TM 9-4940-474-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

CLEANING, STEAM, PRESSURE JET (CUSTOM BUILT TRAILERS CO., INC. MODEL PJC-600) (4940-473-6218)

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1965

Change
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *13 June 1973*

Operator's Manual
CLEANER, STEAM, PRESSURE JET
(CUSTOM BUILT TRAILERS CO., INC.
MODEL PJC-600)
(4940-473-6218)

TM 9-4940-474-10, 19 November 1965 is Changed as follows:

Change title to read as above.

Page 42 (at bottow of page). Add the following paragraph

6-3. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to: Commander US Army Weapons Command, ATTN: AMSWE-MAS-SP, Rock Island IL 61201.

6-4. Components of the End Item

Parts included with the end item and considered as components of the end item configuration are listed in the following table:

Table 6-4. Components of the End Item

Components	Part No.		Qty
BASKET, SOAP:	1023	(21571)	1
GAGE, LEVEL:	1033	(21571)	1
FOOT VALVE AND STRAINER:	53499	(21571)	1
HOSE ASSEMBLY, STEAM:	60111	(21571)	2
HOSE ASSEMBLY, SUCTION:	60220	(21571)	1
HOSE ASSEMBLY, WATER:	60201	(21571)	1
NOZZLE OFFSET: 300 gph	1038	(21571)	4
NOZZLE OFFSET: 600 gph	1037	(21571)	1
NOZZLE RINSE:	1030	(21571)	1
NOZZLE STRAIGHT: 300 gph	1028	(21571)	2
NOZZLE STRAIGHT: 600 gph	1089	(21571)	1
STEAM GUN ASSEMBLY:	1026	(21571)	2

Page 43. The appendix is superseded as follows

APPENDIX A
BASIC ISSUE ITEMS LIST
AND
ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the crew/operator for operation of the pressure jet steam cleaner.

2. General

These basic issue items and items troop installed or authorized lists are divided into the following sections:

a. Basic Issue Items List. Not applicable.

b. Items Troop Installed or Authorized List. Not applicable.

By Order of the Secretary of the Army:

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DCSLOG(3)	Corps(2)
CNGB(1)	Instl(2), except
TSG(1)	Ft Monmouth(5);
COE(5)	USAECFB(4);
Dir of Trans(1)	Ft Story(3);
ACSC-E(1)	Ft Wood(3);
CONARC(2)	APG(1)
ARADCOM(2)	USAFS(1)
ARADCOM Rgn(2)	USAES(1)
AMC(17)	TEAD(16)
WECOM(10)	LBAD(2)
MUCOM(2)	LEAD(2)
AVSCOM(2)	SHAD(1)
OS Maj Comd(2)	USAAPSA(1)
LOGCOMD(2)	USACOMZEUR(2)
Armies(3) except	USASA Sup & Maint Cen(1)
Seventh USA(5);	Ft Knox FLDMS(10)
Eighth USA(5);	4th USASA Fld Sta(1)

ARNG: State AG(3).
USAR: None.
For explanation of abbreviations used, see AR 310-50.

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SECTION I

INTRODUCTION AND DESCRIPTION

1-1. **GENERAL**

1-2. This handbook contains Operation and Maintenance Instructions for an oil fired Steam Pressure Jet Cleaner manufactured by Custom Built Trailers Company, Farmingdale, N. Y. This cleaner is identified as Custom Built Trailers Model PJC-600. See Figure 1.

1-3. **PURPOSE**

1-4. The cleaner is designed to use cleaning compounds conforming to Spec MIL-C-11494 for the removal of dirt, grease, and heavy oil deposits from aircraft sub-assemblies, transportation vehicles, construction equipment similar equipment and parts for maintenance and overhaul. It is a means for combining the cleaning effect of steam, hot water and detergent with impact. The cleaner requires only fuel, cleaning compound, water and electrical connections for its complete operation. It employs a high pressure pump and heater to generate sufficient pressure and temperature to spray the cleaning solution with high impact upon the equipment or surface to be cleaned. The cleaner is also equipped to provide a high pressure rinse when cleaning operations require a solid, high velocity stream of hot or cold water. Cleaning accomplished by using any of the cleaning methods shown in table 1-1 and directing the solution or spray upon the equipment to be cleaned.

TABLE 1-1

METHOD OF CLEANING	DISCHARGE CAPACITY	DISCHARGE PRESSURE	FUEL CONSUMPTION
Vapor Spray	600 gph	90 psig	12 gph
Vapor Spray	600 gph (300 gph/gun)	90 psig	12 gph
Vapor Spray	300 gph (one gun)	90 psig	6.5 gph
Hot Rinse	500 gph	300 psig	6.5 gph
Cold Rinse	500 gph	300 psig	0

1-5. **GENERAL DESCRIPTION** (See Figure 1.)

1-6. **PHYSICAL.** The equipment consists of a unit enclosed within a steel cabinet mounted on a skid base. Two vapor cleaning guns with various interchangeable nozzles and all necessary hoses and accessories are furnished with the cleaner. To clarify location of the various parts of the equipment, the operating side of the cleaner, on which all the valve handles are located, is considered the front of the cleaner. Therefore, facing the front of the unit, the heater assembly is on the left side of the unit, the tanks on the right side of the unit and the water inlet connections on the rear of the unit. Dimensions, weight, etc., of the cleaner are given in Table 1-2.

1-7. The cleaner components are fully enclosed in the metal cabinet with the exceptions of operating valve handles, water inlet connections, gauges and electrical cord. Cleaner components are easily accessible through the cabinet cover and removable panels.

TABLE 1-2. TABLE OF LEADING PARTICULARS

Height (Overall)	64 inches
Width (Overall)	46 inches
Length (Overall)	73 inches
Dry Weight	2400 lbs.
Heating Method	Pressure Atomizing Burner
Fuels	Fuel Oils, 30-38 API Gravity
Fuel Tank Capacity	57 Gallons
Compound Tank Capacity	57 Gallons
Operating Water Pressure, inlet	25 to 125 psi
Minimum Water Source Output	600 gph
Discharge Hose	50 ft.
Suction Hose	25 ft.
Supply Hose	50 ft.

Power Source Required: 3-phase, 220 volts, 60 cycles, 12.0 amperes

The top access panel, which remains open during operation is designed so that it does not protrude beyond the outside edge of the cabinet during normal operation. All valves and controls required for operation are accessible from the operator's (front) side or rear of the unit. An instruction plate, giving an outline of operation instructions is fastened on the front panel. The name and serial number plate is the only specific identification marking on the unit, and it should be kept legible, intact and with the equipment at all times. The cleaner is also equipped with stowage devices and racks to accommodate hoses, steam guns, tools and spare nozzle tips when not in use. The racks and stowage devices are arranged so that stowed items cannot be dislodged during transit.

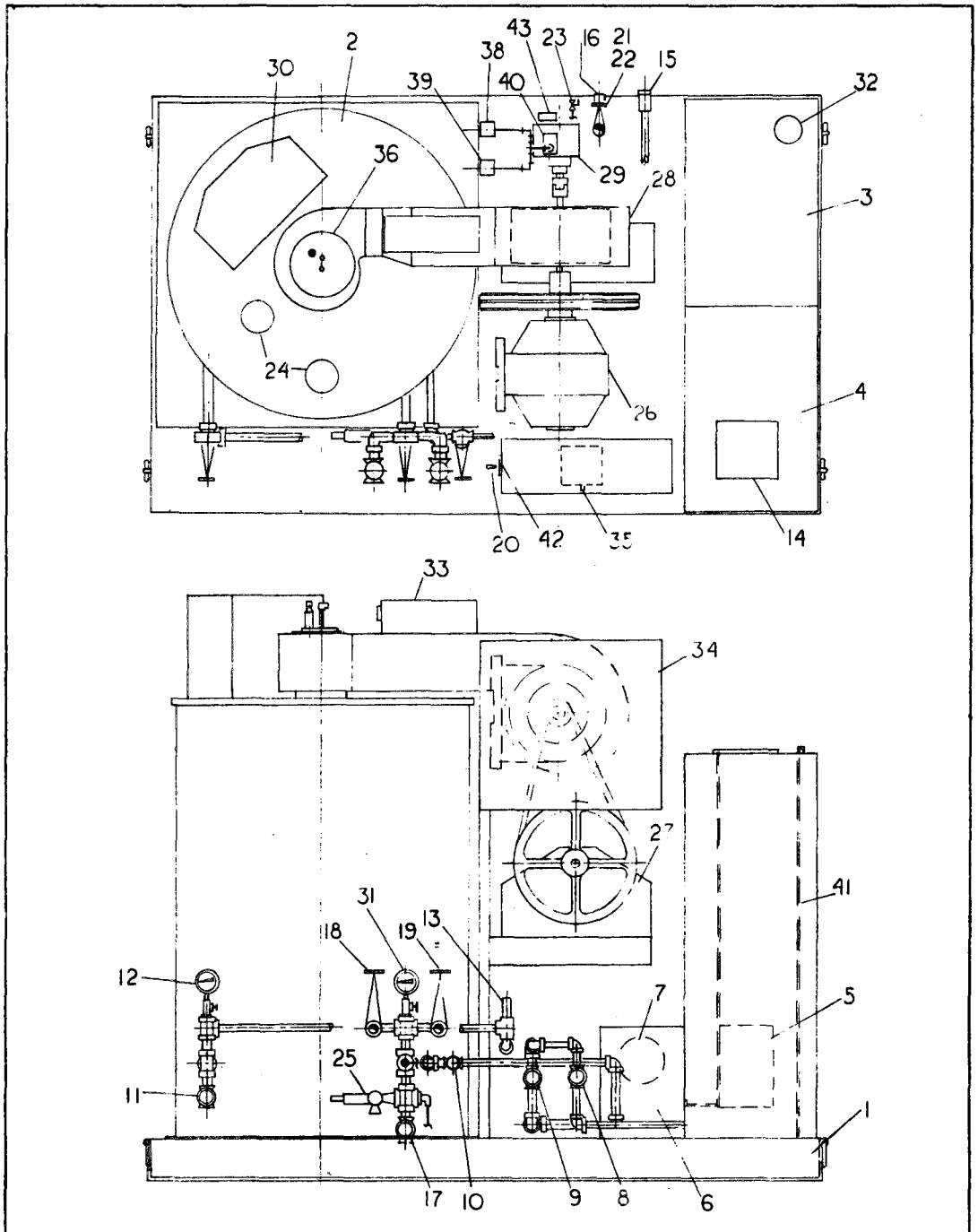


FIG. 1 STEAM CLEANER

LEGEND: FIGURE 1. STEAMCLEANER

1. Skid Base
2. Heater
3. Fuel Tank
4. Solution Tank
5. Soap Basket
6. Float Tank
7. Float Valve
8. Soap Metering Valve
9. Float Tank Suction Valve
10. Solution Tank Fill Valve
11. Intake Blow Down Valve
12. Intake Pressure Gauge
13. Low Flow Valve
14. Solution Tank Cover
15. Pressure Inlet Plug
16. Suction Inlet Cap
17. Discharge Blow Down Valve
18. Discharge Valve
19. Discharge Valve
20. Main Switch
21. 300 GPH Vapor By-Pass
22. 500 GPH Rinse By-Pass
23. Pump Air Vent
24. Heater Clean Out Cap
25. Safety Valve
26. Motor
27. Water Pump
28. Fan
29. Fuel Pump
30. Stack Opening
31. Discharge Pressure Gauge
32. Fuel Fill Cap and Screen
33. Ignition Transformer
34. Control Panel
35. Burner Control Reset
36. Burner Head
37. Duct
38. Fuel Modulating Valve 'B'
39. Fuel Modulating Valve 'A'
40. Solenoid Valve
41. Level Gauge
42. Hourmeter
43. Fuel Pressure Gauge

1-8. The skid upon which the cleaner is mounted is construction of structual channel iron and is sufficiently braced to allow it to be dragged on a hard surface. Lifting and towing rings are provided. Replaceable skids are provided.

1-9. FUNCTION DESCRIPTION. (See Figure 2) The unit can be divided into three major systems as follows: water-compound, fuel and electrical. The three systems function interdependently.

1-10. FUEL SYSTEM. Fuel is drawn from the fuel tank through a filter into the fuel pump. It is then pumped under pressure to the atomizing nozzles via a solenoid valve and two modulating valves. The solenoid and modulating valves control the flow of fuel to the nozzles in response to pre-set conditions and safety factors. Control circuits determine the operating mode of the unit and monitor safe operating limits of the unit.

