

MANDATORY SERVICE BULLETIN NO. MSBD4-018/2

SUPERSEDES MANDATORY SERVICE BULLETIN
NO. MSB40-018/1

I. TECHNICAL DETAILS

1.1 Category

Mandatory.

1.2 Airplanes affected

DA 40 D: serial numbers D4.001 up to and including D4.017 equipped with Honeywell KAP 140 autopilot.

1.3 Time of Compliance

At the next inspection, but not later than 31st of August, 2003.

1.4 Subject

Autopilot.

ATA-Code: 22-10

1.5 Reason

To reduce the possibility of inadvertently engaging the autopilot.

1.6 Concurrent documents

- Work Instruction No. WI-MSBD4-018, latest effective issue.
- Service Bulletin No. KC 140-M1, Rev. 1 from Honeywell.
- Supplement A13, revision 1 or later.
- Temporary Revision TR-MÄM-40-099 in English or German language.

1.7 Approval

The technical information or instructions contained in this document relate to the Design Change Advisory no. MÄM 40-099 which has been approved under the authority of MOT Design Organization Approval no. MOT JA-01.

The technical information contained in this document has been approved under the authority of MOT Design Organization Approval no. MOT JA-01.

1.8 Measures

- a) Service Bulletin No. KC 140-M1, Rev. 1 from Honeywell must be complied with **except** the described testing procedure. The testing procedure must be complied with in accordance with Work Instruction WI-MSB40-018, latest effective issue.
- b) Work Instruction No. WI-MSB40-018, latest effective issue must be complied with.
- c) Temporary Revision No. AFM-TR-MÄM-40-099 (English version) or FHB-TR-MÄM-40-099 German version) must be incorporated into the Airplane Flight Manual, unless it has already been incorporated by an official revision of the Airplane Flight Manual.

NOTE: This Temporary Revision has already been incorporated into Airplane Flight Manual DA 40 D, Doc. Nos. 6.01.05 and 6.01.05-E, Revision 3.

- d) Supplement A13 must be incorporated into the Airplane Flight Manual.
- e) The new part numbers (according to the Service Bulletin No. KC 140-M1, Rev. 1 from Honeywell) must be incorporated into the Airplane Flight Manual.

1.9 Mass (Weight) and CG

No change.

II. PLANNING INFORMATION

2.1 Material & Availability

All necessary parts with specific part numbers can be ordered from Diamond Aircraft Industries GmbH or from your local General Distributor or Diamond Service Center or from Honeywell. All other parts shall be procured locally. Airplane Flight Manuals and all necessary supplements must be ordered from Diamond Aircraft Industries directly.

2.2 Special Tools

No special tools are required.

2.3 Labor effort

4 hours.

2.4 Credit

Refer to Service Bulletin No. KC 140-M1, Rev. 1 from Honeywell.

2.4 Reference documents

Installation Manual Bendix/King KAP 140, Flight Control System, latest effective issue.

III. REMARKS

1. The work must be carried out by the manufacturer, a certified aircraft service station or a certified aircraft maintenance mechanic and must be recorded in the appropriate log book.
2. In case of doubt, contact Diamond Aircraft.

WORK INSTRUCTION WI-MSBD4-018/1

„AUTOPILOT HONEYWELL KAP 140“

SUPERSEDES WORK INSTRUCTION WI-MSB40-018

SUBJECT

Testing procedure for the Autopilot Bendix/King KAP 140.

ACCOMPLISHMENT INSTRUCTIONS

WARNING: **MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU WORK ON IT. MAKE SURE THAT THE ELECTRIC MASTER AND THE ENGINE MASTER ARE SET TO "OFF". SET THE POWER LEVER TO "IDLE".**

1	Reinstall the KC 140 in the aircraft.
2	Do a leakage test of the static system.
3	Turn on the avionics power in the aircraft and verify that the KC 140 passes Preflight Test.
4	Connect the PC to the diagnostic port in the aircraft. Access the diagnostic program and select S - Display SW ID. The Software Identification shall read 722-20014-0301.
5	Enable Voice MSG in accordance with the Installation Manual Bendix/King KAP 140, Flight Control System.
6	Run the following test to ensure proper AP engagement/disengagement operation. A. Press the AP button, and hold it for at least 0.25 seconds. The autopilot shall engage. B. Momentarily press the AP DISC button on the control stick. The autopilot shall disengage. If voice messages are enabled, the voice message <i>AUTOPILOT</i> shall be heard. C. Momentarily press each of the other buttons on the KC 140. The autopilot shall NOT engage.
7	If steps 1 through 6C pass, then the software update was successful and the conversion is complete.



