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Important: Before using the Firebreaker, read this instruction manual in its entirety.

Disclaimer

Firebreak Equipment CC will not be held responsible or liable for any incidental or consequential damages or for any loss or injury arising in connection with the use or inability to use this product. Correct use of the Firebreaker is the sole responsibility of the user. Follow all the safety precautions normally taken when burning a firebreak.

If in doubt, contact us for assistance via our website at www.firebreak.co.za

About the Firebreaker

The Firebreaker is an implement that helps you create firebreaks faster than conventional methods and with less risk of runaway fires.

Drawn behind a low-gear vehicle, usually a tractor, the Firebreaker burns a 1.35-m wide strip. A single burned strip is not sufficient to act as a firebreak. To create an effective firebreak, you need to burn a second strip, parallel to the first strip, and then do a regular burn between the two strips.

Depending on the length of the grass, the second strip should be 1 to 5 m away from the first strip. Burning the grass between the two strips allows you to create a firebreak of 3.7 m or wider.

Generally, firebreaks need to be at least twice as wide as the adjacent vegetation is tall. Some guides suggest that firebreaks be at least twice as wide as the expected flame length.

The implement is built to handle reasonably rocky terrain. It accommodates rocks up to 25 cm high.

For more information and photographs visit our website at www.firebreak.co.za

Components and Working of the Firebreaker

Components

The Firebreaker has two components:

- The *Basic Burner* is the primary component that burns the firebreaks.
- The *Afterburner* is an optional component that further improves safety and operational speed by extending the enclosed burning area.

The *Basic Burner* consists of:

- A burning chamber mounted on skids
- A *burning system*
- A *water system*

The *Afterburner* consists of:

- A burning chamber mounted on skids
- A *water system*

Important: To protect the inside of the burning chamber during transport, a cover is fitted over the top of the chamber. This cover is for transport purposes only. You must remove the cover before using the Firebreaker.

The *burning system* consists of:

- Two (or optionally three) gas burners mounted at the front of the burning chamber.
- A gas supply hose with a gas regulator and quick coupler.

The burning system requires liquefied petroleum gas (LPG), provided by a 48-kg double-valve gas cylinder, which has fittings for liquid withdrawal.

The *water system* consists of:

- Eight adjustable spray heads with embedded filters.
- A fixed water supply line with four taps.
- A water supply hose with a quick coupler.

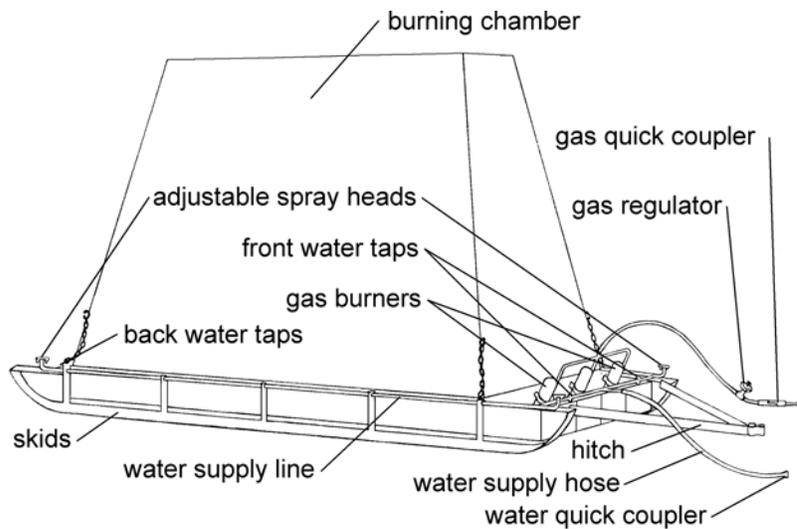


Figure 1: Positions of key components of the Basic Burner

The water system depends on, and extends, an independent water sprayer (usually a tractor-mounted firefighter) with:

- A water tank with filters.
- A pump (usually a Power Take-Off pump) delivering a minimum of 22 ℓ per minute at a pressure of 3–15 bar.
- A manifold capable of supporting three hoses.
- Two high-pressure handguns.

Configuration

The Firebreaker must be towed by a low-gear vehicle. The towing vehicle usually carries the water sprayer and the LPG cylinder.

A tractor carrying the water sprayer and gas cylinder on a three-point hitch makes an ideal towing vehicle. A low-gear truck carrying a skid sprayer and a gas cylinder is a suitable alternative.

Working

The slow-moving vehicle tows the Firebreaker along the ground. Flames from the gas burners ignite the grass inside the burning chamber. The grass burns safely within the confines of the chamber—a positive upward draught keeps the flames inside the chamber.

The adjustable spray heads on either side of the burning chamber spray water onto the ground alongside the chamber. These wet lines prevent the spread of flames beyond a 1.35-m burned strip.

