine running.

### C. POSSIBLE CAUSES

- Low oil pressure switch
- Oil pump
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-813-807-A01

# CONTROLLED ENGINE SHUTDOWN NOT POSSIBLE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

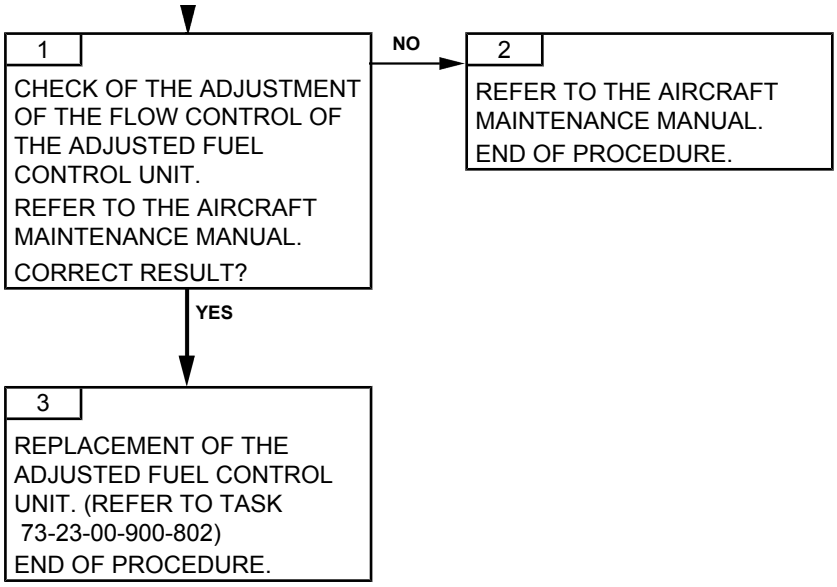
Display of the twist boom visual indicator on "stop".

The twist boom is used to turn off the flow valve of the adjusted fuel control unit. The fuel supply of the engine is stopped.

### C. POSSIBLE CAUSES

– Adjusted fuel control unit
– Aircraft

## 2. PROCEDURE



TASK 71-00-06-813-808-A01

# NR DRIFT TROUBLESHOOTING

## 1. GENERAL

***NOTE:*** ***To do a satisfactory analysis of the occurrence, please fill in the EC120 B - ARRIUS 2F "Investigation Form" and send it to your nearest Safran Helicopter Engines representative ( Refer to Figure 101)***

### A. PHASE

During operation or during level flight at maximum continuous power.

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The nominal speeds and maximum continuous power ratings are defined in the flight manual.

### C. POSSIBLE CAUSES

- P3 pipe
- Anticipator - Refer to the aircraft manufacturer documentation
- Aircraft fuel system (engine inlet strainer)
- FCU filtering element
- Fuel control unit
- Adjusted valve assembly

***NOTE:*** ***Do a check of the NR measurement system for correct operation. Refer to the Aircraft Maintenance Manual.***

PAGE LEFT BLANK INTENTIONALLY

## EC120 B - ARRIUS 2 F

"Investigation Form"

### External parameters:

Where is the helicopter parked before flight? ☐ Inside ☐ Outside

Atmospheric pressure and temperature when helicopter is parked:

P0:

T0:

### Equipment:

FCU P/N:

FCU S/N:

FCU TSN:

Engine S/N:

Engine TSN:

Fuel type:

### Engine parameters prior to incident (if available):

N1:

N2:

T45:

Engine oil pressure:

Torque:

### Engine parameters reached during incident:

N1:

N2:

T45:

Engine oil pressure:

Torque:

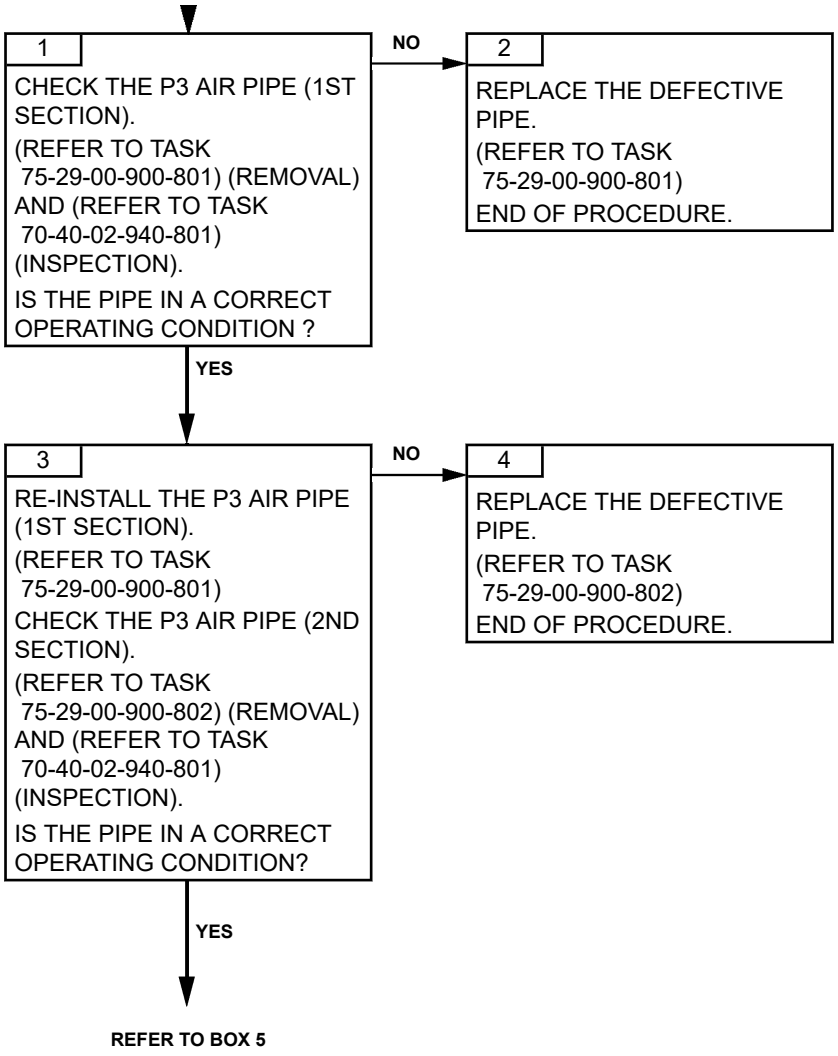
### Flight conditions:

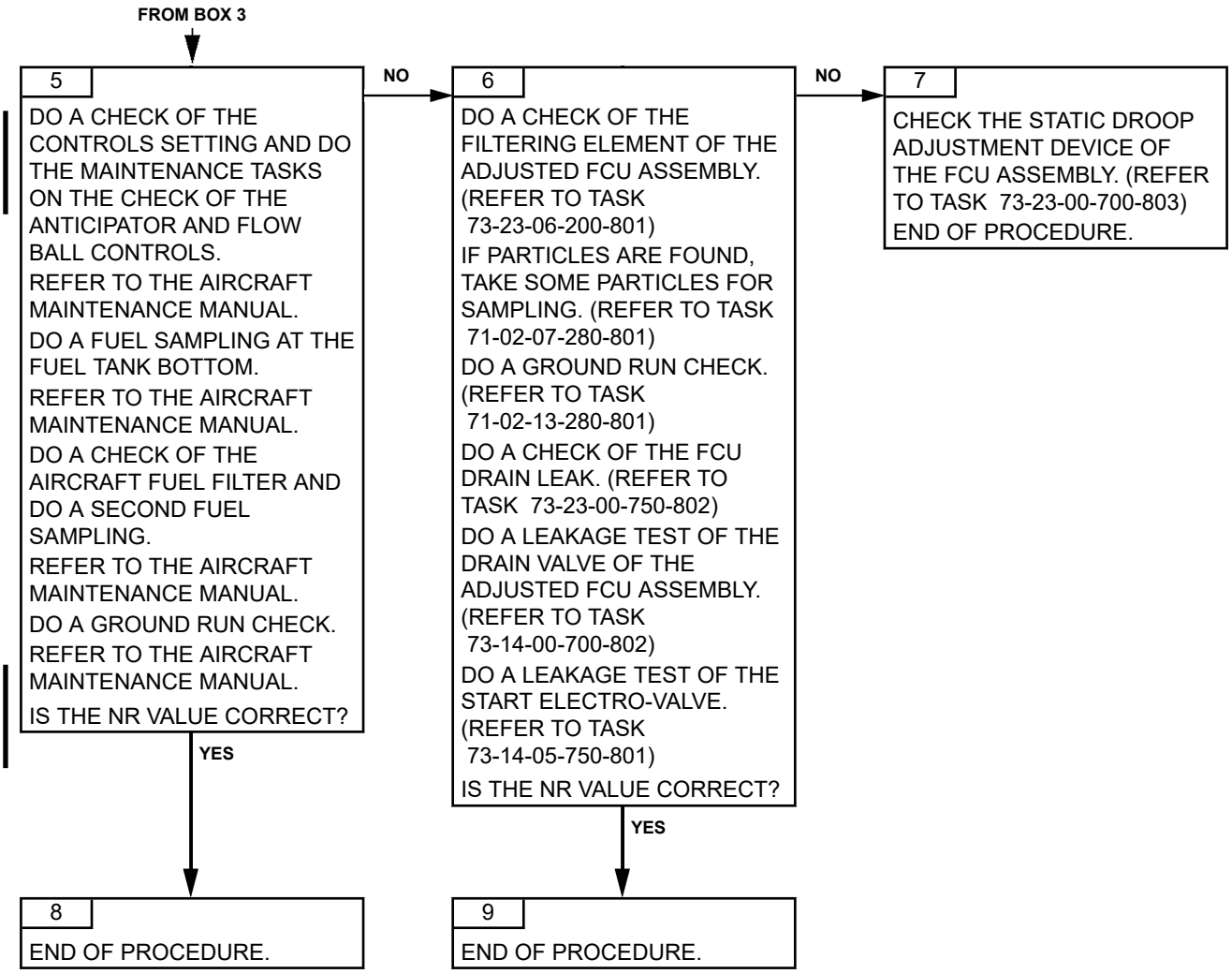
☐ Cruising flight ☐ Hovering flight

☐ During a power increase ☐ During a power decrease

Investigation Form
Figure 101

## 2. PROCEDURE





TASK 71-00-06-813-810-A01

# POWER ASSURANCE CHECK - INCORRECT MARGIN TROUBLESHOOTING

## 1. GENERAL

### A. GENERAL DESCRIPTION

For the PAC (Power Assurance Check) to be acceptable:

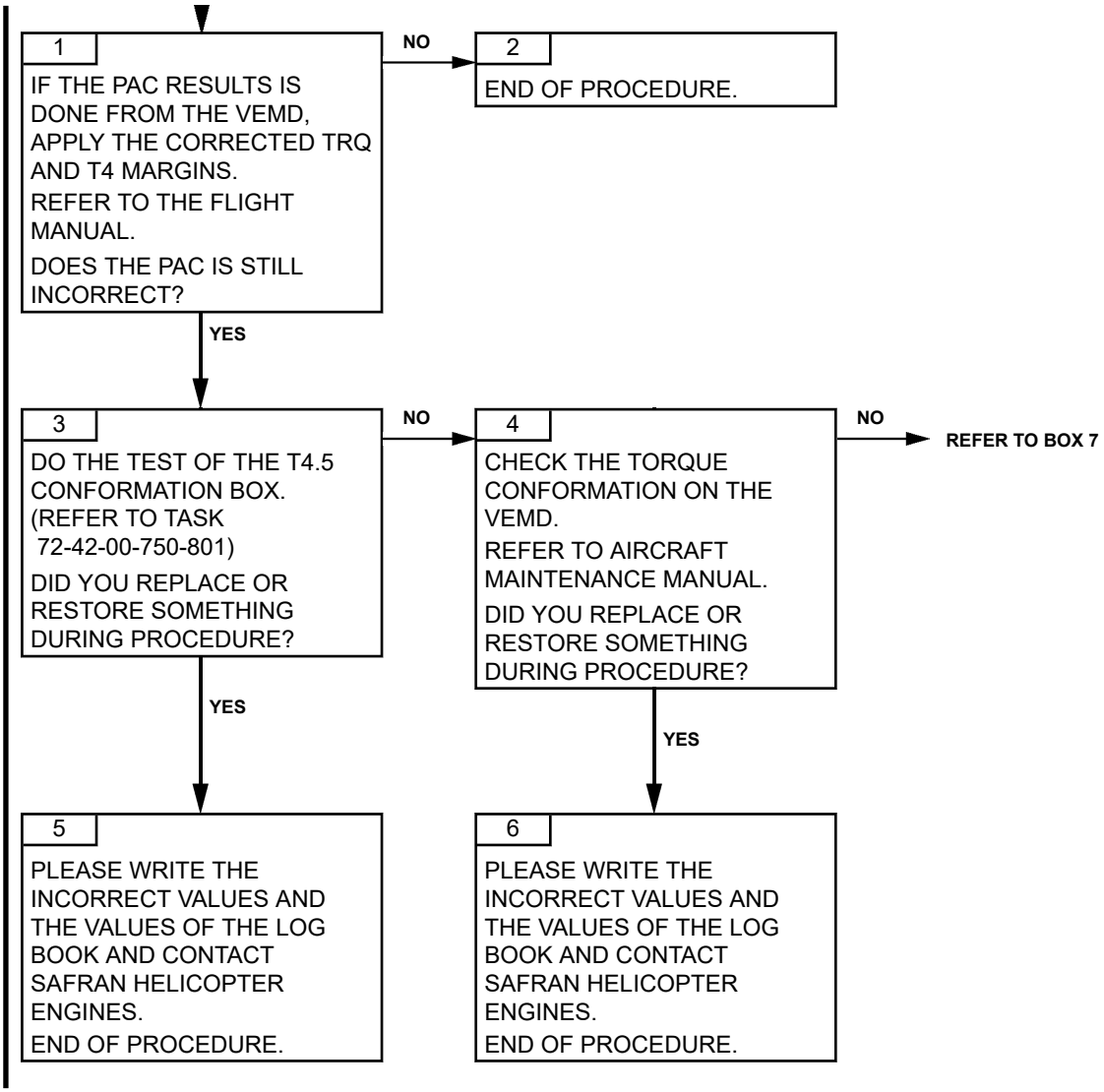
- The value "TRQ MARGIN" must be positive corresponding on VEMD display to "GOOD"
- The value "T4 MARGIN" must be negative corresponding on VEMD display to "GOOD".

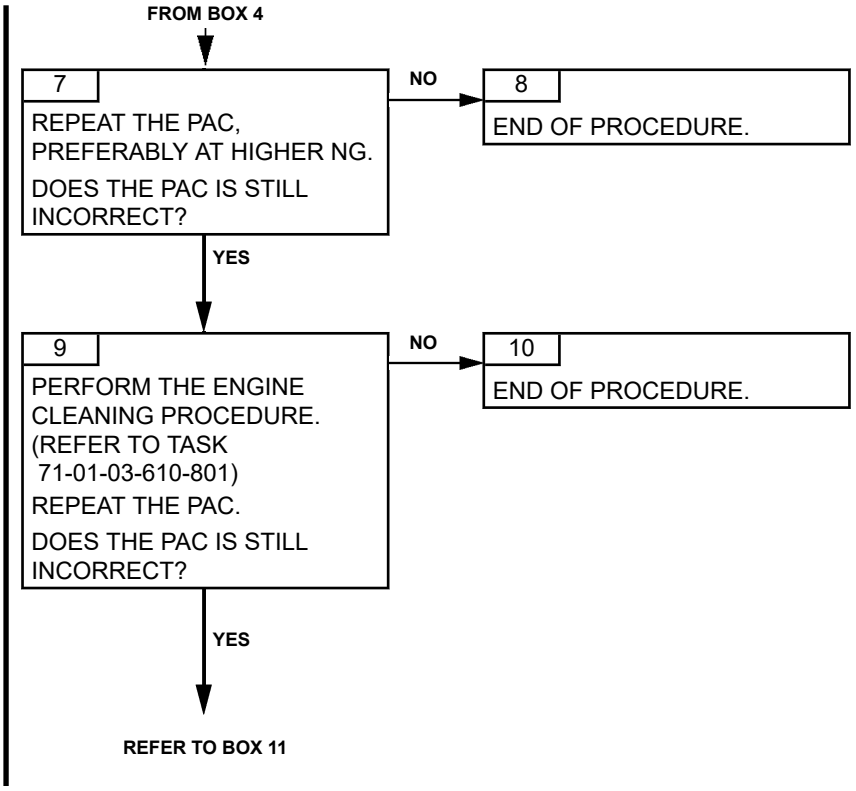
The PAC procedure is defined in the Flight Manual, Section 5.3.

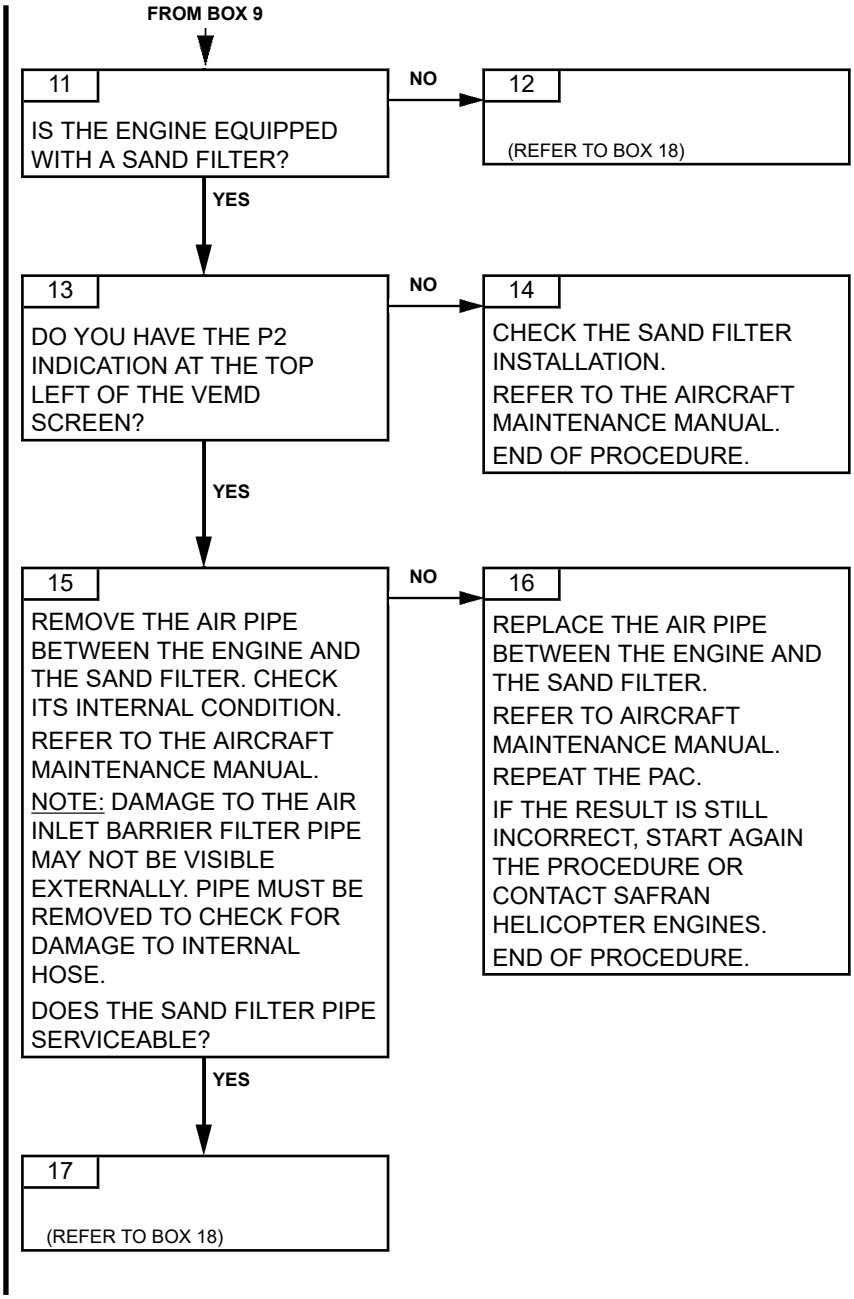
### B. POSSIBLE CAUSES

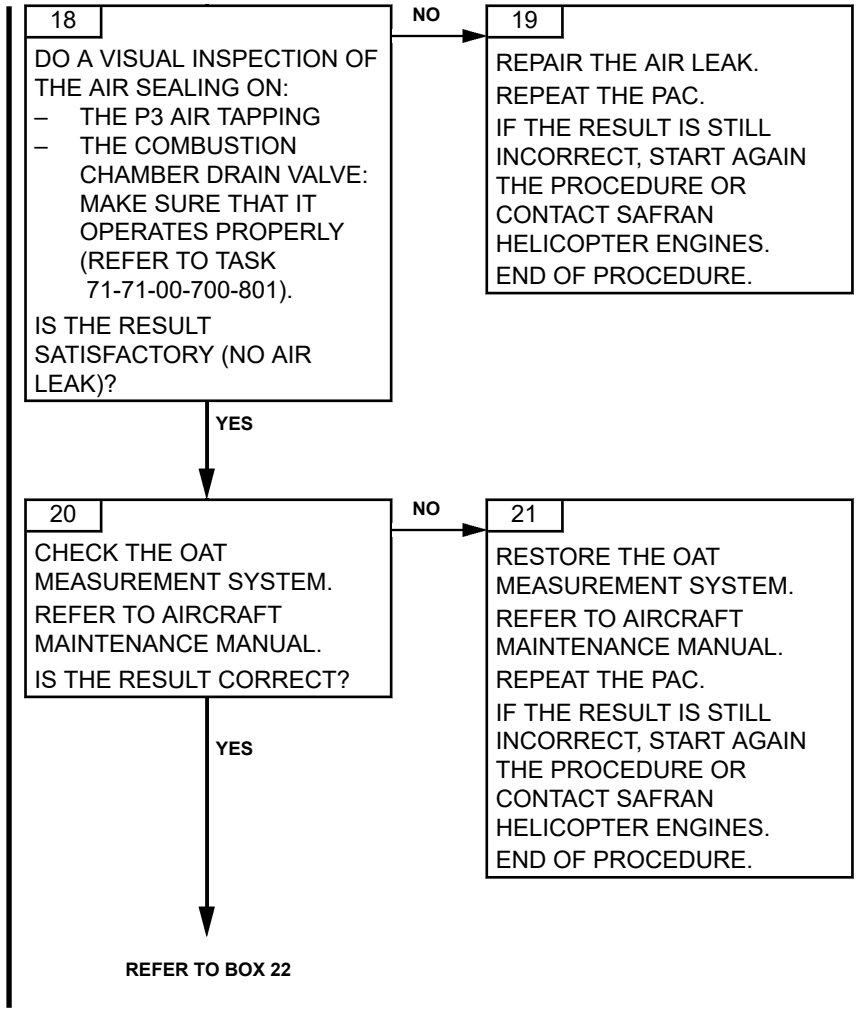
- T4.5 conformation
- TORQUE conformation
- Air path contamination
- Air leaks
- Torquemeter pressure transmitter
- Torquemeter piston seal
- Module 2
- OAT sensor (Aircraft)
- Sand filter air pipe (Aircraft)
- Sand filter installation system (Aircraft).

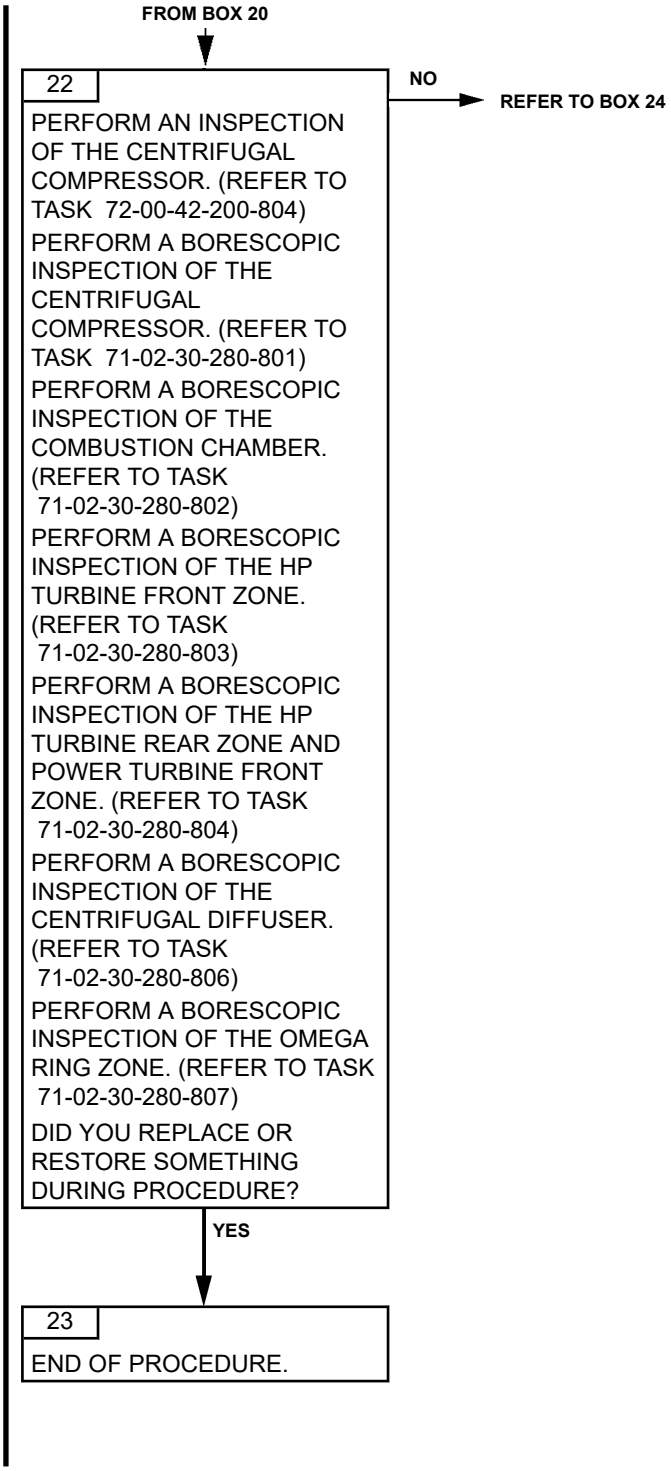
## 2. PROCEDURE

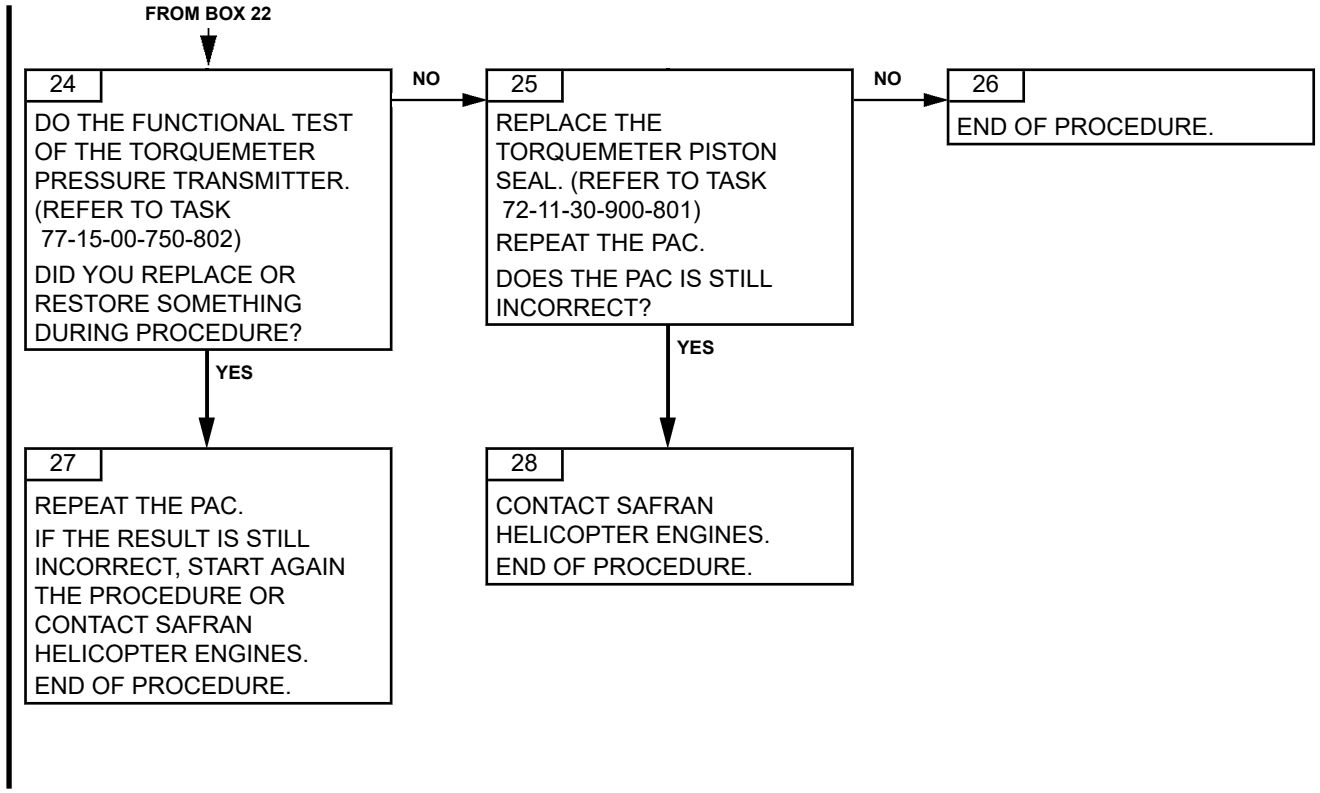











FROM BOX 22
24
DO THE FUNCTIONAL TEST OF THE TORQUEMETER PRESSURE TRANSMITTER. (REFER TO TASK 77-15-00-750-802)
DID YOU REPLACE OR RESTORE SOMETHING DURING PROCEDURE?
NO
25
REPLACE THE TORQUEMETER PISTON SEAL. (REFER TO TASK 72-11-30-900-801)
REPEAT THE PAC.
DOES THE PAC IS STILL INCORRECT?
NO
26
END OF PROCEDURE.
YES
27
REPEAT THE PAC.
IF THE RESULT IS STILL INCORRECT, START AGAIN THE PROCEDURE OR CONTACT SAFRAN HELICOPTER ENGINES.
END OF PROCEDURE.
YES
28
CONTACT SAFRAN HELICOPTER ENGINES.
END OF PROCEDURE.

PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-813-811-A01

# UNJUSTIFIED FIRE SIGNAL TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

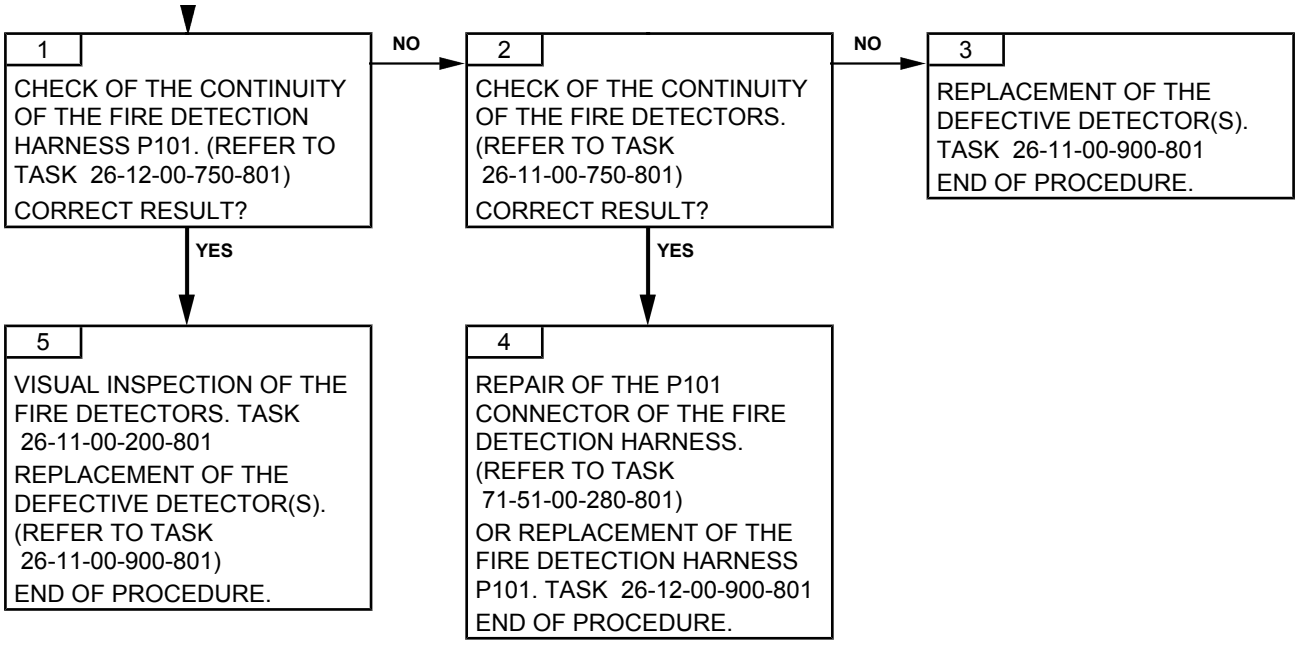
### B. REMINDER OF THE NORMAL OPERATING CONDITION

The fire visual indicator system of the aircraft is correct.
No display of the signal.

### C. POSSIBLE CAUSES

– Fire detector
– Fire detection harness P101

## 2. PROCEDURE



TASK 71-00-06-813-812-A01

# ENGINE PARAMETER OSCILLATIONS: TORQUE, NG, NR
# TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Toutes

### B. REMINDER OF THE NORMAL OPERATING CONDITION

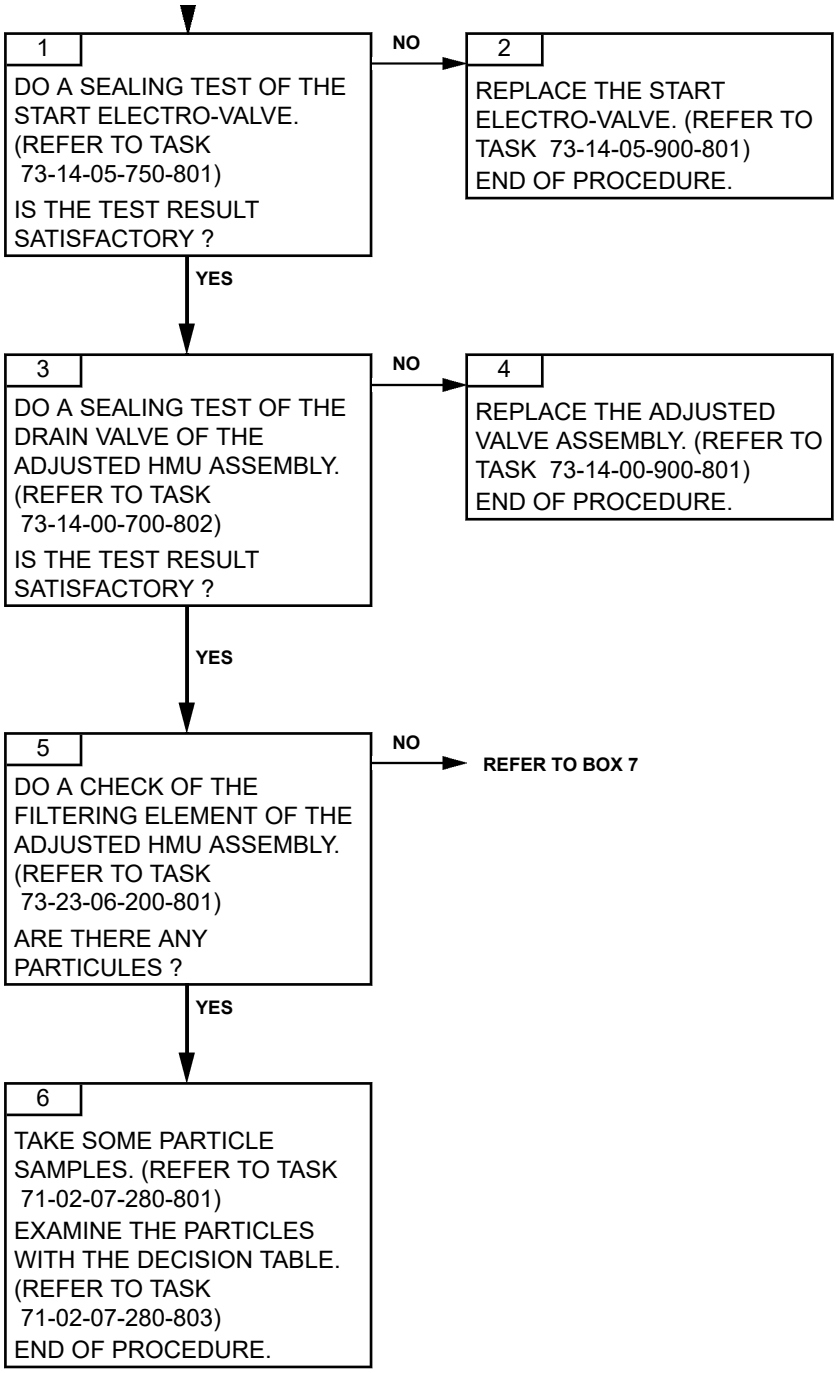
The engine parameter oscillations must remain in compliance with the criteria.
(Refer to Task 71-00-01-940-801)

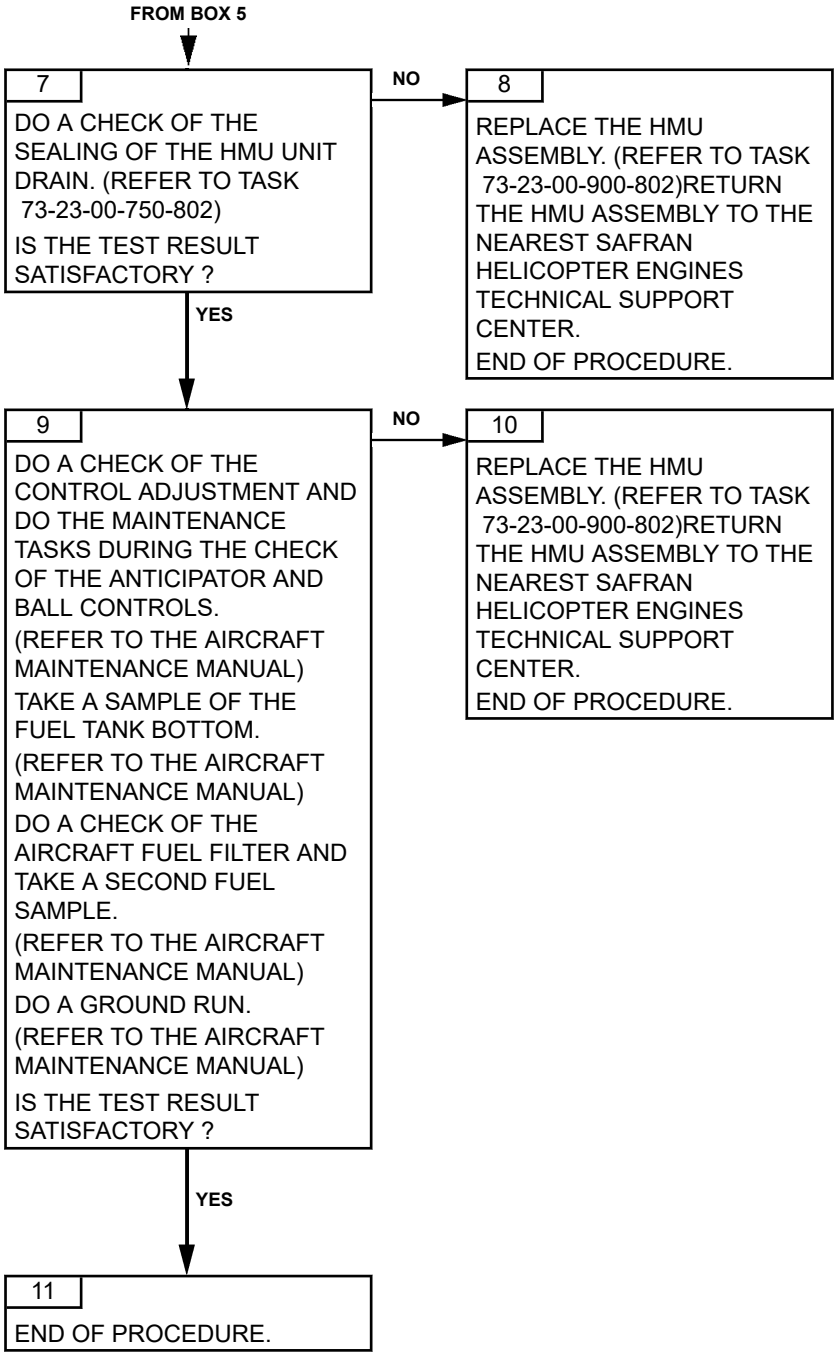
### C. POSSIBLE CAUSES

- Start electro-valve
- Adjusted valve assembly
- Fuel contamination
- HMU assembly
- Anticipator control

## 2. PROCEDURE

***NOTE:*** ***To do a correct analysis of the event, please complete the EC120 B - ARRIUS 2F "Investigation Form" and send it to the nearest Safran Helicopter Engines representative.***





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-813-813-A01

# NONCOMPLIANT TEMPERATURE MARGIN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

**CAUTION: IF A MAINTENANCE OPERATION HAS BEEN RECENTLY PERFORMED ON ONE OF THE ABOVE LISTED FUNCTIONS, GIVE PRIORITY FIRST TO THE CHECK OF THE FUNCTION CONCERNED BY THIS OPERATION.**

**CAUTION: IN THE CASE OF A NEW HELICOPTER AND/OR NEW ENGINE, GIVE PRIORITY TO THE CHECK OF THE MEASUREMENT SYSTEMS.**

**CAUTION: IF POSSIBLE, CHECK THE CONSISTENCY OF THE OAT MEASUREMENT SYSTEM DISPLAYED ON VEMD WITH AN EXTERNAL REFERENCE. IN CASE OF INCONSISTENCY, GIVE PRIORITY TO THE CHECK OF THIS MEASUREMENT SYSTEM.**

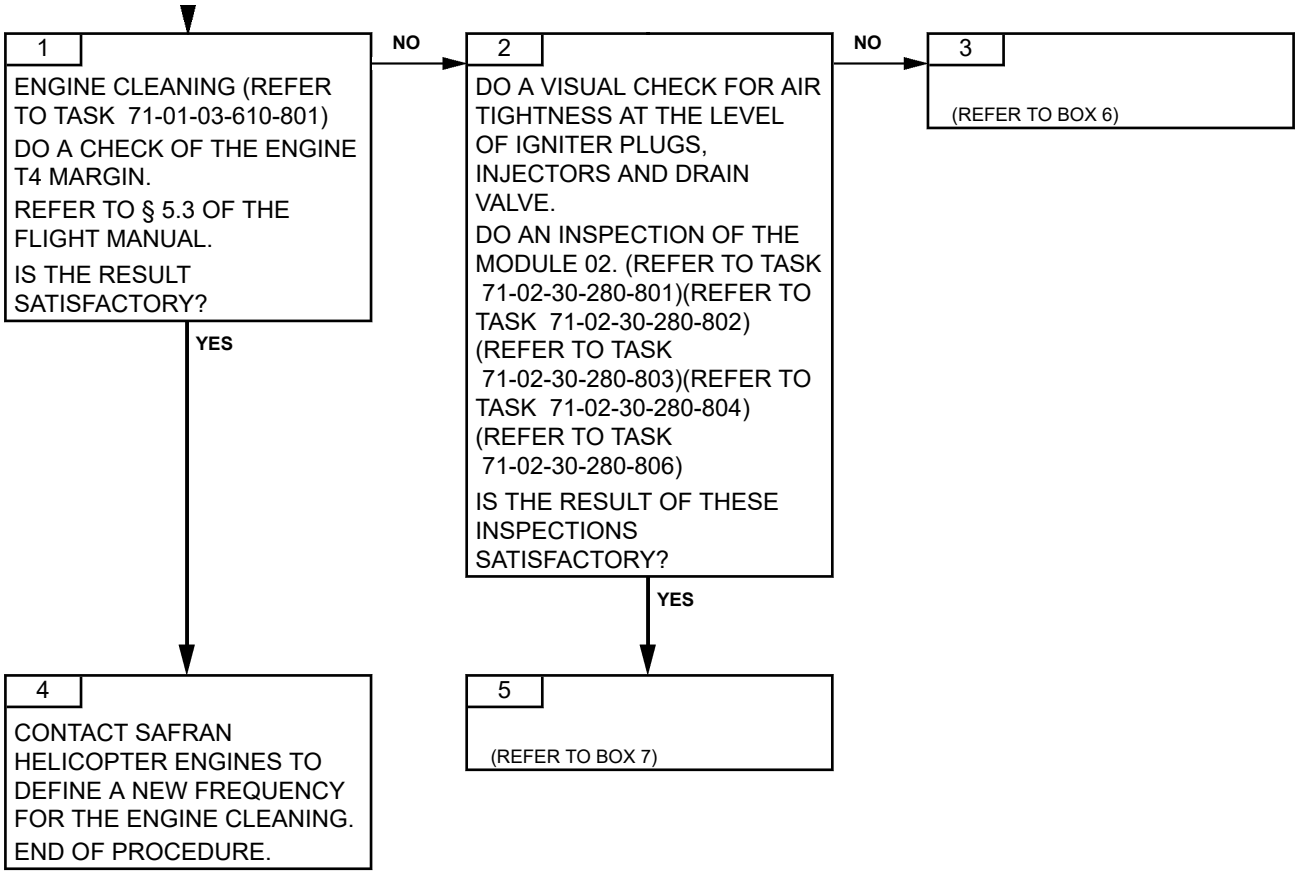
During operation

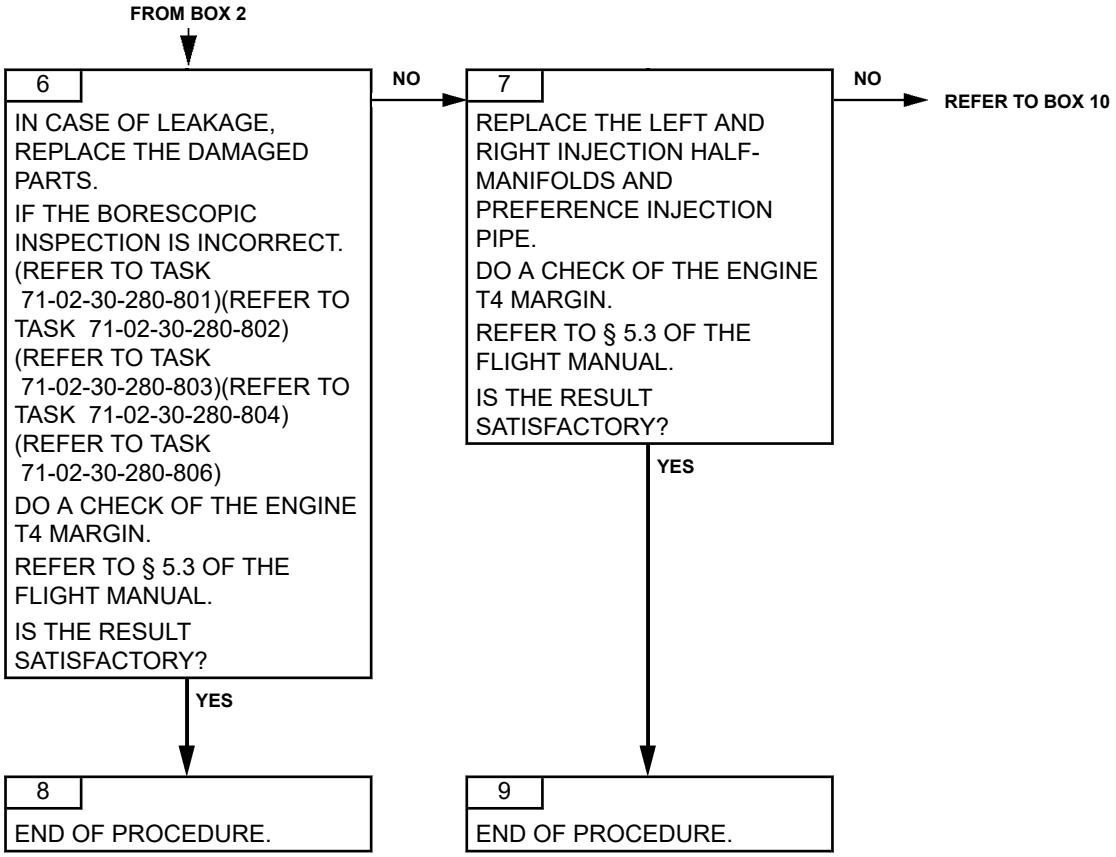
Findings made following the application of the procedure for checking the engine in flight.

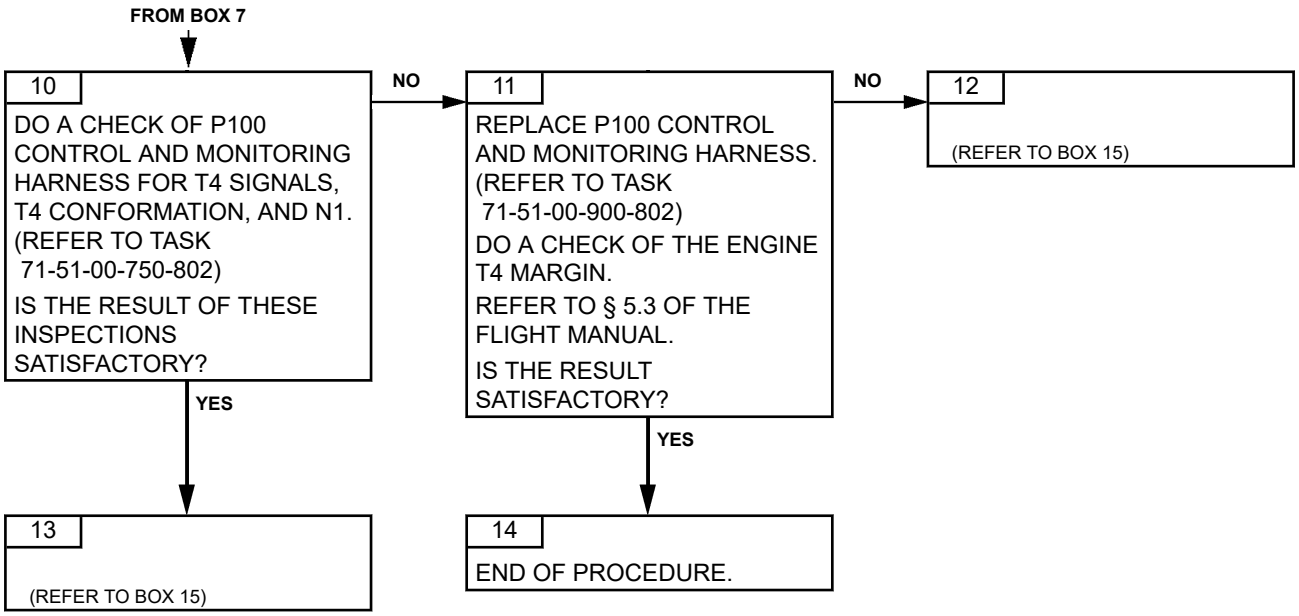
### B. POSSIBLE CAUSES

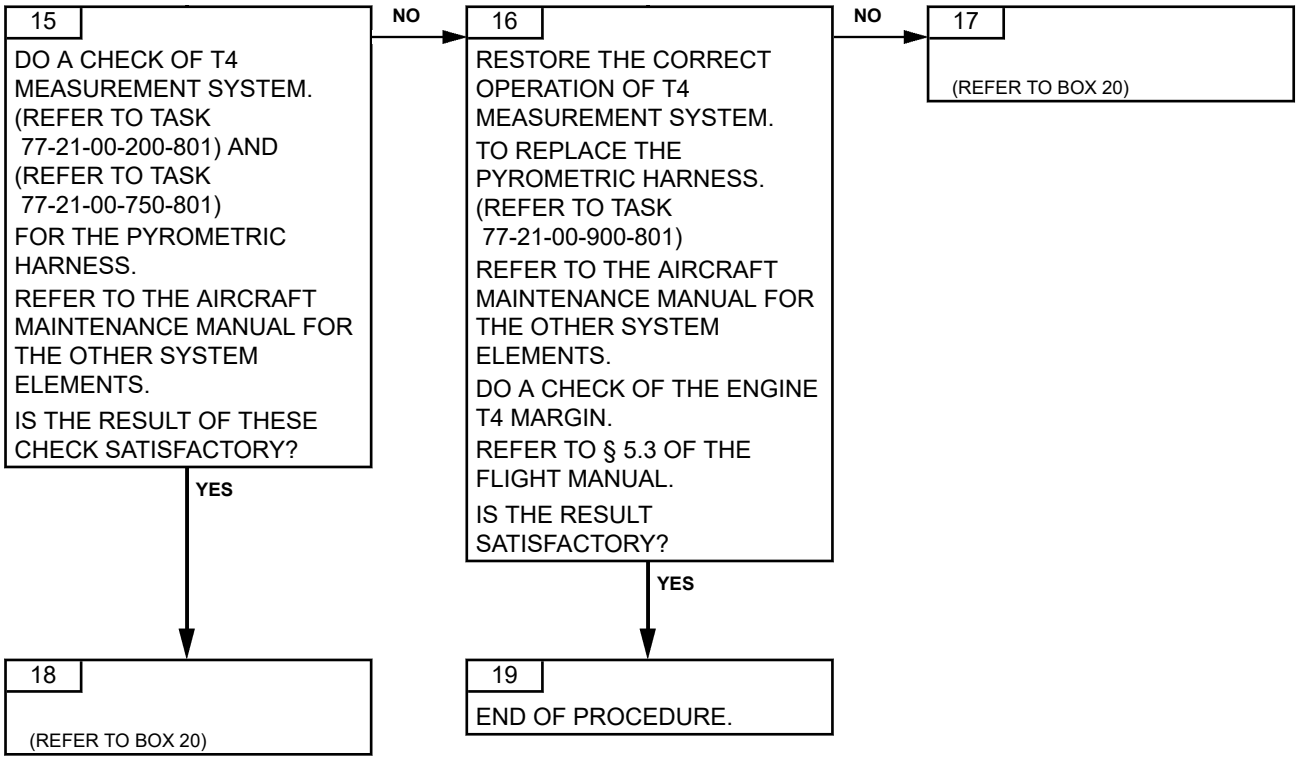
- Air path (cleaning)
- Module 02
- Injectors (air leakage and blockage)
- Igniter plugs (air leakage)
- Drain valve (air leakage)
- Air tapping (air leakage)
- Control and monitoring harness
- T4 measurement system
- OAT measurement system
- Zp measurement system

