MANDATORY SERVICE BULLETIN
NO. MSBD4-029

I. TECHNICAL DETAILS

1.1 Category

Mandatory.

1.2 Airplanes affected

Type: DA 40 D

Serial numbers: D4.020 - D4.024, D4.026, D4.041, D4.043 - D4.045, D4.049, D4.056, D4.060 - D4.064, D4.066, D4.067, D4.078

1.3 Time of Compliance

Action a) Upon receipt of this Service Bulletin
Action b) During next scheduled inspection, not later than 31-Mar-2004.

1.4 Subject

a) Temporary Revision TR-MÄM-40-122 of the Airplane Flight Manual Doc. No. 6.01.05-() to be inserted in the Flight Manual.

b) Check of insulation and if necessary isolation of pins of the shut off connector of the engine loom.

ATA-Code: 71-50

1.5 Reason

a) It has been found during further flight testing that with changed emergency procedures for handling engine problems additional troubles as the one described below can be resolved. Therefore a Temporary Revision to the AFM, Rev. 3 has been issued.

b) During production the housing of the plug ‘shut off‘ (initially intended for an additional backup valve and not used for the DA 40 D) is removed, the pins are insulated separately and finally protected with a shrink tube.
Few airplanes have been found where the insulation of the pins is missing which results in a latent failure: In case of too low rail pressure the circuit for the plug is switched to ON and results in a short circuit in the power supply of the valves and therefore causing the engine to shut down. A reset of the ECU in flight is necessary (see a))

1.6 Concurrent documents

Excerpt of TAE Repair Manual RM-02-01, Doc. No. 25.4.

1.7 Approval

This MSB has been approved by Austro Control GmbH in accordance with Article 10, paragraph 1, of the EC-Regulation No. 1592/2002.

1.8 Accomplishment/Instructions

Action a) Insertion of TR in Flight Manual

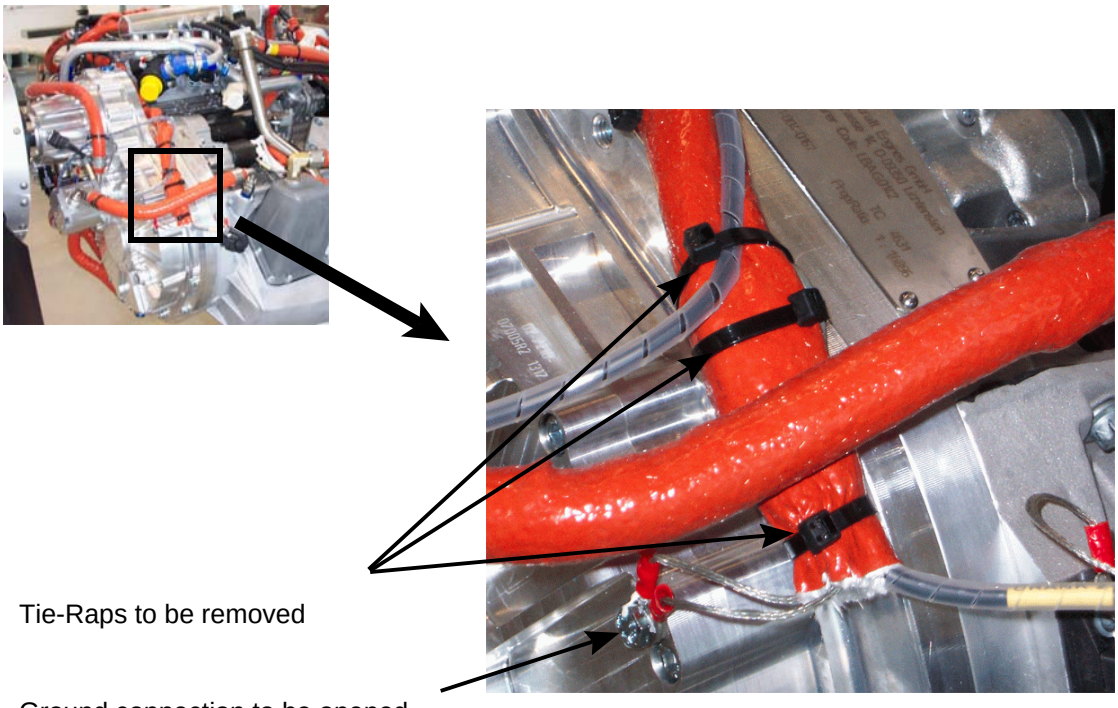
The Temporary Revision TR-MÄM-40-122 must be inserted into the Flight Manual Doc. No. 6.01.05-().

