



Air-Fuel Outfit

INSTALLATION AND OPERATION INSTRUCTIONS

Before Installing or Operating, Read and Comply with These Instructions

Controls Corporation of America
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To Order Call 1-800-225-0473 or 757-422-8330 • Fax 757-422-3125
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USER RESPONSIBILITY

This equipment will perform in conformity with the description contained in this manual and accompanying labels and/or inserts when installed, operated, maintained, and repaired in accordance with the instructions provided. This equipment must be checked periodically. Improperly working equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated, should be replaced immediately. Controls Corporation of America (CONCOA) recommends that a telephone or written request for service advice be made to CONCOA Customer Service in Virginia Beach, Virginia, PHONE: 1-800-225-0473 (toll-free), or 1-757-422-8330; FAX: 1-757-422-3125, or E-MAIL: e-mail@concoa.com.

This equipment or any of its parts should not be altered without prior written approval by CONCOA. The user of this equipment shall have the sole responsibility for any malfunction that results from improper use, faulty maintenance, damage, improper repair, or alteration by anyone other than CONCOA or a service facility designated by CONCOA.

CUSTOMER SERVICE

In the event of equipment failure, call CONCOA Customer Service. Please be prepared to provide the model number and serial number of the equipment involved, in addition to some details regarding its application.

WARNING

- Protect yourself and others.
- Read and understand these instructions.
- FUME AND GASES can be dangerous to your health.
- HEAT RAYS (INFARED RADIATION from flame or hot metal) can injure eyes.
- Read and understand the manufacturer's instructions and your employer's safety practices.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the flame, or both, to keep fumes and gases from your breathing zone, and the general area.
- Wear correct eye, ear and body protection.
- See American National Standard Z49.1 *Safety in Welding and Cutting* published by the American Welding Society, Box 351040, Miami, FL 33135; OSHA Safety and Health Standards, 29 CFR 1910, available from U.S. Government Printing Office, Washington, DC 20402.

GENERAL SAFETY PRACTICES

Operation of air-fuel torches involve atmospheric, air flammable gases under pressure, open flames, hot metal, metal fumes and combustion products. Follow the precautions in the SAFETY section and those throughout this manual for your personal safety and the safety of people near the equipment.

1. Operate torches only in a well-ventilated area.
2. Check gas connections for leaks after installation and regularly thereafter. Do not operate equipment if gas leaks exist. Combustion will occur when a spark or flame comes in contact with the leaking gas.
3. Keep combustibles away from work area or protected from sparks and flames.
4. If used, test proper function of check valves regularly as described in check valve instructions.
5. Open gas cylinder valve slowly, to less than one full turn of the cylinder.
6. Before lighting torch, purge air from fuel hose. Adjust regulator for 15 PSIG delivery and fully open torch valve for three to five seconds to purge gas line. Failure to purge could cause burning or explosion of mixtures of gas and air in the hose. Keep torch away from flame or sparks while purging.
7. Wear eye protection safety goggles with filter lens and other protective equipment when using this outfit. Select the filter-lens based on the following guide from the American Welding Society:

OPERATION	SHADE NUMBER
Torch Brazing	3 or 4
Torch Soldering	2

8. Shut off gas supply whenever leaving torch unattended.
9. Keep equipment clean and in good operating condition.
10. Read torch and regulator instruction manuals packed with these items for additional safety and operating guidelines before operating equipment.
11. Also refer to the latest versions of the following sources of safe practices in welding and cutting:
 - A. National Fire Protection Association Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from NFPA, Batterymarch Park, Quincy, MA 06269.
 - B. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING AND CUTTING obtainable same as item A.
 - C. CONCOA publication ADE 872, latest version, SAFE PRACTICES IN WELDING AND CUTTING, obtainable from CONCOA.

INTRODUCTION

This manual provides installation, operation, service and parts information for a CONCOA Air-Fuel Outfit.

