

**Supplement O04**  
**TO THE AIRPLANE FLIGHT MANUAL DA 40 NG**  
**Diesel Operation**

**Doc. No. : 6.01.15-E**

**Date of Issue : 06-Dec-2013**

**Design Change Advisories : OÄM 40-370**

This Supplement to the Airplane Flight Manual has been approved by EASA with EASA Approval No. 10047557.



Intentionally left blank.

## 0.1 RECORD OF REVISIONS

Rev. No.	Reason	Chapter	Page(s)	Date of Revision	Approval Note	Date of Approval	Date Inserted	Signature

**0.2 LIST OF EFFECTIVE PAGES**

Chapter	Page	Date
0	9-O04-1	06 Dec 2013
	9-O04-2	06 Dec 2013
	9-O04-3	06 Dec 2013
	9-O04-4	06 Dec 2013
	9-O04-5	06 Dec 2013
1	9-O04-6	06 Dec 2013
2	EASA approved 9-O04-7	06 Dec 2013
	EASA approved 9-O04-8	06 Dec 2013
	EASA approved 9-O04-9	06 Dec 2013
3	9-O04-10	06 Dec 2013
4A	9-O04-11	06 Dec 2013
	9-O04-12	06 Dec 2013
4B	9-O04-13	06 Dec 2013
5	9-O04-14	06 Dec 2013
6	9-O04-15	06 Dec 2013
7	9-O04-16	06 Dec 2013
	9-O04-17	06 Dec 2013
8	9-O04-18	06 Dec 2013

### 0.3 TABLE OF CONTENTS

	Page
1. GENERAL .....	9-004-6
2. LIMITATIONS .....	9-004-7
3. EMERGENCY PROCEDURES .....	9-004-10
4A. NORMAL OPERATING PROCEDURES .....	9-004-11
4B. ABNORMAL OPERATING PROCEDURES .....	9-004-13
5. PERFORMANCE .....	9-004-14
6. MASS AND BALANCE .....	9-004-15
7. SYSTEM DESCRIPTION .....	9-004-16
8. AIRPLANE HANDLING, CARE AND MAINTENANCE .....	9-004-18

## 1. GENERAL

This Supplement supplies the information necessary for operation of a DA 40 NG with Diesel Fuel according to EN 590.

The information contained in this Supplement is to be used in conjunction with the complete AFM. The limitations and information contained herein either supplement or, in the case of conflict, override those in the Airplane Flight Manual or its previous Temporary Revisions.

This Supplement is a permanent part of this AFM and must remain in this AFM at all times if OÄM 40-370 is implemented.

### **NOTE**

For Diesel Fuel operation a dedicated engine and Garmin G1000 software is required. Refer to MSB40NG-002 and MSB40NG-003, latest effective issue.

## 2. LIMITATIONS

### 2.4 POWER-PLANT LIMITATIONS

j) Fuel temperature

Minimum : - 30 °C

Maximum : 60 °C

### 2.5 ENGINE INSTRUMENTS MARKINGS

Indi- cation	Red arc/bar = lower prohibited range	Yellow arc/bar = caution range	Green arc/bar = normal operating range	Yellow arc/bar = caution range	Red arc/bar = upper prohibited range
Fuel temp.	below -30°C	-30° to +4°C	+5° to 55°C	55° to 60°C	above 60°C

## 2.14 FUEL

### Diesel Fuel:

Diesel (EN 590)  
 and blends of the approved Jet fuel grades: see  
 CAUTION below.

### **CAUTION**

Additional temperature limitations must be observed if the airplane is operated with Diesel Fuel or blends of Diesel Fuel with JET Fuel.

### **CAUTION**

For Diesel fuel operation no fuel additives are permitted.

## 2.15 LIMITATION PLACARDS

### In the Forward View of the Pilot:

No engine start below	No take-off below	Diesel Fuel Class
-5°C (+23°F)	+5°C (+41°F)	Diesel Fuel of unknown class or unknown fuel blend
-10°C (+14°F)	-5°C (+23°F)	Diesel Fuel Class C
-15°C (+5°F)	-10°C (+14°F)	Diesel Fuel Class D, E or F



## 2.16 OTHER LIMITATIONS

### 2.16.1 TEMPERATURE

Diesel Fuel of an unknown class, Blends of Diesel Fuel with JET Fuel, or unknown fuel grade:

Engine starting fuel temperature . . . . . min. -5 °C (+23 °F)  
Take-off fuel temperature . . . . . min.+5 °C (+41 °F)  
Maximum fuel temperature . . . . . +60 °C (+140 °F)

Diesel Fuel Class C:

Engine starting fuel temperature . . . . . min. -10 °C (+14 °F)  
Take-off fuel temperature . . . . . min. -5°C (+23°F)  
Maximum fuel temperature . . . . . +60 °C (+140 °F)

Diesel Fuel Class D, E or F:

Engine starting fuel temperature . . . . . min. -15 °C (+5 °F)  
Take-off fuel temperature . . . . . min. -10°C (+14°F)  
Maximum fuel temperature . . . . . +60 °C (+140 °F)

For more information about Diesel fuel classes refer to Section 7.9.4 - FUEL SYSTEM.

