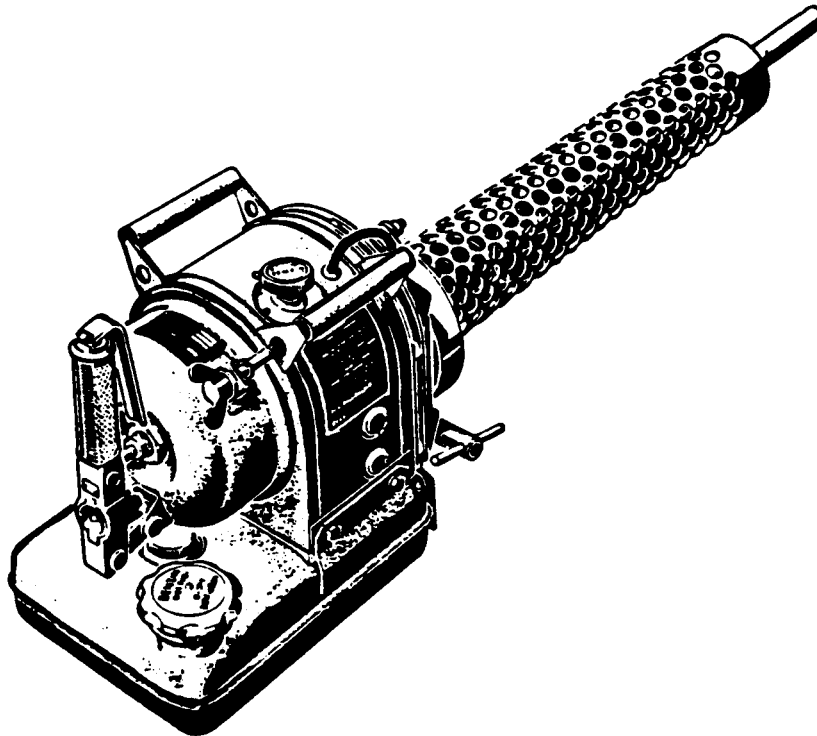


UNITED STATES ARMY ALASKA



Maintenance of Supplies and Equipment

Swingfire Heater Operation, Organizational Repair Parts, and Care and Maintenance Procedures (National Stock Number 2990-01-202-4128)

United States/Army Alaska Pamphlet 750-5

15 September 1996

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY ALASKA
Fort Richardson, Alaska 99505-5000

United States Army Alaska Pamphlet 750-5

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Maintenance of Supplies and Equipment

Swingfire Heater Operation, Organizational Repair Parts and Care Procedures

Summary. This pamphlet concerning the Swingfire heater has been revised. This pamphlet covers Swingfire usage for the United States Army Alaska (USARAK). This pamphlet has been revised to reflect the change to USARAK.

Applicability. This pamphlet applies to the active Army and the United States Army Reserve.

Impact on New Manning System. This pamphlet does not contain information that effects the New Manning System.

Supplementation. Supplementation of this pamphlet is prohibited without prior approval from the Directorate of Logistics, Maintenance Division, APVR-RDL-M.

Interim changes. Interim changes to this pamphlet are not official unless they are authenticated by the director of information management. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Suggested improvements. Users are invited to send comments and suggested improvements on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) directly to APVR-RDL-M.

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*This pamphlet supersedes 6th Infantry Division (Light) Pamphlet 750-5, dated 14 December 1990.

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Chapter 1 Introduction

1-1. General

a. Scope. This pamphlet covers Swingfire heater operation, organizational maintenance, and lists repair parts for use within USARAK.

b. Forms and records. Use equipment forms and records Defense Department (DD) Form 314 (Equipment Maintenance Log (Consolidated)), DA Form 2408-14 (Uncorrected Fault Record), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) and DA Form 2408-9 (Equipment Control Record) to record actions associated with the Swingfire heater (transfer, gain and loss, etc.).

1-2. References

a. Related publications. (Related publications are merely sources of further information. The user does not have to read them to understand this pamphlet.)

(1) DA Pamphlet 738-750 (Functional Users Manual for the Army Maintenance Management System (TAMMS)).

(2) TM 9-2320-266-34P (Direct and General Support Maintenance Repair Parts and Special Tools List for Truck, Cargo: 1 1/4-ton, 4X4, M880 (NSN 2320-00-579-8942) M881 w/28 V, 60 Ampere Generating System Kit (2320-00-579-8943); M882 w/28 V, 60 Ampere Generating System and Communications Kits (2320-00-579-8957); M883 w/28 V, 60 Ampere Generating System and Communications Kits (2320-00-579-8957); M883 w/28 V, 60 Ampere Generating System and S250 Shelter Kits (2320-00-579-8959); M884 w/28 V, 100 Ampere Generating System and S250 Shelter Kits (2320-00-579-8985); M885 w/S250 Shelter Kit (2320-00-579-8989); Truck, Cargo: 1 1/4-Ton, 4X2, M890 (2320-00-579-8991); M891 w/28 V, 60 Ampere Generating System Kit (2320-00-579-9046); M892 w/28 V, 60 Ampere Generating System and Communications Kits (2320-00-579-9052); Truck, Ambulance: 1 1/4-Ton, Truck, Chassis: 1 1/4-Ton, 4X4, M887 (2320-00-579-9080); 1 1/4-Ton, 4X2, M893 (2310-00-125-5679) and Truck, Telephone Maintenance: 1 1/4-Ton, 4X4, M888 (2320-01-044-0333).

b. Referenced forms

(1) DA Form 348 (Equipment Operator's Qualification Record). Cited in paragraph 2-2.

(2) DA Form 2028 (Recommended Changes to Publications and Blank Forms). Cited in the suggested improvements statement.

(3) DA Form 2404 (Equipment Inspection and Maintenance Worksheet). Cited in paragraph 1-1b.

(4) DA Form 2408-9 (Equipment Control Record). Cited in paragraph 1-1b.

(5) DA Form 2408-14 (Uncorrected Fault Record). Cited in paragraph 1-1b.

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(6) Defense Department (DD) Form 314 (Equipment Maintenance Log (Consolidated)). Cited in paragraph 1-1b.

(7) Optional Form (OF) 346 (U.S. Government Motor Vehicle Operator's Identification Card). Cited in paragraph 2-2.

1-3. Explanation of terms

- a. DA..... Department of the Army
- b. DC..... direct current
- c. DD..... Defense Department
- d. fig..... figure
- e. FSCM..... Federal Supply Codes for Manufacturers
- f. NSN national stock number
- g. OF..... Optional Form
- h. SMR..... source, maintenance, and recoverability
- i. TAMMS..... The Army Maintenance Management System
- j. TM..... Technical Manual
- k. U.S..... United States
- l. USARAK..... United States Army Alaska

1-4. Material source

Material for this pamphlet was compiled from data that was published in TM 9-2320-266-34P and TMs that are no longer available through the Army Publication System.

Chapter 2 Operating Instructions

2-1. Foreword

The Swingfire heater is the primary means of preheating equipment during extreme cold weather. Swingfire heater systems, installed on equipment, permit vehicle operation in extreme cold weather conditions. The Swingfire preheating system consists of two major components: 1) the heat exchange and hardware that is installed on the vehicle, and 2) the Swingfire heater. Swingfire heater usage aids vehicle starting even if it is cold-soaked down to -50 degrees Fahrenheit. The Swingfire heater, manufactured by J. Eberspacher of West Germany, is used to preheat vehicle engine coolant in extreme cold conditions. The heater runs on gasoline; leaded, unleaded, or aviation type fuel the heater. A 12- or 24-volt direct current (DC) outlet is installed on equipment to permit initial starting, after which the heater works by self-ignition in the combustion chamber. In addition to engine preheating, the Swingfire heater can be used to warm vehicle components, such as the differential transfer, road wheels, and tires. It is also used to keep water from freezing in water trailers.

2-2. Safety training

The Swingfire heater is fuel burning equipment that requires special handling. Swingfire heater operators must be properly trained on heater operation and the system mounted on the equipment. The exhaust fumes from the Swingfire heater are POISONOUS. They must not be allowed to enter a closed room inhabited by personnel. Enter training data on DA Form 348 (Equipment Operator's Qualification Record) and Optional Form (OF) 346 (U.S. Government Motor Vehicle Operator's Identification Card).

2-3. Operations

See appendix A for operational instructions.

2-4. Preventive maintenance checks and services

Preventive maintenance checks and services are covered in appendix B.

2-5. Malfunctions

Common malfunctions that you may find during Swingfire heater operation or maintenance are found in appendix C.

2-6. Repair parts and repair part support

Repair part illustrations and lists are in appendix D. Process all repair parts heater as local purchases.

2-7. Maintenance allocation chart

The source, maintenance, and recoverability (SMR) codes listed in table D-1 will be used to determine what level of maintenance will accomplish repairs. The SMR code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in figure 2-1.

