

MANUAL

BT400-NEX-G

INSTALLATION-OPERATION/MAINTENANCE INSTRUCTIONS AND PART LIST



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A French translation of this manual is available upon request.
Une traduction en Française de ce manuel est disponible sur demande.

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SECTION 1 - INTRODUCTION

1.1 General

1.2 Scope

- 1.3** These instructions are for use by personnel who have purchased the BT400-NEX-G heater manufactured by AEROTECH HERMAN NELSON INC. Contained within is the information on the operation and maintenance of the heater as well as the description of the major components and their functions in relation to other parts in the heater. In addition, a list of repair parts which may be required for maintaining the heater is provided in Section 6.

1.4 Safety Precautions

- 1.5** Precautionary measures to be taken during operation and maintenance of the heater are contained in the appropriate paragraphs of the manual.
- 1.6** Listed below are the definitions of commonly used terms in this manual.

DANGER: You will be subject to serious injury or death if you fail to follow instructions!

WARNING: You could be subject to serious injury or death if you fail to follow instructions!

CAUTION: You can be hurt if you fail to follow instructions!

NOTICE: Your heater or other property could be damaged if you fail to follow instructions!

1.7 Moving heaters while in operation

- 1.8** It is strongly recommended by **AEROTECH HERMAN NELSON INTL INC.** that our heaters NOT be moved while in operation. There is a strong possibility that the fuel being sloshed around inside the fuel tank can leak out of the vents and come in contact with the flame in the combustion chamber causing a fire. The fuel pick up line in the tank may suck in air which will cause cavitation of the fuel pump, which will stall the engine; the flame in the combustion chamber will go out, causing the heat exchanger to warp due to lack of cooling air, which will decrease the life of the heat exchanger. If the engine has stopped because of a cavitation the fuel system will need to be bled to remove the air. When the fuel pump has no fuel the gears may become damaged introducing metal filings into the fuel system. These metal filings can then get into the engine causing major damage to a host of major components on your heater

SECTION 2 - DESCRIPTIONS

2.1 General

2.2 Scope

2.3 The model **BT400-NEX-G** heater (see figure 2-1 and 2-2) is a fully enclosed, portable heater shown on the optional trailer. The heater is intended for use in the heating of maintenance shelters, portable hangers, aircraft engines and fuselages, and other similar enclosures.

2.4 Power Unit

2.5 The model **BT400-NEX-G** heater is supplied with a 5.5 hp HONDA engine. The engine supplies all the power necessary for operation of the heater. Air is drawn through the air inlet louvers (see figure 2-1), passes through and around the heat exchanger, and is discharged through ducts mounted on the duct adapter assembly (see figure 2-2). The engine has a coupling attached to the drive shaft. A drive coupling is connected to the driven coupling by a flexible rubber sleeve which mates with the two. The driven coupling drives the heater fan directly as well as an integral pulley with a V-belt that drives the fuel pump mounted ahead of the fuel service point on the left side. The heater ignition coil is located on the opposite side of the unit.



Figure 2-1 Left Front View

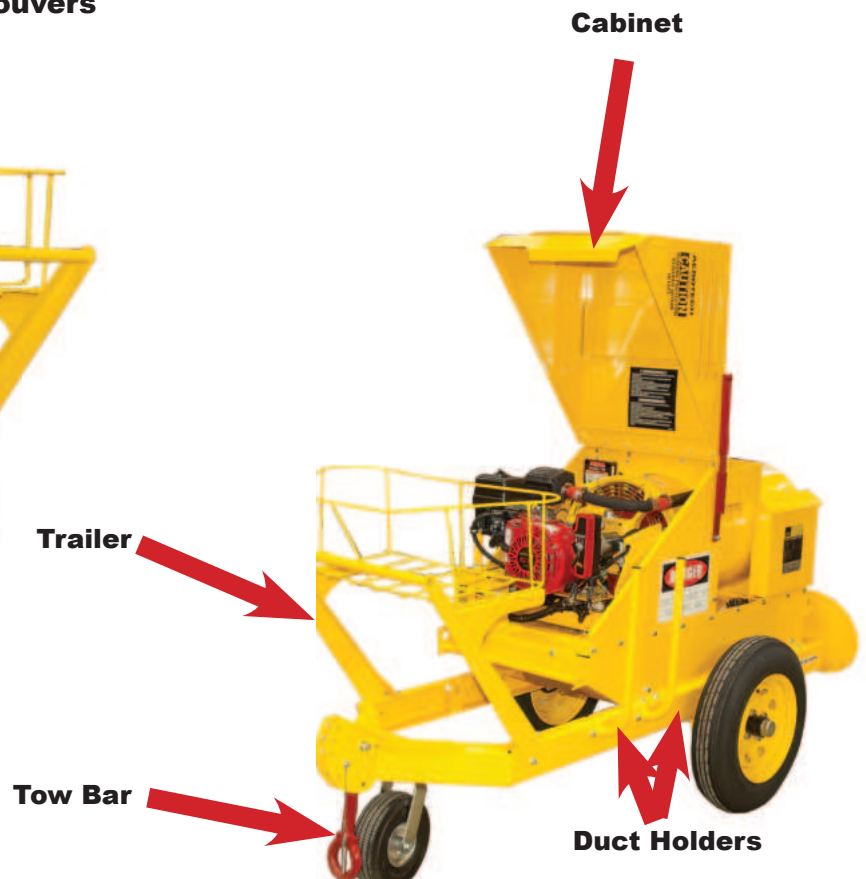


Figure 2-2 Right Front View

SECTION 2 - DESCRIPTIONS



2.6 Fuel System

- 2.7** The fuel system (see figure 2-3) supplies fuel for the heater and to the engine. Fuel is drawn from a removable 16 gallon fuel tank suspended by straps in the base of the heater, through an automotive type fuel filter. A belt-driven fuel pump draws fuel through the filter and delivers it under constant pressure to the heater combustor and gasoline engine. A burner fuel valve is provided to activate the combustion, and to automatically shut down the combustion in the event of dangerously high discharge air temperature. A temperature control valve is provided to control discharge air temperatures between 150°F and 250°F. The fuel nozzle is contained in a holder with inlet and bypass fuel lines. Fuel flows through the nozzle and is atomized. As the fuel leaves the nozzle it is ignited by the igniter plug in the combustor. Fuel is also bypassed from the nozzle, through a check valve (5 PSI), to the temperature control valve. A 5psi check valve is installed on the inlet side of the temperature control valve to maintain a minimum pressure so the fuel nozzle maintains a proper fuel spray pattern.

SECTION 2 - DESCRIPTIONS

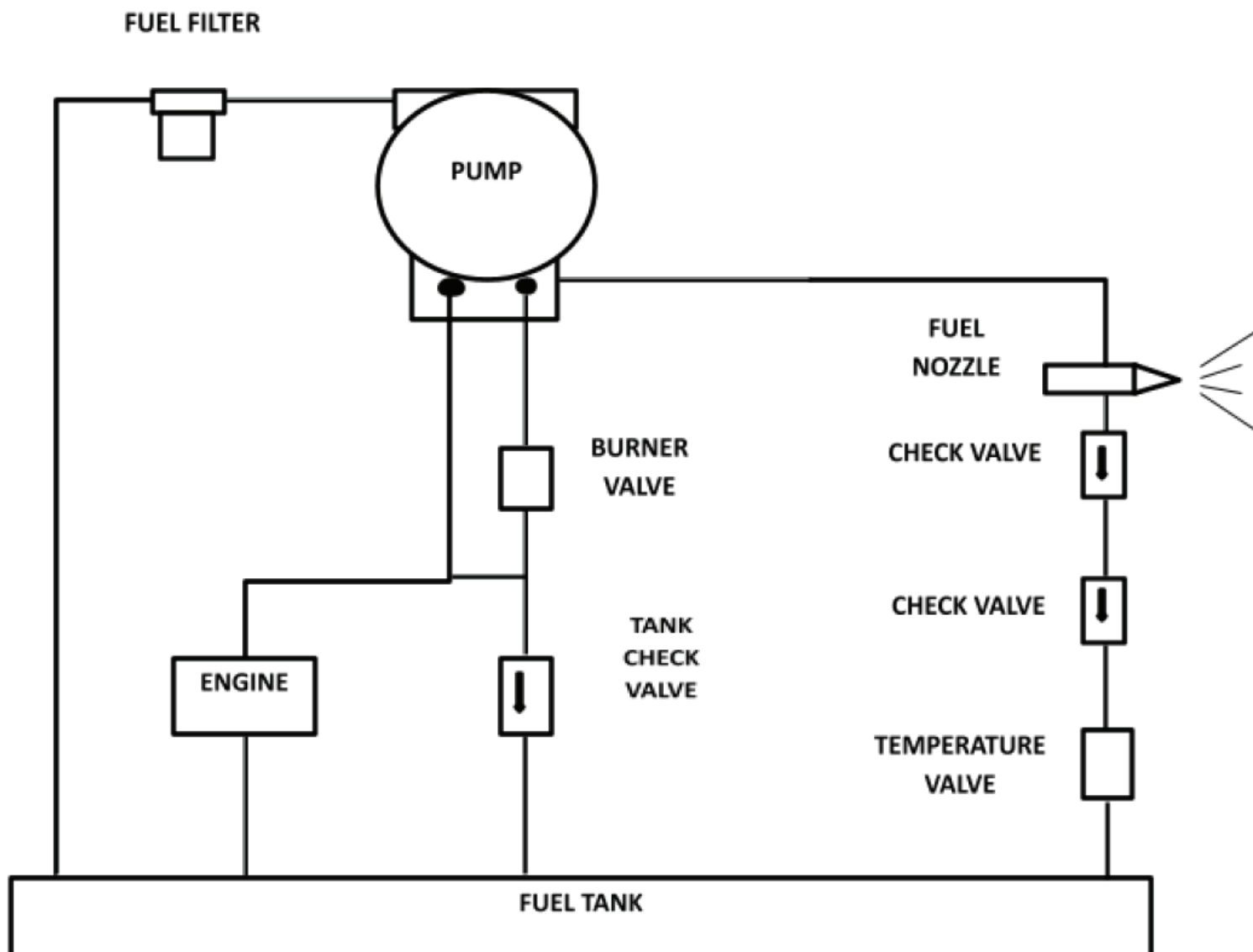


FIGURE 2-4 FUEL SYSTEM SCHEMATIC

SECTION 2 - DESCRIPTIONS

2.8 Heat Exchanger

2.9 Fuel flowing from the nozzle is ignited in the combustion chamber (see figure 2-4). The burning fuel strikes a plate or target in the combustor and is diffused into the heat exchanger. Air from the fan enters holes in the side of the combustor in a manner that will ensure proper fuel-air mixture. From the combustor, the burning fuel flows through the heat exchanger in a spiral path between the surfaces of the ventilating air tubes and is expelled through the parallel tubes and the space between the surfaces of the ventilating air tubes and is expelled through the exhaust opening at the top of the casing. (See figure 2-5) The ventilating or heating air is forced through the parallel tubes and the space between the heat exchanger shell and the casing. Heat is exchanged between the hot exhaust gases and the ventilation air. At the discharge end of the heat exchanger is the temperature sensing elements. The air control assembly consists of a baffle and a series of radial tubes. Air traveling between the walls of the heat exchanger and the casing is directed radially inward behind the baffle where it is mixed with warmer air leaving the parallel tubes of the heat exchanger. This mixing ensures a more uniform temperature throughout the discharge airstream. A duct adapter assembly is installed on the discharge end of the heater to connect the flexible duct (see figure 2-2).