1-11. Dribble proof valves mounted directly before the atomizing nozzles prevent any fuel leakage into the combustion chamber until the required pressure is obtained by the fuel pump. This insures proper atomization of the fuel for ignition. Stable fuel system pressure is maintained by a by-pass valve, which is an integral part of the fuel pump, that circulates fuel back to the tank.

1-12. WATER COMPOUND SYSTEM. This system consists of a float tank, solution pump, compound tank, and auxiliaries necessary for the proper functioning of the water-solution system. The float tank utilizes water from a tap pressure of 25 to 125 psi. The pump draws from the float tank. A constant level valve maintains the level in the float tank. Fresh water can also be obtained from the suction inlet when drawing water from a lake, pond or stream. Soap concentrate is drawn into the system from the compound tank via compound metering valve. The cleaning solution is then heated in the heater assembly and discharged through the valves, delivery hoses and gun.

1-13. ELECTRICAL SYSTEM. The electrical system consists of the necessary controls to energize the motor, provide an ignition spark in the burner, control the fuel solenoid valves and provide control current for the safety cycle. The purpose of the safety cycle circuit is as follows:

a. Will not permit fuel to enter the combustion chamber until the chamber has been purged sufficiently to remove any combustible gases. This purging period is 20 seconds and is measured from the time the burner switch is energized until the fuel enters the chamber. Therefore, whenever the burner flame has been extinguished (either due to shut down or malfunction) 20 seconds must elapse after reset before fuel can enter the combustion chamber.

b. Will not permit fuel to continue to enter the combustion chamber if a flame is not established.

c. Will cut off the fuel supply in the event of flame failure during operation.

d. Will cut off the fuel supply in the event of insufficient water flow through the heater.

e. Will cut off the fuel supply in the event safe temperature limits are exceeded.

1-14. DETAILED DESCRIPTION.

1-15. GENERAL. Detailed information is arranged in three major divisions discussed above. Component parts of each system are described individually in the order in which such components are affected in the progressive flow through the particular system. Electrical components are discussed as part of the electrical system rather than the particular system in which they function.

1-16. FUEL SYSTEM

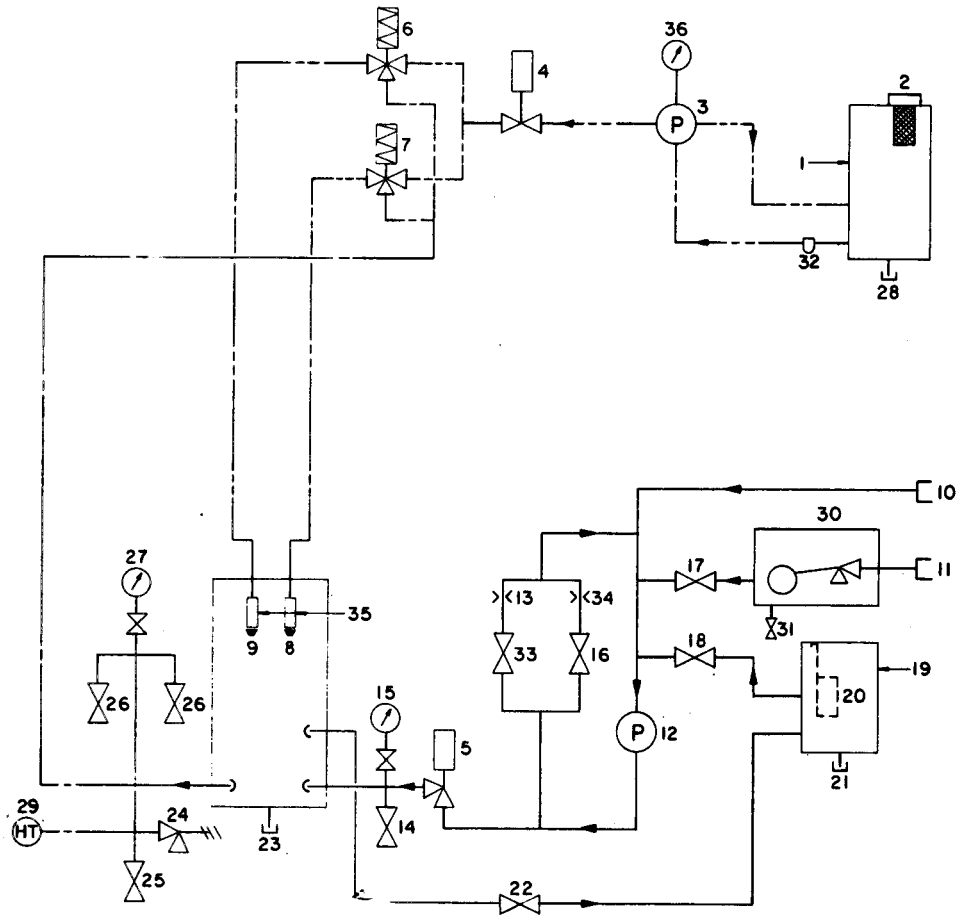
1-17. FUEL TANK. The fuel tank is a 57 gallon sheet metal enclosure which is provided with a tight fitting filler cap in the top plate. A strainer is provided to insure that only clean fuel enters the tank. Fuel suction and return connections are provided on the tank. The tank is fitted with a drain plug.

1-18. FUEL PUMP. The fuel pump is a single stage, rotary gear type pump equipped with an adjustable pressure regulating valve. The pump is driven through direct coupling to the stub shaft, and delivers fuel from the fuel tank through solenoid control valves and modulating valves to the burner nozzles. Excess fuel is returned to the fuel tank.

1-19. FUEL FILTER. Mounted on the outlet of the fuel tank to insure that only clean fuel enters the pump.

1-20. BURNER. The burner is a pressure atomizing unit containing nozzles and ignition electrode. This assembly consists of 2 electrodes, a flame detector a 5.5 and 6.5 gallon nozzles, dribble proof valves and connecting fuel lines. The burner head is mounted in a vertical position at the top of the heating coil, in such a manner as to provide for downdraft combustion.

1-21. CENTRIFUGAL FAN. The function of this component is to supply air required for efficient combustion.



1. FUEL TANK
2. FILL CAP & STRAINER
3. FUEL PUMP
4. FUEL SOLENOID VALVE
5. LOW FLOW CONTROL
6. FUEL MODULATING VALVE
7. FUEL MODULATING VALVE
8. BURNER NOZZLE
9. BURNER NOZZLE
10. WATER SUCTION CONN.
11. WATER PRESS. CONN.
12. WATER PUMP
13. 300 GPH ORIFICE
14. INTAKE BLOW DOWN & DRAIN
15. INTAKE PRESS. GAUGE
16. RINSE BY-PASS
17. SHUT-OFF VALVE
18. COMPOUND METERING VALVE
19. SOLUTION TANK
20. SOAP BASKET
21. SOLUTION TANK DRAIN
22. HOT WATER VALVE
23. COMBUSTION CHAMBER DRAIN
24. RELIEF VALVE
25. DISCHARGE BLOW DOWN & DRAIN
26. DISCHARGE VALVE
27. DISCHARGE PRESS. GAUGE
28. FUEL TANK DRAIN
29. HIGH TEMP. CONTROL
30. FLOAT TANK
31. FLOAT TANK DRAIN
32. FUEL STRAINER
33. 300 GPH BY-PASS
34. RINSE ORIFICE
35. DRIBBLE VALVES
36 FUEL PRESS. GAUGE

LEGEND

——— WATER SYSTEM
– – – – FUEL SYSTEM
——— CONTROL LINE

FIG. 2
WATER-FUEL FLOW DIAGRAM

1-22. HEATER ASSEMBLY. The heater is a continuous coil within an insulated shell in which the liquid is heated by combustion of the fuel. The heater contains a continuous tubular coil designed for efficient heat transfer. Baffles are provided to direct the products of combustion around the coils and out the stack located on the top heater plate. The heater also contains two clean out caps.

1-23. SOLENOID VALVE. The solenoid valve permits fuel to enter the modulating valves only if certain safety criteria have been established (see paragraph 1-13). The solenoid valve is normally closed and can only be opened by proper operation of the safety cycle.

1-24. MODULATING VALVES. The modulating valves are spring-loaded valves that control fuel flow to the burner. Fuel flow is reduced as heater pressure rises. The valves are adjusted so that they will close when certain heater discharge pressures are reached or exceeded. Modulating valve (A) will close if the discharge pressure exceeds 110 psi and modulating valve (B) will close if the discharge pressure exceeds 300 psi. Therefore, in the steam cycle, if the discharge pressure exceeds 110 psi, valve (A) will close, cutting off fuel from one nozzle. In the rinse cycle, if the discharge pressure exceeds 300 psi valve (B) will close, cutting off fuel from the rinse nozzle.

1-25. WATER COMPOUND SYSTEM

1-26. FLOAT TANK. This tank serves as a means to prevent back-siphoning of solution into the inlet water system. A float type valve is mounted at the inlet end of the tank to control the water level in the tank.

1-27. COMPOUND TANK. Dry chemical cleaning compound (soap) is mixed with water in this 57 gallon tank to form a concentrated solution. The dry compound is placed in the basket and dissolved by agitation during the operational set-up procedure. One filling of the basket is sufficient to obtain normal concentration for a full tank of solution. The tank also contains a level indicator graduated in 5 gallon increments.

1-28. COMPOUND (SOAP) METERING VALVE. The concentrate rate of flow is regulated by the compound metering valve which is mounted in the line from the compound tank to the inlet of the solution pump. This valve maintains a constant delivery of compound solution from the compound tank and thus controls the concentration of the cleaning vapor discharged from the steam gun. The valve capacity should be adjusted between 0 and 14½ gallons per hour and introduce one part of concentrated compound solution to 11.8 parts of clear water. Dial is graduated from 0-10. Valve is adjusted based on the cleaning operation.

1-29. **PUMP.** The pump is a positive displacement pump whose function is to pump water and solution through the heater at a constant flow and pressure.

1-30. **BY-PASS VALVES.** The by-pass valves connected between the suction and discharge of the solution pump are set to maintain a fairly constant rate of flow. The rinse by-pass is set to maintain a flow of 500 gph of rinse water. The 300 gph vapor by-pass is set to maintain a flow of 300 gph when only one 300 gph steam gun nozzle is in operation. Both valves are closed when the 600 gph or two 300 gph steam gun nozzles are in operation.

1-31. **INTAKE PRESSURE GAUGE.** This gauge measures the inlet pressure into the heating coil, in pounds per square inch, which is also the pump discharge pressure.

1-32. **INTAKE BLOW DOWN VALVE.** This valve is installed on the inlet to the heating coil line and is used when the heating coil is blown down. Refer to paragraph 4-9 for further clarification on blow down procedures. This valve is normally closed.

1-33. **SAFETY RELIEF VALVE.** Connected in the heater discharge piping, the safety relief valve provides automatic relief in the event that water system pressure exceeds 350 psi. The safety relief valve is normally closed and opens when the system pressure exceeds the setting.

1-34. **DISCHARGE PRESSURE GAUGE.** This gauge is connected in the system to accurate measure the pressure of the discharge from the heater.

1-35. **DISCHARGE BLOW DOWN VALVE.** This valve is mounted directly on the discharge line from the heating coil and is used only during the blow down of the heating coil. This valve is normally closed.

1-36. **MISCELLANEOUS VALVES.** Manually controlled operating valves are summarized below:

a. Snubber valves provide for shut off and dampening of the pressure gauges.
b. Float tank valve controls water flow from float tank to pump.
c. Compound tank fill valve controls water flow to the compound tank from the heater and is used to dissolve the soap in the compound tank.

1-37. ELECTRICAL SYSTEM. (See Figure 3)

1-38. CONTROL BOX. This component serves as a housing and mounting for the components of the electrical control components. A terminal block is provided to facilitate the connection of the outside components.

1-39. MOTOR. The motor is rated at 3 hp. 1750 rpm and is designed for continuous operation on a 3-phase, 220 volt, 60-cycle power source. The motor drives the water pump, fuel pump and blower.

1-40. IGNITION TRANSFORMER. The ignition power transformer is used to produce the spark between the electrode and ground which ignites the fuel when it is atomized through the burner nozzle.

1-41. MOTOR STARTER. The motor starter is a magnetic contactor designed for three phase power. Its function is to supply operating power to the motor. The contactor contains protective overload relays.

1-42. HOURMETER. The hourmeter is connected across the imput power line and records, in hours, the cumulative operating time of the steam cleaner. The hourmeter will record whenever the motor is running. It is provided as a convenient means to determine when periodic servicing procedures should be performed.

