TECHNICAL MANUAL

AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

CH-47D HELICOPTER

This manual together with TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-6, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-11, supersedes TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, 10 May 1983, and TM 55-1520-240-23-6, 6 May 1983, including all changes.

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HEADQUARTERS, DEPARTMENT OF THE ARMY
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TECHNICAL MANUAL
NO. 55-1520-240-23-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 19 SEPTEMBER 2002

AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

CH-47D HELICOPTER

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028. For the World Wide Web use: https://amcom2028.redstone.army.mil.

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CHAPTER 12
UTILITY SYSTEMS

SECTION I
WINDSHIELD AND ANTI-ICING SYSTEM DESCRIPTION AND THEORY OF OPERATION

12-1 WINDSHIELD ANTI-ICING SYSTEM 12-1

DESCRIPTION

The windshield anti-icing system operates independently on the three cockpit windshields. The pilot's and copilot's windshields have anti-icing and anti-fogging systems. The center windshield has an anti-fogging system only.

The total system consists of the three windshields, three switches on the overhead panel, and three relays and control boxes behind the nose dynamic absorber. Each windshield is made of laminated layers with an embedded temperature sensor. The inner surface of the outside layer is a transparent heating element. When the switch is operated, current passes through the transparent element, heating the windshield.

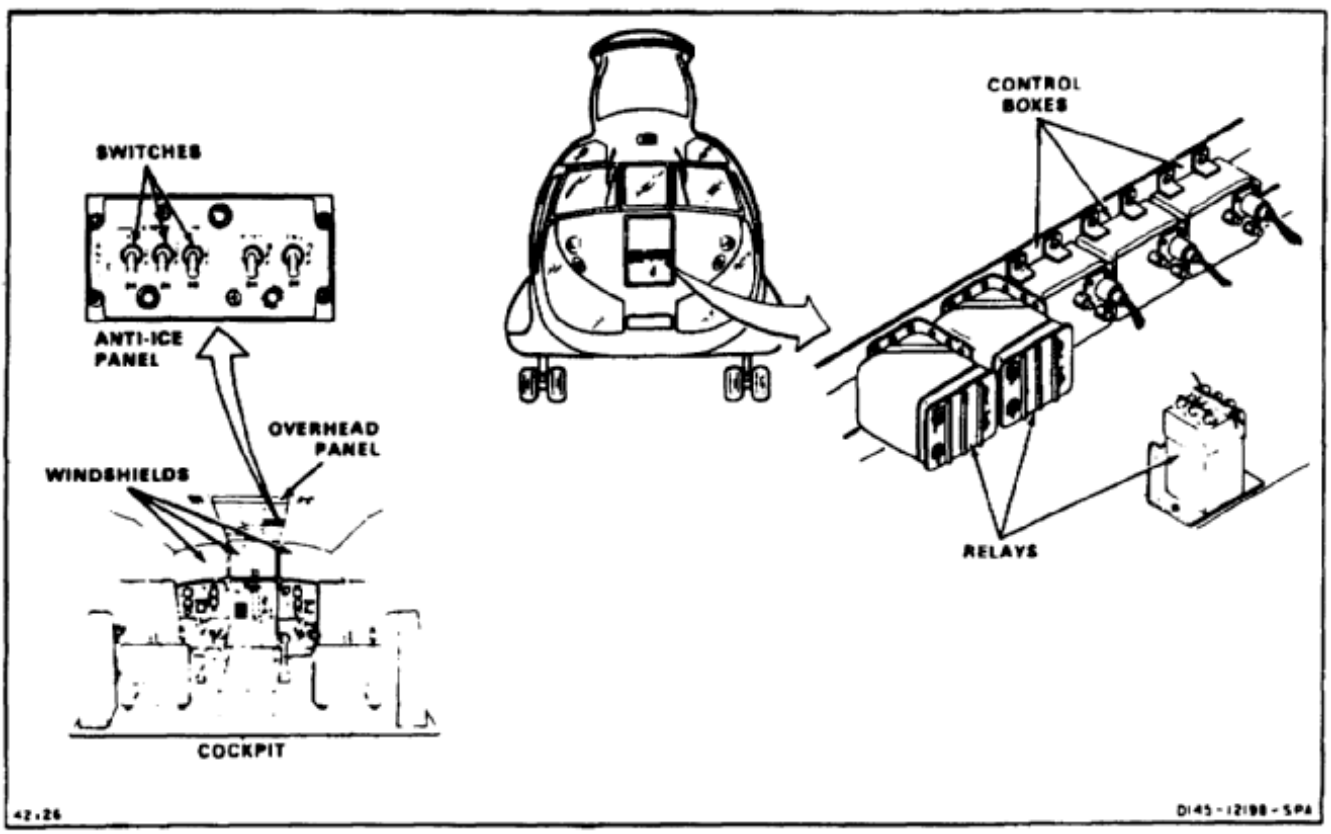
Electrical circuits for the three windshields are identical, except that the cut-in temperature for the center windshield is lower.