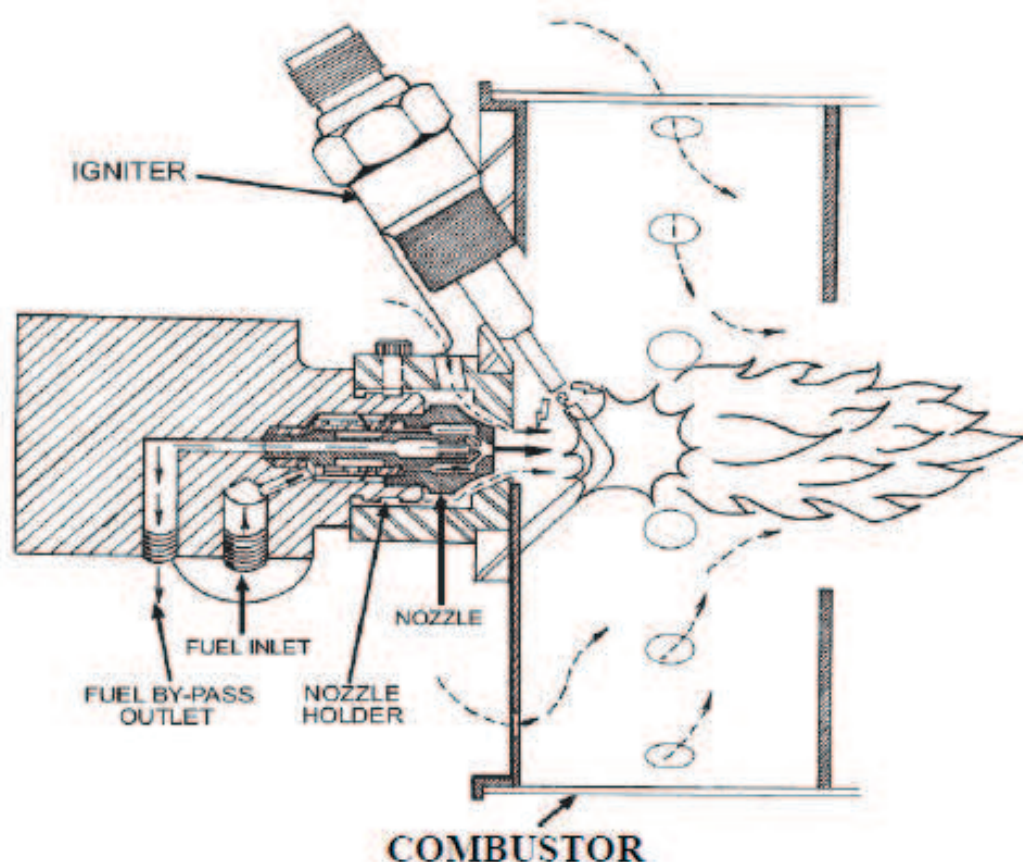


Figure 2-5 Sectional View of Nozzle & Combustor

SECTION 2 - DESCRIPTIONS

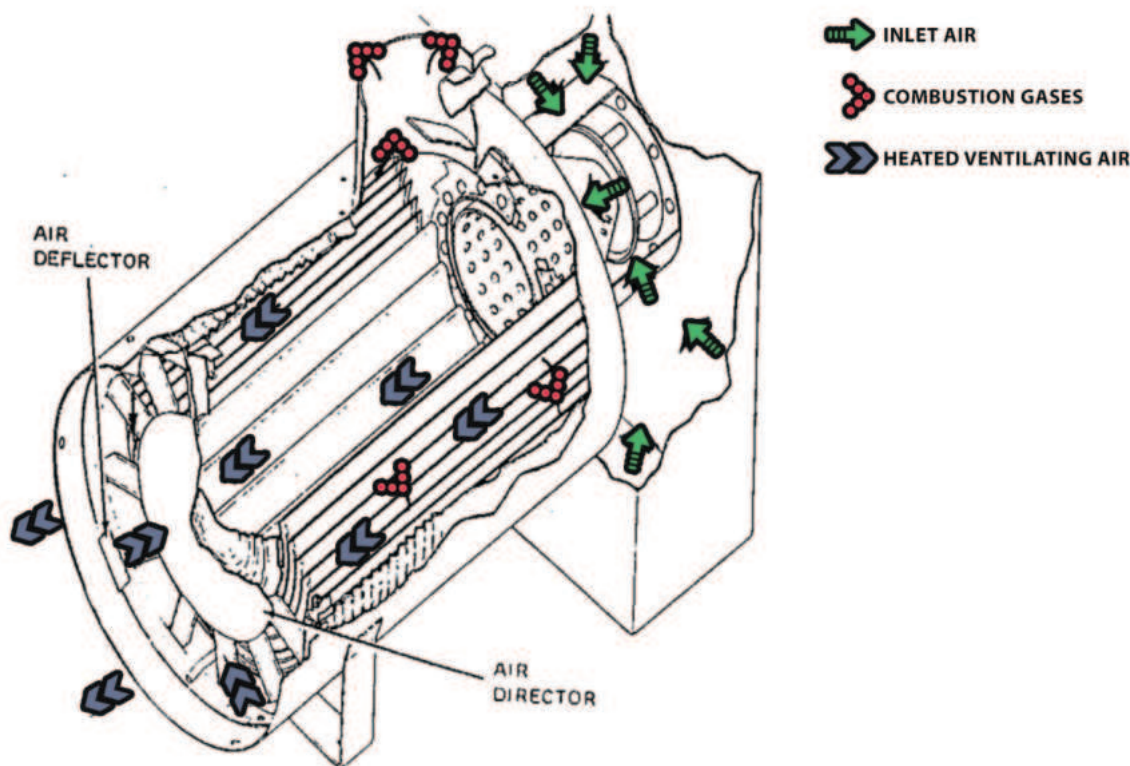


Figure 2-6 Air Flow

2.10 Cabinet

- 2.11** The Honda engine is enclosed in the cabinet (see figure 2-1) which affords protection against the elements and prevents damage during storage or transit. The cabinet is hinged and is provided with cabinet supports. When the heater is in operation, the cabinet must be closed. The control box, located on the right of the heater has a hinged cover which opens to allow access to the controls.

2.12 Trailer

- 2.13** A trailer is provided as an option to transport the heater when moving from worksite to worksite. The duct holders located on the side of the trailer (see figure 2-1 and figure 2-2) hold the ducts when they are not in use.

**PLEASE
NOTE:**

DO NOT EXCEED 20 M.P.H. WHEN TOWING

SECTION 2 - DESCRIPTIONS

2.14 Leading Particulars.

2.15 The leading particulars for the model BT400-NEX-G2 heater are as follows:

A-Heater

Manufacturer	AEROTECH HERMAN NELSON INC.
Model	BT400-NEX-G
Fuel	Gasoline
Discharge air temperature range	150°F to 250°F

B-Engine

Manufacturer	Honda Power Equipment
Model	GX 160
Max output	5.5 hp @ 3600rpm
Cooling System	Forced Air
Ignition System	Transistorized magneto
PTO Shaft Rotation	Counter clockwise

C-Igniter Plug

Point Setting	0.1250 to 0.1876
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D-Tires

Size	5.3-12
Pressure	35 PSI

E-Fuel Tank

Capacity	16 Imperial gal (72 Liters)
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F-Shipping Dimension & Weight

BT400-NEX-G	with MA-1 Trailer
Weight 405 lbs	Weight 615 lbs.
Length 55"	Length 84"
Width 25"	Width 43"
Height 35"	Height 45"

SECTION 3 - DESCRIPTIONS

3.1 General

3.2 Scope

3.3 The heater unit is shipped on a skid or in a packing crate. Unloading should be accomplished as follows:

- (a) Remove all tie downs and blocks securing packing crate to carrier.
- (b) Use cable slings and hoist, with a capacity of 1,000 lbs., to lift heater from carrier.



CAUTION

Be careful when using crowbars, pinch bars, and hammers while uncrating the equipment to prevent damage to the heater. Be careful when removing cardboard boxes from packing crate.

3.4 Inspection and Servicing of Equipment

3.5 Tires

3.6 Inspect tires for leaking valves, cuts, or improper inflation.

3.7 Trailer Frame and Cabinet

3.8 Perform the following:

- (a) Inspect trailer frame and cabinet for broken welds, dents, and loose or missing hardware.
- (b) Inspect cabinet to see that no damage has occurred during shipment.
- (c) Inspect fuel tank for breaks or dents.

3.9 Honda Engine

3.10 Perform the following:

- (a) Inspect for exterior damage and loose or missing hardware.
- (b) Turn engine over several times with the recoil starter to ensure that the piston moves.
- (c) Add Oil.

3.11 Heater

3.12 Inspection and servicing of the heater consists of the following:

- (a) Performing the required preventive maintenance services. (Refer to section 5.)
- (b) Fill fuel tank with the proper grade of gasoline.



When filling the fuel tank, do not smoke or use an open flame in the vicinity.

SECTION 3 - PREPARATIONS FOR USE AND STORAGE

3.13 Preparation for Storage

3.14 Proper storage preparation is essential for keeping the heater trouble-free and looking good. The following steps will keep rust and corrosion from impairing the heaters' function and appearance.

(a) Clean all exterior surfaces with a mild detergent and water.



Water contacting a hot engine can cause damage. If the engine has been running, allow it to cool for at least half an hour before washing.

(b) Drain fuel from tank



Old gasoline will cause hard starting, and it leaves gum deposits that clog the fuel system. If the gasoline deteriorates during storage, you may need to have the carburetor and other fuel components serviced or replaced.

(c) Drain fuel from carburetor by removing the drain bolt with the sediment cup, and then move the fuel valve lever to the "ON" position. Reinstall the drain bolt and sediment cup after all the fuel has drained (see figure 3-1).



Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Keep heat, sparks, and flame away. Handle fuel only outdoors. Wipe up spills immediately.

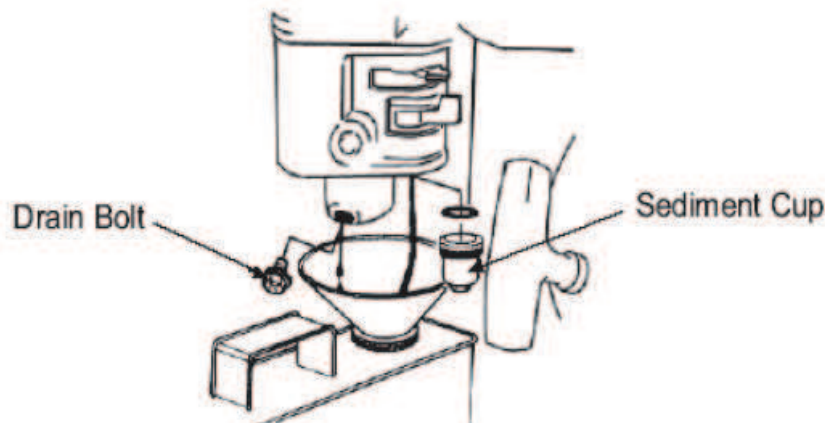


Figure 3-1

3.15 You can extend fuel storage life by adding a gasoline stabilizer that is formulated for that purpose, or you can avoid fuel deterioration problems by draining the fuel tank and carburetor. When adding a gasoline stabilizer, fill the fuel tank with fresh gasoline. If only partially filled, air in the tank will produce more fuel deterioration during storage. If you keep a container of gasoline for refueling, be sure that it contains only fresh gasoline.

(a) Add gasoline stabilizer following the manufacturer's instructions.

(b) After adding a gasoline stabilizer, run the engine outdoors for 10 minutes to be sure that treated gasoline has replaced the untreated gasoline in the carburetor.

(c) Stop the engine.

3.16 If equipped with a battery for electric starter, recharge the battery once a month while the engine is in storage. This will help to extend the service life of the battery.

SECTION 4 - Operation Instructions

4.1 General

4.2 Scope

4.3 This section describes the theory of operation, operating controls and indicators and the operating procedures for the heater.

4.4 Theory of Operation

4.5 The description will be presented in two parts; (1) General Description and (2) Detailed Description. The general description explains the interrelationship of functional components at an operation level. Functions of individual components and unique assemblies are given in the detailed description.

4.6 General Theory

4.7 Fuel is drawn from the fuel tank through the fuel filter and delivered under constant pressure to the variable discharge combustion nozzle. The ignition system produces a high voltage spark at the igniter plug to ignite the fuel and air mixture. The resultant flame heats the heat exchanger. Ambient air is forced through the heat exchanger by the fan assembly. As the ambient air passes through the heat exchanger it is heated to the desired temperature. When the heated air leaves the heat exchanger it is directed through the heat deflector to the heat exchanger outlet. As the heated air leaves the heat exchanger outlet, it passes over the temperature and temperature indicating elements.

4.8 Controls



Figure 4-1 Engine Controls

SECTION 4 - Operation Instructions

4.9 Choke

- 4.10** The choke (see figure 4-3), installed on the engine, enables the operator to enrich the fuel mixture for cold weather starting. The choke is attached to a lever on the engine carburetor.

4.11 Engine Start Switch

- 4.12** The engine “START” switch is installed on the engine shroud. The switch is connected in the ignition circuit to enable the operator to start and stop the engine.

4.13 Recoil Starter Handle

- 4.14** The recoil starter handle (see figure 4-3) is attached to the engine for the purpose of manual starting.

4.15 Burner Control Valve

- 4.16** The burner valve is an electrically operated, normally open valve that when energized turns the combustor on.

4.17 Temperature Control Valve

- 4.18** The temperature control valve is an electrically operated, normally open valve that when energized maintains a selected discharge temperature, from approximately 150°F to 250°F.

4.19 Discharge Air Temperature Gauge

- 4.20** The discharge air temperature gauge (see figure 4-4) is located in the control box. The temperature gauge is a dial type instrument which indicates the actual temperature of the discharge air in degrees Fahrenheit. The temperature gauge sensing element is mounted in the discharge air stream. (See figure 4-5)



Figure 4-2 Heater Fuel Controls

SECTION 4 - Operation Instructions

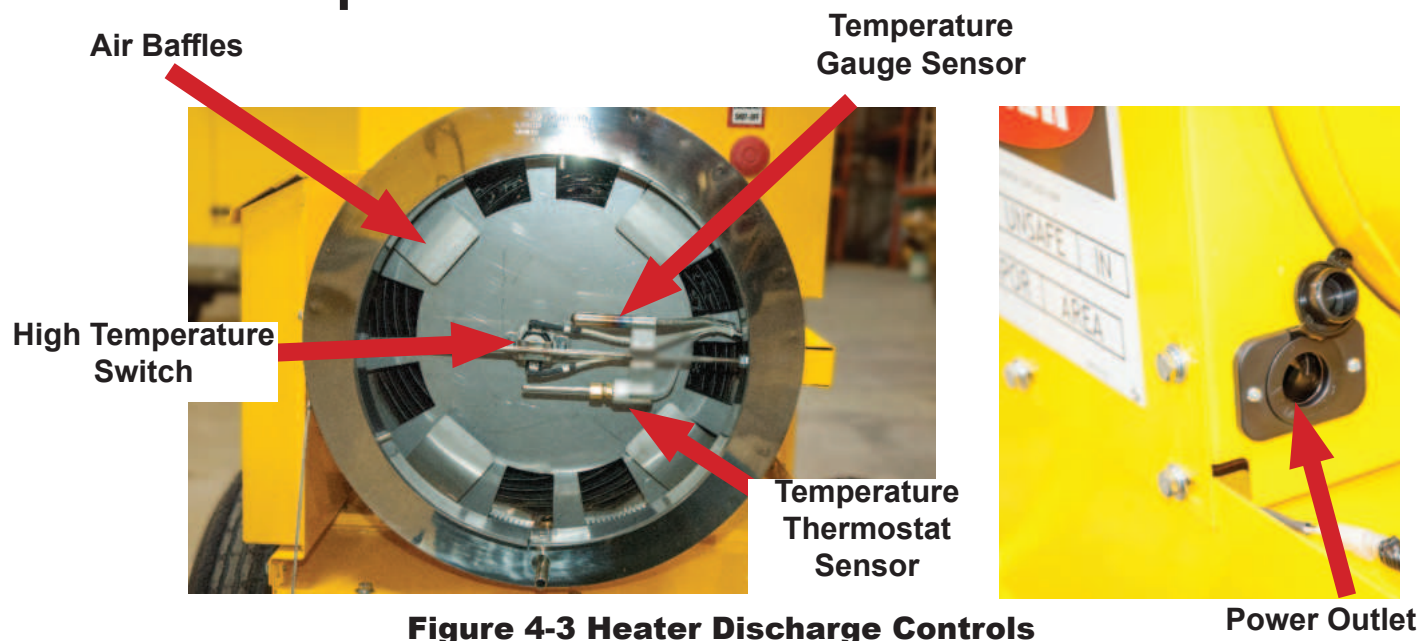


Figure 4-3 Heater Discharge Controls



Figure 4-4 Thermostat Control

4.21 High Temperature switch

- 4.22** A high temperature switch is installed in the outlet air stream to limit the maximum temperature that can be reached. (Maximum temperature is 250°F) (Figure4-5)

4.23 Thermostat Control

- 4.24** The thermostat is a 12 volt electronic controller that supplies the voltage to the temperature control valve. (Figure4-6)
- 4.25 Emergency Shut Off** An emergency shut-off switch stops the burner and engine in case of an emergency.
- 4.26 Power Outlet** A 12 volt power outlet is supplied for the accessories.