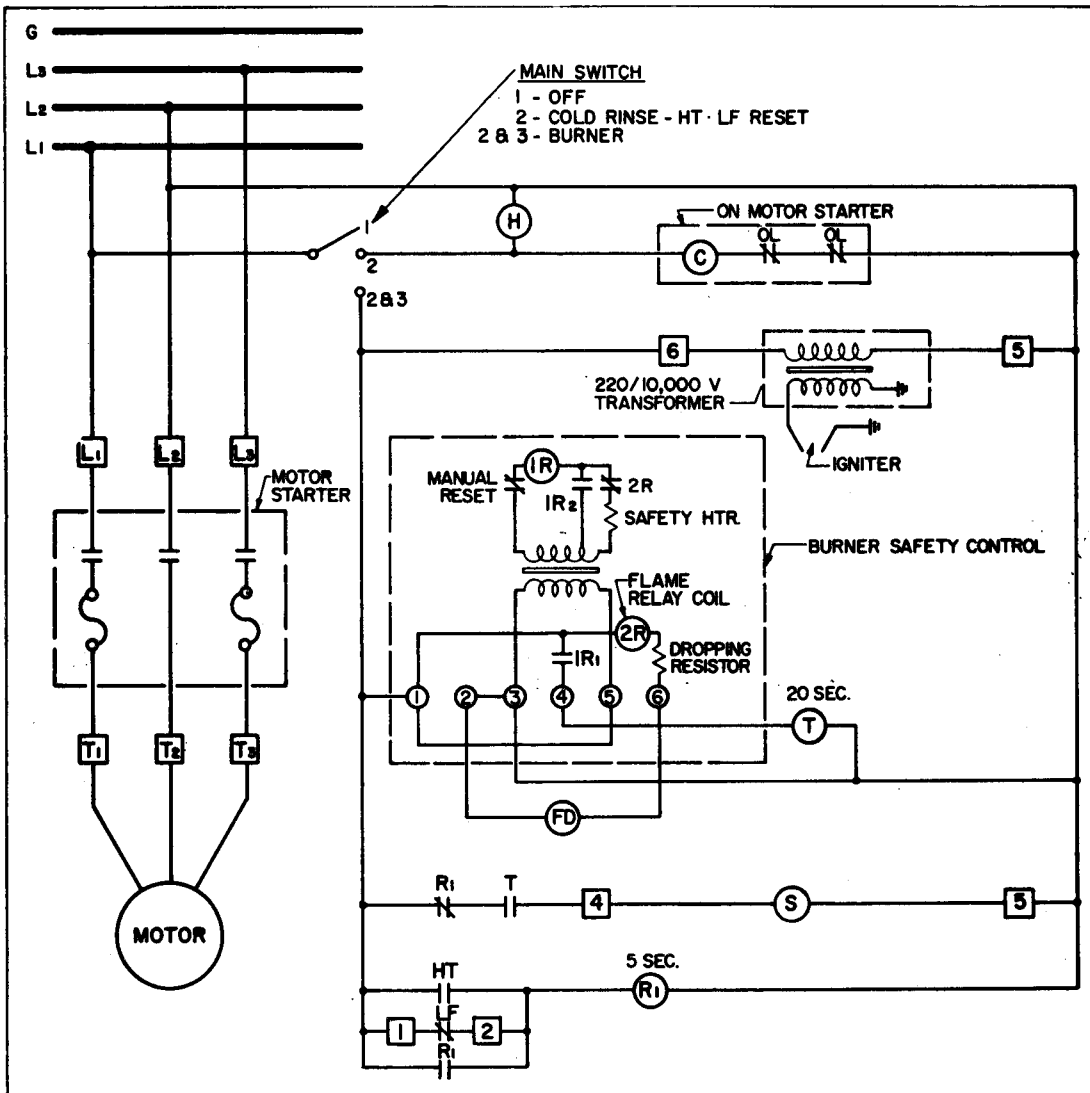
1-43. SWITCH. One manually operated switch provides for all operations of the cleaner. The main switch energizes the cleaner for all operations. The main switch has 3 positions. These are:

1) Off
2) Cold Rinse and HT-LF Reset
3) Burner

The main switch must be out of the burner position to reset the safety control after high temperature or low flow condition has shut down the burner.

1-44. IGNITER. The igniter provides the spark for ignition of the fuel. The igniter is shielded to provide for radio interference protection.

1-45. IGNITION LEAD. This high tension lead is encased in a metal braid whose purpose is to provide radio interference protection for the high tension system.



L E G E N D

(FD)	FLAME DETECTOR	OL	OVERLOAD
(C)	COIL	(T)	TIMER COIL
(H)	HOURMETER	(S)	SOLENOID VALVE
(R1)	RELAY COIL	HT	HIGH TEMPERATURE
II	CONTACT N.O.	LF	LOW FLOW
ℕ	CONTACT N.C.	[1]	TERMINAL BLOCK

FIG. 3

ELECTRICAL SCHEMATIC DIAGRAM

1-46. SAFETY CYCLE CIRCUIT.

1-47. GENERAL DESCRIPTION. The safety cycle is divided into two separate controls as follows:

1. Low Flow and High Temperature Control.
2. Burner Flame Control.

The low flow switch will open the safety cycle if the heater is not provided with sufficient water. The high temperature switch will open the safety cycle if the safe temperature limits are exceeded. The heater will only function when all safety conditions are satisfied. When low water or high temperatures stops the flow of fuel to the burner, these controls must be reset with the main switch in the reset position prior to starting. If flame fails for any reason, that condition must be corrected and the burner control reset before fuel will flow to the burner.

From an analysis of the schematic wiring diagram and the above explanation, it can be seen that the safety cycle functions automatically to perform the following:

a. The burner cannot be "fired-up" unless sufficient water is provided, and the heater has been purged.

b. During operation, the burner will be shut down if the flame is lost. Upon re-cycling, the time delay relay will again have to complete its cycle before fuel will flow to the burner.

1-48. LOW FLOW SWITCH. The flow switch located in the pump discharge line is provided to prevent damage to the heating coil which would result from a water supply failure. Should a water supply failure occur, this switch will automatically open the circuit to the burner switches, thus causing the solenoid valve to close, cutting off the fuel supply from the burner. The flow switch contacts will be closed as long as there is a flow of 60 gph in the incoming water line; if the flow drops below 60 gph, the contacts of the switch will close, thus de-energizing the circuit to the solenoid valves. The flow switch consists of a spring loaded shuttle assembly which magnetically actuates the hermetically sealed switch contacts. Flow rates are accurately detected as the shuttle assembly leaves or approaches the seat.

1-49. HIGH TEMPERATURE SWITCH. The High Temperature Switch closes when the safe limit has been exceeded. This switch is set to close at 350°F.

1-50. BURNER FLAME CONTROL. This control consists of a time delay relay and a photo sensitive flame detector. The flame detector control controls the operation of the time delay relay which in turn permits operation of the fuel solenoids through its contact. For a complete description of the sequence of operation of the burner flame control see separate operation instructions at the rear of this manual.

1-51. TIME DELAY RELAY. Provides a 20 second purge period for the heater before fuel is admitted to the burner.

SECTION II. SPECIAL SERVICE TOOLS

2-1. GENERAL.

2-2. No special tools are required for the operation, service or maintenance of this equipment other than ordinary mechanics tools and pipe wrenches.

SECTION III. PREPARATION FOR USE, STORAGE OR SHIPMENT

3-1. PREPARATION FOR USE.

3-2. UNPACKING. The cleaner is shipped complete with accessories fastened securely within one crate. No special unpacking precautions are necessary except that reasonable care should be exercised when removing the cleaner from the crate to prevent damage to the gauges, control handles and sheet metal parts of the equipment. Check all items against packing list to insure that all necessary accessories are present and in good physical condition. Place the cleaner in close proximity to water and electrical services.

3-3. FUEL SUPPLY. Fill the fuel tank by removing the filler cap and pouring the fuel into the tank via the filler neck. The fuel tank capacity is sufficient for 4 hours of continuous operation.

> CAUTION. Use only fuels having 30 to 38 API Gravity; this includes Kerosene and light Diesel fuel.

3-4. ELECTRICAL SUPPLY. Place the Main Switch to OFF and plug the power cable into the electrical power supply having proper characterisitcs. Check that the unit is electrically grounded.

NOTE: The unit is shipped wired for 3-phase, 220 volts, 60 cycle operation.

CAUTION. Never operate from a source having any other characteristics. If an additional length of electrical cord is required use a 12 gauge 4 conductor cord. Do not exceed an additional length of 50 ft.

3-5. WATER SUPPLY.

3-6. GENERAL. The cleaner is furnished with two water hose assemblies; one is designed for supplying water to the unit from a pressure source and the other for drawing water from a stream, well or other suction source.

3-7. PRESSURE SOURCE. Attach the 50 ft. water supply hose to the water inlet connection at the rear of the unit. This is a 1" I.D. hose. Secure the other end to a supply having a static pressure between 25 and 125 psi and a volume of not less than 600 gph when operating the cleaner. Turn on the water supply and allow the float tank to fill.

3-8. SUCTION PRESSURE SOURCE. Attach the 25 foot water hose to suction inlet connection at the rear of the unit. The is a 1 1/4" I.D. hose. Assemble the foot valve to the other end of the hose and close float tank valve at the front of the cleaner. Place the foot valve in the water source and position it so that it is free of sand and debris that may clog it. Prime the hose for faster action.

NOTE: Insufficient water supply will cause the cleaner to shut down automatically. However, it is best for overall efficiency to prevent such shut downs. Therefore, check the water supply at the initial hook-up and periodically thereafter.

3-9. HOSES, GUNS AND NOZZLES.

a. Connect the steam hose to the outlet of one of the discharge valves if 600 gph steam cleaning operation is to be performed. If two gun operation (300 gph steam cleaning) is desired connect both steam hoses to the discharge valves. Use a wrench to tighten the clamp after the coupling has been tightened on the outlet.

b. Screw the combination gun to the free end of the steam hose, making sure that it is secure.

c. Attach a nozzle to the end of the gun. The choice of nozzle will be determined by the type of cleaning to be accomplished.

The cleaner s equipped with the following nozzles:

a. One straight vapor nozzle, 600 gph.

b. Two straight vapor nozzles, 300 gph each.

c. Four offset vapor nozzles, 300 gph each.

d. Two offset vapor nozzles, 600 gph each.

e. One high pressure rinse nozzle, 500 gph.

SECTION IV. OPERATION INSTRUCTIONS.

4-1. GENERAL. (See Figure 1)

4-2. Instructions given in this section are intended to acquaint the operator with each every phase of operation. Because of the great variety of equipment that it is possible to clean with this unit, no attempt is made in this handbook to instruct the operator as to the manner of actual cleaning. The most effective distance and angle that the gun nozzle is held from the surface to be cleaned can be determined in a few seconds after the operation has begun.

> CAUTION. As a precaution, care should be taken to keep the overspray or splash from electrical equipment or any material that would otherwise be damaged by cleaning compound and water.

4-3. PRECAUTIONS TO BE OBSERVED.

WARNING

1. Never fill the fuel tank with the burner firing. Allow the unit to cool before pouring fuel as the hot exhaust from the stack may ignite the fumes.

2. Never touch the electrodes while the ignition circuit is energized.

3. Secure the gun in a safe location. This will prevent water or cleaning solution from being sprayed on personnel when the gun is out of the operator's hands.

4. Do not operate the cleaner in extremely close quarters. Ample air circulation is necessary. Always operate unit with top cabinet door open.

5. Check all hoses and connections for restrictions.

6. When operating the heater, never go to the burner position on the main switch on starting. Start the heater on the cold rinse cycle first and after water flows from the nozzle go into the burner position.

7. Make sure that the blow down valves and drain caps and valves are closed tight at all times except when blowing down or draining the unit.

8. Check the direction of rotation of the motor. Direction of rotation is counter clockwise when viewed from the pump shaft. If rotation is incorrect, phase connection must be changed immediately as follows:

    1. Place the Main Switch to the OFF position.

    2. Open the Control box and switch any two leads to the contactor.

    3. Close the Control box and check motor rotation again.

9. If the cleaner is to be operated indoors, it is advisable to connect an extension from the stack to the outside to remove flue gases. Use an extension having an area no smaller than the stack outlet.

4-4. PRELIMINARY CHECKS. Before starting any operation the checks outlined in Table 4-1 should be accomplished.

4-5. PRELIMINARY CHECKS.

CHECKS	REMARKS
Main Switch	Make sure it is in OFF position.
Fuel Tank	Check Fuel.
Compound Tank	Check for compound if soap cleaning is to be done.
Water Supply	Insure supply is adequate.
Electrical Supply	220 V 3 phase supply. 12 amp minimum.
Manually Operated Valves	Check that all manually operated valves are initially closed.