XX Source Code <i>(Positions 1 and 2)</i>	XX Maintenance Code <i>(Postions 3 and 4)</i>		X Recoverability Code <i>(Postions 5)</i>
<u>1st and 2nd Positions</u> <i>How you get an item</i>	<u>3d Position</u> <i>Who can install, replace or use the item</i>	<u>4th Position</u> <i>Who can complete repair on the item</i>	<u>5th Position</u> <i>Who determines disposition actions on an unserviceable item</i>

Complete repair: maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment to restore serviceability to a failed item.

Figure 2-1. Source, maintenance, and recovery code explanation

2-8. Publications

The Swingfire heater is a commercial equipment item. The only maintenance manuals available are the manufacturer's manual and an extract from a manual that is no longer available through the publication system.

2-9. Basic issue items

Basic issue items are described and illustrated in appendix E.

2-10. Storage

To protect the pulsating pipe and shield, store the Swingfire heater with the mixing pipe (part number 269042) installed.

2-11. Technical data

Heater output	40,000 British thermal units
Fuel	Gasoline
Fuel consumption per hour	1.04 quarts
Tank capacity	1 gallon
Voltage	12-volt or 24-volt DC
Power consumption (for starting only)	150 watts
Cold starting	Down to -65 degrees Fahrenheit; -60 degrees Celsius
Weight (with fuel)	35 pounds

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Appendix A Operation

A-1. Heater operating preparations

- a. Fill the Swingfire heater tank with clean gasoline. Leaded, unleaded or aviation type gasoline will fuel the heater.
- b. Tighten the fuel tank cap (number 1 at fig A-1).
- c. Check the air shut-off valve (number 2 at fig A-1) by pushing the pin in (number 3 at fig A-1). The pressure pin must bounce back.

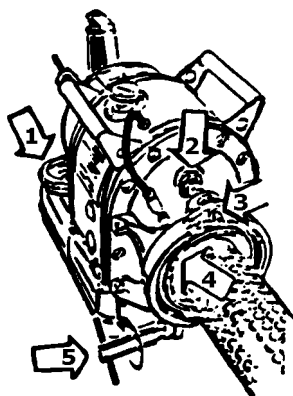


Figure A-1. Preparation for operation

A-2. Starting the Swingfire heater at temperatures above 1 degree Fahrenheit

Note: Since exhaust gases, including carbon monoxide, are TOXIC, the Swingfire heater MUST NOT to be operated in an enclosed area.

- a. Install the starting cable by plugging the connector end into the receptacle located on the vehicle/equipment. Plug the cable's other end into the heater handle. Check the current flow by squeezing the handle lever (number 1 at fig A-2) to activate the push button switch. You should hear a distinct humming sound.
- b. Close the fuel regulator by turning the knob counter-clockwise (number 2 at fig A-2).
- c. Move the pump handle (number 3 at fig A-2) forward and backward in a firm and regular manner. After moving it back and forth three or four times, open the fuel regulator

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knob 1/2 to 1 turn with one hand while continuing to operate the pump lever handle with the other hand.

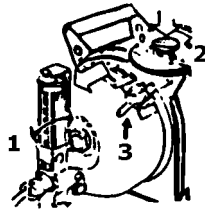


Figure A-2. Starting heater

d. When the first pulsating sounds are heard, continue pumping and adjusting the fuel regulator knob until the pulsating sounds come in regular intervals. At this point, stop pumping.

e. Because a warm heater requires less fuel than a cold one, keep the heater running for 3 to 5 minutes while continuing to fine adjust the fuel regulator knob. This knob controls the fuel and air mixture.

f. If you move the pump lever too fast or open the regulator knob too wide, you will flood the heater, causing a white fog to come from the pulsation pipe and the pulsation to stop. To correct this condition close the fuel regulator knob and pump the handle until the surplus fuel has been blown out the exhaust pipe and pulsations start again. Once the pulsations start, open the fuel regulator knob 1/2 to 1 turn and adjust as in paragraph d above.

g. If the heater has been flooded to the point where fuel overflows from the diaphragm valve into the mixing chamber, correct as follows:

- (a) Disconnect the cable from the equipment.
- (b) Open the chamber cover (number 3 at fig A-2) by unscrewing the wing nut.
- (c) Tilt the heater to the left to let the fuel run out.
- (d) Clean up the runoff fuel and let the chamber dry out.

A-3. Starting the Swingfire heater below 0 degrees Fahrenheit (-18 degrees Celsius)

a. The heater is started as stated in paragraph A-2 except that before pumping as in paragraph A-2c, depress the push button switch on the handle to activate the preheating plug and hold for the length of time applicable to temperature range as follows:

(1) For 0 degrees Fahrenheit (-18 degrees Celsius) to -20 degrees Fahrenheit (-28 degrees Celsius), depress the push button switch for 2 minutes before pumping.

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(a) For -20 degrees Fahrenheit (-28 degrees Celsius) to -30 degrees Fahrenheit (-36 degrees Celsius), 3 minutes.

(b) For -30 degrees Fahrenheit (-36 degrees Celsius) to -40 degrees Fahrenheit (-40 Celsius), 4 minutes.

(c) For -40 degrees Fahrenheit (-40 degrees Celsius) to -50 degrees Fahrenheit (-46 degrees Celsius), at least 5 minutes.

(2) When starting to pump, as in paragraph A-2b, open the regulator knob 1 to 1 1/2 turns for these low temperatures.

Note: If the heater stops after a long operating period it is probably flooded. Sometimes 10 to 15 pump movements with the regulator valve closed will bring back regular pulsations. The heater cable is not required since the heat from the chamber will ignite the fuel.

A-4. Storing the Swingfire heater after use

a. With the vehicle engine running, turn off the heater by closing the fuel regulator knob completely. Remove the heater from the water jacket.

b. Let the heater cool. Be certain to tighten the heater clamp to the rack retaining tube to prevent damage to the heater when the vehicle is moving. If the heater is not to be used for at least 48 hours, let it cool off and remove the remaining gasoline from the heater's fuel tank.

c. Swingfire heaters placed in storage for the summer months should be stored with the mixing pipe (national stock number (NSN) 2540-12-135-1958) installed to protect the shield that covers the pulsating pipe. Additionally, heaters placed in storage should be in a serviceable condition.

Appendix B
Preventive Maintenance Checks and Services

A cutaway illustration and a parts index are shown at figure B-1. Table B-1 provides preventive maintenance and service information. The checks and services in table B-1 are to be made in the order listed, within the designated intervals.

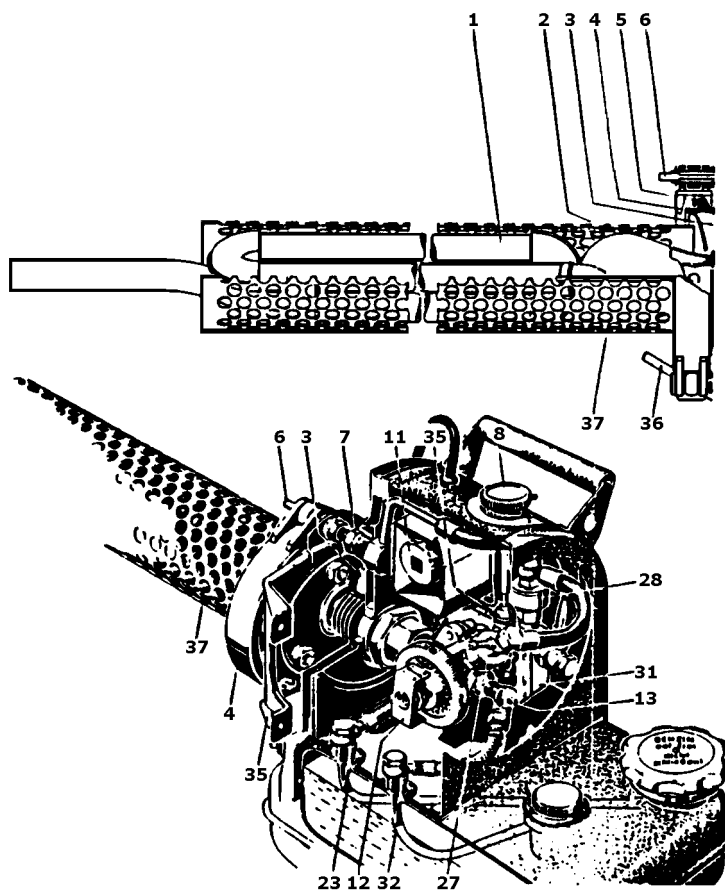


Figure B-1. Swingfire Heater (cutaway view)