SECTION 4 - Operation Instructions

4.27 Detailed Theory

4.28 Fuel System

4.29 Fuel Pump

4.30 The fuel pump is mounted on a bracket to the left of the engine. The pump is belt driven by the gas engine. There are three outlet ports and two inlet ports (**see figure 4-5**). The primary by-pass will handle all the flow if the balanced valve is closed. The burner valve, which is in the primary by-pass line, is closed to obtain fuel flow to the nozzle. Closing the burner valve allows the pump to build up pressure to the point where the balancing valve opens allowing fuel flow in the nozzle fuel line. The pressure at which the balanced valve opens is determined by the compression of the piston spring, normally the spring is adjusted to 150 psi. The secondary by-pass supplies fuel to the engine and returns surplus back to the fuel tank. When the burner valve is open the pump cannot build up sufficient pressure to open the balanced valve and effect flow through the nozzle fuel line. Since the pump delivers fuel in excess of the maximum nozzle capacity maximum nozzle capacity there will always be flow through the secondary by-pass line when the burner valve is on.

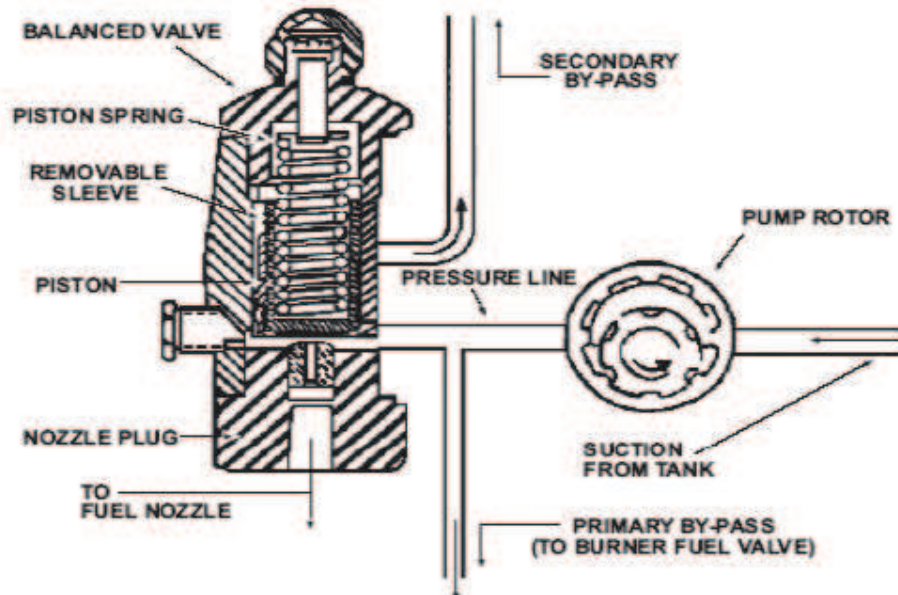


Figure 4-5 Schematic Diagram of Fuel Pump

4.31 Burner Control Valve

4.32 The burner control valve is a 12 volt DC electrically operated electronically controlled normally open valve. When 12 volts is applied the valve closes and allows the pressure to build up in the balanced valve of the fuel pump. The valve is fail-safe to the open position. So if 12 volts power is lost the valve will open and shut off fuel to the combustion chamber.

SECTION 4 - Operation Instructions

4.33 Fuel Atomizing Head

- 4.34** The fuel nozzle screws into a nozzle holder, the combination being known as the fuel atomizing head. Fuel from the inlet line enters the nozzle supply chamber through a strainer screen then flows through slots in the inner head through which impacts a whirling motion to the fuel so that it partially atomizes as it enters the swirl chamber. Atomization is completed as the fuel sprays through the discharge orifice into the combustor. A portion of the fuel is also forced into a bypass chamber which leads to the by-pass outlet passage in the nozzle holder. A 5 PSI check valve connected between the outlet and by-pass fuel line prevents a reverse fuel flow to the nozzle from the by-pass line. Fuel is discharged from the nozzle at a fixed continuous rate and a continuous fixed flame is obtained. A change in heat output is obtained by varying the volume of fuel discharged from the nozzle. This is accomplished indirectly by controlling the pressure of fuel flowing through the by-pass fuel line through the action of the temperature valve.

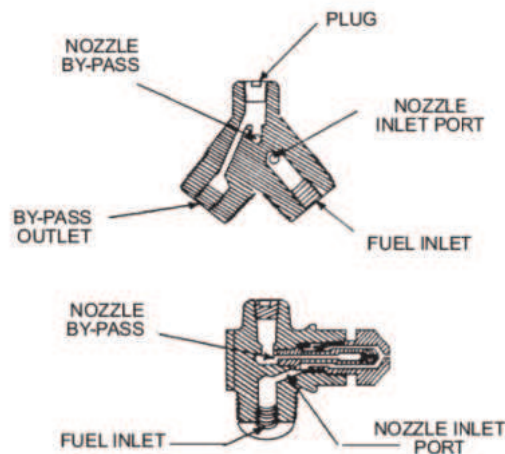


Figure 4-6 Fuel Atomizing Head

4.35 Temperature Control Valve

- 4.36** The temperature control valve is a 12 volt DC electrically operated normally open valve. This valve controls the bypass fuel pressure from the nozzle. The pressure should be between 25psi in low flame to 80psi in high flame.

4.37 Thermostat

- 4.38** The thermostat is a 12 volt electronic controller that supplies the voltage to operate the temperature control valve. The temperature range is from 150° F to 250°F. When a temperature is first selected 12 volts is sent to the temperature control valve. The valve closes and the pressure goes up to about 80psi or high flame. When the desired temperature is reached the voltage is removed from the temperature control valve and the pressure drops to about 25psi or low flame.

4.39 LOCKOUT LIGHT

The lockout light will come on when the cad cell (Flame detector) does not detect the flame. If a flame is not detected after 15 seconds of the burner switch being turned to the "ON" position the light will come on and the fuel and ignition will be turned off. To reset the control from lockout, turn the burner switch to the "OFF" position for at least 2 seconds.

4.40 Emergency Shut-Off Switch

- 4.41** An emergency shut-off switch is located on the left side of the heater on the control box above the thermostat. This switch removes power from the burner control shutting off the burner and provides a ground to stop the engine.

SECTION 4 - Operation Instructions

4.42 Power Outlet

The 12 volt power outlet is located on the back of the rear hood. The power outlet supplies 12 volts for the strobe light.

4.43 Discharge Air Temperature Gauge

4.44 The discharge air temperature gauge is located in the control box. The temperature gauge is a dial-type instrument which indicates the actual temperature (100°F to 350°F+/- 10°) of the discharge air in degrees Fahrenheit.

4.45 Fuel Gauge



Do not operate heater in explosive vapor area.

4.46 Preparation for Starting

4.47 Preparation for starting is accomplished as follows:

- (a) Perform the required preventive maintenance services. (Refer to section 5)
- (b) Remove air outlet and exhaust stack covers. Install 12" duct and exhaust stack extension.
- (c) Fill fuel tank with gasoline.



Improper maintenance of the engine, or failing to correct a problem, could cause a malfunction in which you could be seriously injured. Always perform a pre-operation inspection and correct any problems.

- (d) Check the general condition of the engine.
 1. Look around and underneath the engine for signs of oil or gasoline leaks.
 2. Remove any excessive dirt or debris, especially around the muffler and recoil starter.
 3. Look for signs of damage.
 4. Check that all shields and covers are in place, and all nuts, bolts, and screws are tightened.
- (e) Check the engine oil level



The oil alert system will automatically stop the engine before the oil level falls below safe limits. However, to avoid an unexpected shutdown, always check the engine oil level before start-up.



Carbon monoxide gas is toxic. Breathing it can cause unconsciousness and even kill you. Avoid any area or actions that expose you to carbon monoxide.

SECTION 4 - Operation Instructions

4.48 Engine Start- Up Procedure

1. Check fuel level
2. Remove outlet and exhaust covers.
3. Install exhaust stack and flexible air ducts.
4. Ensure the **"RED EMERGENCY SHUT OFF"** is pulled out.
5. Open control panel access door. Ensure the burner switch is in the **"OFF"** position, temperature switch is in the **"HIGH"** position and that the thermostat selector is in the **"LOW"** position.
6. Open hood and insure that there is no fuel or oil leaks and all is secure. Check oil level.
7. Move the fuel lever to the **"ON"** position.
8. Turn the engine start key to the **"START"** position and hold until engine starts then release.
9. For cold weather starting move the choke lever to close then turn key to the **"START"** position and hold until the engine starts then release. Slowly open the choke lever as the engine warms up.
10. Allow the engine to run for about one minute or until the RPM has stabilized.
11. Turn burner switch to the **"ON"** position.
12. **"SLOWLY"** turn the thermostat selector to the desired temperature.

4.49 Engine Shut- Down Procedure

1. Turn the temperature selector down to **"LOW"** and leave the temperature switch in the **"HIGH"** position.
2. Turn the burner switch to the **"OFF"** position and allow the temperature to cool down.
3. Once the temperature is in the green on the temperature gauge turn the key to the **"OFF"** position.
4. Remove the exhaust stack and ducts from heater. Store away as necessary.
5. Install the outlet and exhaust covers.
6. In case of emergency press the **"RED EMERGENCY SHUT OFF"** to shut down the unit.

SECTION 4 - Operation Instructions



Allow the gasoline engine to operate for two minutes after the burner valve is in the "OFF" position or until the temperature gauge reads in the green.

4.50 Operation in Extreme Cold

4.51 General instructions for operation of the heater in extreme cold are as follows:

- (a) Ensure the fuel tank is full to prevent condensation. Remove snow or ice from fuel tank cap and dispensing equipment before filling fuel tank.
- (b) Check oil every five hours in operation above 0°F, every three hours in operations below 0°F.
- (c) Change oil every 100 hours in operation.
- (d) Operate heater a short time each day to prevent water from settling in the heater controls.
- (e) Cover heater with tarpaulin to protect it from the weather when not in use.
- (f) Park heater in a sheltered spot out of the wind, or park indoors, if possible.

4.52 Operation in Dusty or Sandy Areas

4.53 General instructions for operation in dusty or sandy areas are as follows:

- (a) Before operating, if water is available, wet the surrounding area with water to keep down the accumulation of dust.
- (b) Take all necessary precautions to prevent dust or sand from entering the fuel tank while filling.
- (c) Perform more frequent inspections and lubrication. Wipe off all excess lubricant.
- (d) Remove accumulations of sand and dirt at frequent intervals.

4.54 Operation in Salt Water and High Humidity Areas

4.55 General instructions for operation in salt water and high humidity areas are as follows:

- (a) Wipe all accessible exposed areas frequently.
- (b) Coat all exposed machined surfaces with oil.
- (c) Keep fuel tank cap tightly closed.
- (d) Keep electrical connections dry.

SECTION 5 - Maintenance Instructions

5.1 General

5.2 Scope

- 5.3 This section contains instructions for maintaining the **BT400-NEX-G**. If performed on a regular basis will insure proper operation and extend the life of your heater.

5.4 Cleaning

- 5.5 For access to the heater components for cleaning, proceed as follows:
- (a) Prop open the cabinet top.
 - (b) Brush dirt and dust from the components with a soft bristle brush or blow dirt and dust away using dry compressed air.



WARNING Compressed air used for cleaning will not exceed 30 psi and then only with approved personnel protective equipment such as safety goggles or face shield.

- (c) With hood and access doors closed tightly, wash heater using a soft bristle scrub brush to apply a solution of detergent mixed in warm water. Remove the detergent solution with clean water.

5.6 Lubricating

- 5.7 Lubrication of the BT400-NEX-G heater consists of greasing the wheel bearings, and changing the oil in the Honda engine.

5.8 Wheel Bearings

- 5.9 Lubrication of the wheel bearings is accomplished as follows:
- (a) Remove the rubber grease cap from hub assembly.
 - (b) Using a grease gun add grease.



The Oil Alert system will automatically stop the engine before the oil level falls below safe limits, to avoid the inconvenience of an unexpected shutdown; always check the engine oil level before start-up.

SECTION 5 - Maintenance Instructions

5.10 Engine Oil Change

5.11 Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

(a) Place a suitable container below the engine to catch the used oil, then remove the filler cap/dipstick and the drain plug.

(b) Allow the used oil to drain completely, and then reinstall the drain plug, and tighten it securely. (Figure 5-1)

(c) Dispose of used motor oil in a manner that is compatible with local by-laws. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation.



Do not throw oil into the trash; pour it on the ground, or down a drain. Dispose of used oil in accordance with local regulations

(d) With the engine in a level position, fill to the outer edge of the oil filler hole with the recommended oil. Engine oil capacity: 0.63 US quarts (0.6 l)

(e) Screw in the filler cap/dipstick securely.

5.12 Engine Oil Recommendations

5.13 Oil is a major factor affecting performance and service life. SAE 0W-30 Arctic oil is recommended for general use.

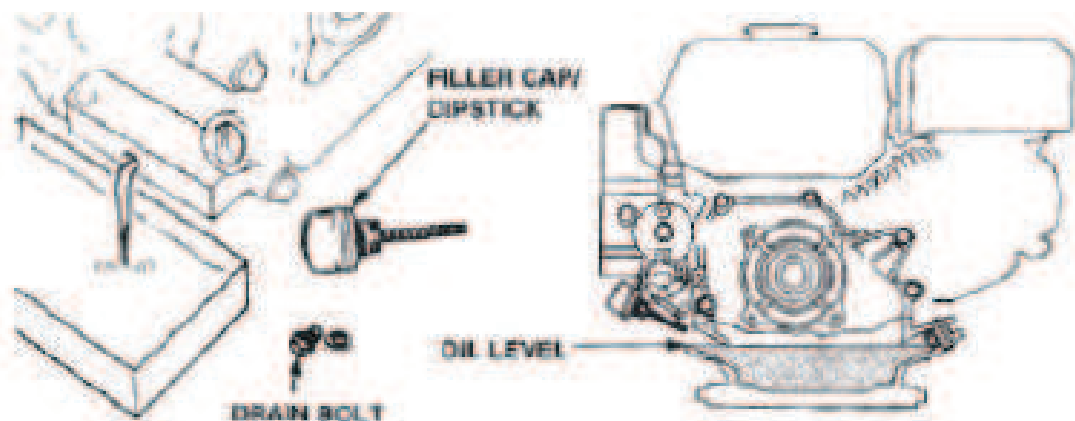


Figure 5-1 Oil Level

SECTION 5 - Maintenance Instructions

5.14 Preventive Maintenance

- 5.15** The preventive maintenance checks for the BT400-NEX-G heater are contained in table 5-1. The intervals indicated are recommended requirements under normal operating conditions. If the heater is operated under unusual conditions, consult AEROTECH HERMAN NELSON INC. for recommendations applicable to your individual needs.