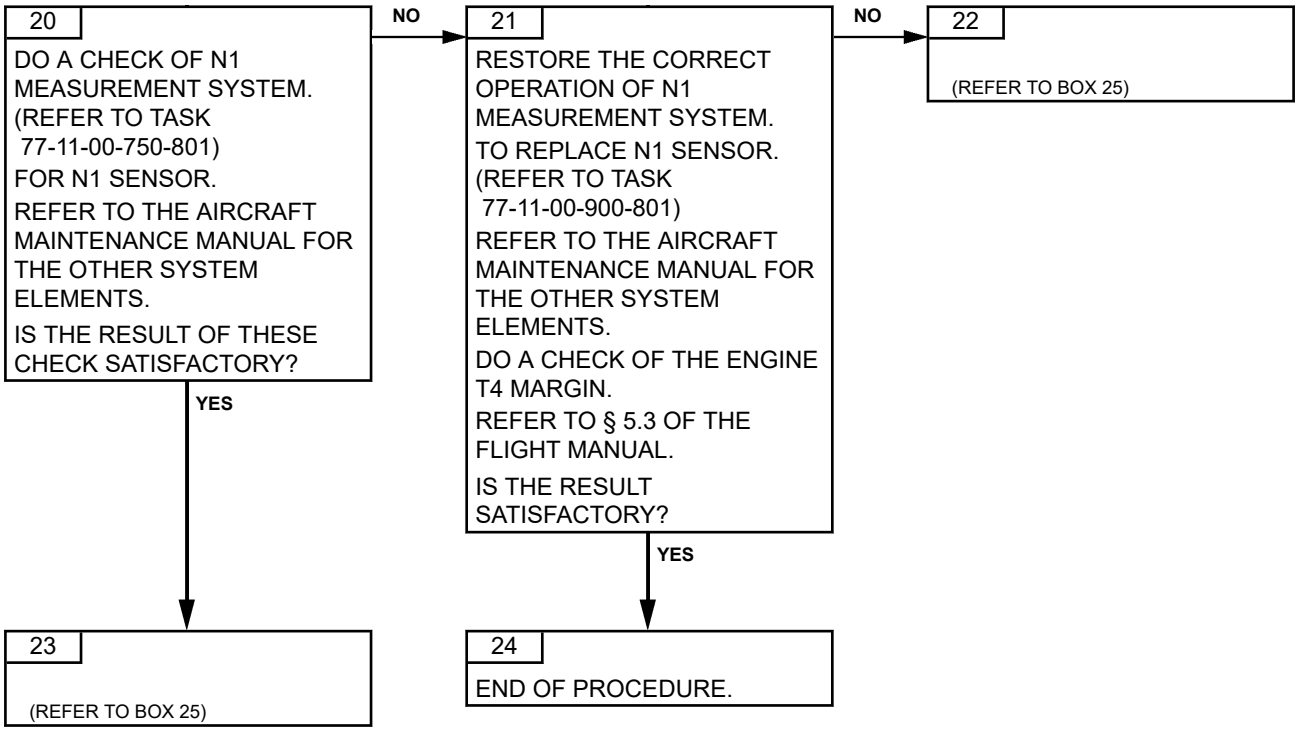
## 2. PROCEDURE

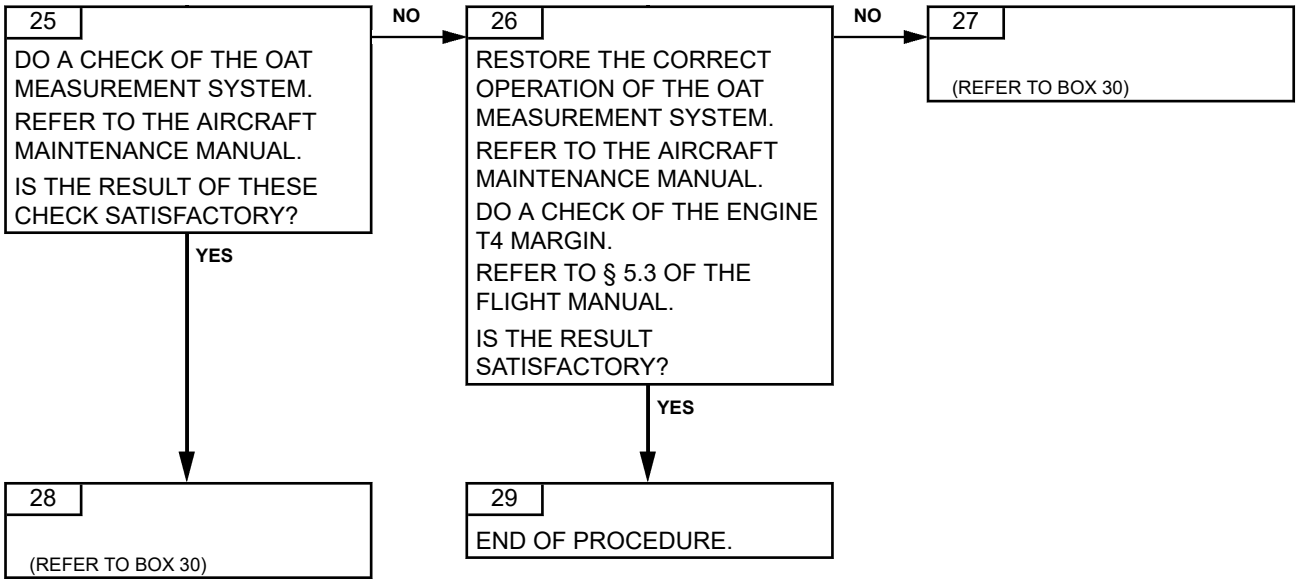


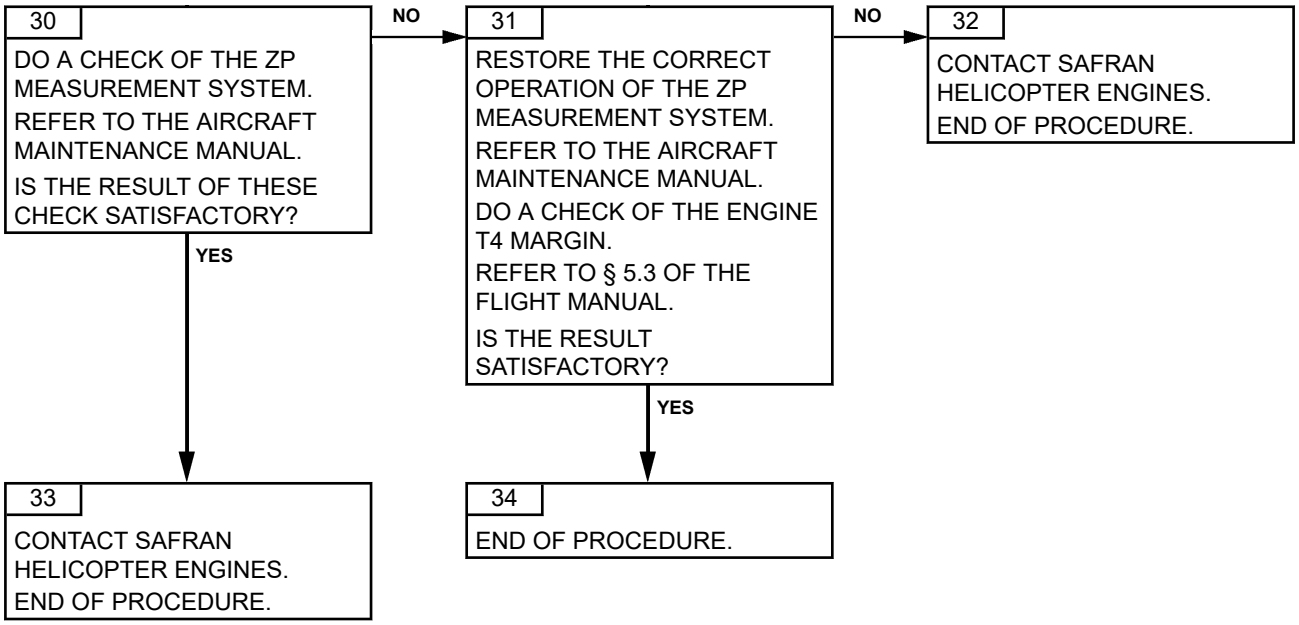












TASK 71-00-06-814-802-A01

# ABNORMAL NOISES TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Stop phase

### B. REMINDER OF THE NORMAL OPERATING CONDITION

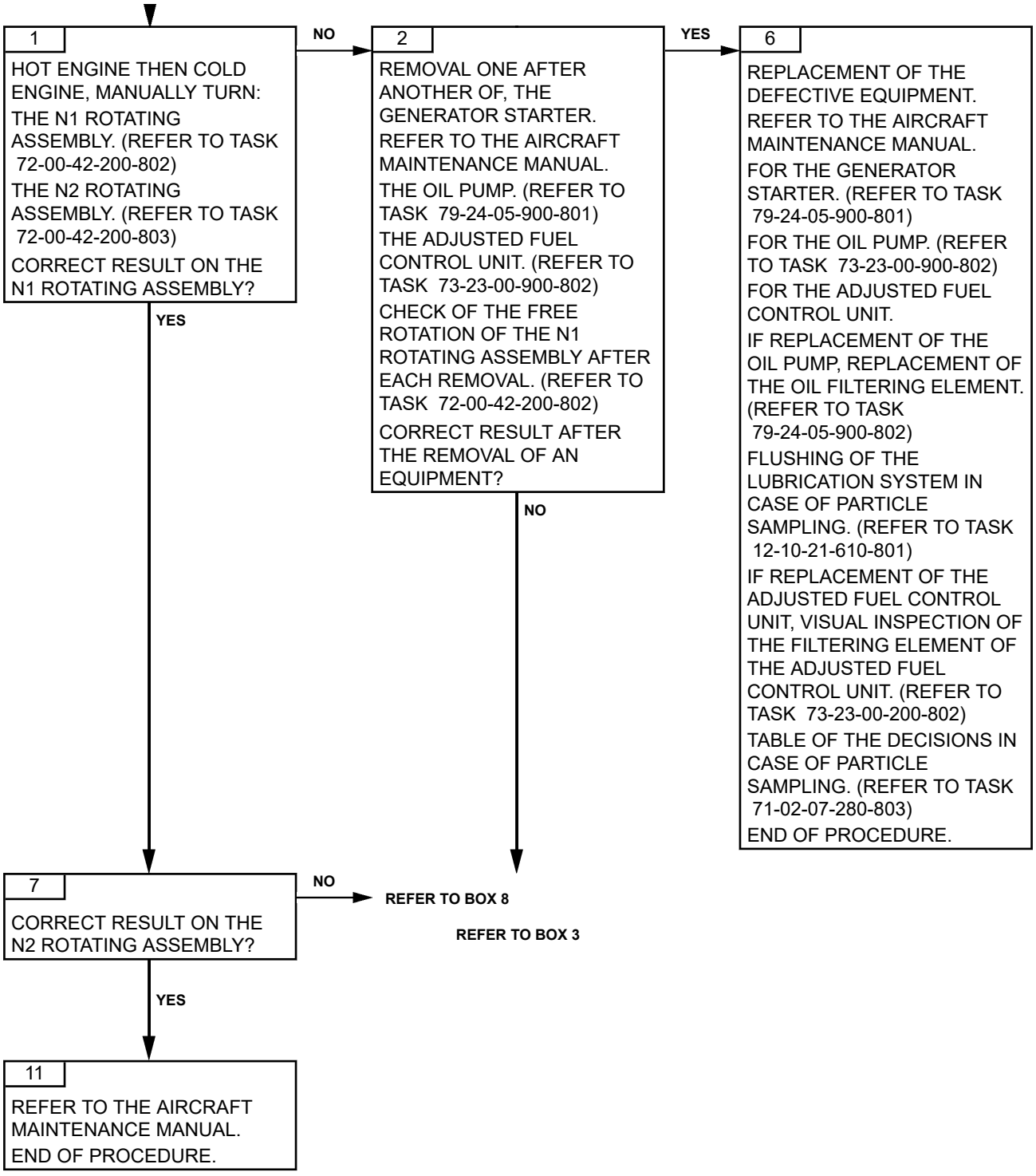
No defects during operation.

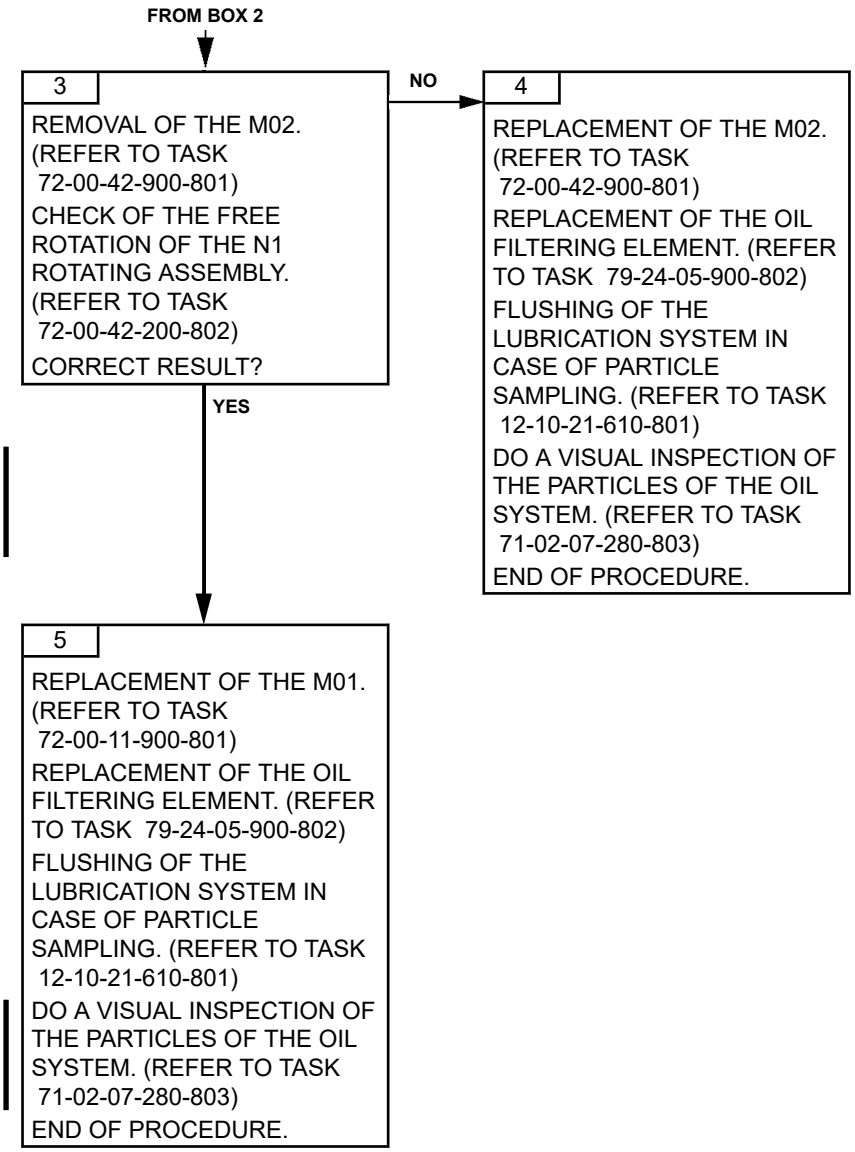
Only the rattle of the blade roots of the free turbine in the housing of the wheel is normal.

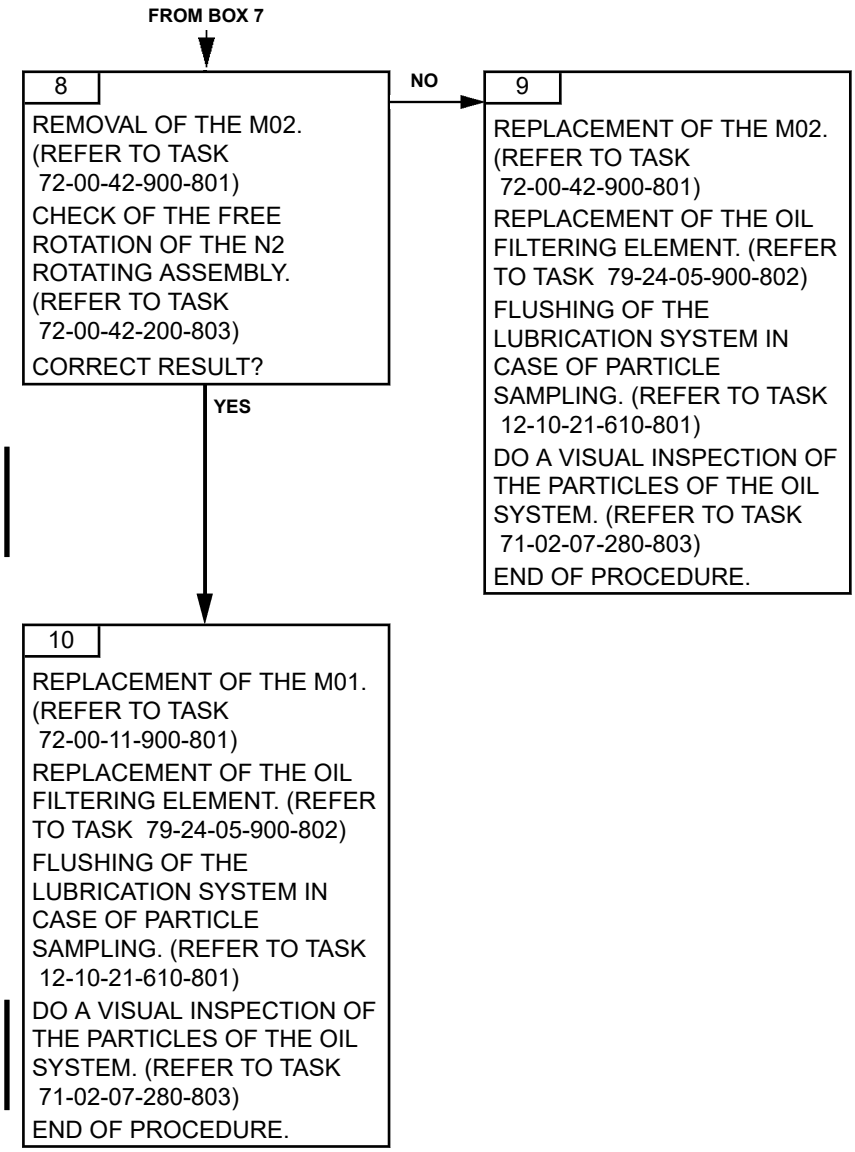
### C. POSSIBLE CAUSES

- Module 1 or 2 (M01 or M02)
- Oil pump
- Adjusted fuel control unit
- Generator starter
- Aircraft

## 2. PROCEDURE







TASK 71-00-06-814-804-A01

# VIBRATIONS TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

N1 < 15 efficient mm/s between 0 and 45,000 rpm.

N1 < 10 efficient mm/s between 45,000 and 56,000 rpm.

N2 < 15 efficient mm/s between 0 and 44,000 rpm.

or

The overall vibration level (N1 + N2) is> 20 efficient mm/s.

It is measured during a start phase after a stop ≤ 3 mn.

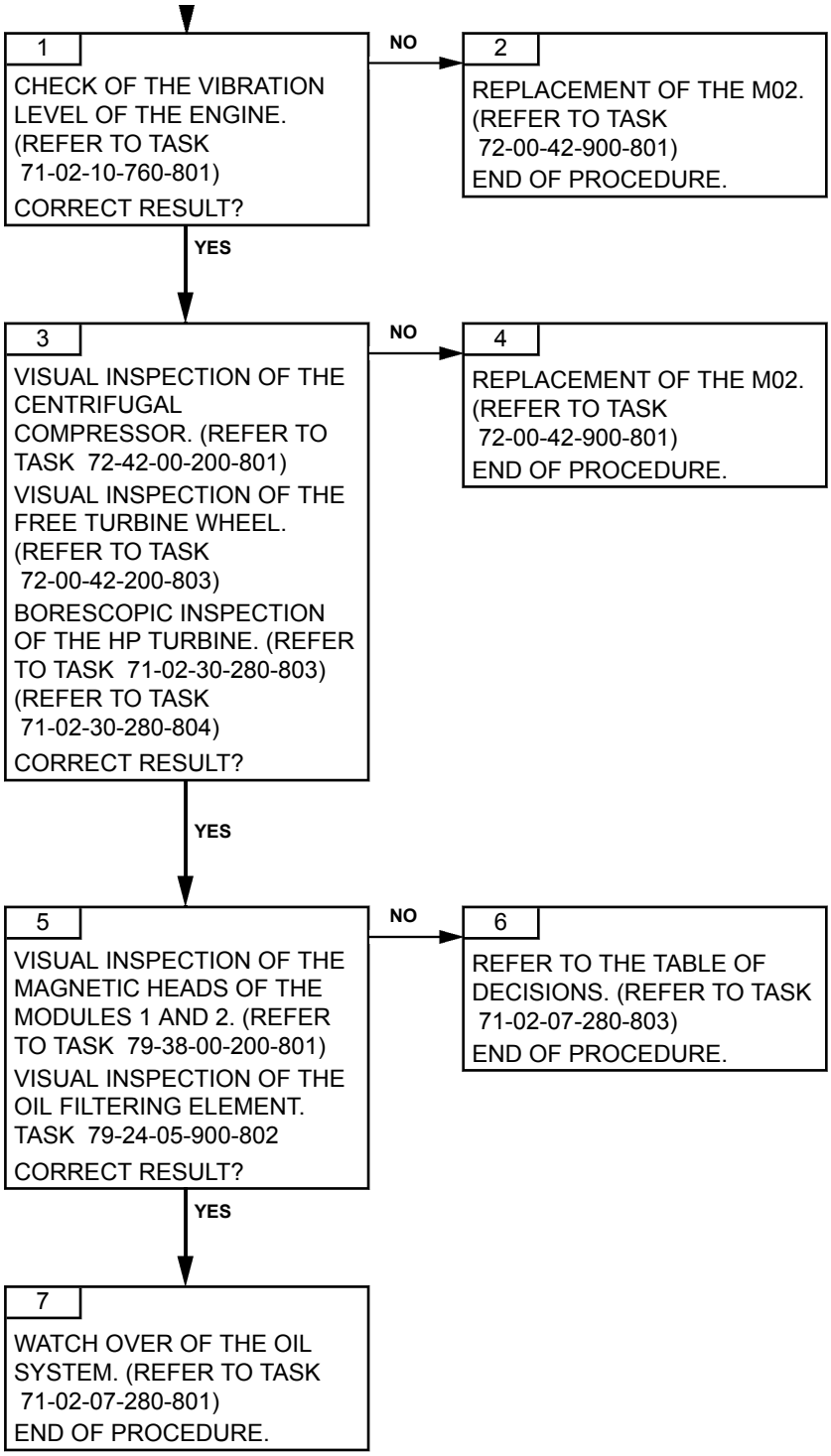
The generator starter, the engine attachments, the coupling and the engine alignment/M.G.B of the aircraft are correct.

Abnormal noises or/and repetitive cracks show that the vibration level is incorrect.

### C. POSSIBLE CAUSES

– Module 2 (M02)

## 2. PROCEDURE



TASK 71-00-06-814-806-A01

# SURGE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

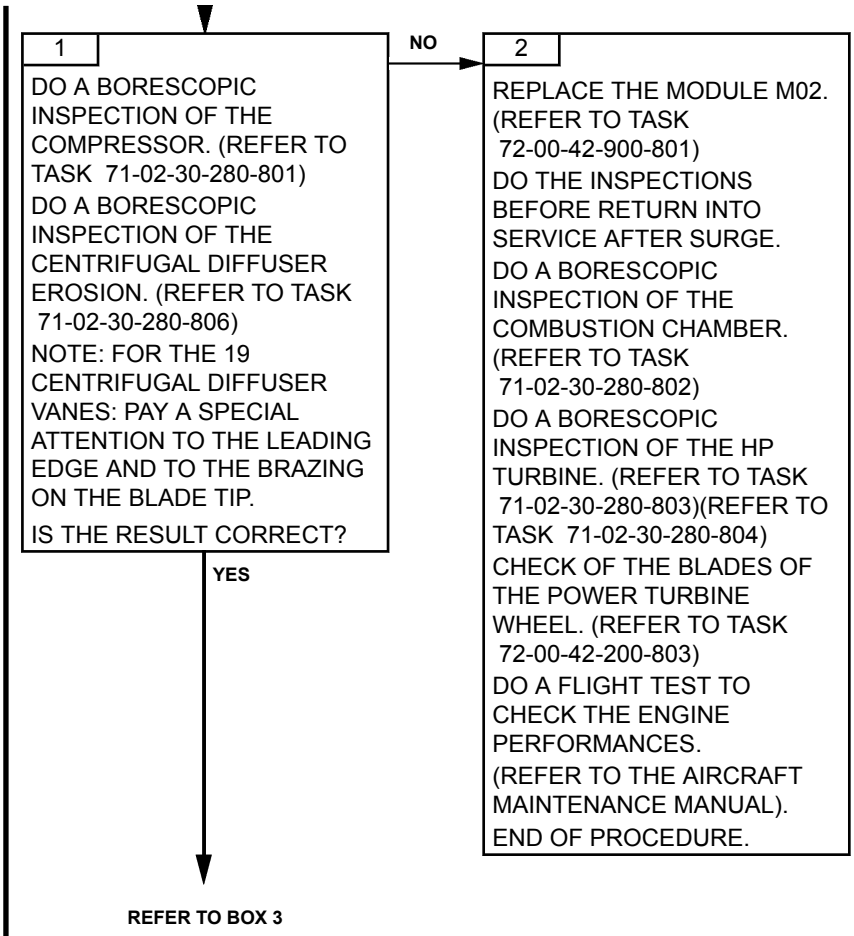
The surge phenomenon is reflected by:

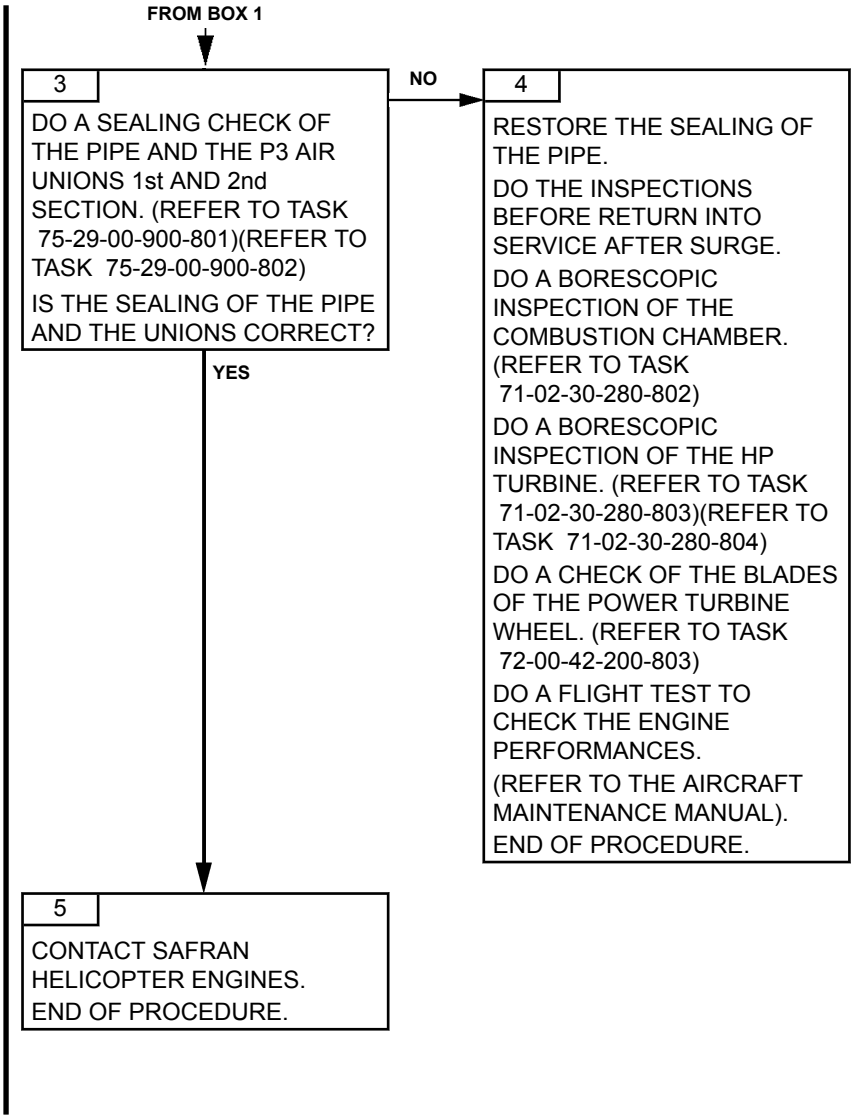
- Violent noise(s) and jerk(s)
- Fish tailing
- Vibrations
- Potentially loss of power

### C. POSSIBLE CAUSES

- Module 2 (M02)
- Air P3 acceleration controller

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-814-807-A01

# SMELLS IN THE CABIN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

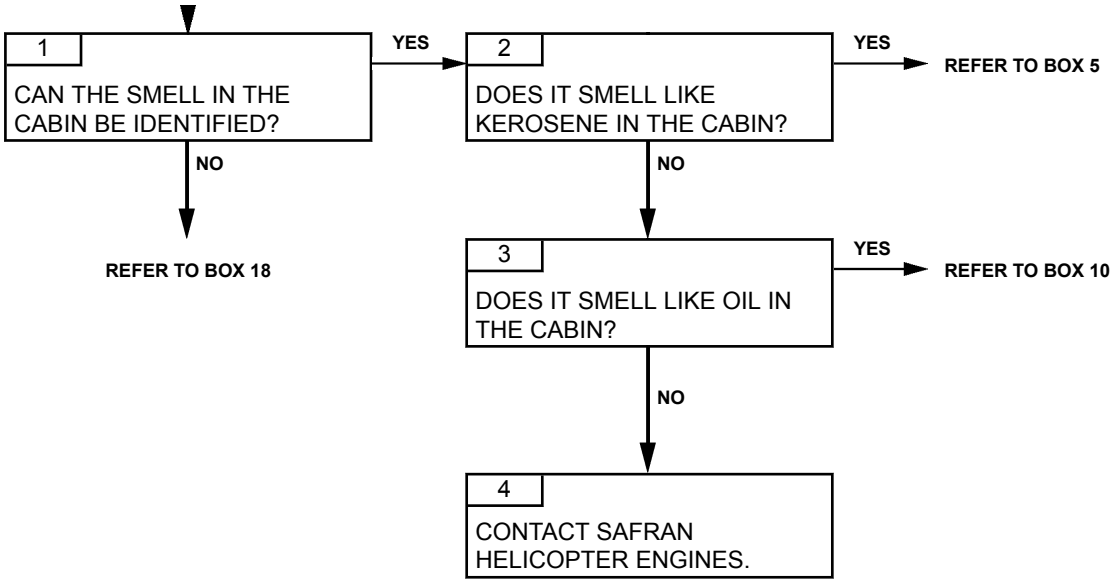
### B. REMINDER OF THE NORMAL OPERATING CONDITION

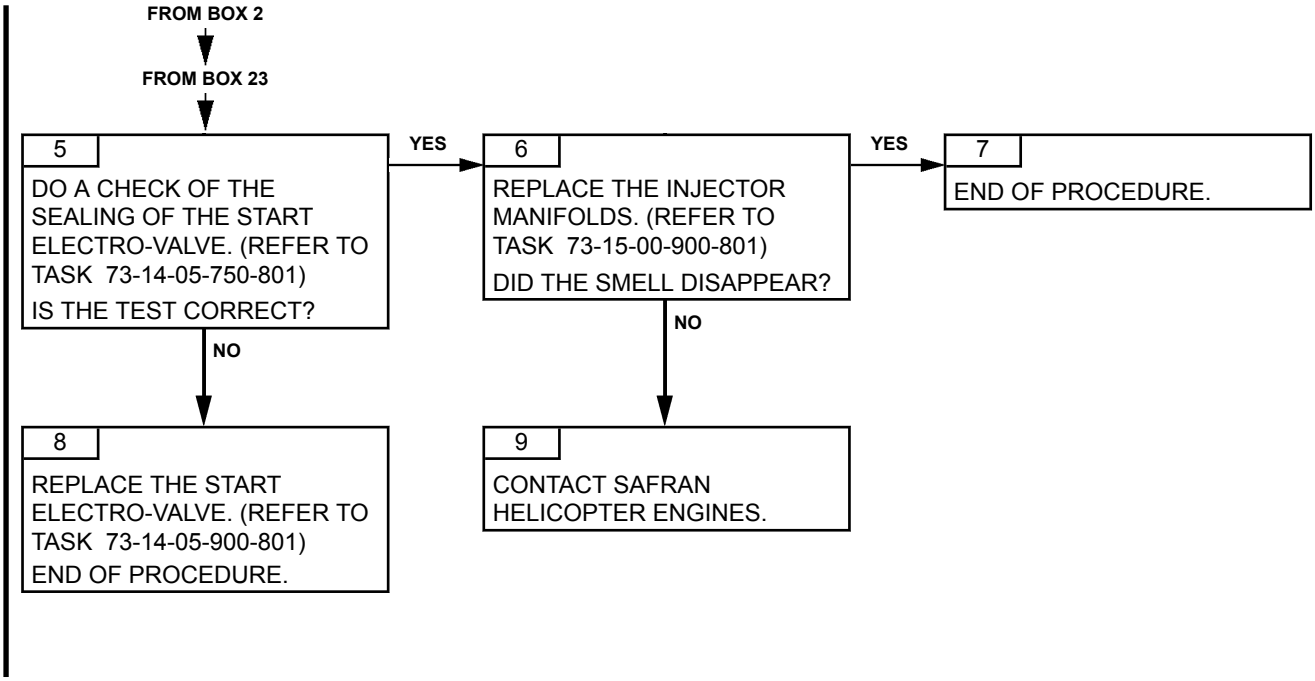
No smell in the cabin.