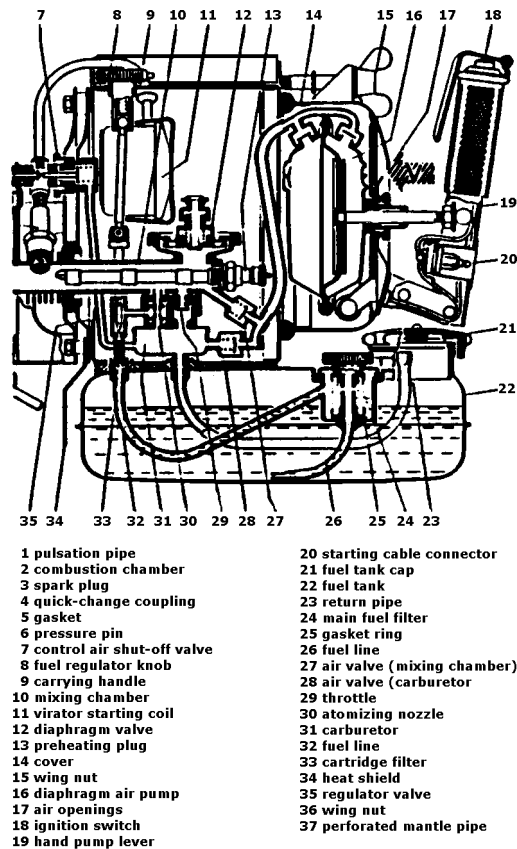
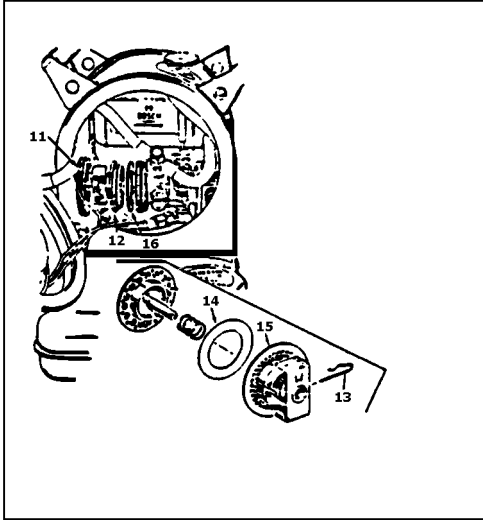
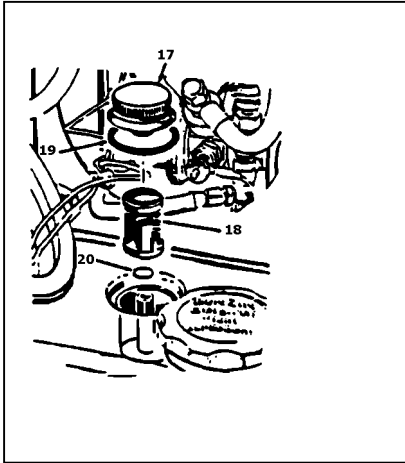


Figure B-1. Swingfire Heaters (cutaway view)—Continued

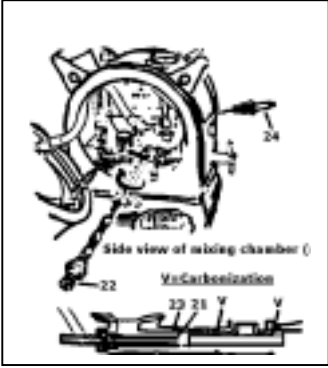
Table B-1 Organizational/operator preventive maintenance checks and services						
Item Number	Interval				Item to be inspected procedure (check for and have repaired, filled, or adjusted as needed)	Equipment is not ready/available if—
	B	D	A	S		
1				•	<u>Pump Pushrod:</u> Lubricate with grease suitable for extreme cold use.	Push will not operate
2				•	<u>Spark Plug:</u> Use special tool wrench to remove spark plug. Clean with a fine steel brush. Use feeler gauge to check gap and adjust to 1 to 2.2 millimeter, if necessary. Reconnect spark plug to cable; ground spark plug thread at heater housing and apply current. Sparks must develop at gap.	Spark plug defective
3	•		•	•	<u>Control Air Shut-Off Valve</u> Remove dirt and other material with clean rag.	Air valve defective
4				•	<u>Fuel Tank</u> Clean with cleaning solvent.	Fuel leak
5				•	<u>Air Valves and Hose Connections</u> Check for loose connections and tighten as necessary.	Air leaks
Legend: B—before operation; D—during operation; A—after operation; S—semiannually						

Table B-1
Organizational/operator preventive maintenance checks and services—Continued

Item Number	Interval				Item to be inspected procedure (check for and have repaired, filled, or adjusted as needed)	Equipment is not ready/available if—
	B	D	A	S		
6					 <ul style="list-style-type: none"> • <u>Diaphragm Valve</u> Unscrew wheel (11) and remove diaphragm (12) and gasket (16). Pull out pin (13) and disassemble valve. Clean all parts in oil-free gasoline. Replace diaphragm membrane (14) if worn or damaged. Position valve as shown and tighten wheel (11) on valve shaft. Adjusting bracket (15) should be set to “+” position. 	Diaphragm tracked, missing parts
7					<ul style="list-style-type: none"> • <u>Preheating Plug</u> Remove electrical lead from preheating plug and remove plug, using special tool wrench. Clean plug carefully with fine steel brush. Reconnect lead to preheating plug, ground plug thread at heater housing, and apply current. Preheating plug becomes warm in a few minutes if operating normally. 	Preheating plug defective
Legend: B—before operation; D—during operation; A—after operation; S—semiannually						
Table B-1						

Organizational/operator preventive maintenance checks and services—Continued						
Item Number	Interval				Item to be inspected procedure (check for and have repaired, filled, or adjusted as needed)	Equipment is not ready/available if—
	B	D	A	S		
8	•		•	•	 <p><u>Fuel Filter</u> Remove filter cover (17). Warning: DO NOT release compressed air in direction of other personnel as injury could result. Take filter (18) out and blow out with compressed air. Check gaskets (19 and 20), replacing if worn or damaged. When reassembling, check for tight fit.</p>	Fuel leaks, cracked or missing gasket
9	•		•	•	<p><u>Quick Change Coupling</u> Check wing nut and thread. Replace gasket if worn or damaged.</p>	Gasket missing, coupling will not seal
Legend: B—before operation; D—during operation; A—after operation; S—semiannually						
Table B-1 Organizational/operator preventive maintenance checks and services—Continued						

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Item Number	Interval				Item to be inspected procedure (check for and have repaired, filled, or adjusted as needed)	Equipment is not ready/available if—
	B	D	A	S		
10					 <p>Side view of mixing chamber () NoCarbonization</p> <ul style="list-style-type: none"> • <u>Mixing Chamber</u> Screw special tool cleaning rod (21) into position where preheating plug (22) is normally located. Keep turning rod while pushing it forward and backward to scrape off carbon deposits in mixing chamber (23). You can observe partial results through spark plug (24) hole. Remove cleaning rod, install spark and preheating plugs and connect to respective leads. Start heater to blow out loose carbon from mixing chamber. 	Defective mixing chamber
Legend: B—before operation; D—during operation; A—after operation; S—semiannually						

**Appendix C
Maintenance Instructions—Troubleshooting**

Swingfire Heater Troubleshooting

Table C-1 lists the common malfunctions that you may find during the Swingfire heater operation or maintenance. Most corrective actions directed under the "Remedy" column are detailed in table B-1.

Table C-1 Swingfire Heater troubleshooting		
Trouble	Reason	Remedy
Swingfire does not start	<ul style="list-style-type: none"> a. Valve dirty. b. Membrane sticks. c. Membrane damaged. 	Clean membrane valve, exchange damaged membrane. Keep interior of housing clean. When heater is operating keep cover closed. Do not remove rubber plug at the side of housing. Dirt could enter here.
Mixing chamber	Mixing chamber clogged.	Clean mixing chamber, preheating plug and spark plug.
Possible leaks	<ul style="list-style-type: none"> a. Tank cover or cover over main filter leaks. b. Main filter cover leaks. c. Air valves leak. d. Control air shut-off leaks or is stuck. e. Air lines leak. f. Fuel lines leak. g. Carburetor leaks at mixing chamber. h. Diaphragm air pump fails. 	<ul style="list-style-type: none"> a. Tighten tank or main filter cover or replace gaskets if necessary. b. Tighten main filter cover. Replace gasket, if necessary. c. Clean air valves, check gaskets, and replace damaged gaskets. d. Dismantle and clean valve, replace gasket, if necessary. When pushing the pressure pin in, it must bounce back. e. Check connections, replacing gaskets where necessary. f. Tighten connections and replace gaskets where necessary. g. Tighten carburetor screws. h. Remove pump and repair.
Lack of fuel supply	<ul style="list-style-type: none"> a. No fuel in tank. b. Fuel line in fuel tank plugged up. c. Main fuel filter dirty. 	<ul style="list-style-type: none"> a. Fill tank up short of overflowing. If connected to a fuel supply system, fill in only 1 quart. b. Blow compressed air through line. Clean and flush out fuel tank. c. Remove and clean filter.
Table C-1 Swingfire Heater troubleshooting—Continued		
Trouble	Reason	Remedy
Lack of current (no	a. No current available from vehicle battery.	a. Check the 24-volt battery system.