Action b) Check of the pins and if necessary isolation:

WARNING

All actions must be carried out in accordance with the instructions, including safety precautions, given in the AMM, Doc. No. 6.02.01

b.1) remove upper cowling
b.2) remove tie-raps of loom at indicated area



Tie-Raps to be removed

Ground connection to be opened

b.3) open connection to ground

SHUTOFF wire
(underneath shrink tube marked with yellow sleeve)

b.4) push back fire sleeve and separate SHUTOFF cable (NOT PGEAR cable)
b.5) remove carefully the heat shrink of SHUTOFF cable. Do NOT damage wires !
b.6) check for insulation of pins
  b.6.1) if NOT in compliance with TAE Repair Manual RM-02-01, Doc. No. 25.4 insulated, comply with TAE Repair Manual RM-02-01, Doc. No. 25.4, item 2 and subsequent
  b.6.2) if in compliance with TAE Repair Manual RM-02-01, Doc. No. 25.4 insulated, comply with TAE Repair Manual RM-02-01, Doc. No. 25.4, item 3 and subsequent
b.7) reconnect ground wires
b.8) bring fire sleeve back into initial position to protect wires
b.9) re-secure loom with tie-raps as shown on pictures
b.10) check for loose ground connection and foreign objects
b.11) reinstall upper cowling
b.12) perform engine run up, check for proper function

1.9 Mass (Weight) and CG

Not affected.

II. PLANNING INFORMATION

2.1 Material & Availability

The Temporary Revision FHB-TR-MÄM-40-122 of the Flughandbuch Dok. Nr. 6.014.05 / AFM-TR-MÄM-40-122 of the Airplane Flight Manual Doc. No. 6.01.05-E are attached to this Service Bulletin.

Excerpt of TAE Repair Manual RM-02-01, Doc. No. 25.4. is attached to this Service Bulletin.

For shrink tubes refer to excerpt of Thielert Repair Manual RM-02-01, Doc. No. 25.4

2.2 Special Tools

No special tools are required.

2.3 Labor effort

15 minutes.

2.4 Credit

Not applicable.

2.5 Reference documents

DA 40 Series Airplane Maintenance Manual, Doc. No. 6.02.01.

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.

Removal of shutoff connector from the wiring harness

Parts

P/N	Discription	Quantity
02-7150-52100R7	Wiring harness	--
02-9150-52170R1	Raychem DR25 heat shrink tubing 3/16, 50mm	2
02-9150-52171R1	Raychem DR25 heat shrink tubing 1/2, 80mm	1

Instructions

1. Remove shutoff connector housing by extracting the crimps using an extraction tool resulting in an assembly as depicted in Fig. 1.

