



## Drip Torch for Fuel Bottles

*Jim Tour, Project Leader*

The Missoula Technology and Development Center has evaluated a drip torch for 1-liter Sigg or MSR fuel bottles (figure 1). The drip torch provides the continuous drips of flaming chain saw gas needed for burnout operations. It was successfully used by hotshot fire crews during the 2000 fire season and can be used as a substitute for fusees.

The drip torch will operate safely using pure chain saw fuel. However, it is more effective if it is used with fuel that has been diluted with oil. The drip torch can also operate with standard drip-torch fuel. Users should remember to flush out fuel bottles that have been used to dispense drip-torch fuel before adding fuel for use in chain saws.

Tests revealed that a 32-ounce fuel bottle with the drip torch would continuously dispense raw chain saw fuel for about 11 minutes and a 3:1 fuel-to-oil mixture for about 17 minutes. The thicker the mixture the longer the dripping and the longer the residual burn time after the drips land on forest fuels.



Figure 1—The Fireline Engineering drip torch mounted on an MSR fuel bottle.

The new drip torch includes a travel container (figure 2). The drip torch should be wiped clean before being placed in the travel container. The travel container **is not designed to carry liquid fuel.**

The drip torch is mailed in the assembled travel configuration (figure 3). The fuel tube (part no. 14) is screwed into the bottom of the check valve body (part no. 3). Note that the position of the breather tube (part no. 1) prevents the fuel tube from becoming dislodged while the drip torch is inside the container and must be pushed aside for disassembly. The travel screw (part no. 15) is screwed into the insert (part No. 10) that is inside of the check-valve body (part no. 3). The travel screw must be removed before assembling the stainless-steel tube (part no. 14) into the top of the check-valve body (part no. 10). The travel screw applies force to the fuel-flow ball (part no. 8), shutting off the flow of fuel. The drip torch does not have to be reassembled into the original configuration before being returned to the travel container.





Figure 2—The drip torch's travel container. The drip torch is configured so it will fit inside the container.



Figure 3—The Fireline Engineering drip torch, travel container, and MSR fuel bottle.

## Operation

Remove the entire assembly from the transport container and unscrew the stainless-steel fuel tube (part no. 14) from the check-valve body (part no. 3), gently moving the breather tube (part no. 1) aside so the 360-degree

bend in the fuel tube will slip past the breather tube. Remove the travel screw (part no. 13) from the insert in the top of the check valve body (part no. 3) and screw the fuel tube into the insert as far as possible. Hand tighten the assembly into any Sigg or MSR fuel bottle. Orient the fuel bottle

so the vacuum adjusting screw (part no. 7) is on top and the fuel tube is on the bottom (in relation to the ground). Back the fuel tube out until the 360-degree bend is pointing down (the same orientation as a standard drip torch). Twist the locking nut (part no. 12) down to force the rubber washer (part no. 11) onto the top of the insert, forming a seal and locking the fuel tube into position. Loosen the wick nut (part no. 22) and rotate the wick assembly down and away from the brass nozzle (part no. 16). Tighten the wick nut to secure the wick assembly. Adjust the vacuum adjusting screw to obtain the desired flow of fuel. You are now ready to operate the device by lighting the wick and dispensing fuel.

To extinguish the wick, hold the unit at least slightly above eye level and blow out the flame. Avoid contact with fuel and do not breathe fuel vapors.

## Maintenance

When the firing operation has been completed, the drip torch may be disassembled for transport. Drain as much fuel from the assembly as possible and wipe off excess fuel. Be careful not to contaminate fuel bottles used for chain saw gas with oil or soot from the drip torch assembly.

All O-Rings (parts no. 2 and 16) and the rubber washer (part no. 11) are made of neoprene and should be replaced with the same material when needed. The wick material is 1-inch cotton oil lamp wick that may be purchased at any hardware store. Any wick material can be used as long as it is cut to fit into the wick cage (part no. 20). Figure 4 and table 1 show the parts for the drip torch.