TABLE 5-1 INSPECTION CHECKS

COMPONENT	INSPECTION, CHECK OR SERVICE	INTERVAL
Heater unit	Visually inspect for loose or missing hardware.	Daily
Air ducts	Visually inspect for damage or wear. Replace as necessary.	Daily
Engine Crankcase	Check oil level, add oil if necessary.	Daily
Engine Air Filter	Check for dirt. Clean if necessary.	Daily
Tires	Check for abnormal or uneven wear, cuts and embedded foreign material. Check for proper air pressure.	Daily
Controls and Instruments	Visually inspect for damage. Replace if necessary. Daily	Daily
Fuel Gauge	Visually inspect for damage. Replace if necessary.	Daily
Exhaust system	Inspect for secure mounting, cracks or dents. Inspect exhaust stack and extensions for damage. Check screen for damage. Clean or replace as necessary.	Weekly
Fuel System	Inspect all lines for kinks, breaks, and loose connections. Tighten or replace as required.	Weekly
Fan, Mounting Ring and Pulley	Inspect for security, cracks, or other damage. Check for vibration during operation. Inspect flexible rubber sleeve for cracks, broken teeth or deterioration. Repair or replace defective parts.	Monthly
V-belt	Check for proper adjustment. Inspect for wear, fraying and stretching. Replace if necessary.	Monthly
Engine Crankcase	Change oil.	Yearly or 100hrs
Fuel Filter	Replace Filter	3 Months
Fuel Pump	Check pump for proper operation	Yearly
Ignition System	Check system for loose or bad connections, broken insulators, kinks, or breaks in shielding. Check point gap.	6 Months
Heat Exchanger	Inspect for carbon deposits or other defects. Clean or replace as necessary.	Yearly
Ventilating Air	Perform carbon monoxide test.	Yearly

SECTION 5 - Maintenance Instructions

5.16 Troubleshooting

5.17 Table 5-2 provides information useful in diagnosing unsatisfactory operation or failure of the BT400-NEX-G heater and its components. Each trouble symptom stated is followed by a list of probable causes. A possible remedy is described opposite the probable cause.

TABLE 5-2 TROUBLESHOOTING GUIDE

	TROUBLE	PROBABLE CAUSE	REMEDY
1	Engine will not start	1. Fuel valve in OFF position	Move lever to ON position
		2. Choke OPEN	Move lever to CLOSED position
		3. Insufficient fuel supply	Fill tank with appropriate fuel
		4. Faulty spark plug	Clean, gap, or replace spark plug
		5. Dead battery	Charge or replace battery
		6. Emergency Shut-off Switch pushed in	Pull out switch
		7. Engine oil level low	Fill with recommended oil to proper level
		8. Engine fault	Refer to engine supplement
2	Engine turns over but fails to start or starts then stops	1. Insufficient fuel supply.	Fill tank with appropriate fuel.
		2. Clogged filter.	Replace filter.
		3. Fuel return check valve dirty.	Clean or replace check valve.
		4. Faulty fuel pump.	Check fuel pump
		5. V-belt slipping	Adjust V-belt.
		6. Engine fault	Refer to engine supplement
3	Engine stops suddenly	1. Insufficient fuel supply.	Fill fuel tank with appropriate fuel
		2. Contaminated fuel.	Drain and flush tank. Refill and replace fuel filter
		3. Incorrect fuel supply	Drain and flush tank. Fill with appropriate fuel.
4	Burner fails to ignite	1. Insufficient fuel supply.	Fill fuel tank with appropriate fuel
		2. Defective fuel pump.	Check fuel pump or replace
		3. Fuel pump pulley slipping	Tighten set screw on pulley.
		4. Defective burner valve.	Replace burner valve.
		5. Defective ignition coil	Replace with serviceable ignition coil.
		6. Defective ignition cable.	Replace cable.
		7. Defective igniter plug.	Adjust igniter plug or replace.
		8. Fuel nozzle dirty or defective.	Replace nozzle
		9. Defective control box	Replace control box

SECTION 5 - Maintenance Instructions

TABLE 5-2 TROUBLESHOOTING GUIDE

	TROUBLE	PROBABLE CAUSE	REMEDY
5	Burner ignites by itself	1. Defective burner control valve	Clean or replace burner control valve
		2. Defective control box	Replace control box
6	Excessive smoke emitted from exhaust	1. Air flow restricted	Remove restriction
		2. Engine operating below normal speed	Check engine speed
		3. Incorrect nozzle spray pattern	Replace nozzle
		4. Carbon buildup in exhaust system	Clean exhaust system
		5. Excessive fuel pressure	Adjust pump pressure
7	Combustor flame cuts out	1. Air flow restricted	Remove restriction
		2. Discharge air restricted	Remove restriction
		3. Defective high limit switch	Replace high limit switch
		4. Flame detector defective	Replace detector
8	Combustor flame fails to go out or unit overheats	1. Defective burner valve	Replace valve
		2. Defective high limit switch	Replace high limit switch
		3. Defective burner switch	Replace switch
		4. Thermostat not wired correctly	Rewire as per wiring diagram
		5. Control set point too high	Adjust the control set point
		6. Sensor shorted	Replace sensor
9	Maximum heat output not obtainable	1. Fuel system leak	Inspect fuel lines, tighten loose connections. Replace damaged fuel lines.
		2. Defective fuel pump	Check pump or replace
		3. Clogged fuel filter	Inspect and replace filter
		4. Defective temperature control valve	Replace valve
		5. Heat exchanger clogged	Clean heat exchanger
		6. Defective nozzle	Replace nozzle
10	After burning in combustion chamber	1. Nozzle check valve being held open by contaminant.	Clean or replace valve
		2. Defective nozzle	Clean or replace nozzle
		3. Fuel leak in nozzle holder or fuel lines at nozzle holder.	Tighten or replace fuel lines.
11	No temperature control or heater will not go into high flame	1. Thermostat not wired correctly	Wire as per wiring diagram
		2. Control set point too low	Adjust control set point
		3. Open sensor	Replace sensor
		4. Control power is incorrect	Check battery voltage
		5. Defective temperature valve	Replace valve
		6. Defective fuel pump	Replace fuel pump
		7. Defective fuel nozzle	Replace fuel nozzle

SECTION 5 - Maintenance Instructions

5.18 Air Filter Cleaning

- 5.19** A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If you operate the engine in very dusty areas, clean the air filter more often than specified in the **MAINTENANCE SCHEDULE**



Operating the engine without an air filter, or with a damaged air filter, will allow dirt to enter the engine, causing rapid engine wear.

5.20 Dual-Filter-Element Types (Figure 5-2)

- Remove the wing nut from the air cleaner cover, and remove the cover.
- Remove the wing nut from the air filter, and remove the filter.
- Remove the foam filter from the paper filter.
- Inspect both air filter elements, and replace them if they are damaged. Always replace the paper air filter element at the scheduled interval.
- Clean the air filter elements if they are to be reused.
 - Paper air filter element: Tap the filter element several times on a hard surface to remove dirt, or blow compressed air not exceeding 30 psi (207 kpa) through the filter element from the inside. Never try to brush off dirt; brushing will force dirt into the fibers.
 - Foam air filter element: Clean in warm soapy water or clean in nonflammable solvent, rinse, and allow too dry thoroughly. Dip the filter element in clean engine oil, and then squeeze out all excess oil. The engine will smoke when started if too much oil is left in the foam.
- Wipe dirt from the inside of the air cleaner base and cover, using a moist rag. Be careful to prevent dirt from entering the air duct that leads to the carburetor.
- Place the foam air filter element over the paper element, and reinstall the assembled air filter. Be sure the gasket is in place beneath the air filter. Tighten the air filter wing nut securely.
- Install the air cleaner cover, and tighten the cover wing nut securely

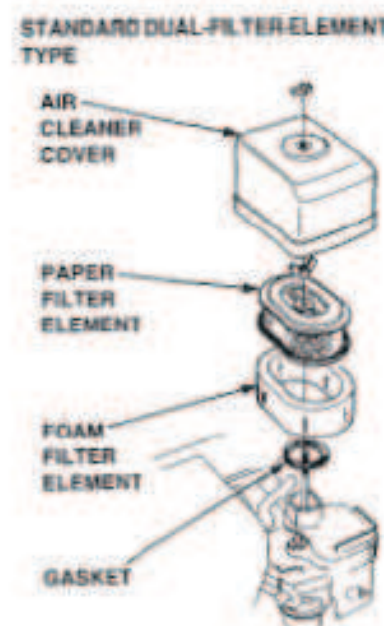


Figure 5-2

5.21 Honda Engine Removal

5.22 Remove the Honda engine power unit as follows:

- Open heater cabinet.
- Remove the three thumb screws securing gasoline engine to the resilient mounts.
- Disconnect engine fuel line quick disconnect coupling.
- Disconnect the wires.
- Remove the engine with attached mounting brackets from heater.

SECTION 5 - Maintenance Instructions

5.23 Drive Coupling

5.24 Removal and repair of the drive coupling is described as follows.

- (a) Remove drive coupling from crankshaft, using a suitable puller.
- (b) Remove tapered bushing from drive coupling.

5.25 Cleaning, Inspection and Repair

- (a) Clean all parts and dry thoroughly.
- (b) Check drive coupling for cracks and damaged teeth.
- (c) Inspect tapered bushing for cracks and distortion.
- (d) Replace all damaged parts.

5.26 Installation of drive coupling

- (a) Install tapered bushing into drive coupling.
- (b) Place key into engine crankshaft.
- (c) Install assembled bushing and coupling onto engine crankshaft.

5.27 Engine Mounting Brackets

5.28 Removal of Engine Mounting Brackets

- (a) Remove drive coupling.
- (b) Remove four nuts, washers, lock washers and bolts securing mounting bracket to engine.
- (c) Remove four bolts, washers and lock washers securing front mounting bracket to engine.

5.29 Cleaning, Inspection and Repair

- (a) Inspect brackets for cracks, bends, distorted screw holes, rust, and other damage.
- (b) Weld cracks and straighten bent bracket. Paint exposed metal surfaces.
- (c) Replace all damaged parts.

5.30 Installation of Engine Mounting Brackets

5.31 Installation of engine mounting brackets is the reverse of removal.

5.32 Engine Installation

5.33 Install the Honda engine by reversing the removal procedures.

5.34 V-Belt

5.35 The v-belt encircles the driven coupling, and fuel pump pulley.

SECTION 5 - Maintenance Instructions

5.36 Adjustment of V-Belt

5.37 Adjust the V-belt as follows:

- (a) Open cabinet.
- (b) Loosen two bolts securing the fuel pump to the fuel pump mounting bracket.
- (c) Move the fuel pump to the left to tighten V-belt or to the right to place slack in the belt.
- (d) Check belt tension. To check the tension, depress the v-belt between the driven coupling and the fuel pump. The deflection should be 1/2 inch with 5 pound of force.
- (e) Tighten fuel pump mounting screws to secure adjustment.
- (f) Close cabinet.

5.38 Cleaning and Inspection

5.39 Clean V-belt with a clean, damp cloth. Check for wear, fraying, and stretching. Replace as necessary.



**Adjustment
Bolts**

Figure 5-3 V-Belt & Fuel Pump Adjustment



Do not overtighten V-belt.

SECTION 5 - Maintenance Instructions

5.40 Fan and Mounting Ring

- 5.41** The fan supplies the air for both the combustion and heating. A mounting ring supports the fan and associated parts. Power for the fan is transmitted by a flexible rubber coupling sleeve which mates with a drive coupling on the power unit and a driven coupling which is pressed on the fan bearing shaft. The fan hub is fastened to the fan and is pressed on the fan bearing shaft.

5.42 Removal of Fan and Mounting Ring

- 5.43** Remove the vane axial fan and mounting ring as follows:
- (a) Remove the Honda engine.
 - (b) Remove v-belt from fan and bearing support assembly from heater.
 - (c) Remove mounting ring with attached fan and bearing support assembly from heater.
 - (d) Remove screws, self-locking nuts, and lock washers and remove air straightening vane from mounting ring.
 - (e) Remove three screws and lock washers and remove fan from fan hub.
 - (f) If guards, thumb screw or attaching parts are damaged, remove the three screws, lock washers, two nuts, two lock washers, and remove three guards from mounting ring. Remove thumb screws.
 - (g) Remove four screws and lock washers and remove bearing support from mounting ring.
 - (h) Remove four screws and lock washers and remove two retainers. Remove flexible rubber coupling sleeve from driven coupling.

5.44 Cleaning, Inspection and Repair

- 5.45** Cleaning, inspection and repair are accomplished as follows:
- (a) Clean all parts, except the flexible rubber coupling sleeve, using a solvent and dry thoroughly.
 - (b) Inspect fan for cracks or broken blades, distortion and other damage. Replace a damaged fan.
 - (c) Inspect fan hub for cracks and distortion. Replace a damaged hub.
 - (d) Inspect mounting ring for breaks, cracks, and other damage. Replace the mounting ring if it is damaged.
 - (e) Inspect air straightening vane for cracks or bent conditions. Replace if vanes are damaged.
 - (f) Inspect drive coupling for cracks and damaged teeth. Replace damaged coupling.
 - (g) Inspect flexible rubber sleeve coupling for broken teeth, distortion, deterioration, and cracks. Replace damaged coupling or insert.
 - (h) Inspect resilient mount for damage and hardening of cushion. Replace damaged or hardened resilient mount.

SECTION 5 - Maintenance Instructions

5.46 Installation of Fan and Mounting Ring

5.47 Install the vane axial fan and mounting ring as follows:

- (a) Install fan on hub and secure with three screws and lock washers.
- (b) Install air straightening vane with associated fastening hardware.
- (c) Install fan and bearing support assembly.
- (d) Position resilient mount on bearing support and secure with two screws. Install three guards and secure with three screws, three lock washers, two lock washers and two nuts.
- (e) Install sleeve bushing in flexible rubber coupling sleeve and place flexible rubber coupling sleeve in driven coupling. Install two retainers and secure with four screws and lock washers.
- (f) Install mounting ring, with attached parts in casing and secure with three screws and lock washers.
- (g) Install the Honda engine by performing the removal procedures in reverse order.

