

HEATING TOOLS
INSTALLATION AND REPAIR PRACTICES FOR
AIRCRAFT ELECTRIC AND ELECTRONIC WIRING

This WP supersedes WP 012 00 dated 1 September 2004

Reference Material

Aircraft Fuel Cells And Tanks NAVAIR 01-1A-35
Environmental Test Methods for Aerospace and Ground Equipment MIL-STD-810

Alphabetical Index

<u>Subject</u>	<u>Page No.</u>
CV- 5000, Thermogun Mark II Heating Tool	18
Operation	19
Post- operation	20
Pre- operation	18
Reflector Selection	18
CV- 5300/CV- 5302, Mini- gun Hot Air Tool	20
Operation	22
Post- operation	23
Pre- operation	21
Reflector Selection	21
General	3
Confined Space	4
Motorized Heat Guns Usage Policy	4
Permit Required Confined Space	4
Safety Precautions	3
HT- 900B/HT- 920B Compressed Air/ Nitrogen Heating Tool	4
Operation	6
Post- operation	7
Pre- operation	5
Reflector Selection	5
Termination Sleeve Reflector	5
Miniature Termination Sleeve Reflector	6
Boot and Tubing Reflector	6
Needle Point Reflector	6
Large Boot and Tubing Reflector	6
HT- 71002 Nitrogen/Compressed Air Hot Air Tool	8
Air/Temperature Settings	10
Compressed Air	8
Connecting Air/Nitrogen Supply	8
Nitrogen Gas Supply	9
Observe Warning On Power Cable	8
Operation	9
Powering Up The HT- 71002	9
Shrinking/Curing	10
Solder Sleeve Connectors	10
Introduction	3

Alphabetical Index

<u>Subject</u>	<u>Page No.</u>
IR- 500, Radiant Heating Tool	13
Operation	14
Post-operation	15
Pre-operation	13
Reflector Selection	14
IR- 550 Mark II, Infrared Heating Tool	10
Operation	12
Post-operation	13
Pre-operation	11
Reflector Selection	11
IR- 1759, Miniray Infrared Heating Tool	15
Operation	16
Post-operation	17
Pre-operation	15
Reflector Selection	15
AE- 897 Wide Aperture	16
Standard Aperture Reflector Assembly	15
MCH- 100- A Battery Powered Heat Gun	23
Changing Hot Air Nozzles	27
Charging Batteries	27
Hot Air Tool Controls	25
Installation of Batteries Into Power Pack	24
Introduction	23
Operating Procedures	24
Operation in Unusual Weather Conditions	27
Preparation for Movement After Use	28
Setup Procedures	27
Unpacking Tool	24

Record Of Applicable Technical Directives

None

Support Equipment Required

Nomenclature	Part Number/Type Designation
Compressed Air/Nitrogen Heat Gun	HT-71002
Heat Gun, Compressed Air/Nitrogen	HT-900B
Heat Gun, Compressed Air/Nitrogen	HT-920B
Heat Gun, Battery Powered	MCH-100-A
Heating Tool, Radiant	IR-500
Heating Tool, Infrared	IR-550
Heating Tool, Infrared	IR-1759
Heating Tool, Thermogun	CV-5000
Mini-Gun Hot Air Tool	CV-5300
Mini-Gun Hot Air Tool	CV-5302
Nitrogen Bottle	—

Materials Required

Nomenclature	Part Number/Type Designation
Isopropyl Alcohol	TT-I-735
Nitrogen Bottle	

1. INTRODUCTION.

2. This work package (WP) provides information and operating procedures for heating tools used for build-up and repair of aircraft wiring system.

3. GENERAL.

4. Performing maintenance on an aircraft can be very hazardous to personnel and equipment. Extreme caution must be observed while using heating tools with electric motors on aircraft. The following paragraphs list the procedures that shall be adhered to while performing aircraft wiring maintenance.

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever

AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electro-magnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electro-magnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

5. **SAFETY PRECAUTIONS.** Prior to performing repair procedures on any aircraft wiring system using heating tools with brush type electric motors, refer to

NAVAIR 01-1A-505-1
TO 1-1A-14
TM 1-1500-323-24-1
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Page 4

NAVAIR 01-1A-35 for procedures concerning gas-free certifications. For definitions of confined spaces, refer to paragraph 7.

6. MOTORIZED HEAT GUNS USAGE POLICY.

The policy for use of motorized heating tool on aircraft not strictly considered confined space is:

a. Do not perform any other maintenance during defueling, depuddling, purging, or inerting operations. See NAVAIR 01-1A-35.

b. Aviation Gas Free Environment (AVGFE) check spaces for Oxygen, (19.5% to 23.5%) and 0% flammables (0% Lower Explosive Limit [LEL]) whenever any of the following conditions exist:

(1) Any fuel cell is open.

(2) Any fuel line is open.

(3) Any fuel system component has been removed anywhere on the aircraft.

c. If there are no open fuel cells, no fuel lines have been broken, and no fuel system components have been removed, it is not necessary to check Oxygen, and LEL.

NOTE

This policy also applies to drop tanks and support equipment. For confined spaces, refer to NAVAIR 01-1A-35.

7. CONFINED SPACE. Confined space is defined as:

a. A space large enough and so confined maintenance personnel can bodily enter and perform assigned work.

b. A space having limited or restricted means for entry or exit.

c. A space not designed for continuous maintenance personnel occupancy.

8. PERMIT REQUIRED CONFINED SPACE. Permit required confined space means a confined space that has one or more of the following characteristics:

a. A space that contains, or has the potential to contain a hazardous atmosphere.

b. A space that contains a material that has the potential for engulfing an entrant.

c. A space that has an internal configuration such that an entrant could be trapped and asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a small cross section.

d. A space that contains any other recognized serious safety hazard.

9. HT-900B/HT-920B COMPRESSED AIR/NITROGEN HEATING TOOL.

WARNING

Use of nitrogen with the HT-900B/HT-920B heat gun in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

10. Compressed air/nitrogen heating tool (Figure 1), is a portable source of heat for use with heat-shrinkable tubing, meltable solder fittings, and is qualified for use on fueled aircraft. With the exception of a source of compressed air/nitrogen, the is self-contained. Specifications are listed in Table 1. Tool contains several safety features as follows:

a. If the air/nitrogen pressure monitored at the heating tool falls below a preset minimum, a safety switch shuts off power to the heating element.

b. Cool air passes between the heating element and heating tool handle, keeping the handle cool.

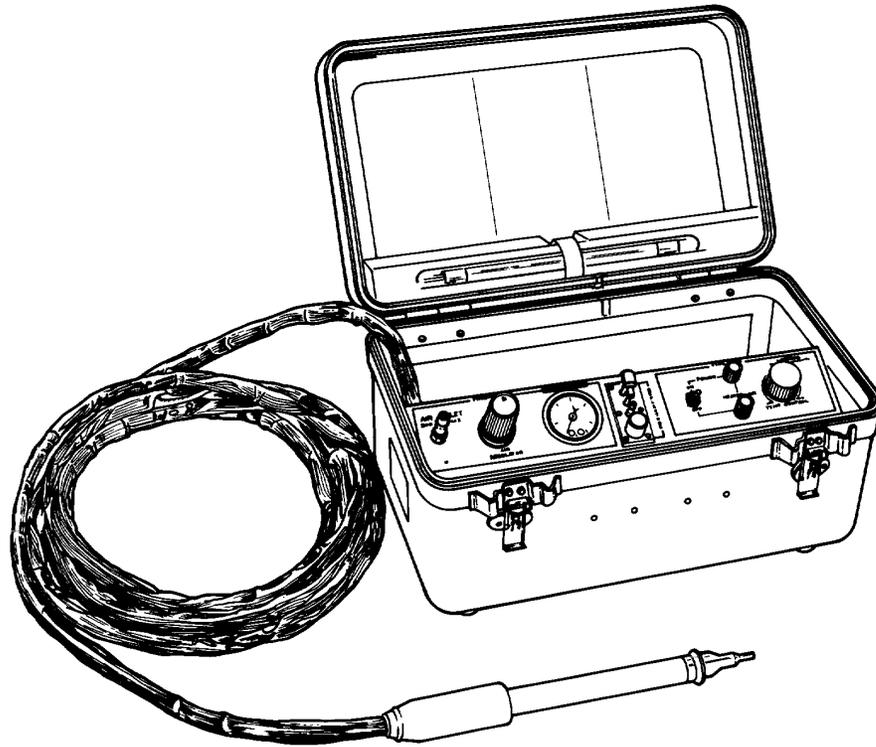


Figure 1. Compressed Air/Nitrogen Heating Tool With Case

c. If the heating tool is inadvertently connected to an air source in excess of 200 psi, an air safety valve protects both the equipment and the operator.

11. **PRE-OPERATION.** Prior to using compressed air/nitrogen heating tool (Figure 1), proceed as follows:



Do not connect the heating tool to a compressed air/nitrogen source greater than 200 psig.