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humming sound when igniting)	<p><i>b.</i> Circuit breaker not working.</p> <p><i>c.</i> Plug is not properly grounded.</p> <p><i>d.</i> Defective cable.</p> <p><i>e.</i> Defective plug.</p> <p><i>f.</i> On/off switch defective.</p> <p><i>g.</i> Electric connections loose.</p> <p><i>h.</i> Broken cable.</p> <p><i>i.</i> Broken condenser.</p> <p><i>j.</i> Points are oxidized/burnt.</p> <p><i>k.</i> Vibrator starting coil damaged.</p>	<p><i>b.</i> Replace circuit breaker.</p> <p><i>c.</i> Ground plug.</p> <p><i>d.</i> Repair or replace cable.</p> <p><i>e.</i> Replace plug.</p> <p><i>f.</i> Replace switch.</p> <p><i>g.</i> Tighten connections.</p> <p><i>h.</i> Replace cable.</p> <p><i>i.</i> Replace condenser.</p> <p><i>j.</i> Clean points.</p> <p><i>k.</i> Replace coil.</p>
Lack of ignition	<p><i>a.</i> Spark plug clogged or damaged.</p> <p><i>b.</i> Ignition cable plug damaged.</p> <p><i>c.</i> Ignition cable damaged.</p>	<p><i>a.</i> Clean or replace spark plug.</p> <p><i>b.</i> Replace plug.</p> <p><i>c.</i> Replace cable.</p>
Swingfire is hard to start	<p><i>a.</i> Starting mistakes.</p> <p><i>b.</i> Diaphragm valve dirty or clogged; diaphragm sticks.</p> <p><i>c.</i> Swingfire leaks.</p> <p><i>d.</i> Spark plug electrodes distance incorrect.</p> <p><i>e.</i> Preheating plug clogged or defective (important at temperatures below 30 degrees Fahrenheit).</p>	<p><i>a.</i> Practice starting frequently. Open diaphragm valve clockwise to fully open position.</p> <p><i>b.</i> Clean diaphragm valve.</p> <p><i>c.</i> Eliminate leaks.</p> <p><i>d.</i> Adjust distance of electrodes to 1 to 1.2 millimeters.</p> <p><i>e.</i> Clean preheating plug or replace.</p>
Swingfire stops after short start	Swingfire leaks.	Eliminate leaks.
Swingfire sputters	<p><i>a.</i> Swingfire not fine adjusted.</p> <p><i>b.</i> Fuel line clogged.</p> <p><i>c.</i> Regulator valve clogged or defective.</p> <p><i>d.</i> Atomizing nozzle clogged or defective.</p> <p><i>e.</i> Diaphragm valve or diaphragm damaged.</p> <p><i>f.</i> Fuel not suitable.</p>	<p><i>a.</i> Fine adjust Swingfire.</p> <p><i>b.</i> Blow out fuel line with compressed air, clean fuel tank.</p> <p><i>c.</i> Remove and dismantle regulator valve, clean and check, replace.</p> <p><i>d.</i> Remove, dismantle, clean and check carburetor, replace gaskets and reinstall.</p> <p><i>e.</i> Remove, clean or replace diaphragm.</p> <p><i>f.</i> Clean fuel tank and fill up with proper fuel. Use unleaded, leaded or aviation gasoline without oil.</p>

Table C-1
Swingfire Heater troubleshooting—Continued

Trouble	Reason	Remedy
Swingfire continues to run in spite of	Fuel regulator valve is damaged.	Remove and disassemble fuel regulator valve, clean and check, replace damaged parts and reinstall.

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closed fuel regulator knob		
Swingfire stops after a short while	<ul style="list-style-type: none"> a. Fuel regulator knob too wide open—Swingfire drowned. b. Fuel regulator knob not wide enough open. c. Fuel regulator knob loose (regulator valve not firmly controlled). d. Adjusting nut at diaphragm valve loose (regulator valve not firmly controlled). e. Fuel not suitable. 	<ul style="list-style-type: none"> a. Start Swingfire and fine adjust. b. Start Swingfire and fine adjust. c. Tighten securing nut at regulator valve. d. Repair or exchange diaphragm valve. e. Clean fuel tank and fill up with proper fuel. Use unleaded, leaded or aviation gasoline without oil.
Swingfire has poor performance	<ul style="list-style-type: none"> a. Diaphragm valve bracket is set on (-) not fully opened. b. Mixing chamber carbonized. 	<ul style="list-style-type: none"> a. Turn back to (+) fully open position. b. Clean mixing chamber.

Appendix D
Repair Parts

Figures D-1 through D-15 show the Swingfire heater assemblies and various repairs parts. Refer to table D-1 for the SMR codes, NSNs, part numbers, Federal Supply Codes for Manufacturers (FSCMs), repair part descriptions (names) and the quantity included in the unit.

