

Chapter 14

Stoves

The USAP issues four types of portable stove to field groups. All four types operate on the principle of pre-heating liquid gasoline or kerosene so the fuel pressurizes, exits the jets as a vapor, and is ignited.

14.1 Types of Stoves

MSR Whisper Lite International® stove burns white gas (Coleman fuel) or kerosene (with a change of the stove's jets). It's the lightest of the stoves issued (17.8 ounces without fuel). A nearly identical version of the Whisper Lite International is the "shaker jet" model of the same stove with an in-line jet cleaner. The Whisper Lite International, either version, is issued as the emergency stove in all Survival Bags. (See figure 14-1).

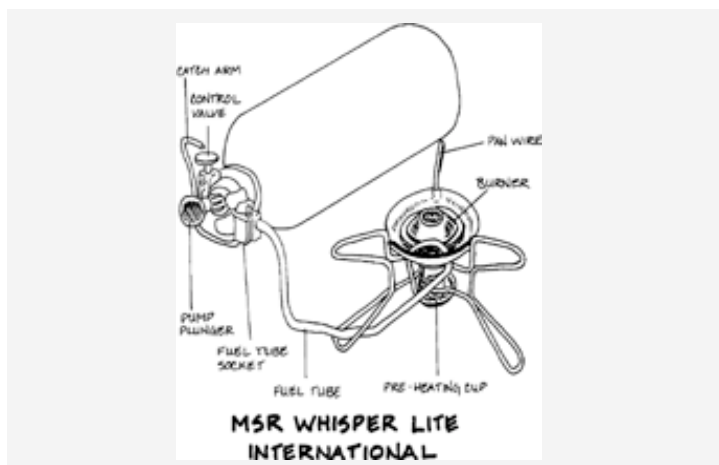


Figure 14-1: MSR Whisper Lite International® stove.

The **Optimus 111**® stove burns white gas (Coleman fuel) or kerosene. This is a compact stove (approximately 7 x 7 x 4 inches) and very reliable. In the field, it's used both as a primary stove and as a back-up or emergency stove. (See figure 14-2).

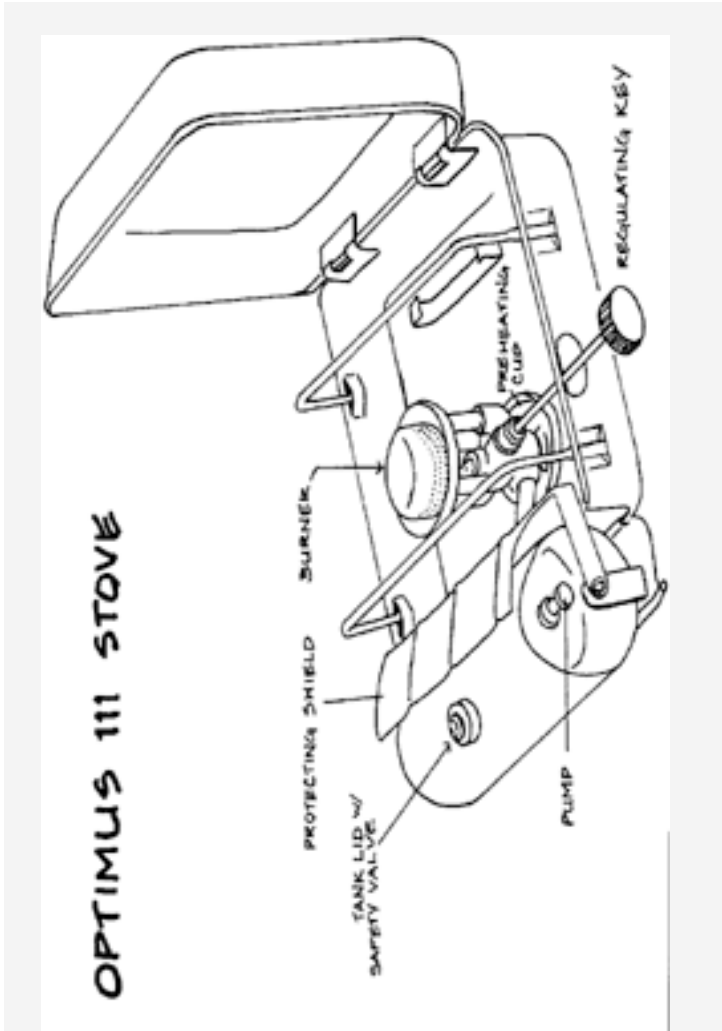


Figure 14-2: Optimus 111® stove.