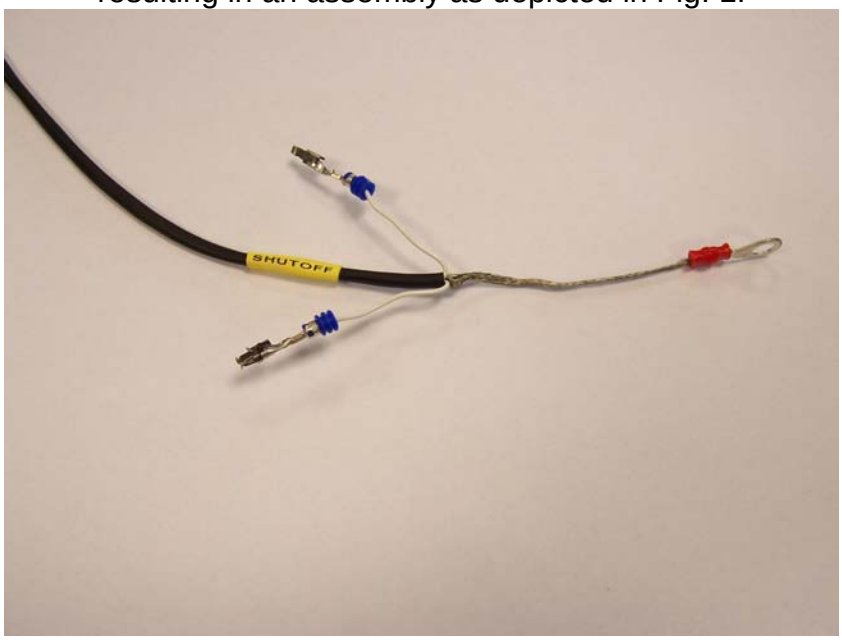


Fig. 1 – after removal of connector

2. Wrap crimps and wire ends in 02-9150-52170R1 DR25 heat shrink tubing 3/16, 50mm and heat-shrink it to isolate the contacts. See Fig. 2 for an illustration of the finished isolated contacts.

   Please note: Heat-shrink all DR25 tubing according to manufacturer instructions!

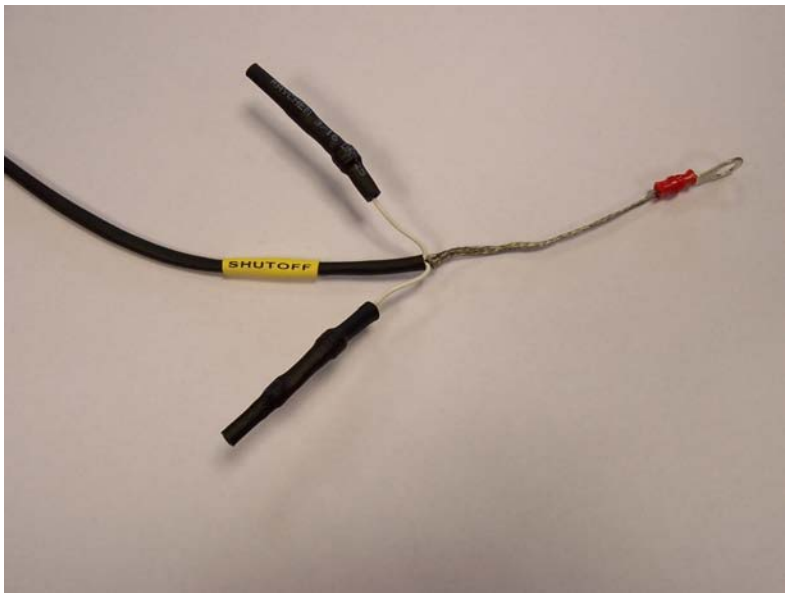


Fig. 2 – after isolating the contacts

3. Bend back wire ends but leave shielding straight
4. Wrap the isolated wire ends and part of the loom but not the shielding in 02-9150-52171R1 DR25 heat shrink tubing 1/2, 80mm and heat-shrink it. See Fig. 3 for an illustration of the finished repair.