The outfit consists of a torch, a tip, a regulator, and a 10-foot hose. It is designed to be used for heating, soldering and silver and phos-copper brazing with MAPP® Gas, acetylene or propane, depending upon the model. The lightweight torch consists of a handle with tip seat, and a rear-mounted valve which provides fuel gas shutoff. The tip seat has a ½-20 thread. Tips are listed in the Table II Selection Guide.

INSTALLATION

TIP SELECTION

Choose the appropriate tip from the Selection Guide according to the process used and the work size. The high velocity RAM-JET® tip provides a short flame and more concentrated heat to a given area than a conventional tip, which is used with acetylene only.

MAPP gas and propane require pressures of at least 10 PSIG, and can use up to 35 PSIG, depending on the work size; most work requires 15 PSIG. This wide range of pressure (and flow rates) is possible because of the extreme flame stability of these tips. As shown in Table II, one tip size cover a wide work range.

Table I. Acetylene Tip Selection Guide

Conventional Tip			Copper Tubing (Work Sizes) Maximum Diameter (Inches)			RAM-JET TIP (High Velocity)		
			Process					
Size	Stock #	Flow Range (SCFH)	Soft Soldering	Silver Brazing	Phos-Cu Brazing	Size	Stock #	Flow at 13 PSIG (SCFH)
1	810 1011	1 to 4	3/8	1/4	None			
3	810 1013	1 to 4.3	3/4	1/2	None			
			1-1/2	3/4	3/4	5	810 1005	6
5	810 1015	3 to 9	1-1/2	3/4	None			
			2	1-1/2	1-1/2	10	810 1010	
Heat shrink tip for plastic cable covering materials in utility and communication industries.						1-1/2	810 4715	

Table2. MAPP Gas, Propane-Air Tip Selection Guide

Stock No.	Size	Flame Type	Flow @ 14 PSIG (SCFH)	Copper Tubing Maximum Diameter (Inches)		
				Soft Solder	Brazing Silver	Phos-Copper
810 1029*	0	Pencil Point	0.35		Specialty Tips	
810 1030	0	Pencil Point	0.8		Specialty Tips	
810 1031*	1	RAM-JET	0.8	3/4	3/8	1/4
810 1033	3	RAM-JET	1.5	1	1/2	1/2
810 1034	4	RAM-JET	3.0	to 1-1/2	to 3/4	to 3/4
810 1035	5	RAM-JET	11.0	1 to 6	3/4 to 2-1/2	3/4 to 2-1/2
810 1036*	Bulbous Tip	Pencil Point	0.8		Specialty Tips	
810 1038*	Long Flame	Pencil Point	3.0		Specialty Tips	
810 4616	Heat Shrink 7/8	Small Bushy	4.0	Specialty tips-heat shrink of plastic cable covering materials in utility and communication industries.		
810 4402	Heat Shrink 1 1/2	Large Bushy	12.0			
*MAPP ONLY						

CONNECTIONS

Use only the CONCOA gas regulator supplied. The regulator is required to reduce cylinder pressure to operating pressure. The regulator should have the proper cylinder connection for the fuel gas selected.

To connect outfit (Figure 1):

- a. Wipe cylinder valve outlet and regulator connecting surfaces with a clean lint-free cloth to remove foreign matter that may clog orifices or damage seats.
- b. With adjusting screw of regulator released fully counterclockwise, connect inlet (Figure 1) to cylinder valve outlet. Tighten nut with suitable wrench.
- c. Connect hose between regulator outlet and torch inlet (both left-hand threads) and wrench-tighten.
- d. Check that the white seat washer is seated inside the torch, and screw selected tip in snugly by hand. Check that torch valve is closed (clockwise).
- e. Stand to side of regulator, open cylinder valve slightly, and then open to LESS than one full turn.