4-6. **STARTING THE CLEANER.** (See Figure 1)

a. Open the top cover of the cleaner.

b. Fill the fuel tank (3) with a suitable fuel.

c. Connect the water supply. If a pressure source of water is used, open float tank valve (9). If a suction source of water is used, float tank valve remains closed in order to by-pass the float tank.

d. Prepare soap concentrate as follows:

1. Open the compound tank cover (14) and fill the soap compound basket (5) with Steam Cleaning Compound MIL-C-11494. Hang the basket in the tank.

2. Close valves (8, 17 and 11).

3. Connect steam hoses and guns to discharge valves (18) or (19).

4. Connect desired nozzle to end of steam gun.

5. Open suitable by-pass valve for rinse (22) or 300 gph vapor (21) operation.

NOTE: If 600 gph vapor operation is desired, both by-pass valves (21) and (22) remain closed.

6. Open solution tank fill valve (10) and close soap metering valve (8).

7. Place the MAIN Switch (20) to Cold Rinse.

8. When compound tank (4) is one half full, close solution tank fill valve (10).

e. Start the heater as follows:

1. Place Main Switch to burner position.

2. When hot water or vapor comes from the steam gun, open the solution tank fill valve (1) until solution tank is full. After tank is full close valve (10).

NOTE: It is advisable to fill the solution tank as described above with the rinse nozzle in operation. If a vapor nozzle is used at the steam gun, the tank fill valve should be opened only slightly. With the tank fill valve opened too wide it is possible to exceed 350°F. at the heater outlet which will in turn shut down the burner.

f. Set the soap metering valve (8) at desired soap setting. This setting will be a matter of the operators judgement.

4-7. 600 GPH VAPOR OPERATION (90-110 PSI). This can be either a one gun or two gun operation.

a. One Gun Operation. Connect the 600 gph steam nozzle to one gun. Keep one discharge valve (18 or 19) open (the one which is connected to the gun to be used) and the other closed.

b. Two Gun Operation. Connect the 300 gph steam nozzle to each gun and open discharge valves (18 and 19).

4-8. 300 GPH VAPOR OPERATION 90-110 PSI). This is a one gun operation.

a. Open 300 GPH by-pass valve (21).

b. Connect 300 GPH nozzle to one gun.

c. Open discharge valve for the operating gun and close adjacent valve.

d. Place Main Switch (20) in burner position.

4-9. 500 GPH HOT WATER RINSE (300 PSI).

a. Open rinse by-pass valve (22).

b. Connect the 500 GPH rinse nozzle to one gun.

c. Open the discharge valve for the operating gun and close the adjacent discharge valve.

d. Set Main Switch (20) to burner position.

4-10. 500 GPH COLD WATER RINSE (300 PSI)

a. Open rinse by-pass valve (22).

b. Connect the 500 GPH rinse nozzle to one gun.

c. Open the discharge valve for the operating gun and close the adjacent discharge valve.

d. Place Main Switch (20) to cold rinse position.

4-11. BLOW DOWN OF HEATING COIL

NOTE: The blow down procedure should be performed after every 8 hours of operation (consult the hourmeter) or after every 4 hours of operation in areas containing hard water.

a. Place the cleaner in the 600 cph steam operation.

b. When the cleaner reaches full operating pressure open the intake blow down valve (11) two full turns. Immediately close discharge valves (18 and 19).

c. Permit cleaner to operate for 45 seconds only.

CAUTION: Do not permit cleaner to operate longer than the specified 45 seconds as damage to the heater coil will result. Keep discharge valves closed.

d. Immediately place Main Switch to OFF.

e. Open the intake blow down valve full and permit cleaner to blow down for 15 seconds.

f. Close intake blow down valve (11) and open discharge blow down valve (17).

g. Place Main Switch (20) to Cold Rinse. Stand clear of outlet as steam and hot water will flow out of the valve outlet.

WARNING: Do Not place Main Switch (20) to Burner position.

h. Permit unit to flush until clear water is discharged. Place Main Switch (20) to OFF.

i. Open discharge valves and close discharge blow down valve (17).

4-12. DESCALING THE COIL.

a. Disconnect delivery gun from delivery hose.

b. Close all the valves.

c. Attach the free end of the delivery hose to the float tank (6) and secure it in place with wire.

d. Place the Main Switch (20) to Cold Rinse and let cold water circulate for two minutes.

e. Place Main Switch to OFF.

f. Turn off the water supply and remove the water supply hose from the unit.

g. Lower the water level in the float tank to within 6 inches from the top edge.

h. Place the main switch to Cold Rinse and slowly add one quart of descaling acid in the float tank.

i. Let the machine run for five minutes and add another quart of descaling acid. Repeat this operation until a total of six quarts

of descaling acid has been used. Do not use a full strength concentrate.

j. Let the machine run for an additional 15 minutes. Place the Main Switch to OFF.

k. Remove the delivery hose from the float tank and place it in a receptacle for disposal.

l. Reconnect the water supply.

m. Place the Main Switch of Cold Rinse and permit the machine to run for 20 minutes in order to flush all parts with clear water.

n. Place Main Switch to OFF.

o. Inspect and clean float tank components.

4-13. REMOVING SOOT FROM THE HEATING COIL.

NOTE: Perform the desooting operation every 8 hours of operation. Consult the hourmeter.

a. Remove the heater clean out caps (25).

b. Operate the cleaner on the Cold Rinse operation.

c. Insert the gun nozzle into each safety vent opening (25) and flue stack opening. Direct spray in as many directions as possible.

d. Continue cleaning until clear water runs out of drain.

e. Replace cap (37).

4-14. SHUT DOWN. The extent to which the operator must go in order to shut the cleaner down depends on the length of time it is to be out of service. For periodic shut down, i.e., the end of the day's work or for servicing follow the directions given in paragraph 4-15. For long term shut down, i.e., storage, follow the directions given in paragraph 4-16.

4-15. PERIODIC SHUT DOWN.

a. Place the main switch to the OFF position and close the soap metering valve.

b. Turn off the water supply and remove the power cable from the electric source.

c. Store the cable, hoses, guns and other accessories in their prepare place.

4-16. LONG TERM (STORAGE) SHUT DOWN.

a. Blow down the heating coil as directed in paragraph 4-10. Place main switch to OFF position.

b. Turn off the Water supply.

c. Open the discharge blow down valve (17) and intake blow down valve (11).

d. Drain the compound tank, fuel tank and float tank by opening their drain valves or plugs.

e. Blow the unit out with compressed air.

f. Drain the pump.

g. Disconnect all hoses, guns, nozzles, cable and other accessories.

4-17. STORAGE IN FREEZING TEMPERATURES

a. Remove all water from the tanks, plumbing and pump.

b. Blow out the heating coil with compressed air to remove all water.

c. Break the union at the solution tank fill valve (10) and put one gallon of anti-freeze into the heater coil through this connection.

d. Freezing water in the heater coil can result in a broken coil. Preventative measures must be taken to remove all water from the system.

SECTION V

PERIODIC INSPECTION, MAINTENANCE AND LUBRICATION

5-1. GENERAL.

5-2. Overall inspection and maintenance of the cleaner requires a series of periodic tests and corrective measures which must be carried out in proper sequence. Paragraph references are given in these instructions whenever further information may be required to correct a malfunction.

5-3. PERIODIC INSPECTION.

5-4. DAILY INSPECTION.

a. Check the instructions, given in paragraphs 4-3 and 4-4.

b. Check the fuel pump suction filter for sediment accumulation.

c. Start the cleaner in the Hot Rinse cycle. Check the flue stack for clean fire and freedom from smoke. Black smoke is an indication of insufficient air. Smoke indicates a dirty burner condition or faulty blower operation. Check burner nozzles and blower wheel rotation.

d. When the discharge pressure gauge registers approximately 300 psi check and tighten any leaks in the piping.

e. Check all hoses and couplings. Hoses must be free of blisters and any physical damage. Couplings must be correctly attached and secured.

5-5. FOUR HOUR INSPECTION.

a. Blow down the heating coils (paragraph 4-11) in areas of hard water.

b. Check the supply of compound concentrate. Prepare according to instructions outlined in paragraph 4-5d.

c. The air chamber of the pump must be properly charged with air. Open the petcock on the suction air chamber (tee) for approximately 30 seconds while the pump is operating. This action will charge the pump chamber after which the petcock should be closed.

5-6. EIGHT HOUR INSPECTION.

a. Blow down the heating coils (paragraph 4-11) in areas of normal water.

b. Desoot the heating coils according to instructions in paragraph 4-12.

5-7. TWENTY-FIVE HOUR INSPECTION.

a. Remove the burner head (paragraph 5-19) and check the electrode gap (Figure 8). Remove all carbon deposits from the electrodes.

b. Remove and clean the screen strainer in the burner nozzles.

5-8. MAINTENANCE.

5-9. GENERAL. The following instructions are maintenance procedures required by periodic inspections (paragraphs 5-3) through (5-7) and for rectifying malfunctioning components indicated in the trouble shooting tables of Section VI. It should be understood, however, that instructions in disassembly, repair, etc. for the individual components should be accomplished by competent personnel.

5-10. FLOAT BALL AND VALVE ASSEMBLY. Turn on the water supply and check the action of the float valve. Pressing the ball down into the tank should allow water from the outside source to flow into the tank. Release the ball and again observe the action of the valve. If the tank is sufficiently full, the ball should rise and the valve close off the incoming water. If the valve is not functioning properly, water will continue to flow into the tank, thereby causing water to overflow. Check the valve plunger for wear and replace plunger if necessary. Check the float for leakage and solder any holes found after removing water.

5-11. WATER PUMP. If the pump cannot maintain required pressure, check the belts for slippage and tighten if necessary. If belts are tight, the pump should be checked for wear or damage.

5-12. TANKS.

5-13. CLEANING AND INSPECTION. After each 500 hours of operation, remove the drain plugs from the bottom of the tanks and drain off fluid. Flush the tanks clean.

5-14. FUEL FILTER. Close fuel tank shut off valve. Remove cap screw on bottom of metal bowl and remove bowl carefully. Remove gasket and filter. Remove sediment from the bowl replace filter in proper position and replace gasket and bowl. Tighten cap screw holding bowl. Open fuel tank valve and open bleed screw on filter top untill all air has been removed. Close bleed screw.

5-15. FUEL PUMP. (See separate instructions and parts sheets at rear of this manual). The following servicing procedures on the fuel pump are the only ones authorized to be performed by operating personnel.

5-16. INTAKE PORT PLUG. To check the tightness of the unused port, insert a 3/8 inch Allen key wrench into the plug and tighten to the right.

5-17. FUEL PUMP STRAINER REMOVAL. Loosen the 8 screws holding the cover to the body with a 7/16 inch offset socket wrench. After the screws are loose they may be removed by hand. Take the cover and cover gasket off and lift strainer out.

As the strainer disassembles horizontally all of the dirty oil in the strainer chamber will run out. This is desirable as otherwise the dirty oil would immediately fill the strainer after cleaning. Clean out any dirt remaining in the strainer chamber. Clean the strainer with kerosene, trichlorethylene or very hot water under pressure from a faucet. Inspect the strainer for dents or tears. Replace as necessary. Inspect the gasket for wear or tears. Replace if necessary.

5-18. RE-ASSEMBLY. Position the gasket in pump body and replace the strainer. Secure the strainer cover to the pump body with the gaskets and screws.

5-19. BURNER HEAD. (See Figure 4)

WARNING: Remove ignition cable from the igniter.

5-20. REMOVAL.

a. Disconnect the two tubing fuel lines (1).

b. Remove the burner cover plate (2) by removing the screws which fasten the burner head to the burner housing.

c. Carefully lift the burner head out of the housing and lay it on its side.

CAUTION: Care should be exercised when removing the burner head since the porcelain insulators crack easily and the flame detector leads have not been disconnected.

5-21. CLEANING AND INSPECTION.

a. Clean all carbon deposits from the electrodes and burner nozzle. Check the electrode gap and adjust as shown in Figure 4.

b. Remove burner nozzles (3 and 4) and disassemble. Check the screens for holes; solder or replace as necessary. Blow out each part with compressed air, making certain grit is removed.

c. Remove carbon deposit from electrodes (5) and (6).

d. Disassemble dribble valves (8) and clean inside. Blow out with compressed air. Replace if necessary.

5-22. ASSEMBLY.

a. Reassemble the burner nozzles, dribbe valves and electrodes, and replace in burner head.

b. Replace burner head in housing, being careful not to damage any parts. Secure the head to the housing.

c. Connect the two tubing fuel lines.