THEORY OF OPERATION

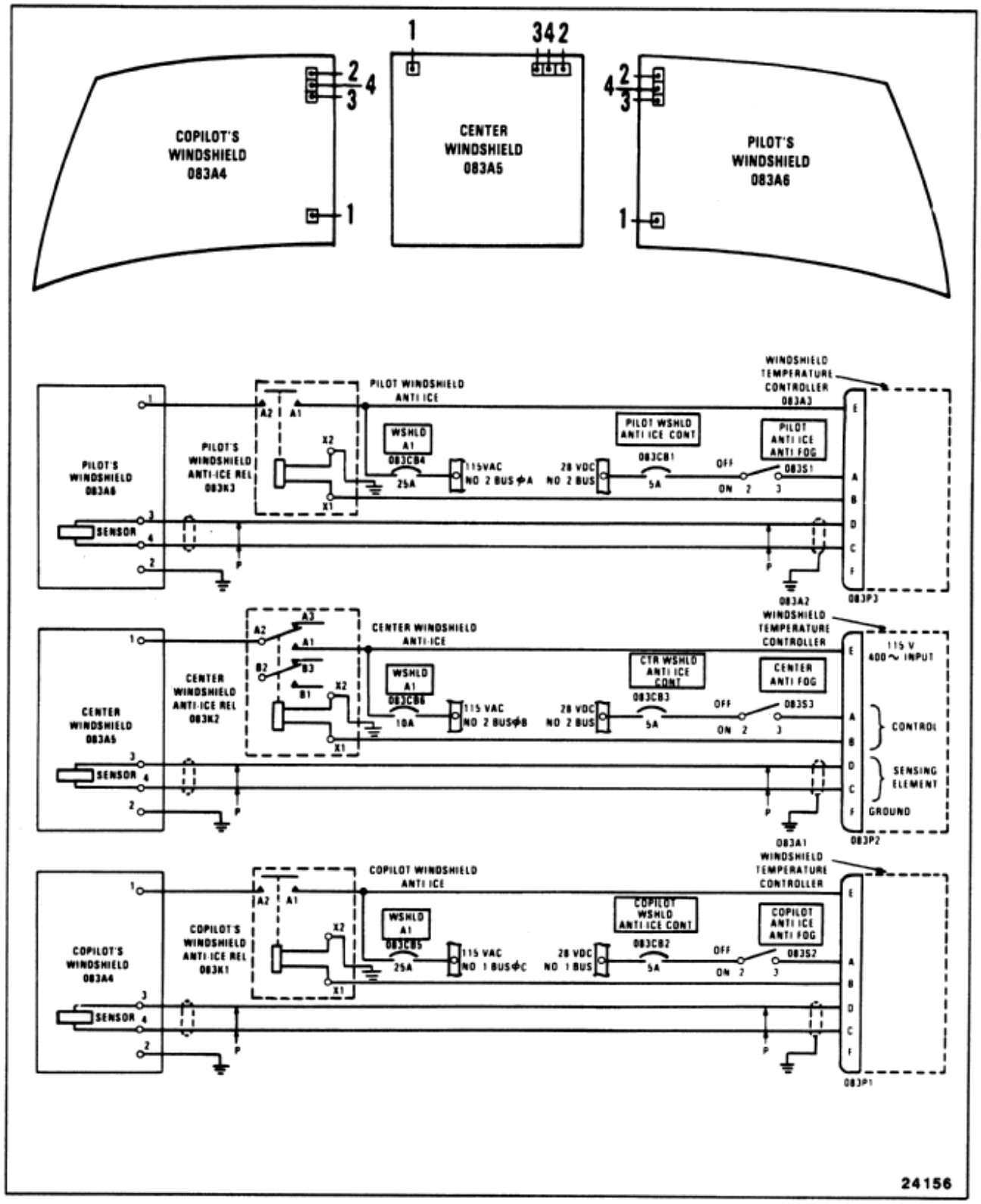
When any of the windshield switches on the ANTI-ICE overhead panel is moved to ON, **28 vdc** is applied to the temperature controller for the associated windshield. If the temperature of the windshield, as sensed by an imbedded sensor, is below **90ºF (32ºC)** (pilot's or copilot's windshield) or **80ºF (27ºC)** (center windshield), relay K1 in the controller is energized, applying **115 vac** to the heating element in the windshield.