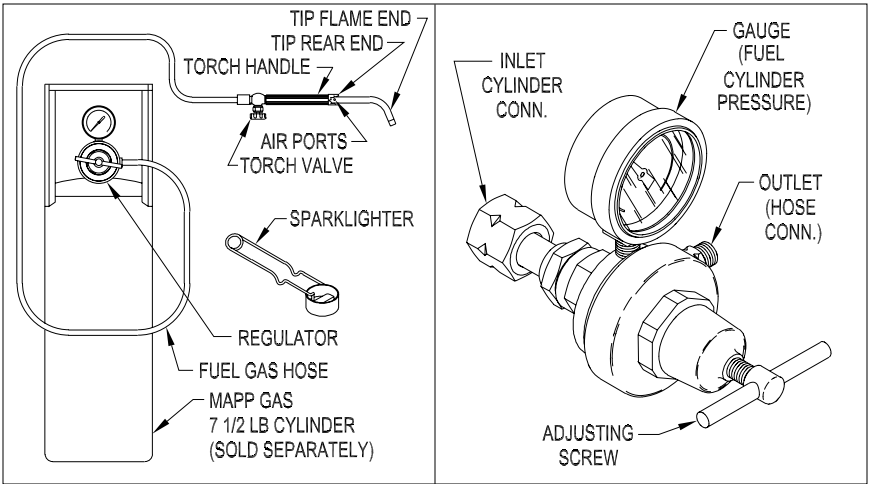


Figure 1. Typical Air Fuel Outfit Setup (left) and Acetylene Regulator (right).

- f. Open torch valve, turn regulator adjusting screw in clockwise, and purge air from tip.

CAUTION

Never purge toward people, flame or source of ignition.

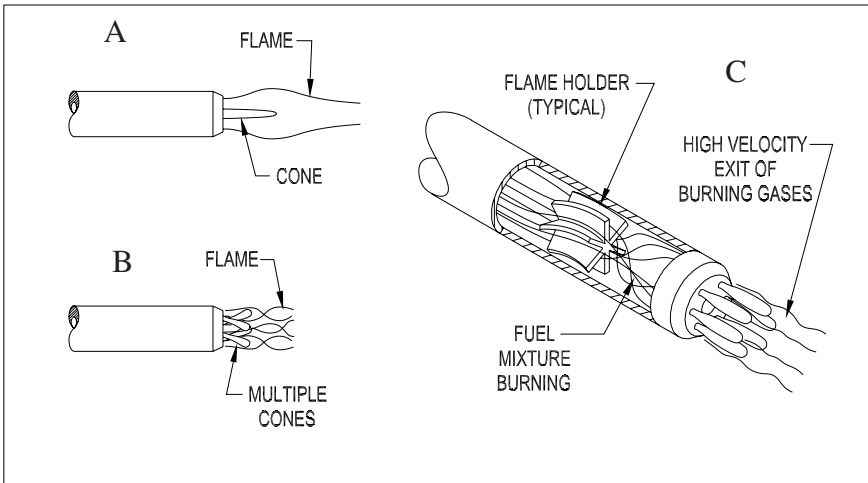


Figure 2. Typical Air-Fuel Torch Flames

- g. Close torch valve and test all joints (including cylinder connection) by brushing on an approved leak detection solution. Tighten leaking connections or replace faulty part, and retest. When done, wipe off solution. Equipment is ready for use.

OPERATION

PRINCIPLES OF OPERATION

General

Fuel gas enters the torch through the valve (See Figure 1). The gas flows through the handle to the tip rear end where it passes through a constricting orifice to create a fuel jet. As it jets past the air ports beyond the orifice, air is sucked in and mixed with the fuel gas to form the required combustion mixture. The mixture flow to the tip flame end where it is ignited.

High Velocity Tip

As seen in Figure 2, view A, a conventional tip flame roots at the tip flame end. In a high-velocity RAM-JET tip, however, the flame roots INSIDE the flame end. Instead of a conventional small cone and envelope, multiple cones issue from the tip (view B) within a high velocity envelope. Cutaway of a RAM-JET tip (view C) shows flame rooted at end of flame holder. Partial combustion inside the flame end increases the velocity of the burned-gas flame exiting from the tip to provide faster heat transfer.

