

SPENCER MANUFACTURING COLDBUSTER MARK IV

Chapter 1 General Information and Operating Instructions Table of Contents

Section 1: Description	3
1. General	3
Section 2: Operation	4
1. Controls and Indicators	4
A. Control Panel	4
(1) Master Switch	4
(2) Start Button	4
(3) Circuit Breaker	4
(4) Hour Meter	4
(5) Fuel Gauge	4
(6) Voltmeter	4
(7) Oil Pressure Gauge	4
(8) Coolant Temperature Gauge	4
(9) Air Delivery Control	4
(10) Tachometer	4
(11) Throttle Control Switch	5
(12) Duct Temperature Gauge	5
(13) Duct Pressure Gauge	5
(14) Panel Light Switch	5
(15) Panel Light	5
2. Operation	7
A. Before Operating	7
B. Starting the Coldbuster Mark IV Heater	7
C. Running the Unit	8
D. Stopping the Unit	9
Section 3: Specifications and Capabilities	10
1. Physical Specifications	10
A. Length	10
B. Width	10
C. Height	10
D. Weight	10
E. Towing Speed	10
F. Tire Pressure	10
G. Tire Size	10
H. Ground Clearance	10
I. Coolant System Pressure	10

SPENCER MANUFACTURING COLDBUSTER MARK IV

2. Fluid Capacities	10
A. Engine Oil	10
B. Coolant.....	10
C. Fuel.....	10
3. Operating Capabilities	11
A. Operating Temperature.....	11
B. Operating Time	11
<u>Section 4: Shipping.....</u>	<u>12</u>
1. Preparation for Shipping	12
<u>Section 5: Storage.....</u>	<u>13</u>
<u>Section 6: Torque Table.....</u>	<u>13</u>
<u>Section 7: Warranty.....</u>	<u>14</u>

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 1: Description

Coldbuster Mk IV



Figure 1-1. Coldbuster Mark IV

1. General

The Coldbuster Mark IV is a compact, rugged heating unit, designed to provide a large volume of clean, heated air for industrial use. The unit is designed for ease of operation and maintenance in cold environments, and is equipped to operate safely unattended, with a highly visible warning light supplied to alert nearby personnel in the event of low fuel level or other engine related problems.

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 2: Operation

1. Controls and Indicators

A. Control Panel

The following controls and indicators are located on the control panel (see figure 2).

(1) Master Switch

The master switch energizes the control panel, warning light and the engine electronic control module (ECM). It also controls the run and stop modes.

(2) Start Button

The start button engages the starter motor.

(3) Circuit Breaker

The 25-amp circuit breaker provides circuit protection for the electrical control system.

(4) Hour Meter

The hour meter records the total running time in hours on the engine.

(5) Fuel Gauge

The fuel gauge shows the remaining fuel level in the fuel tank.

(6) Voltmeter

The voltmeter shows the alternator output voltage.

(7) Oil Pressure Gauge

The oil pressure gauge shows the engine oil pressure.

(8) Coolant Temperature Gauge

The coolant temperature gauge shows the engine coolant temperature at the thermostat.

(9) Air Delivery Control

The air delivery control cable allows the operator to regulate the position of the recirculation valve, thus controlling the volume of airflow recirculated through the air to water heat exchanger and to the outlet duct. The cable is a locking vernier type to allow precise adjustment of air temperature and flow.

(10) Tachometer

The tachometer shows the engine speed in RPM.

SPENCER MANUFACTURING COLDBUSTER MARK IV

(11) Throttle Control Switch

The throttle control is a 4-position switch used to set the engine speed. The 4 – positions are:

full counterclockwise (low idle)	– 1100 RPM
first midrange	– 1800 RPM
second midrange	– 2300 RPM
full clockwise (high idle)	– 2800 RPM.

(12) Duct Temperature Gauge

The duct temperature gauge shows the air temperature at the flexible duct where it leaves the heater cart.

(13) Duct Pressure Gauge

The duct pressure gauge shows air pressure at the duct inlet.

(14) Panel Light Switch

The panel light switch energizes the panel light.

(15) Panel Light

The panel light illuminates the front face of the control panel.

