

Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

21e

OLSEN™

Medium Duty

64408

OXYGEN/ACETYLENE WELDING KIT



Visit our website at: <http://www.harborfreight.com>
Email our technical support at: productsupport@harborfreight.com

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

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No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools. Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.






⚠ WARNING

Read this material before using this product.
Failure to do so can result in serious injury.
SAVE THIS MANUAL.

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WARNING SYMBOLS AND DEFINITIONS

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	Addresses practices not related to personal injury.

IMPORTANT SAFETY INSTRUCTIONS

⚠ WARNING

Read all safety warnings and instructions.

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur.

It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Work Area Safety

- 1. Keep your work area clean and well lit.**
Cluttered benches and dark areas invite accidents.
- 2. Keep bystanders, children, and visitors away while operating.** Distractions can cause you to lose control. Protect others in the work area from intense heat. Do not allow others close enough to look at the flame as eye damage is a real possibility. Provide barriers or shields as needed.
- 3. When possible, move the work to a location well away from combustible materials.** If relocation is NOT possible, protect the combustibles with a cover made of fire resistant material. Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area.
- 4. Enclose the work area with portable fire resistant screens.** Use a fire resistant material to block all openings and protect combustible walls, ceilings, floors, etc.
- 5. If working near/on a metal wall, ceiling, floor, etc., prevent ignition of combustibles on the other side by moving the combustibles to a safe location.**
If relocation of combustibles is NOT possible, designate someone to act as a fire watch equipped with a fire extinguisher during the welding or cutting process and for at least one half hour after the welding or cutting project is completed.
- 6. Do not place the Torch on any material other than bare concrete until it has cooled completely.**


7. **Do not weld or cut any material that has a combustible coating or a combustible internal structure, such as drums or tanks, without an approved method for eliminating the hazard.**
8. **Do not dispose of hot slag in containers holding combustible materials.**
9. **Keep a fully charged fire extinguisher close by and know the proper way to use it.**
10. **After welding or cutting make a thorough check for evidence of fire and be aware the easily visible flame or smoke may not be present for some time after a fire has started.**
11. **Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapors, liquids, or dust.**
12. **Clean and purge containers before applying heat.** Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors. Vent closed containers, including castings, before preheating, cutting, or welding.

Personal Safety

1. **Wearing and using personal safety clothing and safety devices reduce the risk of injury. Wear the following:**
 - a. **Fire-resistant clothing** (Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.)
 - b. **Fire-resistant leather leggings and work boots**
 - c. **Dry, insulating leather welding gloves**
 - d. **NIOSH-approved respirator**
 - e. **Shade 5 or higher welding goggles**
 - f. **Appropriate head covering to protect head and neck**
 - g. **Fire-resistant ear plugs or ear muffs (if welding or cutting overhead or in confined spaces)**

Keep clothing and safety equipment free of grease, oil, solvents and any other flammable substances.

2. **Stay alert. Watch what you are doing, and use common sense when operating this Torch. Do not use while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating may result in serious personal injury.
3. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control in unexpected situations.

4.  **INHALATION HAZARD: Welding and Cutting Produce TOXIC FUMES.**
Exposure to welding or cutting exhaust fumes can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding or cutting exhaust fumes are:

- Early onset of Parkinson's Disease
- Heart disease
- Ulcers
- Damage to the reproductive organs
- Inflammation of the small intestine or stomach
- Kidney damage
- Respiratory diseases such as emphysema, bronchitis, or pneumonia



Use natural or forced air ventilation and wear a respirator approved by NIOSH to protect against the fumes produced to reduce the risk of developing the above illnesses.

5. **Avoid overexposure to fumes and gases.** Keep your head out of the fumes. Do not breathe fumes. Use enough ventilation or exhaust, or both to keep fumes and gases away from your breathing area. Where ventilation is questionable, have a qualified technician take an air sampling to determine the need for corrective measures. If necessary, use mechanical ventilation to improve air quality. If this is not possible, use an approved respirator. Do not work in confined areas unless they are well-ventilated or you are wearing an air supplied ventilator. Always follow OSHA guidelines for Permissible Exposure Limits (PEL's) for various fumes and gases. Follow the American Conference of Governmental Industrial Hygienists recommendations for the Threshold Limit Values (TLV's) for fumes and gases. Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding or cutting situation.

Equipment Setup Safety

1. **Make sure you are prepared to begin work before opening gas supply.**
2. **To prevent explosion, use reverse-flow check valves and flashback arrestors (sold separately) on the base of the Torch.**
3. **Use with oxygen and acetylene only.** Do not modify this torch or use it for a purpose for which it is not intended.
4. **Set Acetylene Regulator no greater than 15 PSI.** Acetylene is unstable and can explode if over-pressurized.
5. **Do not use oil, grease or thread seal tape on any connector.**
6. **Use clamps (not included) or other practical ways to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control, fire and/or personal injury.
7. **Use only accessories that are recommended by the manufacturer for your model Torch.** Accessories that may be suitable for one Torch may become hazardous when used on another Torch. Only use proper gas hoses.

Cylinder Safety

1. **Do not use dented or damaged cylinders.**
2. **Secure cylinders to a cart, wall, or post to prevent them from falling.** Use and store cylinders in an upright position only.
3. **Use cylinder caps when moving or storing cylinders.**
4. **Do not store cylinders in temperatures 120° F or higher.**
5. **EMPTY CYLINDERS: DO NOT DROP, STRIKE, PUNCTURE, HEAT OR SET FIRE TO A CYLINDER, EVEN IF IT IS EMPTY.** Keep empty cylinders in specified areas and clearly mark "empty." Contact local solid waste authorities for instructions on correct disposal or recycling of empty cylinders.
6. **KEEP WRENCH ON ACETYLENE CYLINDER'S VALVE whenever cylinder is in use to allow quick shutoff in case of emergency.**

Equipment Inspection

1. **DO NOT USE FLAME TO DETECT LEAKS.**
2. **INSPECT BEFORE EVERY USE.** Look for the following, and do not use kit if any damage is noted:
 - a. **Inspect the tapered seating surfaces on the Nozzles and the Tip Nut.** Have a qualified technician resurface the seat area if it has dents, burrs, or is burned. A poor seating surface may result in backfire or flashback.
 - b. **Examine all hoses for cuts, cracks, burns, worn areas, or other damage.** Do not use if damaged.
 - c. **Check for loose connections using soapy water solution.** Tighten or repair any leaks found.
 - d. **Do not use the Torch Kit if either gas does not turn off completely when the Oxygen Torch Valve and Acetylene Torch Valve are closed.** Leakage of gas from the tip is a substantial safety risk. If gas cannot be turned off at the Torch Handle, it is dangerous and must be replaced.
 - e. **Inspect for any other defects or damage.** Do not use any damaged parts. Tag damaged parts "Do not use" until repaired.

Operation Safety

1. **Inspect before every use; see previous warning section.**
2. **Use only with proper ventilation.**
3. **Do not touch workpiece or tip until cool.**
4. **Keep hoses away from hot parts, from weld/cut area, and from flame.**
5. **Never leave the Torch unattended when it is attached to a gas supply.**
6. **Allow sufficient time for the Torch to completely cool before storing.**
7. **Any material discharged from the work area during use will be extremely hot.** Use care to not get burned by slag or other waste products.

8. BACKFIRE:

When the flame goes out with a loud “pop,” it is called a **backfire**. Backfire can be caused by:

- Operating the Torch at lower pressures than required for the Tip used.
- Touching the Tip against the workpiece.
- Overheating the Tip.
- An obstruction in the Tip.

If backfire occurs, close the Torch Handle Valves (oxygen first, then acetylene) and after remedying the cause, relight the torch.

9. FLASHBACK:

Flashback is a condition that results when the flame flashes back into the Torch and burns inside with a shrill hissing or squealing noise.

If flashback occurs,

close the Torch Handle Valves

(oxygen first, then acetylene) IMMEDIATELY!

Flashback generally indicates a problem that should be repaired before proceeding with the job at hand. A clogged Tip, improper functioning of the Valves,

or incorrect acetylene/oxygen pressure could lead to flashback. Find and correct the cause before relighting the Torch.

If the cause is not found, have the kit serviced by a qualified technician before returning to your project.

10. Beware of leaking gas.

If you notice the odor of acetylene during use, close the Torch Handle Valves

(oxygen first, then acetylene) IMMEDIATELY!

Extinguish all open flames and carefully check all hoses and connections for leaks using soapy water.

NEVER check for leaks using a flame.

If the odor continues do not use the Torch.

Call acetylene supplier for assistance.

11. Read and understand all instructions and safety precautions as outlined in the manufacturer's manual for the material you will weld or cut.

12. After use, bleed lines and store all components out of reach of children and other untrained persons. Torches are dangerous in the hands of untrained users.

Service

1. Torch service must be performed only by qualified repair personnel.

Service or maintenance performed by unqualified personnel could result in a risk of injury.

2. When servicing, use only identical replacement parts. Follow instructions in the “Maintenance Instructions” section of this manual. Use of unauthorized parts or failure to follow maintenance instructions may create a risk of fire or injury.

3. Maintain product labels and nameplates.

These carry important information.

If unreadable or missing, contact Harbor Freight Tools for a replacement.



SAVE THESE INSTRUCTIONS.

Symbology

CGA	Compressed Gas Association
ft³	Cubic Feet
PSI	Pounds per Square Inch
CFH	Cubic Feet per Hour flow
OXY	Oxygen related components
GAS	Fuel gas (acetylene) related components

	WARNING marking concerning Risk of Eye Injury. Wear ANSI-approved safety goggles with side shields.
	Read the manual before set-up and/or use.
	WARNING marking concerning Risk of Explosion. Do not use flame to detect leaks. Handle cylinders properly.
	WARNING marking concerning Risk of Inhalation Hazard. Use in well-ventilated area only.

Specifications

Welding Nozzle	VM-W, Size 0, welds up to 1/16"
Cutting Tip	3-101, Size 0, cuts up to 1/2"
Cutting Tip Replacement	Victor Style



Victor-Style Tip

Regulators	Oxygen: CGA 540 – Acetylene: CGA 510
Hose type	12.5 ft. L x 3/16" inside diameter Color Coded Twin Hose Green oxygen hose w/right-hand fitting threads Red acetylene hose w/left-hand fitting threads
Accessories	Shaded Goggles, Striker, Tip Cleaner

Setup



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Workpiece and Work Area Setup

1. Designate a work area that is clean and well-lit. The work area must not allow access by children or pets to prevent distraction and injury.
2. Remove all combustible material from area and/or cover surfaces with fire resistant material.
3. The work area must have a fireproof floor.
4. Secure loose workpieces using a vise or clamps (not included) to prevent movement while working.

Note: Proper weld preparation can be complicated, and is outside the scope of this manual.

