

# National Torches

Made in USA



• NOTE •

**Not to be used with mixtures of  
Acetylene and Oxygen**

## **Operating Procedures and Safety Information for National Torches**

**Models 3A-B, 3B-B, 4B, 6B, 7L, 8R, and 8M**

### **Introduction**

Before operating any fuel gas and air or oxygen equipment, read and follow the information in this instruction sheet or other qualified operation/training instructions. Torches using any combination of fuel gas and air or oxygen produce a high temperature flame that can result in property damage or severe personal injury if not used properly. Exercise extreme caution when using this equipment.

National torches listed above are designed for normal operation using Natural Gas and compressed air or oxygen as the principle gases. The unique design of this equipment also allows substitution of other fuel gasses such as, propane, butane, Mapp and other manufactured fuel gases except acetylene and hydrogen. Caution should be observed with oxygen as the oxidizer since it achieves a hotter flame, which has greater service potential.

Do not alter or attempt to repair any fuel gas and air or oxygen equipment. Only authorized repair personnel should perform repairs.

### **General Safety Information**

- ◆ Protect your eyes at all times with approved goggles. Oxygen-fuel heating and brazing may produce hazardous rays (infrared/ultra-violet), so an approved filter lens (at least a number five shade or darker) should be used. Do not allow bystanders to look directly at your work without proper eye protection.
- ◆ Appropriate protective clothing such as gloves, aprons, safety shoes, etc. are required when using fuel-air/oxygen equipment. Reflected heat, molten metal or sparks can cause severe burns to unprotected parts of the body.
- ◆ Fuel gas and air or oxygen heating or brazing operations should be performed whenever possible in an open, well ventilated area. Combustion fumes and fumes from heated flux must be adequately exhausted or dispersed from the work area.
- ◆ The safety of the workplace must be maintained:
  - The work place must have a fireproof floor.
  - Workbenches must have fireproof tops.
  - The work site should be clear of combustible materials, especially oil or grease.
  - Never allow gas-air equipment to be contaminated with petroleum-based substances. In the presence of oxygen, these substances can easily ignite and burn violently.
- ◆ Use only compressed gas cylinders that are approved by the Department of Transportation (DOT), and follow the instructions and safety procedures provided by your gas cylinder supplier, such as:
  - Cylinders must be in the vertical position when in use and secured from falling.
  - Keep cylinder valve protection caps on and valves closed whenever cylinders are not in use.

- Locate cylinders away from flames or sparks.
- ◆ Never use compressed gases from cylinders without an approved gas pressure regulator attached to the outlet of the cylinder.
- ◆ Use caution to keep flames and heated objects away from the gas hoses.
- ◆ Use only a spark/friction lighter to ignite the flame at the torch tip. Never use a match or cigarette lighter.
- ◆ It is recommended that reverse flow check valves be installed in the system between the regulator and the torch. Consult your gas cylinder or regulator supplier for installation and maintenance.

### **Torch Uses (Not to be used with mixtures of acetylene and oxygen)**

The National torches listed at the beginning of this brochure are used for lampworking, heating, glasswork, soldering, light brazing and silver soldering. The equipment can be used on a variety of materials that can withstand the level of heat generated by the flame. Use the Tip Selector Charts and the Flame Temperature Chart printed later in this instruction sheet to assist in selecting the equipment and gases for the application.

This is not a welding torch and is not designed for welding applications.

### **Installation**

National torches are connected to fuel and air or oxygen supplies with an industrial welding grade hose. Industrial welding grade hoses are generally color coded red for fuel gas, black for air and green for oxygen.

Supply ends of the hoses must have properly crimped screw fittings indexed with 9/16-18 left hand threads for fuel gas and 9/16-18 right hand threads for the air or oxygen. Connection of the fuel gas hose to a natural gas valve or line should be done by a licensed plumber to meet codes. If cylinders are used, connect hoses to properly selected regulators and check valves.

Before attaching hoses to the torch, purge hoses individually to remove any preservative talc or cut-off particles by opening valves or regulators for 5 seconds when set at 5 psi pressure with hoses attached.

Torches 3B-B and 4B, with "B" size (9/16-18) threaded hose connections, and torch 8R, with "A" size (3/8-24) threaded hose connections, are also indexed right hand and left hand for air/oxygen and fuel, respectively. Simply make the threaded connections to an industrial welding grade hose set that is assembled with crimped ferrules for a leak free hook-up. (Industrial welding grade hose sets are available from Premier Industries.)

The 3A-B, 7L, 5B and 6B torches have hose barbs to connect the gas supplies. Hoses are connected to the torch by first applying the ferrule, and then pushing the hose onto the barbed fittings until all barbs are covered. Crimp the ferrule and test by pulling on the hose for firm attachment. Do not use the torch without properly crimped ferrules on the hoses.

If you do not have the facilities for applying hoses properly, consult your dealer or cylinder supplier who will provide proper fittings and attach them in most cases.

Before lighting torch, test all connections with a soap water solution. Never test with or near an open flame.

### **Adjusting Gas Pressures**

National Torch tips are designed to operate with specific pressure settings to achieve desired performance. Please consult the Tip Selector Charts that follows for proper tip selection and pressure settings.

Set the regulator pressures with the torch valves closed. Turn the adjusting screw of the air or oxygen regulator clockwise until the desired pressure is registered on the low pressure gauge. Repeat for the fuel regulator unless fuel hose is connected to a natural gas pipe or a preset regulator is used.

