TYPE O-11B CRASH FIRE TRUCK

OBJECTIVE

To learn the visual identification, inspection, maintenance, operation and individual crew positions of the Type O-11B crash fire truck.

INTRODUCTION

The Type O-11B crash truck is a self-contained firefighting vehicle designed for emergency rescue work on military airfields. The appearance, design and operation is similar to the Type O-11A crash fire truck.

GENERAL INFORMATION

The firefighting systems, as well as their components, are mounted on a specially designed 6x6 truck chassis which is propelled by a six cylinder Continental engine. An eight cylinder Continental air-cooled engine drives the pump for the foam system. Hose reels, auxiliary generator, coolant heating system, water and foam tanks, special tools, and the pump and its drive engine are in separate compartments designed to make it accessible for operation and maintenance. A five man crew is required to operate the truck and its firefighting equipment, which consists of two independent systems: (1) FOAM; and (2) CBM.

TABLE OF SPECIFICATIONS

Gross weight	42,100 lbs
Overall length	31' 3 3/4"
Overall width	8' 5 3/4"
Overall height (to top of turret)	12' 1"
Ground clearance	14 1/2"
Radius of turn	44' 3 1/2"
Inside tread - front wheels	61"
Inside tread - rear wheels	58 1/2"
Gasoline tank capacity	65 gallons

MAIN ENGINE

The Model S 6820-5 six-cylinder, in-line, liquid-cooled Continental engine propels the crash truck. It provides 325 HP at maximum output. Engine power is transmitted through the clutch, transmission, transfer case and propeller shafts to either the four rear wheels or to the front wheels. The engine is accessible through a hatch cover located on the top of the truck body and by removable side panels on each side of the engine compartment alongside the crew seats, which are located inside of the rear sets of doors. The engine is equipped with a waterproof, 24-volt electrical system for operation under all climatic conditions. Normal

starting and operating temperature of the engine is maintained by means of a heating and cooling system which is interconnected to the radiator and water pump on the main engine cooling system. An additional temperature control is provided by a diversion valve which is capable of by-passing the coolant from the engine as a temperature of 71°C (160°F) is reached.

TABLE OF SPECIFICATIONS

Type	Continental Motors
Weight (with accessories)	2203 lbs
Number of cylinders	6
Cooling	Liquid
Maximum brake HP	325 at 2800 rpm
Oil capacity	18 qts

PUMP ENGINE

An air-cooled, opposed, eight cylinder engine is provided to drive the main discharge pump. The pump engine is independent of the main engine, but gasoline is supplied from the same fuel tank. The pump engine has a fuel pump and filter for the supply of fuel. The ignition system consists of a starting motor energized from batteries, and magnetos to furnish the spark for operation of the engine. The starter is not energized unless the ignition switch is in the "ON" position, and with the switch in the "OFF" position, the magnetos are gounded out, cutting off the spark and stopping the engine. For quick adjustment of the throttle, depress the red button in the center of the knob and push in for more rpm or out for less rpm. For fine adjustment, turn the knob to the right to increase the rpm and to the left to decrease the rpm.

PUMP ENGINE SPECIFICATIONS

Make	Continental Motors
Model	PE 200-2
Cylinders	8 horizontally opposed
Horse power	220 @ 2400 rpm
Oil capacity	15 qts

FOAM-WATER SYSTEM

The foam water system is the primary firefighting system and is made up of a 1000 gallon water tank and a 100 gallon collapsible foam bag which is contained in the water tank, foam and water piping, pump, pump engine, and discharge outlets. This system is the same as the one on the O-11A except for minor changes and improvements which you will note.

PUMP SPECIFICATIONS

Make	Hale Manufacturer
Model	ZEYDH
Capacity	500 GPM @ 350 psi

DISCHARGE SPECIFICATIONS

Turret	400/200 GPM
Handlines	100/50 GPM
Ground sweeps	35 GPM
Under truck	15 GPM each

TURRET SYSTEM

The movements of the turret up and down and left to right are accomplished hydraulically, with the oil pressure originating at the hydraulic oil pump which is coupled to the pump engine. In the event of a loss of hydraulic pressure due to a malfunction, it is possible to operate this turret manually. The decontrol valves must be in the UP position for manual operation. All other movements associated with the turret, rate control, discharge control, and dispersion control are achieved manually through linkage.

TURRET OPERATION PROCEDURES

The turret system may be operated hydraulically by adhering to the following steps: (See Figure NR 1)

1. Pull both decontrol valves to the down position.

2. Set throttle in half position.

3. Start pump engine (observe tachometer).

4. Using turret control handle (extended), lift turret from bracket and swing forward.

5. Depress red button on turret control handle.

6. Move the electrical water switch on the ceiling of the cab to the "ON" position.

7. Check to assure that the rate control, discharge control, and dispersion control levers are all in their forward positions.