- a. Push down and fully turn AIR REGULATOR ccw.
- b. Remove dust cap from AIR INLET nipple. Connect nipple to pressurized air/nitrogen source.

c. Push down and turn AIR REGULATOR cw until pressure of 5 to 7 psig is registered on AIR PRESSURE GAGE.

12. **REFLECTOR SELECTION.** The attachments for the air/nitrogen heater consist of five reflectors. These reflectors are attached to the tip of the heat gun and concentrate the heated air/nitrogen output around the material. The uses of the various reflectors are as follows:

13. **Termination Sleeve Reflector.** Used for heating solder termination sleeves and shrinking small-diameter tubing (Figure 2).



Figure 2. Termination Sleeve Reflector

14. **Miniature Termination Sleeve Reflector.** Used for heating small solder termination sleeves and making terminations in a confined area (Figure 3).



Figure 3. Miniature Termination Sleeve Reflector

15. **Boot and Tubing Reflector.** Used for shrinking tubing and molded components such as strain-relief boots and potting caps (Figure 4).



Figure 4. Boot and Tubing Reflector

16. **Needle Point Reflector.** Used where a lower precise air-flow is required to terminate micro-miniature connectors, or to repair or modify low-temperature insulated wire termination (Figure 5).

Table 1. Specifications

Electrical Power, HT-900B	115 VAC, 50-400 Hz, single-phase, 7 Amps
Electrical Power, HT-920B	220 VAC, 50-400 Hz, single-phase, 3.5 Amps
Heat gun output temperature	550-920°F (290-495°C)
Compressed air/nitrogen	80-200 psig, 4 SCFM (Dry and oil-free)



Figure 5. Needle Point Reflector

17. **Large Boot and Tubing Reflector.** Used for installing large diameter tubing and molded parts (Figure 6).

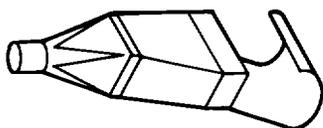


Figure 6. Large Boot and Tubing Reflector

18. **OPERATION.** To operate compressed air/nitrogen heating tool (Figure 7), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

- a. Push reflector over gun tip.

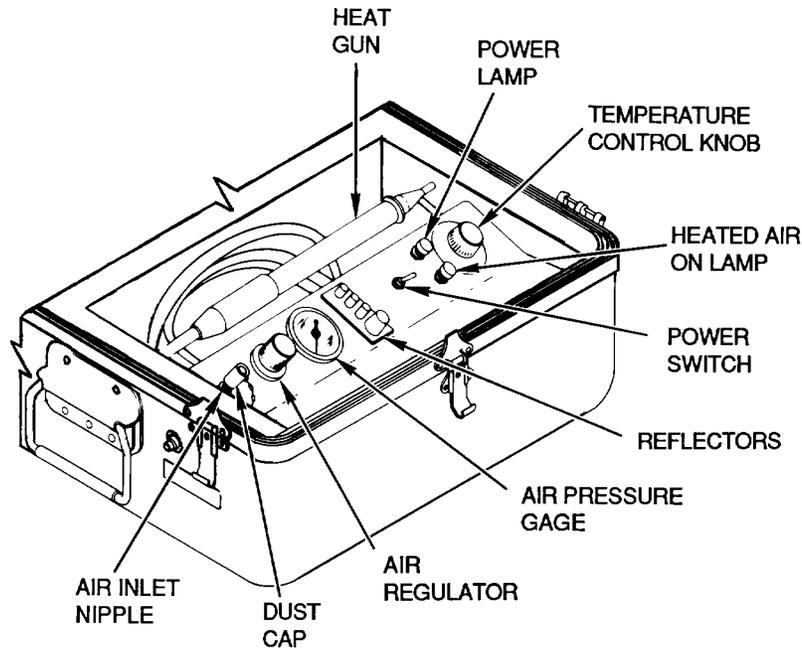


Figure 7. Compressed Air/Nitrogen Heating Tool

b. Plug in power cord to 115 VAC, 50-400 Hz, single-phase, 7 AMPs minimum power source, for the HT-900 tool, and to 220VAC, 50-400 Hz, single phase, 3.5 AMPs minimum power source for the HT-920B tool.

c. Set POWER switch to ON. POWER lamp and HEATED AIR ON lamp should light.

NOTE

The HEATED AIR ON lamp does not light unless the switch in the heat gun handle is in the forward position. Heated air can be removed from the heat gun at any time during operation, without powering down the control module, by positioning the switch to the rear of the handle.

d. Allow one minute warm-up. After warm-up, air pressure will be 10-15 psig.

e. Adjust TEMP CONTROL knob to desired setting.

19. **POST-OPERATION.** After using compressed air/nitrogen heating tool (Figure 7), proceed as follows:

a. Push down and fully turn AIR REGULATOR ccw. Observe that AIR PRESSURE GAGE registers 0 psig and HEATED AIR ON lamp goes out.

b. Position heat gun handle switch to rear of handle.

c. Position POWER switch to OFF. Observe that POWER lamp goes out.



Failure to cool the gun, as directed below, will shorten heating element life.

d. Cool heat gun, for a minimum of one minute, by allowing air/nitrogen to flow until cool.

e. Disconnect power connector from power source.

f. Disconnect compressed air/nitrogen source from AIR INLET nipple. Install dust cap.



Figure 8. HT- 71002 Nitrogen/Compressed Air Hot Air Tool.

- g. Allow a few minutes for reflector to cool.
- h. Remove reflector and store in case.

20. HT-71002 NITROGEN/COMPRESSED AIR HOT AIR TOOL.

a. The HT- 71002 hot air tool is designed to operate in a potentially hazardous/explosive environment as spelled out in MIL-STD- 810, Method 511.3, Procedure 1. This device produces hot air at temperatures up to 950° F, utilizing compressed air/nitrogen passing through a high resistance electric heat element and is directed or diffused through various types of special purpose nozzle attachments. Some examples of application are: heat shrinkable tubing, solder sleeve electrical connectors, drying and curing applications.

b. This unit comes packaged in a fiberglass/aluminum carrying case and consists of two major parts: The control unit and heat pistol (Figure 8).

When operating the HT- 71002 in a potentially explosive atmosphere, the following instructions must be followed explicitly.

- 21. **Observe warning on power cable.**

WARNING

Failure to observe connection procedures as described in paragraphs a. and b. may result in explosion and or fire.

Before applying power to the HT- 71002, the following procedures must be adhered to exactly.

- a. Disconnect power at the source.

b. If using hangar or ships power, disengage the supply circuit at the circuit breaker panel, connect up the extension cord to the HT- 71002 supply at the circuit breaker panel, activate the 115Vac (50 – 400 Hz) and observe the control unit panel indicator that AC is present.

22. CONNECTING AIR/NITROGEN SUPPLY.

- a. Air input Maximum 150 psi. Air input operating range: 60–150 psi.

23. COMPRESSED AIR.

a. Air supply must be water and contaminant free. The HT-71002 employs a three (3) stage filtration system that purges water from the system automatically, however in order to minimize contamination of the extremely fine particulate and water filtration system of the HT-71002, the air supply (compressor) should be drained of water prior to connecting up the HT- 71002 to the air supply.

b. Connect the air supply to connection nipple marked AIR INPUT. Observe the Air Pressure gauge and LOW AIR indicator. The minimum operational pressure for the HT-71002 is 3.5 psi. The LOW AIR lighted indicator will illuminate at approximately 2.0 psi, however steady state operation requires a pressure setting of 3.5 psi minimum.

- c. If there is no pressure indicated on the control unit pressure gauge and the air supply to the unit is

present at 60–150 psi, rotate the pneumatic control pressure regulator clockwise until pressure is indicated on the pressure gauge, to a setting of 3.5 psi. At approximately 2.0 psi, the LOW AIR lamp will illuminate, indicating that the low limit air protection circuitry has determined that air is insufficient and that the tool cannot be powered up.

24. NITROGEN GAS SUPPLY.

WARNING

Bottled nitrogen is usually contained in high pressure cylinders with pressures in excess of 2000 psi. Be certain that the appropriate input line pressure to the HT- 71002 is observed. Proper regulation of the high pressure nitrogen is mandatory.

a. Connect the Nitrogen supply to connection nipple marked AIR INPUT. Observe the air pressure gauge and LOW AIR indicator. The minimum operational pressure for the HT- 71002 is 3.5 psi. The LOW AIR lighted indicator will illuminate at approximately 2.0 psi, however steady state operation requires a pressure setting of 3.5 psi minimum.

b. If there is no pressure indicated on the control unit pressure gauge and the Nitrogen supply to the unit is present at 60–150 psi, rotate the pneumatic control pressure regulator clockwise until pressure is indicated on gauge of 3.5 psi. At approximately 2.0 psi, the LOW AIR lamp will illuminate, indicating that the low limit Nitrogen protection circuitry has determined that Nitrogen is insufficient and that the tool may not be powered up.

