



Operator's Manual Medium Duty Torch Kit HTK-MD



WARNING: Do not assemble, install or operate this equipment without reading ALL of this manual and the safety precautions and warnings illustrated in this manual.

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SAFETY PRECAUTIONS AND WARNINGS **PLEASE READ BEFORE USING EQUIPMENT**



WARNING

- Keep children away from this equipment
- Protect your self and others from possible injury
- Pacemaker wearers should consult with their doctor before operating
- Read and follow all instructions in this manual before operating
- All installation, operation, and maintenance procedures are to be performed only by qualified individuals



ARC RAYS CAN BURN SKIN AND EYES

- Arc rays when welding produce intense ultraviolet and infrared rays that can burn skin and eyes
- Wear face protection, either helmet or shield when operating with ANSI Z49.1 approved shade #9 recommended for all cutting currents less than 300 amperes. The lens should conform to ANSI Z87.1 standards for testing.
- Wear approved safety glasses with side shields under the face protection
- Warn others not to stare at the arc as it can cause damage to the eyes. Provide barriers to protect other workers in the area from the arc while operating
- Wear flame resistant gloves, clothing, and shoes when operating



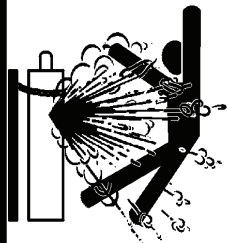
FUMES AND GASES CAN BE HAZARDOUS

- Arc welding produces fumes and gases and breathing these gases is hazardous to your health
- Keep your head out of the fumes and do not breath the fumes while welding
- Work only in a confined area if it has sufficient ventilation, or while wearing an air supplied respirator. Fumes from welding deplete the oxygen supply and can be harmful. Always be sure there is ample breathing air
- Read the MSDS sheets and the instructions from manufacturers for metals to be welded, coatings, and cleaners
- Do not use the welder near hydrocarbon vapors coming from degreasing, cleaning, or spraying operations. The heat and rays can react with solvent vapors to create the gas phosgene, a very toxic gas and other irritating gases
- Do not weld coated metals, such as galvanized, lead, or cadmium plated steel. Before welding, all plating must be removed. The area must be well ventilated or an air supplied hood must be used. The coatings and chemicals when burned cause highly irritating and toxic fumes.
- Do not weld containers with toxic, flammable, or reactive elements stored in them. They must be emptied and properly prepared before welding.



WELDING SPARKS CAN CAUSE INJURY, FIRE, OR EXPLOSION

- Remove all flammable materials from the welding area.
- Always have a charged fire extinguisher available in the welding area.
- When not welding make sure the welding gas cylinder valves are closed.
- Avoid welding near hydraulic lines, fuel lines, electrical cords, air hoses, or welding gas lines.
- Sparks and hot metal fly out from the work area when welding, wear approved safety glasses with side shields under approved helmets, wear proper body and hand protection, and wear flame resistant ear plugs to keep sparks from entering the ears



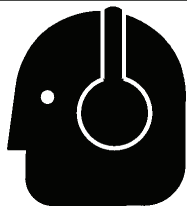
CYLINDERS CAN EXPLODE IF DAMAGED

- Gas cylinders contain gas under very high pressure. If damaged they can result in that cylinder exploding. Gas cylinders are a major part of metalworking and must be treated with care.
- Protect gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs
- Always keep cylinders in an upright position securely fastened to a fixed support
- Valve protection caps should always be in place and hand tight except when the cylinder is in use
- Keep all cylinders away from any welding or electrical circuits
- Never allow the flame or arc from a welder to contact a cylinder
- Never cut any type of pressurized cylinder, an explosion could result
- Always turn your face away from the valve when opening the cylinder
- Read and follow all instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in the Safety Standards before using



HOT PARTS CAN CAUSE SERIOUS BURNS

- Do not touch hot parts without wearing protection.
- Allow the torch to cool sufficiently before working with parts that could potentially be hot.