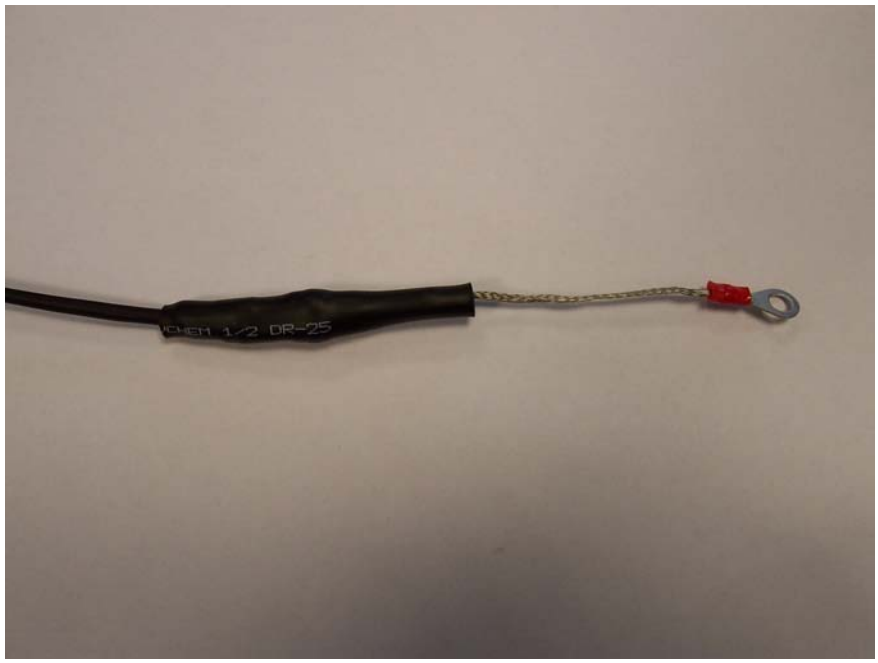


Fig. 3 – Finished Assembly

Please note: Reconnect shielding to engine ground after repair.

Removal of shutoff connector from the wiring harness

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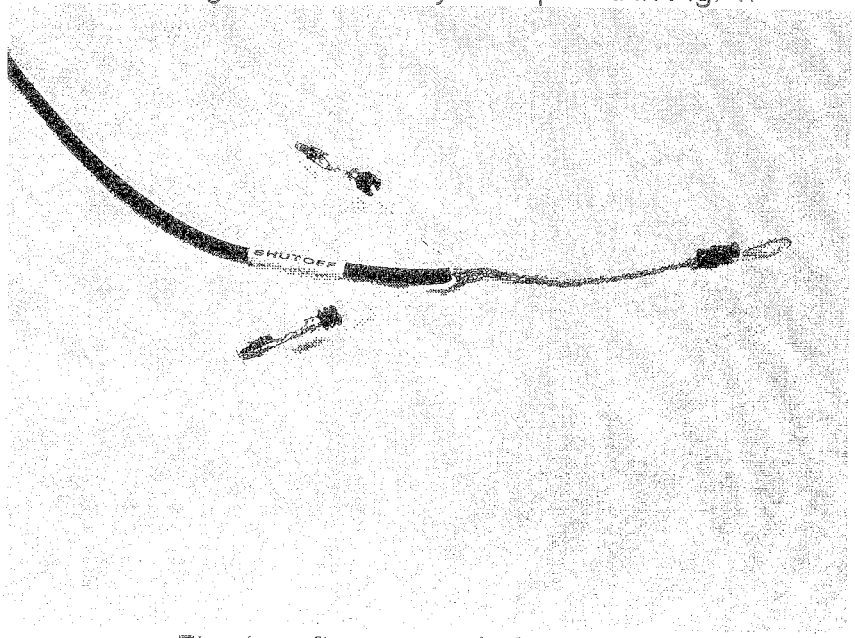

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   Please note: Heat-shrink all DR25 tubing according to manufacturer instructions!

Prepared by:	Checked by: Claus Christensen, MPI	Approved: Erik Bollen, EBL

TEMPORARY REVISION
TR MÄM-40-122
Change of Emergency Procedures in case of Engine Problems

This Temporary Revision TR MÄM-40-122 is approved in conjunction with the Mandatory Design Change Advisory MÄM 40-122. For the operation of the DA 40 D this TR must be included in the AFM or that AFM revision must be used in which the TR is incorporated.

The limitations and information contained herein either supplement or, in the case of conflict, override those in the Airplane Flight Manual.

Affected Chapters:

3. EMERGENCY PROCEDURES

3.2 ENGINE PROBLEMS

3.2.2 ENGINE PROBLEMS DURING TAKE-OFF

(b) Take-off can no longer be aborted

1. Airspeed . . . . . 72 KIAS (1150 kg, 2535 lb)
   66 KIAS (1000 kg, 2205 lb)
   59 KIAS (850 kg, 1874 lb)

WARNING

If, in the event of an engine problem occurring during take-off, the take-off can no longer be aborted and a safe height has not been reached, then a straight-ahead emergency landing should be carried out. Turning back can be fatal.

if time allows:

2. Power lever . . . . . check MAX
% 3. ECU SWAP . . . . . ECU B
%
% ECU reset:
% 4. ENGINE MASTER . . . . . OFF - ON

WARNING

If the problem does not clear itself immediately, and the engine is no longer producing sufficient power, then an emergency landing must be carried out in accordance with 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF.

