

Diamond Aircraft Industries G.m.b.H. N.A. Otto-Straße 5 A-2700 Wiener Neustadt

MANDATORY SERVICE BULLETIN NO. MSB D4-037/2

SUPERSEDES MANDATORY SERVICE BULLETIN

NO. MSB D4-037/1

I. TECHNICAL DETAILS

1.1 Category

Mandatory.

1.2 Airplanes affected

Type: DA 40 D

Serial numbers: 40.080, 40.084, D4.001 up to and incl. D4.179

NOTE: This Mandatory Service Bulletin is **not** valid for TAE-engines with compression 19:1 (P/N 02-7200-14001R4, S/N number up to: **-0ff-0100**; exclusive engines converted in accordance with TAE TM 125-0005)

1.3 Date of Effectivity

The initial issue of the Service Bulletin became effective on: 12-Jul-2005. The revisions of the Service Bulletin do not change the effectivity date.

1.4 Time of Compliance

Within the next 300 hours of operation starting from the date of effectivity, but not later than 31-May-2006

1.5 Subject

Modification of engine and power plant installation for better service reliability.

ATA-Code: 71-00

1.6 Reason

Modified Cooling for better reliability



1.7 Concurrent documents

MÄM 40-161, latest revision

1.8 Approval

The technical information or instructions contained in this document relate to the Mandatory Design Change Advisory No. MÄM 40-161 which has been approved under the authority of EASA Design Organization Approval no. EASA.21J.052.

The technical content in this document has been approved under the authority of EASA DOA No. EASA.21J.052.

1.9 Accomplishment/Instructions

Installation of a new oil cooler, an additional fuel cooler and modification of the lower cowling in accordance to the instructions given in the Work Instruction WI-MSBD4-037, Thielert Installation Manual IM-02-01 and Airplane Maintenance Manual. Work Instruction No. WI-MSB40-037 must be complied with.

1.10 Mass (Weight) and CG

Change in mass and cg is negligible.

II. PLANNING INFORMATION

2.1 Material & Availability

Materials are available from Diamond Aircraft Industries.

2.2 Special Tools

none

2.3 Labor effort

Overall work: 16 hours

2.4 Credit

If data of Cylinder Pressure Loss Test has been recorded and submitted to Diamond Aircraft Industries:

16 working hours, materials, drawings. template for cut out as required



2.5 Reference documents

DA 40 Series Airplane Maintenance Manual, Doc. No. 6.02.01, always latest revision.

III. REMARKS

- 1. All measures must be carried out by the manufacturer, a certified aircraft service station or a certified aircraft maintenance mechanic.
- 2. Accomplishment of the measures must be confirmed in the log book.
- 3. In case of any doubt, contact Diamond Aircraft or Thielert Aircraft Engines.



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WORK INSTRUCTION

WI-MSB-D4-037

"MODIFICATION OF ENGINE AND POWER PLANT INSTALLATION"

I. GENERAL INFORMATION

1.1 Subject:

The mandatory modification of engine and power plant installation for better reliability

1.2 Reference Documents:

Diamond Aircraft DA 40 Airplane Maintenance Manual, Doc. No. 6.02.01, latest effective issue.

1.3 Remarks:

- a) The work must be carried out by a certified aircraft service station or a certified aircraft maintenance mechanic. In case of doubt, contact Diamond Aircraft.
- b) All works, particular those that are not especially described in this work instruction, have to be carried out in accordance with the referenced maintenance manual issue.

II. DRAWINGS, SPECIAL TOOLS & MATERIAL

2.1 Drawings:

D4D-2823-20-00-SBFuel cooler installation RHD4D-2823-30-00Fuel cooler assemblyD4D-3219-12-00Main landing gear cover - AssemblyD4D-3219-22-00Main landing gear coverD4D-3219-40-00Baffle AssemblyD4D-7116-03-00-SBLower cowling - AssemblyD4D-7116-13-00-SBLower cowling lay upD4D-7116-15-01-SBLower cowling - Insert Assembly

2.2 Special Tools:

none



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2.3 Material:

All required Materials are available from Diamond Aircraft Industries

Qty	Description	Part Number
1 (a.r.)	Coolant Radiator	D4D-7520-00-00
1 (a.r.)	Kit Cylinder Head	Material as listed in Thielert Aircraft Repair Manual RM-02-01, Chapter 38
1 (a.r.)	Template for cut out	D4D-7116-15-02-SB
1	MSB-D4-037-Kit:	
1	Fuel cooler assembly	D4D-2823-30-00
2	ECU fixing assembly	D4D-7603-10-00
1	Baffle for fuel cooler inlet	D4D-3219-40-01
1	Camloc Stud	2600-4WD
1	Camloc Receptical	212-12N
1	Camloc Retaining Ring	V2600-LW-7
2	Rivet 2,4 x 5	DIN 7337-B-2,4x5
4	Washer M5	DIN 125A-A2
4	Hex. head screw M5 x 16	DIN 933-A2
1	Fuel hose	A 22303-01
1	45° Fitting	P_EVW45_9_16UNF
1	Fuel cooler inlet duct	D4D-3219-50-00
0,35 m	Rubber gasket (for fuel cooler inlet duct)	210550
2	Air in- and outlet	D4D-3219-30-00
1	Oil radiator (5 ribs)	10568R
1	Lower Cowling - Insert Assembly	D4D-7116-15-00-SB
0,55 m	Rubber gasket (for oil radiator inlet duct)	10.2508.8961
7	Rivet d 4 x 12.1 mm	DIN 7337-4x12.1-AL TAP/D
7	Washer M4	DIN 125 A-A2
2	Camloc Stud	40S5-6D
2	Camloc Grommet	4002-N-3
2	Camloc Retaining Ring	R4G-2



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III. INSTRUCTIONS

	GENERAL
1	De-fuel the airplane (Refer to Section 12-10).
2	Remove the engine cowlings (Refer to Section 71-11)
3	Carry out Recommended Service Bulletin RSBD4-043, latest revision (Cylinder Pressure Loss Test)
	EXCHANGE OF CYLINDER HEAD (as required)
4	NOTE: Required material to exchange the cylinder head is not part of this Work Instruction (Refer to Thielert Aircraft Engines Repair Manual RM-02-01, always latest revision)
5	Exchange Cylinder head if the pressure loss (refer to item 3) is greater than the limit given in the Thielert Aircraft Engines Repair Manual RM 02-01, Chapter 37. Do not refill cooling system
	INSTALL FUEL COOLER
6	Remove stub wing cover
7	Remove RH Main Landing Gear Strut according the following items of the AMM, Section 32-10-00
	B. Remove a Main Landing Gear Strut
	Note: Do not remove Inner Bolt with Castle nut, only remove Retaining Bolts.
	Items: (1), (3), (4), (6), (8), (9), (10), (11);
8	Disconnect fuel lines from fitting of main landing gear rib (Pos.1 and Pos.2). Refer to drawing D4D-2823-20-00-SB. De-fuel lines if necessary and close them with caps.
9	Caution: Fuel cooler must be installed in the fuel return line. It is possible that the fuel return line is either on Pos 1 or Pos 2. To find the correct position the following test is necessary:
	Remove fuel caps from both main tanks. The correct line can be found by blowing into the fittings. It is possible to blow reduced air into the line in which the fuel cooler will be mounted. This line goes directly to the main tank (LH). The second fuel line is closed by a check valve, it is not possible to blow air in this fuel line.
	After a successful test, mark the fitting, in case of doubt contact DAI.



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10	Mark position for fuel cooler according to drawing D4D-2823-20-00-SB on inside of wing top shell.
11	Sand carefully bonding area on wing top shell, do not damage glass layers!
12	Check positions of the 90°-fittings on the fuel cooler assembly given in drawing D4D- 3219-30-00, check cooler assembly visually for damages. Check also torque seal paint on all screws and fittings of the fuel cooler assembly for damages.
13	Mount ECU fixing assemblies (D4D-7603-10-00) to fuel cooler assembly (refer to drawing D4D-2823-20-00-SB)
14	Remove peel ply and sand bonding areas carefully. Bond in fuel cooler assembly with mounted ECU fixing on marked position with thickened resin according to the instructions given in the AMM, Chapter 51. Fuel cooler and inlet duct will be used as template. Install fuel cooler and allow to cure.
15	Post curing in accordance to AMM, Chapter 51
16	Cut two holes (inlet, outlet) in RH Main Landing Gear Cover according to drawing D4D-3219-22-00.
17	Sand bonding areas of Landing Gear Cover carefully!
18	Remove peel ply and sand bonding areas of part No.: D4D-3219-30-00 carefully and bond in Part No.: D4D-3219-30-00 (2 pieces) with thickened resin according to drawing D4D-3219-12-00 and AMM, Chapter 51. Caution: Take care to position the parts in right direction!
19	Drill hole for Camloc in RH Main Landing Gear Cover according to drawing D4D- 3219-12-00, use baffle as template.
20	Install Camloc according to drawing D4D-3219-12-00
21	Mount 45° fitting to bulkhead on main landing gear rib according to drawing D4D-2823-20-00-SB
22	Put fuel cooler inlet duct on the fuel cooler (refer to drawing D4D-2823-20-00-SB)
23	Connect fuel lines according to drawing D4D-2823-20-00-SB. Make sure to connect the fuel cooler on the above mentioned marked fitting.
24	Refuel Airplane (Refer to Section 12-10).
25	-
26	Mount rubber gasket (refer to drawing D4D-3219-02-00)
27	Install RH Main Landing Gear Strut according the following items of the AMM, Section 32-10-00
	C. Install a Main Landing Gear Strut
	Items: (2), (3), (4), (5), (6), (9), (11), (13), (14), (16), (17), (18);
28	Clean working area and check for foreign objects.
29	-