25. OPERATION.

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT- 900B, HT- 920B, HT- 71002 and MCH- 100- A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT- 71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH- 100- A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

26. POWERING UP THE HT- 71002.

a. Once the required electrical and air/nitrogen connections have been made, the HT- 71002 is ready for operation.

- (1) Set Air/nitrogen air pressure 3.5 psi minimum.
- (2) Set Temperature control on heat tool at "0".
- (3) Observe that the LOW AIR lamp is extinguished.
- (4) Depress POWER ON switch and indicator will illuminate.

27. AIR/TEMPERATURE SETTINGS.

a. The working environment of the HT- 71002 will affect the resultant temperature at the nozzle of the heat tool. Such conditions are:

- (1) Wind and air turbulence.
- (2) Ambient temperatures that are below freezing and above 70 degrees F.
- (3) Air compressor supplied input where the compressor is subjected to ambient temperatures.

b. Normal operating air pressure range of the HT- 71002 is between 3.5 and 9.0 psi. With a constant temperature setting and an increased airflow, the resultant nozzle temperature will decrease, therefore a higher temperature setting will be required to achieve the desired temperatures.

c. With an ambient temperature of 70 degrees F, a "0" setting on the heat tool equals ambient temperature at 3.5 psi and "10" setting on the heating tool at 3.5 psi equals approximately 975 degrees F.

28. SHRINKING/CURING.

- a. Set temperature control on tool between "4" and "6" with air pressure set between 3.5 – 4.0 psi.
- b. If shrinking or curing operation requires more heat, leave air pressure at initial setting and increase temperature.

29. SOLDER SLEEVE CONNECTORS.

- a. Install spoon reflector nozzle on heat tool.
- b. Set temperature control between "5" and "8" on heat tool, with air pressure between 3.5 and 4.0 psi.
- c. Depending on the connector and wire size, either a higher or lower setting will be required.

(1) Observe the solder ring in the connector for reflow. Do not leave heat on connector longer than is required to achieve a high integrity connection.

30. IR-550 MARK II, INFRARED HEATING TOOL.

31. Infrared heating tool, IR-550 Mark II (Figure 9), is a portable electric heating tool designed for fast reliable installation of solder devices and other heat-shrinkable products. It can be used as a hand tool or as a bench heater. As a hand tool, it is operated by a switch on the handle; as a bench heater, it is operated by a foot switch or the handle switch. This tool provides an unobstructed view of work in process and quiet, hands free operation. Instant on/off heat is generated by an optically filtered, commercially available tungsten-halogen lamp. Reflectors focus the heat from the lamp, concentrating heat energy within the work area of the front reflector. Optical filter between the lamp and the work area eliminates glare from the lamp, allowing the operator to observe the heating process. Tool is also equipped with a viewing window to ensure operator eye comfort. These features minimize operator errors and fatigue, significantly reducing installation time and costs. Specifications are listed in Table 2.

Table 2. Specifications	
Electrical Power	115 VAC, 50-60 Hz, 4 1/2 Amps
Normal lamp life	Over 1000 hours of intermittent use
Duty Cycle	80%, 90 second heating times

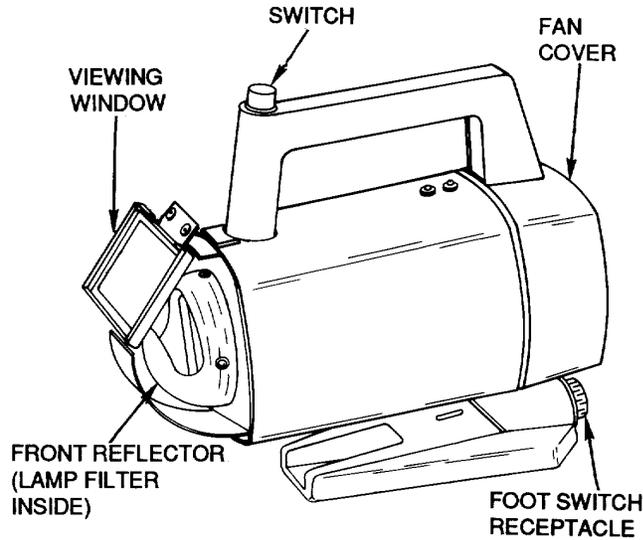


Figure 9. Infrared Heating Tool, IR-550 Mark II

32. **PRE-OPERATION.** Prior to using infrared heating tool (Figure 9), proceed as follows:

- a. Visually check front reflector and outer face of lamp filter for contamination.
- b. If contamination is found, remove front reflector by lifting upper nose plunger from hole in reflector; tilt reflector away from housing, lift the reflector off lower plunger and slide it out of the housing.

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

- c. Clean contaminated surfaces of front reflector and outer face of lamp filter with a soft cloth and isopropyl alcohol.
- d. Install front reflector being careful not to contaminate inner reflective surface.

33. **REFLECTOR SELECTION.** The attachments for the infrared heating tool consist of four reflectors. These reflectors are attached to the front end of the tool housing and concentrate the heated infrared output around the material. The uses of the various reflectors are as follows:

- a. RG-2. Used for heating solder termination sleeves and shrinking large-diameter tubing. Has a 3/4 inch wide aperture and comes with heating tool when ordered.
- b. RG-6. Used for heating solder termination sleeves and shrinking large-diameter tubing. Has a 3/4 inch wide aperture and has to be ordered separately (Figure 10).
- c. RG-10. Used for heating solder termination sleeves and shrinking small-diameter tubing. Has a 3/8 inch wide aperture and has to be ordered separately (Figure 11).
- d. RG-11. Used for heating solder termination sleeves and shrinking small-diameter tubing. Has a 1/2 inch wide aperture and has to be ordered separately (Figure 12).

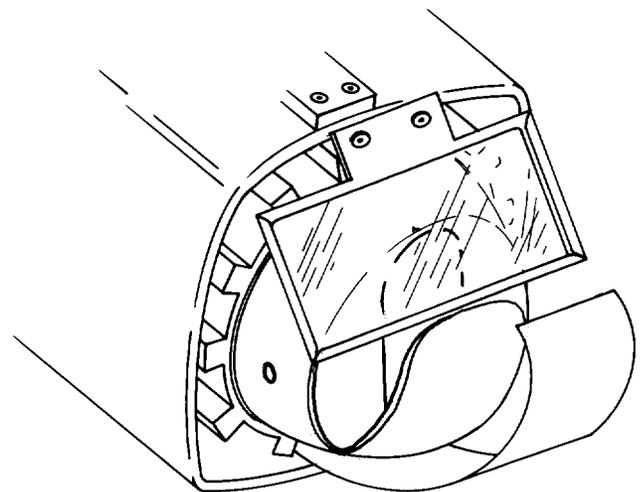


Figure 10. RG-6 Reflector

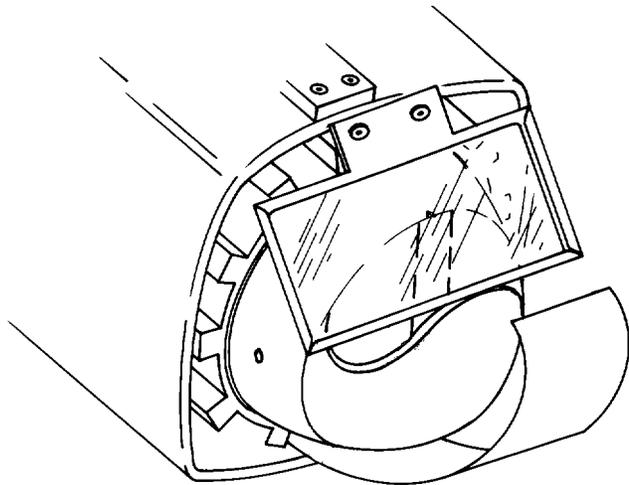


Figure 11. RG-10 Reflector

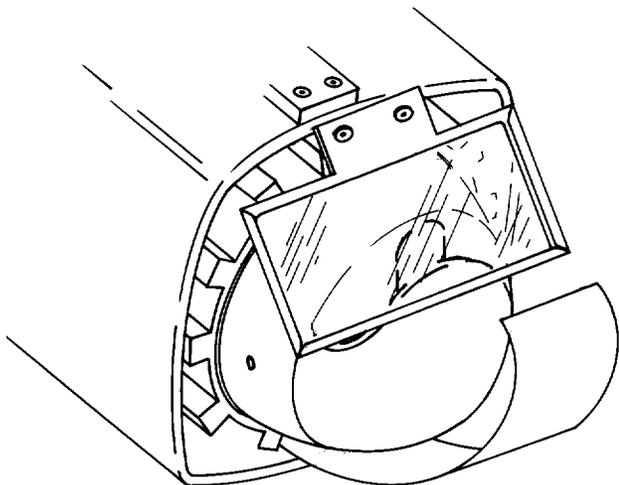


Figure 12. RG-11 Reflector

34. **OPERATION.** To operate infrared heating tool (Figure 3), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and

purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

- a. Select the appropriate front reflector for the application.
- b. Clip the front reflector onto the front end of the lamp housing by sliding the reflector between the

upper and lower nose plungers until the bosses on the clips snap into the upper and lower holes in the reflector.

c. Plug in power cord to 115 VAC, 50-60 Hz, 4 1/2 Amps minimum power source. (For foot switch operation, foot switch must first be plugged into receptacle on rear of tool before plugging into power source.)

d. Prepare assembly to be heated.

e. Place the assembly to be terminated into slot of front reflector.

f. Turn heat lamp on by depressing switch on handle or by depressing foot switch.