SPENCER MANUFACTURING COLDBUSTER MARK IV

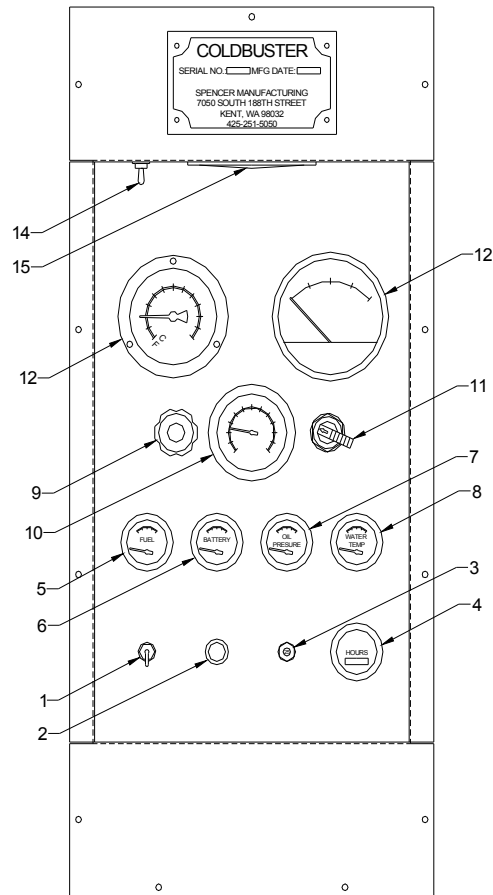


Figure 1-2 – Control Panel

SPENCER MANUFACTURING

COLDBUSTER MARK IV

2. Operation

A. Before Operating

NOTE: The heater is shipped without fuel and with battery cables disconnected. The heater must be fueled and cables must be connected to battery before operation. Always connect the positive cable first, then the negative cable.



WARNING: BEFORE OPERATING UNIT, ENSURE PARKING BRAKE IS ENGAGED TO AVOID UNEXPECTED MOVEMENT OF THE HEATER. THE PARKING BRAKE SYSTEM IS CONNECTED TO THE TOWBAR THROUGH ADJUSTABLE LINKAGE. MOVING THE TOWBAR TO THE UPRIGHT AND LOCKED POSITION ENGAGES THE BRAKES.



WARNING: THE HEATER CART MUST NOT BE OPERATED INDOORS UNLESS PROVISION IS MADE TO VENT EXHAUST GASES TO THE OUTSIDE.



WARNING: NEVER TOW THE HEATER WHILE THE ENGINE IS RUNNING.

CAUTION: CHECK ENGINE OIL AND COOLANT LEVELS PRIOR TO OPERATION. INSUFFICIENT LEVELS COULD RESULT IN ENGINE DAMAGE.

To check coolant level, locate the sight glass on the surge tank. The fluid level is normal when the surge tank is approximately half full in the cold state. Add fluid only if none is visible in the sight glass.



WARNING: DO NOT OVERFILL THE SURGE TANK; HOT COOLANT COULD BE EXPELLED AS THE SYSTEM HEATS UP.

CAUTION: NEVER OPERATE THE HEATER WITH 12" DUCT IN STORED POSITION. ENGINE OVERHEATING COULD RESULT.

B. Starting the Coldbuster Mark IV Heater

To start the heater engine, proceed as follows:

- (1) Open rear door and deploy the duct as desired.
- (2) Turn on master switch.
- (3) Turn the throttle position switch to the far left (counterclockwise), low idle position.
- (4) Press and hold the start button. Release the start button when the engine starts.

NOTE: The engine computer control senses the outside air temperature and automatically adjusts the starting fuel air ratio to deliver the correct amount of fuel without the need for choke control or block heaters. Block heaters may be added in extremely cold weather locations.

SPENCER MANUFACTURING

COLDBUSTER MARK IV

NOTE FOR AIRCRAFT GROUND SUPPORT PERSONNEL: 12" aircraft adapter is designed to mate directly to standard aircraft flange. To attach, move green levers to "up" position. Press the adapter against flange and rotate clockwise to lock. Move the green levers down to seal the adapter to the flange. See figure 1-3.

C. Running the Unit

- (1) After the engine has been operated a few minutes and runs smoothly, warm up the heating system by closing the air delivery valve and increasing the engine RPM to position 4 (2800 RPM). Engine coolant temperature will stabilize at 195 F to 220 F (91 C to 104 C).