NOISE CAN DAMAGE HEARING

- Prolonged noise exposure from welding equipment can cause damage if levels of noise exceed the OSHA standards
- Wear approved hearing protectors
- Warn other workers nearby of the high noise level and hazard

CALIFORNIA PROPOSITION 65 WARNINGS

- Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects, and in some cases, cancer. (California Health and Safety Code Section 25249.5 et seq.)

PRINCIPAL SAFETY STANDARDS

AMERICAN WELDING SOCIETY

- AWS C5.2, Recommended Practices for Plasma Arc Cutting
- AWS F4.1, Recommended Safe Practices for the Preparation for Welding and Cutting

OSHA STANDARDS

- OSHA 29 CFR 1910, Safety and Health Standards

NATIONAL FIRE PROTECTION ASSOCIATION

- NFPA Standard 70, National Electric Code
- NFPA Standard 51B, Cutting and Welding Processes

AMERICAN NATIONAL STANDARDS INSTITUTE

- ANSI Standard Z87.1, Safe practices for Occupation and Educational Eye and Face Protection
- ANSI Standard Z49.1, Safety in Welding and Cutting

Installation & Setup

Features & Functions

Features

- Brass & Stainless Construction
- Welds up to 1/2 Inch*
- Cuts up to 6 Inches*
- Welding Tip, #1, 2 & 3 Size
- Cutting Tip, 6290AC Harris Style
- Twin Welding Hose, 12.5' x 3/16"
- Oxygen Regulator
- Acetylene Regulator
- Torch Handle
- Cutting Head
- Goggles
- Striker
- 10 Way Wrench
- Tip Cleaner

* Requires larger tips not included in this kit.

Functions

- Steel Cutting up to 6"*
- Welding up to 1/2"*
- Solders up to 3/4" Copper & Brass
- Silver Solders

* Requires larger tips not included with this kit.

Package Contents

1. Acetylene Regulator
2. Oxygen Regulator
3. Goggles
4. Cutting Head & Tip 6290AC
5. Torch Handle
6. Hose
7. Heating Tip #6
8. Welding Tip #1
9. Welding Tip #2
10. Welding Tip #3
11. Striker
12. Tip Cleaner
13. 10 Way Wrench



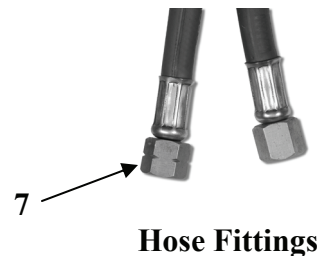
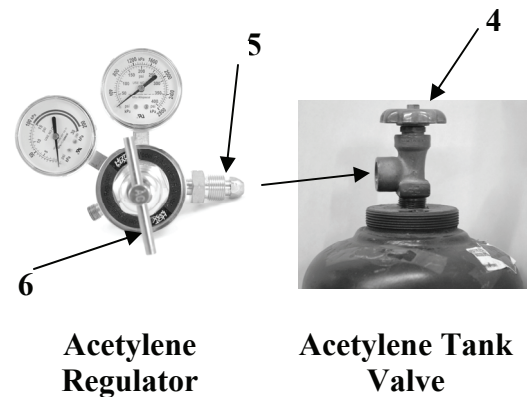
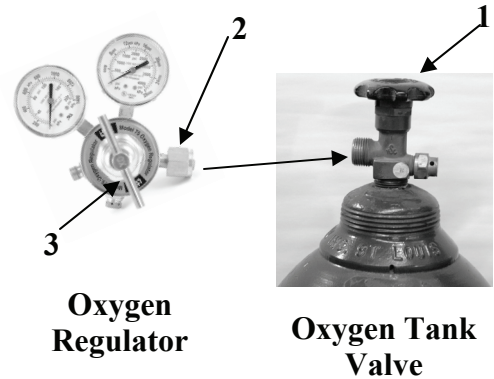
Installation & Setup

Tanks

The VTK-MD is designed to be used with CGA540 type tanks, these tanks can be purchased or leased from your local gas distributor. Different welding gas suppliers handle tank filling differently; some will fill the tanks while you wait while others require a tank exchange. You will need to select the type of supplier you prefer.