Tool Set Up 1 of 3 - Assembly



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

⚠ WARNING



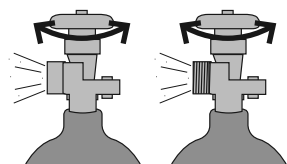
TO PREVENT SERIOUS INJURY FROM EXPLOSION:

Turn the Oxygen and Acetylene Torch Valves fully clockwise to close (oxygen first and acetylene second) before making any adjustments or performing any inspection or service to this product.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual. All instructions in this manual are **for oxygen and acetylene gas only**.

1. Secure cylinders to a cart, wall, or post to prevent them from falling. **Do not place Acetylene Cylinder on its side.**
2. While standing to one side, "crack" each cylinder valve. "Cracking" is to quickly open and close the valve, allowing a small amount of gas to escape and clearing the valve of any foreign material.
3. Attach the Green labeled Oxygen Regulator to the Oxygen Cylinder and the green oxygen hose to the Regulator.
4. Attach the Red labeled Acetylene Regulator to the Acetylene Cylinder and the red acetylene hose to the Regulator, **tighten counterclockwise - threads are reversed.**

WARNING! TO PREVENT FIRE AND EXPLOSION: Make sure there is no oil, grease, or ignition source (such as a hot weld, electric motor, or another welding operation) nearby before proceeding with the next step.

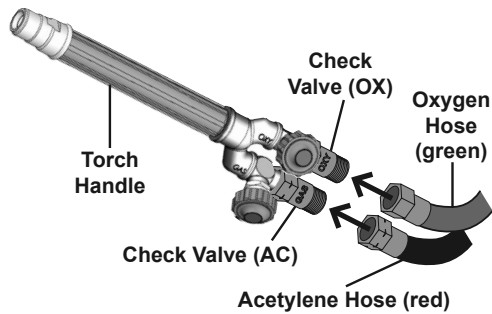


Briefly open valve to clean, then close valve.

Assembly Step 2: Crack Each Cylinder Valve

5. Torch Handle Setup:

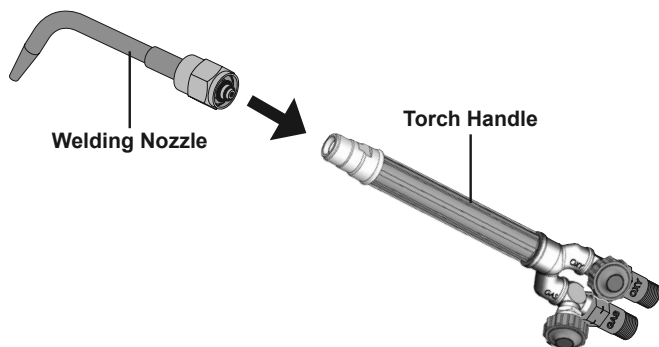
- Remove the inlet covers.
- Make sure both Check Valves are in place on the Torch Handle.
- Connect the green-oxygen hose to the oxygen Check Valve on the Torch Handle.
- Connect the red-acetylene hose to the acetylene Check Valve on the Torch Handle, **tighten counterclockwise - threads are reversed.**



Assembly Step 5: Torch Handle Setup

6. Welding Nozzle Setup:

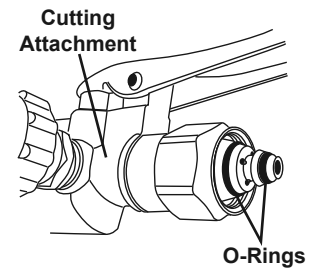
Connect the Welding Nozzle to the Torch Handle.



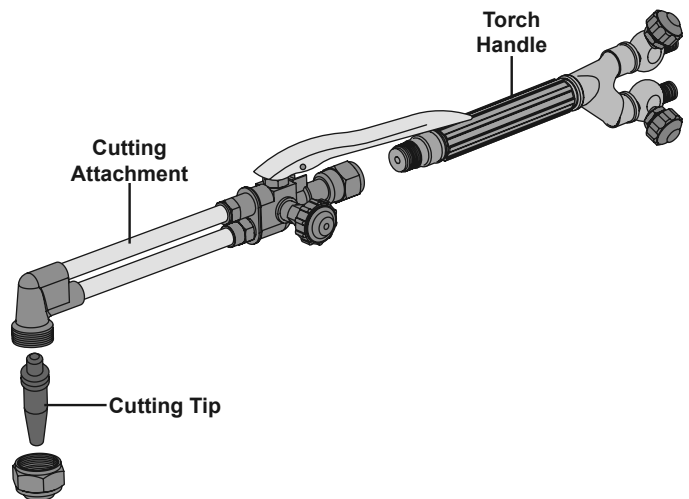
Assembly Step 6: Welding Setup

6a. Cutting Attachment Setup:

WARNING! TO PREVENT SERIOUS INJURY: BEFORE CONNECTING, make sure the two O-Rings on the end of the Cutting Attachment are not damaged or missing, otherwise gases will mix inside the Torch Handle and result in flashback or backfires.



Connect the Cutting Attachment to the Torch Handle. Then, connect the Cutting Tip to the Cutting Attachment.



Assembly Step 6a: Cutting Setup

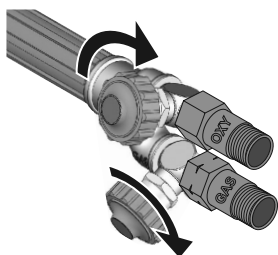
- Before operation, the leak tests on the following pages must be done after connection to check for leaks in the system.**

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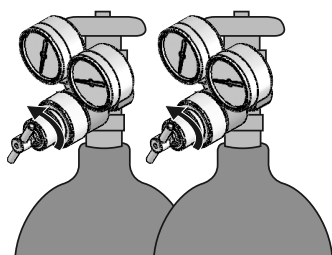
Tool Set Up 2 of 3 - First Leak Test: Soapy Water

This test detects major leaks.

1. After everything is connected, close both Torch Handle Valves, turning clockwise. Close Regulators, turning knobs counterclockwise until loose.



Close Valves
(Turn clockwise.)

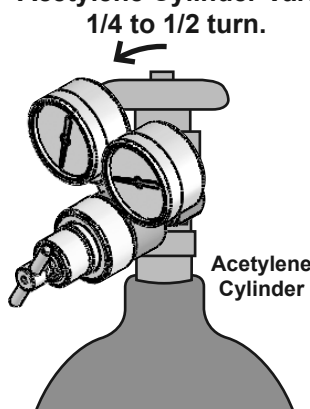


Close Regulators
(Turn counterclockwise until loose.)

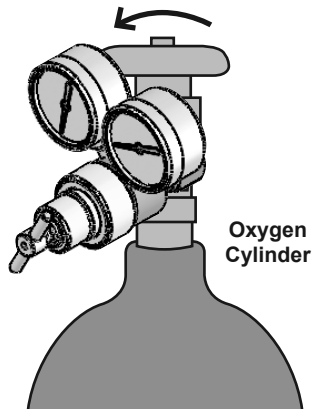
Leak Test 1 Step 1

2. Open the cylinder valves turning counterclockwise only until the gas starts flowing.

CAUTION! Only open Acetylene Cylinder Valve 1/4 to 1/2 turn.



Acetylene Cylinder

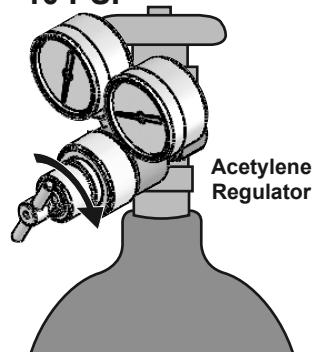


Oxygen Cylinder

Leak Test 1 Step 2: Open Cylinder Valves

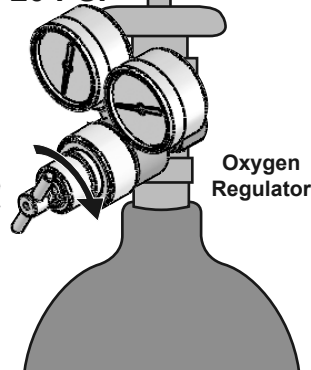
3. Open the **Oxygen** cylinder valve completely, turning it counterclockwise.
4. Adjust the **Oxygen** Regulator to deliver **20 PSI**. Adjust the **Acetylene** Regulator to deliver **10 PSI**. **DO NOT EXCEED 15 PSI ACETYLENE PRESSURE.**

10 PSI



Acetylene Regulator

20 PSI



Oxygen Regulator

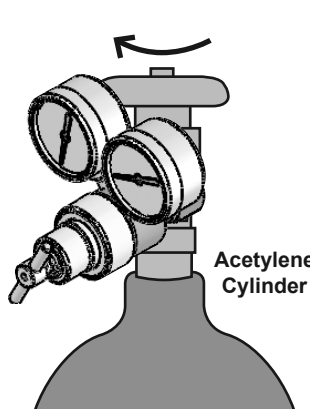
Leak Test 1 Step 4: Set Testing Pressures

5. Check all connections for leaks using soapy water:
 - If leaks are found, tighten connections.
 - If a leak persists, discontinue use and call gas supplier.
 - If no leaks are found with this test, move on to the Gauge Monitoring test.

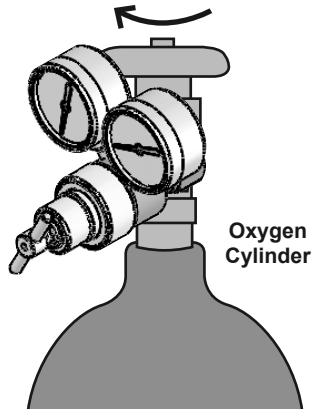
Tool Set Up 3 of 3 - Second Leak Test: Gauge Monitoring

This test detects minor leaks.

1. Follow all steps in the Soapy Water test above to prepare for the Gauge Monitoring test.
2. Close both cylinder valves, turning clockwise.