### 3. EMERGENCY PROCEDURES

No changes.

## **4A. NORMAL OPERATING PROCEDURES**

### **4A.5 CHECKLISTS FOR NORMAL OPERATING PROCEDURES**

#### **4A.5.2 BEFORE STARTING THE ENGINE**

#### **WARNING**

If Diesel Fuel of unknown class or a blend of Diesel Fuel with JET Fuel is used, the engine must not be started if the fuel temperature indication prior to operation is below  $-5\text{ }^{\circ}\text{C}$  ( $+23\text{ }^{\circ}\text{F}$ ).

#### **NOTE**

Make sure which fuel grade is being used (see Section 7.9.4). If it is not possible to determine the fuel grade, the Diesel Fuel temperature limitations must be observed.

#### 4A.5.19 REFUELING

#### **NOTE**

If the airplane is operated with Diesel Fuel additional temperature limitations (refer to Sections 2.15 - LIMITATION PLACARDS and 2.16.1 - FUEL TEMPERATURE) must be observed. No fuel additives are permitted.

If JET Fuel is used, make sure that no Diesel Fuel is remaining in the tanks, neither in the left nor in the right tank (see fuel grade, Section 7.9.4 - FUEL SYSTEM). Otherwise the temperature limitations for Diesel Fuel operation must be observed.

#### **4B. ABNORMAL OPERATING PROCEDURES**

No change.

## **5. PERFORMANCE**

### **5.3 PERFORMANCE TABLES AND DIAGRAMS**

#### **5.3.7 TAKE-OFF DISTANCE**

Below 10° C (50° F) OAT:

Add 6% to the take-off ground roll

Add 6% to the take-off distance over a 15m obstacle

#### **5.3.8 CLIMB PERFORMANCE - TAKE-OFF CLIMB**

Below 10° C (50° F) OAT:

Reduce climb performance by 50 ft/min (0.25 m/s)

#### **5.3.9 CLIMB PERFORMANCE - CRUISE CLIMB**

Below 10° C (50° F) OAT:

Reduce climb performance by 50 ft/min (0.25 m/s)

## 6. MASS AND BALANCE

No change.

## 7. SYSTEM DESCRIPTION

### 7.9 POWER PLANT

#### 7.9.4 FUEL SYSTEM

##### Fuel Temperature

There are six different classes for Diesel fuel according to EN 590. Each class has a temperature limit to prevent fuel filter plugging due to fuel flocculation. Refer to the table below:

Property	Unit	Limits					
		Class A	Class B	Class C	Class D	Class E	Class F
CFPP	° C	+5	0	-5	-10	-15	-20
CFPP	° F	+41	+32	+23	+14	+5	-4

CFPP ..... Cold filter plugging point

The lower yellow bar indicates that the airplane is not ready for take-off if Diesel Fuel (unknown class) or a blend of Diesel Fuel with JET Fuel grades is used (approved only if OÄM 40-370 is incorporated). If the fuel grade is uncertain, take-off is not allowed in this temperature range either.

In the temperature range below -5 °C (23 °F) the engine must not be started if Diesel Fuel (unknown class) or a blend of Diesel Fuel with JET Fuel grades is used. If the fuel blend is uncertain, the engine must not be started in this temperature range either.

If the airplane is being operated with JET Fuel grades or Diesel Fuel class C, D, E or F, operation in the yellow temperature range is permissible. Refer to Section 2.15 - LIMITATION PLACARDS.

Approved fuel grades are listed in Section 2.14 - FUEL. As the fuel grade is important concerning operating temperature limitations, the pilot must be sure about the fuel grade. Cold Diesel Fuel tends to flocculate, which can lead to clogging of the fuel filter. The fuel filter is not heated.



If the airplane is operated in an cold environment, it must be changed from Diesel Fuel operation to JET Fuel operation. To ensure that no blend of JET Fuel with Diesel Fuel is in one of the tanks, each tank must be refilled at least twice with more than 17.2 US gal (65 l) of JET Fuel. Otherwise both tanks must be drained before refueling with JET Fuel.

**NOTE**

In order to provide information about the fuel grade it is recommended to enter the fuel grade in the airplane log each time fuel is refilled.

## **8. AIRPLANE HANDLING, CARE AND MAINTENANCE**

No change.