5.48 Heat Exchanger Assembly

5.49 To remove the heat exchanger assembly, proceed as follows:

- (a) Remove hood assembly by removing the 16 bolts and washers that secure hood to heater. Remove capillary tube cover. Lift hood from heater.
- (b) Remove the 4 bolts from mounting brackets of heat exchanger assembly.
- (c) Remove clamps from flexible exhaust hose and remove hose.
- (d) Remove V-belt by slipping belt from pulley.
- (e) Remove duct adapter at rear of heat exchanger assembly. Remove sensing elements.
- (f) Remove heat exchanger assembly from skid base assembly.

5.50 To install heat exchanger assembly, proceed as follows:

- (a) Place heat exchanger on base assembly and align with engine. Using shims under heat exchanger mounting brackets may be required to obtain proper alignment. Maximum parallel misalignment is 0.015 inches. Maximum angular misalignment is 0.056 inches.
- (b) Tighten the 4 mounting bolts.
- (c) Install sensing element in discharge air stream and install duct adapter.
- (d) Install V-belt. Ensure proper belt tension.
- (e) Install hood and capillary tube cover.

5.51 Heat Exchanger

5.52 To remove the heat exchanger, proceed as follows:

- (a) Remove heat exchanger assembly.
- (b) Remove fan and mounting ring assembly.
- (c) Disengage clamp from notches in combustion chamber. Remove nozzle holder and combustor plate.
- (d) Remove fuel lines from nozzle holder.

SECTION 5 - Maintenance Instructions

- (e) Remove ignition cable from igniter plug.
- (f) Remove exhaust stack and cover by removing the 12 screws and washers. Remove gasket.
- (g) Remove heat exchanger from heat exchanger housing by pulling the heat exchanger from the front of housing.

5.53 Cleaning, inspection and repair are accomplished as follows:

- (a) Clean heat exchanger using a carbon cleaner.
- (b) Inspect for cracks, distortion and other damage. Replace damaged heat exchanger.

5.54 Installation

5.55 To assemble the heat exchanger, reverse the removal procedures.

5.56 Carbon Monoxide Test

5.57 To check the ventilating air stream of the heater for carbon monoxide contamination, proceed as follows:



On units that are used on a seasonal basis, this test shall be performed prior to the unit being put into service. A second test will be required if the heating season is longer than six month. Additional tests shall be performed any time contamination is suspected or if maintenance has been performed on the exhaust system.

- (a) Attach one twelve inch duct to the heater. Attach a 3-way duct adapter to the twelve inch duct and attach three six inch ducts to adapter. Ensure there are no kinks in the ducts.
- (b) Start heater using proper start procedures. Rotate thermostat selector to obtain a discharge temperature of 200°F.
- (c) Using a carbon monoxide tester, measure the carbon monoxide level at one of the six inch ducts. The carbon monoxide level will not exceed 35 PPM.
- (d) Investigate any reading.

5.58 Heater Ignition System

5.59 A sparking type igniter plug within the combustor ignites the atomized fuel. The flame, once established, is self-sustaining and ignition would normally be required only when the burner is started. As a safety precaution, constant spark ignition is provided to ensure re-ignition in the event of a momentary interruption of fuel flow. Components of the ignition system are the coil, ignition cable, and igniter plug.

5.60 Ignition coil

Battery voltage is supplied to an electronic (printed circuit board) interrupter located in the same housing with the ignition coil. The interrupter and the coil convert battery voltage to a high AC voltage and is delivered to the combustion chamber to produce an arc that ignites the fuel in the combustion chamber.

SECTION 5 - Maintenance Instructions

5.61 Ignition cable and Igniter plug

5.62 The igniter plug produces the spark necessary for fuel ignition within the combustor. Electrical current flows from the coil to the igniter plug through the ignition cable.

5.63 Removal

5.64 Remove the ignition cable and igniter plug as follows:

- (a) Remove vane axial fan and mounting ring.
- (b) Disconnect the ignition cable from the igniter plug and coil.
- (c) Remove the grommet from casing and remove the ignition cable.
- (d) Remove the igniter plug from the combustor back plate.
- (e) Disengage the combustor clamp from notches in the combustor can. Remove the clamp and nozzle holder from the combustor back plate and remove the plate.

5.65 Cleaning and Inspection

5.66 Cleaning and inspection are accomplished as follows

- (a) Clean the igniter plug and ignition cable with a cloth dampened in an electronic cleaner and dry thoroughly
- (b) Inspect igniter plug for burning or pitting, cracks, or other damage. Clean the points with a fine emery cloth and polish with crocus cloth. Replace a cracked or damaged igniter plug.
- (c) Inspect ignition cable for breaks, damaged threads, or frayed or broken insulation. Replace damaged ignition cable.

5.67 Installation

5.68 Install igniter plug and ignition cable as follows:

- (a) Install igniter plug in combustor back plate. Measure the point gap. The gap should be 1/8 to 3/16 inch. Bend electrode on combustor plate to obtain correct gap.



Do not bend igniter plug electrode.

- (b) Install combustor back plate on combustor. Insert nozzle holder with clamp attached in bore of plate. Install combustor clamp in notches on combustor to secure nozzle.
- (c) Insert ignition cable through hole in casing, and secure grommet around cable. Connect ignition cable to igniter plug.
- (d) Install the vane axial fan and mounting ring.

SECTION 5 - Maintenance Instructions



BEND THIS
ELECTRODE

5.69 Fuel System

5.70 The heater fuel system consists of a fuel tank mounted in the base, fuel filter, tube assemblies, and hose assemblies, fuel pump, fuel control valves, and combustor. The fuel pump draws fuel from the fuel tank, through the fuel filter, and delivers it under constant high pressure to the variable discharge fuel nozzle in the combustor. Unused fuel is bypassed at the pump and the nozzle and is returned to the fuel tank.

5.71 Fuel Pump

5.72 Pressure testing and adjustment should be performed as follows:

- (a) Start engine and allow it to warm up. During warmup, observe pressure gauge; normal reading should be about 20 psi due to flow resistance in fuel piping system.
- (b) Engage burner, check fuel pressure gauge. If pressure is not within 140-150 psi, adjust pump pressure to secure proper reading. Adjustment is performed by removing nut and turning adjustment screw clockwise to increase pressure, or counter-clockwise to decrease pressure.

5.73 Fuel Pump Removal

5.74 To remove the fuel pump, proceed as follows:

- (a) Remove engine
- (b) Remove the v-belt by slipping it off the fuel pump pulley.
- (c) Remove the fuel lines on the pump.
- (d) Remove the pulley by loosening the set screw.
- (e) Remove the two mounting bolts from the fuel pump and remove the pump.

5.75 Fuel Pump Installation

5.76 To install the fuel pump, reverse the removal procedures.

5.77 Fuel Atomizing Nozzle

5.78 Removal

5.79 Remove the fuel atomizing nozzle as follows:

- (a) Remove the mounting ring.
- (b) Disengage combustor clamp from notches in combustor and remove nozzle holder.
- (c) Remove fuel nozzle from nozzle holder.

SECTION 5 - Maintenance Instructions

5.80 Cleaning and Inspection

5.81 Cleaning and inspection are accomplished as follows:

- (a) Clean nozzle holder with a carbon cleaner and dry thoroughly.
- (b) Inspect all parts for brakes, cracks, obstructions, damaged threads, or other damage.
Replace as necessary.
- (c) Replace fuel nozzle.



Check belt tension after installing the fuel pump. Adjust if necessary.

5.82 Installation

5.83 Install fuel atomizing nozzle by performing the removal procedures in reverse order.

5.84 Heater Fuel Filter

5.85 Fuel Filter

5.86 Replace the fuel filter as follows:

- (a) Remove the Honda engine.
- (b) Unscrew metal bowl from top casting.
- (c) Remove filter element and gasket.
- (d) Replace filter element.
- (e) Install gasket and filter element on top casting.
- (f) Install metal bowl on top casting.
- (g) Install the Honda engine.

5.87 Fuel Tank

5.88 Cleaning and Inspection

5.89 Cleaning and inspections are accomplished as follows:

- (a) Install drain plug and fill the tank half full with cleaning solvent. Agitate the solvent, immediately tip fuel drain end of tank as low as possible and drain, inspect for leaks. Run cleaning solvent through the tank until it comes out clean and clear.
- (b) Wash the exterior of the fuel tank dry thoroughly.

5.90 Trailer Components

5.91 The framed trailer is designed to transport the heater. An adjustable tow bar is mounted on the front of the frame to be used in towing the trailer. A basket mounted on the front of the heater carries the 12-inch ducts. Duct holders on the sides support and store the 6-inch ducts when not in use.

SECTION 5 - Maintenance Instructions

5.92 Trailer Wheels

5.93 The two trailer wheels are mounted on the axle and are the pneumatic-tire type. The wheels are free running, with no driving or braking components attached.

5.94 Removal

5.95 Remove the trailer wheels as follows:

- (a) Remove the four nuts and lock washers securing the wheel to the hub assembly.
- (b) Remove wheel

5.96 Disassembly

5.97 Disassembly is accomplished as follows:

- (a) Remove valve cap and valve core from valve stem and allow air to escape.
- (b) Remove tire from the rim.

5.98 Cleaning, Inspection and Repair

5.99 Cleaning, inspection and repair are accomplished as follows:

- (a) Clean tire with mild soap and water and dry thoroughly. Remove rust and scale from inside the tire with a wire brush.
- (b) Clean all metal parts and dry thoroughly.
- (c) Inspect tires for wear, holes, cuts, broken cords, deterioration, or other damage. Replace as necessary.
- (d) Inspect all metal parts for cracks, breaks, wear, damaged threads, corrosion, distortion, or other damage.

5.100 Reassembly

5.101 Reassembly is accomplished as follows:

- (a) Install valve core in valve stem.
- (b) Position tire on rim.
- (c) Inflate to proper pressure.

5.102 Installation

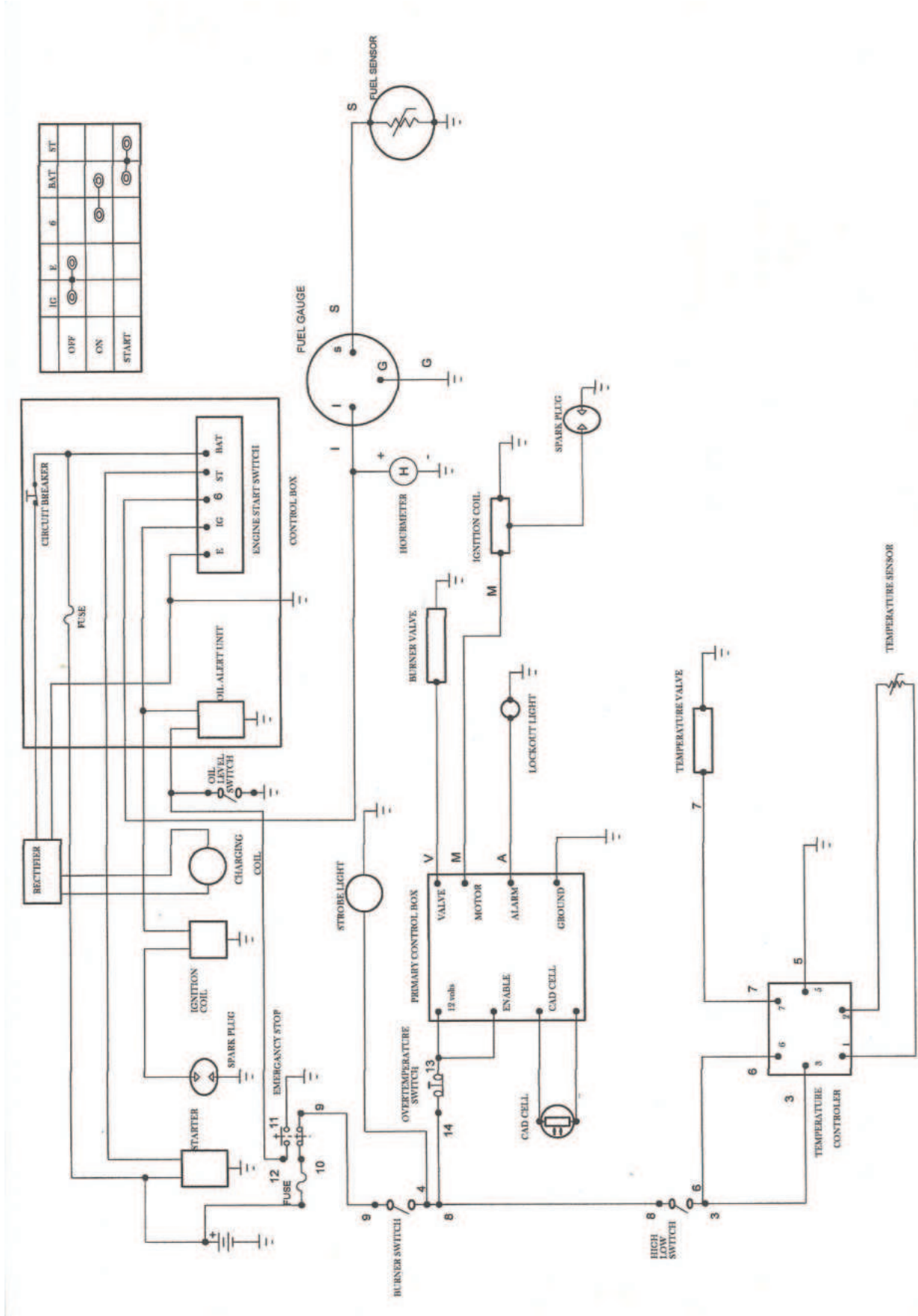
5.103 Install the trailer wheels by reversing the removal procedure.



CAUTION

When inflating trailer tires remain to one side of tire rather than directly in front of it, serious injury may result if tire blows out.