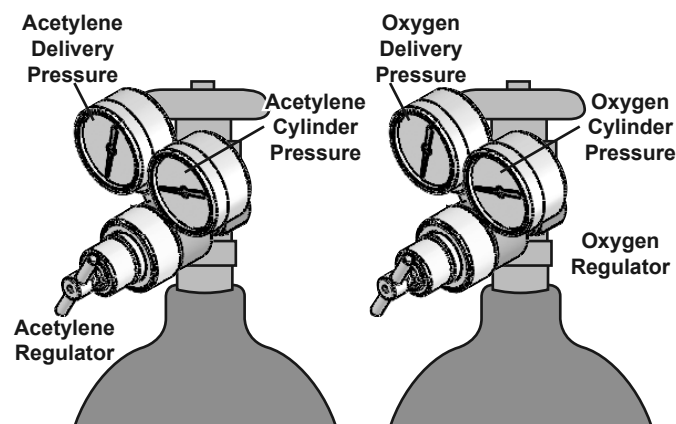
Acetylene Cylinder



Oxygen Cylinder

Leak Test 2 Step 2: Close Cylinder Valves

3. Monitor gauges on both Regulators for five minutes.



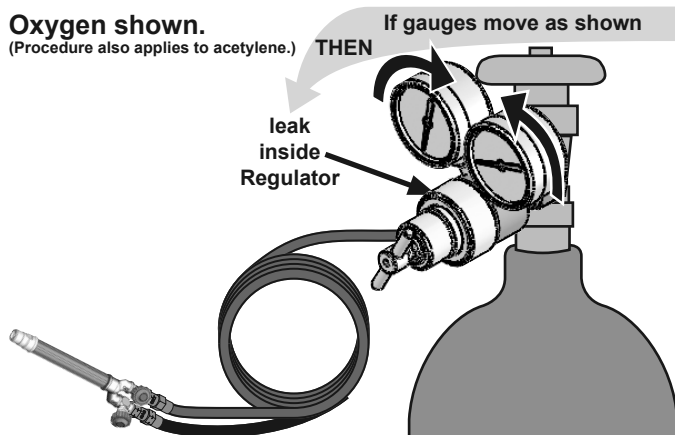
Leak Test 2 Step 3: Monitor Gauges

- If the readings do not change, the test is completed and the system has no leaks.
- If any reading changes, there is a leak on that side of the system. Follow Gauge Leak Analysis on the next page to diagnose.

Gauge Leak Analysis

Oxygen shown.

(Procedure also applies to acetylene.)

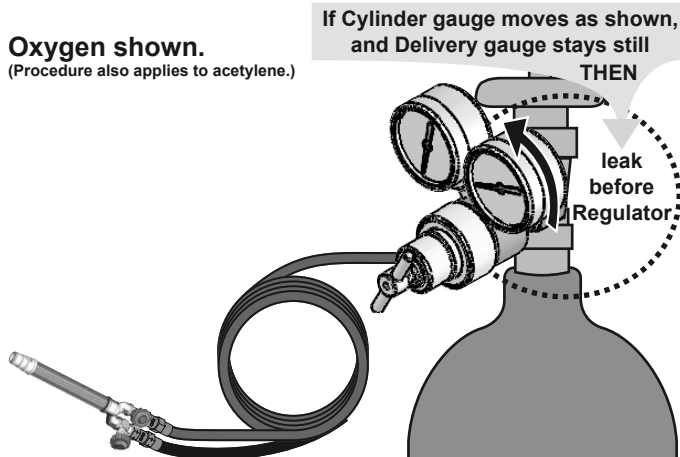


If the Cylinder Pressure decreases and the Delivery Pressure increases -
There is a leak in the Regulator seat.

Have the Regulator repaired by a qualified technician.

Oxygen shown.

(Procedure also applies to acetylene.)



If Cylinder Pressure decreases but the Delivery Pressure remains constant -
The leak is at cylinder valve or connection between Regulator and cylinder valve.



DANGER! To prevent serious injury and DEATH:

DO NOT TIGHTEN OR ADJUST ANY CONNECTION between the cylinder and cylinder valve,

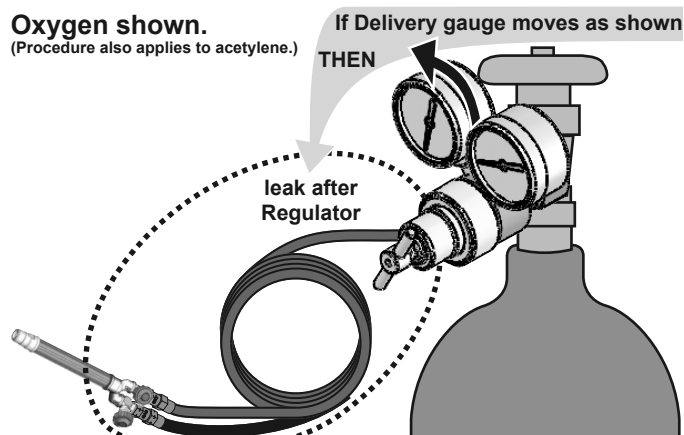
or force the cylinder valve.

If the cylinder valve is leaking, move the cylinder outside and notify your gas supplier immediately.

1. Release pressure from the system.
2. Tighten the connection between Regulator and cylinder valve.
3. Repeat Gauge Leak Test.
 - a. If the gauges do not change, the test is completed and the system has no leaks.
 - b. If the connection still leaks try with a different cylinder.
 - c. If the connection leaks with the different cylinder, have the Regulator examined by a qualified technician.

Oxygen shown.

(Procedure also applies to acetylene.)



If Delivery Pressure decreases -

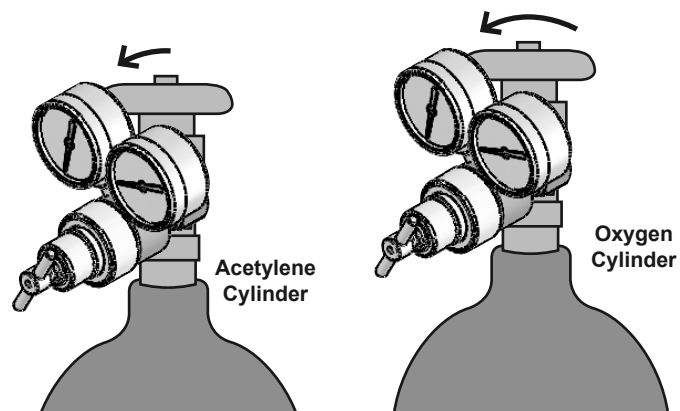
The leak is at the Regulator outlet connection, within the hose, at the torch inlet connection or at the Torch Valve on the Torch Handle.

1. Release pressure from the system.
2. Tighten the Regulator outlet connection.
3. Tighten the Torch Handle Inlet connection.
4. Repeat Gauge Leak Test.
 - a. If the gauges do not change, the test is completed and the system has no leaks.
 - b. If the connections are still leaking, have the Regulator, Torch Handle, and hoses examined by a qualified technician. If the hoses are leaking, replace them, do not attempt to repair the hoses.

No Leaks Found

If the leak testing has been completed and the unit is found to be working properly, open the cylinder valves, turning counterclockwise, and proceed to operation.

WARNING! TO PREVENT SERIOUS INJURY:
Only open Acetylene Cylinder Valve 1/4 to 1/2 turn to allow quick shutoff.



Open Cylinder Valves Only After Testing Confirms There Are No Leaks

SAFETY

SETUP

WELDING

CUTTING

MAINTENANCE

Welding

Welding Tip Pressure Settings

This Torch Handle is capable of welding metals from 1/32" up to 1-1/4" thick.

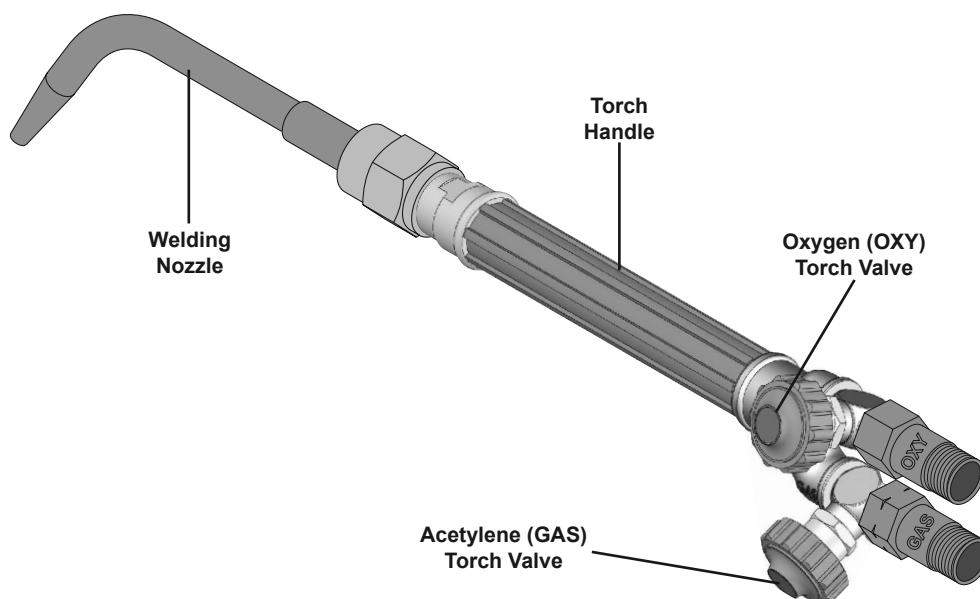
The included Welding Nozzle, size 0, will weld metals up to 1/16" thick.

Check the thickness of the metals to be welded and use the chart below to choose the size nozzle for the job. If welding metals other than 1/32" to 1/16" thick, a different welding nozzle will be needed.

Note: Welding the thicker metals noted below will require special techniques, such as edge chamfering, that are outside the scope of this manual.

Table A: Welding Nozzle Flow Data

Metal Thickness (inches)	Nozzle Size	Tip Orifice Diameter (inches)	Oxygen Pressure (PSI)	Acetylene Pressure (PSI)	Acetylene (CFH)
1/32	000	0.024	3~5	3~5	1~2
3/64	00	0.028	3~5	3~5	1.5~3
1/16	0	0.031	3~5	3~5	1.7~3.4
5/64	1	0.035	3~5	3~5	2~4
3/32	2	0.039	3~5	3~5	3~6
1/8	3	0.051	3~6	3~6	5~10.5
1/4	4	0.067	4~6	4~6	8.5~19
3/8	5	0.079	5~7	5~7	11.5~26
1/2	6	0.091	6~8	5~8	15~35
1-1/4	7	0.126	8~10	8~10	30~60



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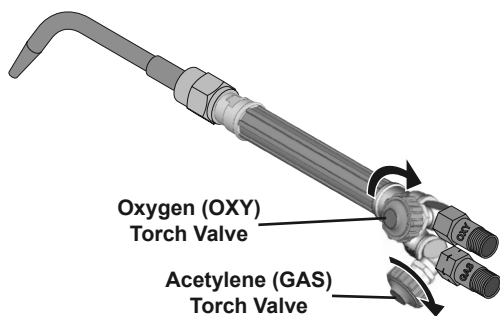
Welding Instructions



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Inspect tool before use, looking for leaking, damaged, loose, and missing parts. If any problems are found, do not use tool until repaired.