Attaching Regulators and Hoses

1. Secure the tanks to an immovable object such as a pole or a cart specifically designed to hold the tanks.
2. Briefly open the oxygen tank valve (1) to remove any debris that may have accumulated.
3. Wipe the oxygen regulator fitting (2) with a clean dry cloth and thread the fitting onto the tank valve and tighten with a wrench. Thread in the regulator valve lever (3).
4. Very briefly open the acetylene tank valve (4) to remove any debris that may have accumulated.
5. Wipe the acetylene regulator fitting (5) with a clean dry cloth and thread the fitting onto the tank valve and tighten with a wrench. Thread in the regulator valve lever (6).
6. Using compressed air; blow out the hoses prior to using them for the first time.
7. Attach the hoses to the regulators; green to the oxygen and red to the acetylene and tighten with a wrench.
8. Attach the other end of the hose to the appropriate fittings on the torch handle and tighten with a wrench.



Note: The acetylene hose has left hand (reverse) threads and is marked with notches in the fitting (7).

Installation & Setup

It is important that all fittings have been tightened with a wrench by this point.

Insure the tank valves, regulators valves and torch handle valves are turned to the off position.

Opening Valves

1. Attach the welding tip and tighten with a wrench.
2. Slowly open the oxygen cylinder valve to allow oxygen to flow to the regulator. Once the regulator begins to register pressure, open the valve an additional 1 to 1 1/2 turns.

Note: This must be done slowly, as a surge of pressure could damage the regulator diaphragm.

3. Slowly open the acetylene tank valve. Open slowly and not more than 1 turn.
4. Check for leaks. Leaks can not be seen, therefore, use soapy water on all connection points to insure there are no leaks.

Setting Working Pressures—Welding

⚠ WARNING

While setting working pressure gases will be released from the torch. It is important that no open flame or other heat source is present during this operation.

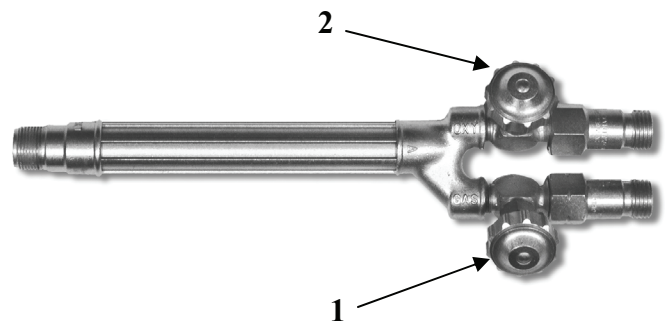
1. Attach the welding tip to the end of the torch handle opposite the hose attachment and tighten with a wrench.

Note: Consult the chart on page 9 for the appropriate tip and working pressures for the thickness of the metal being used.

2. Open the acetylene control knob (1) on the torch handle by turning it counter-clockwise. Turn the control lever on the acetylene regulator until the desired working pressure is reached. Once the working pressure is reached turn off the control knob on the torch handle. The regulator gauge reading may increase slightly.

3. Open the oxygen control knob (2) on the torch handle by turning it counter-clockwise. Turn the control lever on the oxygen regulator until the desired working pressure is reached. Once the working pressure is reached turn off the control knob on the torch handle. The regulator gauge reading may increase slightly.

Note: The VTK-MD is equipped with single stage regulators and as such the working pressure may need to be adjusted as the gas pressure in the tanks decreases.



⚠ WARNING

Prior to lighting the torch make sure the hoses are behind the operator and that there is no chance of them being hit by a hot spark or slag.

Operation

WARNING

At this point the operator should be wearing appropriate protective clothing such as gloves and goggles.