SECTION 5 - Maintenance Instructions



SECTION 6 - Parts List

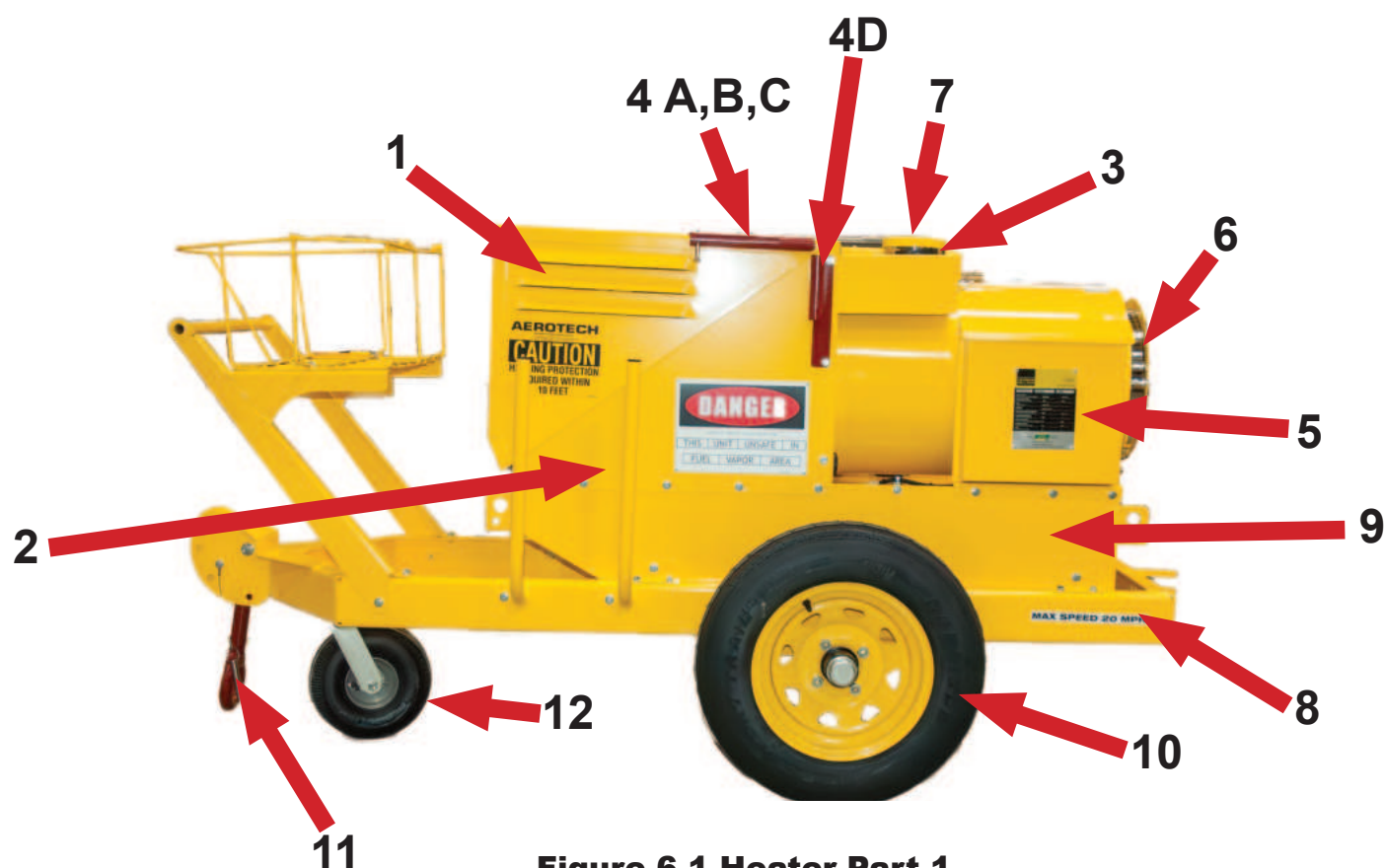


Figure 6-1 Heater Part 1

Item	Part Number	Description	Quantity
1	AGH-0049W	UPPER CABINET	1
2	AGH-0067	SIDE PANEL RIGHT	1
3	AGH-0070	EXHAUST SHIELD	1
4a	05000154-OK	LOCKING TUBE	1
4b	AGH-0066	LATCH PIN	1
4c	301318	BOLT 3/8X2-1/2	1
4d	AGH-0068W	HOOD SUPPORT	1
5	AGH-0057W	MANUAL BOX	1
6	04040020	DUCT ADAPTER	1
7	TR3313	EXHAUST STACK COVER	1
8	MA-1 Trailer	TRAILER, TWO WHEELED (OPTIONAL)	1
9	AGH-0041A	SKID BASE & TOP	1
10	05300990	TIRE & RIM	2
11	TR260	TOW BAR	1
12	05300850	SWIVEL WHEEL	1

SECTION 6 - Parts List

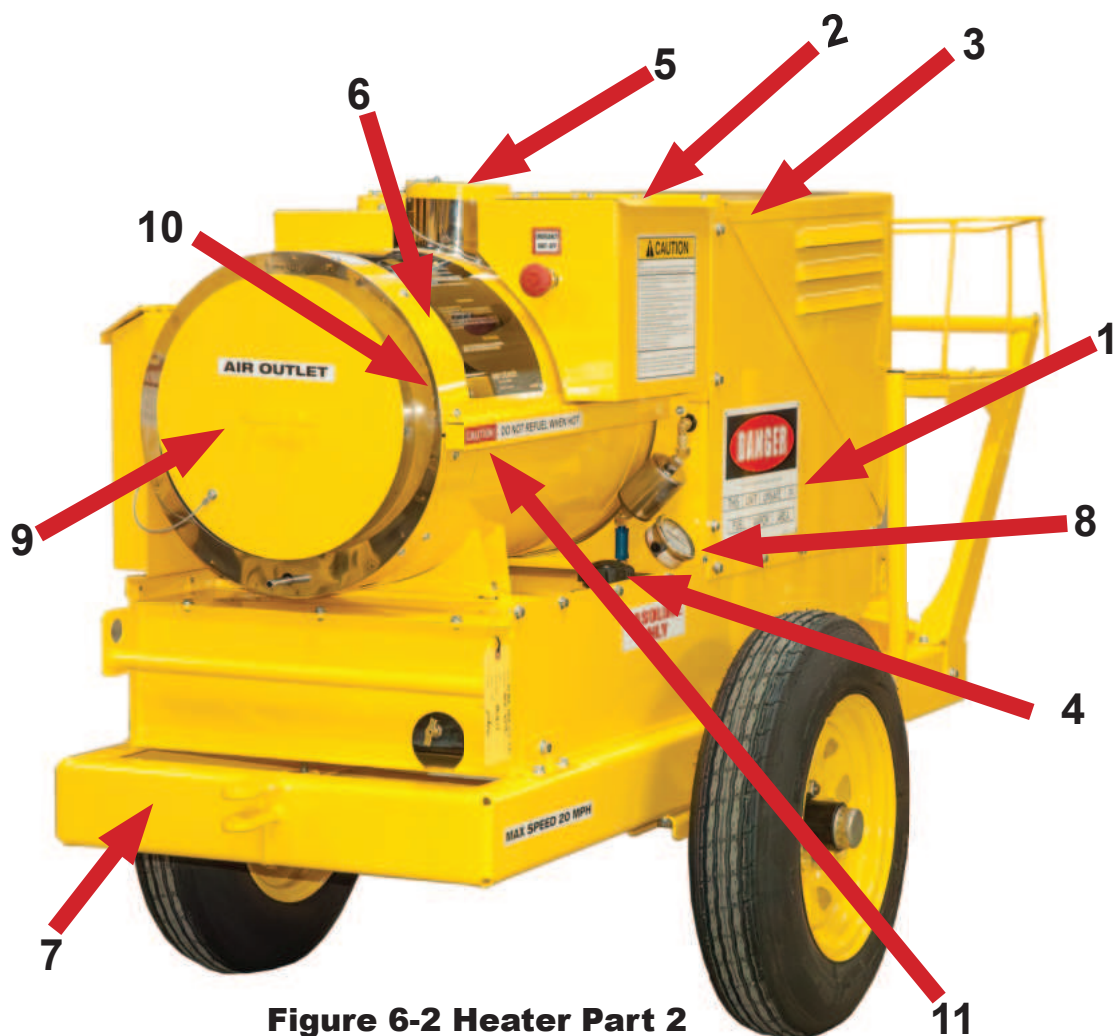


Figure 6-2 Heater Part 2

Item	Part Number	Description	Quantity
1	TCF3266-101-OK	SIDE PANEL LEFT	1
2	AGH-0074W	CONTROL BOX	1
3	AGH-0075	ACCESS DOOR	1
4	05340007	POLY FUEL TANK	1
5	TR3304	EXHAUST STACK W/HOLE	1
6	04050032AT-OK	HEAT EXCHANGER CASING	1
7	MA-1	TRAILER, TWO WHEELED (OPTIONAL)	1
8	05300250	PRESSURE GAUGE	1
9	04040011	OUTLET COVER	1
10	04040020	DUCT ADAPTER	1
11	TA3300-OK	CAPILLARY SHIELD	1

SECTION 6 - Parts List

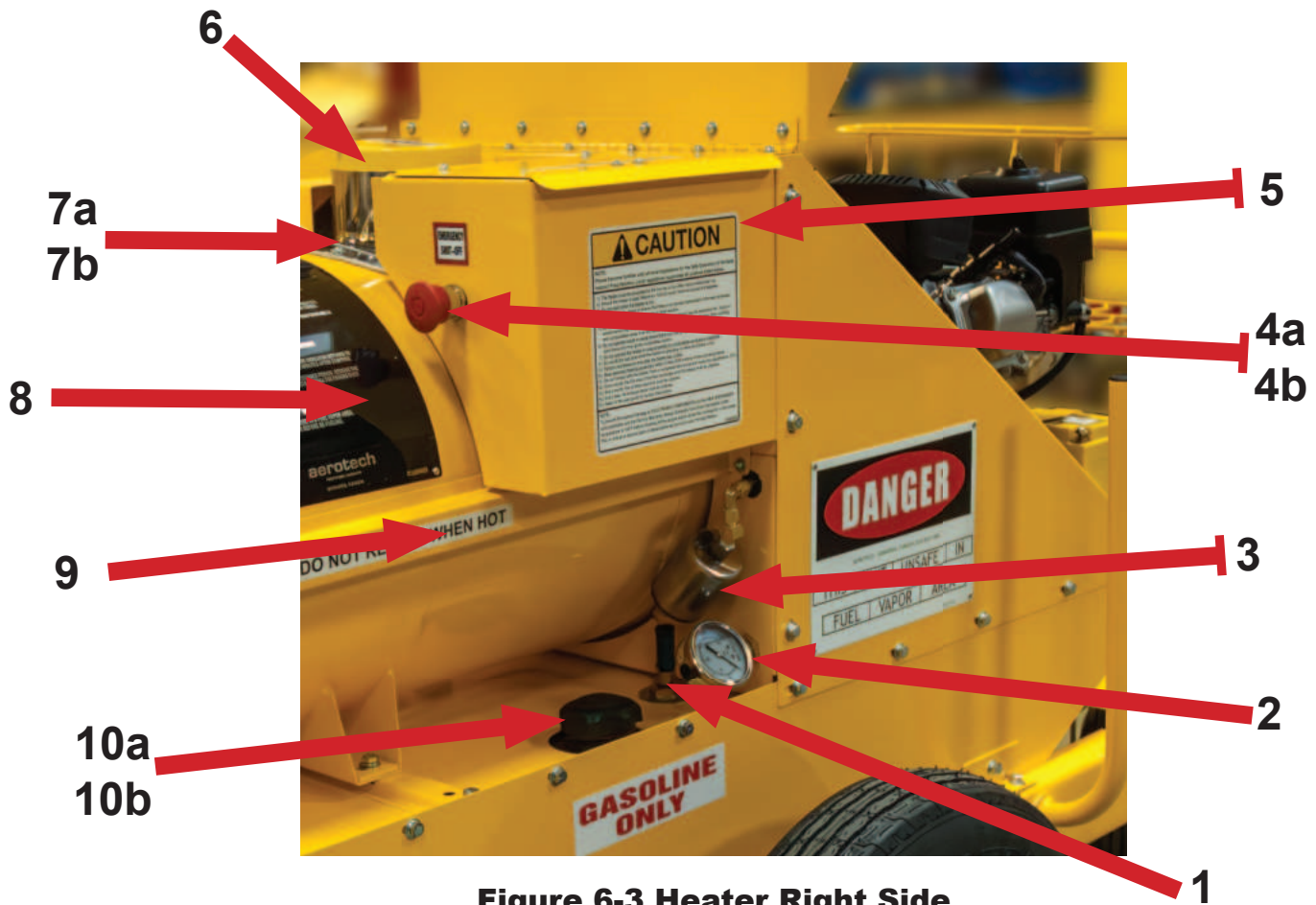


Figure 6-3 Heater Right Side

Item	Part Number	Description	Quantity
1	05300180	CHECK VALVE	1
2	05300250	PRESSURE GAUGE	1
3	TRA3057-100	IN LINE FUEL FILTER	1
4a	05300652	EMERGENCY STOP	1
4b	05300653	CONTACT	1
5	AGH-0074W	CONTROL BOX	1
6	TR3304	EXHAUST STACK W/HOLE	1
7a	TX592	EXHAUST STACK GASKET	1
7b	TX595	HEAT EXCHANGER GASKET	1
8	0450032AT-OK	HEAT EXCHANGER CASING	1
9	TA3300-OK	CAPILLARY SHIELD	1
10a	05340007	POLY FUEL TANK	1
10b	05340010	FUEL CAP	1