1. Set up for welding according to instructions on pages 6-9.
2. Close both valves on the Torch Handle securely.

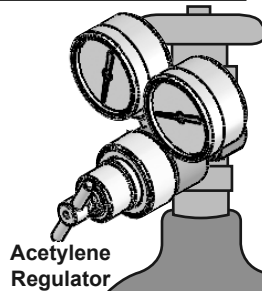


Welding Step 2: Close Valves

3. Adjust the Acetylene and Oxygen Regulators to their proper working pressures. See Table A on page 10.

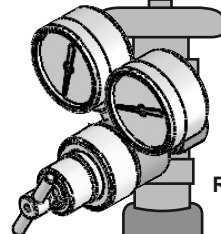
**DO NOT EXCEED 15 PSI
ACETYLENE PRESSURE.**

Acetylene Delivery Pressure
DO NOT EXCEED 15 PSI.



Acetylene
Regulator

Oxygen Delivery
Pressure



Oxygen
Regulator

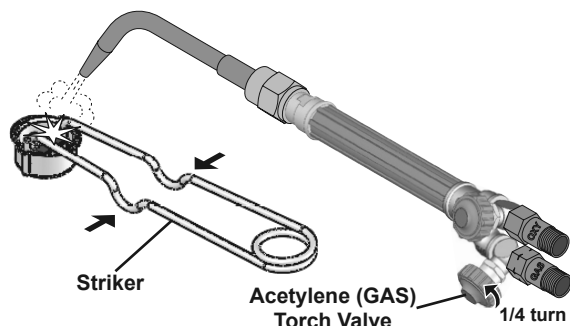
Welding Step 3: Set Welding Pressures
See Table A on page 10.

4. Hold the Torch Handle in one hand and the Striker in the other hand.

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5. Open the Acetylene Torch Valve about 1/4 turn, and quickly ignite the acetylene gas coming out of the Nozzle by squeezing the handle of the striker, creating a spark.

WARNING! TO PREVENT SERIOUS INJURY: Do not use matches or a butane lighter to light the Torch.



Welding Step 5: Lighting Acetylene

6. Put the striker down on a fireproof surface. Slowly open the Acetylene Torch Valve farther until the flame feathers at its edge slightly, as shown below.



Welding Step 6: Slowly Open Acetylene Torch Valve Until Flame Feathers

7. Flame Adjustment:

a. Starting to Add Oxygen:

Slowly open the Oxygen Torch Valve.

The flame will change to a carbonizing flame with a blue/white inner core, a white halo surrounding the core and a light orange flame as shown in Welding Step 7 illustration, below left.

b. Proper Oxygen Mix:

Continue slowly opening the Oxygen Torch Valve until the large light orange section of the flame becomes nearly colorless and the center of the flame has a white core with little or no halo.

This is the "neutral" flame needed for operation as shown in Welding Step 7 illustration, below center.

c. Too Much Oxygen:

If you open the Oxygen Torch Valve too far, the large section of the flame will be bluish-orange and the inner core will be small as shown in Welding Step 7 illustration, below right. Close the Oxygen Torch Valve slightly until you achieve the flame described in step b above.

WARNING! TO PREVENT SERIOUS INJURY:

Wear appropriate welding goggles.

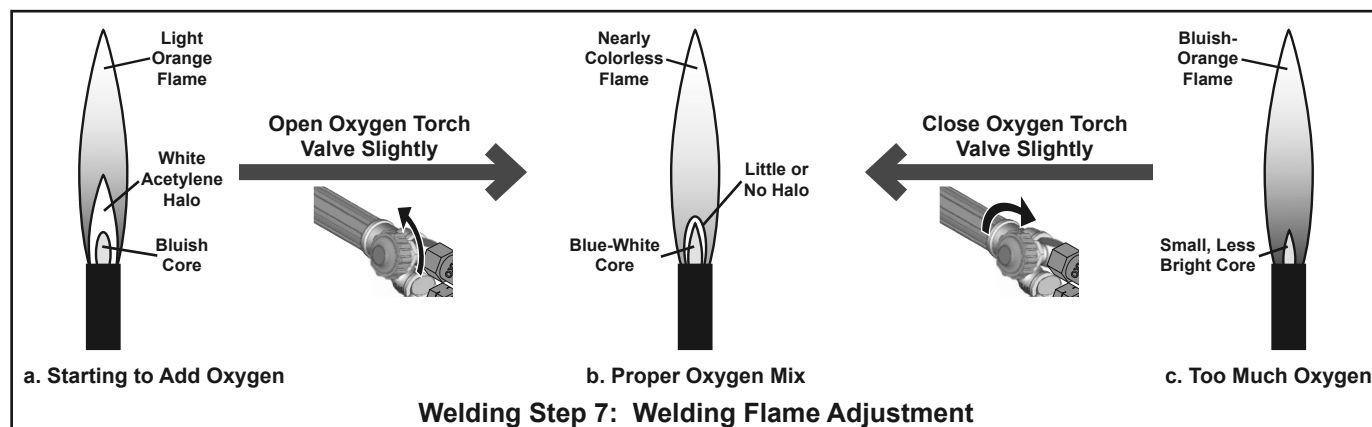
8. After the flame is adjusted as explained and illustrated, proceed with welding.

Note: Oxygen-acetylene welding is a two-handed process:

one hand controls the torch, while the other hand controls a filler rod (sold separately).

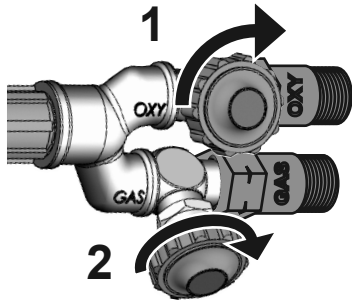
Proper welding techniques and weld preparation are outside the scope of this manual. Welding books and classes are recommended to teach proper methods and technique.

9. After welding, follow shutdown instructions on facing page.



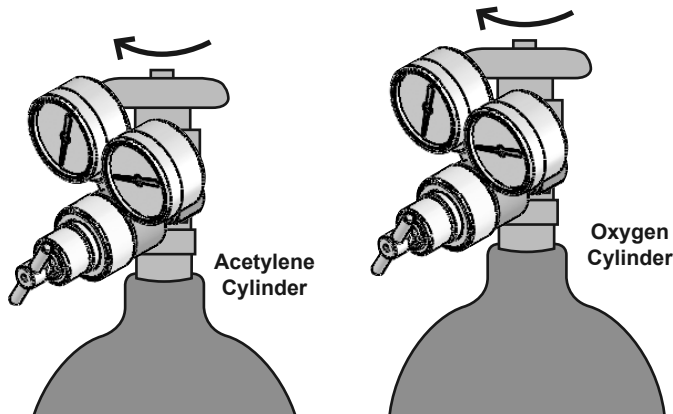
Welding Shutdown Instructions

1. After work is complete, first close the Oxygen Torch Valve clockwise, then close the Acetylene Torch Valve clockwise.



Shutdown Step 1: Close Torch Valves

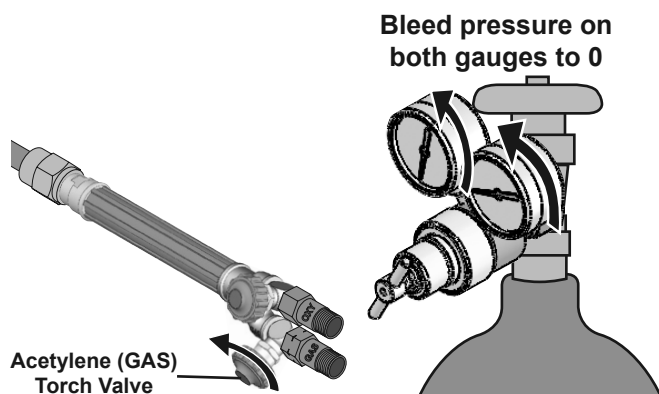
2. Fully close both cylinder valves, turning clockwise.



Shutdown Step 2: Close Cylinder Valves

3. Open the Acetylene Torch Valve counterclockwise to allow all the pressure to bleed out.

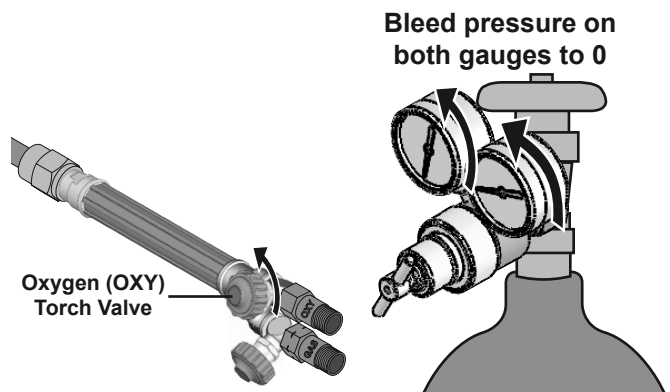
Note: If the tank gauge still has pressure, the Acetylene Regulator needs to be opened.



Shutdown Step 3: Open Acetylene Valve

4. Open the Oxygen Torch Valve counterclockwise to allow all the pressure to bleed out.

Note: If the tank gauge still has pressure, the Oxygen Regulator needs to be opened.

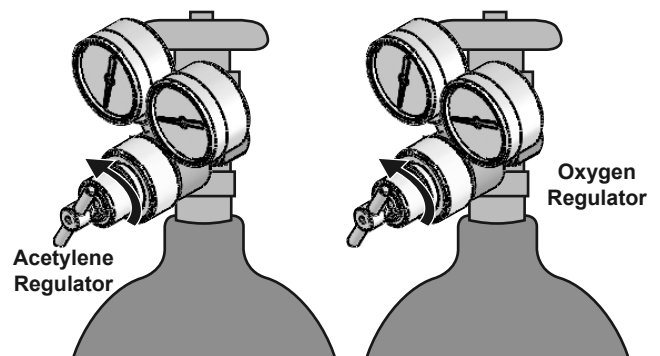


Shutdown Step 4: Open Oxygen Valve

5. After releasing pressure, turn the Acetylene Pressure Adjusting Screw counterclockwise and remove it from its Regulator.

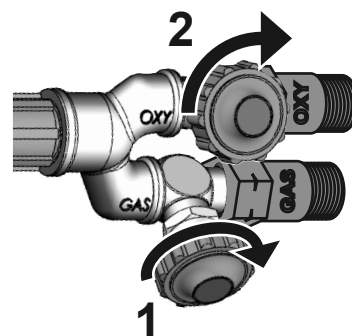
Then, turn the Oxygen Pressure Adjusting Screw counterclockwise and remove it from its Regulator.

IMPORTANT! Failure to release all pressure on the Regulators may permanently damage them.



Shutdown Step 5: Close Regulators (Turn counterclockwise and remove.)

6. Lastly, close the Acetylene Torch Valve clockwise, and close the Oxygen Torch Valve clockwise.



Shutdown Step 6: Close Torch Valves

SAFETY

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Cutting

Cutting Tip Pressure Settings

The Cutting Attachment is used to cut metal up to 3" thick.