3.2.3 ENGINE PROBLEMS IN FLIGHT

(b) Loss of power

NOTE

As long as an airspeed of at least 60 KIAS is maintained, and there is no major mechanical engine defect, the propeller will continue to windmill.

1.	Airspeed	. . . . .	73 KIAS (1150 kg, 2535 lb) 68 KIAS (1000 kg, 2205 lb) 60 KIAS (850 kg, 1874 lb)
2.	Power lever	. . . . .	MAX
3.	If in icing conditions	. . . . .	Alternate Air ON
4.	Fuel qty. MAIN tank	. . . . .	check
5.	Fuel transfer pump	. . . . .	ON
6.	Emergency fuel valve	. . . . .	check NORMAL
7.	ECU SWAP	. . . . .	ECU B

% ECU reset:

% 8. ENGINE MASTER . . . . . OFF - ON

NOTE

If selecting ECU B does not solve the problem, switch back to AUTOMATIC.

WARNING

If the problem does not clear itself immediately, prepare for an emergency landing in accordance with 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF, then try to restart the engine with windmilling propeller in accordance with 3.2.4 - RESTARTING THE ENGINE WITH WINDMILLING PROPELLER.

3.2.4 RESTARTING THE ENGINE WITH WINDMILLING PROPELLER

NOTE

As long as an airspeed of at least 60 KIAS is maintained, and there is no major mechanical engine defect, the propeller will continue to windmill. After a complete stop the propeller starts to windmill at airspeeds above 105 KIAS.

CAUTION

The maximum airspeed for windmilling is 120 KIAS. Higher airspeeds may result in propeller overspeed.

NOTE

Restarting the engine with windmilling propeller is possible at airspeeds between 73 and 120 KIAS and altitudes below 6500 ft pressure altitude.

1. Airspeed for best glide angle . . . . . 73 KIAS (1150 kg, 2535 lb)
   68 KIAS (1000 kg, 2205 lb)
   60 KIAS (850 kg, 1874 lb)
2. Power lever . . . . . MAX
3. Emergency fuel valve . . . . . check NORMAL
4. Alternate air . . . . . OPEN
5. Fuel transfer pump . . . . . ON
6. AVIONIC MASTER . . . . . OFF
7. ELECTRIC MASTER . . . . . ON
8. Airspeed . . . . . 73 to 120 KIAS

% ECU reset:

% 9. ENGINE MASTER . . . . . OFF - ON

NOTE

If it is not possible to start the engine:

- adopt glide configuration as in 3.4 - GLIDING
- carry out emergency landing in accordance with 3.5.1 - EMERGENCY LANDING WITH ENGINE OFF

10. AVIONIC MASTER . . . . . ON, if required

TEMPORÄRE REVISION
TR MÄM-40-122
Änderung der Notverfahren bei Motorstörungen

Diese Temporäre Revision TR MÄM-40-122 wurde im Zusammenhang mit der vorgeschriebenen Änderungsmitteilung MÄM 40-122 anerkannt. Für den Betrieb der DA 40 D muß diese TR im Flughandbuch eingeordnet sein oder die Flughandbuchrevision verwendet werden, in der diese TR eingearbeitet wurde.

Die Betriebsgrenzen und/oder Informationen, die in dieser Temporären Revision enthalten sind, ergänzen oder ersetzen (im Falle von Widersprüchen) jene, die im Flughandbuch enthalten sind.