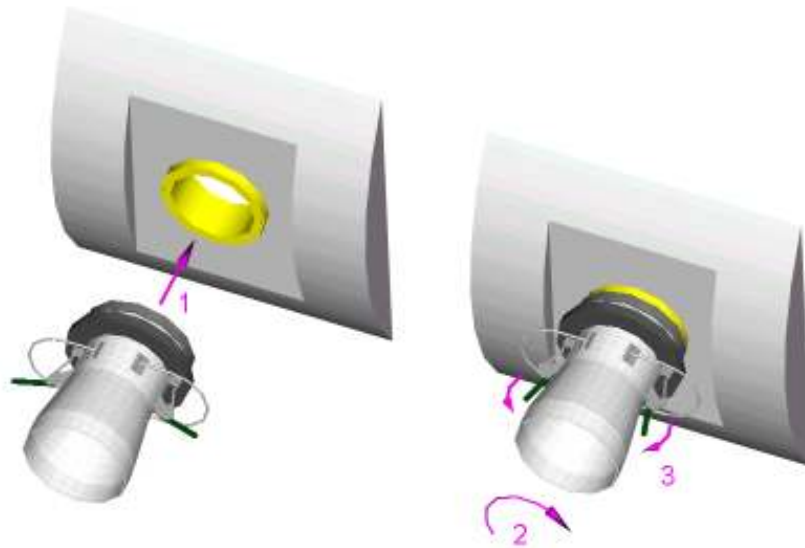


Figure 1-3. Attaching the Aircraft Adapter

NOTE: The onboard computer constantly monitors the cylinder head / coolant temperature. At approximately 240 F (115 C) the computer reduces the fuel ratio to the engine. This results in the coolant temperature dropping and stabilizing. In the event of serious cooling problem the engine will shut off and the warning light start flashing at 250 F (121 C).

- (2) Regulate throttle and air delivery control to obtain desired air volume and temperature.

NOTE: The heat generated at a given engine RPM is relatively constant. Therefore, fine adjustment of the air temperature is obtained with the air delivery control, so that a higher temperature is gained by reducing output airflow.

The Coldbuster Mark IV is equipped with a highly visible warning light mounted on top of the cart. This allows the heater to be operated unattended without the need for periodic checks of its fuel supply.

The warning light will activate under the following conditions:

SPENCER MANUFACTURING COLDBUSTER MARK IV

Low fuel supply- The light starts flashing when less than 1/4 of a tank remains, which is enough for approximately 3 hours of operation at full load.

Low oil pressure or high cylinder head / coolant temperature shutdown- The light flashes when the heater experiences a shut down condition with the master switch in the on position. This can be due to the oil pressure dropping below 15 psi (103 kPa), the cylinder head / coolant temperature exceeding 250°F (121°C) causing emergency shut down.

D. Stopping the Unit

(1) Move the throttle switch to the low idle position (counter clockwise).

(2) Shut off master switch.

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 3: Specifications and Capabilities

1. Physical Specifications

A. Length

9' – 9" (2.97m) tow bar up
12' – 6" (3.81m) tow bar down

B. Width

4' (1.22m)

C. Height

5' - 3" (1.60m)

D. Weight

Approximate Weight = 3600 Lb. (1636 kg)

E. Towing Speed

Maximum towing speed = 15 mph (24km/h)

F. Tire Pressure

Maximum tire pressure = 50 psi (344 kPa) cold

G. Tire Size

18.50 X 8.5-8

H. Ground Clearance

Ground clearance under the tow bar = 4" (10.6 cm)

I. Coolant System Pressure

16 pound per square inch maximum

2. Fluid Capacities

A. Engine Oil

Engine oil capacity = 5 US quarts (4.7L) (SAE 5-30 recommended) see Ford Operator's Manual

B. Coolant

Coolant capacity = 12 US gallons (45 L) (50% water / 50% ethylene glycol)

C. Fuel

Fuel capacity = 50 US Gallons (189.3 L) (regular unleaded 87 or 89 octane gasoline)

SPENCER MANUFACTURING COLDBUSTER MARK IV

3. Operating Capabilities

A. Operating Temperature

Heating mode: -40°F to 50°F (-40°C to 10°C) ambient

B. Operating Time

Running time per tank of fuel = Approx. 12 Hours @ maximum load

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 4: Shipping



WARNING: FUEL TANK IS LOCATED BETWEEN LIFTING TUBES. USE CAUTION WHEN APPROACHING THE CART WITH A FORKLIFT.