SECTION 6 - Parts List

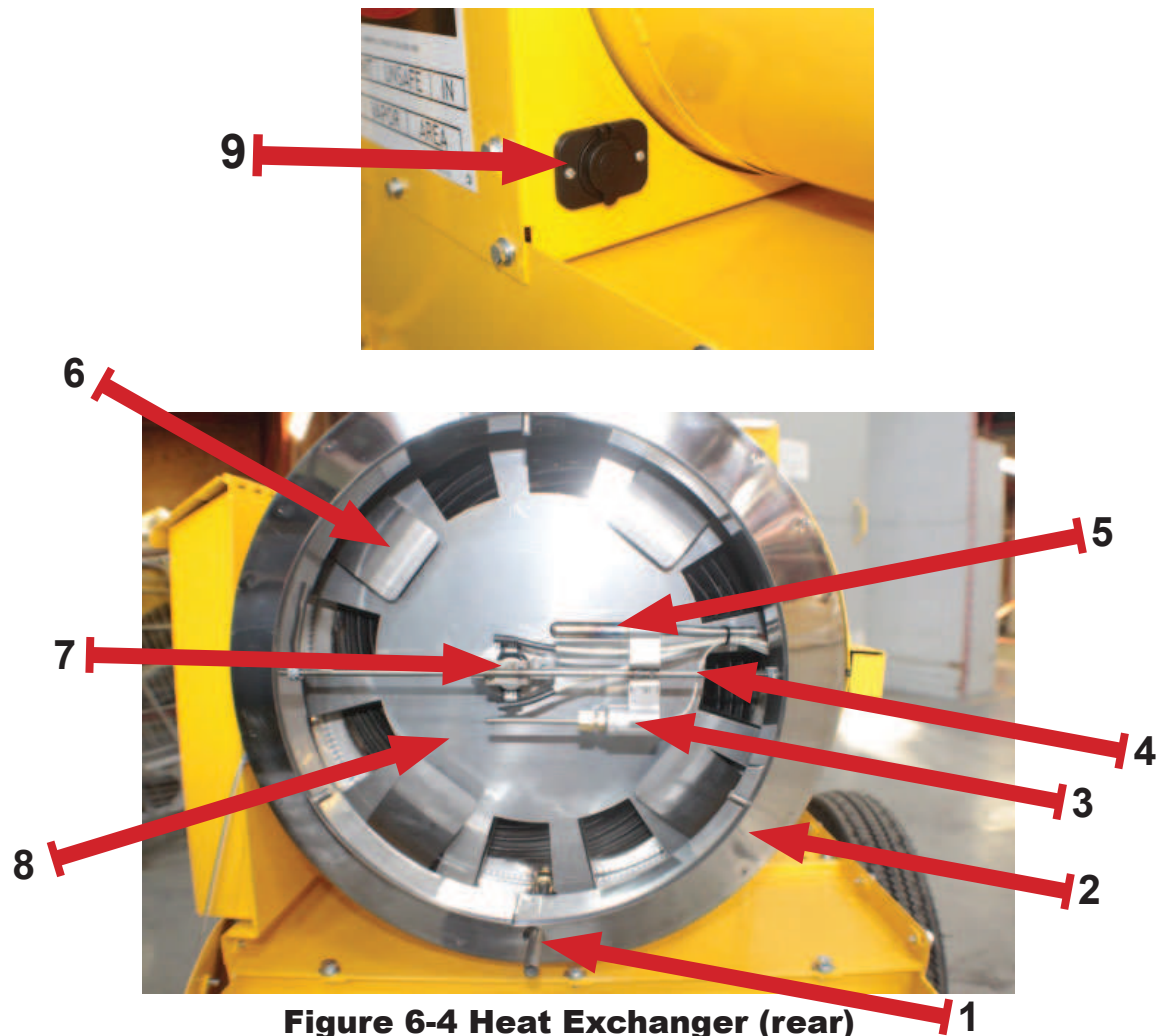


Figure 6-4 Heat Exchanger (rear)

Item	Part Number	Description	Quantity
1	TRF3094	DRAIN TUBE	1
2	04040020	DUCT ADAPTER	1
3	05300360	THERMOSTAT PROBE	1
4	TAF3157MODD	SUPPORT BULB & COIL	1
5	TR3276	DISCHARGE TEMPERATURE GAUGE WITH PROBE	1
6	TA235	HEAT CONTROL BAFFLES	4
7	05300085	HIGH TEMPERATURE SWITCH	1
8	TAF3154-MODA	RADIATION SHIELD	1
9	05300651	12V POWER SOCKET	1

SECTION 6 - Parts List

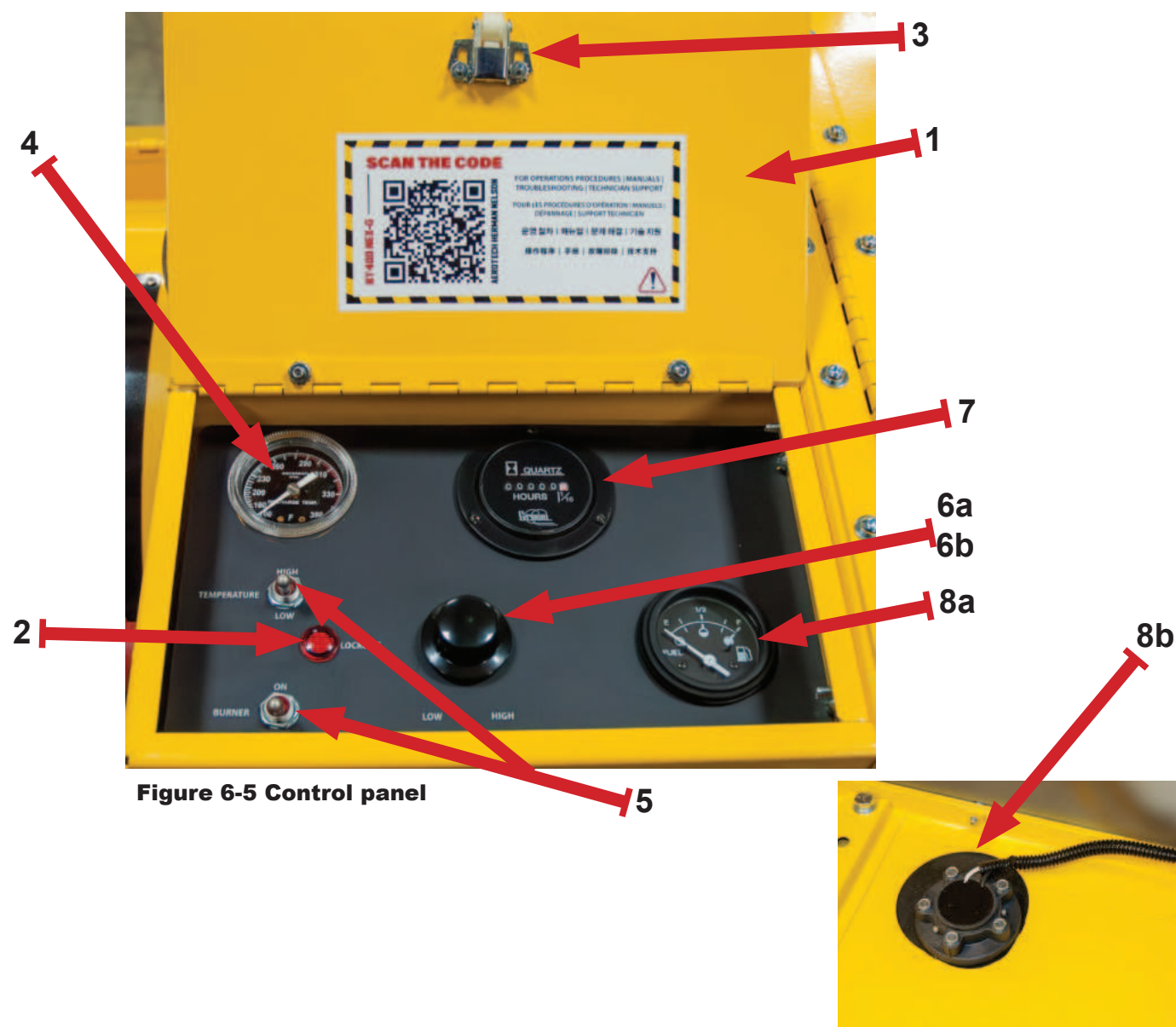


Figure 6-5 Control panel

Item	Part Number	Description	Quantity
1	AGH-0075	ACCESS DOOR	1
2	05300301	LOCKOUT LIGHT	1
3	TC628	FRICTION CATCH	1
4	TR3276	DISCHARGE TEMPERATURE GAUGE WITH PROBE	1
5	MS24523-22	TOGGLE SWITCH	2
6a	05300370	THERMOSTAT KNOB	1
6b	05300350	12 Volt DC Thermostat	1
7	MILM3971-1-1	HOUR METER	1
8a	ABFGSW	FUEL GAUGE	1
8b	ATSW05	FUEL SENDING UNIT	1

SECTION 6 - Parts List

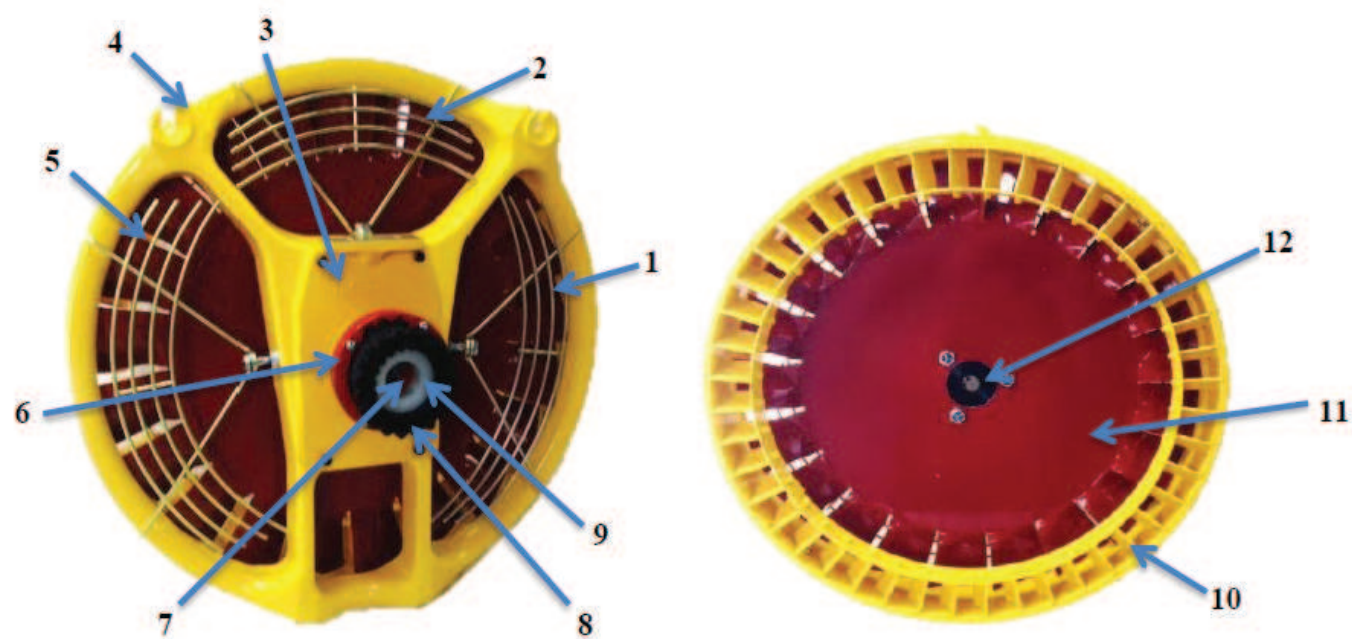


Figure 6-6 Fan Assembly

Item	Part Number	Description	Quantity
1	04020173	FAN GUARD (RIGHT)	1
2	TMF106	FAN GUARD (CENTER)	1
3	04030002	BEARING SUPPORT	1
4	04010017	FAN RING	1
5	04020174	FAN GUARD (LEFT)	1
6	TM3917-1	DRIVEN COUPLING	1
7	TM3916	BEARING SHAFT	1
8	TM3917-2	SLEEVE COUPLING (RUBBER)	1
9	TM3927	SLEEVE BUSHING	1
10	04040022	AIR STRAIGHTENING VANE	1
11	04040018	FAN	1
12	TM3921	FAN HUB	1

SECTION 6 - Parts List

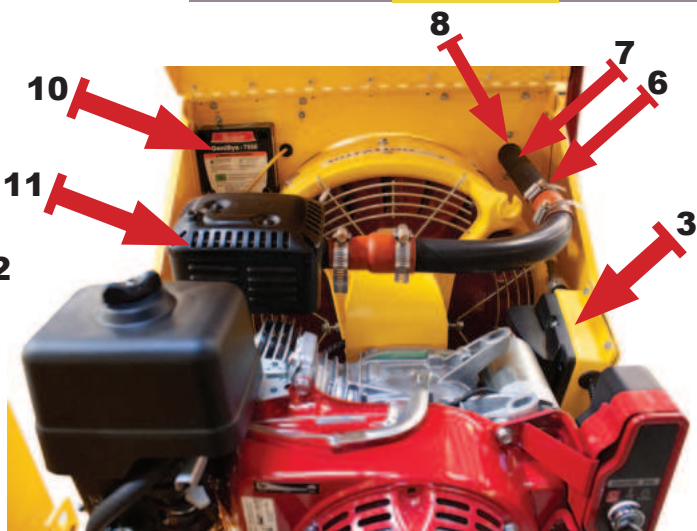
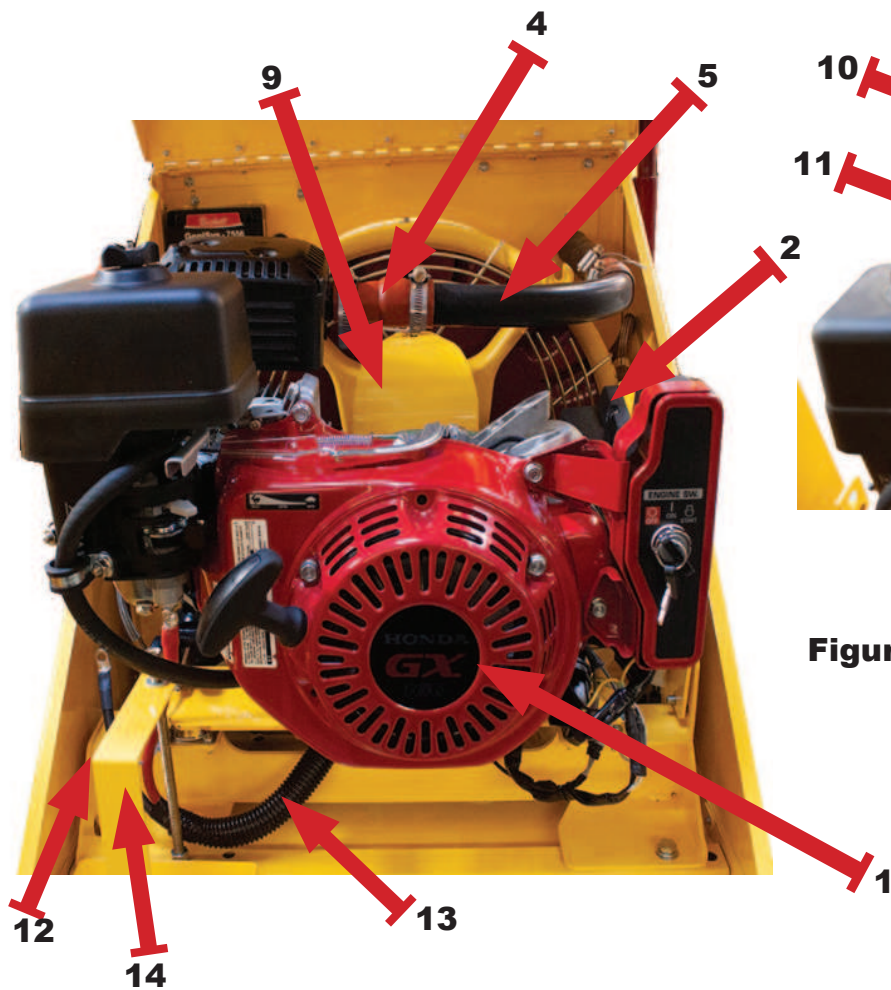