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	MODIFICATION OF COOLING SYSTEM							
31	Drain Cooling system (Refer to AMM Section 75-01-00)							
	De-installation of Silicate Cartridge (if applicable)							
32	Carry out Mandatory Service Bulletin MSB D4-032, latest revision Do not refill cooling system!							
	Coolant Radiator							
33	CAUTION:							
	The Coolant Radiator has to be exchanged in the following cases:							
	a) If the cylinder head has been replaced since Airframe-TSN							
	b) If the engine has been replaced since Airframe-TSN							
	c) If the pressure loss of the cylinder head (refer to item 3 of this Work Instruction) is greater than the limit given in the Thielert Aircraft Engines Repair Manual and the Cylinder Head has been exchanged under item 5 of this Work Instruction.							
34	Exchange Coolant Radiator as required (Refer to AMM, Section 75-01-00)							
35	Exchange Hoses on Coolant Radiator:							
	Disconnect in and outlet of coolant radiator according to AMM, Section 75-01-00							
36	Install the hoses so, that the inlet (hose from the thermostatic valve) is on the upper side and the outlet on the lower side. (crosswise)							
37	Fill and bleed cooling system according to AMM, Section 75-01-00							
	EXCHANGE OIL COOLER							
38	Remove oil radiator according to AMM, Section 79-01							
39	Install new oil radiator 10568R - (5 ribs) according to AMM, Section 79-01							
	MODIFY COWLING							
40	Mount template (Part No. D4D-7116-15-02-SB) on out side of lower cowling (use screws to hold in position)							
41	Mark cut out on lower cowling (refer to Section 51-20 of AMM).							
42	Remove template and cut out marked part.							
43	Position lower cowling insert (Part.No D4D-7116-15-00-SB) and locate it with tape.							
	NOTE: Install Cowling -Check position of insert and equal clearance to the nose landing gear strut.							



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44	Drill holes for positioning from inside of cowling, use holes of cowling insert as template.
45	Remove cowling, tape and cowling insert.
46	Remove peel ply from bonding flange of cowling insert and sand bonding areas carefully on cowling and cowling insert.
47	Use tape to protect the painted areas from resin.
48	Bond in lower cowling insert with thickened resin according to the AMM, Chapter 51. For positioning the new cowling part use 7 rivets TAP/K/BS44, d 4 x 12.1 mm
49	Clean gap in the bonding area from thickened resin.
50	After curing remove tape from painted areas.
51	Post curing in accordance to AMM, Chapter 51.
52	Fill outside gap with white silicone.
53	Apply fire retardant paint on edge of bonding flange of cowling insert (a.r.) (refer to Chapter 51).
54	Drill 2 holes d 12 mm for Camloc studs in cowling insert.
55	Install 2 Camloc studs, part number 40S5-6D, with grommets, part number 4002-N-3, and retaining rings, part number R4G-2, on lower cowling.
56	Mount rubber gasket to air duct on lower cowling.
57	Clean working areas and check for foreign objects.
58	Check all affected points for leakage and test all systems in working area for function.
59	Install engine cowlings (refer to Section 71-11).
60	Check correct position of oil radiator and inlet duct for oil radiator.
61	Adjust oil radiator if necessary and check position of oil radiator and inlet duct again.
	FINAL WORK
62	Do a ground test of engine and check all affected systems for proper operation and check fuel cooler and fuel lines for leakages
63	Install RH main landing gear cover according to AMM (Refer to Section 32-10-00).
64	Install Baffle on main landing gear cover.
64	Make entries as necessary in aircraft records.

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