5-23. **ELECTRICAL SYSTEM.** (See Figure 9)

5-24. Trouble in the electrical system may be caused by an electrical failure of a component or a mechanical failure in another system, which may cause the electrical component to become inoperative. It is advisable to also check the other system trouble shooting tables if the causes listed in table 6-3 are not applicable.

5-25. **ADJUSTMENTS.**

5-26. GENERAL. The following adjustments do not require any component removal from the cleaner and are the only ones authorized by operating personnel.

5-27. SAFETY RELIEF VALVE. To increase or decrease the pop off point on the safety relief valve remove the cap and turn the adjusting screw clockwiee to increase the relief pressure and counterclockwise to decrease the relief pressure.

5-28. FUEL MODULATING VALVES. Modulating valves are set at the factory but may be reset if desired by means of the adjusting screw on top of the valves. Turning the adjusting screw counterclockwise will increase pressure and clockwise will decrease the pressure. Rinse valve should be set for a cut-out pressure of 110 psi.

5-29. **CABINET AND GUN ASSEMBLIES.**

5-30. CABINET. Any or all panels and doors of the cleaner cabinet can be removed by unscrewing the attaching sheet metal screws and machine screws. No maintenance of the cabinet is required and repair can only be accomplished by welding or straightening damaged parts provided that original alignment can be maintained.

5-31. The nozzles can be removed from the gun proper in the same fashion as standard pipe connections. Compressed air should be used to blow out any foreign matter which has found its way up into the gun. Carbon tetrachloride may be used to remove dirt of grease from any metal components.

> CAUTION: Replace packing and make sure all connections are securely tightened after reassembly.

5-32. **LUBRICATION.** (See Figure 4)

5-33. PUMP. Lubricate per separate instruction sheet at rear of the manual.

5-34. MOTOR. Every 12 months lubricate the motor as follows:

a. Wipe the area of the end bells, front and rear.

b. With the motor shut down, remove the plug at the top of the end bell and replace with a lubrication fitting. Remove drain plug at bottom of end bell.

c. Inject new grease with a pressure gun until all the old grease has been forced out of the bearing through the grease drain. Use Shell Alvania Grease #2 or Phillips IB and RB #2 Grease.

d. Run motor for approximately 5 minutes to relieve bearing of excess grease.

e. Replace drain plug.

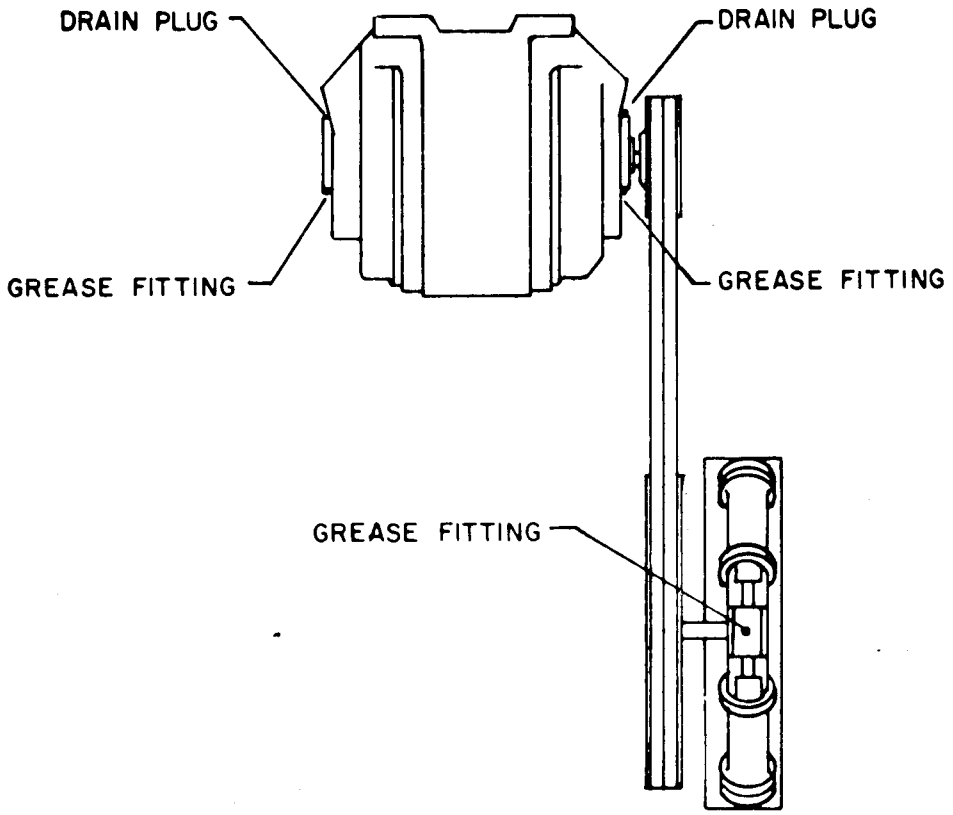


FIG. 4

LUBRICATION DIAGRAM

SECTION VI

TROUBLE SHOOTING

6-1. GENERAL

6-2. The trouble shooting charts in this section are arranged according to the major systems of the unit.

TABLE 6-1. WATER COMPOUND SYSTEM TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
No water or insufficient volume of water through cleaning gun.	Loss of motor speed due to low voltage.	Check electrical supply.
	Belt slippage.	Adjust or replace.
CAUTION: If this occurs shut down cleaner immediately to avoid damage to hose.	Insufficient water supply in float tank.	Reset float valve; water supply at least 600 GPH.
Unit fails to reach operating pressure.	Scale and lime in coil.	Blow down boiler or descale.
	Worn out water pump.	Check water pump; replace if necessary. (See separate overhaul instructions.)
Compound fails to appear at gun.	No compound in compound tank.	Check tank, refill if necessary.
	Suction line clogged up.	Remove and clean.
	Defective soap metering valve or improperly set.	Replace or reset.

TABLE 6-1. WATER COMPOUND SYSTEM TROUBLE SHOOTING (cont'd.)

TROUBLE	PROBABLE CAUSE	REMEDY
Float tank overflows.	Waterlogged float ball or defective float valve.	Check and repair float valve and ball.
	Improper setting of float valve operating arm.	Reset arm so valve shuts off float at level 3" from top.
Discharge pressure higher than normal.	Restricted gun nozzles.	Remove and clean.
	Fuel modulating valves out of adjustment.	Adjust valves.
	Boiler clogged.	Descale.
Dry steam comes out of delivery guns.	Worn pump.	Repair or replace. (See separate overhaul instructions.)
	High Temperature. Cut Out out of adjustment.	Adjust to 350°F.
	Water leak at heater coils.	Check coils and replace as found necessary.
	Loss of water speed, due to low voltage.	Check electric supply and inlet wiring.
	Solution tank fill valve is open wide.	Close down on valve.
Pump Hammers.	Insufficient air in pump air chamber.	Open air vent at rear of cleaner while the unit is operating. If the vent valve is open more than 5 seconds at a time the low flow switch may shut down the burner.

TABLE 6-2. FUEL SYSTEM TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Pump fails to deliver fuel.	The fuel level in the supply tank may be below the level of the intake line in the tank.	Fill the tank with fuel.
	Clogged fuel filter.	Remove and replace.
	Large air leak in intake line; fuel pump has become air bound.	Tighten all fittings. Use approved pipe dope. Bleed pump of air.
	Coupling between fuel pump and drive shaft may be broken or is slipping.	Tighten and/or replace.
Fuel leak.	Pump cover may not be tight.	Tighten screws.
	Shaft seal leak at pump.	Refer to Overhaul Instructions.
	Leak at pressure adjusting cap of fuel pump.	Refer to Overhaul Instructions.
Burner fails to ignite.	Ignition electrode shorted out or not properly set.	Re-gap electrodes.
	Insufficient fuel in tank.	Fill fuel tank.
	Ignition cable grounded.	Replace frayed and broken ignition cables.
	Solenoid valve inoperative.	Check wiring to solenoid.
	Burner Safety cycle not operating.	See separate Overhaul Instructions.
Smoke at stack outlet while burner is in operation.	Insufficient air to burner.	Check fan rotation.
	Improper fuel or water in fuel tank.	Check fuel (paragraph 3-3.)

TABLE 6-3. ELECTRICAL SYSTEM TROUBLE SHOOT ING

TROUBLE	PROBABLE CAUSE	REMEDY
Burner fails to ignite.	Ignition electrode shorted or not properly set.	Check for broken electrode porcelain and reset point. Replace if necessary.
	Ignition cable grounded.	Check for broken electrode porcelain and reset tips. Replace if necessary.
	Time delay coil burned out.	Check time delay coil. Replace if necessary.
	Solenoid valve coils burned out.	Check coils. Replace if necessary.
	Burner control inoperative.	Consult separate Burner Control Instructions.
Pressure continues to build up after cleaning gun shut off valve is closed.	Safety relief valve set too high.	Check operation of safety valve. Adjust or replace if necessary.
Burner cuts in and out rapidly.	Insufficient water flow.	Gun clogged up. Check conditions that exist under water system (Table 6-1.)
	Intake blow down valve partly open causing insufficient flow through boiler.	Close valve.
Ignition spark.	Cracked electrodes. Electrodes spaced incorrectly.	Check and adjust. Replace electrodes as necessary.
	Ignition lead from transformer to electrodes disconnected.	Connect lead.
	Ignition cable damaged, thereby grounding out.	Replace cable.

TABLE 6-3. ELECTRICAL SYSTEM TROUBLE SHOOTING (cont'd.)

TROUBLE	PROBABLE CAUSE	REMEDY
Unit fails to start.	loose or defective electrical connector.	Remove control box cover and check connection.
	Overload relay cut out.	Remove control box cover and reset contactor.
Radio interference.	Shielding system.	Replace igniter. Replace ignition lead. Check bonding straps.

REPLACEMENT PARTS LIST

This replacement parts list illustrates major assemblies and parts subject to replacement. Items listed in the parts list are indexed and keyed to agree with the appearance of the items in the illustration.