NOTE. The foregoing steps are to be accomplished as soon after the alert notification as possible.

The following steps will be accomplished when it is apparent there will be a discharge of agent soon. (3 to 5 minutes)

8. Pull the foam and churn valve levers to the up position.

9. Throttle the pump engine to maximum rpm's.

10. Release the red button on turret control handle to discharge when within range.

NOTE. If discharge is stopped from all appliances for more than a short time, move the pump engine throttle to the idle position. If discharge is stopped for a considerable period, close the foam valve and open the churn valve.

CBM SYSTEM

The CBM system on the type O-11B consists of a container for the CBM liquid, a cylinder of dry nitrogen, (the expellant force), valves, regulator, piping hose and nozzle.

The CB storage tank and nitrogen cylinder are located on the right hand side of the truck in the CB compartment. The CB storage tank has a capacity of 40 gallons and may be filled from gravity or from a pressure fitting. The nitrogen cylinder, when full, contains 2000 psi of nitrogen or dry compressed air and is equipped with an automatic pressure regulator that is set to supply 200 psi to the CB storage tank whenever the discharge rack gear is operated. The nitrogen cylinder should be replaced when the pressure gage reads 250 psi or less. One full nitrogen cylinder will discharge the storage tank three times.

1. Vent line valve
2. Overflow valve
3. Blowout line valve
4. Drain hose
5. Sight gauge
6. Gravity filler line check valve
7. Nitrogen valve operating lever
8. Drain line valve
9. Overflow plug
10. CB storage tank
11. CB storage tank valve
12. Gravity filler funnel
13. Nitrogen cylinder
14. CB handline nozzle
15. CB reel rewind button
16. Pressure regulator
17. Pressure filler line plug
18. Ratchet and valve

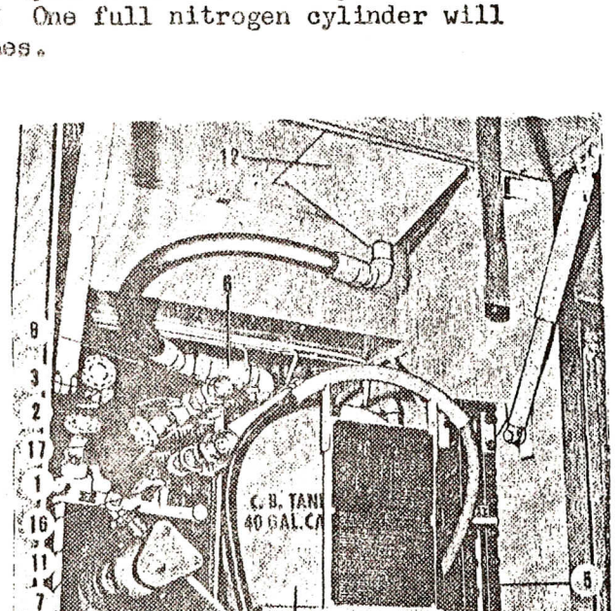


Figure 2. CBM System

SPECIFICATIONS OF CBM SYSTEM

Part number	814E-1195
Capacity	40 gals
Working pressure	200 psi
Handling length	150 feet
Handline diameter	1 inch

CB SYSTEM OPERATION PROCEDURES

1. Remove handline nozzle from truck.

CAUTION. Nozzle must be closed before CB tank is pressurized.

2. Pressurize CB tank by rotating operating lever 7 as far as it will go.

3. Open nozzle and apply CB liquid to fire.

4. After use, return operating lever 7 to original position. Close nozzle.

To Blow out Handline

1. Open handline nozzle.

2. Open valve 3 and purge with air until all CB liquid is drained from handline.

3. Close handline nozzle and rewind hose on reel.

To Fill CB Tank

1. Open tank vent line, valve 1.

2. Attach overflow hose at plug 9, open overflow line, valve 2.

3. Fill tank with CB liquid through funnel, or by pump connected to inlet plug 6, until liquid overflows from overflow hose or sight gage 5 indicates full.

4. Close overflow valve 2 and vent line, valve 1; remove overflow hose and screw plug 9 in tight. Tank is now ready for use.