The included tip, size 0, cuts metal up to 1/2" thick.

Check the thickness of the metal to be cut and use the chart below to choose the appropriate size tip for the job. If cutting metals over 1/2" thick, a different tip will be needed.

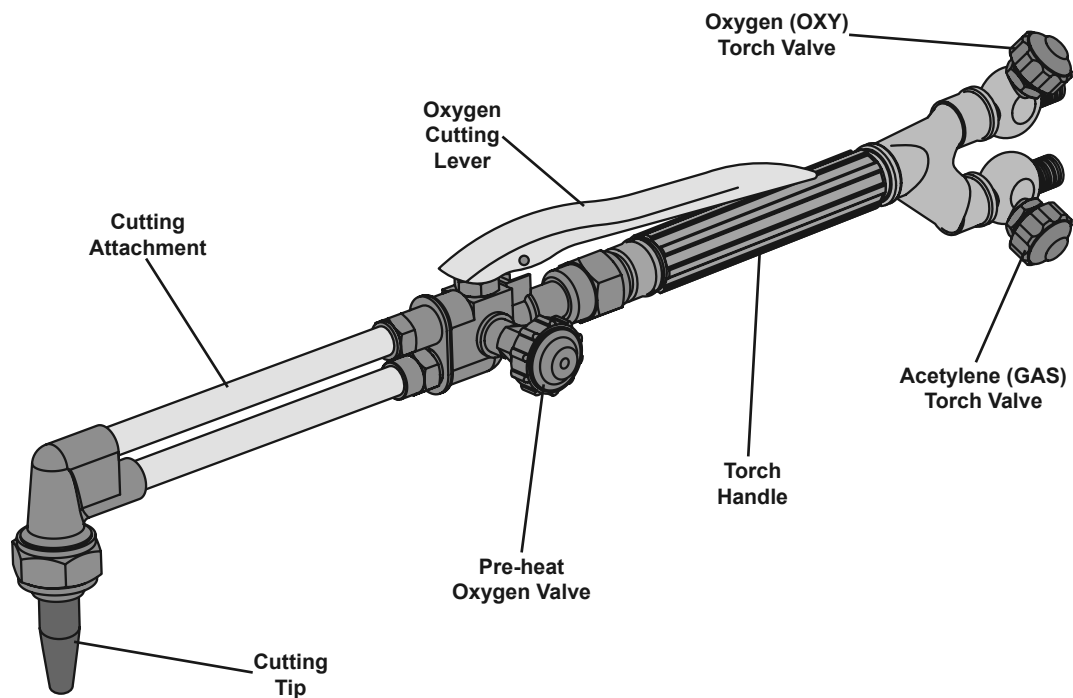
Table B: Cutting Tip Flow Data

Cutting Thickness (inches)	Standard Nozzle Size	Cutting Oxygen Pressure (PSI)	Acetylene Pressure (PSI)	Speed (IPM)
1/2	0	30~35	3~5	20~24
3/4	1	30~35	3~5	17~21
1-1/2	2	40~45	3~7	13~17
2-1/2	3	45~50	4~10	10~13
3	4	45~50	5~10	9~12

The Cutting Attachment is attached to the Torch Handle and a Cutting Tip is attached to the end of the Cutting Attachment.

Pre-heat Oxygen Valve: Adjusts pre-heat flame oxygen level.

Oxygen Cutting Lever: Activates extra flow of oxygen for cutting.



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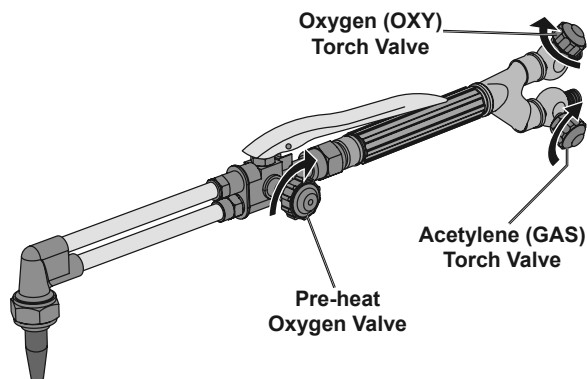
Cutting Instructions



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Inspect tool before use, looking for leaking, damaged, loose, and missing parts. If any problems are found, do not use tool until repaired.

1. Set up for cutting according to instructions on pages 6-9.
2. Close all valves on the Torch Handle and Cutting Attachment securely.



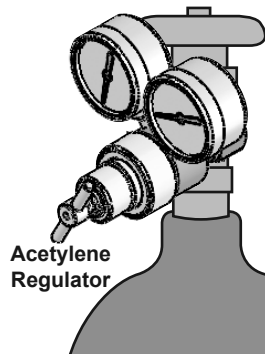
Cutting Step 2: Close Valves

3. Adjust the Acetylene and Oxygen Regulators to their proper working pressures, see Table B on page 14.

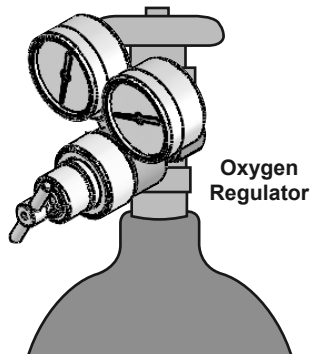
**DO NOT EXCEED 15 PSI
ACETYLENE PRESSURE.**

Acetylene Delivery Pressure
DO NOT EXCEED 15 PSI.

Oxygen Delivery Pressure



Acetylene
Regulator



Oxygen
Regulator

Cutting Step 3: Set Cutting Pressures

See Table B on page 14.

4. Hold the Torch Handle in one hand and the striker in the other hand.

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SAFETY

SETUP

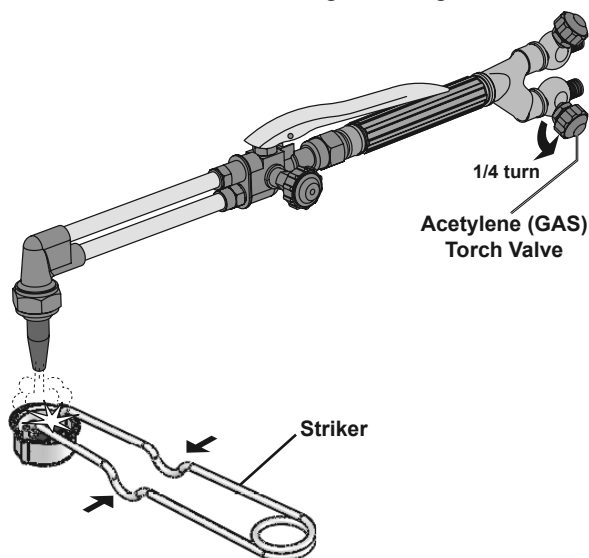
WELDING

CUTTING

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5. Open the Acetylene Torch Valve about 1/4 turn, and quickly ignite the acetylene gas coming out of the Nozzle by squeezing the handle of the striker, creating a spark.

WARNING! TO PREVENT SERIOUS INJURY: Do not use matches or a butane lighter to light the Torch.



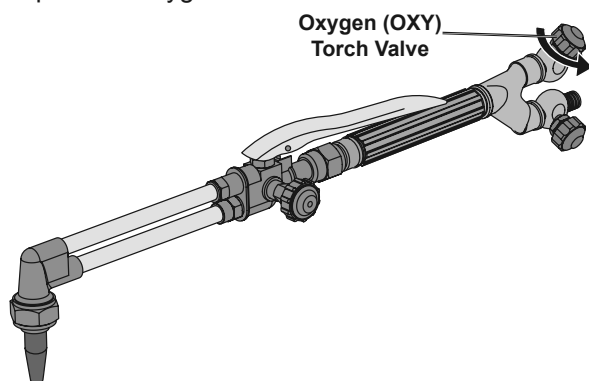
Cutting Step 5: Lighting Acetylene

6. Put the striker down on a fireproof surface. Slowly open the Acetylene Torch Valve farther until the flame feathers at its edge slightly, as shown below.



Cutting Step 6: Slowly Open Acetylene Torch Valve Until Flame Feathers

7. Do not squeeze the Oxygen Cutting Lever. Open the Oxygen Torch Valve.



Cutting Step 7: Open Oxygen Torch Valve

8. Flame Adjustment:

a. Starting to Add Oxygen:

Slowly open the Pre-heat Oxygen Valve. The flame will change to a carbonizing flame with a blue/white inner core, a white halo surrounding the core and a light orange flame as shown in Cutting Step 8 illustration, below left.

b. Proper Oxygen Mix:

Continue slowly turning the Pre-heat Oxygen Valve until the large light orange section of the flame becomes nearly colorless and the center of the flame has a white core with little or no halo.

This is the "neutral" flame needed for operation as shown in Cutting Step 8 illustration, below center.

c. Too Much Oxygen:

If you open the Pre-heat Oxygen Valve too far, the large section of the flame will be bluish-orange and the inner core will be small as shown in Cutting Step 8 illustration, below right. Close the Pre-heat Oxygen Valve slightly until you achieve the flame described in step b above.

WARNING! TO PREVENT SERIOUS INJURY: Wear appropriate welding goggles.

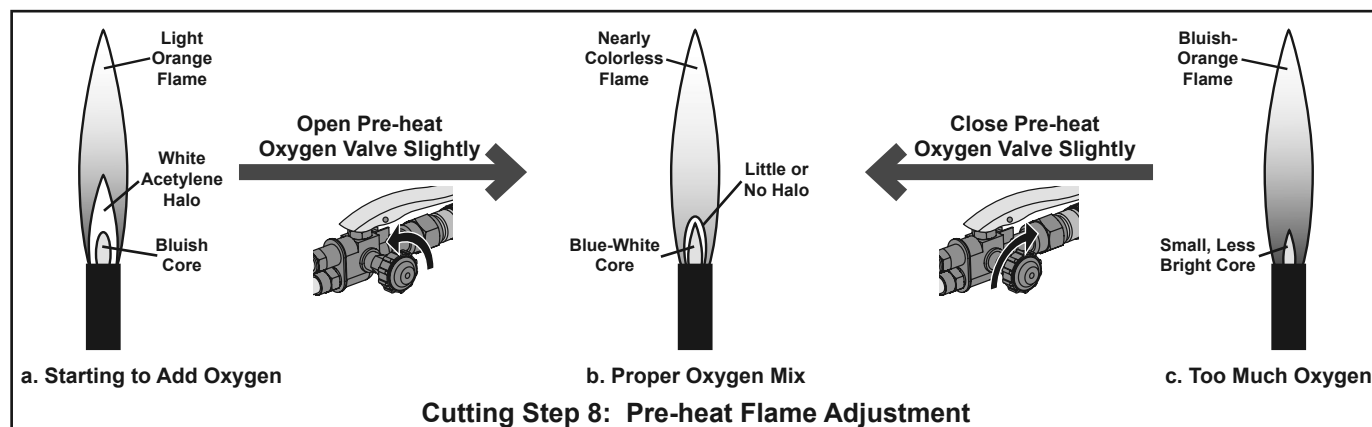
9. After the flame is adjusted as explained and illustrated, proceed with cutting:
 - a. Heat the edge where starting the cut until it is red hot.