As windshield temperature increases, resistance within the sensor also increases. When the temperature reaches **110ºF (43ºC)**, sensor resistance is high enough to reenergize the anti-ice power relay, cutting off power to the heating element. When the windshield cools, the sensor reenergizes the relay and current flows again to the heating element.

Power for the pilot's and center windshield comes from the No. 2 ac bus. Power for the copilot's windshield comes from the No. 1 ac bus. Temperature control of the pilot's and center windshield is through the No. 2 dc bus. Control of copilot's windshield temperature is through the No. 1 dc bus.



12-1 WINDSHIELD ANTI-ICING SYSTEM (Continued) 12-1



END OF TASK

SECTION II
WINDSHIELD ANTI-ICING SYSTEM

12-2 TEST CENTER WINDSHIELD ANTI-FOGGING ELEMENT 12-2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:

None

Personnel Required:

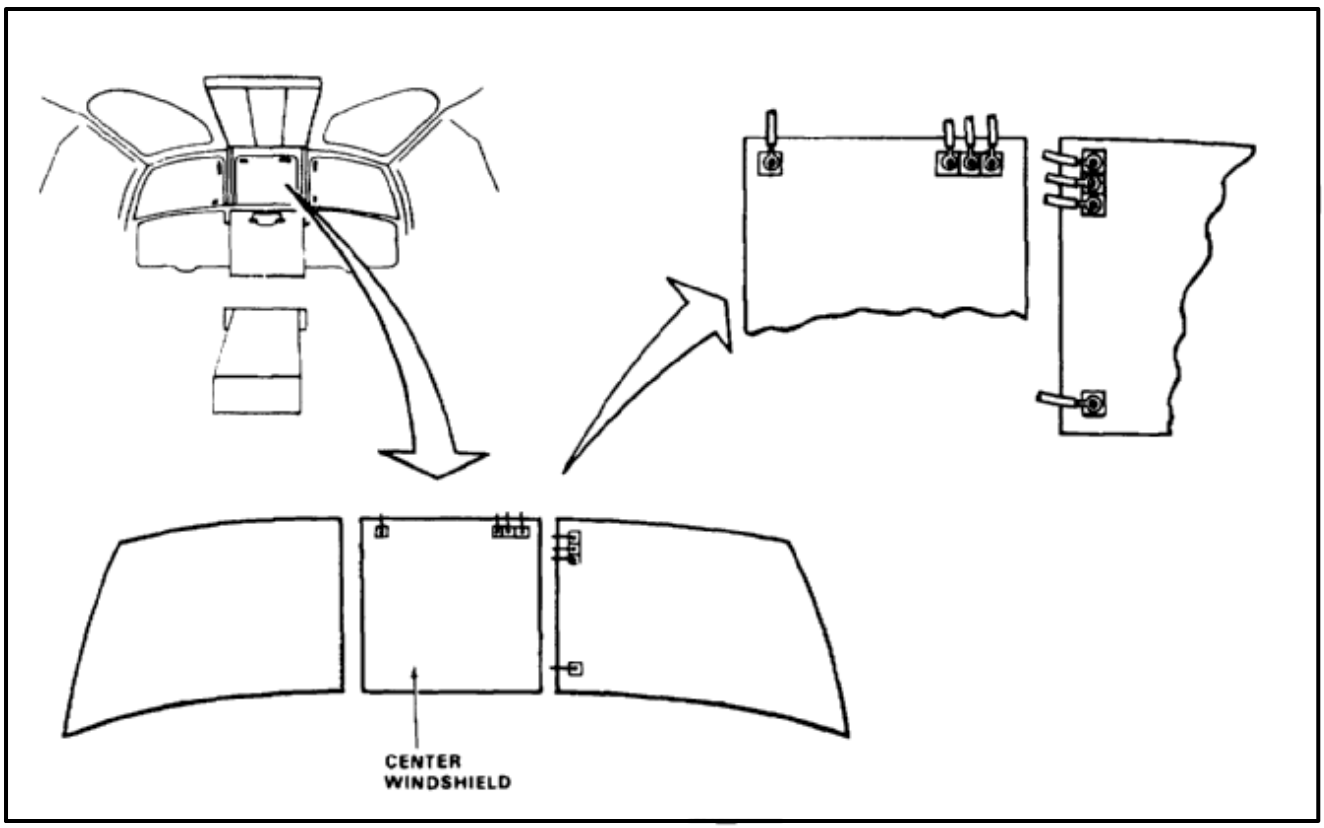
Aircraft Electrician

References:

TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

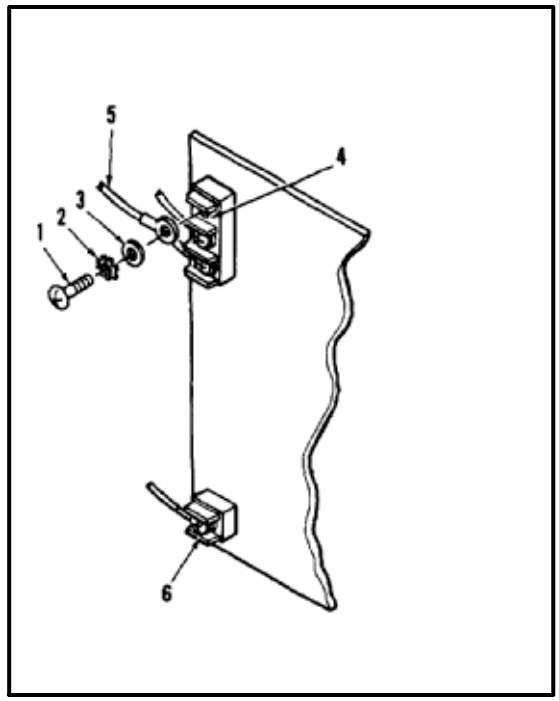


PILOT'S OR COPILOT'S WINDSHIELD HEATING ELEMENT

NOTE

Heating element cannot be seen. It is built into windshield.

Procedure is same to test pilot's or copilot's windshield, pilot's windshield is shown here.

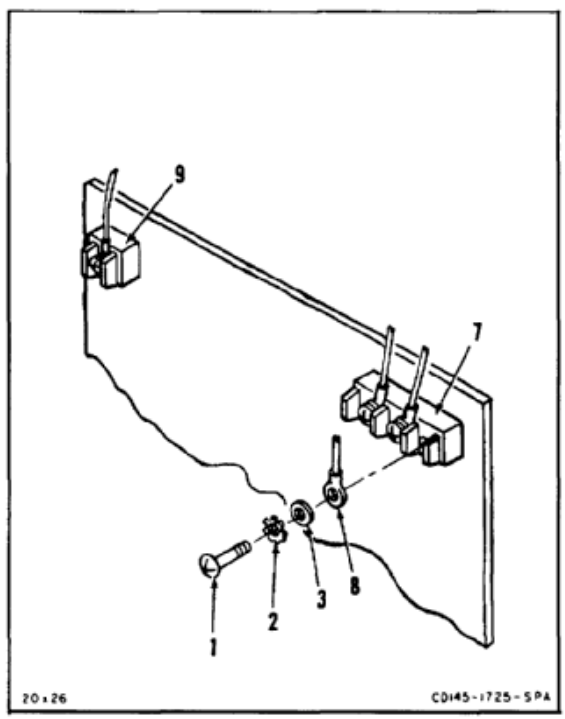


1. Remove screw (1), lockwasher (2), and flat washer (3) from terminal (4). Disconnect wire (5).
2. Measure resistance between terminals (4 and 6). Resistance shall be as follows:

Part No.	Vendor	Resistance (ohms)
114SS601	All	5.6 to 7.6
114SS604	PPG	9.5 to 13.5
114SS604	Sierracin	6.0 to 9.0

Vendor identification is at upper edge of windshield.

3. Connect wire (5) to terminal (4). Install flat washer (3), lockwasher (2), and screw (1).

CENTER WINDSHIELD HEATING ELEMENT

4. Remove screw (1), lockwasher (2), and flat washer (3) from terminal (7). Disconnect wire (8).
5. Measure resistance between terminals (7 and 9). On windshields 114SS602 or 114SS604 series, resistance shall be **39.8 to 53.8 ohms**.
6. Connect wire (8) to terminal (7). Install flat washer (3), lockwasher (2), and screw (1).