Lighting the Torch

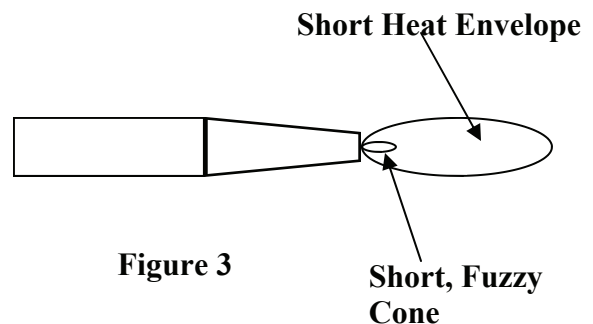
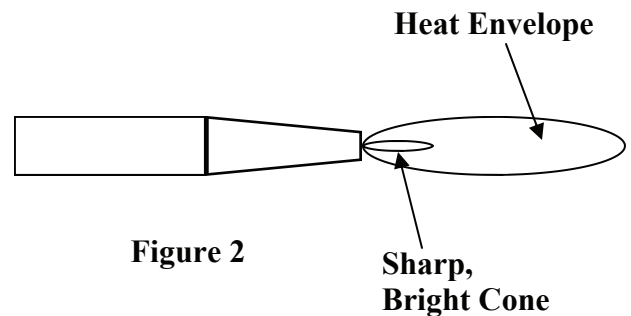
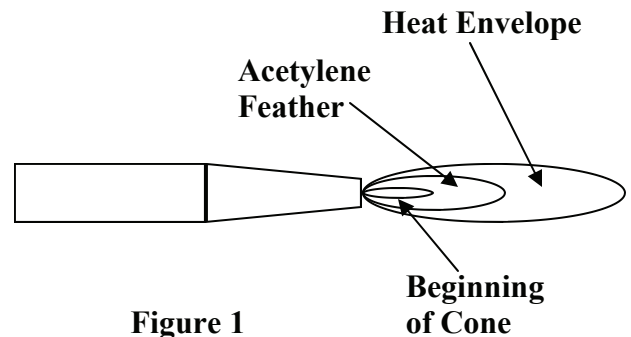
1. Open the acetylene control knob on the torch handle just enough to let some gas flow.
2. Holding the striker close to the welding tip squeeze it a few times to create the sparks required to light the acetylene.

Note: A oxy-acetylene torch should NEVER be lit with oxygen present in the mixture.

Adjusting the Flame

1. If the acetylene is set too high the flame will be a few inches away from the tip. Reduce the amount of acetylene by turning the acetylene control knob counter clockwise.
2. When the flame is about 8—10 inches long and only has a small amount of black smoke; begin to introduce oxygen by turning the oxygen control knob clockwise.
3. As oxygen is added the flame will turn from a yellow-orange to a whitish color and flame will have three distinct cones (Figure 1). This is called a carburizing flame and is not hot enough for welding.
4. As oxygen is added to the mix the acetylene feather will shrink and disappear into the cone (Figure 2). This a neutral flame and is ideal for welding.
5. If additional oxygen is added the cone will become shorter and fuzzy (Figure 3). This is a oxidizing flame and will cause breakdowns in the material being welded and the weld itself.

Once a neutral flame has been achieved the torch is ready for welding.