The Coldbuster Mark IV is equipped with lifting tubes, allowing it to be lifted from either side by a forklift. The same tubes should be used for tying the heater down for transportation.

1. Preparation for Shipping

- A. Disconnect and secure battery cables.
- B. Strap down battery.
- C. Close all access doors.
- D. Secure cart to truck bed or deck by routing chains through lifting tubes as shown.
- E. Set parking brake by raising towbar to the upright and locked position.

If the unit is to be shipped overseas, provisions must be made to protect the unit from the saltwater atmosphere.

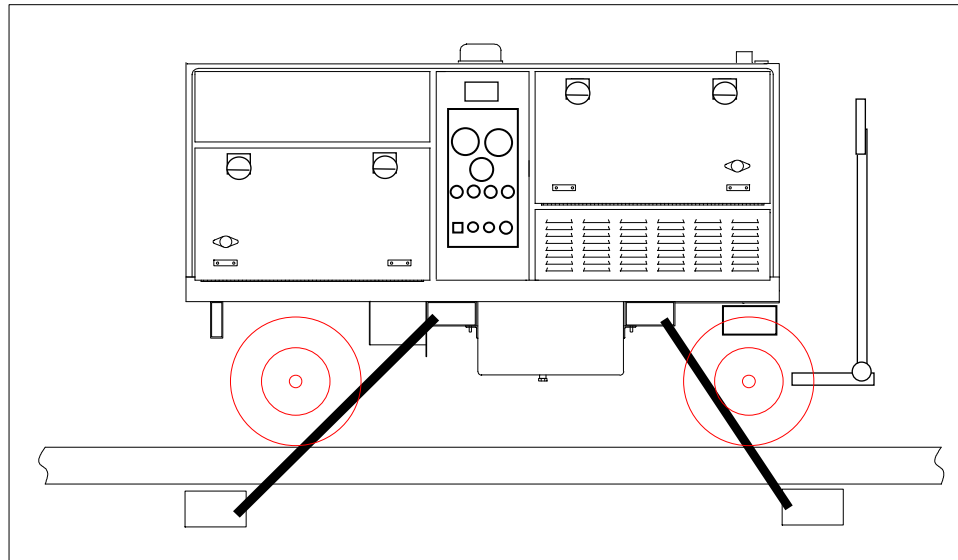


Figure 1-4. Proper Chaining Locations

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 5: Storage

To maximize the life expectancy of the Coldbuster, it should be stored indoors in a cool, dry area. For short-term storage, run engine at idle speed for 10 minutes each week. For storage periods exceeding 6 months, disconnect battery, ensure fuel tank is completely filled, and periodically check tires for proper inflation. See accompanying Ford Maintenance and Operator's Manual for engine preservation instructions.

Section 6: Torque Table

This table is provided as a guide only and is not a replacement for judgment and good shop practice. Consult OEM documentation for engine fastener torque specs. Many factors, such as lubrication, plating, and tolerances affect torque values; critical applications should be referred to a qualified engineer.

Recommended Torque, FT•LBs				
S.A.E. GRADE	1 or 2	5	6	8
Dia, inches.				
1/4	5	7	10	11
5/16	9	14	19	22
3/8	15	25	34	37
7/16	24	40	55	60
1/2	37	60	85	92
9/16	53	88	120	132
5/8	74	120	167	180
3/4	120	220	280	286
7/8	190	302	440	473
1	282	466	660	714

Figure 1-5 Torque Table

SPENCER MANUFACTURING COLDBUSTER MARK IV

Section 7: Warranty

Spencer Manufacturing warrants Coldbuster Mark IV parts of its own manufacture against defects in material and workmanship under normal use and service for a period of one year after the date of initial shipment of the equipment, on the condition that the unit has been operated and maintained in accordance with the operating and maintenance instructions contained in this manual and applicable service bulletins. This warranty is limited to repair or replacement without charge of parts found defective, F.O.B. its plant in Auburn, Washington. The company shall have the option of requiring the return of the defective parts transportation prepaid, to establish the claim. The company shall in no event be held liable for damages caused by defective material/workmanship and no allowance will be made for repairs or modifications done by the customer unless made with Spencer's written consent or approval. Material not of the company's manufacture shall be warranted only to the extent of the manufacturer's warranty. There are no warranties, express or implied, except the above, and the company shall not be liable for any special, indirect, or consequential damages.