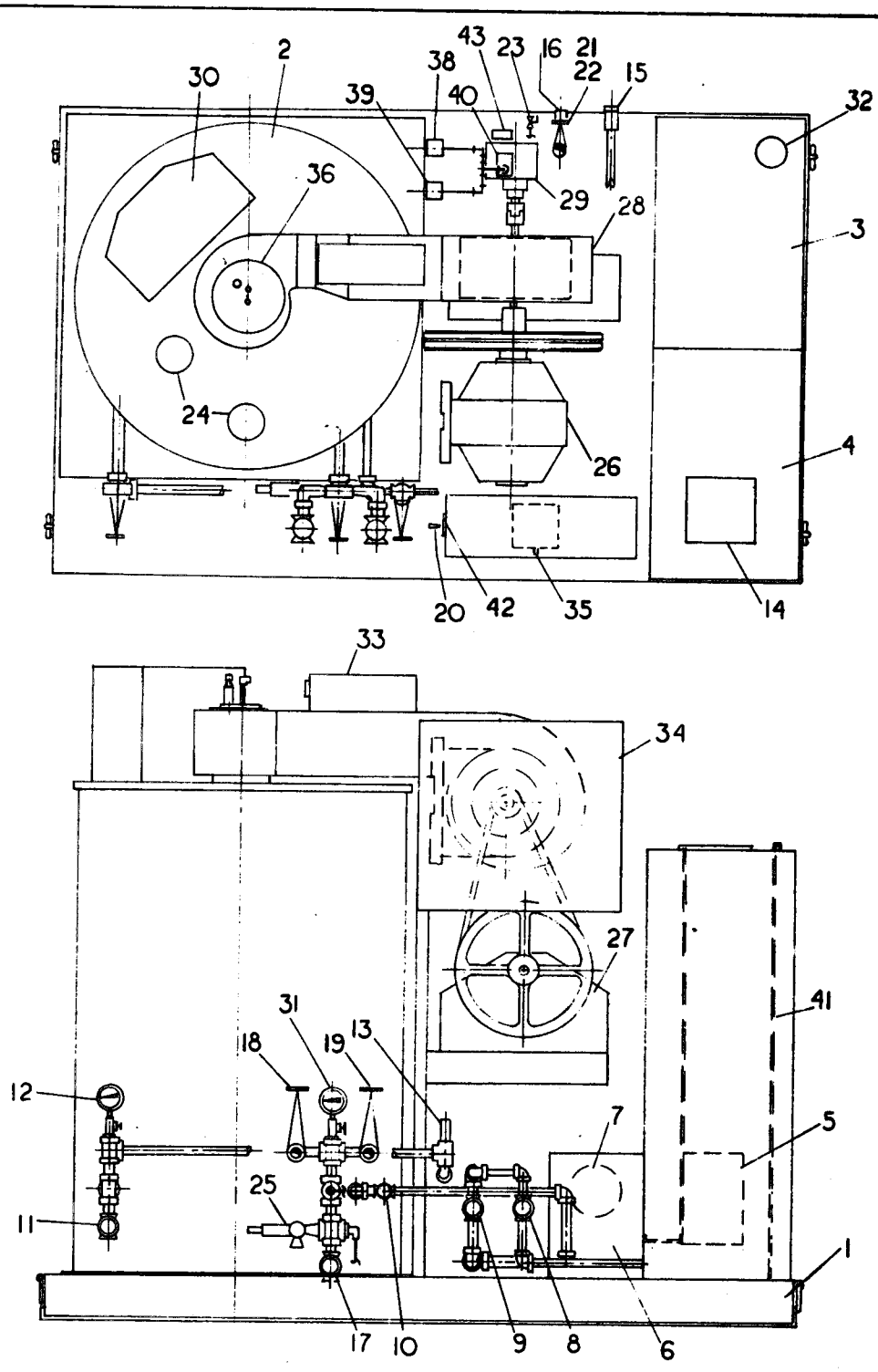


FIG. 5 STEAM CLEANER

FIG. AND INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSEMBLY
5-	PJC-600	Steam cleaner assy	Ref.
-1	107	Skid base	1
-2	106	Heater	1
-3	108	Fuel tank	1
-4	109	Solution tank	1
-5	1023	Soap basket	1
-6	1019	Float tank	1
-7	53350	Float valve	1
-8	53200	Soap metering valve	1
-9	53400	Float tank suction valve	1
-10	53220	Solution tank fill valve	1
-11	53220	Intake blow down valve	1
-12	80010	Intake pressure gauge	1
-13	48100	Low flow valve	1
-14	--	Solution tank cover	1
-15	59002	Pressure inlet plug	1
-16	51300	Suction inlet cap	1
-17	53220	Discharge blow down valve	1
-18	53320	Discharge valve	1
-19	53320	Discharge valve	1
-20	46000	Main switch (See Fig. 5)	Ref.
-21	53200	300 GPH by-pass	1
	1044	.300 GPH orifice nipple	1
-22	53200	500 GPH by-pass	1
	1045	.500 GPH orifice nipple	1
-23	53052	Air vent valve	1
-24	1011	Clean out cap	2
-25	56250	Safety valve	1
-26	45100	Motor (See Fig. 7)	Ref.
-27	57050	Water pump (See Fig. 7)	Ref.
-28	--	Fan (See Fig. 7)	Ref.
-29	57001	Fuel pump (See Fig. 7)	Ref.
-30	--	Stack opening	Ref.
-31	80010	Discharge pressure Gauge	1
-32	94101	Fuel fill cap	1
	93100	.Fuel fill screen	1
-33	47000	Ignition transformer	1
-34	--	Control panel (See Fig. 5)	Ref.
-35	--	Burner control reset	Ref.
-36	--	Burner assy. (See Fig. 8)	Ref.
-37	1025	Duct	1
-38	56100	Fuel modulating valve 'B'	1
-39	56100	Fuel modulating valve 'A'	1
-40	48010	Solenoid valve	1
-41	1033	Level Gauge	1
-42	49000	Hourmeter (See Fig. 5)	Ref.
-43	80001	Fuel pressure Gauge	1

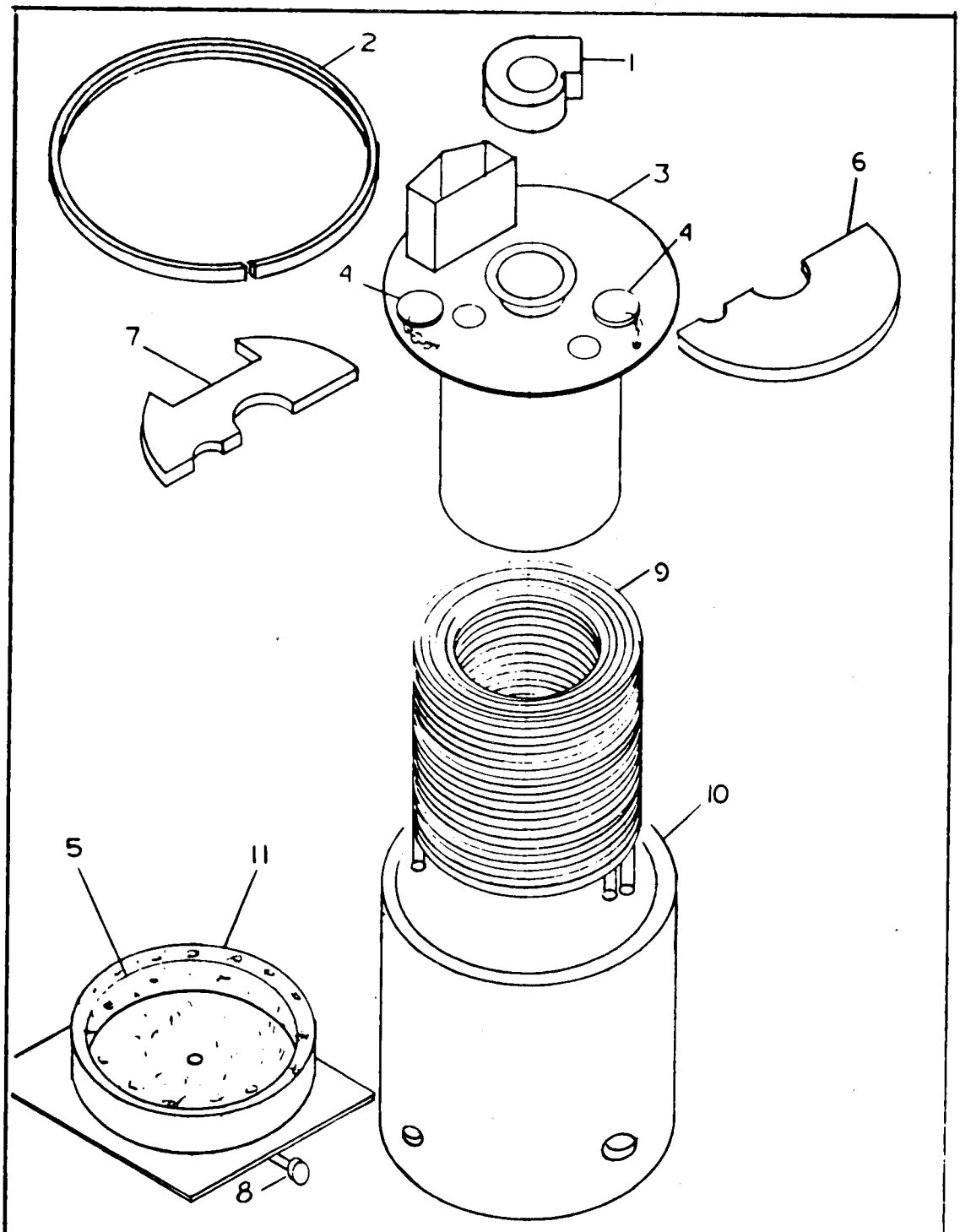


FIG.6 HEATER ASSEMBLY

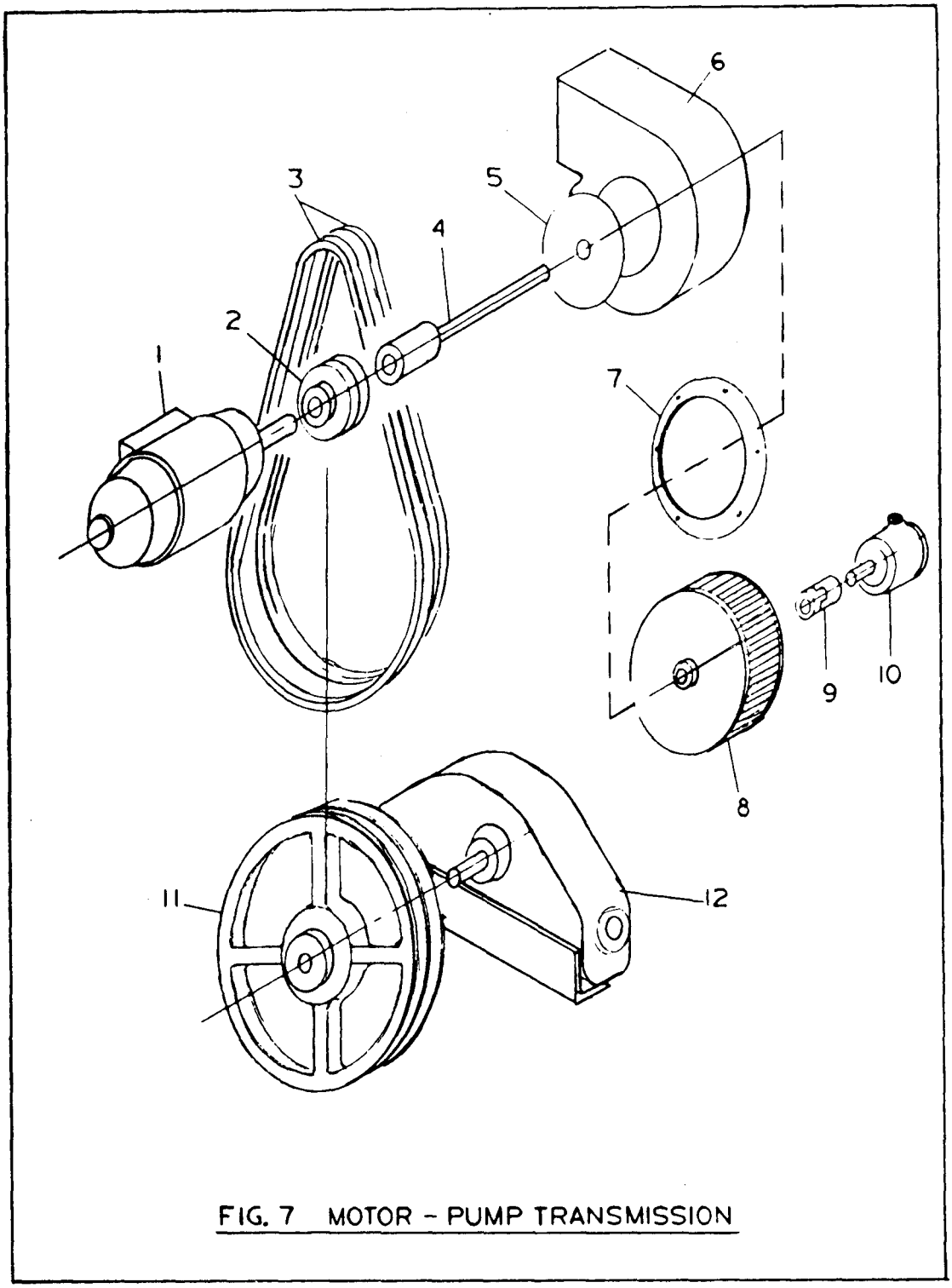
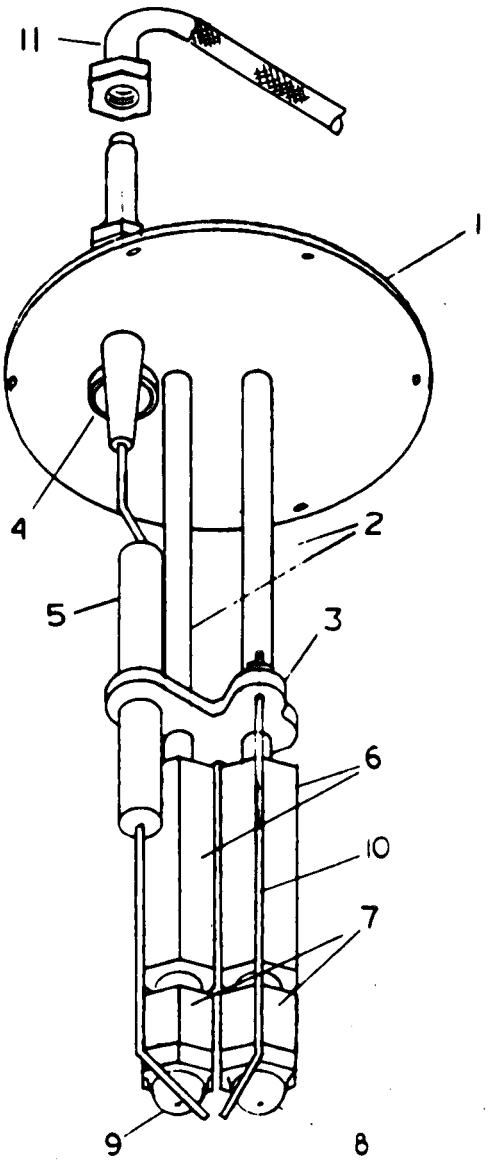
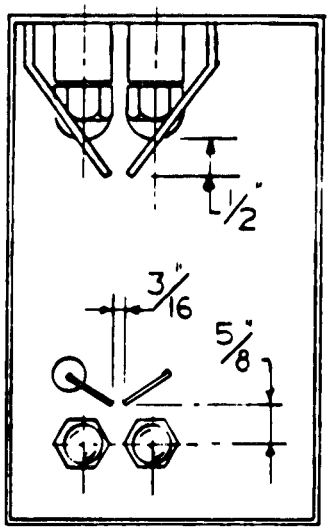