WARNING

Since front reflector is outside the cooling air stream, it may get hot during the long heating cycles. Therefore, front reflector should not be touched when tool is in use.

g. Observe assembly during heating. After assembly has received proper amount of heat (or maximum of 90 seconds), stop heat cycle by releasing switch on handle or removing pressure from foot switch. Repeat if necessary if additional heating time is required.

h. Remove assembly from front reflector and inspect.

35 . **POST-OPERATION.** After using infrared heating tool (Figure 9), proceed as follows:

a. Disconnect power connector from power source.

b. Allow a few minutes for reflector to cool.

c. Visually check front reflector and outer face of lamp filter for contamination. If contamination is found, clean contamination using steps in paragraph 32.

d. Store reflector in proper place.

e. Periodically check the fan area to see if any dirt or lint has accumulated, when necessary clean with a soft brush. To facilitate cleaning, simply remove two mounting screws located on the rear of the fan cover.

36 . **IR-500, RADIANT HEATING TOOL.**

37. Radiant heating tool, IR-500 (Figure 13), is a portable lightweight electric heating tool designed for

fast and reliable installation of heat-shrinkable products. It can be used as a hand tool or as a bench tool and operated with a foot switch. The ellipsoidal reflector focuses the heat produced by halogen quartz lamp into the heating zone in front of the unit. Lamp is optically filtered to eliminate glare which allows the operator to observe the heating process, minimizing faulty installation and thereby assuring a quality finished product. Specifications are listed in Table 3.

38 . **PRE-OPERATION.** Prior to using radiant heating tool (Figure 13), proceed as follows:

a. Visually check reflector and outer face of lamp filter for foreign material accumulation.

b. If accumulation is found, remove reflector by lifting the reflector plunger, and tilting reflector away from housing and off reflector anchor pin.

Electrical Power	115 VAC, 50-60 Hz, 5 Amps
Duty Cycle	50%, 30 second heating times

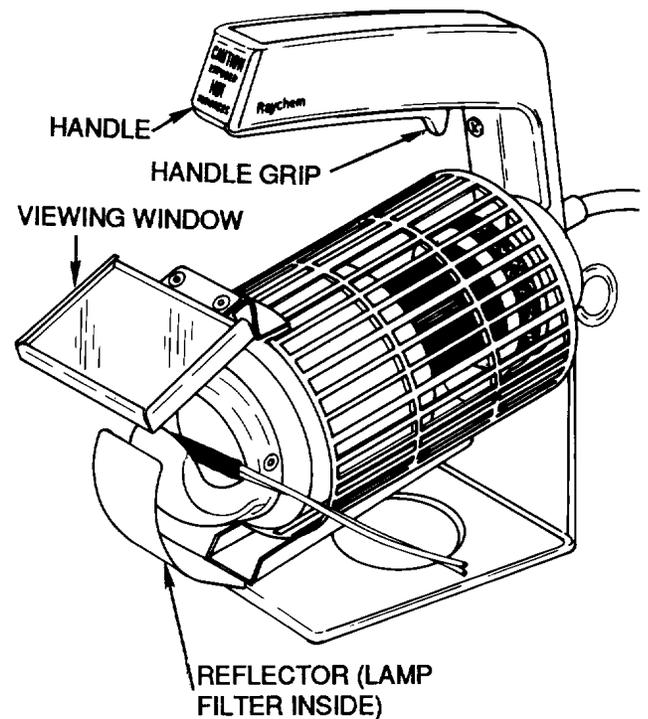


Figure 13. Radiant Heating Tool, IR-500

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

c. Clean foreign material off surfaces of reflector and outer face of lamp filter with a lint free, soft cloth or paper dampened with isopropyl alcohol.

d. Install reflector, being careful not to touch inner reflective surface.

39. **REFLECTOR SELECTION.** The attachments for the radiant heating tool consist of three reflectors. These reflectors are attached to front end of the tool housing and concentrate the heated radiant output around the material. The uses of the various reflectors are as follows:

a. RG-1. Used for installing solder termination sleeves on non-heat sensitive wires; has to be ordered separately.

b. RG-2. Used for installing solder termination sleeves on heat sensitive wires; comes with heating tool when ordered.

c. Tubing Reflector. Used for installing heatshrinkable tubing and molded parts; comes with heating tool when ordered.

40. **OPERATION.** To operate radiant heating tool (Figure 13), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only autho-

alized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

a. Select the appropriate reflector for the application.

b. Install the reflector onto the front end of the lamp housing by putting the bottom of the reflector on the reflector anchor pin and tilting reflector up until it snaps onto reflector plunger.

c. Plug in power cord to 115 VAC, 50-60 Hz minimum power source. (For foot switch operation, foot switch must first be plugged into heating tool power cord before being plugged into power source.)

d. Prepare the assembly to be heated.

e. Place the assembly into heating area.

f. Turn heat lamp on by squeezing handle grip. Handle grip trigger actuates the on-off switch.

WARNING

During use the reflector may become hot.
Do not touch.

g. Observe assembly during heating. When heating operation is complete (or maximum of 30 seconds) turn lamp off by releasing the handle or removing pressure from foot switch. Repeat as necessary if additional heating time is required.

h. Remove assembly from heating area and inspect.

i. If using foot switch for operation, trigger must be moved forward to take it out of its locked position, then released to turn heating tool completely off.

41. **POST-OPERATION.** After using radiant heating tool (Figure 13), proceed as follows:

a. Disconnect power connector from power source.

b. Allow a few minutes for reflector to cool.

c. Visually check reflector and outer face of lamp filter for foreign material accumulation. If material is found, clean using steps in paragraph 32.

d. Store reflector in proper place.

42. **IR-1759, MINIRAY INFRARED HEATING TOOL.**

43. MiniRay infrared heating tool, IR-1759 (Figure 14), is a small, lightweight, medium-duty hand heating tool

designed for quiet, efficient operation. It can significantly reduce installation time on a variety of heat-shrinkable products. The low profile allows product installation where work space is restricted. Specifications are listed in Table 4.

44. **PRE-OPERATION.** Prior to using infrared heating tool (Figure 14), proceed as follows:

a. Visually check aperture reflector for foreign material accumulation.

b. If accumulation is found, remove aperture reflector by removing screw, under reflector, and taking aperture reflector off heating tool.

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

c. Clean foreign material off reflector surface with soft cloth and isopropyl alcohol.

d. Install aperture reflector, being careful not to touch reflective surface.

45. **REFLECTOR SELECTION.** The attachments for the infrared heating tool consist of two reflectors. These reflectors are attached to the front end of the tool housing and concentrate the heated infrared output around the material. The uses of the various reflectors are as follows:

46. **Standard Aperture Reflector Assembly.** Used for heating solder termination sleeves and shrinking small-diameter tubing. Used on devices having a maximum outside diameter of 1/4 inch and a maximum length of 1 inch and comes with heating tool when ordered (Figure 15).

Table 4. Specifications

Electronic Control Unit	
Electrical Power	115 VAC, 60 Hz, 11 Amps
Infrared Heating Tool	
Lamp Type	Tungsten-Halogen
Lamp Power	250 W, 24 VAC, 50-60 Hz
Lamp Life	Average time continuous use 50 hours

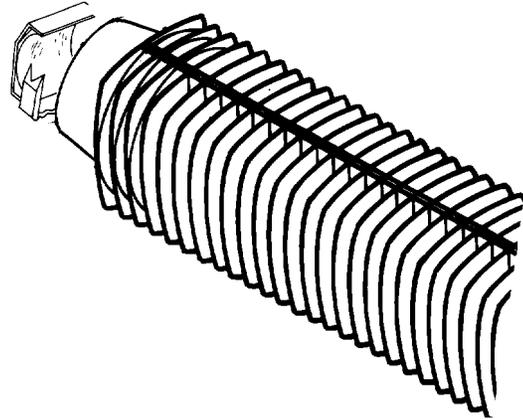


Figure 15. Standard Aperture Reflector Assembly

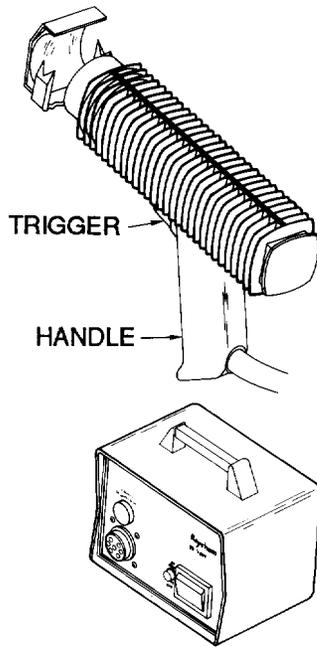


Figure 14. Infrared Heating Tool, IR-1759 with Standard Electronic Control ED-7-004