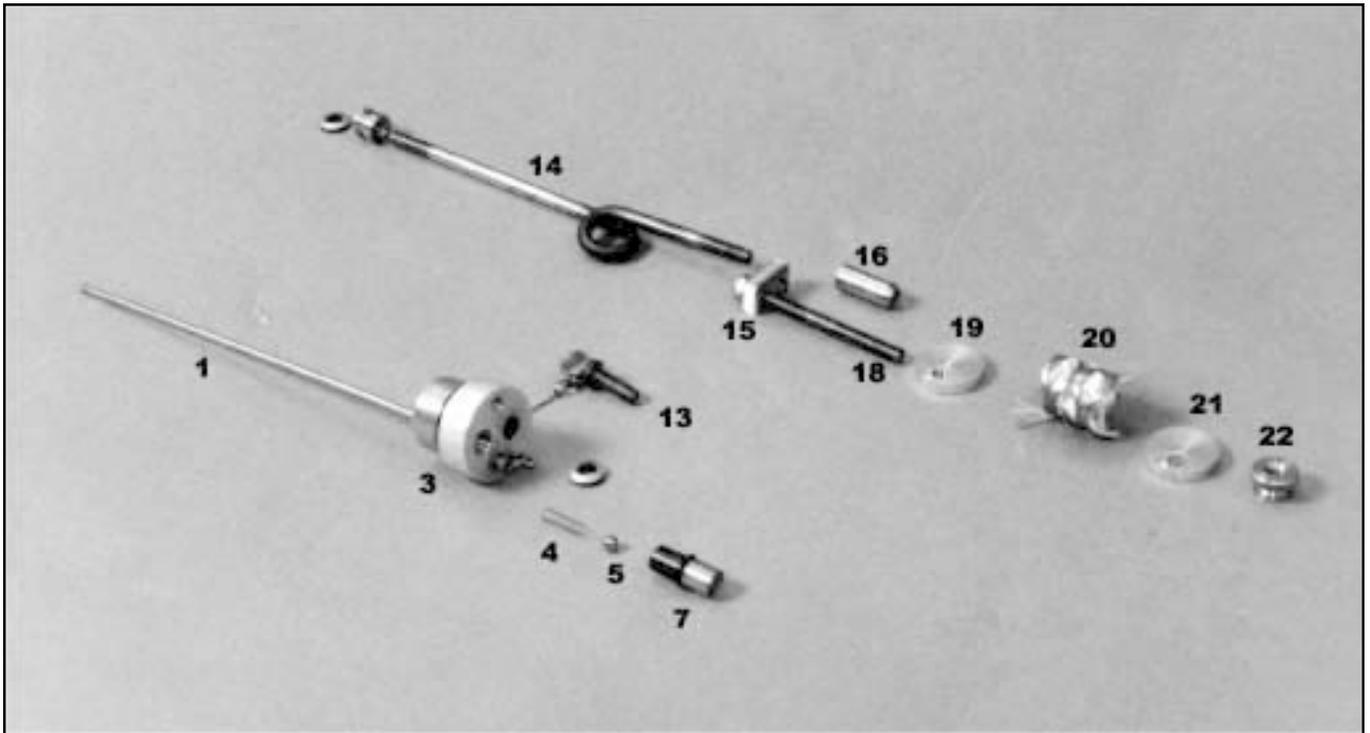


Figure 4—Parts for the Fireline Engineering drip torch.

Table 1—Drip torch parts list.

Part No.	Description	Part No.	Description
1	Stainless-steel breather tube	12	Locking nut
2	O-Ring, AS 586-110	13	Travel screw
3	Check-valve body	14	Stainless-steel fuel tube
4	Vacuum spring, 1 x 0.18	15	Wick adapter
5	Vacuum ball, $\frac{7}{132}$ inch	16	Brass nozzle
6	O-Ring, AS 586-009	17	Stainless-steel lock nut $\frac{1}{4}$ -20
7	Vacuum adjusting screw	18	Wick rod, $\frac{1}{4}$ -20
8	Fuel-flow ball, $\frac{9}{132}$ inch	19	Wick base
9	Fuel-flow spring, $\frac{11}{132}$ x 0.18	20	Wick cage
10	Threaded insert $\frac{3}{16}$ -16, $\frac{1}{4}$ -20	21	Wick cap
11	Rubber washer	22	Wick nut, $\frac{1}{4}$ -20

The drip torch costs about \$65, plus shipping and handling. It is available from:

Fireline Engineering  
 Attention: Chris Johnson  
 321 Locust Street  
 Ridgecrest, CA 93555

## About the Author

Jim Tour is a Project Engineer at MTDC specializing in explosives and incendiaries. Jim began working for the Forest Service in 1970, spending 8 years as a technician at the Technology and Development Center in San Dimas, CA. He received his degree in mechanical engineering at California Polytechnic University Pomona and came to MTDC shortly afterward. He has helped develop incendiary devices such as the Premo MK III aerial ignition device and has helped redesign the helitorch.

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USDA Forest Service, MTDC  
Building 1, Fort Missoula  
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### **For further technical information, contact Jim Tour at the address above.**

Phone: 406-329-3923  
Fax: 406-329-3719  
Lotus Notes: James W Tour/WO/  
USDAFS  
E-mail: jtour@fs.fed.us



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