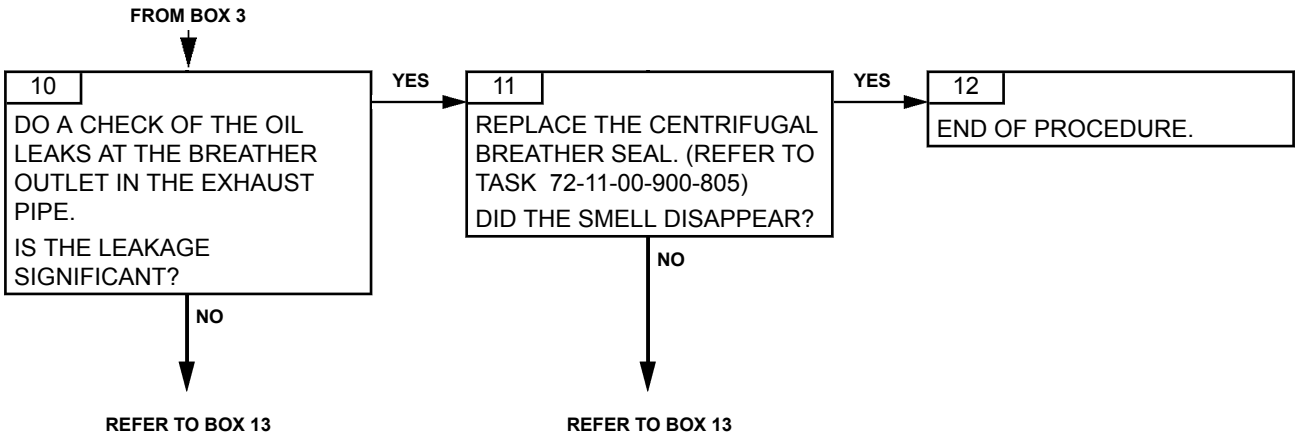
### C. POSSIBLE CAUSES

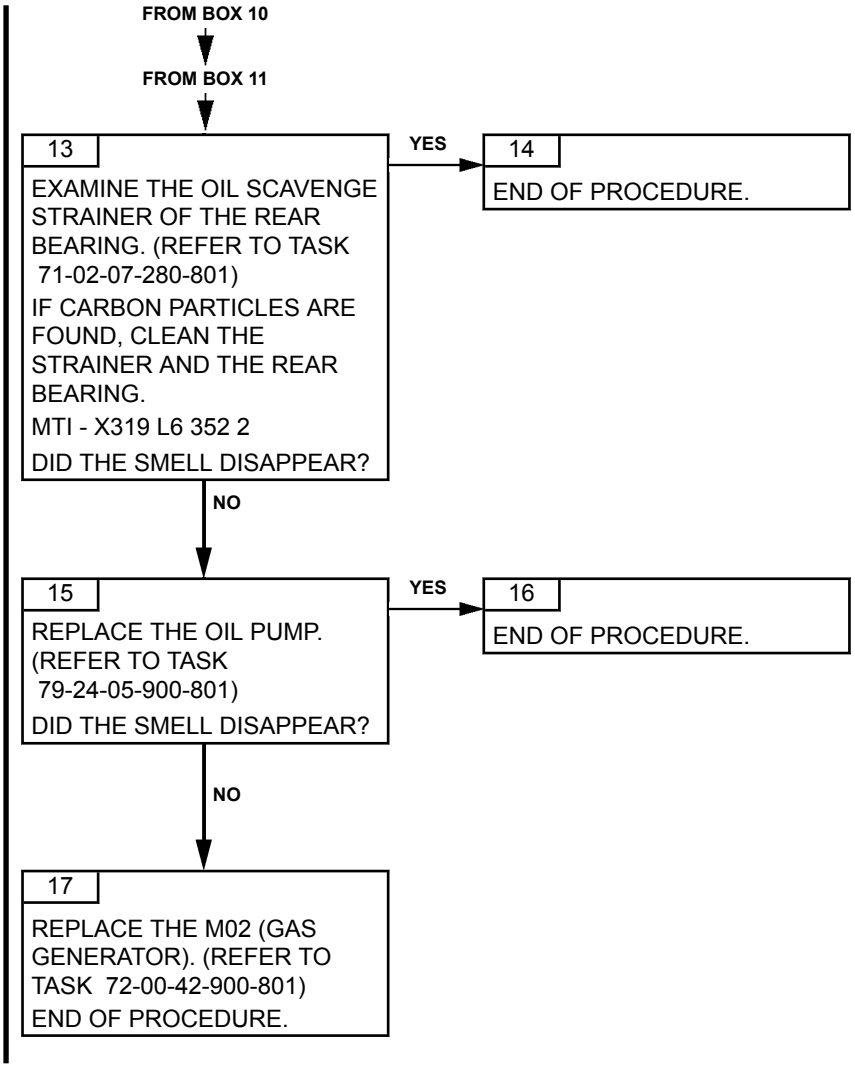
- Start electrovalve
- Injector manifolds
- M02 (Gas generator)
- Breather sealing
- Oil scavenge pipe of the rear bearing
- Oil pump

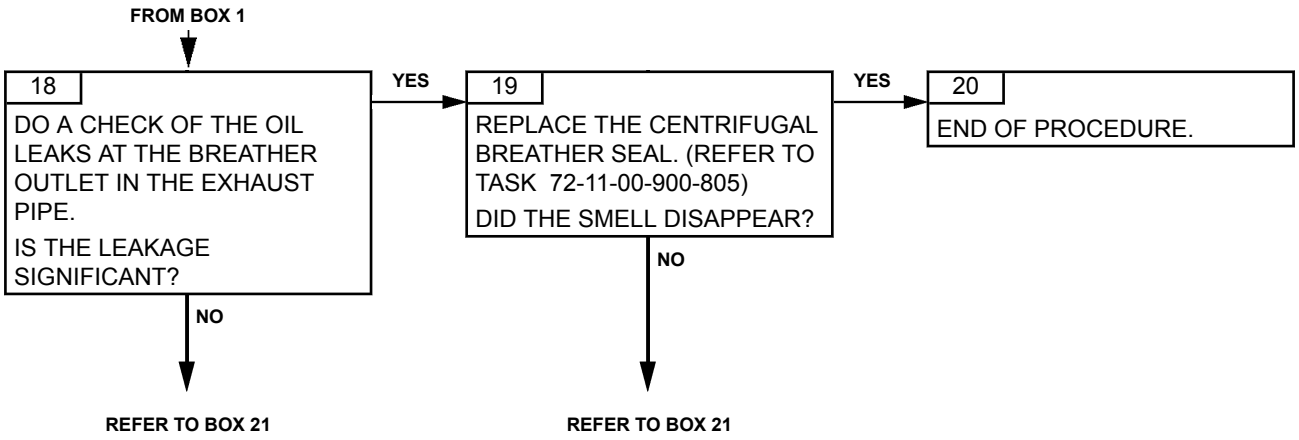
## 2. PROCEDURE

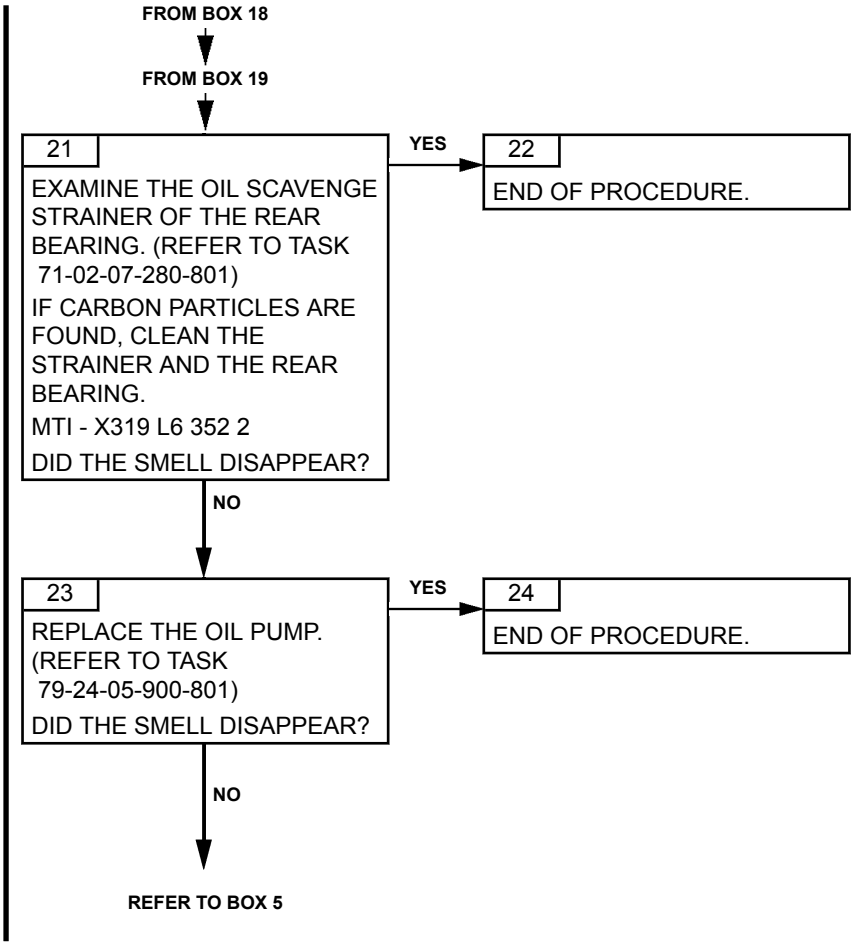












PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-814-808-A01

# N1 OVERSPEED TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

ENGINE LIMITATIONS. (Refer to Task 71-00-01-940-801).

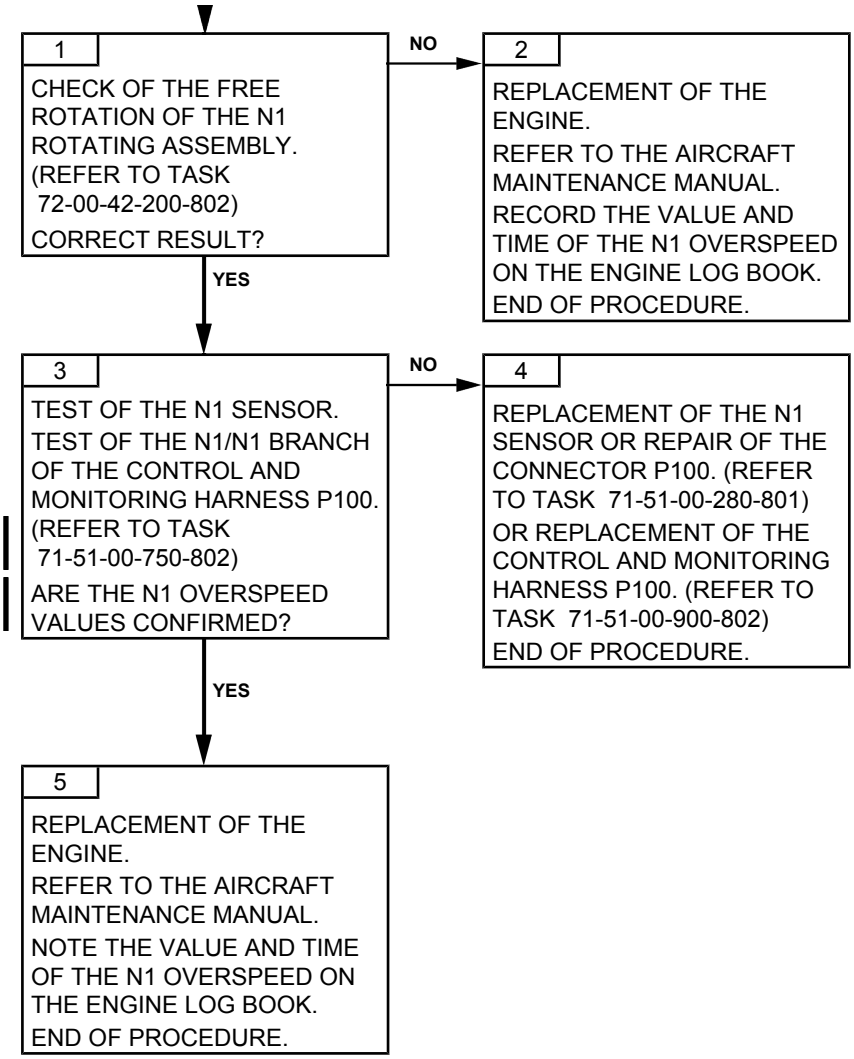
The V.E.M.D is correct.

The N1 speed is checked by the adjusted fuel control unit. The speed must respect the limitations (Refer to Task 71-00-01-940-801).

### C. POSSIBLE CAUSES

- Adjusted fuel control unit
- Control and monitoring harness P100

## 2. PROCEDURE



TASK 71-00-06-814-809-A01

# N2 OVERSPEED (FROM 104 % TO 110 %) TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

ENGINE LIMITATIONS. (Refer to Task 71-00-01-940-801).

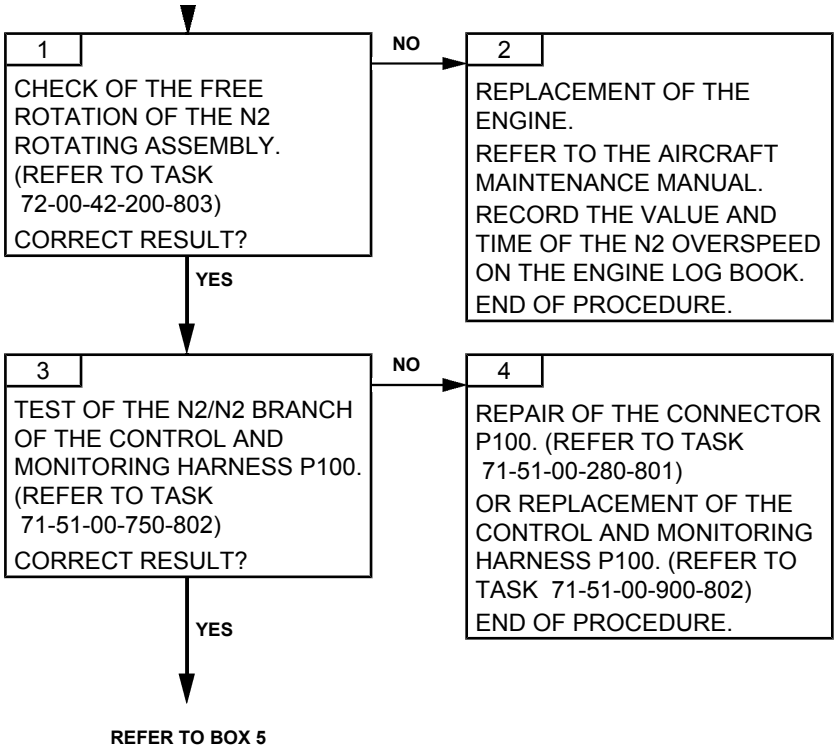
The V.E.M.D is correct.

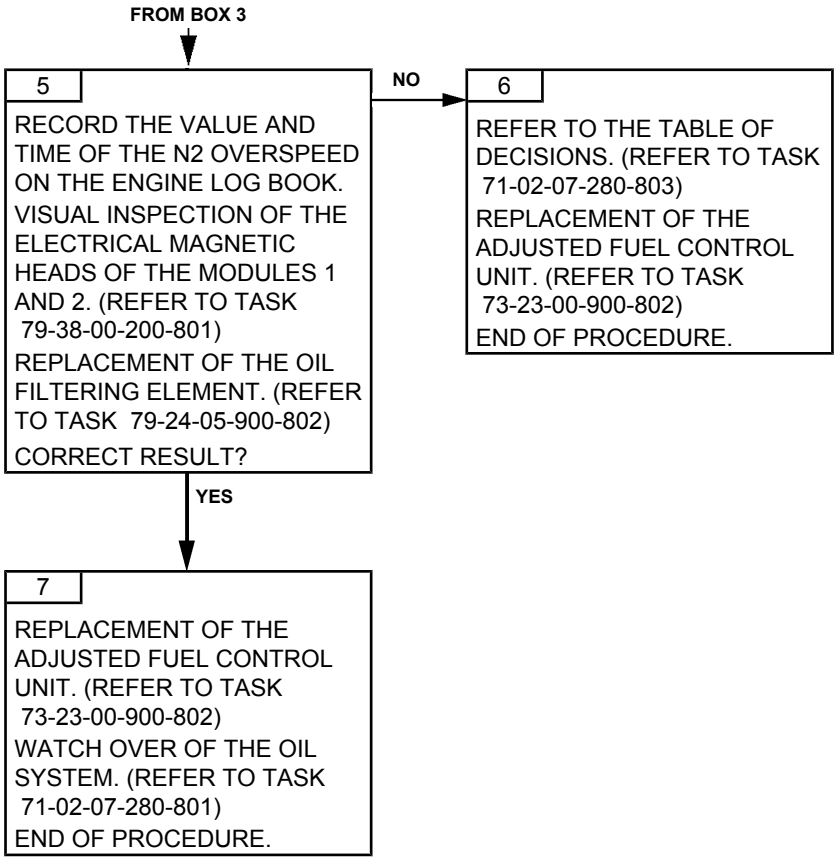
The N2 speed is checked by the adjusted fuel control unit. The speed must respect the limitations (Refer to Task 71-00-01-940-801).

### C. POSSIBLE CAUSES

- Adjusted fuel control unit
- Control and monitoring harness P100

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-814-811-A01

# TORQUE LIMITATIONS EXCEEDED TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

ENGINE LIMITATIONS. (Refer to Task 71-00-01-940-801).

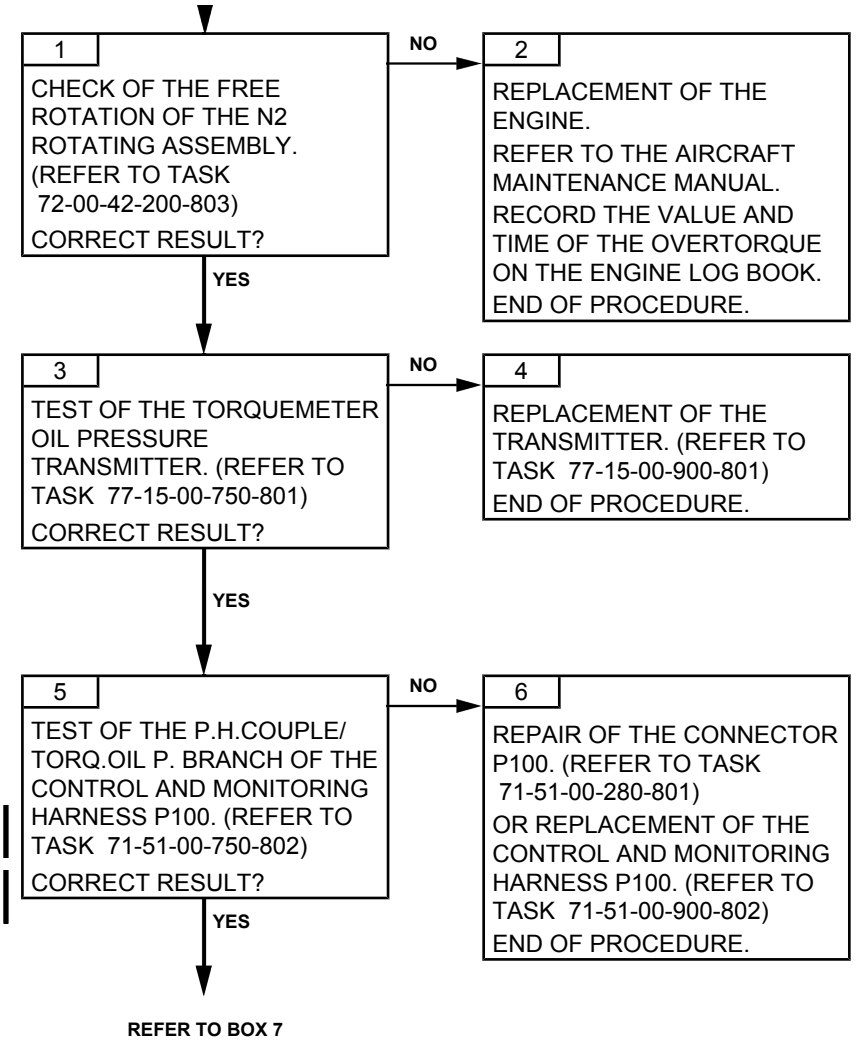
The matching value of the torque of the module 1 (M01) recorded on the V.E.M.D and the measurement system of the torque of the aircraft are correct.

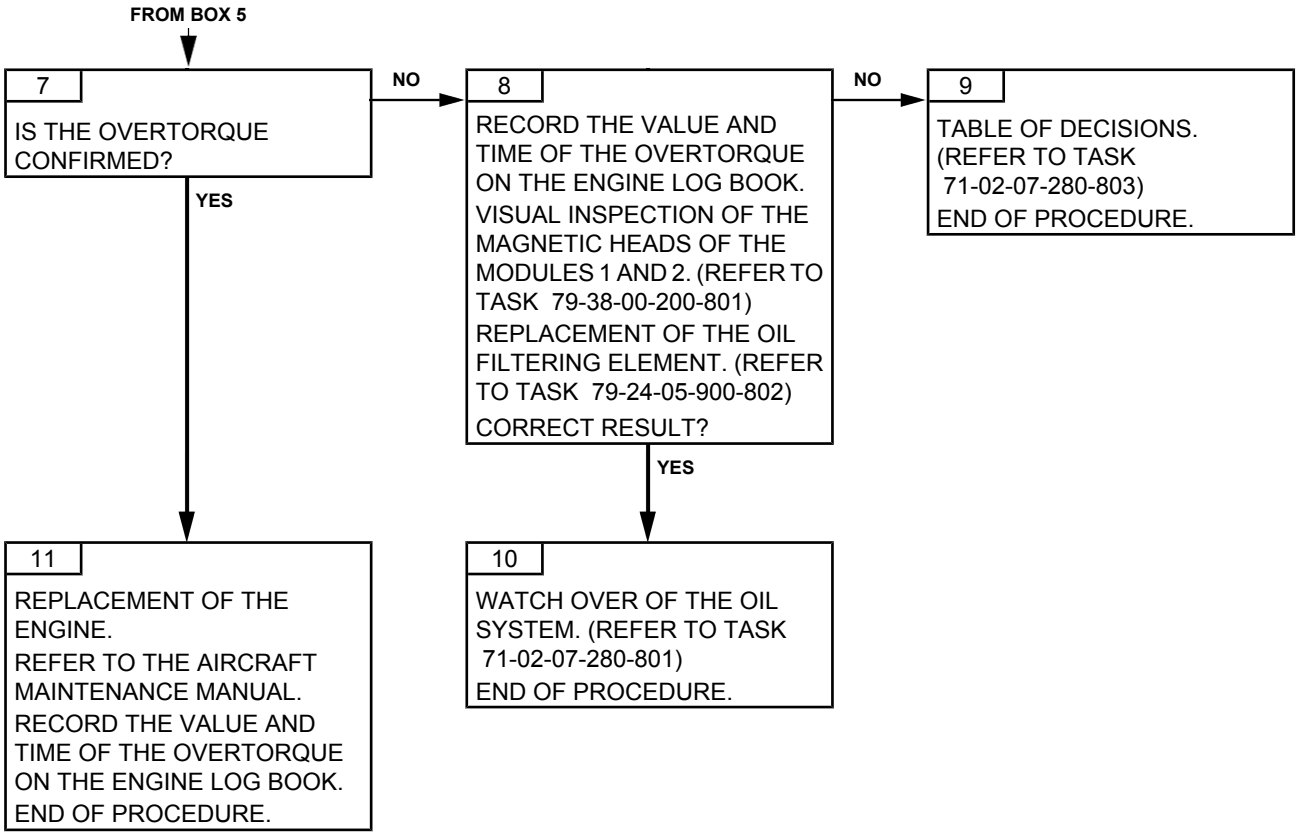
The torquemeter must respect the limitations of the relevant flight envelope (Refer to Task 71-00-01-940-801).

### C. POSSIBLE CAUSES

- Torquemeter oil pressure transmitter
- Control and monitoring harness P100
- M01 (hydraulic torquemeter)

## 2. PROCEDURE


1
CHECK OF THE FREE ROTATION OF THE N2 ROTATING ASSEMBLY. (REFER TO TASK 72-00-42-200-803)
CORRECT RESULT?
NO
2
REPLACEMENT OF THE ENGINE.
REFER TO THE AIRCRAFT MAINTENANCE MANUAL.
RECORD THE VALUE AND TIME OF THE OVERTORQUE ON THE ENGINE LOG BOOK.
END OF PROCEDURE.
YES
3
TEST OF THE TORQUEMETER OIL PRESSURE TRANSMITTER. (REFER TO TASK 77-15-00-750-801)
CORRECT RESULT?
NO
4
REPLACEMENT OF THE TRANSMITTER. (REFER TO TASK 77-15-00-900-801)
END OF PROCEDURE.
YES
5
TEST OF THE P.H.COUPLE/ TORQ.OIL P. BRANCH OF THE CONTROL AND MONITORING HARNESS P100. (REFER TO TASK 71-51-00-750-802)
CORRECT RESULT?
NO
6
REPAIR OF THE CONNECTOR P100. (REFER TO TASK 71-51-00-280-801)
OR REPLACEMENT OF THE CONTROL AND MONITORING HARNESS P100. (REFER TO TASK 71-51-00-900-802)
END OF PROCEDURE.
YES
REFER TO BOX 7



**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-814-812-A01

# T4.5 OVERTEMPERATURE DURING FLIGHT TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

Refer toT4 limitations, (Refer to Task 71-00-01-940-801).

No compressor surge.

The T4.5 measure systems and the aircraft torque are correct.

The T4.5 is defined by an air/fuel report that can be damaged by the condition of the air path, the HP turbine, and the cleanliness of the centrifugal compressor.

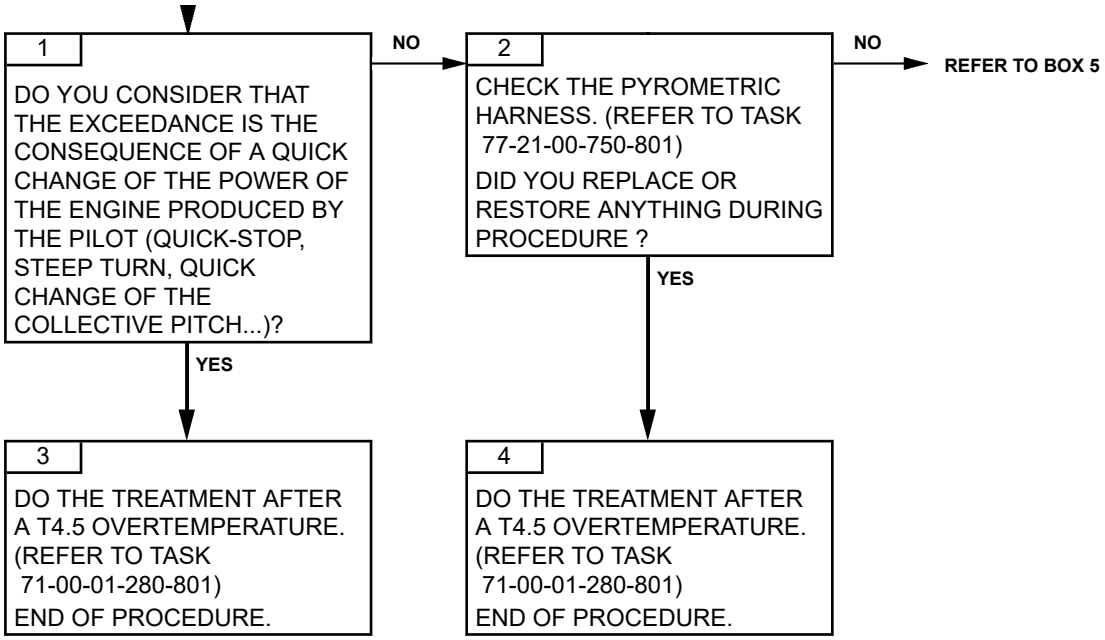
The system includes 4 thermocouple probes wired to a junction box which provides the connection to the VEMD including T4.5 indication and First Limit Indication. The T4.5 conformation box allows a uniform T4.5 temperature indication for a given inlet temperature. It is directly connected to VEMD indication system.

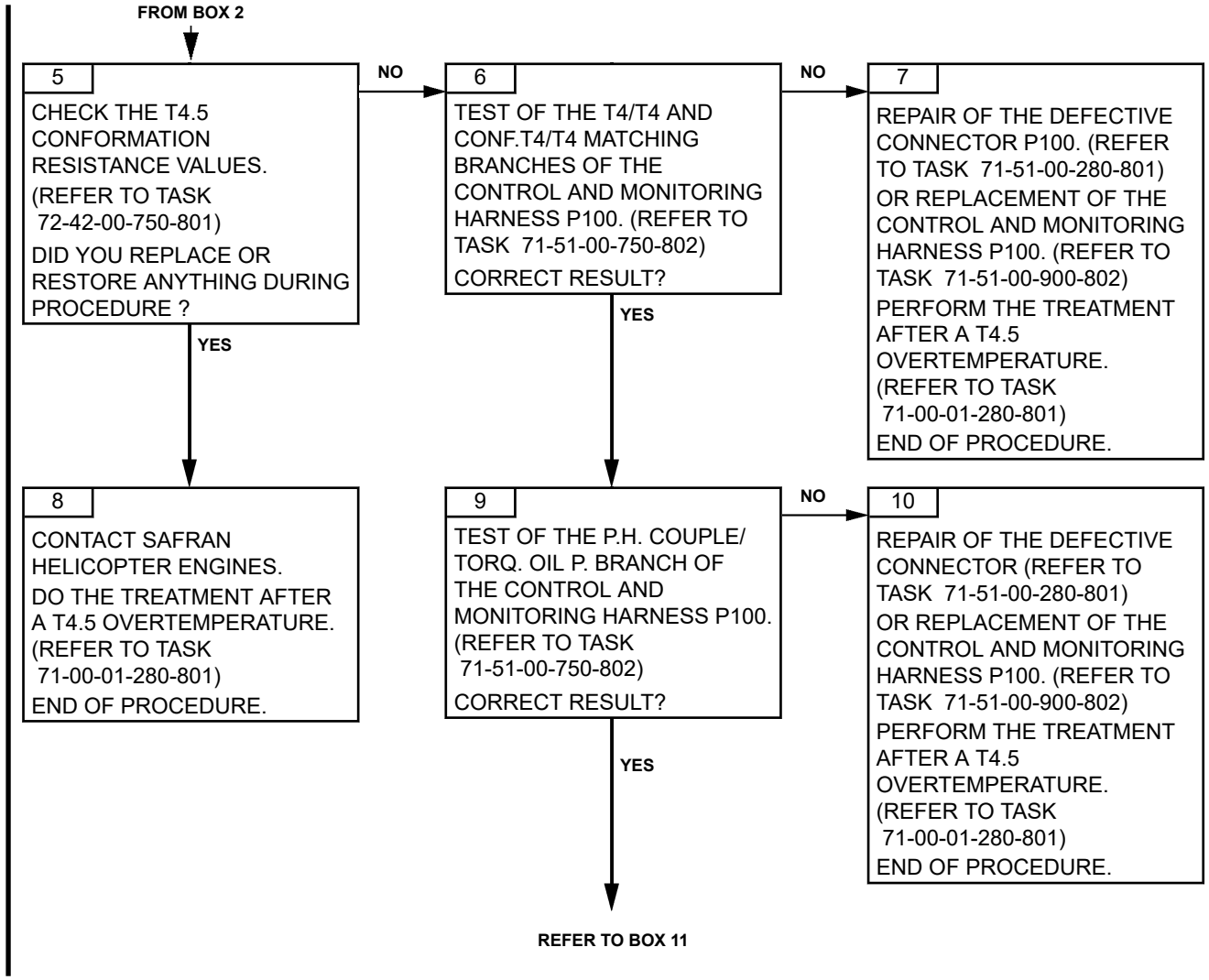
### C. POSSIBLE CAUSES

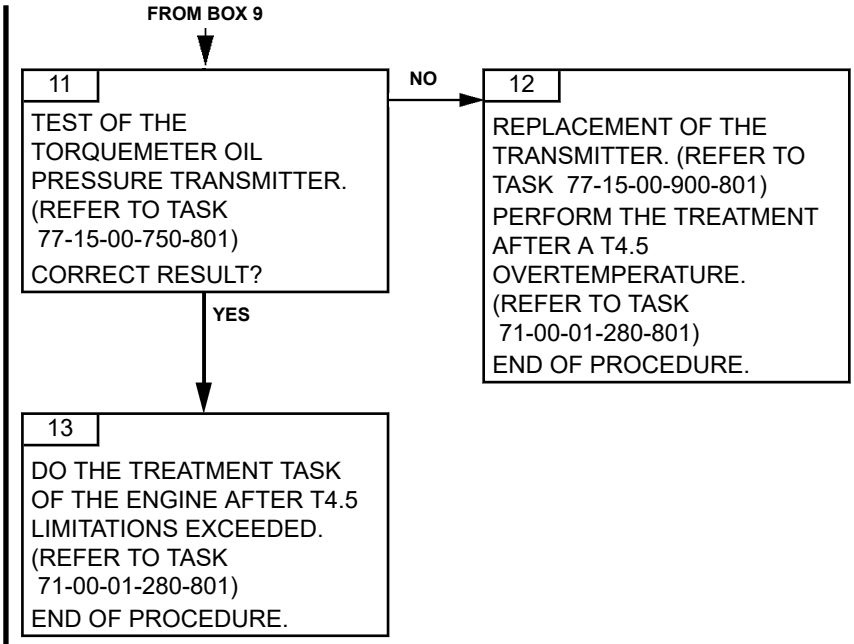
- Pyrometric harness
- T4.5 matching box
- Control and monitoring harness P100
- Torquemeter oil pressure transmitter

## 2. PROCEDURE

***NOTE:*** ***First, the troubleshooting helps you to find the root cause and to repair the part of the engine related to that root cause. Secondly, when this is done, you will have to perform the treatment task for this event to check and repair the consequence of the event on the engine (Refer to Task 71-00-01-280-801).***






FROM BOX 9
11
TEST OF THE TORQUEMETER OIL PRESSURE TRANSMITTER. (REFER TO TASK 77-15-00-750-801)
CORRECT RESULT?
NO
12
REPLACEMENT OF THE TRANSMITTER. (REFER TO TASK 77-15-00-900-801)
PERFORM THE TREATMENT AFTER A T4.5 OVERTEMPERATURE. (REFER TO TASK 71-00-01-280-801)
END OF PROCEDURE.
YES
13
DO THE TREATMENT TASK OF THE ENGINE AFTER T4.5 LIMITATIONS EXCEEDED. (REFER TO TASK 71-00-01-280-801)
END OF PROCEDURE.