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

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REFERENCE DOCUMENTS

Installation Manual Bendix/King KAP 140, Flight Control System.

REMARK

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.

Honeywell

Business, Regional, &
General Aviation
23500 W. 105th St.
Olathe, Kansas 66061

Service Bulletin

BULLETIN NO: KC 140-M1
KC 140 Autopilot Computer

EFFECTIVITY

KC 140 units P/N 065-00176-2602, -5402, and -7702, all serial numbers.

REASON

To reduce the possibility of inadvertently engaging the autopilot.

DESCRIPTION

This conversion consists of changing the KC 140 application software, changing the unit part number, placing an M Tag on the unit serial tag, and updating the unit's Software Mod Tag.

<u>Old Part Number</u>	<u>New Part Number</u>
065-00176-2602	065-00176-2603
065-00176-5402	065-00176-5403
065-00176-7702	065-00176-7703

This conversion makes the following functional changes:

1. The AP button will be the only button that can engage the autopilot.
2. Added two voice messages for autotrim operation.
 - A. The message *TRIM IN MOTION, TRIM IN MOTION* occurs when the autotrim has been running for more than 5 seconds, and it repeats until the autotrim stops running.
 - B. The message *CHECK PITCH TRIM* occurs when the KAP 140 System has detected an out-of-trim condition for more than 15 seconds.
3. The AP button must be depressed for .25 seconds to engage the autopilot. When the autopilot is engaged, the letters *AP* with a box around them are annunciated on the display.

A revised flight manual supplement is needed for each unit that is converted according to this bulletin. Contact the appropriate aircraft manufacturer for the appropriate revised flight manual supplement, or contact Honeywell for an aircraft flight manual supplement for the STC'd aircraft.

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The Pilot's Operating Handbook has also changed; see P/N 006-18034-0000, Rev 2, May/2002.

COMPLIANCE

Required for aircraft with the KAP 140 located near the throttle quadrant; recommended for KAP 140s located in the upper half of the instrument panel.

WARRANTY INFORMATION

Warranty credit or payment will be issued for any KC 140 being converted according to this bulletin. For units that are out of warranty, the conversion must be completed by 31 December 2003. If the unit is converted by an appropriately rated Honeywell Service Center, a properly completed warranty claim for four (4.0) hours labor plus parts must be submitted. If the unit is converted by Honeywell in Olathe, Kansas, a properly completed warranty claim for two and one-half (2.5) hours labor for removal and re-installation must be submitted.

We recommend that you contact Warranty Administration to have the warranty record updated for any converted unit.

APPROVAL

This conversion does not affect the original approval.

MANPOWER

Four (4.0) hours labor including testing to complete the conversion.

Two and one-half (2.5) hours labor for unit removal and installation only.

REFERENCES

This bulletin only.

CONVERSION PROCEDURE

1. Build a test harness as shown in Figure 1 using the following parts. This test harness can be reused to program any number of KC 140 units according to this M bulletin.
 - A. 37-pin connector P/N 030-01175-0000
 - B. 37-pin hood P/N 030-02351-0023
 - C. 5 crimp sockets P/N 030-01157-0011
 - D. 2 screws P/N 089-06415-0006
 - E. Shop-supplied 22AWG wire

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CAUTION

Any disassembly/assembly of the KC 140 **MUST** be done at a static-safe workstation. Removed modules should be placed in static-safe bags when not installed in the unit.