The **Coleman 2-Burner®** stove burns white gas only (Coleman fuel). It's a large stove that allows two large cookpots to be heated at the same time. This is also the most maintenance-free stove that the USAP issues. (See figure 14-3).

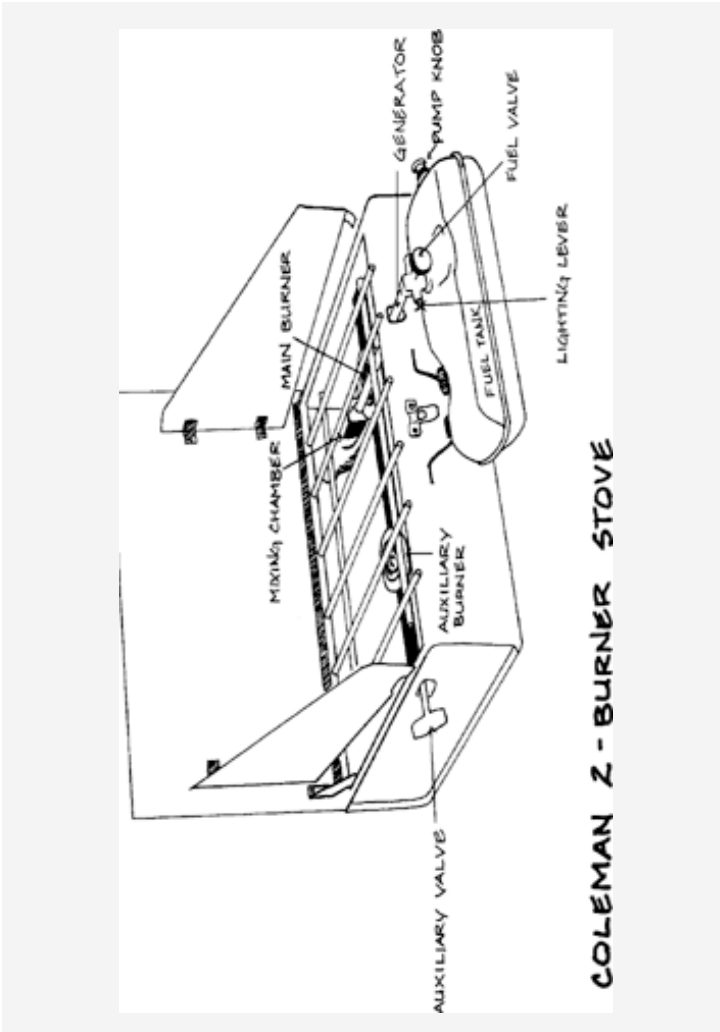


Figure 14-3: Coleman 2-Burner® stove.

The **MSR XGK®** stove burns a variety of fuels: white gas (Coleman fuel), Mogas, kerosene, or JP-8 (with a change of the stove's jets). It's lightweight (18.5 ounces without fuel) and is used primarily as a back-up or emergency stove. (See figure 14-4).