TASK 71-00-06-814-813-A01

# "FUEL PRESS" MESSAGE (LOW FUEL PRESSURE) TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The booster pump visual indicator was on "stop".

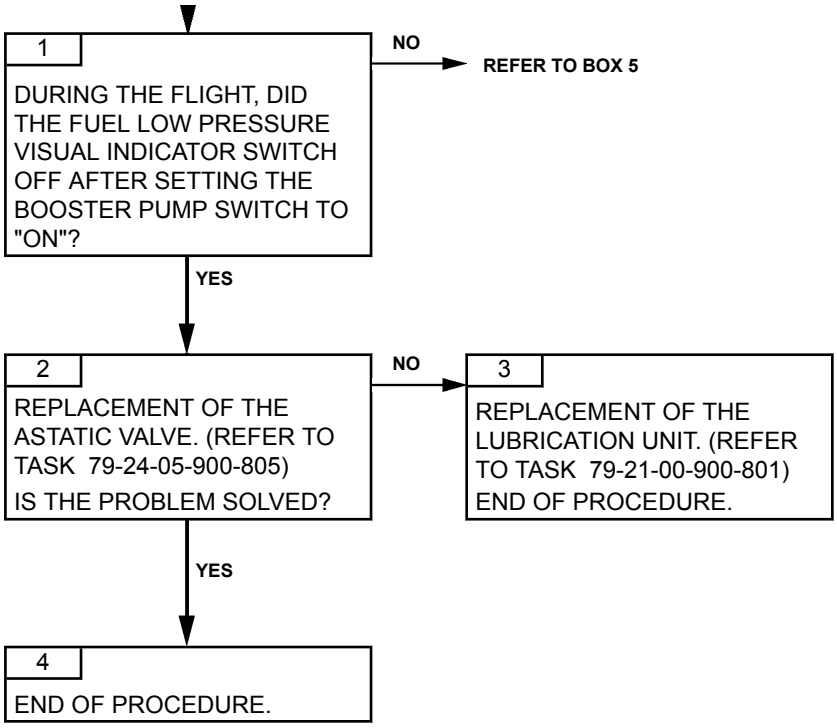
The visual indication system of the low fuel pressure and the fuel system of the aircraft are correct.

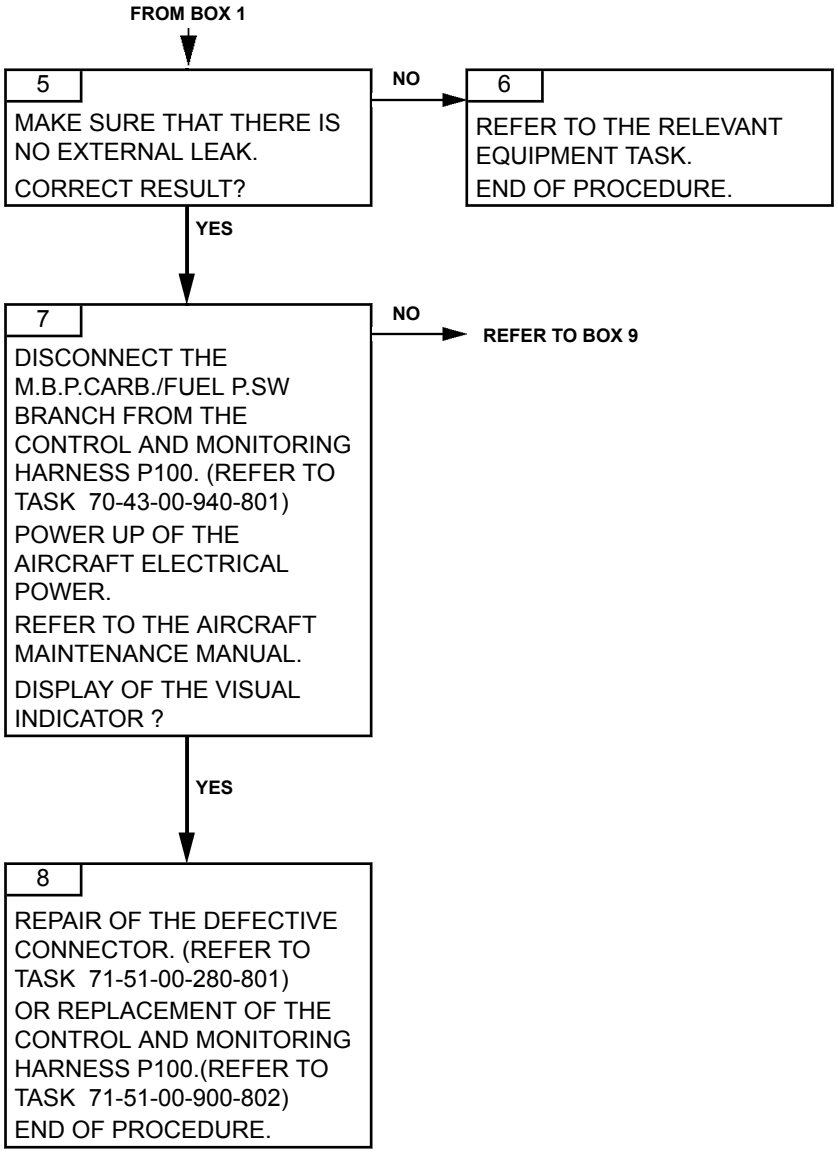
No display of the signal during the engine operation.

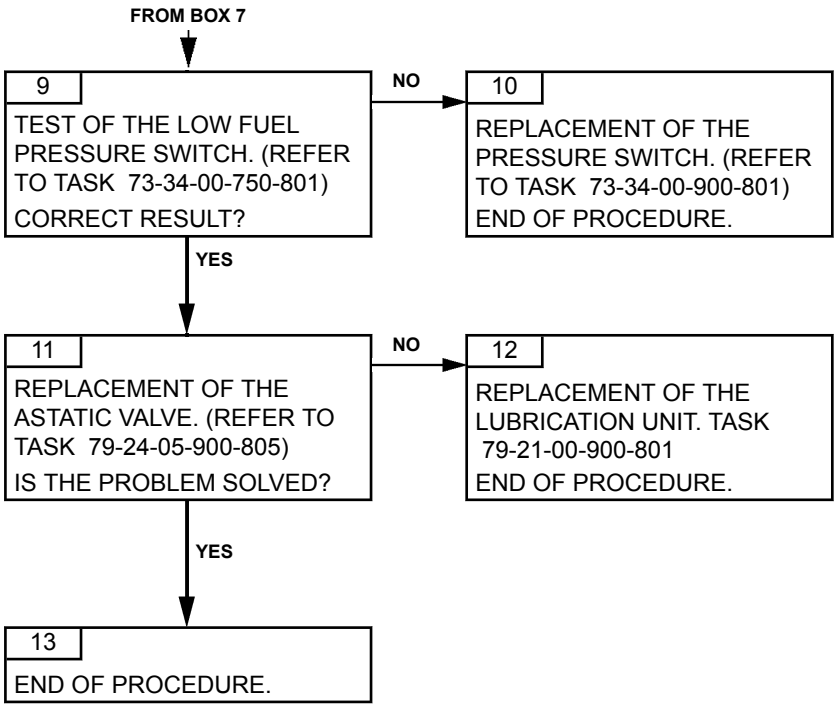
### C. POSSIBLE CAUSES

- Low fuel pressure switch
- External leak
- Lubrication unit (astatic valve or/and ejector)
- Control and monitoring harness P100

## 2. PROCEDURE







TASK 71-00-06-814-814-A01

# "FUEL FILT" MESSAGE (PRE-BLOCKAGE OF THE FUEL FILTERING ELEMENT) TROUBLESHOOTING

## 1. GENERAL

### A. PHASE AND FAILURE DETECTION

During operation

### B. GENERAL DESCRIPTION

The engine is equipped of two fuel filters:

- The first located on the adjusted fuel control unit (FCU)
- The second located on the lubrication device.

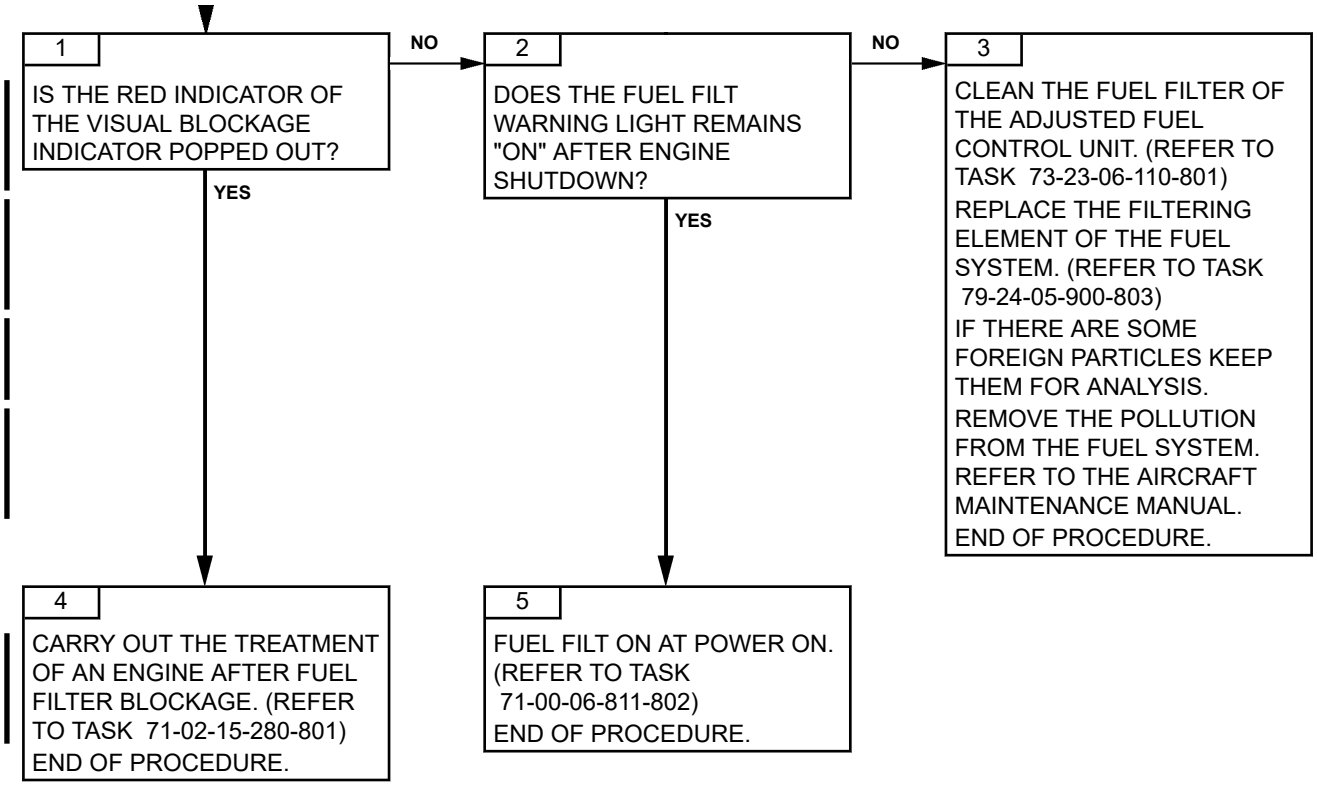
The fuel filter of the adjusted fuel control unit is not monitored by the aircraft. The fuel filtering element located on the lubrication device, has a pre blockage pressure switch connected to the aircraft.

This message "FUEL FLT" is displayed when the aircraft detects a pre blockage of the fuel filtering element located on the lubrication device.

### C. POSSIBLE CAUSES

- Pre blockage pressure switch
- Control and monitoring harness P100
- Fuel pollution
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-814-816-A01

# NO N1 SPEED INDICATION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

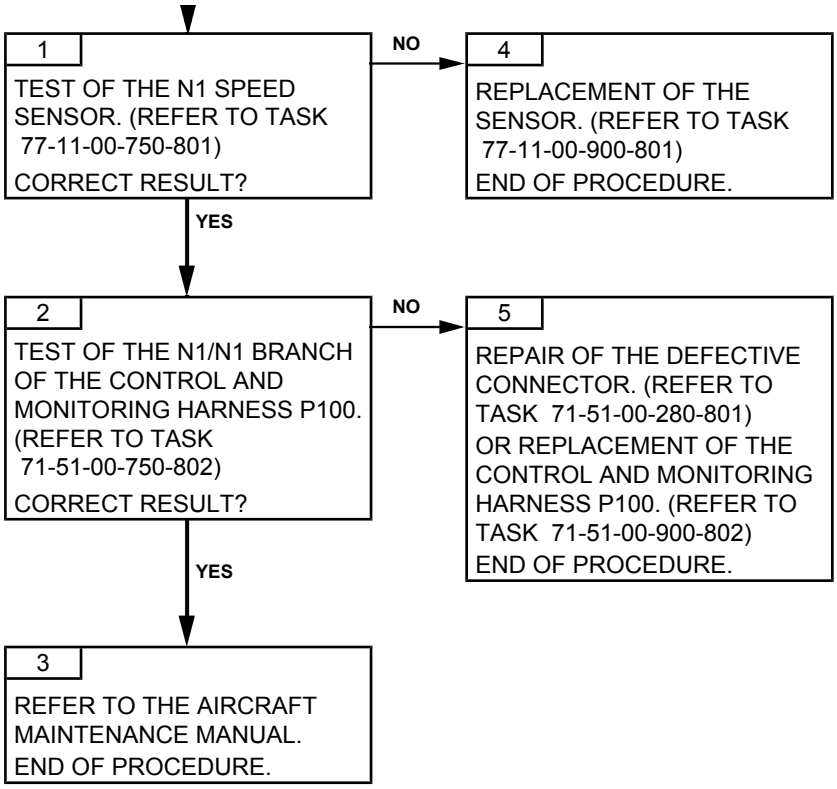
### B. REMINDER OF THE NORMAL OPERATING CONDITION

Steady display of the N1 speed visual indicator when the N1 rotating assembly is driven.

### C. POSSIBLE CAUSES

– N1 speed sensor
– Control and monitoring harness P100
– Aircraft

## 2. PROCEDURE



TASK 71-00-06-814-817-A01

# NO N2 SPEED INDICATION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

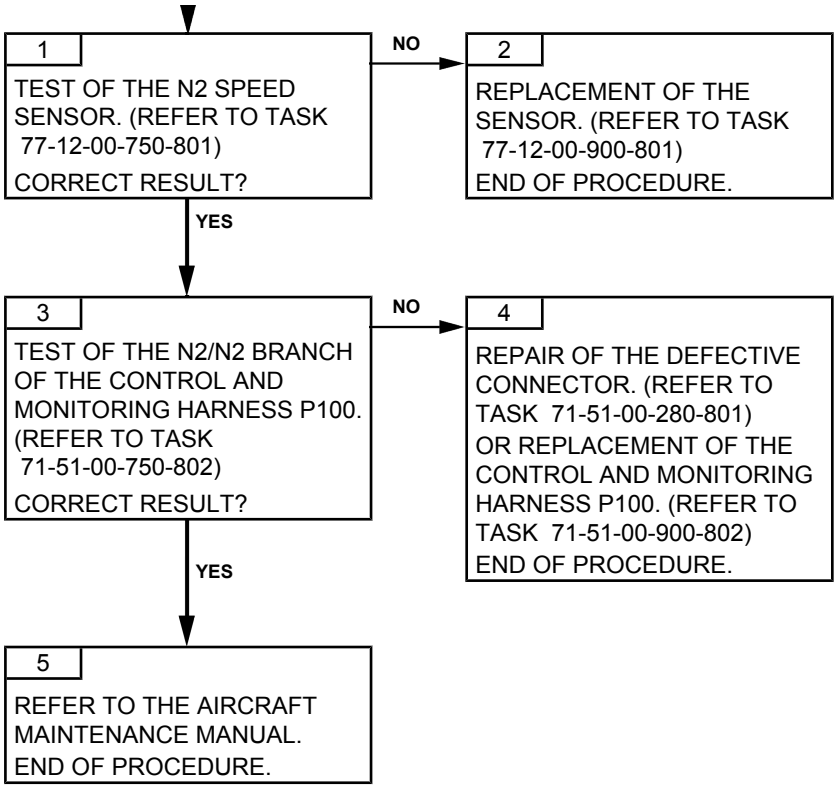
### B. REMINDER OF THE NORMAL OPERATING CONDITION

Steady display of the N2 speed visual indicator when the rotor is driven by the engine.

### C. POSSIBLE CAUSES

– N2 speed sensor
– Control and monitoring harness P100
– Aircraft

## 2. PROCEDURE



TASK 71-00-06-814-818-A01

# NO T4.5 INDICATION TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

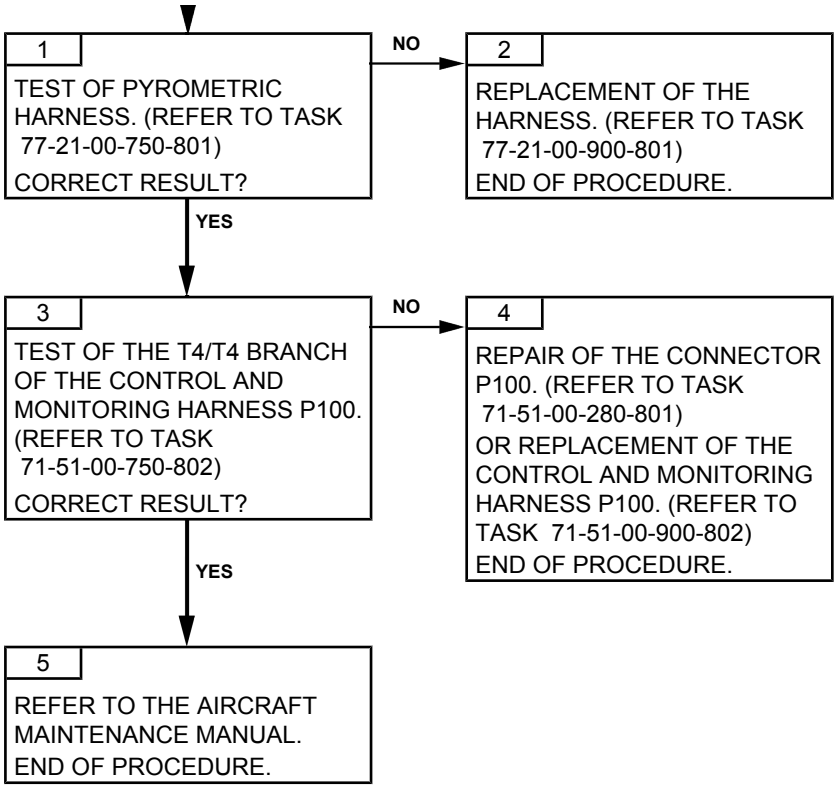
### B. REMINDER OF THE NORMAL OPERATING CONDITION

Steady display of the visual indicator of the T4.5.

### C. POSSIBLE CAUSES

- Pyrometric harness
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-814-819-A01

# T4.5 INDICATION ERRONEOUS TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

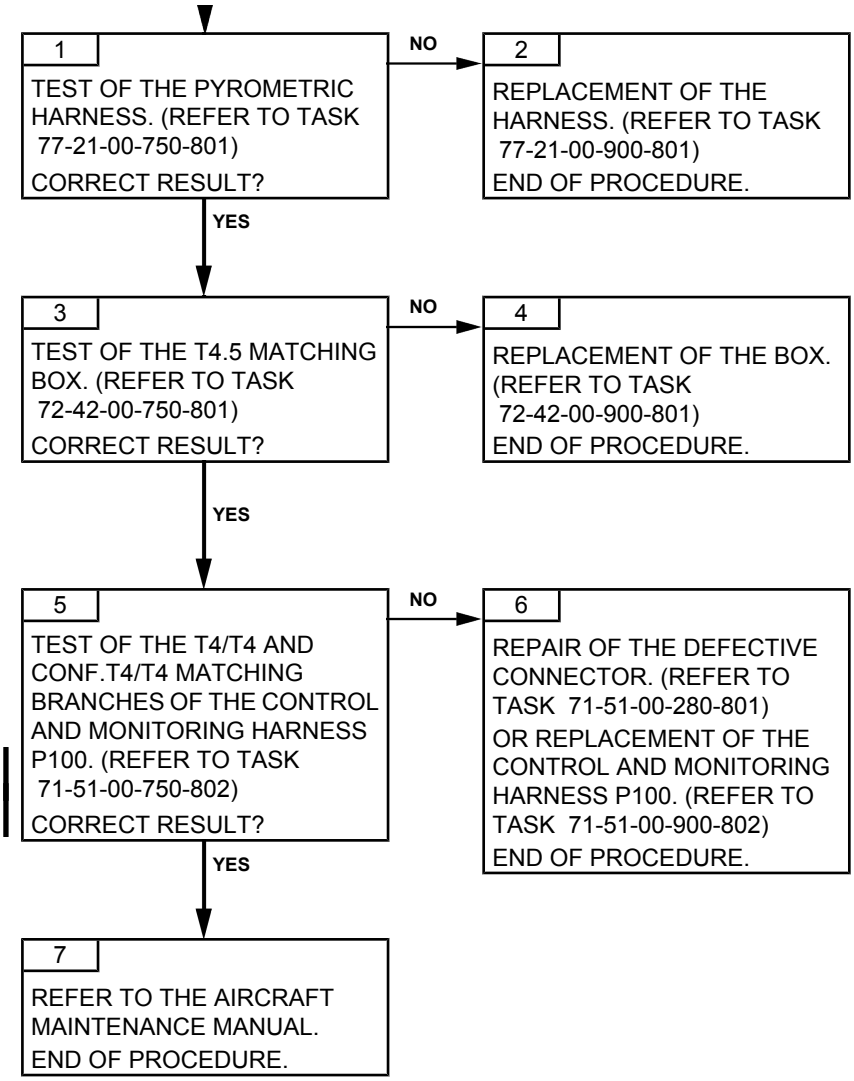
### B. REMINDER OF THE NORMAL OPERATING CONDITION

The T4-5 must be in accordance with the operation rating of the engine.

### C. POSSIBLE CAUSES

- Pyrometric harness
- T4.5 matching box
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE



TASK 71-00-06-814-820-A01

# TORQUE INDICATION ERRONEOUS TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The conformation value of the torque of the M01 is correct on the V.E.M.D.

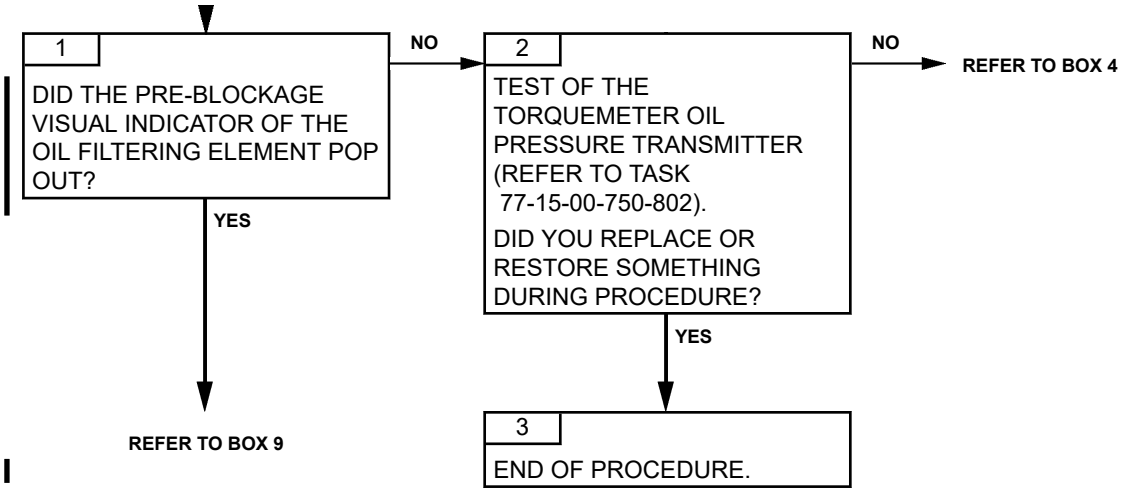
The measurement assembly of the aircraft torque is correct.

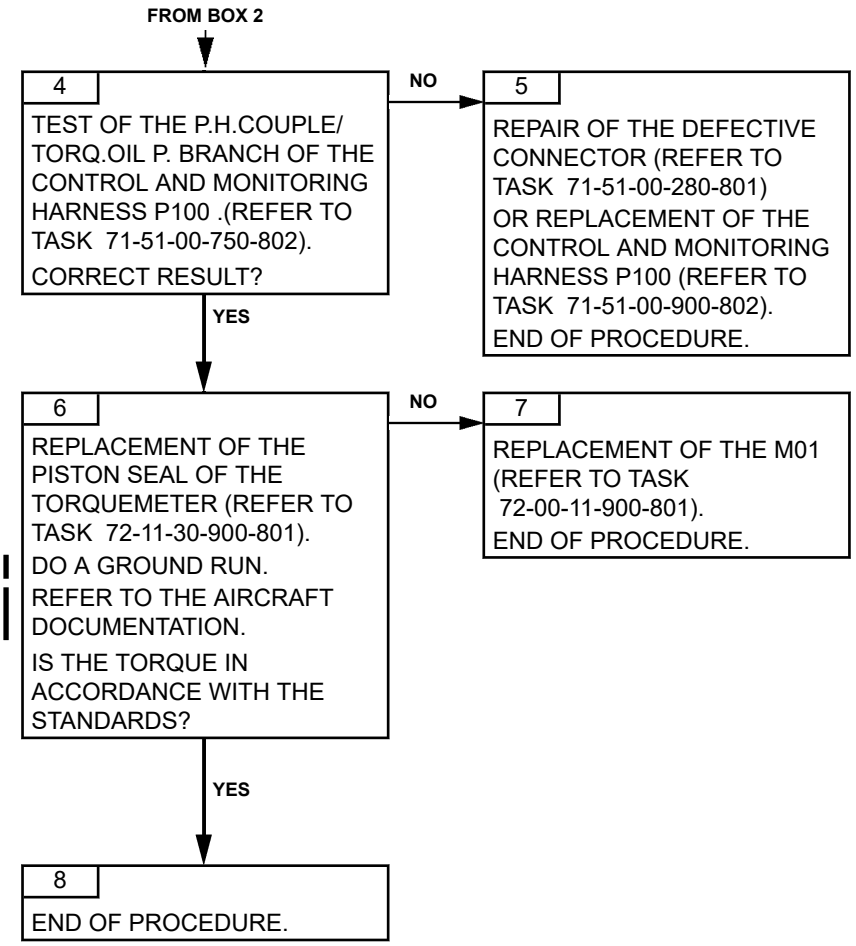
The torque must be in accordance with the relevant diagram in the flight manual.

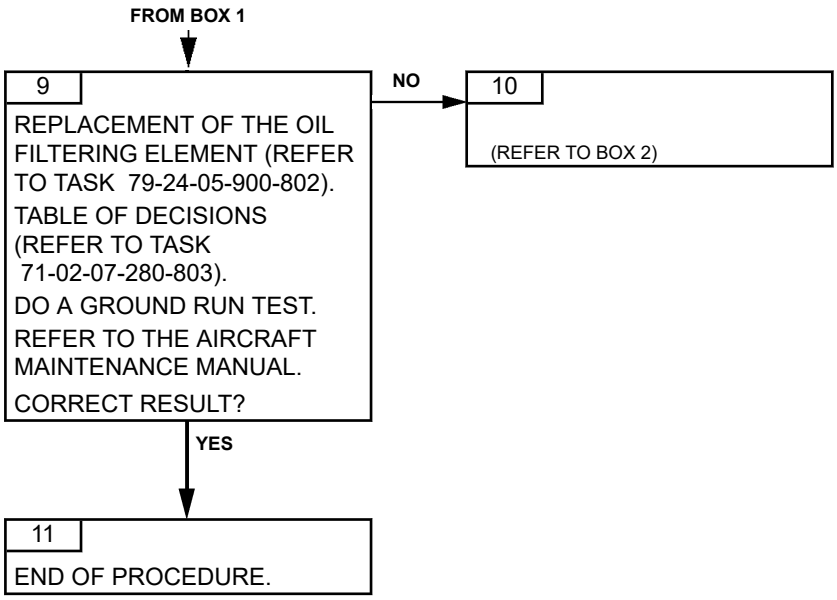
### C. POSSIBLE CAUSES

- Torquemeter oil pressure transmitter
- Control and monitoring harness P100
- Piston seal of the torquemeter
- Oil system contamination
- Module 1 (M01)

## 2. PROCEDURE







TASK 71-00-06-814-823-A01

# OIL OVERTEMPERATURE ON THE DIAGRAM VALUES DISPLAY TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. GENERAL DESCRIPTION

The tolerance criteria for oil temperature limitation are defined:
(Refer to Task 71-00-02-940-801).