When to Burn your Firebreak Strips

By burning your firebreak strips under optimal burning and weather conditions, you will achieve the best results with maximum efficiency. Under optimal conditions, you can expect to burn 4 to 5 km of strip a day.

For best results, ensure that:

- The grass is dead and burns readily.
- The grass is dry.

Note: Since dew on the grass inhibits burning, it is best not to begin burning before 09:30 or 10:00.

- The grass is not too long.

If the grass is longer than 1 m, we recommend that you cut it before burning. This will reduce the risks associated with wind and the height of the flames.

Note: Do not cut the grass shorter than about 25 cm—sufficient fuel is required to burn an effective firebreak.

- The wind is minimal.

Because of the inherent safety of the Firebreaker, a total lack of wind is not a prerequisite. However, wind does increase the risk of embers flaring up in the burned strip and sparks being carried onto surrounding vegetation. Ember flare-up is most likely to occur up to 200 m behind the Firebreaker. We do not recommend burning in wind with gusts of more than 10 to 15 km per hour.

Preparing the Water System

The Firebreaker's water system depends on, and extends, an independent water sprayer, usually a tractor-mounted firefighter.

Before using the Firebreaker:

1. Ensure that the water filters are clean.

Water filters are located:

- Inside each of the eight spray heads on the Firebreaker.
- On the water sprayer, in the supply line between the water tank and the pump.

2. Fill the tank with water. Use clean water only—dirt collecting in the filters reduces the flow of water, compromising safety.

For safety reasons, do not allow the water tank to run completely empty while using the Firebreaker. You can fill the tank while the Firebreaker is in use.

3. Hitch the Firebreaker behind the towing vehicle.
4. Connect the Firebreaker's water supply hose to the manifold on the water sprayer.

Important:

Even under optimal weather conditions, you should augment the water system with:

- At least one backpack sprayer to extinguish flames or embers that flare up in the burned strip.
- At least one person to operate a high-pressure handgun on the water sprayer.

If weather conditions are less favourable:

- Add a second high-pressure handgun operator.
- Add another backpack sprayer.

Note: It is good practice to ensure that the water tank and the backpack canisters are always more than half full.

Preparing the Burning System

The burning system uses liquefied petroleum gas only. Always use a 48-kg double-valve gas cylinder.

Before using the Firebreaker:

1. Ensure that the cover used to protect the inside of the burning chamber during transport has been removed from the top of the chamber.
2. Securely fasten the gas cylinder to the vehicle carrying it.
3. With the Firebreaker hitched behind the towing vehicle, connect the Firebreaker's gas supply hose to the gas cylinder.
4. Check the entire gas supply line for leaks. This is best done using soapy water.

Burning a Strip with the Firebreaker

With the Firebreaker hitched behind the towing vehicle, and the burning and water systems ready for use, you can start burning your firebreak strips.

Important: Before using the Firebreaker, read the entire section, *Precautions*, on page 10.

Drag the Firebreaker to where you want burning to begin, with the towing vehicle facing in the direction in which you want to burn the strip.

To start and adjust the water system

1. Start the water pump and flush the water system by opening all the taps on the Firebreaker's water supply line. (Both the Basic Burner and the Afterburner have four taps.)
2. Close the two water taps at the back of the Firebreaker and adjust the spray heads for optimal water distribution.

Important: On each side of the Firebreaker, you must adjust one of the back spray heads to spray on the dividing line between the burned strip and the unburned grass, exactly under the back sprayers.

You can adjust the other spray heads at the back of the Firebreaker to extinguish residual flames left in the burned strip. Should you notice that the vegetation in the strip is not burning away completely, turn these spray heads to spray outwards, away from the burned strip. Alternatively, turn them off to save water.

To start and adjust the burning system

1. Completely open the liquid withdrawal valve on top of the gas cylinder.
2. Light all the gas burners in front of the burning chamber. We recommend that you use a long-handled lighter.
3. Adjust the length of the flames by turning the pressure regulator next to the valve on the gas cylinder. To increase the length of the flame, turn the tap clockwise. To decrease the length of the flame, turn the tap anti-clockwise.

Note: For the best results, the flames should extend at least 25 cm from the burner nozzles. This ensures consistent burning even when the terrain is uneven.

To burn the firebreak strip

1. Slowly tow the Firebreaker in the direction of the desired strip.

The speed at which the Firebreaker moves, determines the extent of the flames exposed behind the Firebreaker. The faster the Firebreaker moves, the less time the flames have to burn out in the safety of the burning chamber. Drag the Firebreaker sufficiently slowly to minimize the flames exposed in the strip. We recommend that you use a low gear and a low idle speed.