Operation

Shutting Down

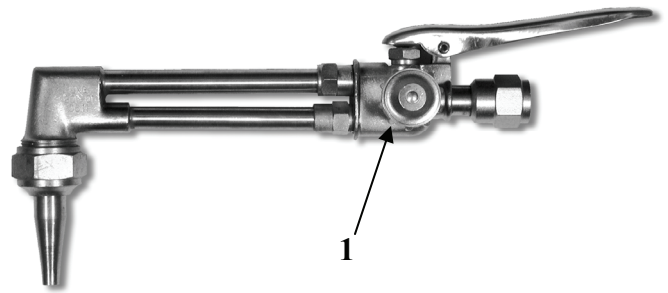
1. Using the acetylene control knob turn off the flow of acetylene to the welding tip. This will allow oxygen to continue to flow and will insure any debris that may be in the orifice is blown out.
2. Turn off the oxygen using the oxygen control knob on the torch handle.
3. If shutting down for only a short period of time, close the tank valve on both the acetylene and oxygen and leave the hoses filled with gas.
4. If shutting down for a longer period of time, close the tank valve on both the acetylene and oxygen.
5. Bleed the acetylene line by opening the acetylene control knob on the torch handle. Watch the regulator gauge, it should move to reading zero.
6. Close the acetylene control knob on the torch handle.
7. Bleed the oxygen line by opening the oxygen control knob on the torch handle. Watch the regulator gauge, it should move to reading zero.
8. Finally release the pressure on the regulator diaphragm by opening the regulator valve until little or no pressure is felt. This will significantly improve the life of the regulator.

Setting Working Pressures—Cutting

⚠ WARNING While setting working pressure gases will be released from the torch. It is important that no open flame or other heat source is present during this operation.

Note: At this point the tanks should be turned off and both the acetylene and oxygen lines cleared of gas.

1. Remove the welding tip from the torch handle and attach the cutting head. Tighten with a wrench.
2. Insure that the both the acetylene and oxygen control knobs on the torch handle are closed (clockwise).
3. Insure the oxygen control knob (1) on the cutting head is closed (clockwise).



4. Select the appropriate cutting tip for the material being cut and attach it to the cutting head (the VTK-MD is shipped with a #1 tip assembled to the cutting head). Tighten with a wrench.
- Note:** The chart on page 9 can be used as a guide for selecting the correct tip for the job.
5. Close (counter clockwise) both the acetylene and oxygen regulator valves.
 6. Slowly open the oxygen cylinder valve to allow oxygen to flow to the regulator. Once the regulator begins to register pressure, open the valve an additional 1 to 1 1/2 turns.

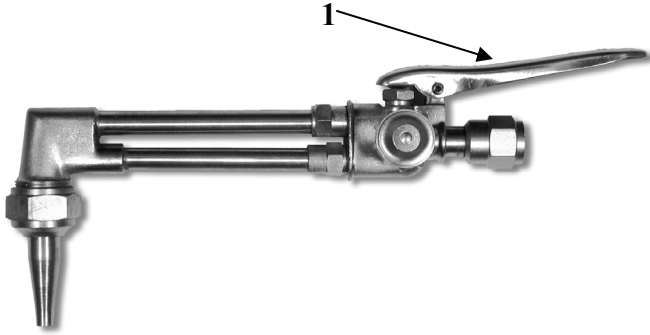
Note: This must be done slowly, as a surge of pressure could damage the regulator diaphragm.

7. Open the oxygen regulator until the regulator reaches the desired working pressure.

Note: Working pressure charts are found on page 9.

Operation

8. Check all connections for leaks. Leaks can not be seen, therefore, use soapy water on all connection points to insure there are no leaks.
9. Open the oxygen control knob on the torch handle two full turns. No oxygen should flow at this time because the oxygen flow is controlled by the valve on the cutting head.
10. Insure oxygen flows by turning the control knob on the cutting head a quarter of turn. Quickly close the valve after confirming oxygen flow.
11. Press the oxygen cutting lever (1) briefly to confirm a stream of oxygen flows from the center hole in the cutting tip.



12. Slowly open the acetylene tank valve. Open slowly and not more than 1 turn.
13. Open the acetylene regulator until the regulator reaches the desired working pressure.

Note: Working pressure charts are found on page 9.

14. Briefly open the acetylene control knob on the torch handle to confirm acetylene is flowing.
15. Check all connections for leaks using soapy water.

Lighting the Torch



Prior to lighting the torch make sure the hoses are behind the operator and that there is no chance of them being hit by a hot spark or slag.