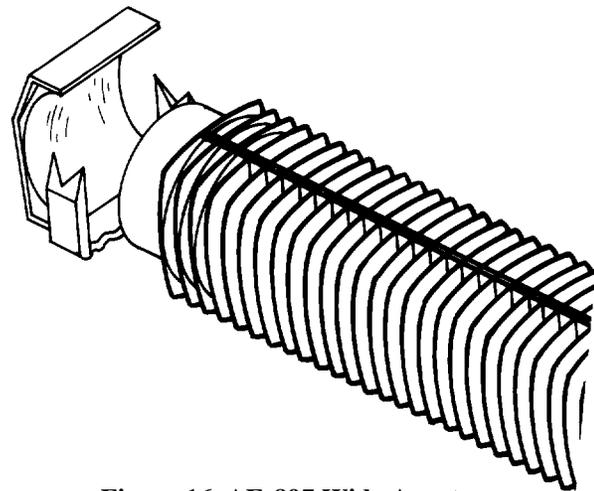


Figure 16. AE-897 Wide Aperture

47. **AE-897 Wide Aperture.** Used for heating solder termination sleeves and shrinking small-diameter handle tubing. Used on devices having a maximum outside diameter of 3/8 inch and a maximum length of 2 inches and has to be ordered separately (Figure 16).

48. **OPERATION.** To operate infrared heating tool (Figure 14), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B heating tool is authorized for use on any aircraft

whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

- a. Select the appropriate aperture for the application
- b. Attach the aperture to heating tool by using screw under front tip of heating tool.
- c. Plug in power cord to 115 VAC, 60 Hz, 11 Amps minimum power source.
- d. Prepare the assembly to be heated.
- e. Place the assembly into heating area.
- f. Turn heat lamp on by squeezing trigger on handle.

WARNING

During use the aperture may become hot. Do not touch.

- g. Observe assembly during heating. After assembly has received proper amount of heat, stop heat cycle by releasing trigger on handle.
- h. Remove assembly from heating area and inspect.

49 . **POST-OPERATION.** After using infrared heating tool (Figure 14), proceed as follows:

- a. Disconnect power connector from power source.
- b. Allow a few minutes for aperture to cool.
- c. Visually check aperture reflector for foreign material accumulation. If material is found, clean as follows:

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

(1) Clean contaminated surfaces of front reflector and outer face of lamp filter with a soft cloth and isopropyl alcohol.

(2) Install front reflector being careful not to contaminate inner reflective surface.

50. CV-5000, THERMOGUN MARK II HEATING TOOL.

51. ThermoGun Mark II heating tool, CV-5000 (Figure 17), is a rugged stand mounted or hand held hot-air tool engineered with a turbo fan driven blower and double jacketed element housing for heavy duty use. Combining features and options such as adjustable side vents, a wide variety of reflectors, and two temperature ranges (determined by model selected). ThermoGun provides precise control when terminating abroad range of heat shrinkable products, including boots and tubing up to 3 inches in diameter. Specifications are listed in Table 5.

Table 5. Specifications	
Model 500B & 502B	
Electrical Power, Model 500B	115 VAC, 60 Hz, 14 Amps
Electrical Power, Model 502B	220 VAC, 50-60 Hz, 7 Amps
Output temperature	500° - 700°F (260° - 371°C)
Model 750B & 752B	
Electrical Power, Model 750B	115 VAC, 60 Hz, 18 Amps

Electrical Power, Model 752B	220 VAC, 50-60 Hz, 9 Amps
Output temperature	750° - 1000°F (399° - 538°C)

52. **PRE-OPERATION.** Prior to using heating tool (Figure 17), Proceed as follows:

- a. Visually check reflector for foreign material accumulation.
- b. If accumulation is found, remove reflector by pulling it straight off ThermoGun nozzle.

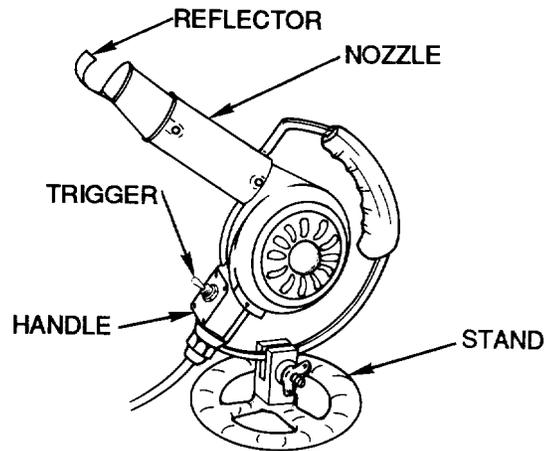


Figure 17. ThermoGun Mark II Heating Tool, CV-5000 with Stand

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

- c. Clean foreign material off surfaces of reflector with a soft cloth and isopropyl alcohol.
- d. Install reflector, being careful not to touch reflective surface.

53. **REFLECTOR SELECTION.** The attachments for the heating tool consist of six reflectors. These reflectors

are attached to nozzle of heating tool and concentrate heated output around the material. The uses of the various reflectors are as follows:

a. TG-12. Used for heating solder termination sleeves and shrinking small-diameter tubing. Used for short lengths of tubing up to 3/4 inch diameter and comes with heating tool when ordered (Figure 18).

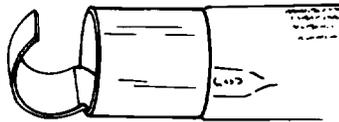


Figure 18. TG-12 Reflector

b. TG-13. Used for heating solder termination sleeves and shrinking large-diameter tubing. Used for short lengths of tubing from 3/4 inch to 2 inches in diameter and has to be ordered separately (Figure 19).

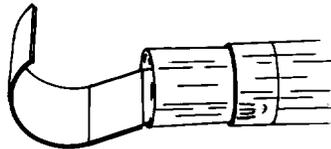


Figure 19. TG-13 Reflector

c. TG-13A. Used for heating solder termination sleeves and shrinking small-diameter tubing. Used for splice covers where wires must be shielded from heat and has to be ordered separately (Figure 20).

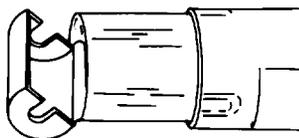


Figure 20. TG-13A Reflector

d. TG-23. Used for heating solder termination sleeves and shrinking medium-diameter tubing and

boots. Used for boots up to 1 3/4 inches in diameter and has to be ordered separately (Figure 21).

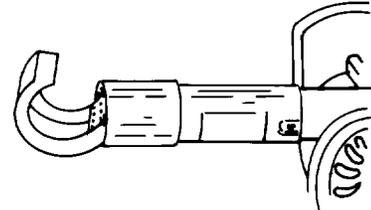


Figure 21. TG-23 Reflector

e. TG-24. Used for heating solder termination sleeves and shrinking large-diameter tubing and boots. Used for boots up to 3 inches in diameter and has to be ordered separately (Figure 22).

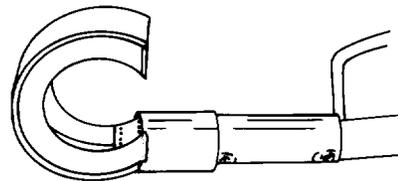


Figure 22. TG-24 Reflector

f. TG-135. Used for heating solder terminations sleeves and shrinking small-diameter tubing. Has to be ordered separately (Figure 23).



Figure 23. TG-135 Reflector

54. **OPERATION.** To operate heating tool (Figure 17), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be

hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

- a. Select the appropriate reflector for the application.
- b. Install the reflector on front of ThermoGun nozzle by pushing reflector straight on nozzle.
- c. Plug in power cord to 115 VAC, 60 Hz, 14 or 18 Amps minimum power source, or 220 VAC, 60 Hz, 7 or 9 Amps minimum power source, depending on the model selected.
- d. Prepare the assembly to be heated.
- e. Place the assembly into heating area.
- f. Turn the heat on by squeezing trigger on handle.

WARNING

During use the reflector may become hot. Do not touch.

g. Observe assembly during heating. After assembly has received proper amount of heat, stop heat cycle by releasing trigger on handle.

- h. Remove assembly from heating area and inspect.

55. **POST-OPERATION.** After using heating tool (Figure 17), proceed as follows:

- a. Disconnect power connector from power source.
- b. Allow a few minutes for reflector to cool.
- c. Visually check reflector for foreign material accumulation. If material is found, clean using steps in paragraph 52.
- d. Store reflector in proper place.