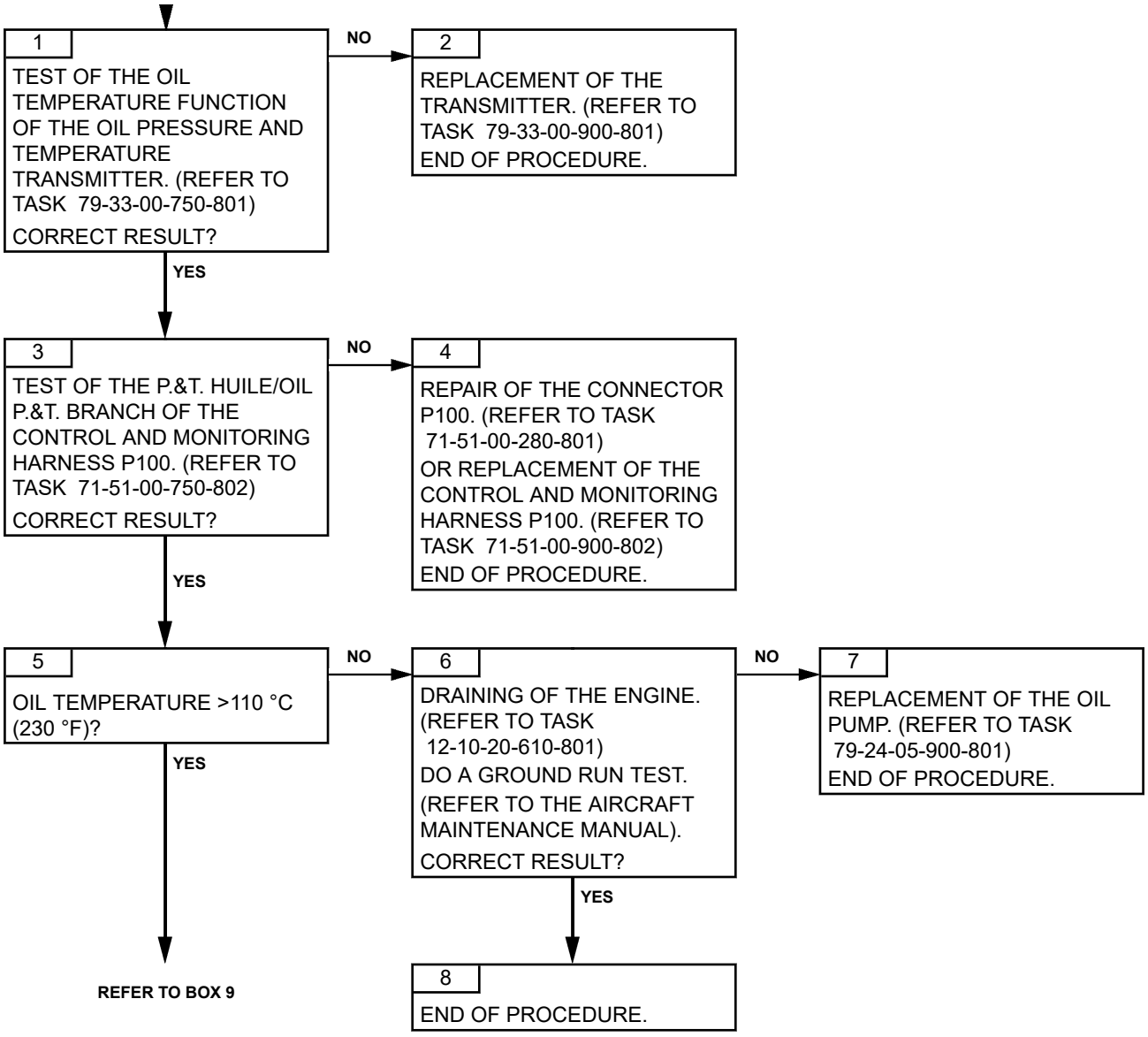
The oil temperature is monitored by the oil pressure and temperature transmitter, connected to the aircraft.

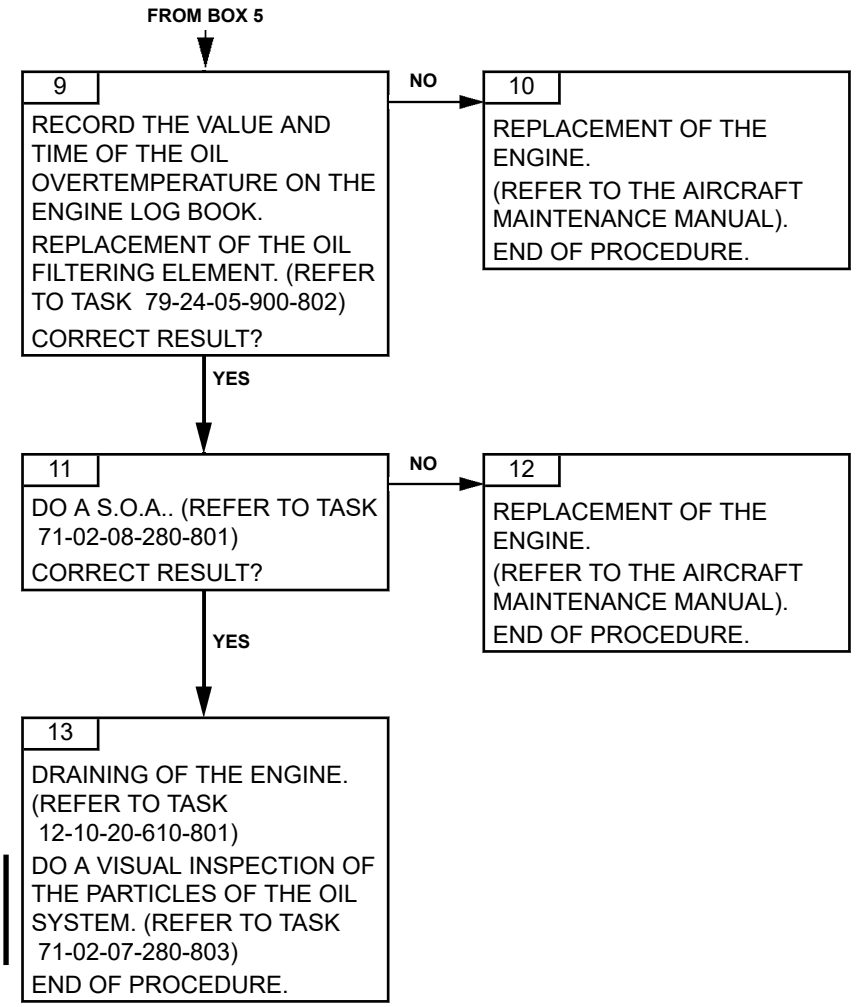
The oil pressure and temperature transmitter is located at the oil filter outlet.

### C. POSSIBLE CAUSES

- Oil pressure and temperature transmitter
- Control and monitoring harness P100
- Oil pump
- Oil characteristics

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-814-826-A01

# FLUCTUATING OIL PRESSURE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The oil is in accordance with the standards.

The oil level is correct.

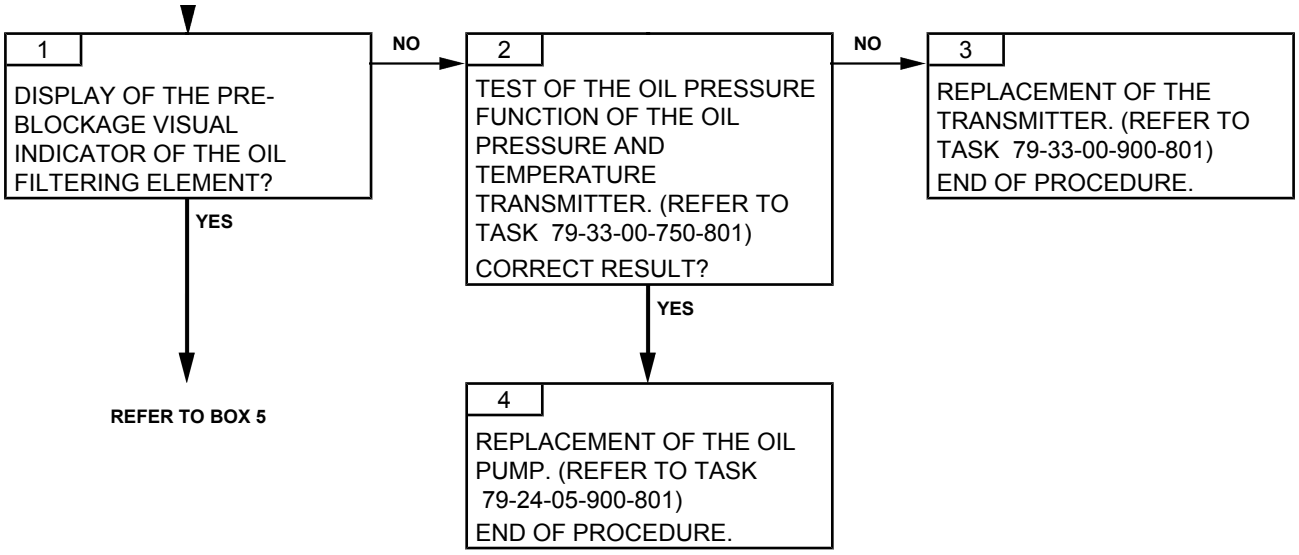
No oil leak (air bleed).

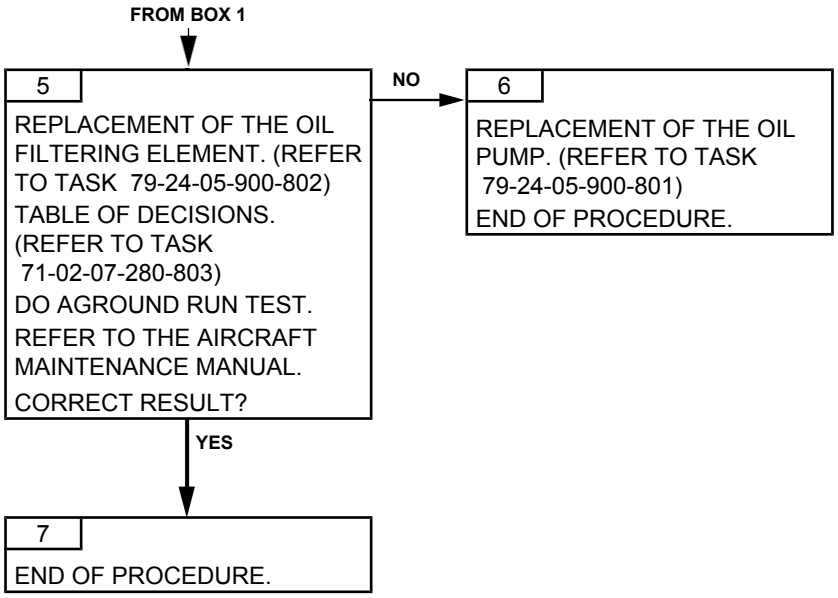
At a constant N1, the oil pressure must remain constant.

### C. POSSIBLE CAUSES

- Oil pressure and temperature transmitter
- Oil pump
- Oil system contamination

## 2. PROCEDURE





**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-814-828-A01

# OIL PRESSURE TOO HIGH TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The oil pressure is less than the values on the diagram or/and more than 1000 kPa.

No oil traces in the air intake casing, no smokes at the engine shutdown.

The visual indicator of the torque is correct.

The oil is in accordance with the standards.

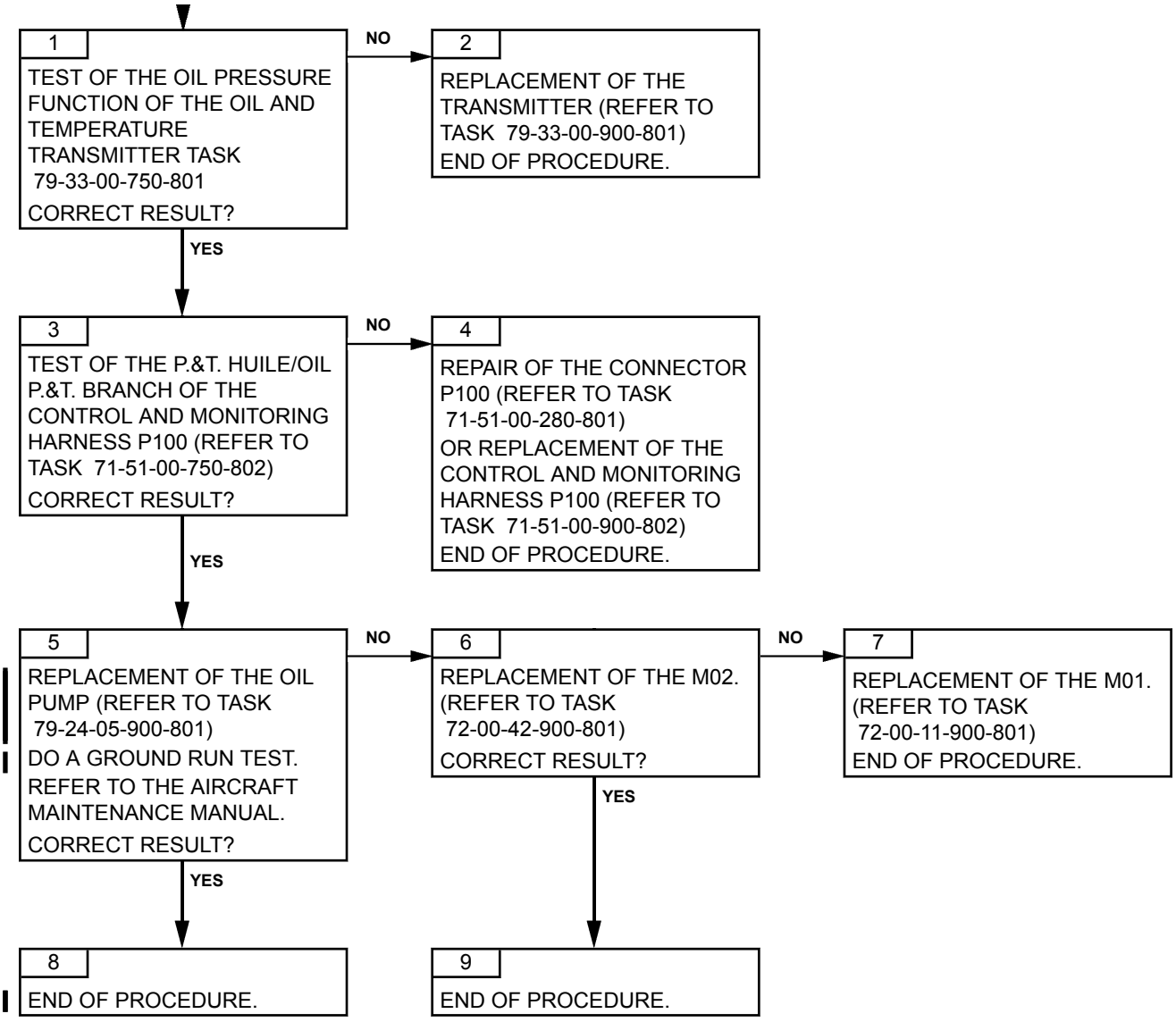
The visual indicator system of the oil pressure of the aircraft is correct.

The oil pressure must correspond to the values given in the task.
(Refer to Task 71-00-02-940-801).

### C. POSSIBLE CAUSES

- Oil pressure and temperature transmitter
- Control and monitoring harness P100
- Oil pump
- Module 1 (M01)
- Module 2 (M02)

## 2. PROCEDURE



TASK 71-00-06-814-829-A01

# "ENG CHIP" MESSAGE (MAGNETIC PARTICLES) TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

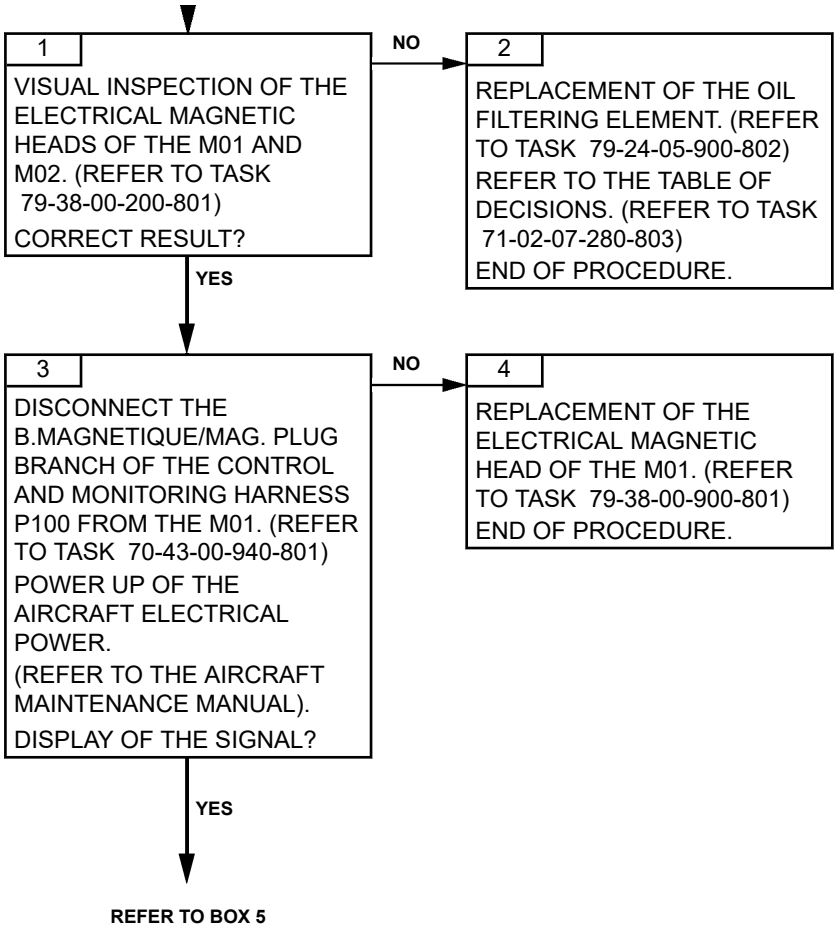
### B. GENERAL DESCRIPTION

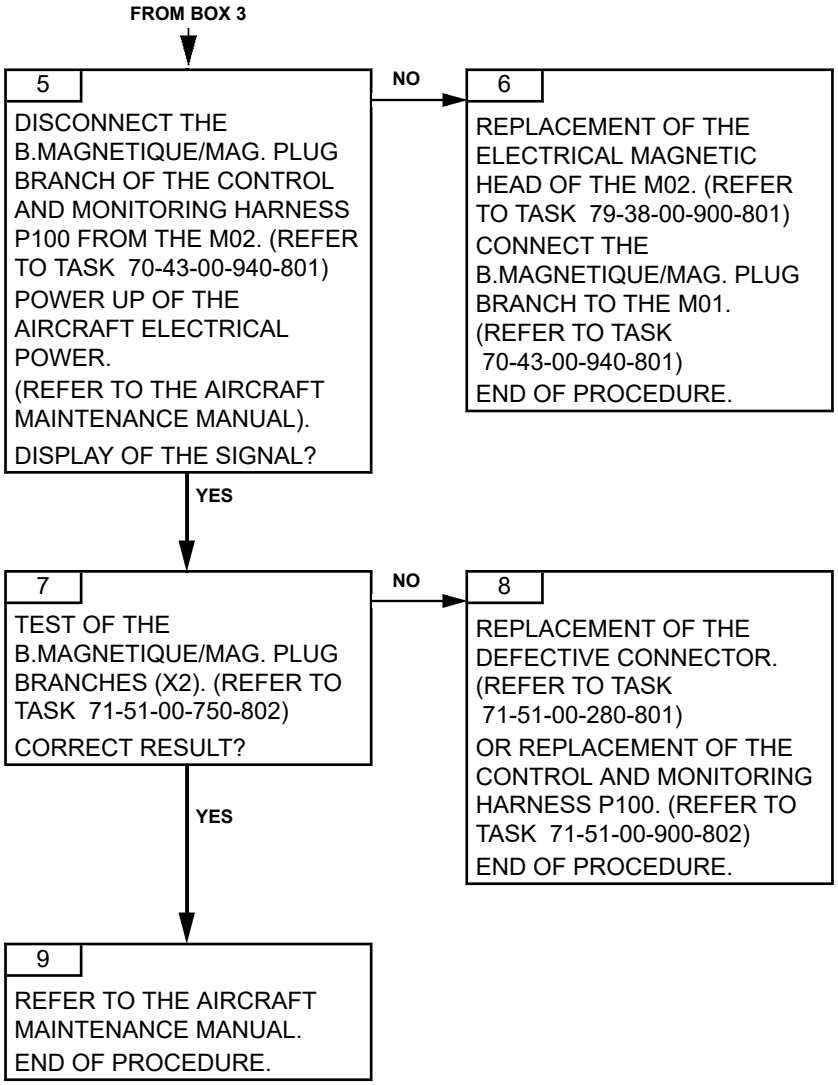
The engine is equipped of two electrical magnetic plugs located at the front and at the rear.
The electrical magnetic plugs are connected to the aircraft.

### C. POSSIBLE CAUSES

- Module 1 (M01) or/and module 2 (M02)
- Electrical magnetic head of the module (M01) or (M02)
- Control and monitoring harness P100
- Aircraft

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-814-837-A01

# N2 OVERSPEED (OVER 110 %) TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During operation

### B. REMINDER OF THE NORMAL OPERATING CONDITION

ENGINE LIMITATIONS. (Refer to Task 71-00-01-940-801).

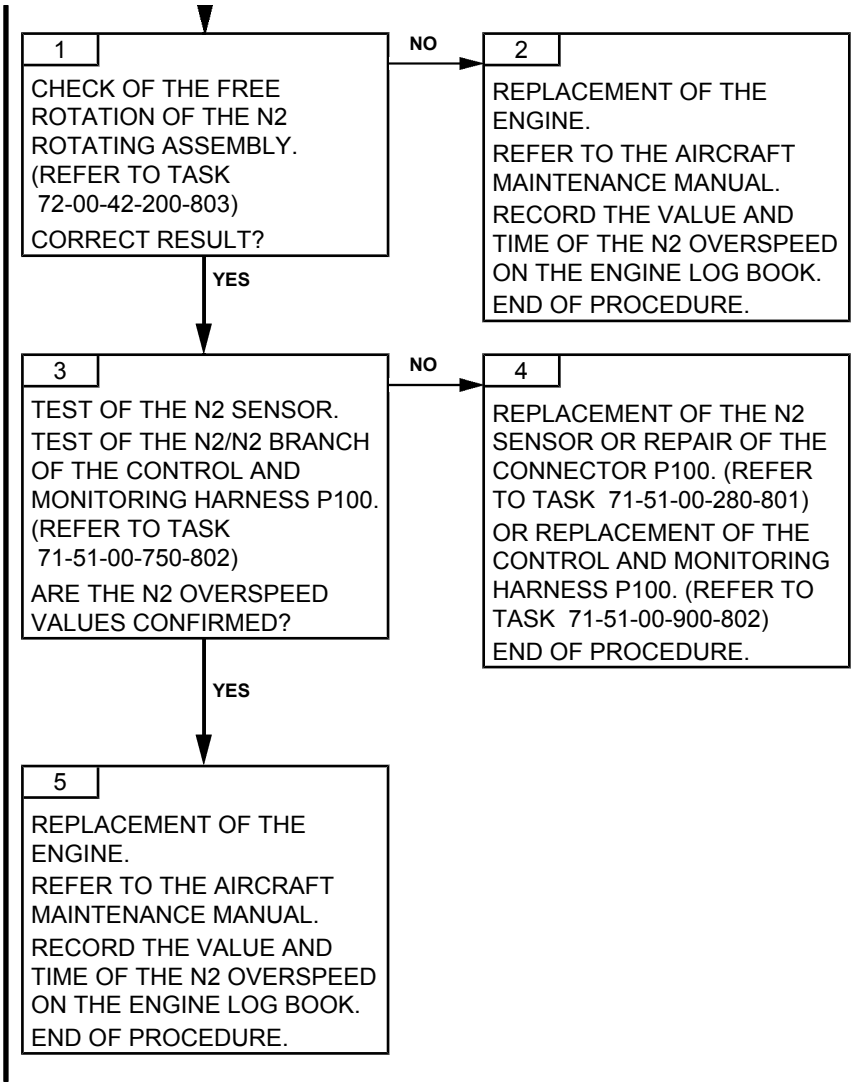
The V.E.M.D is correct.

The N2 speed is checked by the adjusted fuel control unit. The speed must respect the limitations (Refer to Task 71-00-01-940-801).

### C. POSSIBLE CAUSES

- Adjusted fuel control unit
- Control and monitoring harness P100

## 2. PROCEDURE



TASK 71-00-06-814-842-A01

# FIRE ALARM OR NO FIRE ALARM TROUBLESHOOTING

## 1. GENERAL

### A. PHASE AND FAILURE DETECTION

| *PHASE* | *INDICATION* | |
|---|---|---|
| | *CDS CAUTION MESSAGE* | *ALARM INDICATOR LIGHTS* |
| IN OPERATION | | The “FIRE” indicator light is on |

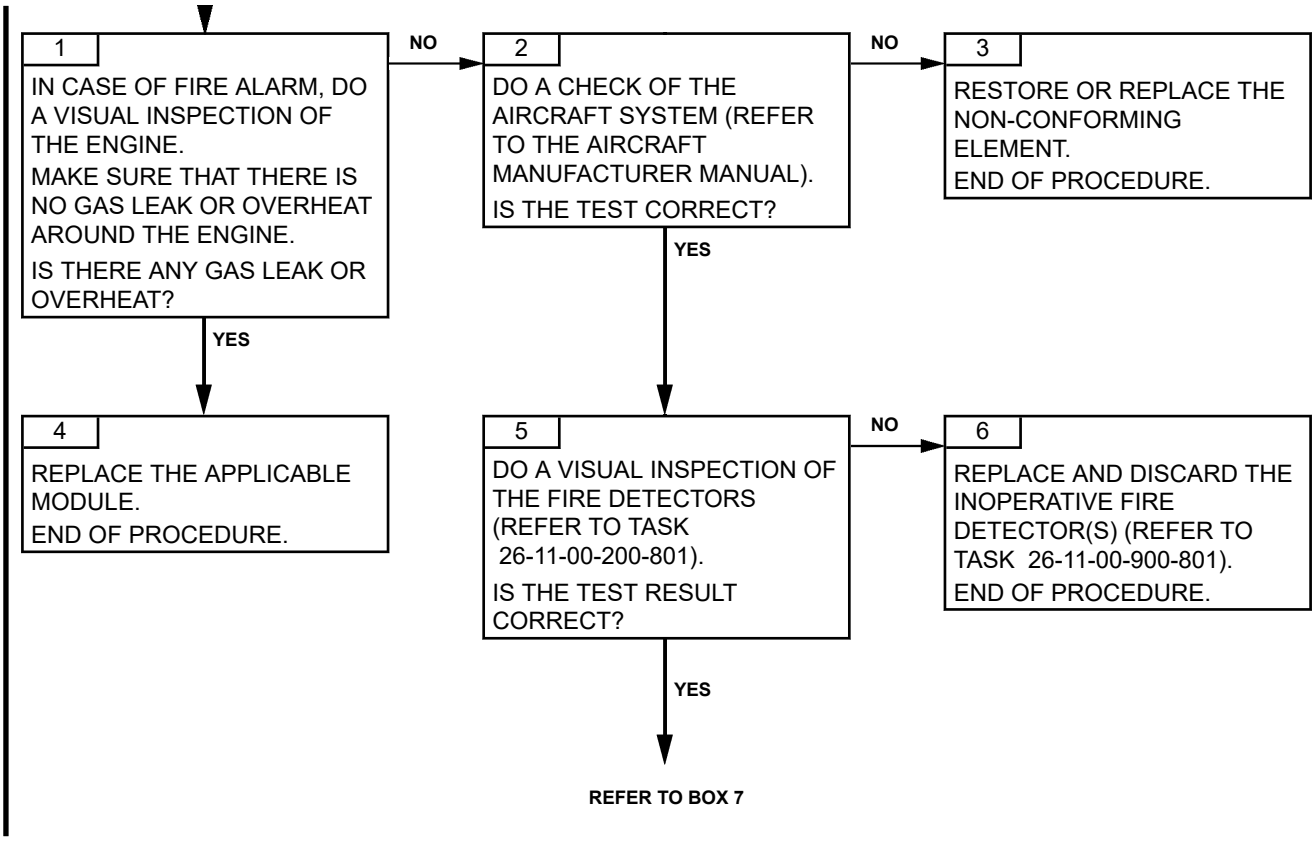
### B. REMINDER OF THE NORMAL OPERATING CONDITION

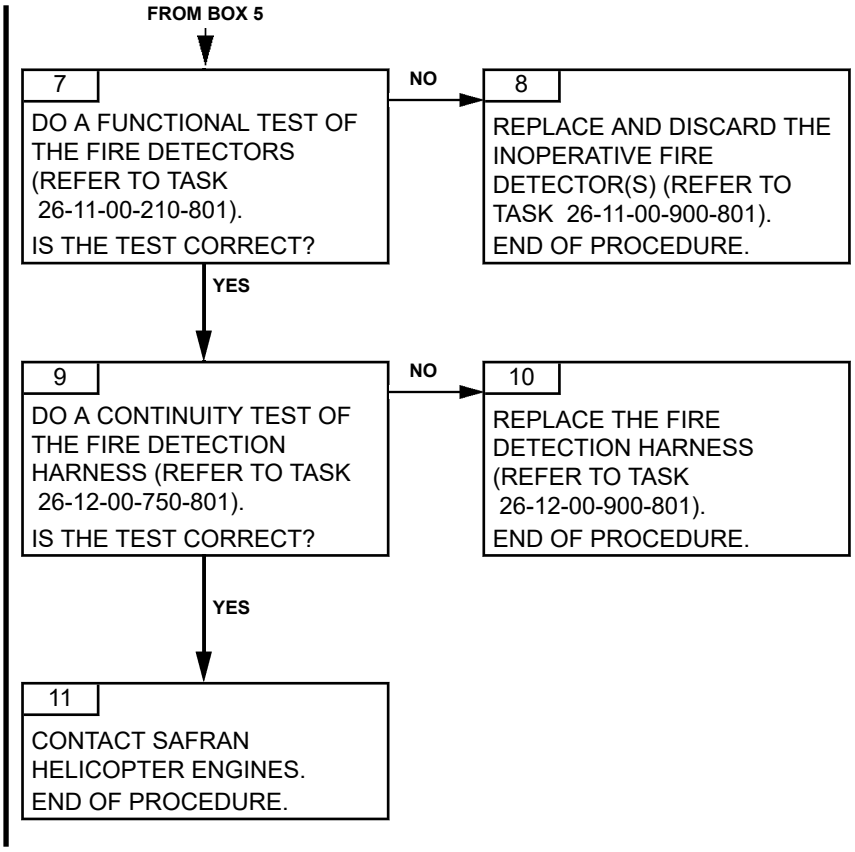
In operation, there is no fire alarm.

### C. POSSIBLE CAUSES

– Fire detection harness
– Fire detectors
– Aircraft.