WARNING! TO PREVENT SERIOUS INJURY: Start the cut at the edge of the workpiece.

If done improperly, attempting to start a cut in the middle of the workpiece will splash molten metal back at the operator. **Do not attempt to start a cut in the middle of a workpiece unless properly trained in safe methods of starting these cuts.**

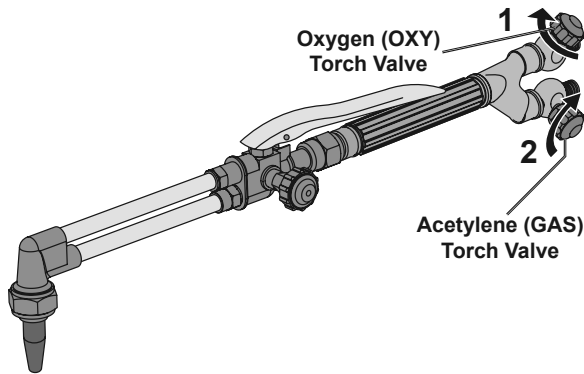
- b. After preheating, press the Oxygen Cutting Lever and slowly guide the torch along the cut line to cut the metal.

10. After cutting, follow shutdown instructions on facing page.



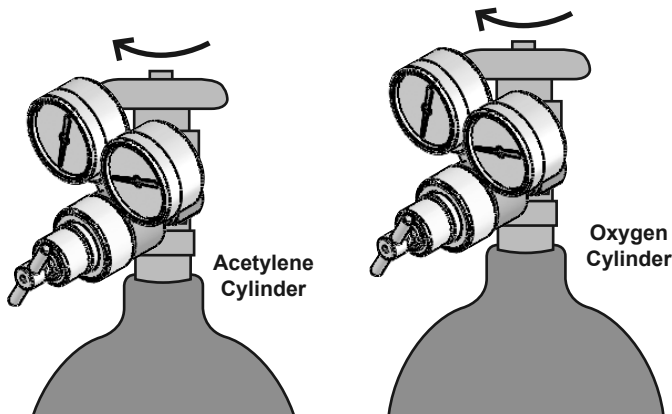
Cutting Shutdown Instructions

1. After work is complete, first close the Oxygen Torch Valve clockwise, then close the Acetylene Torch Valve clockwise.



Shutdown Step 1: Close Torch Valves

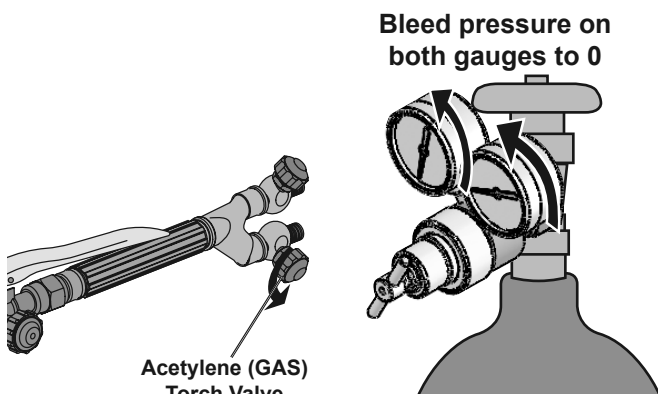
2. Fully close both cylinder valves, turning clockwise.



Shutdown Step 2: Close Cylinder Valves

3. Open the Acetylene Torch Valve counterclockwise to allow all the pressure to bleed out.

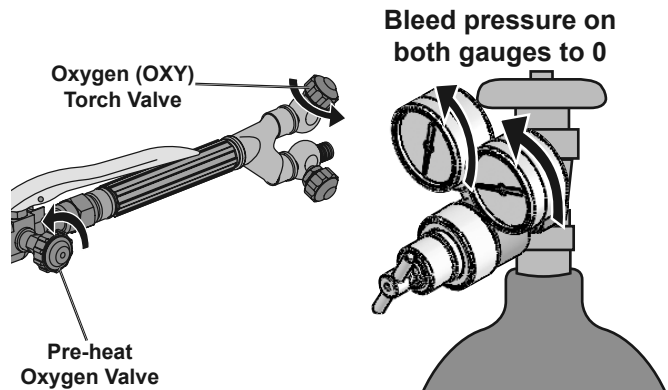
Note: If the tank gauge still has pressure, the Acetylene Regulator needs to be opened.



Shutdown Step 3: Open Acetylene Valve

4. Open the Oxygen Torch Valve counterclockwise and open the Pre-heat Oxygen Valve counterclockwise to allow all the pressure to bleed out.

Note: If the tank gauge still has pressure, the Oxygen Regulator needs to be opened.

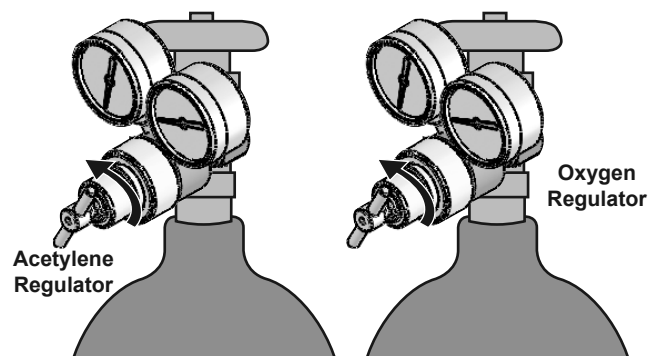


Shutdown Step 4: Open Oxygen Valves

5. After releasing pressure, turn the Acetylene Pressure Adjusting Screw counterclockwise and remove it from its Regulator.

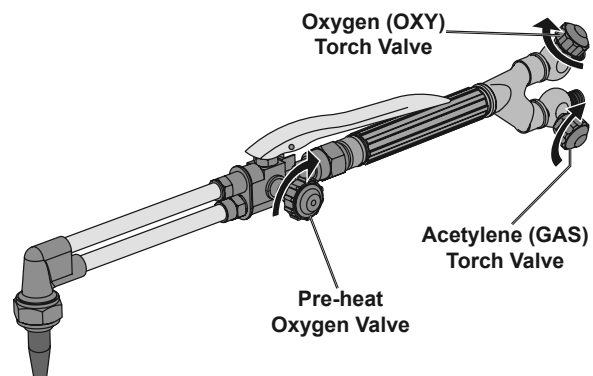
Then, turn the Oxygen Pressure Adjusting Screw counterclockwise and remove it from its Regulator.

IMPORTANT! Failure to release all pressure on the Regulators may permanently damage them.



Shutdown Step 5: Close Regulators (Turn counterclockwise and remove.)

6. Lastly, close the Acetylene Torch Valve clockwise, and close the Oxygen Torch and Pre-heat Oxygen Valves clockwise.



Shutdown Step 6: Close Valves

Maintenance Instructions



Procedures not specifically explained in this manual must be performed only by a qualified technician.

DANGER



TO PREVENT SERIOUS INJURY AND DEATH FROM FIRE OR EXPLOSION:

Close the oxygen cylinder valve, then acetylene cylinder valve and allow the torch to cool completely, then disconnect the hoses before performing any inspection, maintenance, or cleaning procedures.

Do not use damaged equipment. If abnormal noise, vibration, or leaking gas occurs, have the problem corrected before further use.

- BEFORE EACH USE**, inspect the general condition of the Torch Kit. Check for loose hose connections, cracked or worn hoses, and any other condition that may affect its safe operation.

If any abnormal condition occurs or is noticed, have the problem corrected before further use.

Do not use damaged equipment.

- Periodically use a tip cleaner to clean out Cutting Tip and Welding Nozzle.
- To clean the outer body of the Torch, use a clean, dry, cloth. Do not immerse any part of the Torch in ANY liquid. **Do not use solvents or other flammable agents to clean the Torch.**

MAINTENANCE CHART

Maintenance Type	Before Use	After Use
Inspect tool for damage.	X	X
Use tip cleaner to clean tip opening.	X	X
Wipe off with clean, dry cloth. NEVER USE SOLVENTS TO WIPE DOWN THIS TORCH.		X

Troubleshooting

Problem	Possible Causes	Likely Solutions
Before turning on Torch, gas odor is noticed.	<ol style="list-style-type: none"> Hose connections loose. Crack in hose. Cylinder leak at neck. 	<ol style="list-style-type: none"> Tighten all connections. Check hoses. If any cracks are found, replace entire hose. DO NOT PATCH OR TAPE GAS HOSES. Check neck area of cylinders. If cracks or damage are found, do not use. Secure upright, in a well-ventilated area, well away from sources of ignition. Contact gas supplier IMMEDIATELY. Replace cylinders before proceeding with work.
Flame is irregular.	<ol style="list-style-type: none"> Tip clogged or dirty. Gas low. 	<ol style="list-style-type: none"> Close gas, acetylene first, then oxygen. Let Torch cool completely. Remove Tip, check for dirt and debris. Use tip cleaner to clean Tip or replace if necessary. Check gas level and refill if needed.



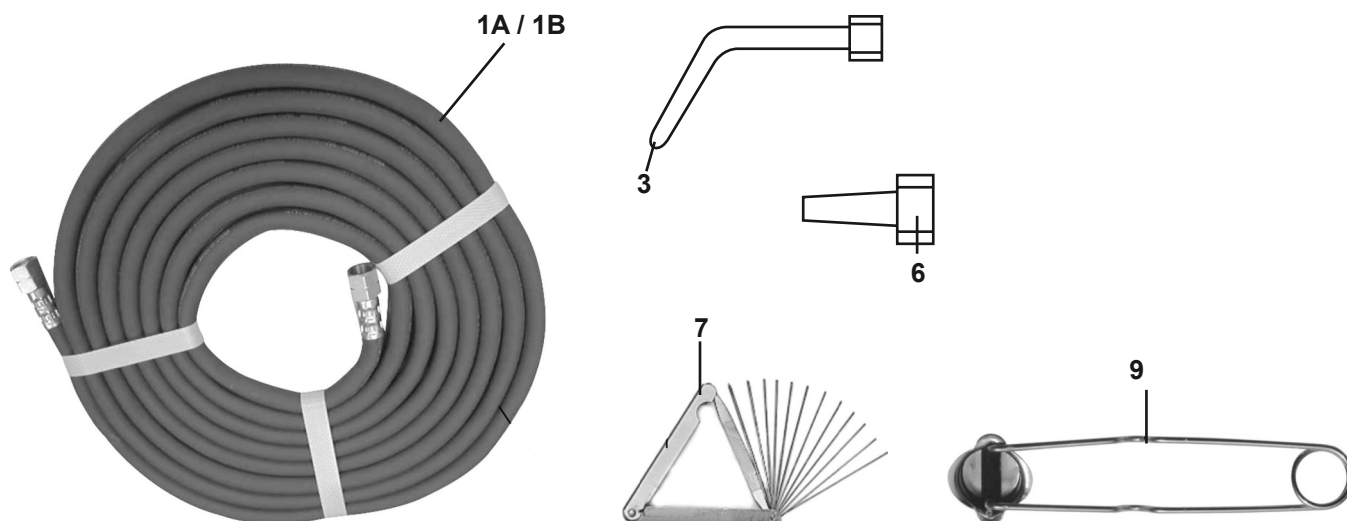
Follow all safety precautions whenever diagnosing or servicing the tool. Disconnect air supply before service.