56. **CV-5300/CV-5302, MINI-GUN HOT AIR TOOL.**

57. Mini-Gun hot air tool, CV-5300/CV-5302 (Figure 24), is a lightweight hand-held tool used for applying a variety of heat-shrinkable products and solder termina-

NAVAIR 01- 1A- 505- 1
TO 1- 1A- 14
TM 1- 1500- 323- 24
Change 1

tion products. It provides a continuous flow of heated air at temperatures of 450° - 700°F (232° - 371°C), depending on the hot-air reflector used. Specifications are listed in Table 6.

Table 6. Specifications	
Electrical Power, CV-5300	115 VAC, 60 Hz, 7 Amps
Electrical Power, CV-5302	220 VAC, 50 Hz, 3.5 Amps
Output temperatures	
Without adapter	450°F (232°C)
With adapter only	550°F (288°C)
With MG-1 Reflector	700°F (371°C)
With MG-2 Reflector	450°F (232°C)

58. **PRE-OPERATION.** Prior to using mini-gun heating tool (Figure 24), proceed as follows:

- a. Visually check reflector for foreign material accumulation.
- b. If accumulation is found, remove reflector by pulling it straight off mini-gun adapter.

WARNING

Isopropyl Alcohol, TT-I-735 is highly flammable and toxic. Do NOT use synthetic wipe cloths due to possible electrostatic discharge and ignition. Use in a well ventilated area. Keep away from open flames. Avoid prolonged or repeated breathing of vapor or contact with skin. Avoid any contact with eyes. Safety glasses and protective gloves are recommended. Wash hands after use.

- c. Clean foreign material off surfaces of reflector with a soft cloth and isopropyl alcohol.

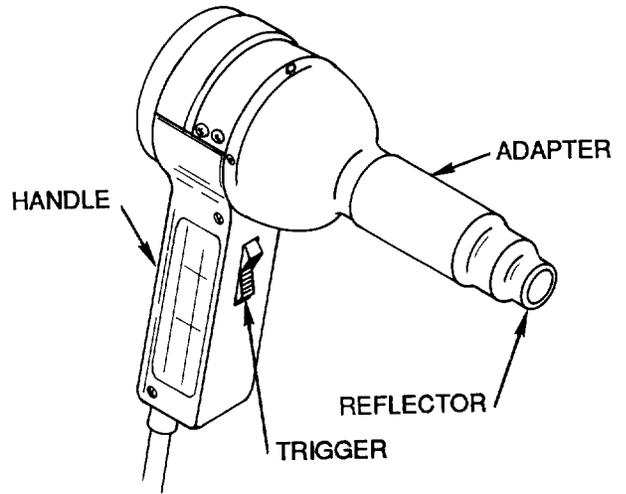


Figure 24. Mini-Gun Hot Air Tool, CV-5300/CV-5302

- d. Install reflector, being careful not to touch reflective surface.

59. **REFLECTOR SELECTION.** The attachments for the heating tool consist of two reflectors. These reflectors are attached to adapter on nozzle of heating tool and concentrate heated output around the material. The uses of the various reflectors are as follows:

- a. MG-1. Used for heating solder termination sleeves and shrinking small-diameter tubing. Used for concentrated, high-temperature heating and tubing reflector and comes with heating tool when ordered (Figure 25).

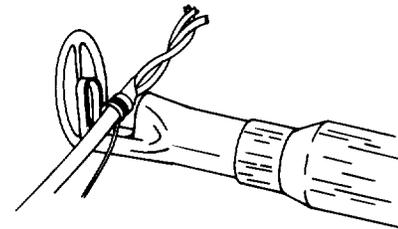


Figure 25. MG-1 Reflector

- b. MG-2. Used for heating solder termination sleeves, molded parts, and shrinking large-diameter tubing. Used for surrounding heat-shrinkable tubing and molded parts with lower-temperature air, and has to be ordered separately (Figure 26).

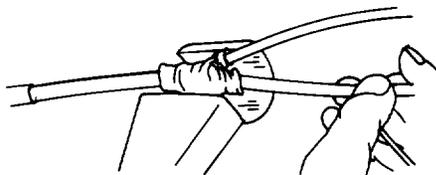


Figure 26. MG-2 Reflector

c. Barrel Adapter. Permits attachment of either reflector to the mini-gun.

60 . **OPERATION.** To operate heating tool (Figure 24), proceed as follows:

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT-900B, HT-920B, HT-71002 and MCH-100-A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT-71002, MCH-100-A heating tools are authorized for use on any aircraft whenever

AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

The MCH-100-A heat gun has been electromagnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electromagnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

a. Mount the mini-gun on its stand or operate it as a hand held tool (Figure 27).

(1) Bench stand clips into back of the heat gun body and onto nozzle, providing for various operating positions.

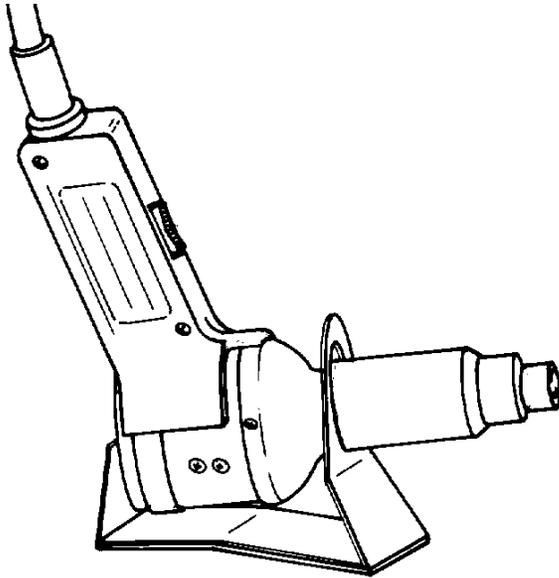


Figure 27. Mini-Gun Hot Air Tool, CV-5300/CV-5302 on Bench Stand

b. While the power is off and nozzle is cool, attach barrel adapter and appropriate reflector for the application to mini-gun.

(1) Reflector opening should face upward with mini-gun in its operating position.

c. Plug in power cord to 115 VAC, 60 Hz, 7 Amps minimum power source, or 220 VAC, 50 Hz, 3.5 Amps minimum power source.

d. Move switch to hot.

e. Allow heat gun to warm up for at least 30 seconds.



Nozzle, barrel adapter and reflector are hot. Do not adjust or remove them without first moving switch to cool and allowing blower

to operate until reflector is cool (at least 90 seconds).

f. Prepare the assembly to be heated.

g. Place assembly into heating area.

h. Observe assembly during heating. After assembly has received proper amount of heat, stop heat cycle by removing assembly from heating area.

i. Inspect assembly.

61 . **POST-OPERATION.** After using heating tool (Figure 24), proceed as follows:

a. Move switch to cool position and allow blower to run until output air is cool. Then move switch to off:

b. Disconnect power connector from power source.

c. Allow a few minutes for reflector to cool.

d. Visually check reflector for foreign material accumulation. If material is found, clean using steps in paragraph 58.

e. Store reflector in proper place.

62 . **MCH-100-A BATTERY POWERED HEAT GUN.**

63 . **INTRODUCTION.**

64 . Portable battery powered hot air tool MCH-100-A is a lightweight portable unit designed for field deployment or shop usage. It is to be used for various applications such as contactless soldering and desoldering, shrink tubes, plastic welding, drying, and many more applications that would require hot air.

65 . The MCH-100-A consists of a heat gun, power cord, 16 mm spoon reflector, 10 mm sleeve reflector, carrying case, battery charger with adapter plate, and battery case with two batteries (Figure 28). The battery case and the two rechargeable batteries are displayed in (Figure 29).

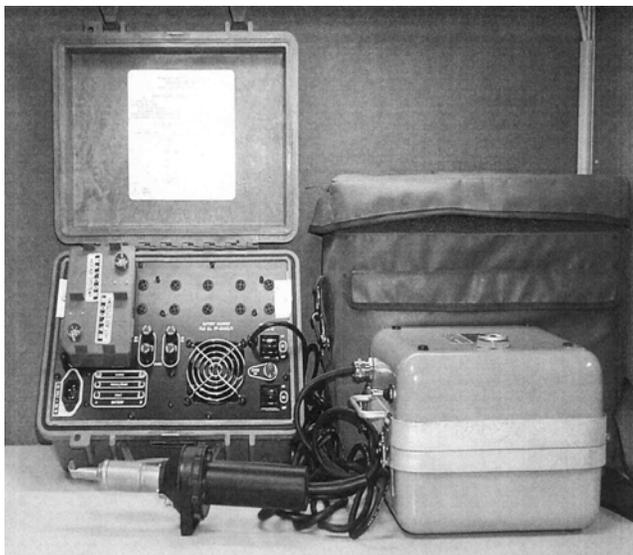


Figure 28. MCH-100-A.