Figure 6-7 Engine Compartment Part 1

PARTS LIST

Item	Part Number	Description	Quantity
1	GX160UQXE5	HONDA ENGINE W/UPGRADED CHARGING SYSTEM	1
2	04100111	IGNITION COIL	1
3	04100216	COIL MOUNTING BRACKET	1
4	TAH45	FLEX EXHAUST HOSE	2
5	TMF3232MODB	EXHAUST PIPE	1
6	62020	HOSE CLAMP	4
7	TMF3240	EXHAUST PIPE TO STACK	1
8	TM4031-1-OK	EXHAUST PIPE FLANGE	1
9	TM4004MODB-OK	ENGINE BRACKET	1
10	05300050	BURNER CONTROL	1
11	GX160MM	HONDA MODIFIED MUFFLER	1
12	AGH-0035W	PRIME MOVER	1
13	05200158	WIRE HARNESS	1
14	AGH-0036W	BATTERY TRAY	1

SECTION 6 - Parts List

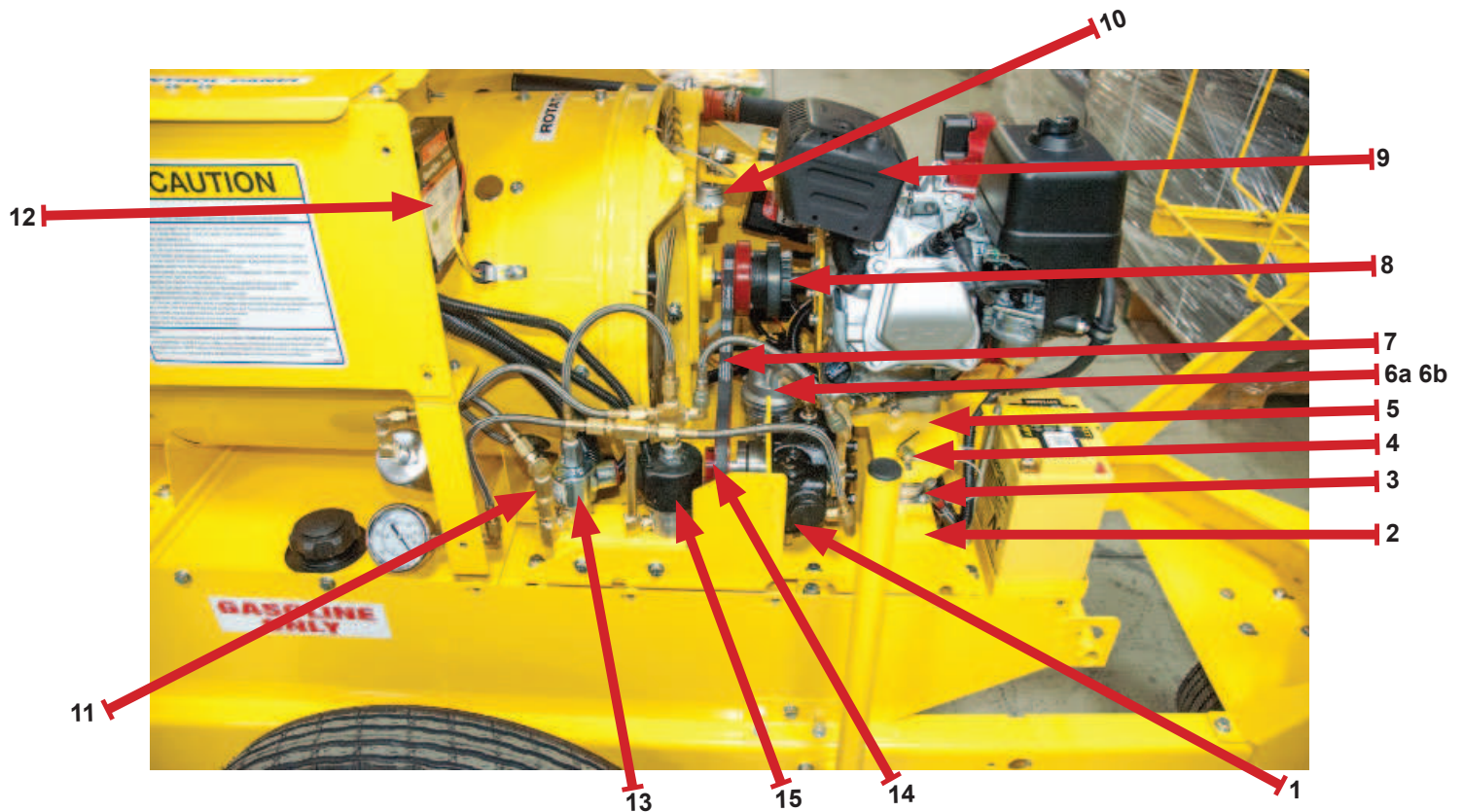


Figure 6-8 Engine Compartment Part 2

Item	Part Number	Description	Quantity
1	TR3277	FUEL PUMP	1
2	AGH-0035W	PRIME MOVER	1
3	TR3375-1	RESILIENT MOUNT	2
4	TC4021	THUMBSCREW	3
5	05300591-OK	ENGINE BRACKET	1
6a	TRA3056-100	FUEL FILTER ASSEMBLY	1
6b	5650960	FUEL FILTER ELEMENT (INSIDE)	1
7	MS15290	FAN BELT	1
8	TM3917-3 MOD B	DRIVE COUPLING	1
9	GX160MM	HONDA MODIFIED MUFFLER	1
10	TM3939	RESILIENT MOUNT	1
11	T0655A	5 PSI CHECK VALVE	1
12	05300050	BURNER CONTROL	1
13	05300265	TEMPERATURE CONTROL VALVE	1
14	TM3919	PUMP PULLEY	1
15	05300255	BURNER CONTROL VALVE	1

SECTION 6 - Parts List

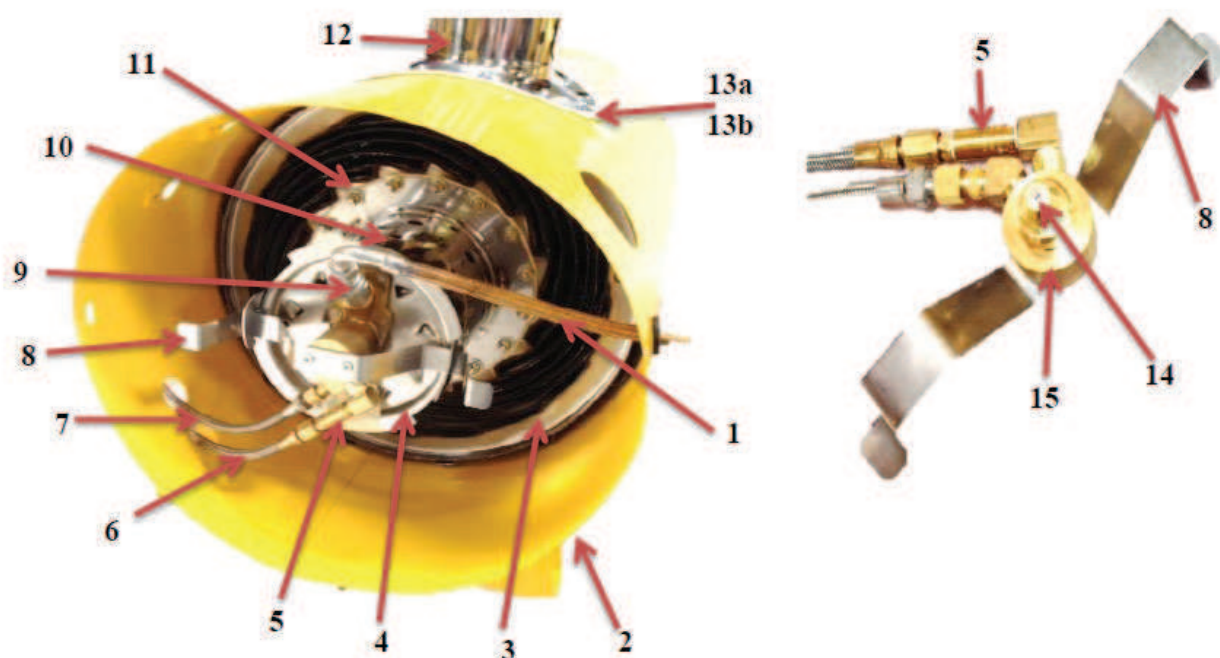


Figure 6-9. Heat Exchanger (Front)

Item	Part Number	Description	Quantity
1	04100156	IGNITION CABLE	1
2	04050032AT-OK	HEAT EXCHANGER CASING	1
3	8227028-10	HEAT EXCHANGER	1
4	TRF762 MOD A	COMBUSTOR PLATE	1
5	T0655A	5 PSI CHECK VALVE	1
6	05300410	16 INCH FUEL LINE	1
7	04100157-1	FUEL LINE	1
8	T0553C	COMBUSTOR NOZZLE CLAMP	1
9	TE1010B	IGNITER PLUG	1
10	TRF763	COMBUSTOR	1
11	TR776A	COMBUSTOR GASKET	1
12	TR3304	EXHAUST STACK	1
13a	TX595	HEAT EXCHANGER GASKET	1
13b	TX592	EXHAUST STACK GASKET	1
14	TR775	FUEL NOZZLE 2.5 GPH	1
15	05300144	NOZZLE HOLDER	1

SECTION 6 - Parts List

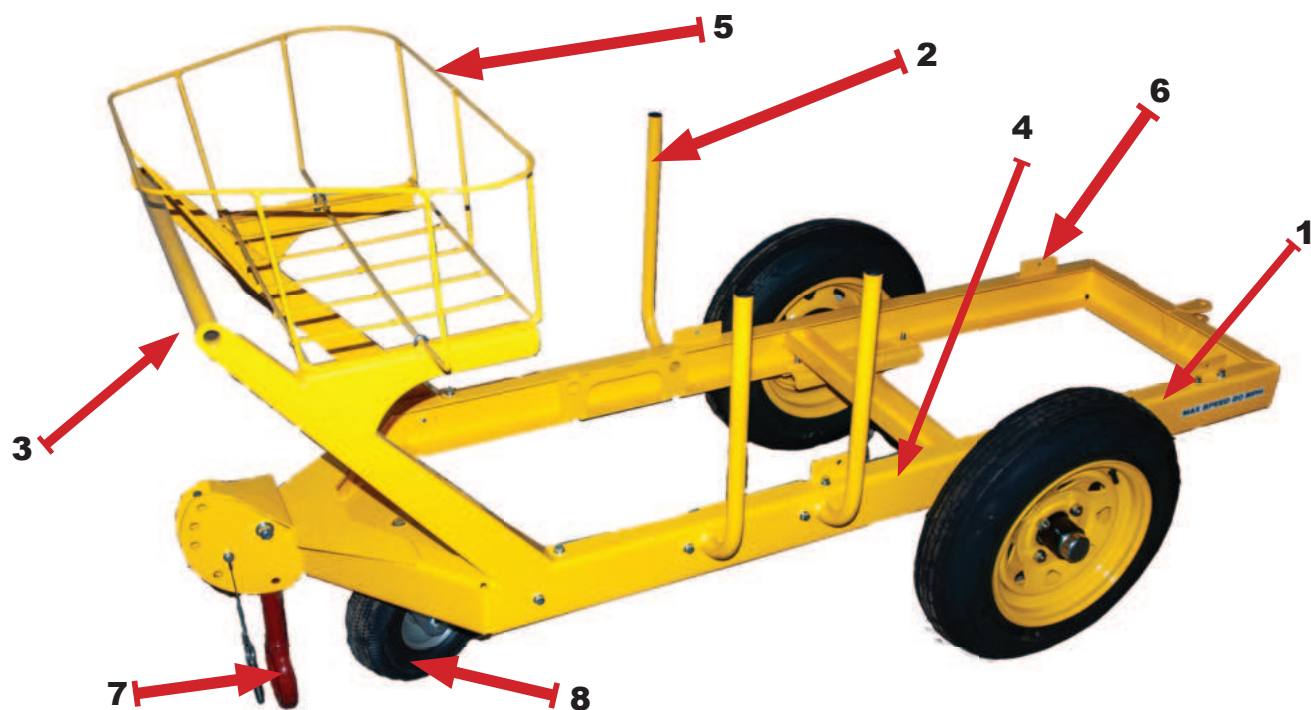


Figure 7-0 MA-1 TRAILER Parts

Item	Part Number	Description	Quantity
1	AGH-0001W	MAIN FRAME, TRAILER	1
2	AGH-0004W	DUCT HANGER	3
3	AGH-0009W	HANDLE	1
4	AGH-0011A	AXLE	1
5	AGH-0016W	BASKET	1
6	AGH-0027	MOUNTING BRACKET	4
7	TR260	TOW BAR	1
8	05300850	SWIVEL WHEEL	1

Change the crankcase oil 25 hours after initial operation and every 100 hours thereafter, using the following procedure:

- ## Oil Cartridge

Recommended Motor Oil	
Below 41 °F (5 °C)	SAE0W-30

[illegible]

Contact Aerotech Herman Nelson

HOW TO GET HELP

Please have the model and serial number on-hand when calling
100 Eagle Drive, Winnipeg, MB, Canada R2R 1V5

Local: 1 (204) 633-1999 (24 hr.)

Toll Free: 1 (800) 486-4328

Fax: 1 (204) 694-1612 or 1(204) 632-4441

Email: sales@hermannelson.com

Website: www.hermannelson.com



WARNING

Before operation carefully read this operator's manual to familiarize yourself with the BT400 NEX-G unit

For your own safety and longer product life, follow the instruction notices in this manual.

Keep this Operator Manual and the following manuals in the unit at all times

- Honda 5.5 HP Gasoline Engine Operation Manual

Please visit **www.hermannelson.com** for training videos
specifically designed to help you better understand how to use your BT 400NEX-G