FIG. 7 MOTOR - PUMP TRANSMISSION





IGNITION ELECTRODE ADJUSTMENT

FIG. 8
BURNER ASSEMBLY

INDEX NO.	NO.	DESCRIPTION	ASSEMBLY
6-	106	Heater assembly	1
-1	91103	Burner housing	1
-2	1013	Clamp ring	1
-3	105	Inner shell assy	1
-4	1011	Cap	2
-5	94000	Refractory	
-6	1009-1	Insulation half	1
-7	1009-2	Insulation half	1
-8	51104	Cap, pipe	1
-9	102	Coil	1
-10	104	Outer shell	1
-11	107	Base assy	1
7-	--	Motor-pump transmission	1
-1	45100	Motor	1
-2	70100	Motor pulley	1
-3	71100	'V' belt	2
-4	1001	Motor Shaft	1
-5	91101	Housing back plate	1
-6	91100	Blower housing	1
-7	91102	Housing inlet ring	1
-8	90100	Fan	1
-9	75000	Pump coupling	1
-10	57001	Fuel pump	1
-11	70200	Water pump pulley	1
-12	57050	Water pump	1
8-	--	Burner assy	1
1-	1042	Cover plate	1
2-	51210	Pipe, fuel	2
3-	1046	Bracket, fuel line	1
4-	44201	Flame detector	1
5-	1036	Igniter	1
6-	53000	Dribble valve	2
7-	58250	Adapter, nozzle	2
8-	58050	Burner nozzle 5.5 GPH	1
9-	58060	Burner nozzle 6.5 GPH	1
10-	44301	Ground wire	1
11-	40200	Igniter lead	1

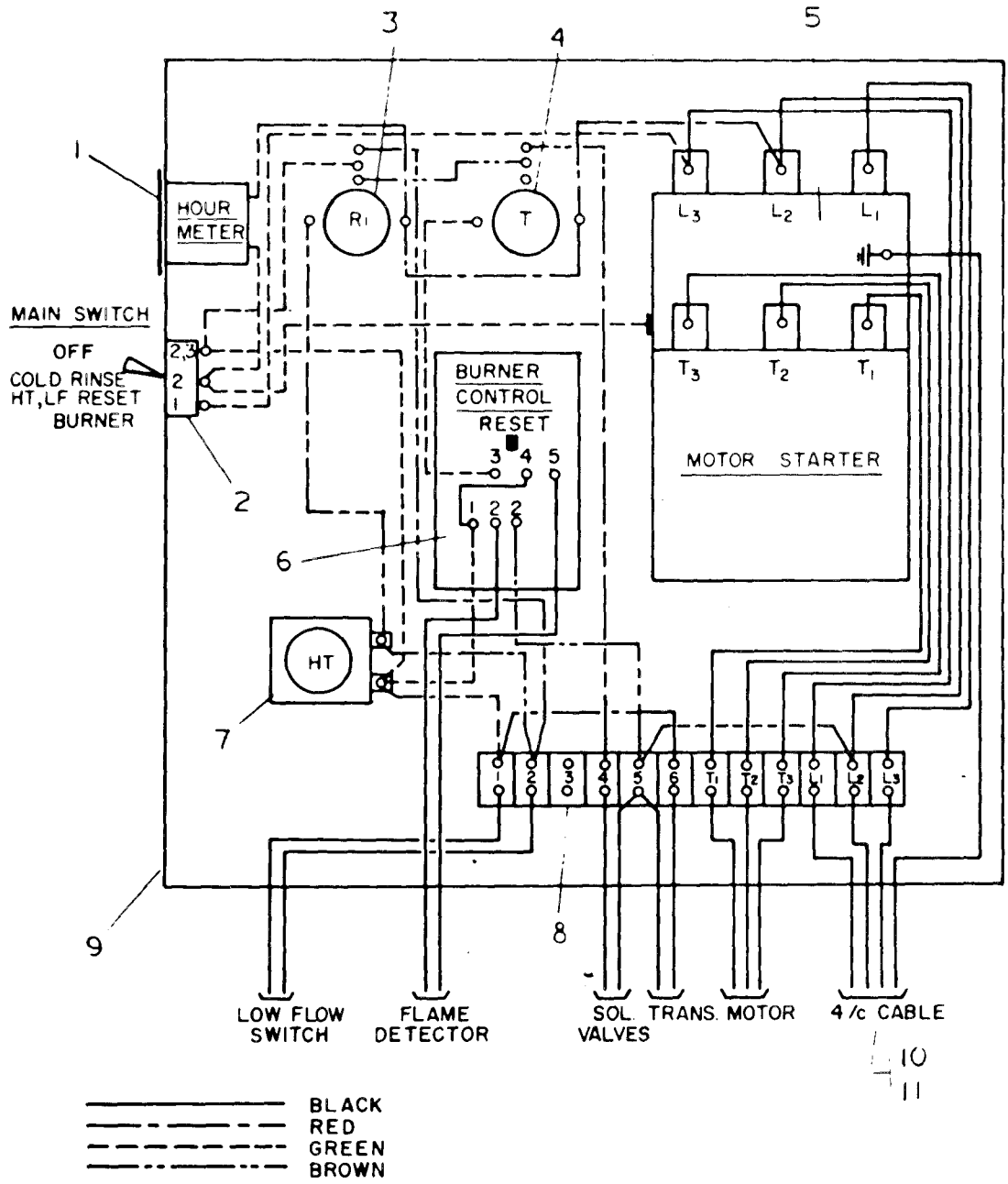


FIG. 9

WIRING DIAGRAM - CONTROL PANEL

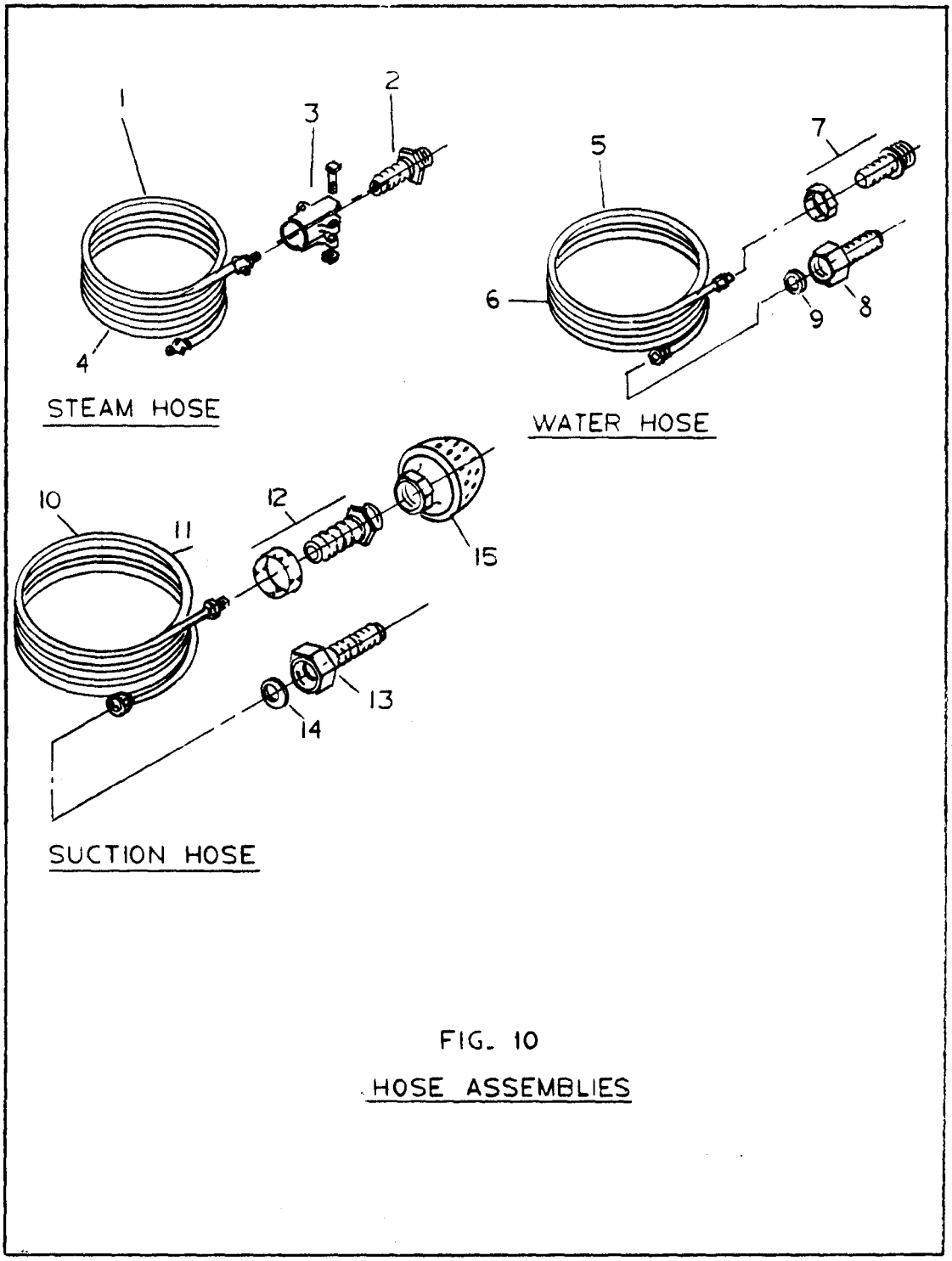


FIG. 10

HOSE ASSEMBLIES

FIG. AND INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSEMBLY
9-	--	Control Panel assy	1
-1	49000	Hourmeter	1
-2	46000	Switch	1
-3	44100	Relay	1
-4	44101	Timer	1
-5	44000	Motor starter	1
-6	44200	Burner control	1
-7	46500	Thermostat	1
-8	42200	Terminal block	1
-9	1047	Control box	1
-10		Electric cord 4/c	1
-11	42100	Plug, twist lock	1
10-	---	Hose assemblies	Ref
-1	60111	Steam hose assembly	2
-2	61110B	.Hose clamp	2
-3	61111DA	.Hose Nipple	2
-4	60110	.Hose, 3/4" I.D. X 50 ft.	1
-5	60210	Water hose assembly	1
-6	60211	.Hose, 1" I.D. X 50 ft.	1
-7	61210	.Male hose coupling	1
-8	61211	.Female hose coupling	1
-9	61211A	.Gasket	1
-10	60220	Suction hose assembly	1
-11	60221	.Hose, 1½" I.D. X 25 ft.	1
-12	61220	.Male hose coupling	1
-13	61221	.Female hose coupling	1
-14	61221A	.Gasket	1
-15	53499	.Foot valve and strainer	1