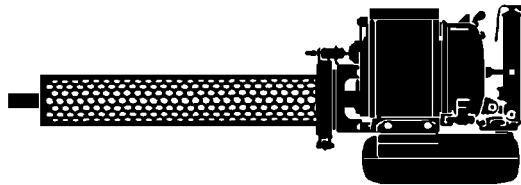


Figure D-1. Swingfire heater assembly

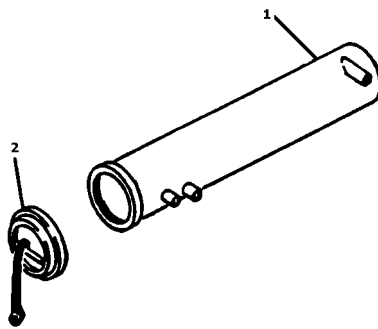


Figure D-2. Water jacket assembly

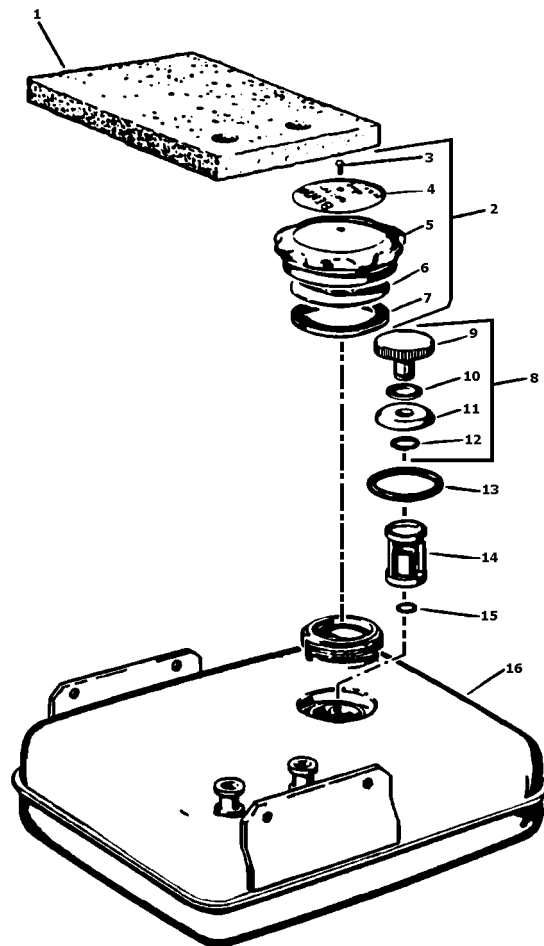


Figure D-3. Fuel tank assembly

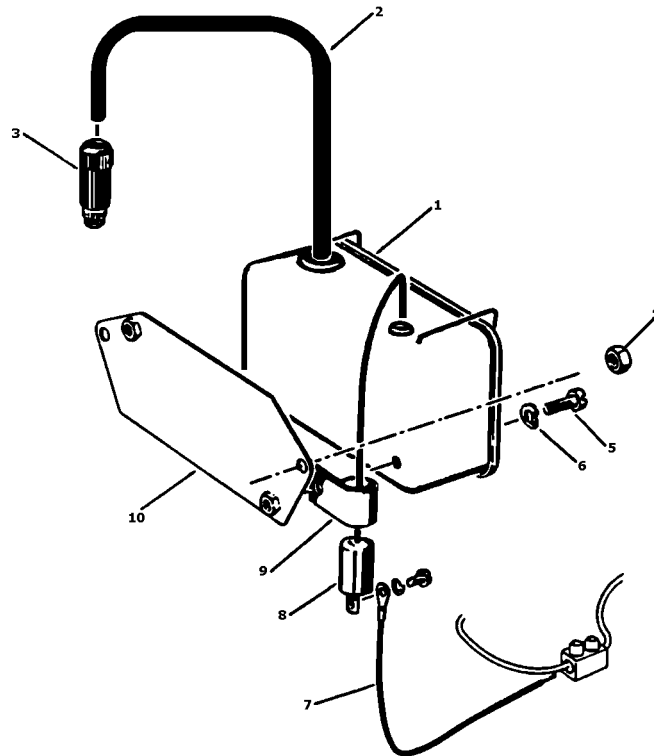


Figure D-4. Starting vibrator coil assembly

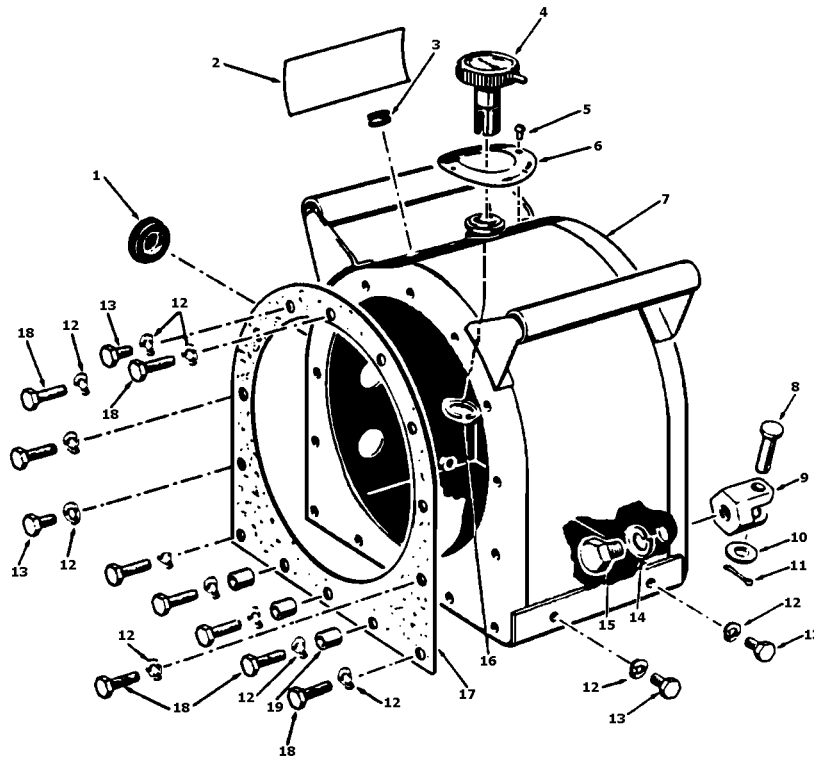


Figure D-5. Heater housing assembly

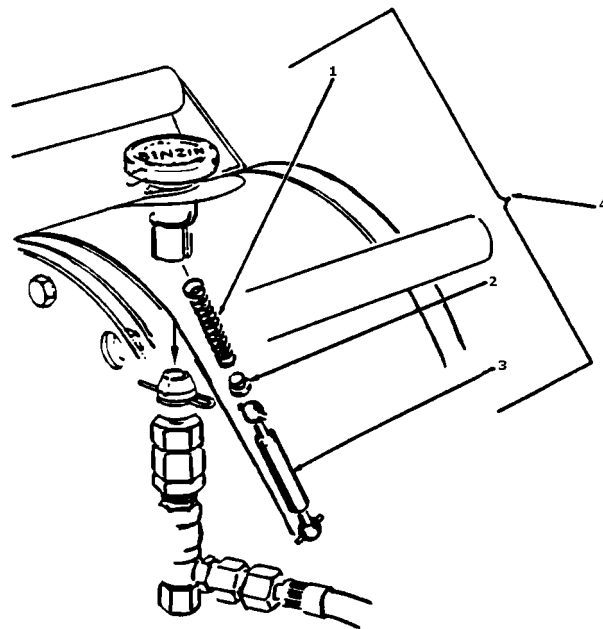


Figure D-6. Joint shaft assembly

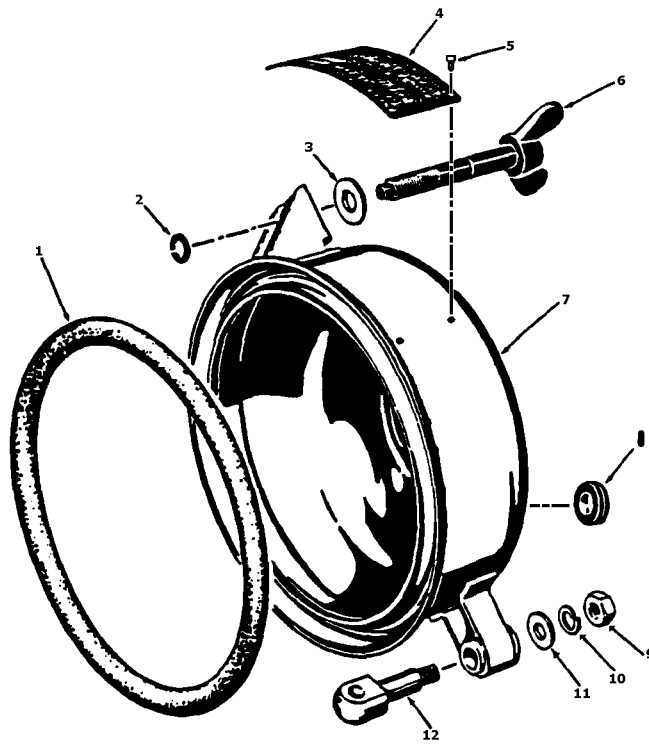


Figure D-7. Heater cover assembly

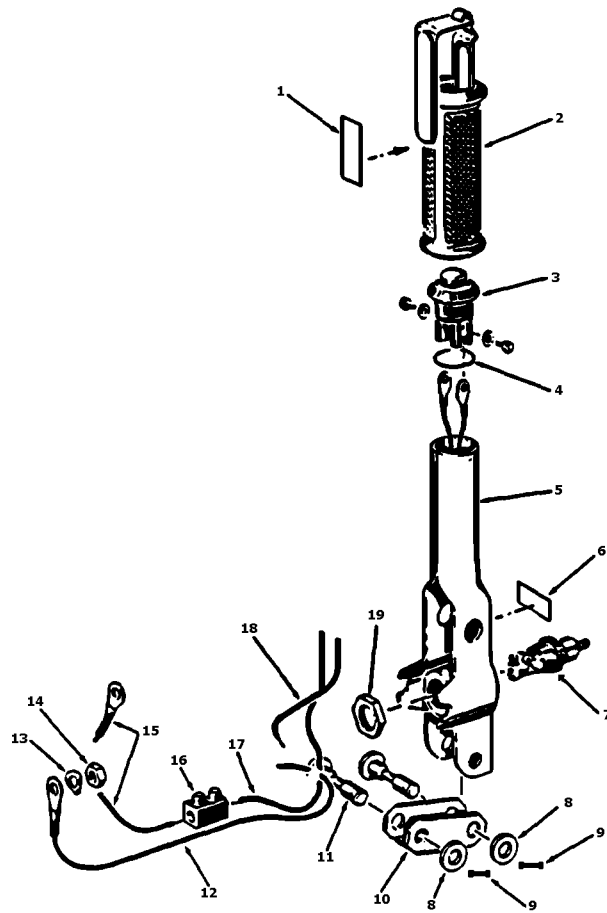


Figure D-8. Pump handle assemblies

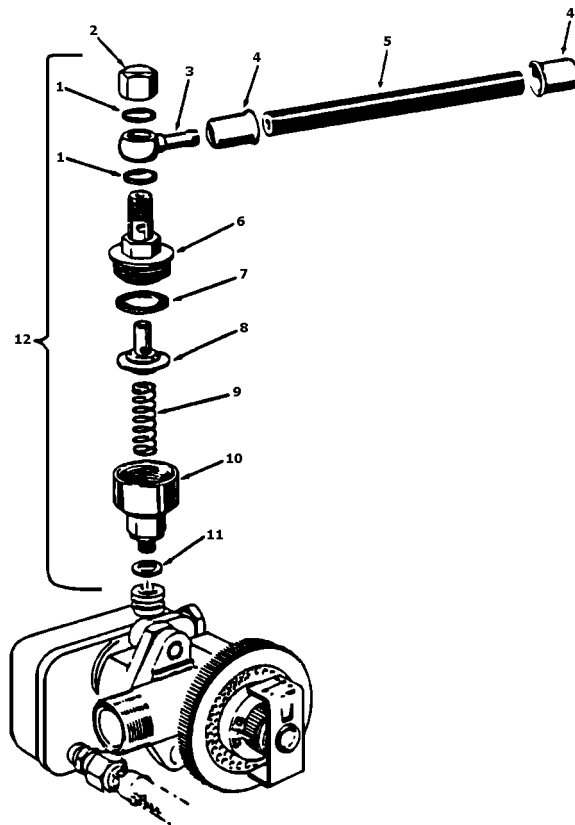


Figure D-9. Heater air carburetor valve

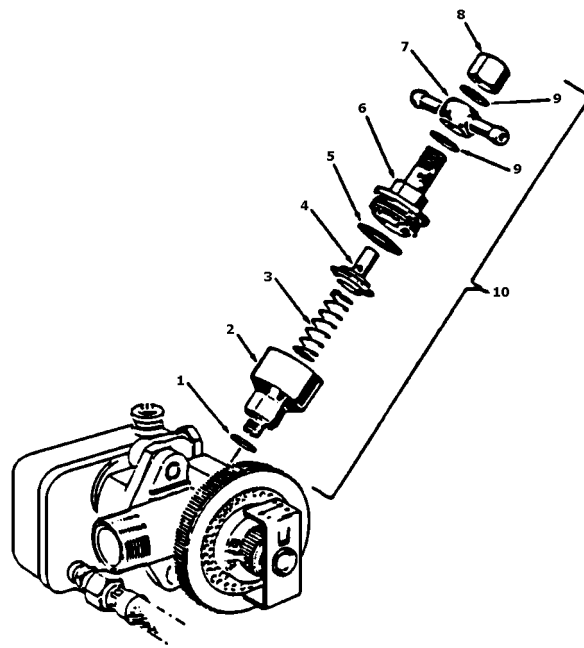


Figure D-10. Air mixing chamber valve assemblies

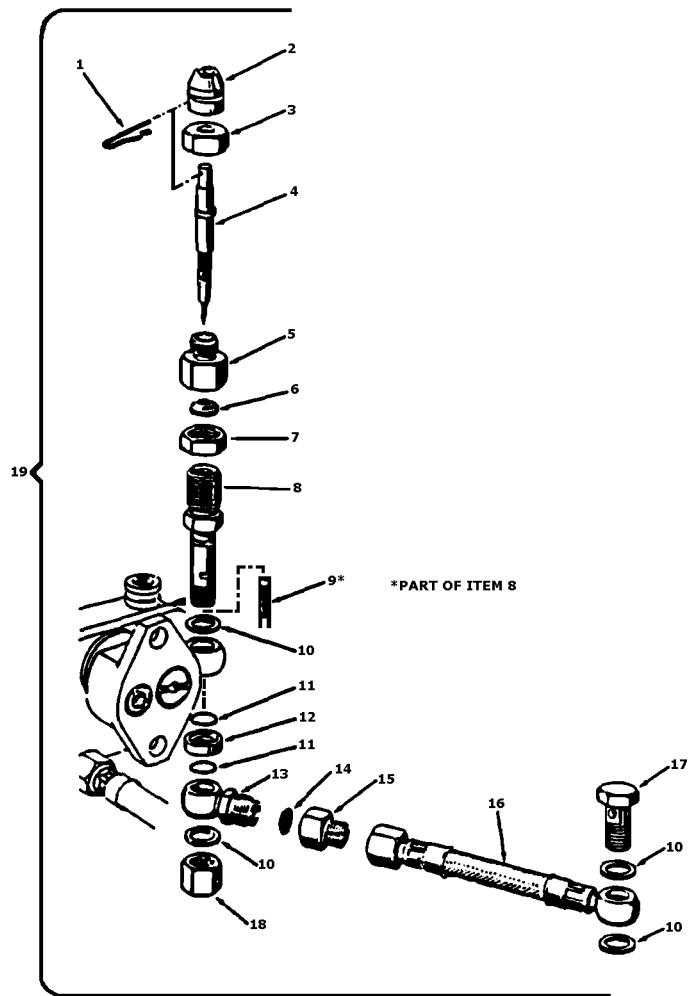


Figure D-11. Heater regulator valve assemblies

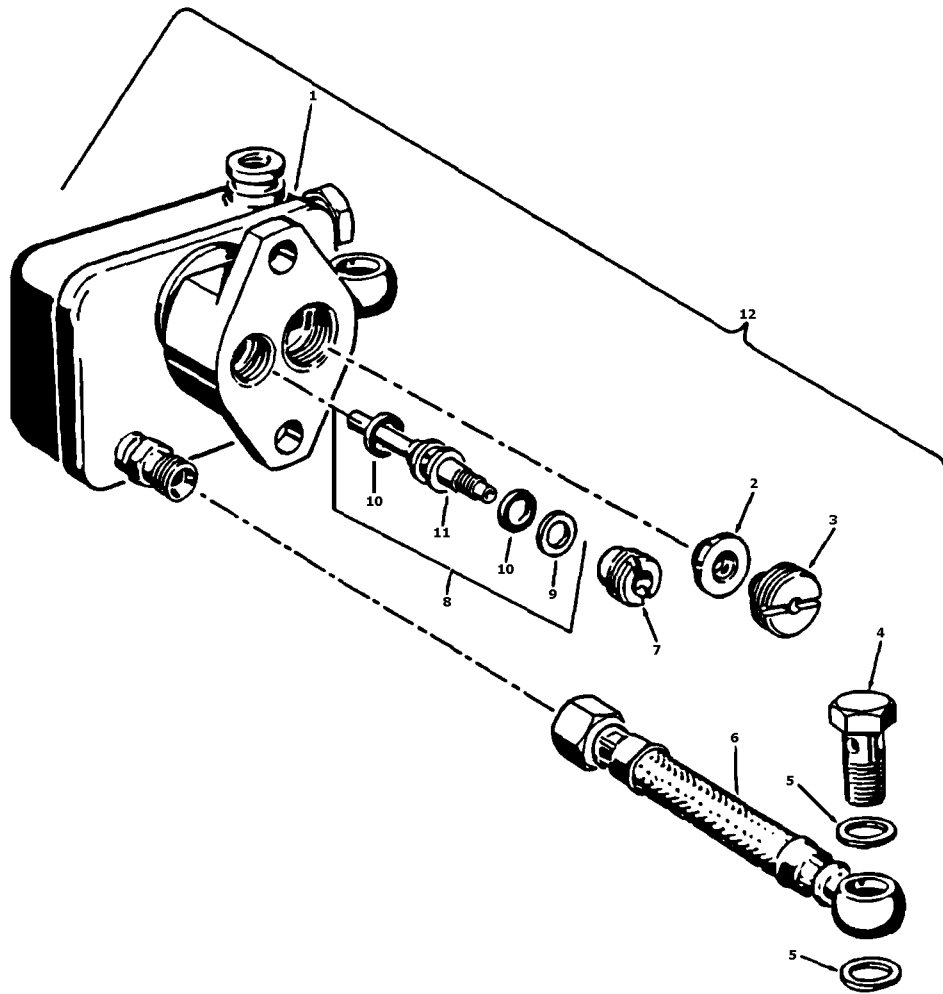


Figure D-12. Carburetor assembly

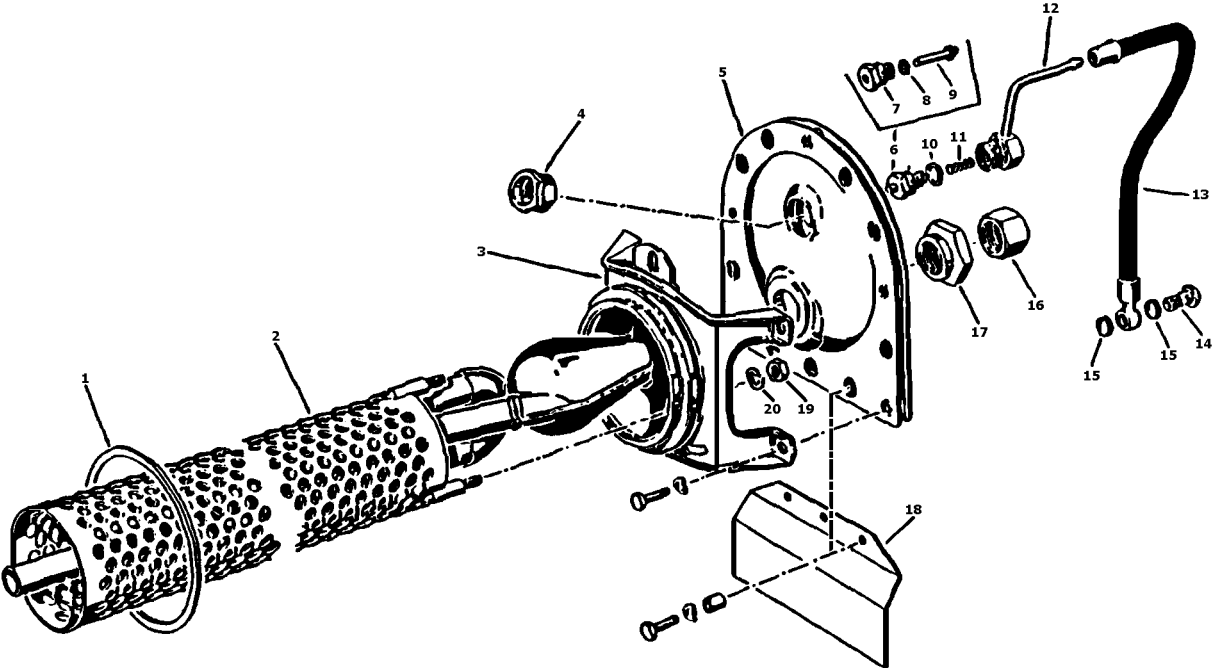


Figure D-13. Pulsating pipe assemblies

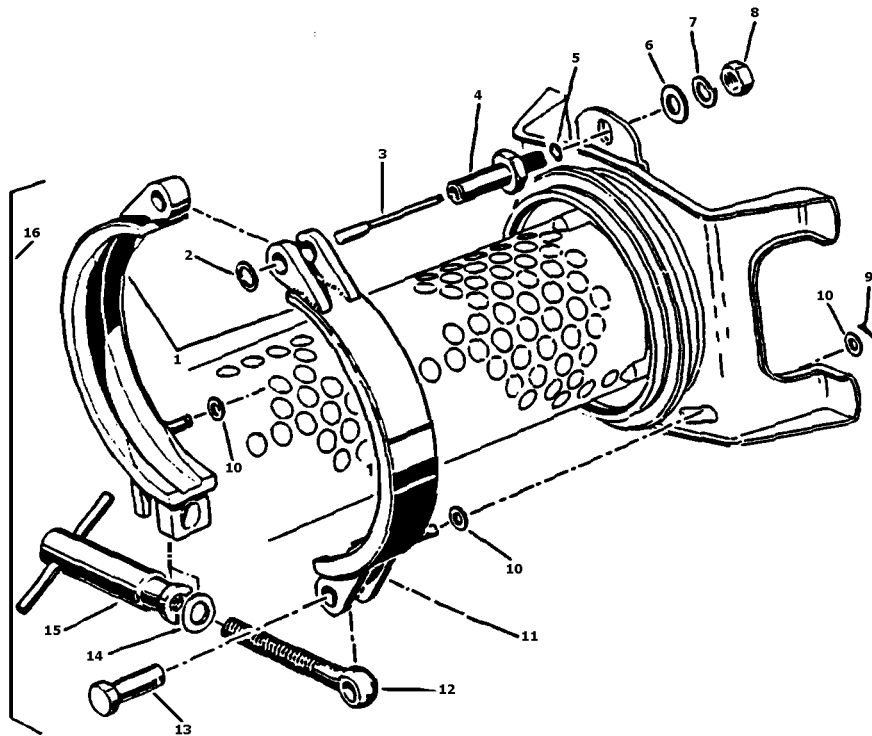


Figure D-14. Quick coupling assemblies

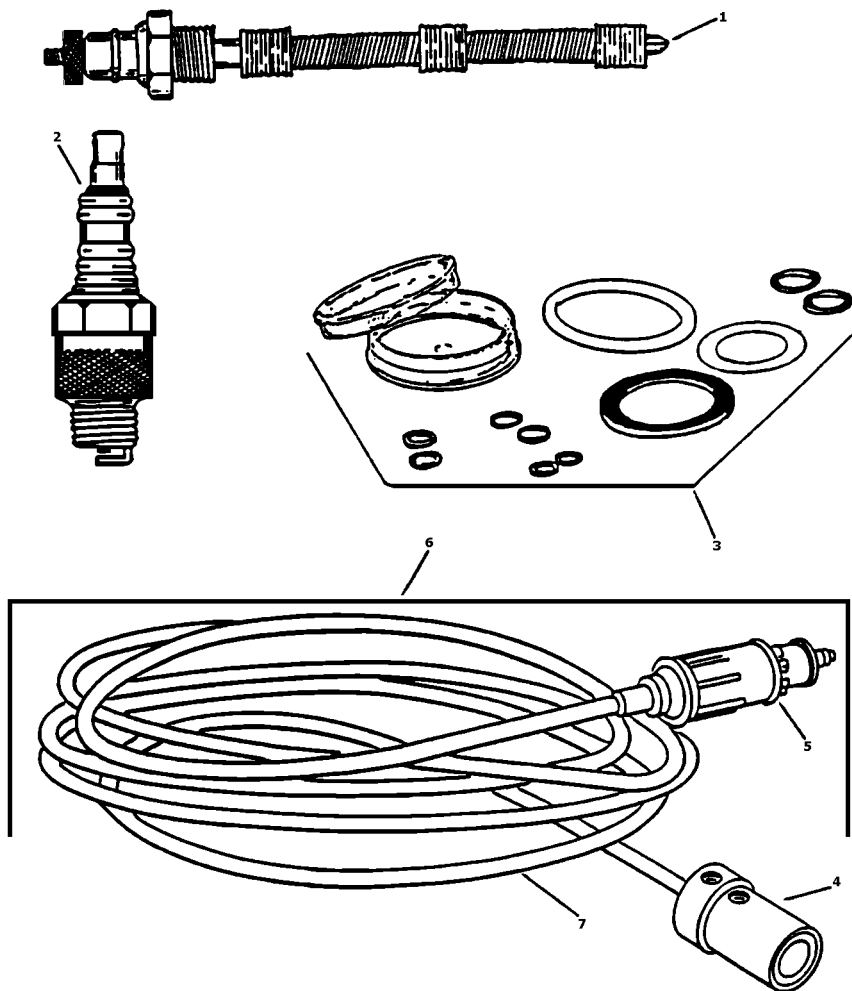


Figure D-15. Miscellaneous parts

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Table D-1 Repair parts							
Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-1		PAOFF	2990-01-202-4128	11668950	19207	Heater Assembly, Swingfire	1