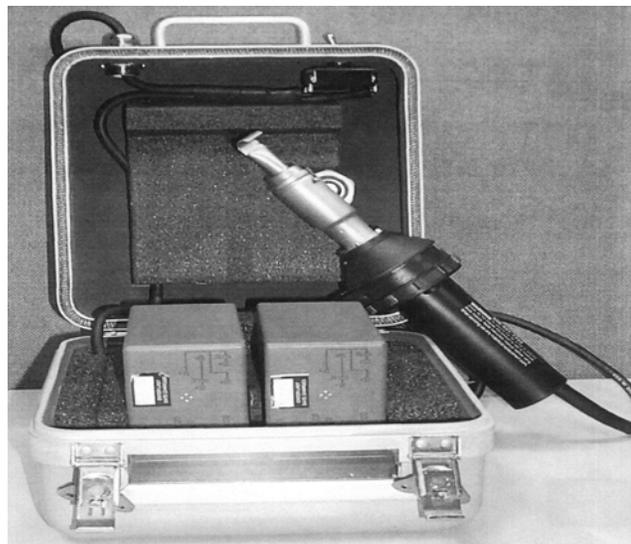


Figure 29. MCH-100-A and Batteries.

66. UNPACKING TOOL.

a. Inventory the MCH- 100- A and check it against the contents chart to ensure all items are present.

b. Pressure release valves are installed on the power pack and charging case to equalize pressure where an imbalance may have occurred during transportation. The valve on the power pack is a push button type, simply push the red button to equalize the pressure. The valve on the charger is located on the bottom of the case and requires a flat head screwdriver to activate.

67. INSTALLATION OF BATTERIES INTO POWER PACK. Batteries should be fully charged before they are placed into the power pack.

a. Install two batteries into the foam slots provided inside the power pack. The connector plug on both batteries must be on the top. Figure 33.

b. Push fit the battery connector onto the batteries. It fits only one way. Figures 34 and 35.

c. Close the power pack lid and secure the latches.

d. Place the power pack into its slot in the carry case.

68. OPERATING PROCEDURES.

WARNING

Do not perform hot work without specific authorization of activity Aviation Gas Free Engineer (AVGFE) or Gas Free Engineer (GFE).

The HT- 900B, HT- 920B, HT- 71002 and MCH- 100- A heat guns are the only authorized heat guns to be used when working on aircraft that have not been defueled and purged. The aircraft must be defueled and purged before using any other heat guns listed in this manual.

Aircraft with open fuel cells or broken or open fuel lines shall be certified gas free in accordance with NAVAIR 01-1A-35 or AF T.O. 1-1-3. Only the HT-900B/HT-920B, HT- 71002, MCH- 100- A heating tools are authorized for use on any aircraft whenever AVGAS, JP-4 or the presence of fuel is imposing an immediate danger.

When using heat guns with electric motors, recertification may be required as work progresses, as directed by the Aviation Gas Free Engineering Technician (AVGFET).

WARNING

The MCH- 100- A heat gun has been electro-magnetic interference (EMI) qualified for flight line or flight deck use. All other electric motor type heat guns are not authorized for flight line or flight deck use due to electro-magnetic interference (EMI). The electric motor type heating tools are safe for use by personnel at the organizational maintenance level to repair aircraft wiring in a hangar or hangar deck environment, provided the aircraft meets the gas-free environment criteria (NAVAIR 01-1A-35 or AF T.O. 1-1-3), and there are no EMI restrictions.

Use of nitrogen with the HT-900B/HT-920B heating tool in an enclosed area can be hazardous. Discharge of nitrogen into a poorly ventilated area can result in asphyxiation.

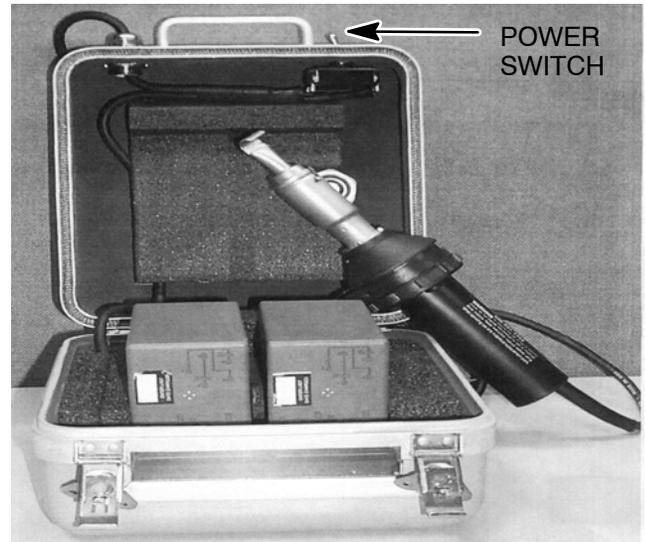
Do not perform wire repair while using explosive solvent/paint products on the aircraft.

Nozzle and output air of heating tools get very hot. Use extreme care while operating heating tool to avoid serious burns.

When using a heat tool, do not use electrical power from the aircraft being repaired. Use electrical power from a ground power unit.

69 . HOT AIR TOOL CONTROLS.

70 . The MCH- 100- A hot air tool has two simple controls which are described below and shown in Figure 30 and Figure 31. Figure 30 shows the on/off switch located on the power pack that activates the power to the heat gun. When this switch is on, the fan in the hot air tool will be running. Figure 31 shows the on/off switch located on the handle of the hot air tool. This provides power to the heating element. Also shown in the figure is the air intake filter.



Item	Function
ON-OFF switch on battery box	Turns power on and off to the hot air tool. The fan starts up in the tool when the switch is on.

Figure 30. MCH- 100 On/Off Switch Located on Power Pack

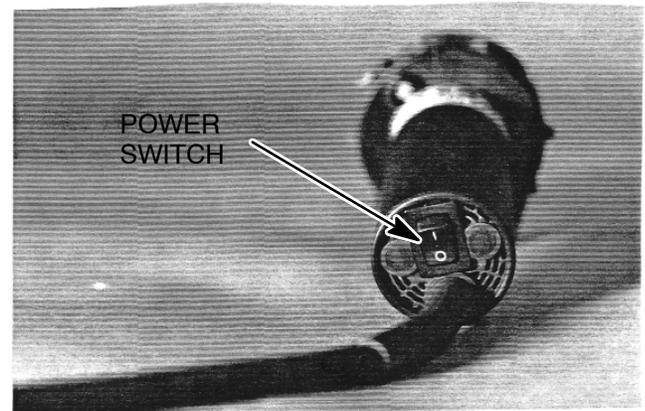
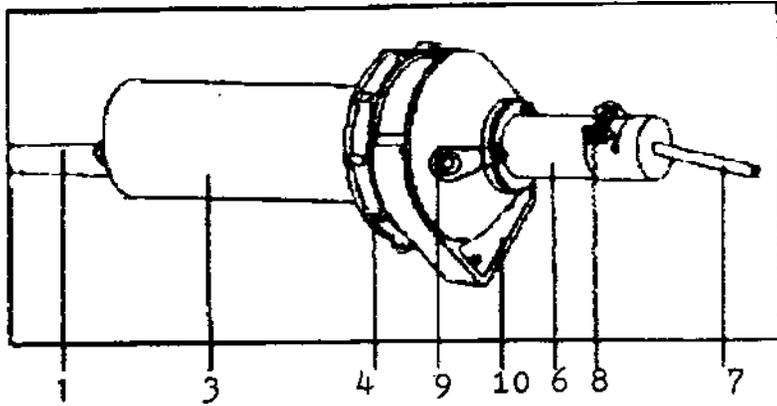
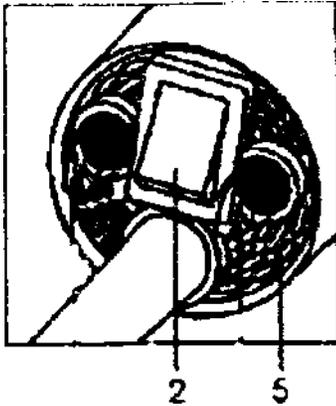


Figure 31. MCH- 100 On/Off Switch Located on Handle of Tool



- 1. Cable to main DC power
- 2. On/off switch
- 3. Handle
- 4. Rubber stand
- 5. Air filter
- 6. Element housing
- 7. Nozzle
- 8. Push-fit nozzle with twist lock
- 9. ESD-lead connection
- 10. Tool stand (can be removed, rotated and fixed)