## 2. PROCEDURE





PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-815-804-A01

# TESTING OF THE NOT COMPLIANT PREFERENCE INJECTOR TROUBLESHOOTING

## 1. GENERAL

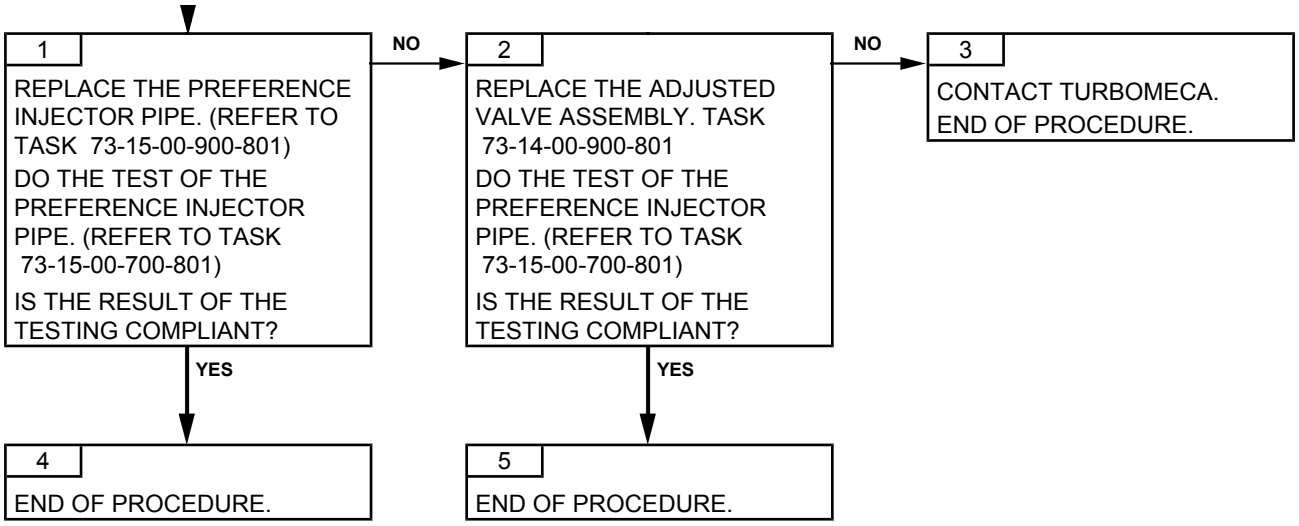
### A. REMINDER OF THE NORMAL OPERATING CONDITION

The testing of the preference injector must be compliant with the criteria defined in the testing task Task 73-15-00-700-801.

### B. POSSIBLE CAUSES

- Adjusted valve assembly
- Preference injector pipe

## 2. PROCEDURE



TASK 71-00-06-816-801-A01

# DEFECTIVE AUTOMATIC CYCLE COUNTING TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. REMINDER OF THE NORMAL OPERATING CONDITION

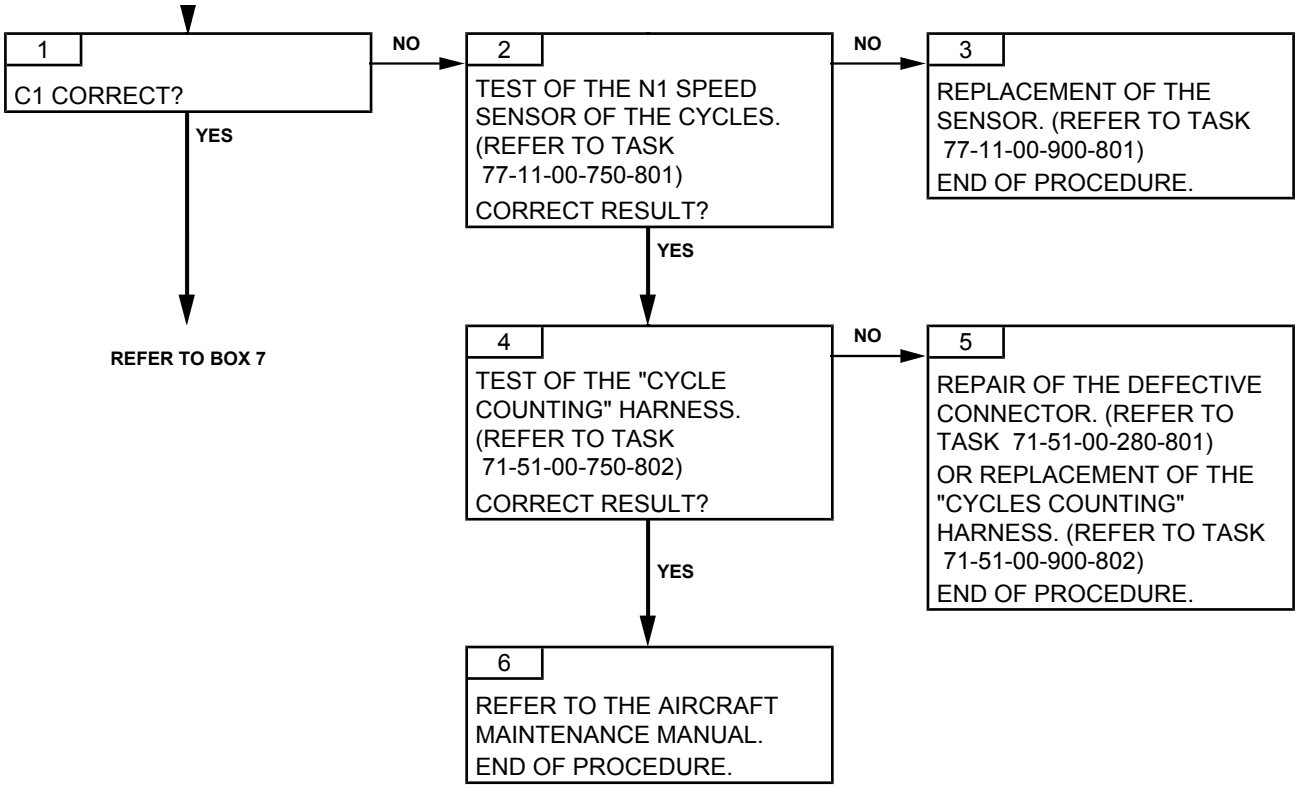
The V.E.M.D is correct.

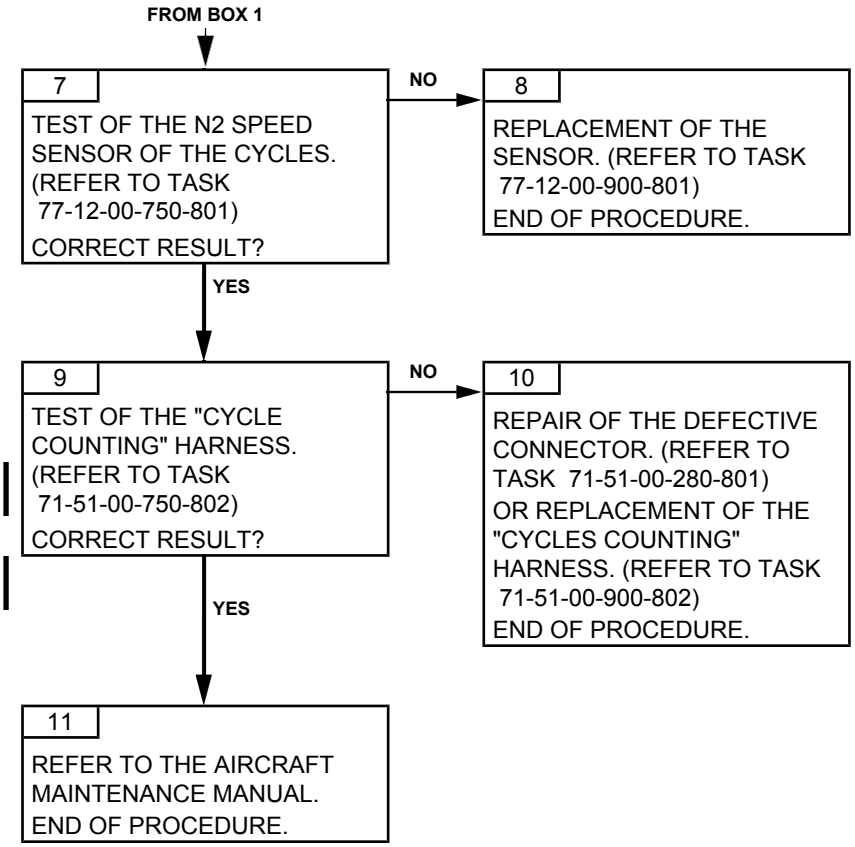
The values displayed on the V.E.M.D must be identical to the values counted manually.

### C. POSSIBLE CAUSES

- N1 speed sensor of the cycles
- N2 speed sensor of the cycles
- "Cycle counting" harness
- Aircraft

## 2. PROCEDURE


1
C1 CORRECT?
NO
YES
REFER TO BOX 7
2
TEST OF THE N1 SPEED SENSOR OF THE CYCLES. (REFER TO TASK 77-11-00-750-801)
CORRECT RESULT?
NO
YES
3
REPLACEMENT OF THE SENSOR. (REFER TO TASK 77-11-00-900-801)
END OF PROCEDURE.
4
TEST OF THE "CYCLE COUNTING" HARNESS. (REFER TO TASK 71-51-00-750-802)
CORRECT RESULT?
NO
YES
5
REPAIR OF THE DEFECTIVE CONNECTOR. (REFER TO TASK 71-51-00-280-801)
OR REPLACEMENT OF THE "CYCLES COUNTING" HARNESS. (REFER TO TASK 71-51-00-900-802)
END OF PROCEDURE.
6
REFER TO THE AIRCRAFT MAINTENANCE MANUAL.
END OF PROCEDURE.



**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-816-802-A01

# EXHAUST FUMES AFTER ENGINE SHUTDOWN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Engine running and/or engine stop

### B. REMINDER OF THE NORMAL OPERATING CONDITION

In operating condition, no smoke at the exhaust pipe outlet.

Some very faint smoke (like cigarette smoke) is allowed after engine shut down.

Indeed, remaining fuel may drip from the main injectors inside the combustion chamber.

### C. POSSIBLE CAUSES

The smoke may be generated either by oil or fuel:

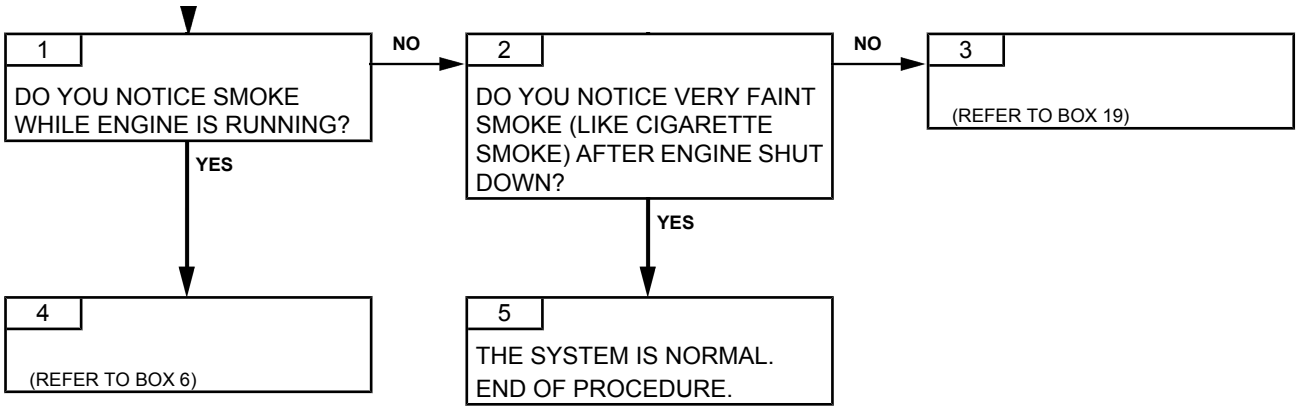
In case of oil smoke:

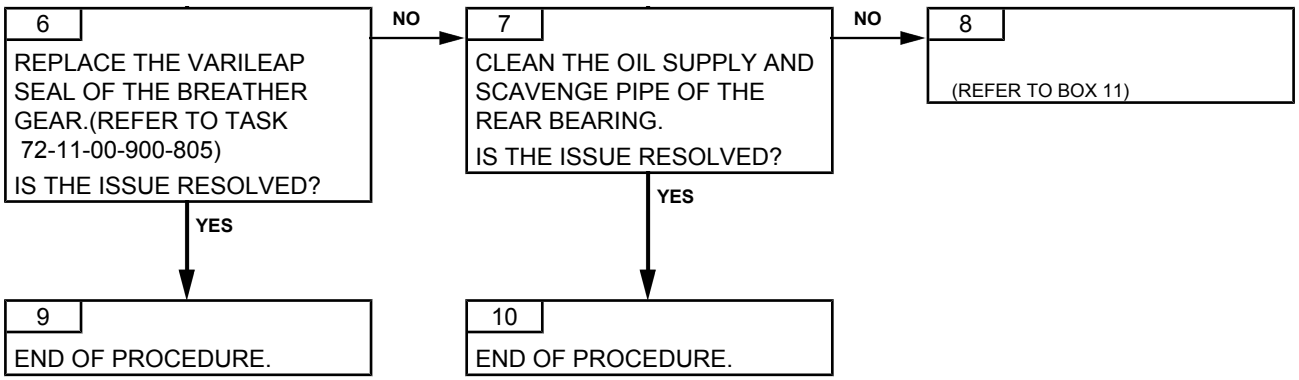
- Lip seal of the breather
- Oil pump
- Module 1 (M01)
- Module 2 (M02)
- Oil Pipes
- Oil check valve of the lubrication unit

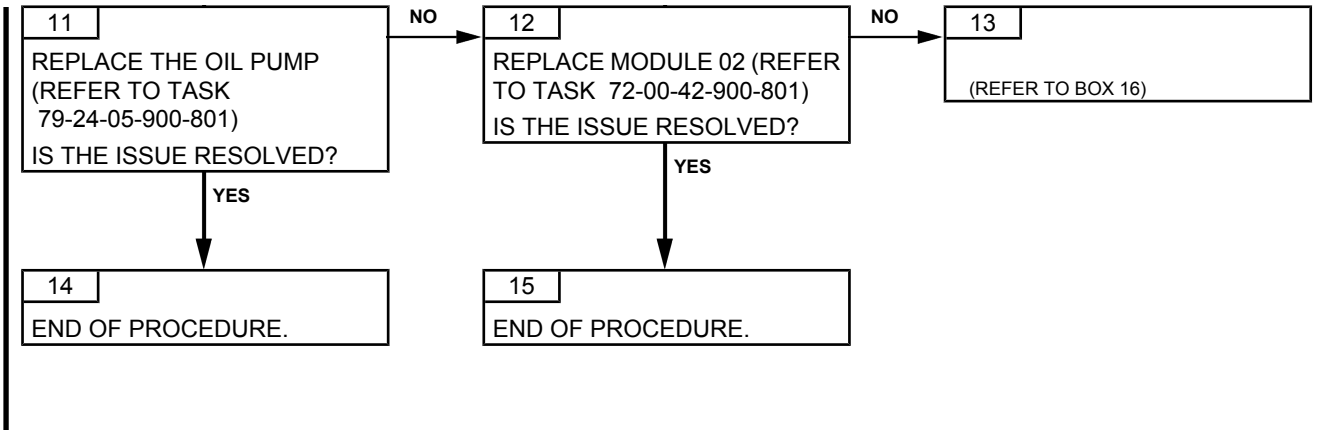
In case of fuel smoke:

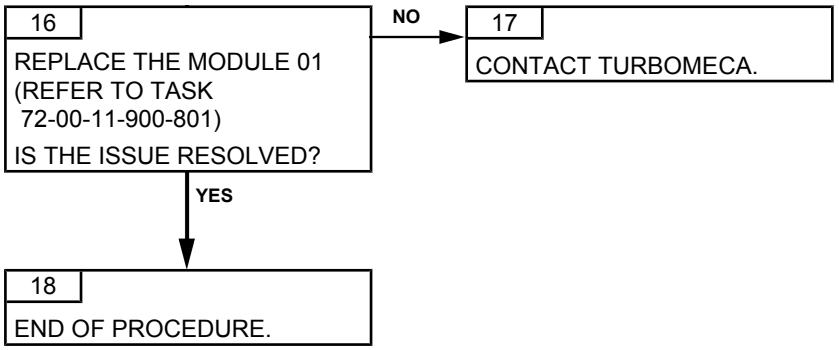
- Adjusted fuel valve assembly

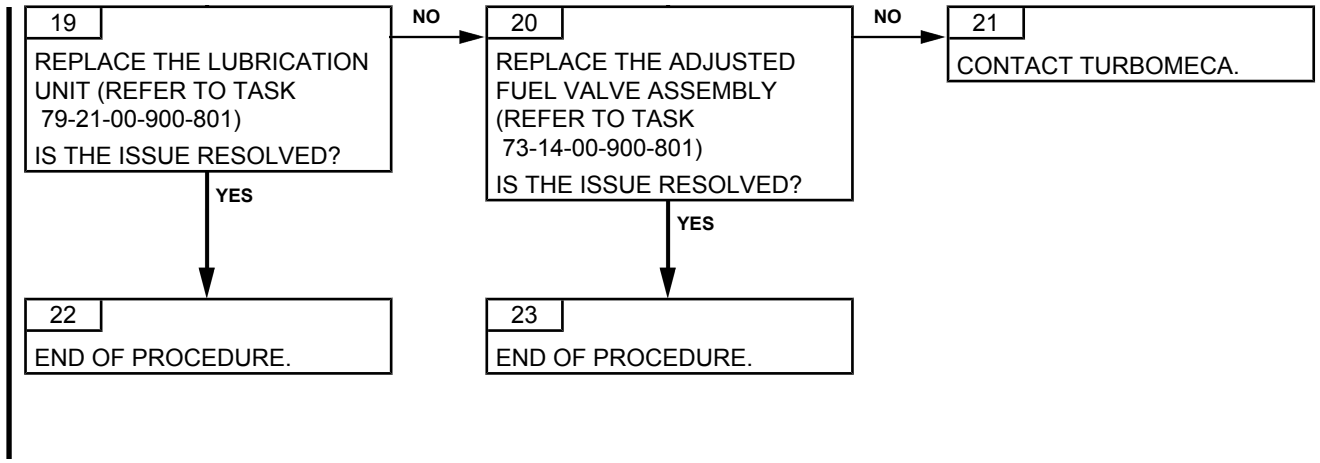
## 2. PROCEDURE








16
REPLACE THE MODULE 01 (REFER TO TASK 72-00-11-900-801)
IS THE ISSUE RESOLVED?
NO
17
CONTACT TURBOMECA.
YES
18
END OF PROCEDURE.



**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-816-805-A01

# POPPING OUT OF THE VISUAL BLOCKAGE INDICATOR OF THE FUEL FILTERING ELEMENT TROUBLESHOOTING

## 1. GENERAL

### A. PHASE AND FAILURE DETECTION

Maintenance

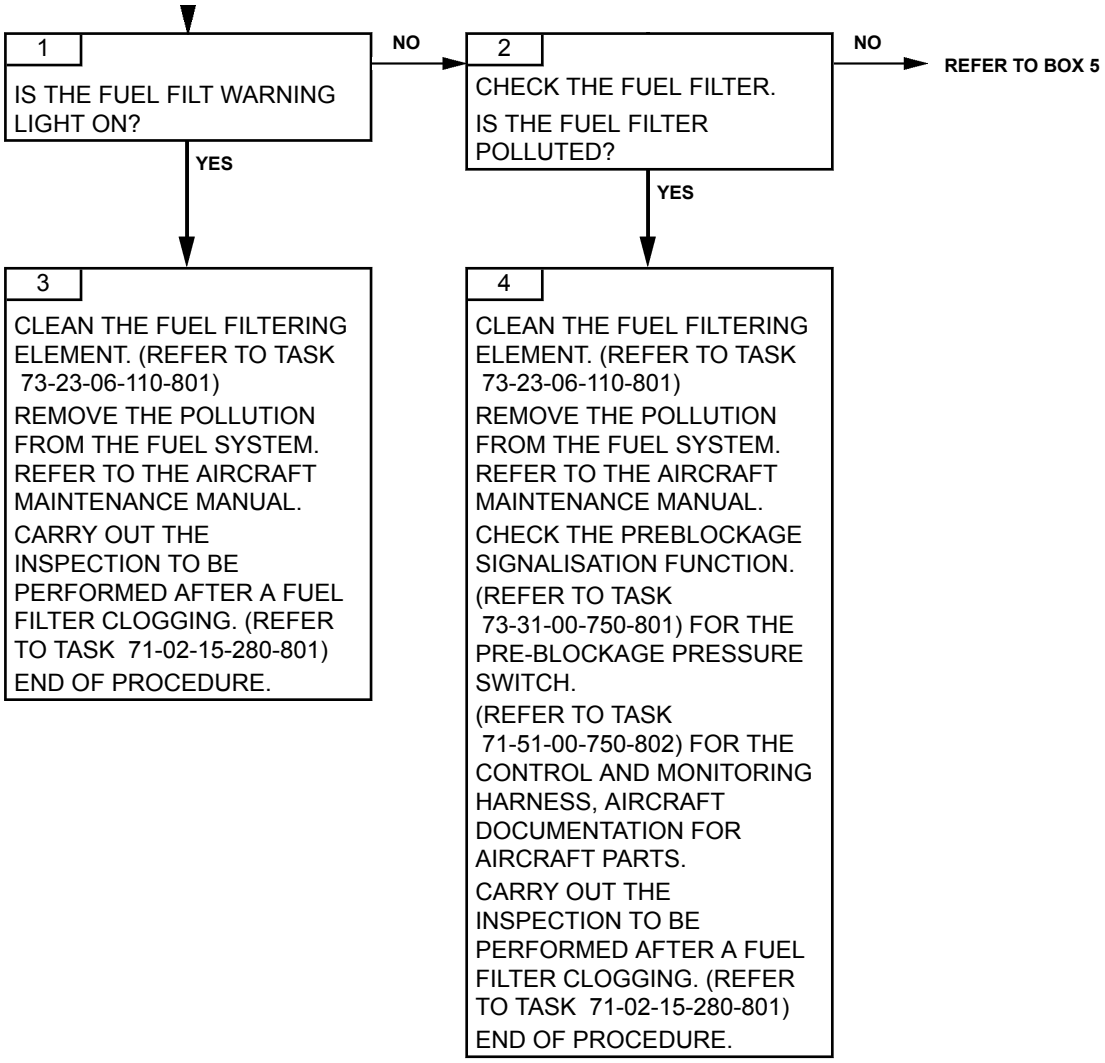
### B. REMINDER OF THE NORMAL OPERATING CONDITION OR FAILURE DETECTION CONDITION

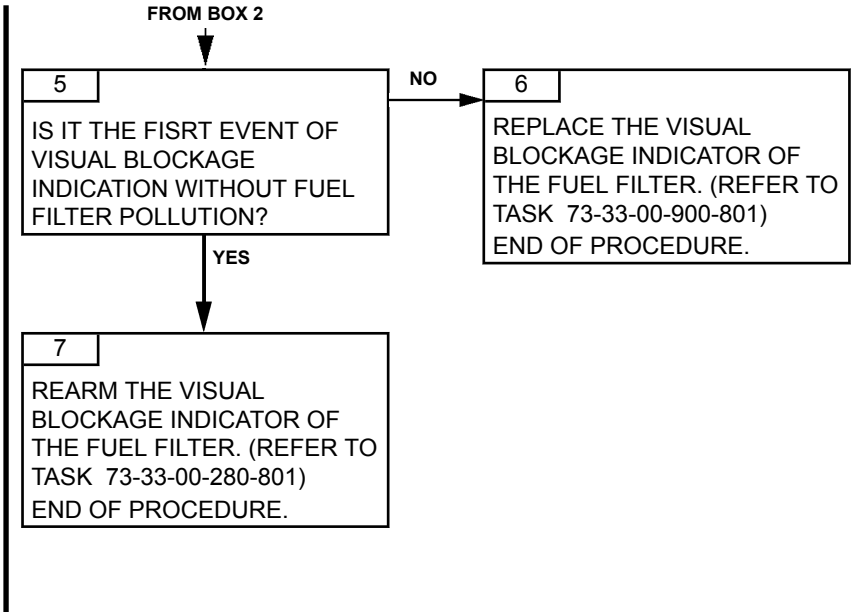
The visual indicator must not be displayed.

### C. POSSIBLE CAUSES

– Visual blockage indicator
– Fuel pollution

## 2. PROCEDURE





**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-816-806-A01

# LEAKAGE AT THE POWER-DRIVE DRAIN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. GENERAL DESCRIPTION

The adjusted fuel control unit has two drains:

- One from the mini flow control valve
- One from the fuel pump drain (collecting the fuel shaft pump and the control unit shaft of the free turbine).

The two drains of the adjusted fuel control unit are connected together, and then connected to the power-drive drain.

The power-drive drain output is connected to the aircraft.

Read the description task of drain pipes for more information
(Refer to Task 71-71-00-870-801).

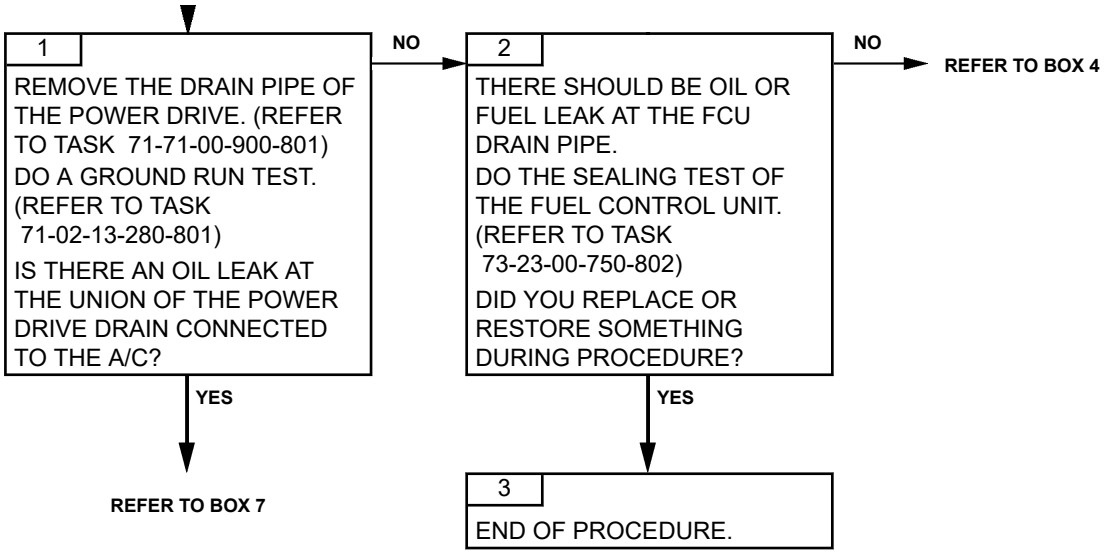
Read the dedicated task for the tolerance criteria of a fuel leakage
(Refer to Task 73-23-00-750-802).

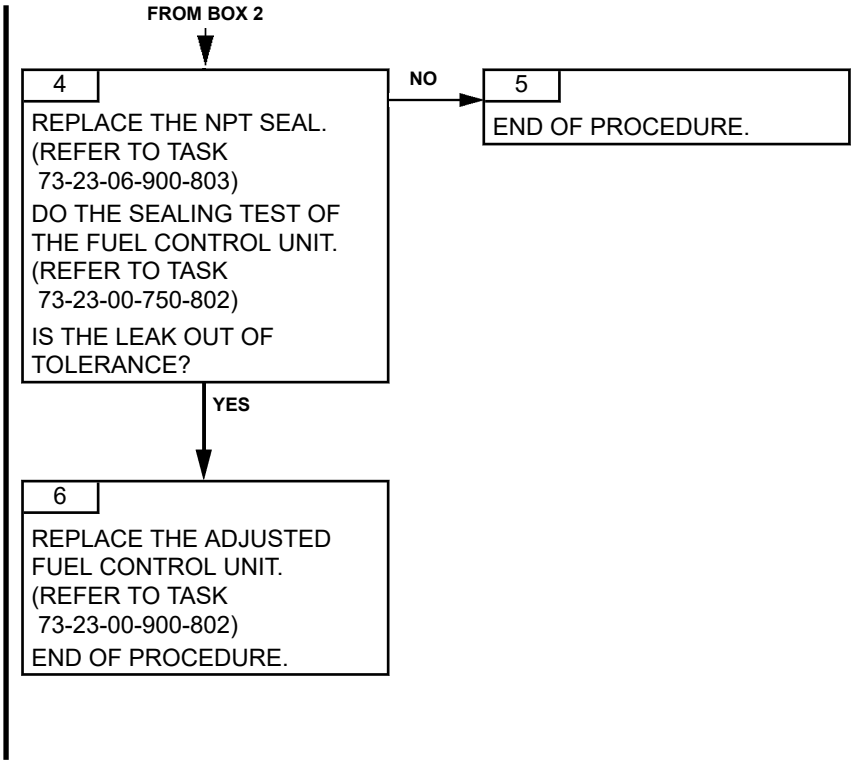
Read the dedicated task for the tolerance criteria of an oil leakage
(Refer to Task 72-11-00-900-803).