### **Lighting and Adjusting the Flame**

To light the flame:

- Open the fuel valve slightly.

- Ignite the fuel gas with a friction lighter.
- Increase the fuel gas flow until the flame appears to leave or separate from the end of the tip.
- Close the gas valve slowly until the flame draws back and meets the end of the tip.
- Open the air or oxygen needle valve very slowly.
- Continue to add air or oxygen flow until a well-defined blue-white inner cone appears.

### **Extinguishing the Torch and Shutting Down the System**

When your work is completed and you wish to shut off the equipment, proceed as follows:

- Close the air-oxygen torch valve.
- Close the fuel gas torch valve.
- Turn off both cylinder or line valves (clockwise).
- Open both torch valves briefly to relieve the residual gas pressure.
- Shut off torch valves again.
- Rotate regulator adjusting screws to the left (counterclockwise).
- Always store the equipment with cylinder or line and torch valves closed.

Shut down complete system whenever torch is unattended or not in use for an extended period.

### **Special Instructions for 7L Lever Torch (Use with Air/Fuel Gas Only)**

*Installation of Adapter/Tips into Torch Head:* The 7L Torch utilizes an adapter (#373) with the National tips. When installing the adapter and tips into the torch head, you must use the following procedure:

1. Thread adapter into tip and tighten hand tight to bottom adapter into the tip.
2. Insert adapter with tip into torch head and tighten hand tight until back end of tip bottoms on torch head.

Torch with tip is now ready for use.

*Operation:* Operation of the 7L Torch is similar to other National Torches except that 1/4 turn ball valves, rather than needle valves, are used to control flow. Ball valves allow for quick flow change with small movements of the valve handle so caution should be exercised when operating the valves.

The ball valves are also equipped with stops allowing for only 90 degrees of rotation. However, since there are no locks in the closed position, care must be taken not to bump the levers and accidentally change the valve position.

### **3A-B and 3B-B Torch Replacement Parts**

335	Green Valve Wheel
336	Red Valve Wheel
331	Elbow Nut Retaining Ring
330-A	Elbow Assembly
329	Elbow Nut
334-VSG	Valve Stem Assembly, Green
334-VSR	Valve Stem Assembly, Red
R5209	O-Ring

CONSULT DISTRIBUTOR FOR REPLACEMENT PARTS FOR OTHER PRODUCTS

#### **ABBEON CAL INC.**

123 Gray Avenue  
 Santa Barbara, CA 93101  
 Phone 800-922-0977 ♦ FAX 805-966-0810 ♦ Abbeon.com

## Tip Selector Charts

(Not all tips manufactured by National are listed below; consult factory or your distributor for special application needs.)

### Propane, Natural Gas and Air

Tip No.	Fuel Capacity (CFH)	Gas Pressure (PSI)	Air Capacity (CFH)	Air Pressure (PSI)	Tip Diameter (inches)
N-0	8	¼	80	5	0.63
N-1	10	¼	100	10	0.63
N-2	20	¼	200	10	0.75
N-3	30	¼	300	25	1.00
N-4	40	¼	400	25	1.10
N-6	60	¼	600	25	1.38
NB-2	60	¼	600	25	1.65
201	3	¼	12	6	0.38

### Propane, Natural Gas and Oxygen

Tip No.	Fuel Capacity (CFH)	Gas Pressure (PSI)	Oxygen Capacity (CFH)	Oxygen Pressure (PSI)	Orifice Diameter (inches)
OX-00	0.3	¼	1	3	0.020
OX-0	0.5	¼	2	3	0.032
OX-1	1	¼	4	3	0.042
OX-2	2	¼	8	6	0.055
OX-3	3	¼	12	6	0.070
OX-4	4	¼	16	6	0.082
OX-5	5	¼	20	8	0.100
<u>Multi-Orifice Tips</u>					
HTM-0	5	¼ to 4	20	8	(7) 0.031
HTM-1	6	¼ to 4	22	10	(9) 0.040
HTM-2	7	¼ to 4	26	12	(9) 0.048
HTM-3	8	¼ to 4	28	15	(9) 0.055
HT-0	3	¼ to 4	12	6	(7) 0.025
HT-1	3	¼ to 4	18	6	(12) 0.025
HT-2	6	¼ to 4	22	10	(19) 0.025
HT-3	7	¼ to 4	25	12	(31) 0.025

### Flame Temperature Chart

Fuel Gas	Flame Temperature, °F, when burned with:		BTU Values per Cubic Ft.	Heat Transfer Velocity (arbitrary)
	Oxygen	Air		
Propane	4,800	3,500	2,420	Fast
Natural Gas	4,600	3,400	1,080	Slow

### EQUIPMENT WARRANTY POLICY

Abbeon Cal Inc. (Abbeon) warrants to the initial user of products that such products are free from defects in material and workmanship, under normal use and service, for a period of ninety days from the date of installation or one year from the date of shipment from the factory, whichever comes first. Within this warranty period, Abbeon agrees to replace or repair at the factory in Minnesota, any product found to have been defective in material or workmanship at no charge to the user. Abbeon will not pay for or warrant repairs made by anyone other than factory personnel.

Abbeon shall not be liable for consequential or indirect damages to the extent permitted by law. This warranty shall be the exclusive warranty and shall be in lieu of all implied warranties including implied warranties of fitness for a particular purpose or application. This warranty shall not apply to product that has been altered or modified except by factory personnel or product which has been damaged by accident, abuse or misuse.