To Drain Tank

1. Connect drain hose to drain plug 4 and place hose in position to drain into container outside truck body.

2. Open vent line valve 1.

3. Open drain line valve 8.

4. Drain contents of tank.

5. Close drain line valve 8 and vent line valve 1.

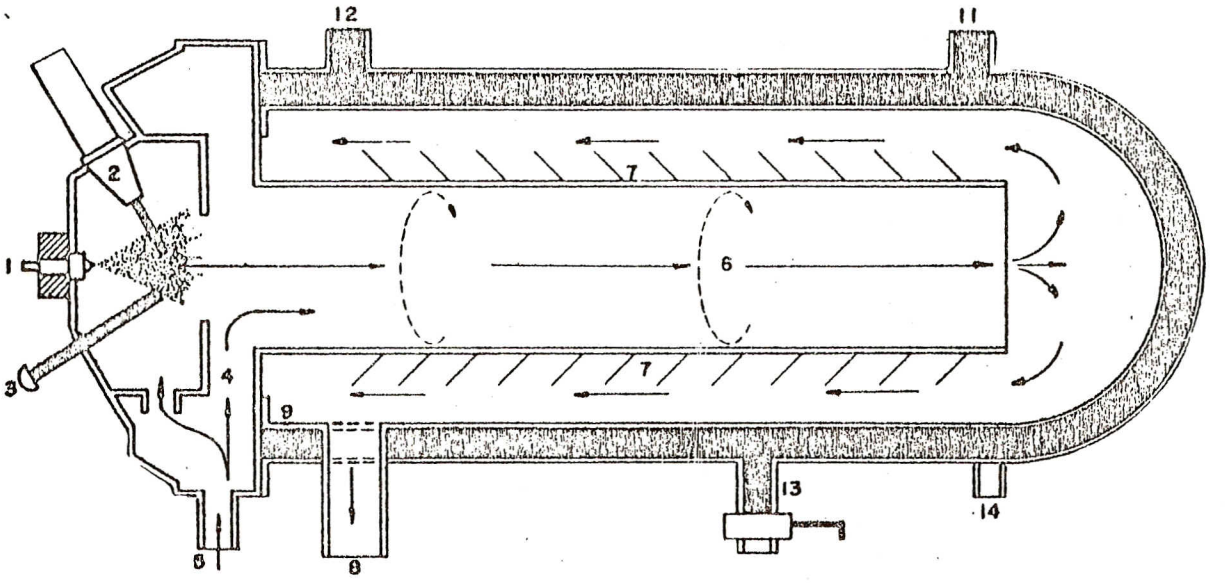
6. Disconnect drain hose and screw plug 4 in tight.

HEATING SYSTEM

TABLE OF SPECIFICATIONS

Coolant capacity	25 gals.
Booster heater	
Make	Surface Combustion
Model	B39B81
Heater output	90,000 BTU per hour
Fuel pressure	32 p.s.i.

The heating system on the Type C-11B crash truck is designed to give complete protection against temperatures as low as 65° below zero. This heating system is an integral part of the main engine cooling and/or heating system; the combined volume is approximately 25 gallons.



1. FUEL SPRAY NOZZLE
2. SPARK PLUG
3. GROUND ELECTRODE (STOVE BOLT)
4. COMBUSTION HEAD
5. BLOWER FAN INLET
6. COMBUSTION TUBE
7. BAFFLES
8. EXHAUST
9. COMBUSTION CHAMBER
10. COOLANT JACKET
11. INLET TO COOLANT JACKET
12. OUTLET OF COOLANT JACKET
13. COOLANT JACKET DRAIN
14. COMBUSTION TUBE DRAIN

Figure 3 - Janitrol Booster Heater

The water for this system is heated from two sources, the main engine and/or the booster heater. The heated water and/or anti-freeze solution is conveyed to all parts of the truck through the hose lines, finned tube radiators and heat exchanger, etc. The most important component of this system is the booster heater which is a gasoline burning 90,000 BTU unit that operates as indicated in the Diagram in Figure 3.

From the preceding diagram it can be seen that the booster heater consists of 14 basic parts in the booster heater proper. In addition, the unit has controls, thermostats and pumps that assure a supply of fuel, ignition temperature and air for the operation of the combustion chamber. Thermostats and pumps assure a flow of coolant through the coolant jacket.

In the event of a malfunction in the booster heater, the trouble is usually with a component that provides air, fuel or ignition temperature to the combustion chamber.

These components should be inspected; the fuel for proper pressure which is 32 psi; the circuit breaker located on the side of the heater control box; also, the "double pole throw switch" and the blower for delivery of air to the combustion chamber.

The booster heater is controlled by the main booster heater switch located on the dashboard and then by water temperature controlled thermostats located in the coolant jacket intake. This water temperature control thermostat actually stops and/or starts ignition in the combustion chamber.

The coolant is moved through the booster heater by a circulating pump that is actuated by the booster heater switch. Ignition is stopped when the coolant intake temperature reaches 165° and starts ignition when it cools to 150°.