D-2	1	PAOFF	2540-01-076-9286	11668948	19207	Jacket Assembly, Water	1
D-2	2	PAOZZ	2540-00-298-6876	269013000600	D8435	Cap, Jacket Assembly	1
D-3	1	PAOZZ		69001110064	D8435	Pad, Cushion, Tank	1
D-3	2	PAOZZ	2540-00-Z25-3210	269001111800	D8435	Cap Assembly, Filler	1
D-3	3	PAOZZ		14005054	D8435	Rivet	1
D-3	4	PAOZZ		269001110802	D8435	Plate, Instruction	1
D-3	5	PAOZZ	2540-00-Z26-2532	269001110601	D8435	Cap, Filler	1
D-3	6	PAOZZ	2540-00-Z98-6285	269001110605	D8435	Washer	1
D-3	7	PAOZZ	2540-00-Z98-6286	269001110604	D8435	Gasket, Part of Set P/N 269001180000	1
D-3	8	PAOZZ	2540-00-Z25-2153	269001110800	D8435	Cap Assembly, Filter	1
D-3	9	PAOZZ		269001110502	D8435	Nut, Knurled	1
D-3	10	PAOZZ	2540-00-Z98-6910	32000003	D8435	Spacer, Ring	2
D-3	11	PAOZZ		269001110501	D8435	Seal	1
D-3	12	PAOZZ		117119082	D8435	Washer, Lock	1
D-3	13	PAOZZ	2540-00-Z25-2154	269001110063	D8435	Gasket, Ring	1
D-3	14	PAOZZ	2540-00-Z25-2155	269001110700	D8435	Filter, Main, Fuel	1
D-3	15	PAOZZ	2540-00-Z25-5431	269001110001	D8435	Gasket, Ring	1
D-3	16	PAOZZ		269001110300	D8435	Tank, Gasoline	1
D-4	2	PAOZZ	2540-00-Z98-6288	20231300	D8435	Cable, Ignition	1
D-4	3	PAOZZ	2540-00-Z25-2151	20631005	D8435	Plug, Electrical Connector	1
D-4	7	PAOZZ	2540-00-Z98-6287	103221059020	D8435	Cable, Power	1

Table D-1
Repair parts—Continued

Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-4	8	PAOZZ	2540-00-Z25-2120	269001340015	D8435	Condenser	1
D-5	1	PAOZZ	2540-00-Z98-6282	269001100043	D8435	Plug, Rubber	2
D-5	2	PAOZZ		269001100056	D8435	Decal, Instruction, Operation, Heater	1
D-5	3	PAOZZ	2540-00-Z98-6283	269001100009	D8435	Grommet, Rubber, Electrical Lead	1
D-5	4	PAOZZ	2540-00-Z25-2133	269001100400	D8435	Knob, Regulator, Fuel and Air Mix	1
D-5	8	PAOZZ	2540-00-Z98-6908	13110015	D8435	Bolt, Cover Bolt to Retainer	1
D-5	9	PAOZZ	2540-00-Z98-6906	269001100036	D8435	Retainer, Bolt Cover	1
D-5	10	PAOZZ		12010007	D8435	Washer, Flat	1
D-5	11	PAOZZ		14140018	D8435	Pin, Cotter	1
D-5	12	PAOZZ		17122111	D8435	Washer, Spring	18
D-5	13	PAOZZ	2540-00-Z25-2620	10010059	D8435	Bolt, Hexagon Head	7
D-5	14	PAOZZ		17122088	D8435	Washer, Lock	1
D-5	15	PAOZZ	2540-00-Z98-6907	10010075	D8435	Bolt, Hexagon Head	1
D-6	1	PAOZZ	2540-00-Z98-6897	269001130017	D8435	Spring, Helical, Compression	1
D-6	2	PAOZZ	2540-00-Z98-6898	269001130016	D8435	Plate, Spring	1
D-6	3	PAOZZ		269001130100	D8435	Shaft, Joint	1
D-6	4	PAOZZ	2540-00-Z25-2129	269001130000	D8435	Shaft, Joint w/Spring and Plate	1
D-7	1	PAOZZ	2540-00-Z25-2149	269001090034	D8435	Gasket, Ring	1
D-7	2	PAOZZ	2540-00-Z98-6290	17122045	D8435	Washer, Lock	1
D-7	3	PAOZZ	2540-00-Z98-6289	12010016	D8435	Washer, Flat	1
D-7	6	PAOZZ	2540-00-Z98-6913	269001090048	D8435	Screw, Wing	1
D-7	8	PAOZZ	2540-00-Z98-6291	209362020034	D8435	Grommet	1