Adjusting Flame

When the outfit has been installed, purged, and tested as described in CONNECTIONS, proceed as follows:

CAUTION

Point tip away from self and others when lighting or using torch.

To adjust flame:

- a. Turn regulator screw clockwise to set delivery pressure of 15 PSIG for MAPP gas or propane. For acetylene, adjust pressure to obtain suitable flame, however do not exceed 15 PSIG.
- b. Open torch valve fully. Smaller tip sizes may not require full open valve when lighting.
- c. IMMEDIATELY light tip with sparklighter. DO NOT USE matches or cigarette lighters.
- d. Flame is ready for use.

Shutdown

To shut off flame between operations, turn torch valve OFF clockwise.

CAUTION

When leaving equipment unattended, or for extended shutdown, the outfit must be shut down as follows:

- a. Close cylinder valve.
- b. Open torch valve and drain regulator and lines. **DO NOT** discharge toward people, flame or source of ignition.
- c. Release regulator adjusting knob fully counterclockwise.
- d. Shut off torch valve. Disconnect torch and regulator for overnight or longer shutdown.

SERVICE

SERVICE PROCEDURE

A unit that is not functioning properly should not be used until all required repairs have been completed and the unit has been tested to ascertain that it is in proper operating condition.

Inspection, troubleshooting, and repair of this equipment as indicated in this manual, may ordinarily be undertaken by a competent individual having at least general experience in the maintenance and repair of equipment of this nature.

CAUTION

No such maintenance or repair should ever be undertaken or attempted by anyone not having such qualifications.

Defective parts should be replaced with either a replacement part manufactured or sold by CONCOA.

In the event of equipment failure, call CONCOA Customer Service at 1-800-225-0473, or 1-757-422-8330. Please be prepared to provide the model number and serial number of the equipment involved, in addition to some details regarding its application.

Warranty Information

This equipment is sold by CONTROLS CORPORATION OF AMERICA under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to the purchase of this equipment directly from CONTROLS CORPORATION OF AMERICA or its Authorized Distributors as new merchandise and are extended to the first Buyer thereof other than for the purpose of resale.

For a period of one (1) year from the date of original delivery (90 days in corrosive service) to Buyer or to Buyer's order, this equipment is warranted to be free from functional defects in materials and workmanship and to conform to the description of this equipment contained in this manual and any accompanying labels and/or inserts, provided that the same is properly operated under conditions of normal use and that regular periodic maintenance and service is performed or replacements made in accordance with the instructions provided. The foregoing warranties shall not apply if the equipment has been repaired: other than by CONTROLS CORPORATION OF AMERICA or a designated service facility or in accordance with written instructions provided by CONTROLS CORPORATION OF AMERICA, or altered by anyone other than CONTROLS CORPORATION OF AMERICA, or if the equipment has been subject to abuse, misuse, negligence or accident.

CONTROLS CORPORATION OF AMERICA's sole and exclusive obligation and Buyer's sole and exclusive remedy under the above warranties is limited to repairing or replacing, free of charge, at CONTROLS CORPORATION OF AMERICA's option, the equipment or part, which is reported to its Authorized Distributor from whom purchased, and which if so advised, is returned with a statement of the observed deficiency, and proof of purchase of equipment or part not later than seven (7) days after the expiration date of the applicable warranty, to the nearest designated service facility during normal business hours, transportation charges prepaid, and which upon examination, is found not to comply with the above warranties. Return trip transportation charges for the equipment or part shall be paid by Buyer.

CONTROLS CORPORATION OF AMERICA SHALL NOT BE OTHERWISE LIABLE FOR ANY DAMAGES INCLUDING BUT NOT LIMITED TO: INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, OR SPECIAL DAMAGES, WHETHER SUCH DAMAGES RESULT FROM NEGLIGENCE, BREACH OF WARRANTY OR OTHERWISE.

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