Accessory Parts List and Diagram

Part	Description	Order Code
1A	Green (OX) Welding Hose	1A/1B*
1B	Red (AC) Welding Hose	1A/1B*
3	Welding Nozzle (#0)	VM-W-O
6	Cutting Nozzle	0-3-101
7	Tip Cleaner	D7

Part	Description	Order Code
8	Shaded Welding Glasses (not shown)	D8
9	Flint Lighter	D9
10	Oxygen Check Valve (not shown)	D10
11	Fuel Gas Check Valve (not shown)	D11

*Attached and only available as a set.



Record Product's Serial Number Here: _____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts. Specify UPC 792363644082 when ordering parts.

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Parts List and Diagram O - Oxygen Regulator

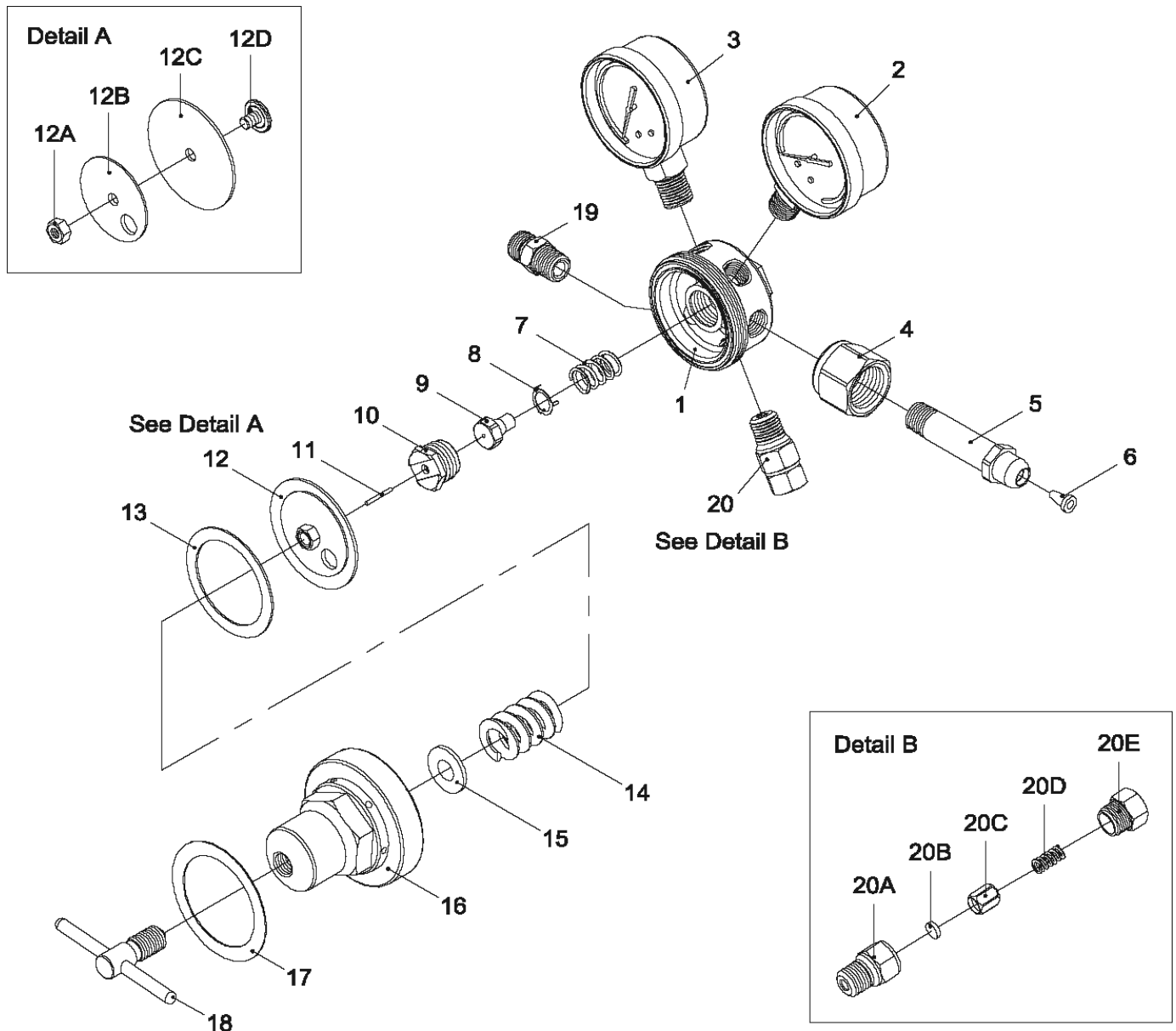
SAFETY

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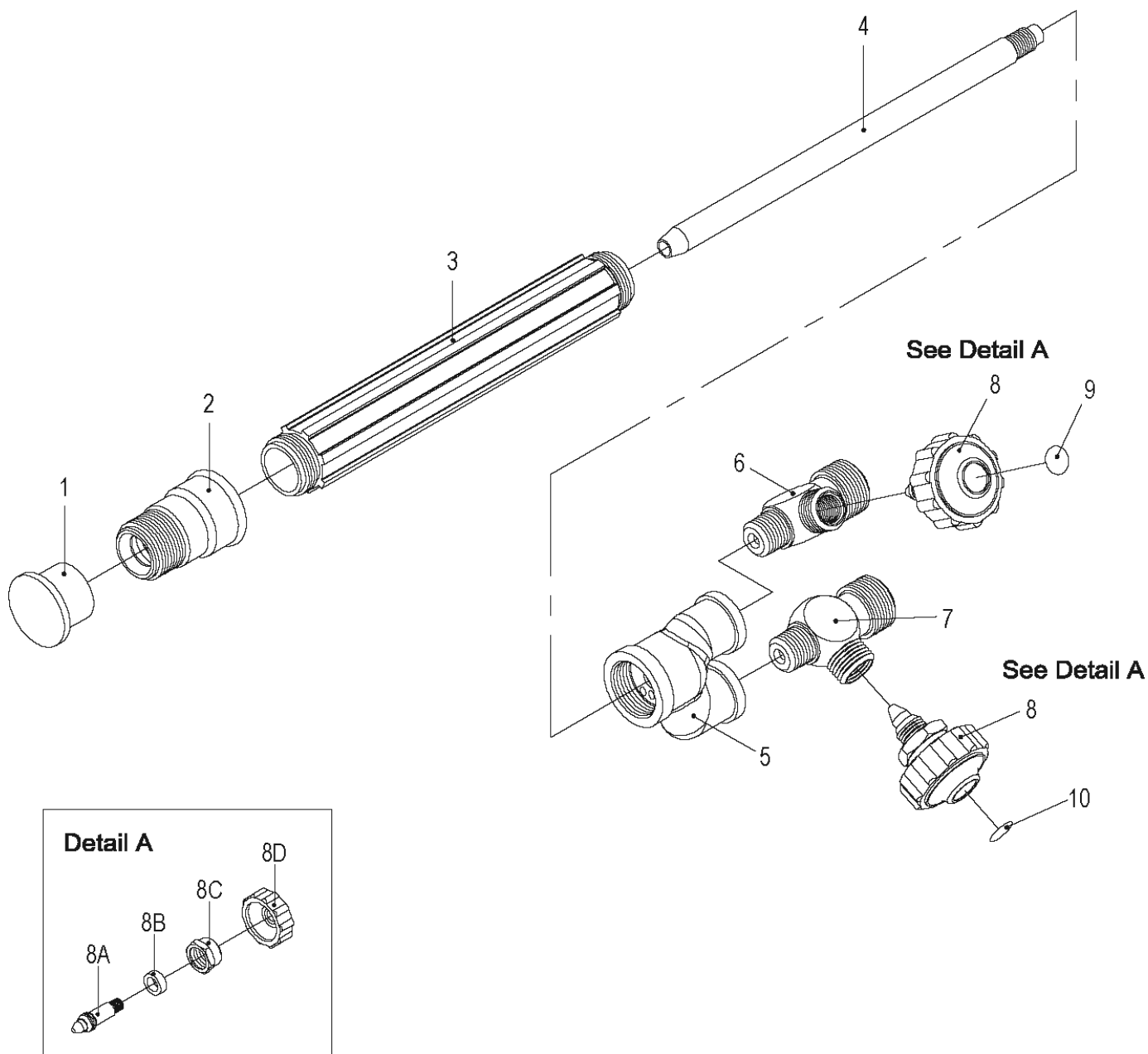
MAINTENANCE



Part	Description	Order Code
ASM O	Oxygen Regulator	OR-VM
O1	Body	VMA01
O2	HP Gauge	25A52AD
O3	LP Gauge	25A52BD
O4	Inlet Nut	76A09AB
O5	Inlet Spigot	25A04
O6	Filter	25A22
O7	Valve Spring	101A83
O8	Damper	101A82
O9	Valve	101A81C
O10	Nozzle	101A80
O11	Plunger	76A74
O12	Diaphragm Asm.	VMA18A
O12A	Nut	101A73
O12B	Diaphragm Plate	101A74

Part	Description	Order Code
O12C	Diaphragm	VMA10A
O12D	Centralizer	101A77
O13	Gasket	VMA09
O14	Adjusting Spring	76A69
O15	Spring Button	101A68
O16	Bonnet	VMA08
O17	Label	VMA14
O18	Adjusting T-Screw	VMA24
O19	Outlet Adapter	25A76
O20	Safety Valve	VHA19C
O20A	Safety Body	VHA19B
O20B	Safety Rubber	56A29
O20C	Safety Seat	VHA22A
O20D	Safety Spring	VHA24
O20E	Safety Cap	VHA25A