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Table D-1 Repair parts—Continued							
Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-7	9	PAOZZ	2540-00-Z25-2146	11010027	D8435	Nut, Hexagon	1
D-7	10	PAOZZ		17122087	D8435	Washer, Lock	1
D-7	11	PAOZZ		12010007	D8435	Washer, Flat	1
D-7	12	PAOZZ	2540-00-Z98-6912	269001090027	D8435	Bolt	1
D-8	1	PAOZZ		269001280603	D8435	Decal, Instruction	1
D-8	2	PAOZZ	2540-00-Z98-6308	261017030100	D8435	Handle Assembly, Ignition	1
D-8	3	PAOZZ	2540-00-Z25-2142	269001280046	D8435	Switch, Push Button, Ignition	1
D-8	4	PAOZZ	2540-00-Z98-6307	269001280047	D8435	Ring, Insulation	1
D-8	5	PAOZZ		269002280500	D8435	Handle, Pump	1
D-8	6	PAOZZ	2540-00-Z98-6922	269002280039	D8435	Decal, Instruction, 24 Volt Use	1
D-8	7	PAOZZ	2540-00-Z25-2141	269001280048	D8435	Plug, Electrical, Connector	1
D-8	8	PAOZZ		12010083	D8435	Washer, Flat	1
D-8	9	PAOZZ		14110018	D8435	Pin, Cotter	2
D-8	10	PAOZZ	2540-00-Z98-6309	269001280029	D8435	Link, Handle	1
D-8	11	PAOZZ	2540-00-Z25-2140	269001280030	D8435	Bolt	2
D-8	12	PAOZZ	2540-00-Z98-6924	103242058044	D8435	Cable, Power	1
D-8	13	PAOZZ		17122111	D8435	Washer, Spring	1
D-8	14	PAOZZ	2540-00-Z98-6925	11010026	D8435	Nut, Hexagon	1
D-8	15	PAOZZ	2540-00-Z98-6311	103241048019	D8435	Lead, Power	1
D-8	16	PAOZZ	2540-00-Z98-6310	102030100001	D8435	Terminal	1
D-8	17	PAOZZ	2540-00-Z98-6306	269001280200	D8435	Cable, Electrical	1
D-8	18	PAOZZ	2540-00-Z98-6305	269001280100	D8435	Cable, Electrical	

Table D-1
Repair parts—Continued

Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-8	19	PAOZZ	2540-00-Z98-6923	269001280049	D8435	Nut, Hexagon	1
D-8	20	PAOZZ	2540-00-Z25-2143	269001280900	D8435	Ignition Handle, Complete	1
D-9	1	PAOZZ	2540-00-Z98-6901	32244003	D8435	Gasket, Ring, Part of Set P/N 259001180000	2
D-9	2	PAOZZ	2540-00-Z98-6273	269001040022	D8435	Nut, Lock	1
D-9	3	PAOZZ	2540-00-Z98-6902	269001250026	D8435	Fitting, Connector	1
D-9	12	PAOZZ	2540-00-Z25-2625	269001250000	D8435	Air Valve, Complete	1
D-10	1	PAOZZ	2540-00-Z98-6276	32316013	D8435	Gasket, Ring, Copper, Part of Set P/N 26900118000	1
D-10	8	PAOZZ	2540-00-Z98-6273	269001040022	D8435	Nut, Lock	1
D-10	9	PAOZZ	2540-00-Z98-6901	32244003	D8435	Gasket, Ring, Part of Set P/N 269001180000	2
D-10	10	PAOZZ	2540-00-Z25-2626	269001260000	D8435	Air Valve, Mixing Chamber	1
D-11	10	PAOZZ	2540-00-Z25-2628	23216002	D8435	Gasket, Ring, Copper, Part of Set P/N 26900480000	4
D-11	14	PAOZZ	2540-00-Z98-6272	269001040023	D8435	Filter	1
D-11	15	PAOZZ	2540-99-Z98-6896	208542040002	D8435	Adapter, Fitting	1
D-11	16	PAOZZ	2540-00-Z98-6274	269001040027	D8435	Hose Assembly, Fuel Suction	1
D-11	17	PAOZZ	2540-00-Z25-2631	10410009	D8435	Screw, Hollow	1
D-11	18	PAOZZ	2540-00-Z98-6273	269001040022	D8435	Nut, Lock	1
D-11	19	PAOZZ	2540-00-Z98-2627	269001700000	D8435	Regulator Valve Assembly	1
D-12	4	PAOZZ	2540-00-Z25-2629	10410009	D8435	Screw, Hollow	1
D-12	5	PAOZZ	2540-00-Z25-2628	32316002	D8435	Gasket, Ring, Copper, Part of Set P/N 269001180000	2
D-12	6	PAOZZ	2540-00-Z98-2627	269001030038	D8435	Hose Assembly, Carburetor	1
D-12	12	PAOZZ	2540-00-Z98-6260	269001240000	D8435	Carburetor Assembly	1
D-13	1	PAOZZ	2540-00-Z25-2634	269001210083	D8435	Gasket, Pulsating Pipe	1

Table D-1

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Repair parts—Continued							
Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-13	2	PAOZZ	2540-00-Z98-6251	269002120800	D8435	Shield, Perforated	1
D-13	14	PAOZZ	2540-00-Z25-2629	10410009	D8435	Nut, Hollow	1
D-13	15	PAOZZ	2540-00-Z25-2628	32316002	D8435	Gasket, Ring, Copper, Part of Set P/N 26900118000	1
D-13	19	PAOZZ	2540-00-Z98-6883	11061000	D8435	Nut, Plain, Hexagon	3
D-13	20	PAOZZ		17122087	D8435	Washer, Lock	3
D-14	1	PAOZZ		269001320700	D8435	Clamp Assembly	1
D-14	2	PAOZZ	2540-00-Z98-6290	17122045	D8435	Washer, Lock	1
D-14	3	PAOZZ	2540-00-Z98-6279	269001320045	D8435	Bolt, Pressure	1
D-14	4	PAOZZ	2540-00-Z25-2624	269001320038	D8435	Bolt, Special	1
D-14	5	PAOZZ	2540-00-Z98-6280	12122151	D8435	Washer, Lock	1
D-14	6	PAOZZ		12010007	D8435	Washer, Flat	1
D-14	7	PAOZZ		17122087	D8435	Washer, Lock	1
D-14	8	PAOZZ	2540-00-Z25-2146	11010027	D8435	Nut, Hexagon	1
D-14	9	PAOZZ		14110014	D8435	Pin, Cotter	2
D-14	10	PAOZZ		12010053	D8435	Washer, Flat	4
D-14	11	PAOZZ		14110020	D8435	Pin, Cotter	1
D-14	12	PAOZZ	2540-00-Z98-6903	269001320042	D8435	Eye, Screw	1
D-14	13	PAOZZ	2540-00-Z98-6904	13010016	D8435	Pin, Headed	1
D-14	14	PAOZZ		1201007	D8435	Washer, Flat	1
D-14	15	PAOZZ	2540-00-Z25-2132	269001320300	D8435	Turnbuckle	1
D-14	16	PAOZZ	2540-00-Z98-6277	269001320000	D8435	Quick Coupling, Complete	1
D-15	1	PAOZZ	2540-00-Z25-2637	269002150000	D8435	Plug, Preheating	1
D-15	2	PAOZZ	2540-00-Z25-2636	269001160000	D8435	Spark Plug	1

Table D-1
Repair parts—Continued

Illustration		SMR Code	National Stock Number	Part Number	FSCM	Description	Quantity included in unit
Figure	Item						
D-15	3	PAOZZ	2540-00-Z25-2139	269001180000	D8435	Gasket Set	1
D-15	4	PAOZZ	2540-00-Z25-2136	20631020	D8535	Plug, Electric, Female	1
D-15	5	PAOZZ	2540-00-Z25-2137	20631010	D8435	Plug, Electric, Male	1
D-15	6	PAOZZ	2540-00-Z26-4666		D8435	Cable, Heater Starting with Plugs, 6 feet	1

**Appendix E
Basic Issue Items**

Figure E-1 shows the Swingfire heater basic issue items. Refer to table E-1 for the NSN, description (name), unit of measure, and quantity that should be included in the unit.

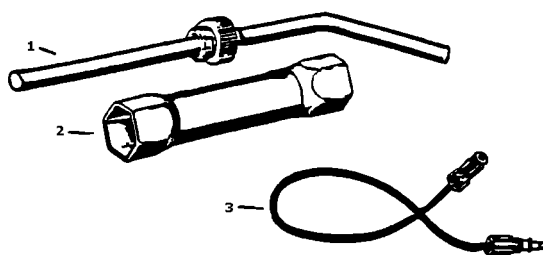


Figure E-1. Swingfire heater basic issue items

Table E-1 Swingfire Heater basic issue items				
Item	National Stock Number	Description	Unit of Measure	Quantity Included in Unit
1	2540-00-Z25-2134	Scraper, carbon, mixing chamber	Each	1
2	2540-00-Z52-2134	Wrench, remover, spark plug and preheating plug	Each	1
3	2540-00-Z26-4666	Cable, heater starter, with plug, 6 feet	Each	1