As an extra measure of safety, there is an upper limit thermostat that will stop ignition if the lower 165° thermostat fails. The upper limit thermostat operates if the coolant temperature reaches 200°.

TANK HEATING SYSTEM

The tank heating system provides a means for heating the water in the main water tank suction line, valves, fire pump, pressure line and churn line. The foam in the foam bag is also heated by the warm water in the water tank.

The recirculating pump forces the tank water through a heat exchanger, and transfers heat from the heated coolant system to the tank water. From the heat exchanger, the water normally flows through the suction line to the fire pump, to the pressure line and returns to the water tank through the churn line. A valve located on top of the heat exchanger provides a by-pass directly back to the water tank when the main suction valve is closed.

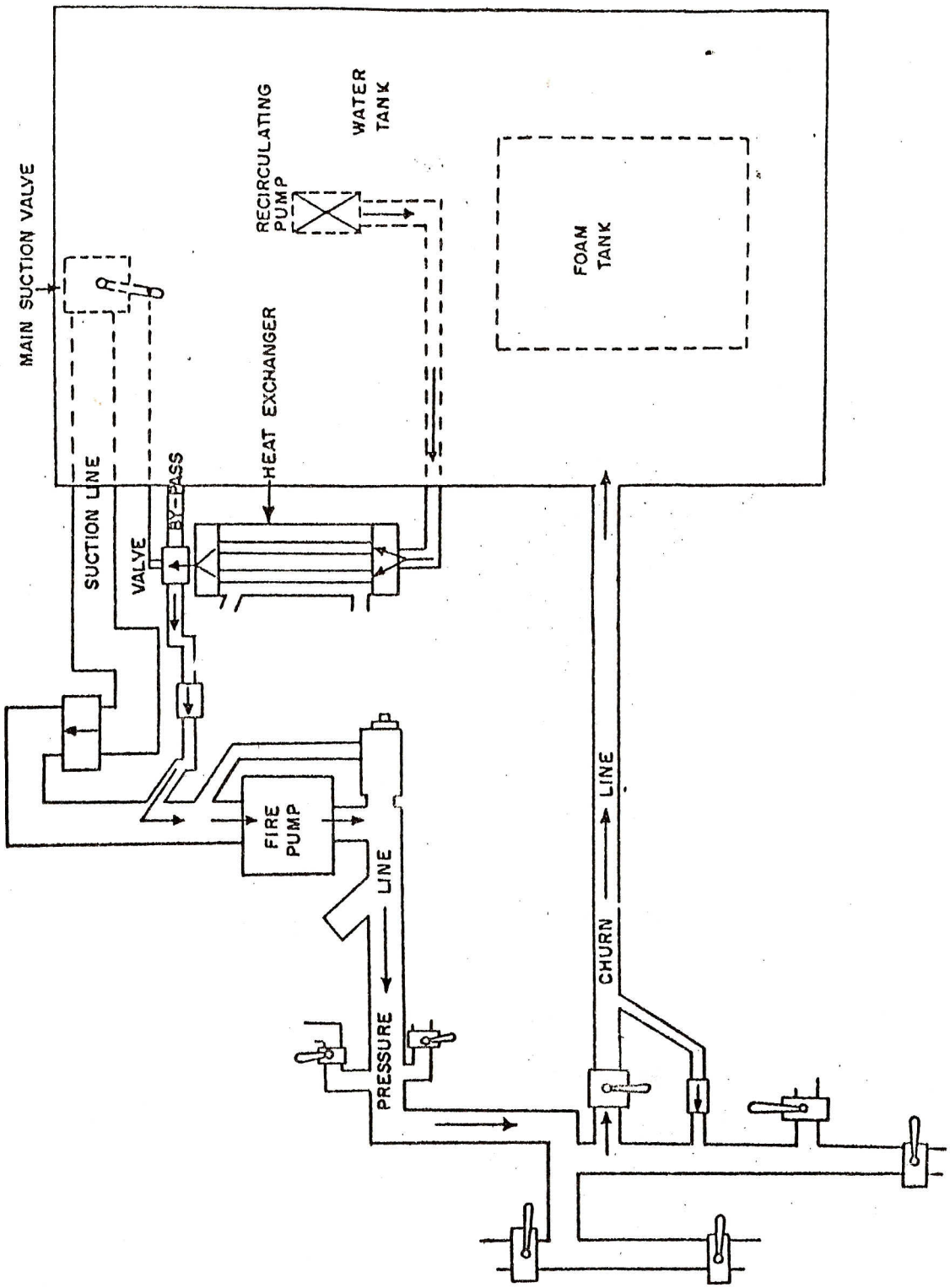


Figure 4. Tank Heating System