Parts List and Diagram H - Torch Handle



Part	Description	Order Code
ASM H	Torch Handle	VM-221
H1	Cover	VMCWA49
H2	Torch Head	VMCWA30
H3	Handle	VMCWA31
H4	Inner Tube	VMCWA32
H5	Tail	VMCWA33
H6	Oxygen Valve Body	VMCWA34
H7	Gas Valve Body	VMCWA35

Part	Description	Order Code
H8	Valve Stem Asm	VMCWA21E
H8A	Valve Stem	VMCWA16
H8B	Washer	VMCWA17
H8C	Nut	VMCWA18
H8D	Adjusting Knob	VMCWA19A
H9	Label (OX)	VMCWA19B
H10	Label (AC)	VMCWA19C

SAFETY

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Parts List and Diagram C - Cutting Attachment

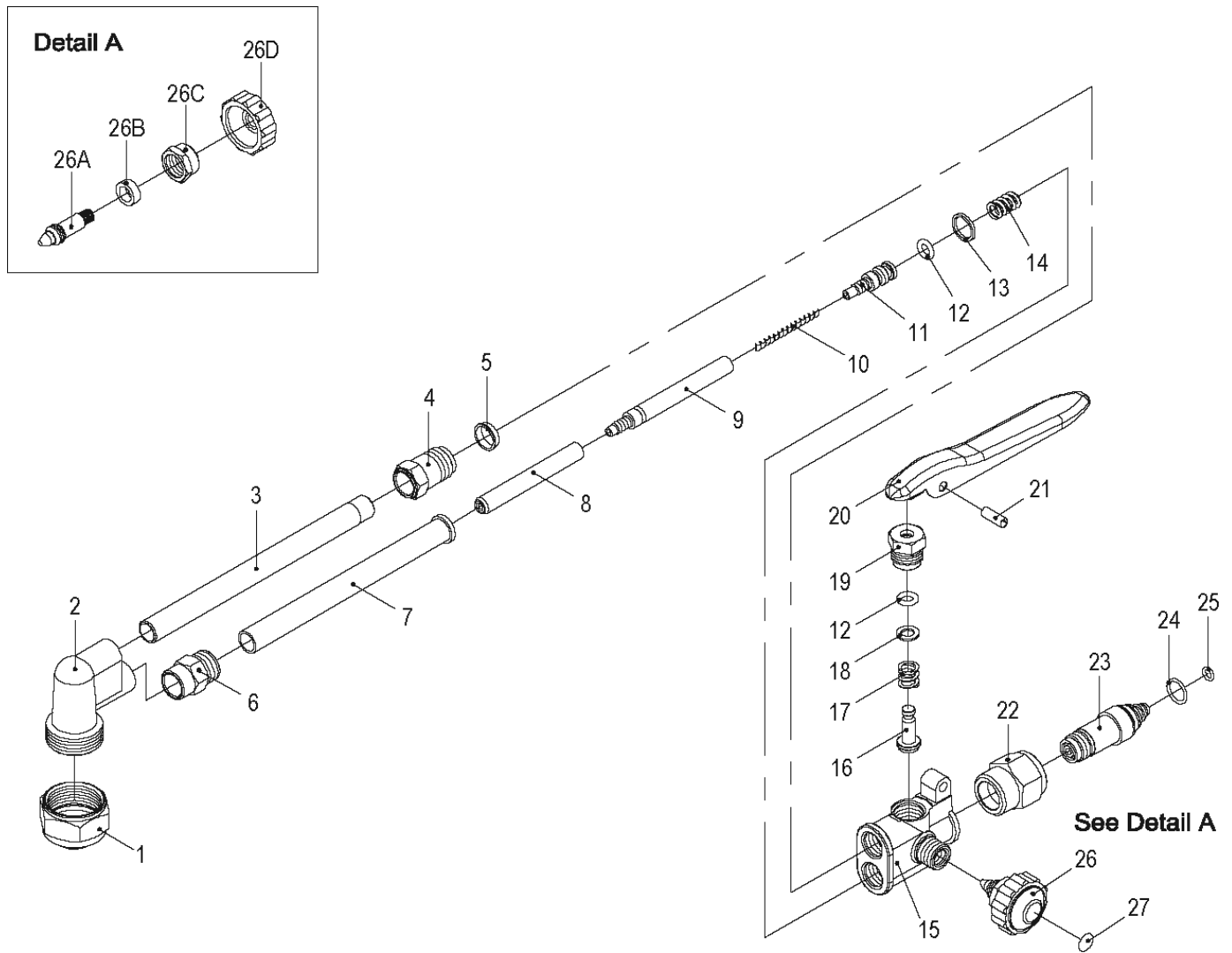
SAFETY

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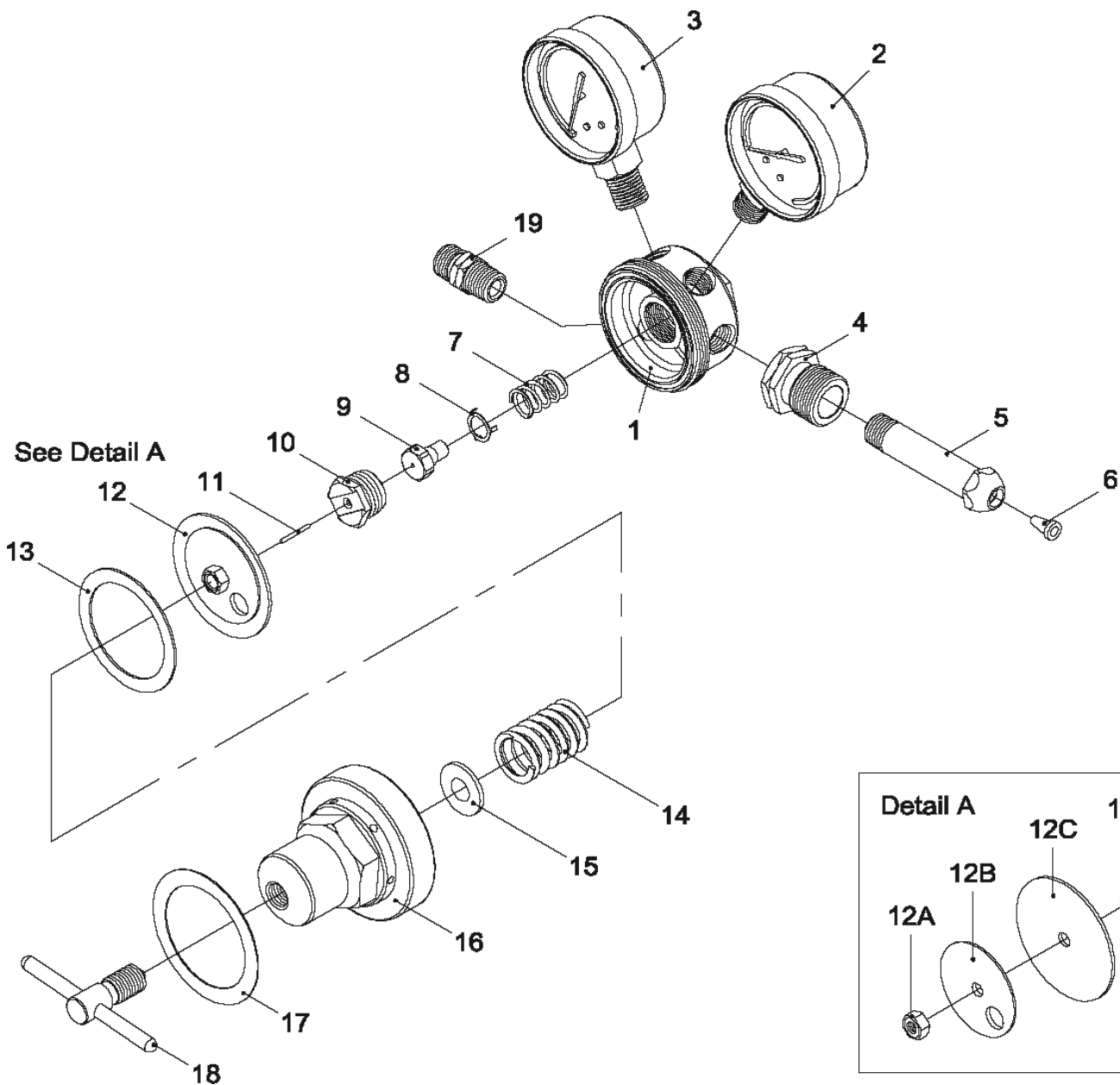
MAINTENANCE



Part	Description	Order Code
ASM C	Cutting Attachment	VM-222
C1	Tip Nut	VMCWA02
C2	Head	VMCWA01
C3	Oxygen Tube	VMCWA03
C4	Nut	VMCWA05
C5	Ferrule	VMCWA04
C6	Nut	VMCWA08
C7	Fuel Tube	VMCWA06A
C8	Inner Tube (A)	VMCWA10
C9	Inner Tube (B)	VMCWA11
C10	Spiral	VMCWA13
C11	Inner Tube (C)	VMCWA12
C12	O-ring	CMA17D
C13	PTFE Washer	VMCWA09
C14	Spring	VMCWA14
C15	Body	VMCWA15

Part	Description	Order Code
C16	Valve	VMCWA20
C17	HP Spring	VMCWA21
C18	Washer	VMCWA22
C19	Valve Cap	VMCWA23
C20	Lever	VMCWA24
C21	Spiral Pin	VMCWA25
C22	Coupling Nut	VMCWA27
C23	Cone End	VMCWA26
C24	O-ring (Big)	VMCWA28
C25	O-ring (Small)	VMCWA29
C26	Valve Stem Asm	VMCWA16C
C26A	Valve Stem	VMCWA16
C26B	Washer	VMCWA17
C26C	Nut	VMCWA18
C26D	Adjusting Knob	VMCWA19A
C27	Label (OX)	VMCWA19B

Parts List and Diagram A - Acetylene Regulator



Part	Description	Order Code
ASM A	Acetylene Regulator	AR-VM
A1	Body	VMA02
A2	HP Gauge	25A52CD
A3	LP Gauge	25A52DD
A4	Inlet Nut	25A16AB
A5	Inlet Spigot	25A06
A6	Filter	25A22
A7	Valve Spring	101A83
A8	Damper	101A82
A9	Valve	101A81
A10	Nozzle	101A80
A11	Plunger	76A74

Part	Description	Order Code
A12	Diaphragm Asm.	VMA18A
A12A	Nut	101A73
A12B	Diaphragm Plate	101A74
A12C	Diaphragm	VMA10A
A12D	Centralizer	101A77
A13	Gasket	VMA09
A14	Adjusting Spring	76A70A
A15	Spring Button	101A67
A16	Bonnet	VMA08
A17	Label	VMA15
A18	Adjusting T-Screw	VMA24
A19	Outlet Adapter	25A76

SAFETY

SETUP

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Limited 90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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