Figure 32. MCH- 100 Controls

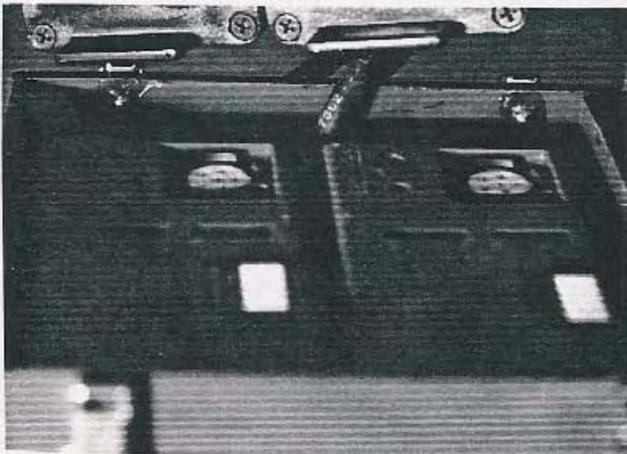


Figure 33. Battery Installation

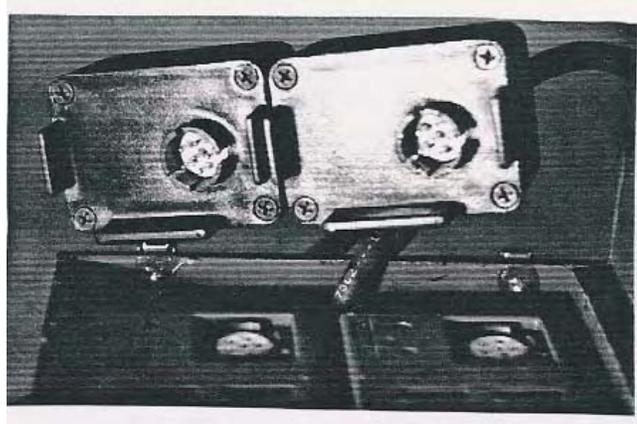


Figure 34. Battery Connection

WARNING

Use only MIL-STD-810 qualified heat guns (HT-900B/HT-920B, HT-71002, MCH-100-A) when working on aircraft that have not been defueled and purged. Only after defueling and purging of the aircraft can other motorized heat guns listed in this manual be used.

71. SETUP PROCEDURES.

- a. Select appropriate nozzle (Figure 32, Item 7) and install (push & twist) onto the hot air tool.

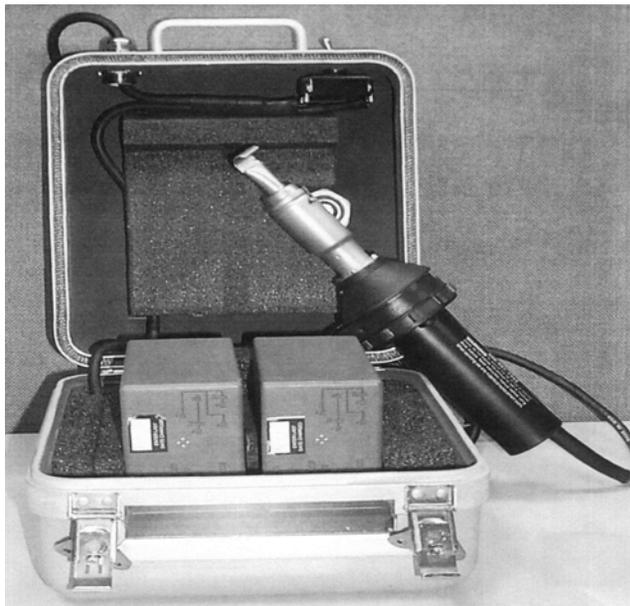


Figure 35. Battery Connection

- b. A clip is provided on the tool for Electrostatic Discharge (ESD). If you are using the tool on printed circuit boards where static discharge may cause damage to the electronics, then you will need to ground the tool via the ESD lead connection located on the hot air tool (Figure 32, Item 9).

- c. Switch on the power at the power pack (Figure 30).

- d. Switch on the power at the hot air tool (Figure 32, Item 2). It should reach full operating temperature in less than one minute.

72. CHANGING HOT AIR NOZZLES.

WARNING

HOT AIR TOOL CAN CAUSE BURNS.

Avoid contact with the hot air tool stainless steel heating element cover and attached nozzles during operation. This part of the tool becomes very hot and can cause burns. Do not point the hot air flow in the direction of personnel.

- a. It is recommended that before changing nozzles the operator allow the tool to cool down by turning off the heat (Figure 32, Item 2) and let the fan cool the nozzle down, or turn off the power to the tool and use only combination pliers and or insulated gloves to remove the hot nozzle. When you install a nozzle it is recommended that the fan to the tool be turned off. Push the new nozzle onto the tool and turn it to lock into place (Figure 36).

WARNING

Do not touch hot nozzle with bare hands. Place the hot nozzle onto a heat resistant surface or drop it into the insulated pocket in the MCH-100-A carrying case.

- b. Only nozzles specifically designed for this tool should be used.

73. CHARGING BATTERIES.

- a. Remove batteries from battery pack.

- b. Place batteries onto the supplied charger adapter plate as outlined in Operating Manual AG-BOHGA-OPM-000.

- c. Charge batteries using only the supplied battery charger (PP-8444A/U) IAW AG-BOHGA-OPM-000.

74. OPERATION IN UNUSUAL WEATHER CONDITIONS. Observe these precautions when the hot air tool MCH-100-A heat gun is operated in area where severe climatic conditions may exist:

- a. Operation in Arctic Climates. The hot air tool performance will be diminished at lower temperatures. The following precautions should be observed:

- (1) Handle equipment carefully.
- (2) Keep equipment clean and dry.
- (3) Prevent ice from forming on the equipment.

Ice formations may prevent proper electrical connections.

- (4) Battery and hot air tool performance decreases as temperature drops.

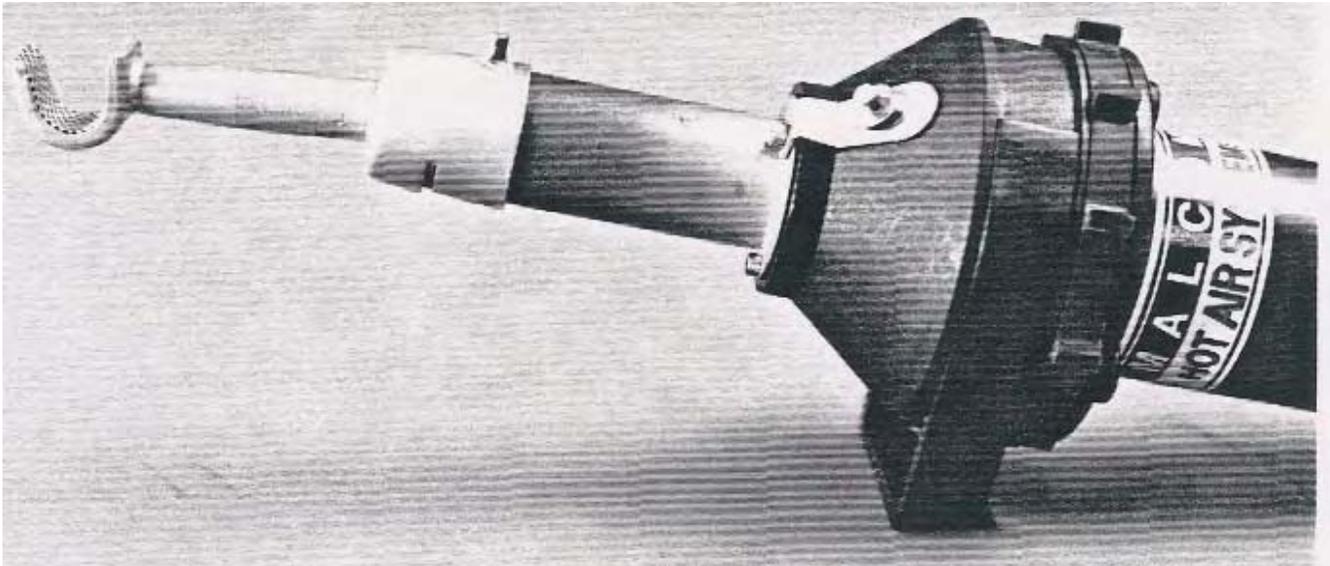


Figure 36. Nozzle Installation

b. Operation in Desert Climates. Temperature extremes of 122°F (50°C) and dryness associated with desert environment will not affect equipment usage. However, the built in thermal safety switch inside the batteries will automatically shut the power off if the interior battery temperatures reach 158°F (70°C). In order to prevent thermal shutdown, turn off the hot air tool once your work is complete. Try to avoid running the tool longer than 10 minutes at one time in the hot desert conditions. Dust storms associated with desert climates may cause poor electrical connections and prevent proper operation. When operating in these conditions, the filter on the back of the hot air tool should be kept clean by periodically brushing it off as it gets blocked.

c. Operation in Salt Spray. Keep equipment clean and dry at all times and immediately wipe salt spray from exposed surfaces, cables and connectors. When not in use, be sure that cover is fully latched, and the hot air tool is stored in the storage bag with the bag flaps in place.

75. PREPARATION FOR MOVEMENT AFTER USE.

- a. Set POWER switch to OFF on the hot air tool to let the tool cool down.
- b. Set POWER switch to OFF on the battery box to stop the fan in the tool.

c. Remove any installed nozzles and place them into the appropriate storage pockets in the carrying bag (Figure 37).

d. Coil DC power cable.

e. Insert hot air tool into appropriate pocket in carrying bag (Figure 37).

f. Insert coiled power cable into appropriate pocket in carrying bag.

g. Close cover to carrying bag and secure.



Figure 37. Hot Air Tool Installed in Carrying Bag