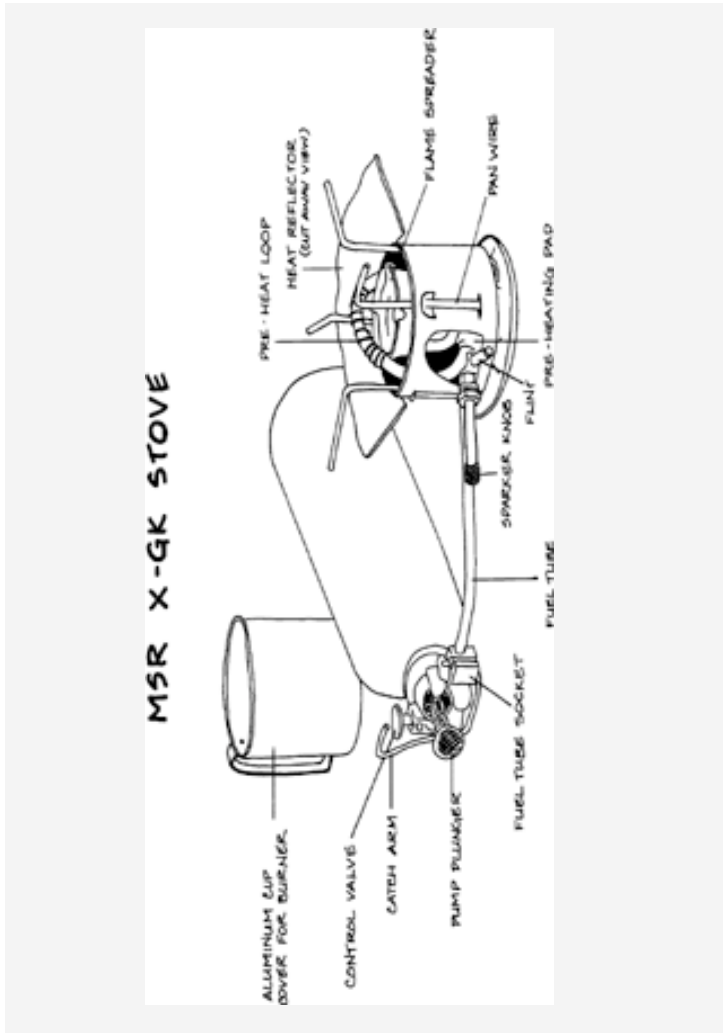


Figure 14-4: MSR XGK® stove.

14.2 Stove Safety

Liquid-fuel stoves are potentially hazardous due to the flammability of the fuels used and the toxicity of the vapors they produce (carbon monoxide). Deaths have occurred in the Antarctic due to improper stove use. When using a stove in the field, make sure to follow the safety measures listed below.

1. Do not use stoves without adequate ventilation.
2. Do not release fuel tank pressure near an open flame.
3. Use extreme caution when refueling. Skin contact with supercooled fuel will cause instant frostbite.
4. Check for leaks before every use.
5. Release pressure in the fuel tank before packing and storing.
6. Pack stoves and fuel away from food.
7. Do not cook in mountain tents except in emergencies. Preheat the stove outside of the tent.
8. Test all stoves before your field deployment.
9. Insulate the base of the stoves so that they won't melt through tent floors.

Should a person's clothing become ignited, **Stop, Drop, and Roll** to extinguish flames. Residues left from evaporated gasoline are combustible.

14.3 Stove Operating Instructions

MSR WhisperLite International and XGK

1. Fill the fuel bottle 3/4ths full with white gas (Coleman fuel), and screw the fuel pump snugly into the fuel bottle. Turn the fuel bottle upside down and check for leaks.
2. Pump 10 to 20 times.
3. Lubricate the end of the fuel tube on the stove with lip salve, sun cream, saliva, etc. to prevent tearing the "O" ring in the fuel-tube socket. Push the fuel tube into the socket on the pump and swing the catch arm around the pump until it snaps behind the pump and over the control valve.
4. Remove the flame spreader (XGK stove only) and poke the jet clean with the jet cleaning wire. Put the flame spreader back in place.
5. Place the reflector ring over the pan support wires and push it down out of the way of the burner assembly. Open the cylinder wind screen and place around the burner assembly, estimating your cook pot size.