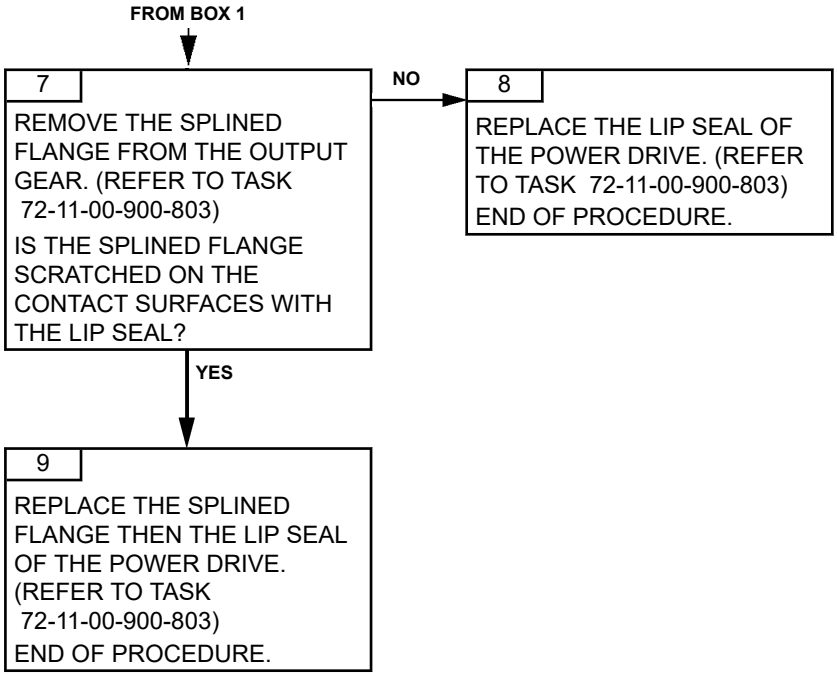
### C. POSSIBLE CAUSES

- Adjusted fuel control unit drains
- Lip seal of the power drive
- Splined flange of the output gear

## 2. PROCEDURE


1
REMOVE THE DRAIN PIPE OF THE POWER DRIVE. (REFER TO TASK 71-71-00-900-801)
DO A GROUND RUN TEST. (REFER TO TASK 71-02-13-280-801)
IS THERE AN OIL LEAK AT THE UNION OF THE POWER DRIVE DRAIN CONNECTED TO THE A/C?
NO
2
THERE SHOULD BE OIL OR FUEL LEAK AT THE FCU DRAIN PIPE.
DO THE SEALING TEST OF THE FUEL CONTROL UNIT. (REFER TO TASK 73-23-00-750-802)
DID YOU REPLACE OR RESTORE SOMETHING DURING PROCEDURE?
NO
REFER TO BOX 4
YES
REFER TO BOX 7
YES
3
END OF PROCEDURE.





TASK 71-00-06-816-806-B01

# LEAKAGE AT THE POWER-DRIVE DRAIN TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. GENERAL DESCRIPTION

The adjusted fuel control unit has two drains:

– One from the mini flow control valve
– One from the fuel pump drain (collecting the fuel shaft pump and the control unit shaft of the free turbine).

The two drains of the adjusted fuel control unit are connected together, and then connected to the power-drive drain.

The power-drive drain output is connected to the aircraft.

Read the description task of drain pipes for more information
(Refer to Task 71-71-00-870-801).

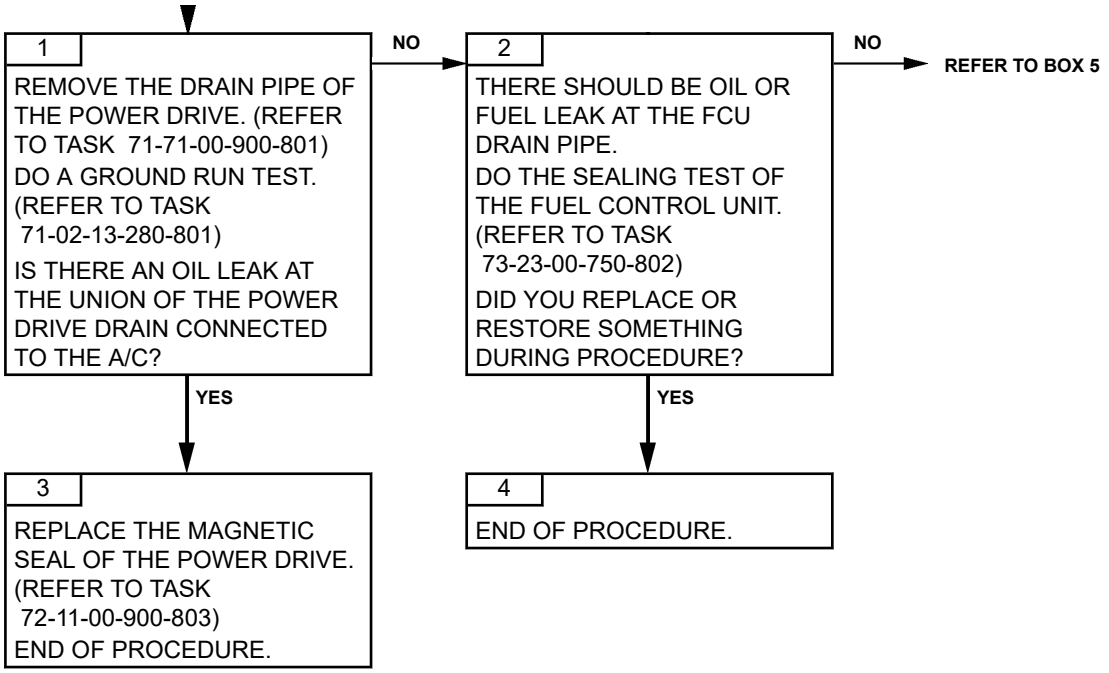
Read the dedicated task for the tolerance criteria of a fuel leakage
(Refer to Task 73-23-00-750-802).

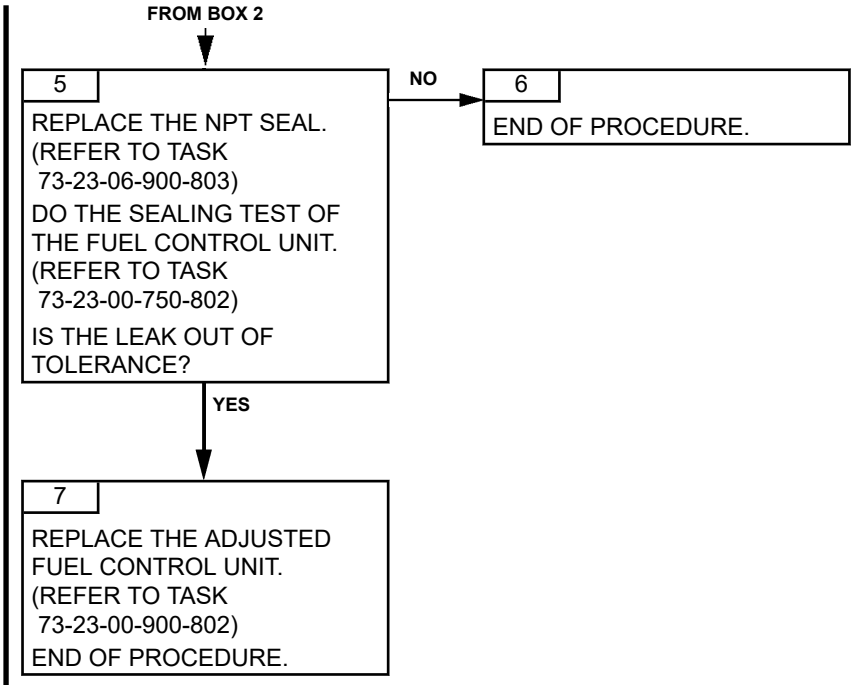
Read the dedicated task for the tolerance criteria of an oil leakage
(Refer to Task 72-11-00-900-803).

### C. POSSIBLE CAUSES

– Adjusted fuel control unit drains
– Lip seal of the power drive

## 2. PROCEDURE




FROM BOX 2
5
REPLACE THE NPT SEAL.
(REFER TO TASK
73-23-06-900-803)
DO THE SEALING TEST OF
THE FUEL CONTROL UNIT.
(REFER TO TASK
73-23-00-750-802)
IS THE LEAK OUT OF
TOLERANCE?
NO
6
END OF PROCEDURE.
YES
7
REPLACE THE ADJUSTED
FUEL CONTROL UNIT.
(REFER TO TASK
73-23-00-900-802)
END OF PROCEDURE.

**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-816-807-A01

# POPPING OUT OF THE VISUAL BLOCKAGE INDICATOR OF THE OIL FILTERING ELEMENT TROUBLESHOOTING

## 1. GENERAL

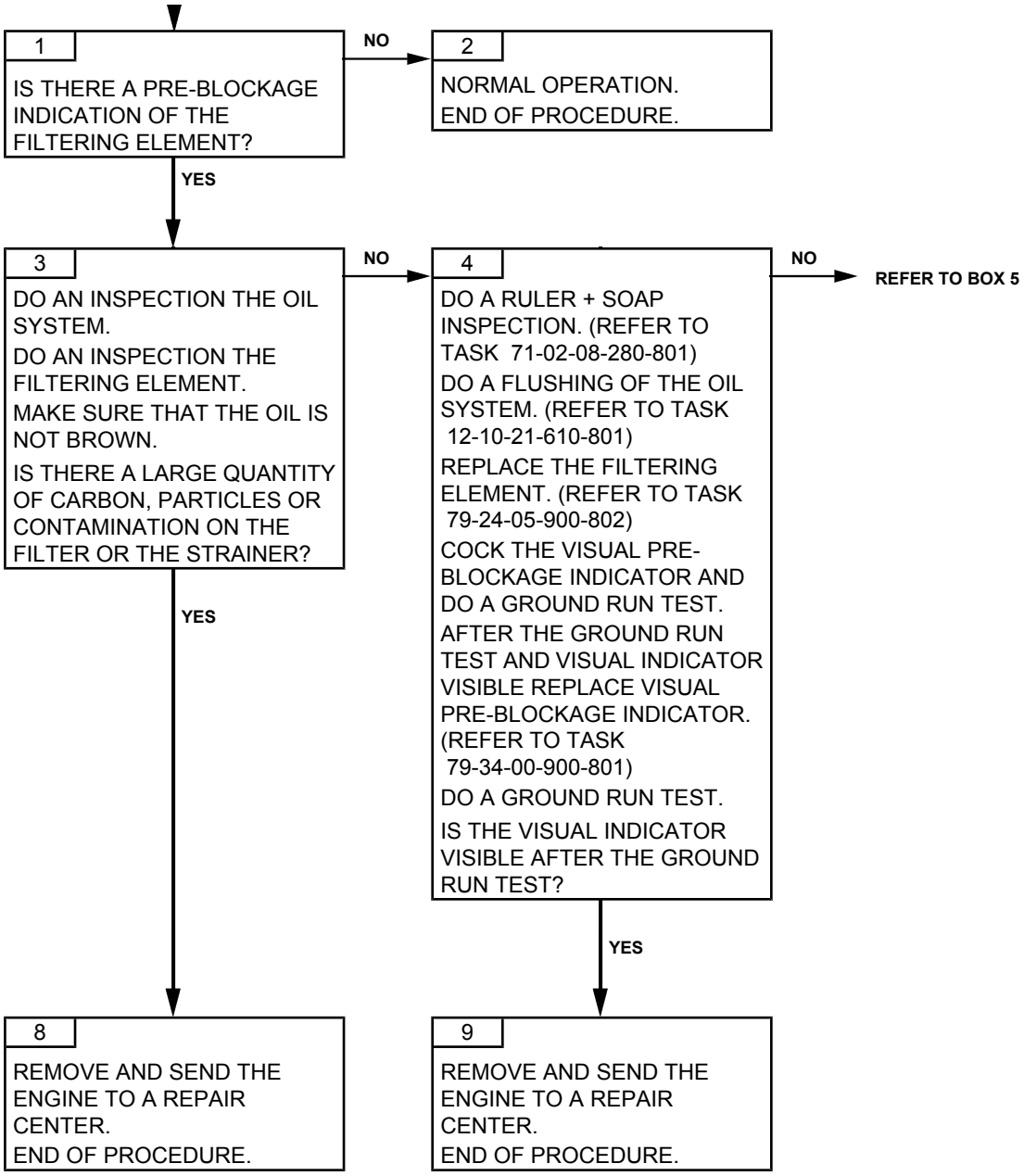
### A. REMINDER OF THE NORMAL OPERATING CONDITION

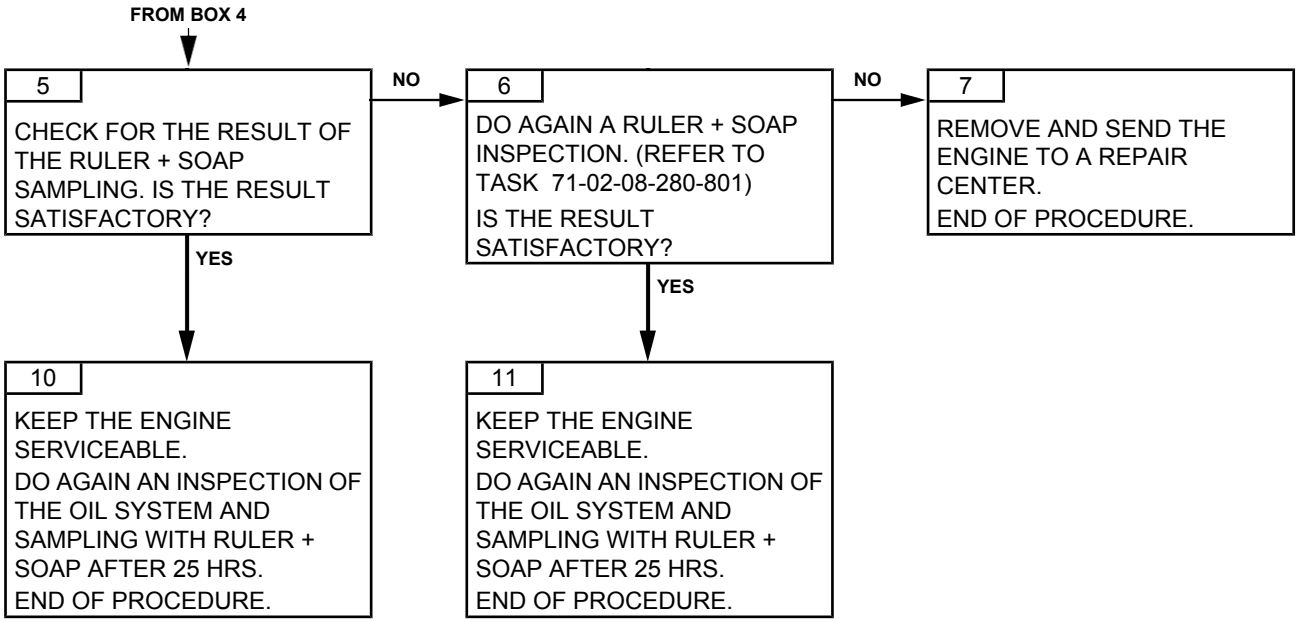
The visual pre-blockage indicator of the oil filtering element must always be armed (not visible).

### B. POSSIBLE CAUSES

- Contamination of the oil system
- Oil filtering element
- Visual pre-blockage element of the oil filtering element

## 2. PROCEDURE





**PAGE LEFT BLANK INTENTIONALLY**

TASK 71-00-06-816-808-A01

# OIL LEAKAGE AT THE STARTER POWER DRIVE TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. REMINDER OF THE NORMAL OPERATING CONDITION

The oil leakage tolerance criteria are defined. Refer to Task 79-00-00-280-801.

### C. POSSIBLE CAUSES

– Lip seal or magnetic seal of the starter power drive

## 2. PROCEDURE

1

REPLACEMENT OF THE LIP SEAL OR THE MAGNETIC SEAL OF THE STARTER POWER DRIVE. (REFER TO TASK 72-11-00-900-804)

DO A GROUND RUN TEST.

REFER TO THE AIRCRAFT MAINTENANCE MANUAL.

END OF PROCEDURE.

TASK 71-00-06-816-811-A01

# OIL TRACES IN THE AIR INTAKE CASING TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. REMINDER OF THE NORMAL OPERATING CONDITION

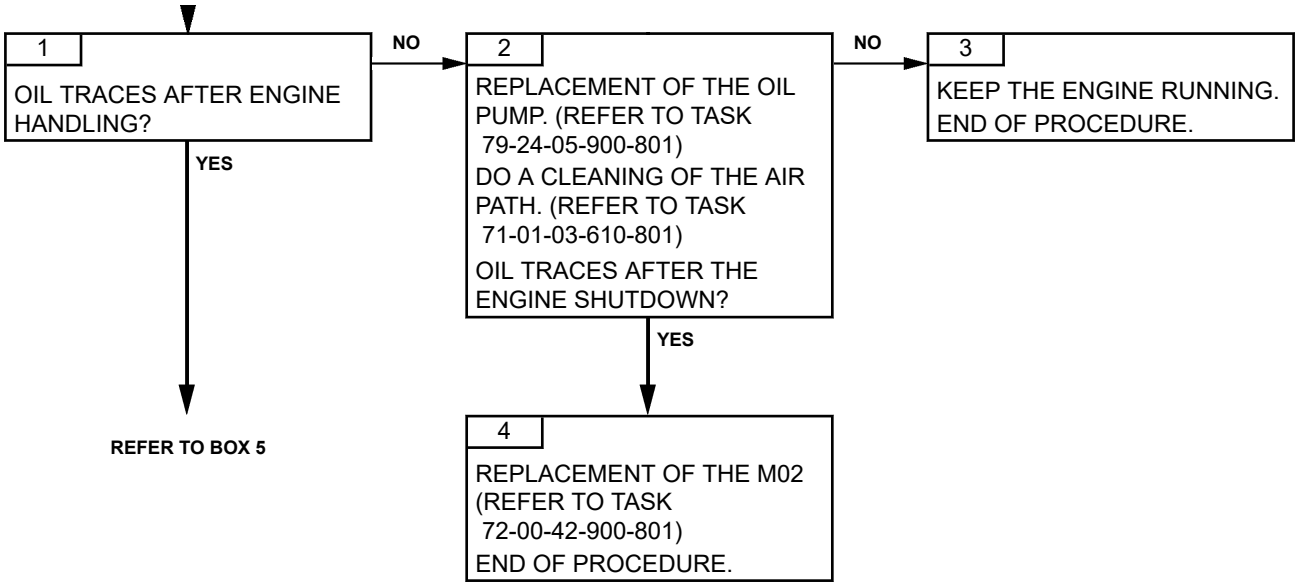
No external leak except in the air intake casing.

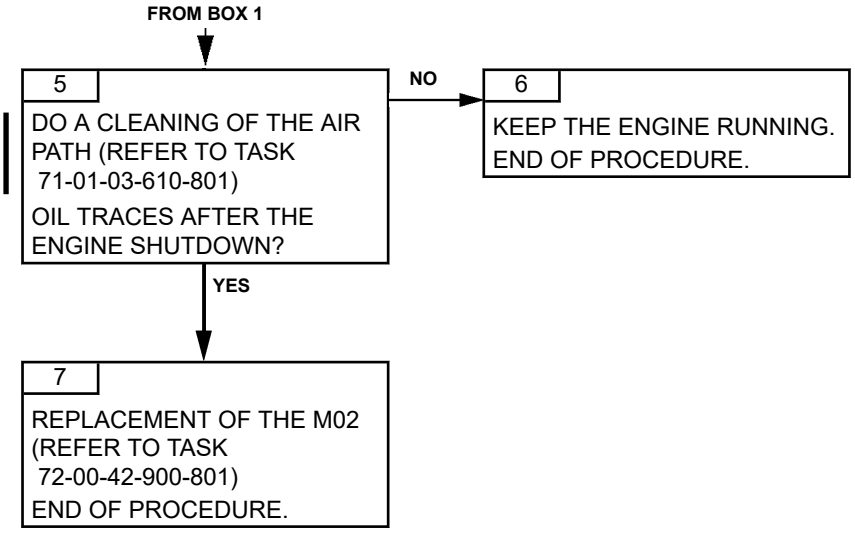
The lubrication of the front casing of the gas generator is ensured by internal pipes of the air intake casing and the sealing is ensured by a double labyrinth seal.

### C. POSSIBLE CAUSES

- Engine position during handling
- Oil pump
- Module 2 (M02)

## 2. PROCEDURE


1
OIL TRACES AFTER ENGINE HANDLING?
NO
2
REPLACEMENT OF THE OIL PUMP. (REFER TO TASK 79-24-05-900-801)
DO A CLEANING OF THE AIR PATH. (REFER TO TASK 71-01-03-610-801)
OIL TRACES AFTER THE ENGINE SHUTDOWN?
NO
3
KEEP THE ENGINE RUNNING.
END OF PROCEDURE.
YES
REFER TO BOX 5
YES
4
REPLACEMENT OF THE M02 (REFER TO TASK 72-00-42-900-801)
END OF PROCEDURE.


FROM BOX 1
5
DO A CLEANING OF THE AIR PATH (REFER TO TASK 71-01-03-610-801)
OIL TRACES AFTER THE ENGINE SHUTDOWN?
NO
6
KEEP THE ENGINE RUNNING.
END OF PROCEDURE.
YES
7
REPLACEMENT OF THE M02 (REFER TO TASK 72-00-42-900-801)
END OF PROCEDURE.

PAGE LEFT BLANK INTENTIONALLY

TASK 71-00-06-816-815-A01

# OIL CONSUMPTION MORE THAN 0.3 L/HR TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

Check and inspection

### B. REMINDER OF THE NORMAL OPERATING CONDITION

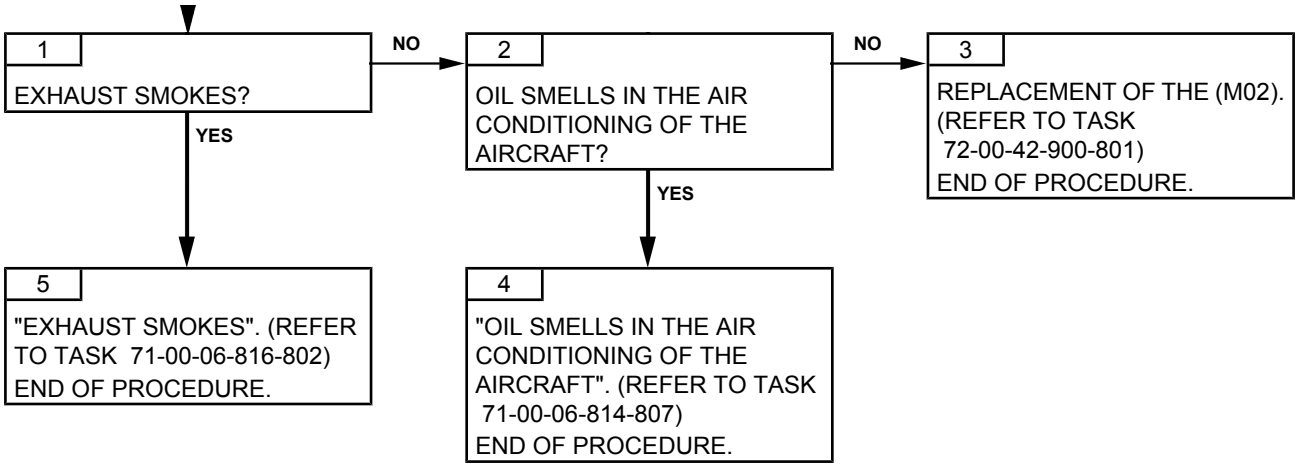
No external oil leak and no oil traces in the air intake casing.

The frequent recompletions show the consumption. The number of recompletions enables to quantify the consumption.

### C. POSSIBLE CAUSES

– Module 2 (M02)

## 2. PROCEDURE



TASK 71-00-06-816-816-A01

# EXTERNAL LEAKS AT ADJUSTED FUEL CONTROL UNIT ASSEMBLY TROUBLESHOOTING

## 1. GENERAL

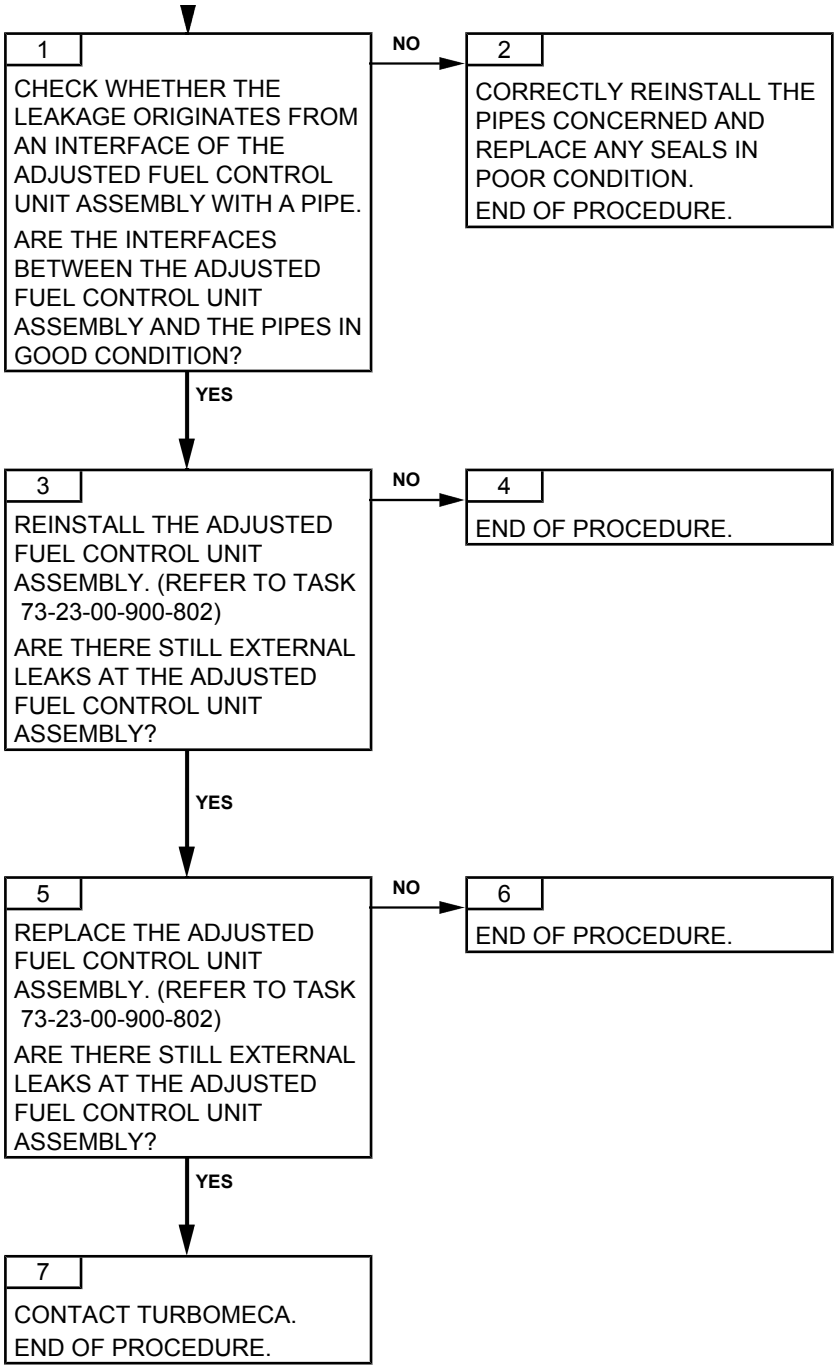
### A. REMINDER OF THE OPERATING NORMAL CONDITION

No external leaks should be observed on the adjusted fuel control unit assembly.

### B. POSSIBLE CAUSES

– Incorrect installation of the pipes
– Incorrect installation of the adjusted fuel control unit assembly
– Adjusted fuel control unit assembly

## 2. PROCEDURE



TASK 71-00-06-816-826-A01

# ABNORMAL VIBRATION, ABNORMAL NOISE OR ACCESSORY DAMAGE TROUBLESHOOTING

## 1. GENERAL

### A. GENERAL DESCRIPTION

Safran Helicopter Engines recommends to do this troubleshooting procedure:

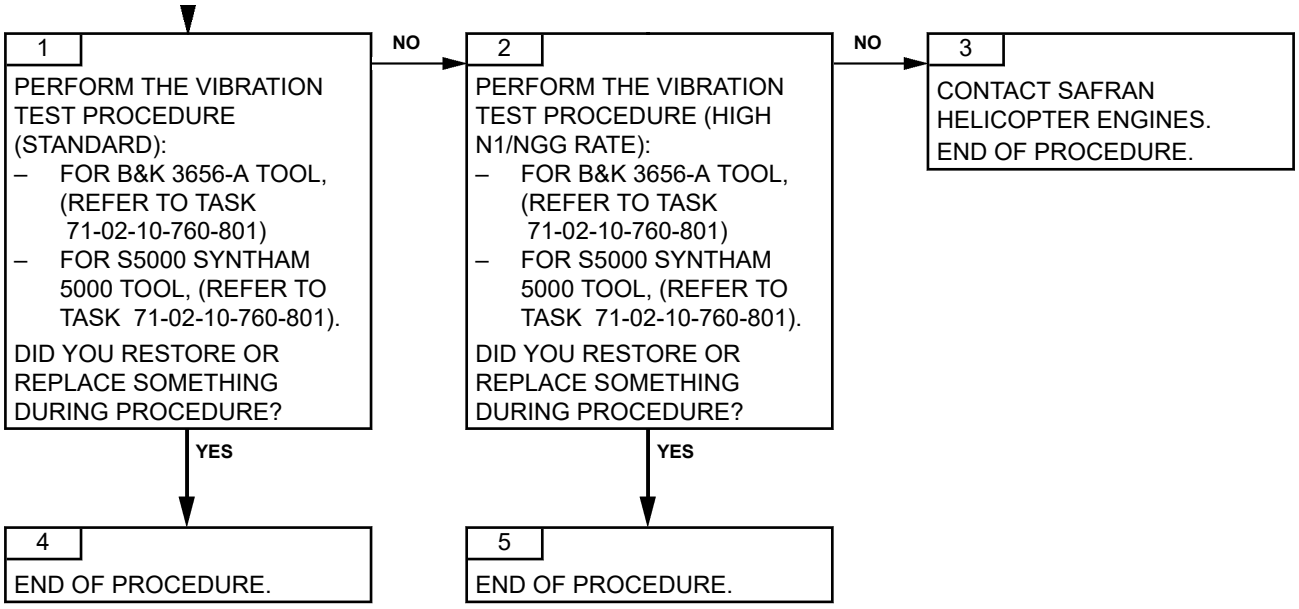
- If you are not sure of the engine vibration level
- After abnormal vibration or abnormal noise reported by the crew
- After a damage possibly caused by an abnormal vibration level:
  - Breaking of pipe or repetitive crack of pipe
  - Repetitive replacement of a same accessory
  - Crack found on a accessory.

The vibration criteria are defined in the tasks (Refer to Task 71-02-10-940-801).

### B. POSSIBLE CAUSES

- Module(s)
- Engine

## 2. PROCEDURE



TASK 71-00-06-816-827-A01

# INJECTION PROTECTION TEST NOT CONFORM TROUBLESHOOTING

## 1. GENERAL

### A. PHASE

During a ground run.

### B. GENERAL DESCRIPTION

The injection protection test is a pilot procedure.

The injection protection test should not lead to a flame-out of the engine.

This troubleshooting procedure has to be done if the injection protection test procedure has lead to a flame-out of the engine.

If the flameout of the engine occurred outside of the injection protection test, please contact Safran Helicopter Engines: do not do this procedure.

### C. POSSIBLE CAUSES

– P3 air pressure switch

## 2. PROCEDURE

1

REPLACE THE P3 AIR PRESSURE SWITCH. (REFER TO TASK 75-41-00-900-801)
END OF PROCEDURE.