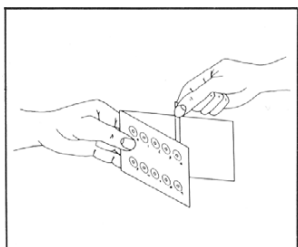
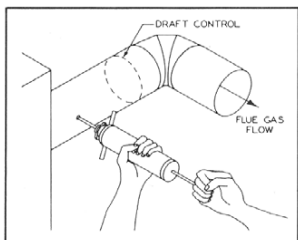
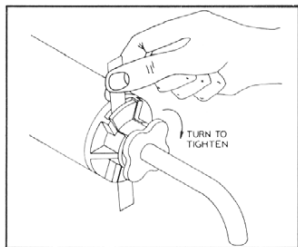


**Dwyer**

## OPERATING INSTRUCTIONS

### No. 920 SMOKE GAGE PUMP



1. Loosen the tubing adapter one full turn counter-clockwise. Insert a 2-3 inch strip of filter paper as shown. Tighten the adapter just enough to hold the paper in place. Do not over tighten.
2. Before drawing sample, allow stack to reach full operating temperature. Insert the sampling tube through a  $\frac{5}{16}$ " hole in pipe. Slowly draw flue gas through paper with 10 full strokes. Pause briefly during each stroke with handle completely extended. This will assure that the correct total volume of gas will pass through the paper. Remove the sampling tube and plug hole in pipe.
3. Loosen adapter and remove the sample paper. Slide the strip between the smoke chart and the backing and determine which spot it most closely matches. Record the number for reference.

A smoke test is necessary to monitor the amount of smoke present in the flue gas. This test is important because too much smoke indicates incomplete combustion and as a result, wasted fuel. Also, as soot forms on the heat exchanger surfaces it creates an insulating effect which further lowers efficiency. Flue passages may even become clogged in severe cases.

To assure complete combustion and therefore lower smoke level, adequate excess air must be supplied. An important point to keep in mind though is that too much excess air also lowers efficiency by reducing the amount of heat transferred to the heat exchanger and instead carrying that heat up the chimney.

A delicate balance must be reached to keep both smoke and excess air at a minimum. The reading obtained from your CO<sub>2</sub> indicator is equally important in determining net efficiency because high CO<sub>2</sub> content results when excess air is low.

#### NOTE

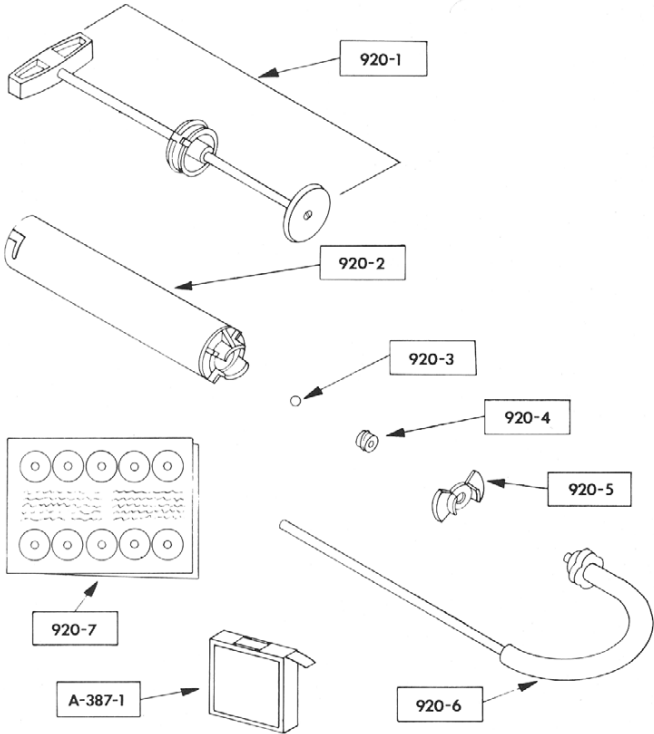
The Dwyer Combustion Efficiency Test kit is for professional or industrial use only by individuals with proper training in the operation and maintenance of the equipment being tested. Improper use could result in personal and/or property damage.





## PARTS LIST

### No. 920 SMOKE GAGE PUMP



- 920-1 Plunger assembly
- 920-2 Pump housing assembly
- 920-3 Check ball
- 920-4 Check ball retainer with "O" ring
- 920-5 Sample paper guide
- 920-6 Tubing adapter, tubing, and sampling tube
- 920-7 Smoke chart
- A-387-1 Sample paper (roll)

#### NOT SHOWN

- A-357 Spring type sample tube holder
- A-388 Awl (for piercing smoke pipe)
- A-386 Metal hole plugs for  $\frac{5}{16}$ " hole, package of 20.

**CAUTION:** If the pump has been disassembled for cleaning or maintenance be very careful when reinstalling the check ball retainer, 920-4. Once the threads are engaged, only  $\frac{1}{2}$  turn is needed to fully seat. Tightening beyond that may damage threads.

**NOTE:** If the plunger becomes difficult to operate, remove and lubricate the piston with a light coating of petroleum jelly or silicone grease.