2. Remove the unit from the aircraft.
3. Make sure there is no power to the test harness and the laptop or desktop computer.
4. Remove the 8 screws securing the top cover of the KC 140. Note that the Power Supply Board is attached to the top cover via a ribbon cable. Do not disconnect the ribbon cable. With the unit's front panel facing you, fold open the unit top cover to the left side, and place the cover next to the main chassis.
5. Connect the test harness from a 28-volt DC supply to J1401 on the KC 140.
6. Connect the ribbon cable from the Programming Interface Box to P4 on the Main Board. See Figure 2 for the location of P4.
7. Connect the parallel port cable from the Programming Interface Box 25-pin D-sub connector to the PC's parallel port.
8. Insert floppy disk PN 225-00047-0301 into the PC's floppy disk drive.
9. Apply power to the KC 140.
10. Apply power to the PC. It should boot to DOS and begin executing an autoexec.bat file to program the KC 140 flash. It will pause and display the message *Ready to begin programming KC 140 Flight Software - Press any key to continue. . . .*
11. When prompted by the PC, press *ENTER*.
12. The PC will begin programming the KC 140 flash ROM; this will take several minutes. When complete, a message will appear on your PC stating *FLASH ROM SUCCESSFULLY PROGRAMMED*.
13. Shut off power to the KC 140. Remove the ribbon cable from J4 on the Main Board to disconnect the Programming Interface Box.
14. Disconnect the test harness from P1401.
15. Reassemble the KC 140, ensuring that the ribbon cable between the power supply and the Main Board remains completely connected.

IDENTIFICATION PROCEDURE

On the unit's serial tag, attach Tag P/N 057-02203-0003 over the last two digits of the unit part number. This changes the unit's part number as noted below.

<u>Old Part Number</u>	<u>New Part Number</u>
065-00176-2602	065-00176-2603
065-00176-5402	065-00176-5403
065-00176-7702	065-00176-7703

Affix an M tag P/N 057-02984-0501 in front of the unit's serial number to indicate that the unit's part number has been changed.

Attach Software Mod Tag P/N 057-05287-0301 in place of the old tag to indicate the change to SW MOD 03/01.

TESTING PROCEDURE

Reinstall the KC 140 in the aircraft.

1. Turn on the avionics power in the aircraft, and verify that the KC 140 passes Preflight Test.
2. Connect the PC to the diagnostic port in the aircraft. Access the diagnostic program and select S – Display SW ID. The Software Identification shall read 722-20014-0301.
3. Run the following test to ensure proper AP engagement/disengagement operation.
 - A. Press the AP button, and hold it for at least .25 seconds. The autopilot shall engage.
 - B. Momentarily press the AP DISC button on the control wheel. The autopilot shall disengage. If voice messages are enabled, the voice message *AUTOPILOT* shall be heard.
 - C. Momentarily press each of the other buttons on the KC 140. The autopilot shall NOT engage.

If Steps 1 through 3C pass, then the software update was successful and the conversion is complete.

MATERIAL INFORMATION

The following three parts are needed for each KC 140 that is converted according to this M bulletin.

Part Number	Qty	Description
057-02203-0003	1	Flavor Sticker (03)
057-02984-0501	1	M Decal
057-05287-0301	1	Software Mod Tag (03/01)

The following parts are needed to convert any number of KC 140 units according to this M bulletin. (These parts are not warranty reimbursable.)

Part Number	Qty	Description
030-01157-0011	5	20 AWG Crimped Socket
030-01175-0000	1	37-pin connector
030-02351-0023	1	37-pin hood
089-06415-0006	2	Screws, PHP 4-20X3/8
200-09421-0000	1	Programming Interface Box
225-00047-0301	1	KC 140 SW Image Disk

NOTE

A revised flight manual supplement is needed for each unit that is converted according to this bulletin. Contact the appropriate aircraft manufacturer for the appropriate revised flight manual supplement, or contact Honeywell for an aircraft flight manual supplement for the STC'd aircraft.