Betroffene Kapitel:

3. NOTVERFAHREN

3.2 MOTORSTÖRUNGEN

3.2.2 MOTORSTÖRUNG WÄHREND DES STARTS

(b) Startabbruch nicht mehr möglich

1. Fluggeschwindigkeit . . . . . 72 KIAS (1150 kg)
   66 KIAS (1000 kg)
   59 KIAS (850 kg)

WARNUNG

Wenn eine Motorstörung während des Starts eintritt, wenn kein Startabbruch mehr möglich ist und noch keine sichere Höhe erreicht ist, soll eine Notlandung geradeaus durchgeführt werden. Eine Umkehrkurve kann tödlich enden.

wenn es die Zeit erlaubt:

2. Leistungshebel . . . . . check MAX
% 3. ECU SWAP . . . . . ECU B
%
% ECU rücksetzen:
% 4. ENGINE MASTER . . . . . OFF - ON

WARNUNG

Läßt sich die Störung nicht sofort beheben, und gibt der Motor keine brauchbare Leistung mehr ab, so ist eine Notlandung gemäß 3.5.1 - NOTLANDUNG MIT STEHENDEM MOTOR durchzuführen.

3.2.3 MOTORSTÖRUNG IM FLUG

(b) Leistungsverlust

ANMERKUNG

Solange eine Fluggeschwindigkeit von 60 KIAS nicht unterschritten wird und kein schwerwiegender mechanischer Defekt vorliegt, dreht sich der Propeller im Windmilling weiter.

1. Fluggeschwindigkeit . . . . . 73 KIAS (1150 kg)
   68 KIAS (1000 kg)
   60 KIAS (850 kg)
2. Leistungshebel . . . . . MAX
3. Falls in Vereisungsbedingungen . . . . . Alternate Air ON
4. Kraftstoffmenge MAIN-Tank . . . . . check
5. Kraftstofftransferpumpe . . . . . ON
6. Emergency fuel valve . . . . . check NORMAL
7. ECU SWAP . . . . . ECU B

% ECU zurücksetzen:

% 8. MASTER ENGINE . . . . . OFF - ON

ANMERKUNG

Falls sich durch Umschalten auf die ECU B die Störung nicht beheben läßt, ist auf AUTOMATIC zurückzuschalten.

WARNUNG

Läßt sich die Störung nicht sofort beheben, auf Notlandung gemäß 3.5.1 - NOTLANDUNG MIT STEHENDEM MOTOR vorbereiten, danach versuchen, den Motor gemäß 3.2.4 - WIEDERANLASSEN DES MOTORS MIT DREHENDEM PROPELLER wiederanzulassen.

3.2.4 WIEDERANLASSEN DES MOTORS MIT DREHENDEM PROPELLER

ANMERKUNG

Solange eine Fluggeschwindigkeit von 60 KIAS nicht unterschritten wird und kein schwerwiegender mechanischer Defekt vorliegt, dreht sich der Propeller im Windmilling weiter. Nach einem kompletten Stillstand beginnt sich der Propeller über einer Fluggeschwindigkeit von 105 KIAS wieder im Windmilling zu drehen.

WICHTIGER HINWEIS

Die Höchstgeschwindigkeit für Windmilling ist 120 KIAS. Höhere Fluggeschwindigkeiten können eine Propellerüberdrehzahl bewirken.

ANMERKUNG

Das Wiederanlassen des Motors mit drehendem Propeller ist bei Fluggeschwindigkeiten zwischen 73 und 120 KIAS und Höhen unterhalb 6500 ft Druckhöhe möglich.

1. Geschwindigkeit für besten Gleitwinkel . . . . 73 KIAS (1150 kg)
   68 KIAS (1000 kg)
   60 KIAS (850 kg)
2. Leistungshebel . . . . . MAX
3. Emergency fuel valve . . . . . check NORMAL
4. Alternate air . . . . . OPEN
5. Kraftstofftransferpumpe . . . . . ON
6. AVIONIC MASTER . . . . . OFF
7. ELECTRIC MASTER . . . . . ON
8. Fluggeschwindigkeit . . . . . 73 bis 120 KIAS

% ECU rücksetzen:

% 9. ENGINE MASTER . . . . . OFF - ON

ANMERKUNG

Wenn der Motor nicht angelassen werden kann:

- Gleitflugkonfiguration gemäß 3.4 - GLEITFLUG einnehmen
- Notlandung gemäß 3.5.1 - NOTLANDUNG MIT STEHENDEM MOTOR durchführen

10. AVIONIC MASTER . . . . . ON, falls erforderlich