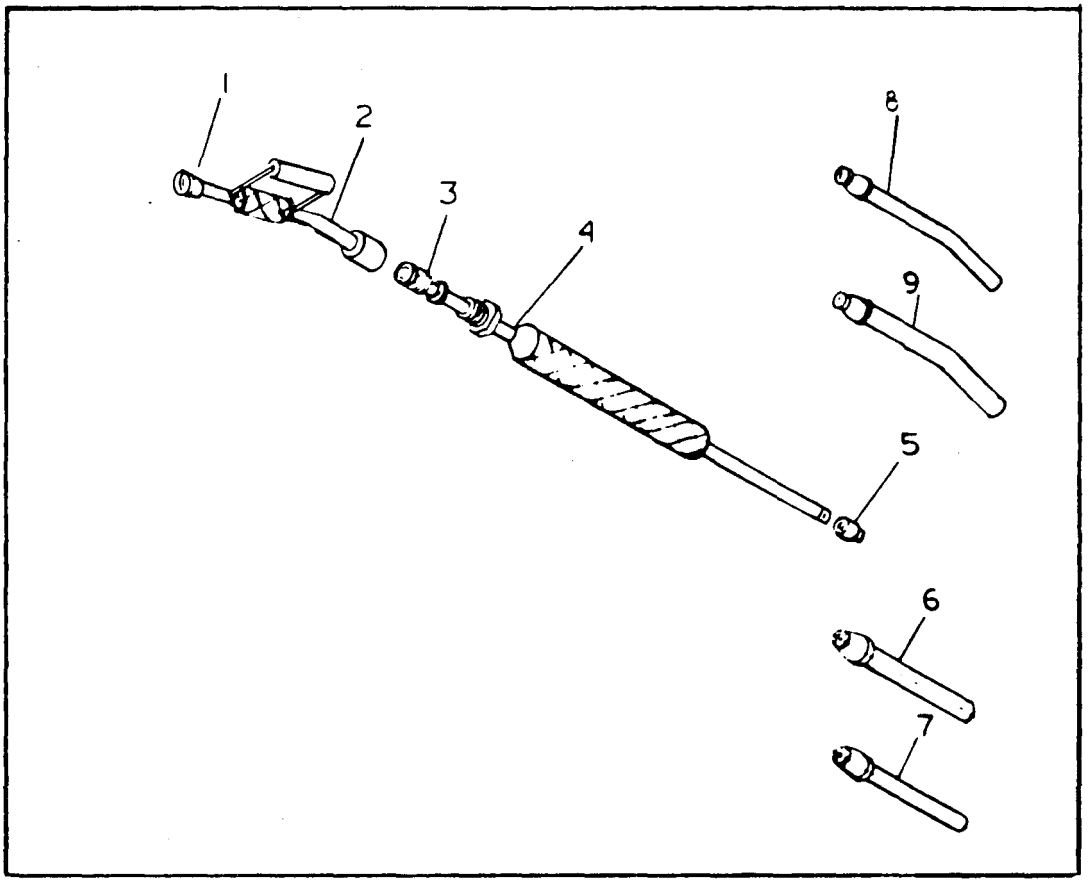


FIGURE NO. 11 STEAM GUN ASSEMBLY

FIG. AND INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSEMBLY
11-	1026	Steam gun assy	2
-1	51050	.Coupling	1
-2	1026-1	.Handle assy	1
-3	59001	.Packing	1
-4	1026-2	.Swivel assy	1
-5	1030	Rinse nozzle	1
-6	1029	600 GPH straight nozzle	1
-7	1028	300 GPH straight nozzle	2
-8	1038	300 GPH offset nozzle	4
-9	1037	600 GPH offset nozzle	2

APPENDIX

BASIC ISSUE ITEMS LIST

Section I. PREFACE

1. General

This appendix is a list of basic issue items. It is composed of those items which make up the major end items of equipment, and the operator's tools and equipment that are issued with the equipment and are required for stockage.

2. Requisition Notes

When requisitioning a C source (local procurement) item identified by a manufacturer's part number, it is mandatory that the following information be furnished the supply officer:

a. Manufacturer's code number (5 digit N. preceding the colon in the descriptive column).

b. Manufacturer's part number (the N. and sometimes letters following the colon, (a above). Dashes, commas, or other marks must be included exactly as listed.

c. Nomenclature exactly as listed herein, including dimensions, if necessary.

d. Name of manufacturer of end item (from cover of TM or manufacturer's nameplate)

e. Federal stock number of end item (from TM).

f. Manufacturer's model number (from TM or name/data plate, preferably name/data plate).

g. Manufacturer's serial number (from name/data plate).

h. Any other information such as type, frame number, and electrical characteristics, if applicable.

i. If Form 1348 (DOD Single Line Items Requisition System Document (Manual)) is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50. Complete form as follows:

(1) In blocks 4, 5, and 6, list manufacturer's code and manufacturer's part number (as listed in description colm).

(2) In "Remarks" field list name (repair part), end item application (FSN of end item), manufacturer, model number (end item), serial number (end item), and any other pertinent information, such as frame number, type, etc.

3. Explanation of Columns

a. Source, Maintenance, and Recoverability Code (colm 1).

(1) *Material numerical code* (colm 1a), This column not required.

(2) *Source* (colm 1b). This column indicates the selection status and source for the listed item. Source code used in this list is-

Code	Explanation
C	Obtain through local procurement. If not obtainable from local procurement, requisition through normal supply channels with a supporting statement of non-availability from local procurement.

(3) *Maintenance level* (colm 1c). This column indicates the category of maintenance authorized to install the listed item. Maintenance level code used in this list is-

Code	Explanation
O / C - - -	----------Operator or crew maintenance.

(4) *Recoverability* (colm 1d). This column indicates whether unserviceable items should be returned for recovery or salvage. When no code is indicated, the item will be considered expendable. Recoverability code used in this list is-

Code	Explanation
R---------	----------Items which economically are repairable at direct and general support maintenance activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number (colm *2).* Self -explanatory.

c. *Description* (colm 3). The following manufacturer's code is included in this column.

Code	Explanation
21571----------	----------Custom Built Trailers Co., Inc., Farmingdale, N. Y.

d. Unit of Issue (colm 4). Quantity Authorized (colm 5), and Illustrations (colm 6). Self-explanatory.

4. Abbreviations

Abbreviation	Explanation
c	----------cycle(s)
gph	----------gallons per hour
incl	----------include(s) (cd) (sive) (ing)
mtd	----------mounted
ph	----------phase
psi	----------pounds per square inch
v	----------volt(s)

5. Errors, Comments, and/or Suggestions

Reports by the individual user, of errors, comments, and suggestions are encouraged. They should be reported on DA Form 2028 (Recommended Changes to DA Publications) and forwarded directly to Commanding General, Headquarters, U. S. Army Weapons Command, ATTN: AMSWE–SMM–P, Rock Island Arsenal, Rock Island, Ill. 61202

Section II. BASIC ISSUE ITEMS LIST

(1) Source, maintenance, and recoverability code				(2)	(3)	(4)	(5)	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability	Federal stock No.	Description	Unit of issue	Quantity authorized	(a) Figure No.	(b) Item No.
					MAJOR COMBINATION				
					The following item is to be requisitioned for initial issue only.				
			R	4940-473-6218	CLEANER, STEAM, PRESSURE JET: steam generator incl, base mtd, 57-gal fuel tank cap, 57 gal compound tank cap, 25 to 125 psi inlet operating water pressure, 600-gph min water source output, 25-ft suction hose, 50-ft supply hose, 50-ft suction hose, 50-ft supply hose, 50-ft discharge hose, 3-ph, 220-vc, 60-c, 12.0-amp power source required (21571:PJC-600).	ea	--	12	1
					COMPONENTS OF MAJOR COMBINATION				
					None authorized.				
					REPAIR PARTS				
					TOOLS AND EQUIPMENT FOR: CLEANER, STEAM PRESSURE JET (21571:PJC-600)				
	C	O/C	-------	----------	BASKET, SOAP: (21571:1023) ----------	ea	1	12	5
	C	O/C	-------	----------	GAUGE, LEVEL: (21571:1033) ----------	ea	1	12	7
	C	O/C	-------	----------	FOOT VALVE AND STRAINER: (21571:53499)----	ea	1	12	11
	C	O/C	-------	----------	HOSE ASSEMBLY, STEAM: (21571:60111) -------	ea	2	12	4
	C	O/C	-------	----------	HOSE ASSEMBLY, SUCTION: (21571:60220) ------	ea	1	12	2
	C	O/C	-------	----------	HOSE ASSEMBLY, WATER: (21571:60201) ------	ea	1	12	3
	C	O/C	-------	----------	NOZZLE, OFFSET: 300 gph (21571:1038) ----------	ea	4	12	13
	C	O/C	-------	----------	NOZZLE, OFFSET: 600 gph (21571:1037) -------	ea	1	12	12
	C	O/C	-------	----------	NOZZLE, RINSE: (21571:1030) ----------	ea	1	12	10
	C	O/C	-------	----------	NOZZLE, STRAIGHT: 300 gph (21571:1028) ------	ea	2	12	8
	C	O/C	-------	----------	NOZZLE, STRAIGHT: 600 gph (21571:1029).	ea	1	12	9
	C	O/C	-------	----------	STEAM GUN ASSEMBLY: (21571:1026).	ea	2	12	6

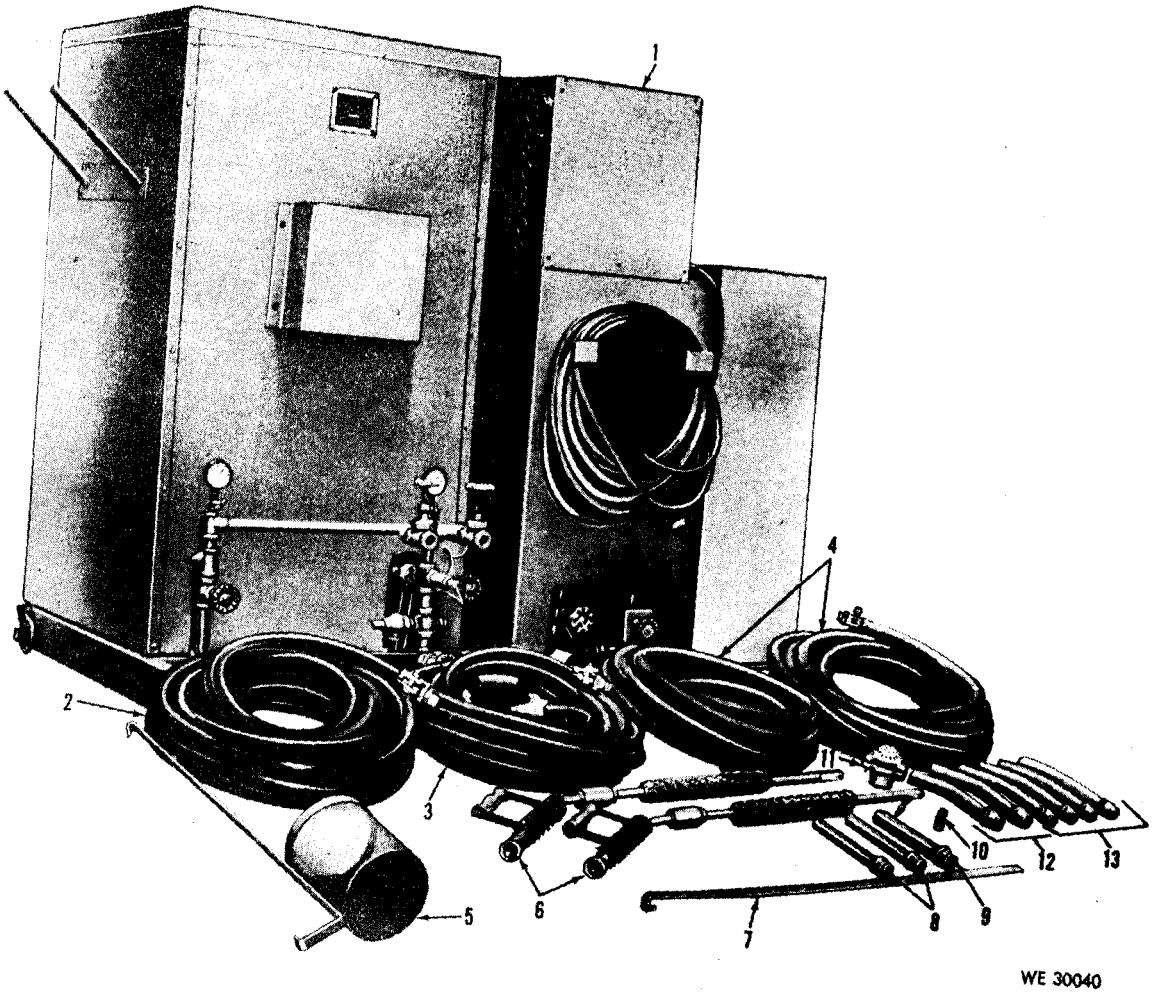


Figure 12. Tools and equipment.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Amy,
The Adjutant General.

Distribution:

Active Army:

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CNGB (1)
CC–E (1)
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USCONARC (3)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (1)
LOGCOMD (3)
USASMC (6)
USAWECOM (75)
USACDCEC (10)
USAAVCOM (10)
Armies (3) except
Seventh (5)
EUSA (5)
Corps (2)
USAC (2)
Ft Belvoir (2)
Ft Story (1)
Ft Wood (1)
USMA (1)
USAES (1)
LEAD (2)
LBAD (1)
SHAD (1)
TEAD (16)
Jefferson PG (1)
USASA Sup & Maint Cen (1)
USAAPSA (1)
USACOMZEUR (1)
4th USASA Fld Sta (1)
Units org under TOE (2 cys ea):
9–7
9–9
9–12
9–57
9–66
9–67
9–76
9–127
9–197

NG: None

USAR: None.

For explanation of abbreviations used, see AR 320–50.

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