2. Position at least one backpack sprayer approximately 30 m behind the Firebreaker to monitor for and extinguish embers that flare up in the burned strip. An additional backpack sprayer can be positioned directly behind the Firebreaker to contain and extinguish residual flames as required.
3. Have at least one high-pressure handgun operator to provide backup support when required.
4. When the towing vehicle stops, flames from the gas burners will be inclined to move forward towards the vehicle—the only place where dry, unburned grass remains. Extinguish these flames immediately.

Precautions

Although using the Firebreaker significantly reduces the risk of starting a runaway fire, you always need to be cautious:

- The burning chamber gets extremely hot during use. Do not touch the chamber while it is in use and for a time afterwards.
- Be vigilant for embers that could flare up in the burned strip 200 to 300 m behind the Firebreaker.
- Be on the lookout for sparks escaping from the burning chamber, which could ignite spot fires in the vicinity.
- Stop burning if the strength or unpredictability of the wind makes you apprehensive. The fire should always be controllable.
- It is good practice to keep all the water tanks more than half full. This reduces the likelihood of running out of water in the event of an emergency.
- When burning the second strip, do not be tempted to allow the flames to burn freely towards the first strip. A change in wind direction could cause the fire to run ahead of the Firebreaker where it will no longer be contained by burned strips.
- When overnight temperatures are expected to drop below freezing level, open all four of the water taps on the Firebreaker and run the water pump until the water tank is empty. This will prevent the pump and the water line from bursting as the water freezes.

Emergency Procedure

In the event of a runaway fire, immediately stop the firebreak-burning process and concentrate all the resources at your disposal on containing the fire.

Decouple the Firebreaker from the vehicle supplying the water, allowing independent use of the sprayer to fight the fire.

To decouple the Firebreaker

1. Disconnect the gas quick coupler.
2. Disconnect the water quick coupler.
3. Remove the pin that secures the Firebreaker to the vehicle supplying the water.

Using the Afterburner

The Afterburner is identical to the Basic Burner, except it lacks ignition devices. Hitched behind the Basic Burner, the Afterburner serves to extend the enclosed burning area, thereby improving safety.

The main advantage of using the Afterburner is that you can cover more ground per day. The additional enclosed area, not the slow speed of the tractor, provides the time needed for flames to burn out in safety. Using the Afterburner, you can expect to burn 8 to 12 km of strip a day.

The Afterburner also enables you to burn firebreaks in longer grass. The length of the grass affects the length of the flames and the amount of heat they generate. It is important that the resulting flames always be controllable.

Note: We do not recommend using the Afterburner in rocky terrain.

To extend the Basic Burner with the Afterburner

1. Ensure that the cover used to protect the inside of the burning chamber during transport has been removed from the top of the chamber.
2. Hitch the Afterburner behind the Basic Burner.
3. Connect the Afterburner's water supply line to that of the Basic Burner.

Note: The water system on the Afterburner requires the same preparation as that on the Basic Burner. Flush the water system before use, as described in the section, *Burning a Strip with the Firebreaker*.

Specifications

Width of single burned strip		1.35 m	
Width of firebreak		You can make a firebreak of any width by successively burning parallel strips and then burning the grass between these strips	
Distance burned per day (single strip)	Basic Burner	4–5 km	Can be increased by using an additional water sprayer behind the last burning chamber
	Basic Burner and Afterburner	8–12 km	
LP gas consumption		± 3 kg per hour	A 48-kg double-valve gas cylinder with fittings for liquid withdrawal is required
Water consumption		500 ℓ per 750 m under optimal wind conditions	Less with the addition of chemical fire retardant. Dependent on the wind.
Water supply Typically a firefighter	Tank size	Typically 500 ℓ	An inline filter is recommended
	Pump pressure	3–15 bar	A Power Take-Off (PTO) pump is typically used
	Pump delivery rate	Minimum of 22 ℓ per minute	
	Fittings	A manifold that can support 3 hoses is recommended	Two high-pressure handguns are recommended
Towing-vehicle power		A minimum of 55 kW to carry a 500-ℓ water tank on the back of the vehicle	Less if the water is carried on the front of the vehicle. A tractor is usually used.
Materials	Burning chamber	Stainless steel, lined with ceramic insulation wool	
	Skids	Tempered steel	
Size of Basic Burner	Weight	± 450 kg	Same for Afterburner
	Dimensions	Length: 350 cm Width: 160 cm Height: 190 cm	
Grass length	Basic Burner	If longer than 1 m, the grass should be cut	Do not cut the grass shorter than about 25 cm
	Basic Burner and Afterburner	Can exceed 1 m in length	
Terrain		Rocks up to 25 cm high can pass beneath the burning chamber	Rocks higher than 23 cm should be cleared away. The towing vehicle should circumvent large rocks that cannot be moved. Using an Afterburner in rocky terrain is not recommended.