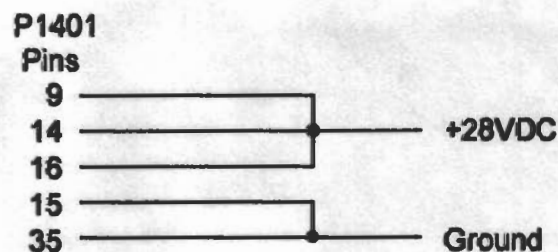


Figure 1
Test Harness

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NEAR-SIDE VIEW OF PC BOARD

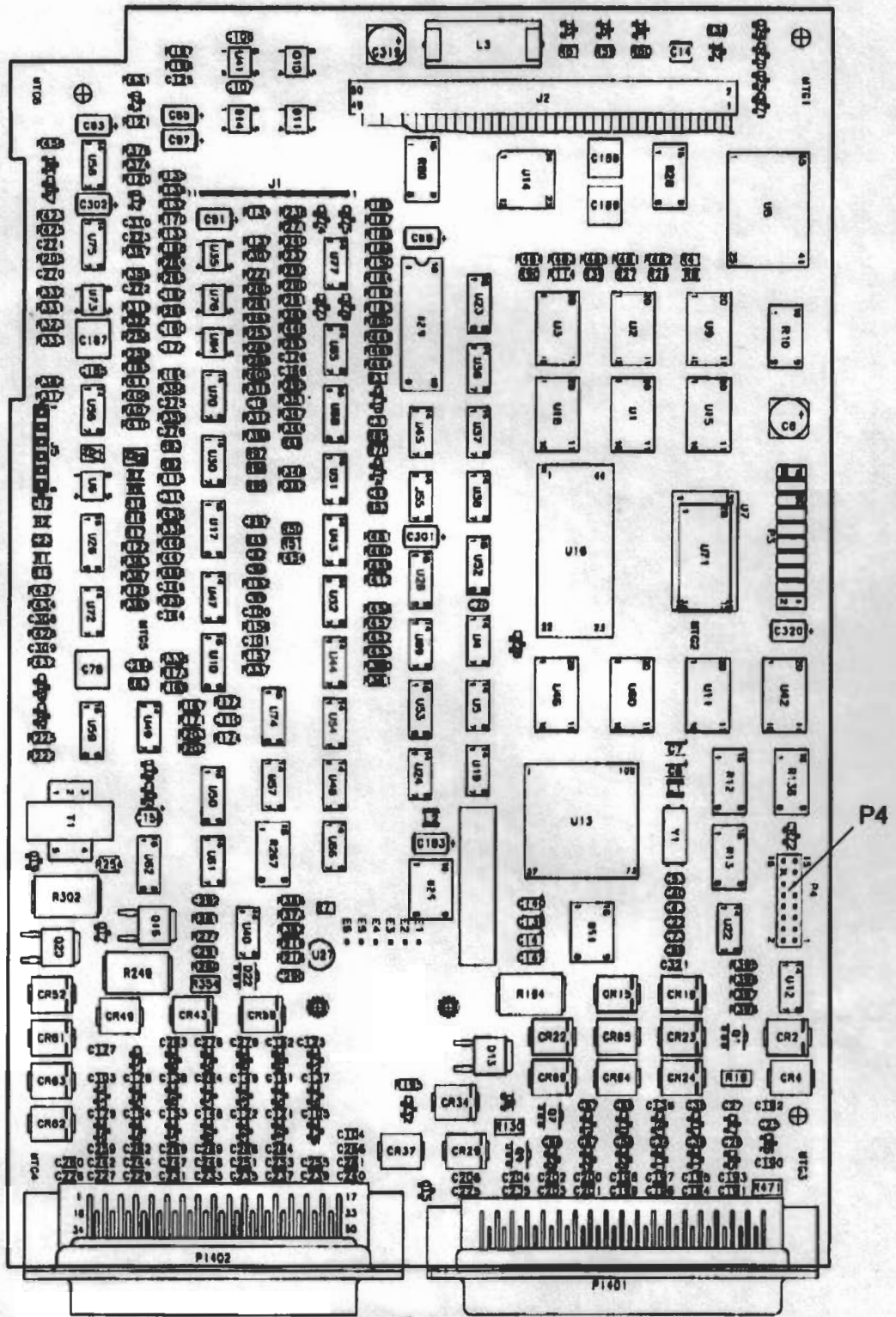


Figure 2
Location of P4 on the Main Board

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