6. Prime the stove by opening the control valve slowly. Let up to one teaspoon of fuel come out of the jet. Close the control valve. Light the spilled fuel. (The flame may be quite high - that is why you should never preheat a stove in a mountaineering tent.)
7. When the priming fuel flame is nearly out, slowly open the control valve up to two full turns. If yellow flame shoots forth, rather than blue flame, shut the control valve off and allow the stove to preheat (prime) a little longer. Then slowly reopen the control valve up to two full turns and adjust to desired heat. Remember, there is a time lag between control valve adjustments and the flow of fuel.
8. Adjust the flame with the control valve and by pumping up the fuel bottle.
9. Turn off the stove by closing the control valve until it is just snug. Don't tighten too much or you'll strip the nylon threads and ruin the pump assembly. It will take 10 to 15 seconds for the flame to go out. You can blow it out when it turns to yellow.
10. To release stove pressure, allow the stove to cool down several minutes. Turn the burner upside down and open the control valve. The pressure will escape through the jet. Close the valve when air stops escaping from the jet.

11. Burning kerosene or JP-8 in the WhisperLite and XGK stoves requires changing the jet to the “K” (kerosene) jet. You cannot prime/preheat the stove by spilling kerosene or JP-8 into the spirit cup.

Note: You must prime the stove with a flammable fuel such as white gas or Meta-paste. It is recommended to prime the stove aggressively before attempting to open the control valve for stove burning.

Optimus 111

1. Fill the tank 7/8ths full with white gas (Coleman fuel). Check the tank cap seal by holding the stove upside down and looking for leaks.
2. Clean the jet/nipple by turning the regulating key quickly all the way open and back again.
3. Preheat the stove by opening the regulating key and pumping the tank, spilling white gas into the preheating cup. Close the regulating key, and light the fuel in cup. Pump the stove 10 to 20 times. When the flame in the preheating cup burns down, turn on regulating key and ignite the stove.

A “thimble-full” of Meta-paste can be used to preheat the stove instead of white gas in the preheating cup.

4. Adjust the flame with the regulating key and by pumping the tank. To extinguish the flame, turn the stove off by turning the regulating key clockwise.

Coleman 2-Burner

1. Fill the tank 7/8ths full with white gas (Coleman fuel). Check the tank cap seal by holding the fuel tank upside down and looking for leaks.
2. Pump the tank 10 to 20 times, with the control valve closed. Plug the tank and generator into the stove so that it fits securely in the proper spot. (The generator rod should be plugged into burner body).
3. Make sure that the secondary burner regulating key (on left side of stove) is turned off.
4. Turn the lighter stem on the generator/valve assembly to the Up position.
5. Open the control valve and light the primary (right) burner. After one minute of burning, turn the lighter stem to the down position. Adjust the flame with the control valve and by pumping up the tank.
6. The second (left) burner can now be ignited by turning on the regulating key on the left side of the stove and lighting the burner with a match.

Note: You can effectively preheat this stove by putting white gas or Meta-paste in the primary burner bowl under the generator stem, lighting it, and allowing it to burn down before turning on the stove and lighting the stove.

14.4 Five Major Stove Problems

1. Insufficient preheating.
2. Clogged jet.
3. Air leak in the system (seals and “O” rings).
4. Wrong jet.
5. Contaminated fuel.

14.5 Stove Troubleshooting

Fuel Leakage:

- At fuel bottle: Fuel cap (or pump) not tight.
- At connectors: Seals or “O” rings damaged.
- At pump: Pump valve or seals are damaged.
- At jet: Control valve is stripped.

Limited or No Fuel:

- No pressure: Pump up fuel tank.
- No fuel: Tank is empty, jet is clogged, fuel tube is clogged, and/or fuel is too cold.

Pump won't work:

- Dry cup: Oil the pump cup.
- Dirty pump: Clogged check valve.

Reduced Performance through Jet:

- Lack of fuel: Check fuel level, pump up pressure-tank.
- Obstructions: Clean jet. Improper jet.
- Too cold: Improperly insulated from snow; warm fuel tank in sleeping bag.

Erratic Burning/Surging:

- Pressure too great: Control valve opened too far.
- Improper jet: Kerosene being burned in "G" jet.
- Gas being burned in "K" jet: Stove is cold. Burner not adequately preheated.

Do not purge gasoline stoves with kerosene or JP-8 as this will ruin them!

Drain and vent only!

Do not leave a venting stove where blowing snow, sand, or dirt could contaminate the fuel tank.