At this point the operator should be wearing appropriate protective clothing such as gloves and goggles.

1. Open the acetylene control knob on the torch handle just enough to let some gas flow about a quarter turn.
2. Holding the striker close to the cutting tip squeeze it a few times to create the sparks required to light the acetylene.

Note: A oxy-acetylene torch should **NEVER** be lit with oxygen present in the mixture.

Adjusting the Flame

1. Open the oxygen valve on the cutting head.
2. Develop a neutral flame at the preheat holes (Figure 4) that results in a cone about 1/8th inch long. This is accomplished by alternately increasing the flow of acetylene and then oxygen.

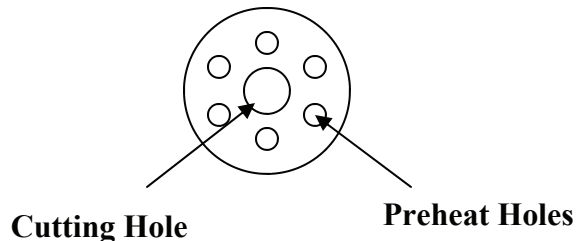


Figure 4

Operation

3. Press the oxygen cutting lever briefly to insure oxygen is flowing through the cutting hole.
4. Further adjustment may now be needed to insure a neutral flame in the preheat holes. Generally a reduction in oxygen.
5. The torch is ready for cutting.

Shutting Down

1. Using the acetylene control knob on the torch handle turn off the flow of acetylene to the welding tip. This will allow oxygen to continue to flow and will insure any debris that may be in the preheat holes is blown out.
2. Press the oxygen cutting lever to insure debris is cleared from the cutting hole.
3. Turn off the oxygen using the oxygen control knob on cutting head.
3. If shutting down for only a short period of time, close the tank valve on both the acetylene and oxygen tank and leave the hoses filled with gas.
4. If shutting down for a longer period of time, close the tank valve on both the acetylene and oxygen tanks.
5. Bleed the acetylene line by opening the acetylene control knob on the torch handle. Watch the regulator gauge, it should move to reading zero.
6. Close the acetylene control knob on the torch handle.
7. Bleed the oxygen line by opening the oxygen control knob on the cutting head. Watch the regulator gauge, it should move to reading zero.
8. Finally release the pressure on the regulator diaphragm by opening the regulator valve until little or no pressure is felt. This will significantly improve the life of the regulator.

Welding Nozzle Chart

| Metal Thickness | Tip Size | Oxygen Pressure P.S.I.G. | | Acetylene Pressure P.S.I.G. | |
|-----------------|----------|--------------------------|------|-----------------------------|------|
| | | Min. | Max. | Min. | Max. |
| Up to 1/32" | 000 | 3 | 5 | 3 | 5 |
| 1/16"-3/64" | 00 | 3 | 5 | 3 | 5 |
| 1/32"-5/64" | 0 | 3 | 5 | 3 | 5 |
| 3/64"-3/32" | 1 | 3 | 5 | 3 | 5 |
| 1/16"-1/8" | 2 | 3 | 5 | 3 | 5 |
| 1/8"-3/16" | 3 | 4 | 7 | 3 | 6 |
| 3/16"-1/4" | 4 | 5 | 10 | 4 | 7 |
| 1/4"-1/2" | 5 | 6 | 12 | 5 | 8 |
| 1/2"-3/4" | 6 | 1 | 14 | 6 | 9 |
| 3/4"-1 1/4" | 7 | 8 | 16 | 8 | 10 |

Cutting Tip Chart

| Metal Thickness | Tip Size | Oxygen Pressure P.S.I.G. | | Acetylene Pressure P.S.I.G. | |
|-----------------|----------|--------------------------|------|-----------------------------|------|
| | | Min. | Max. | Min. | Max. |
| 1/8" | 000 | 20 | 25 | 3 | 5 |
| 1/4" | 00 | 25 | 30 | 3 | 5 |
| 3/8" | 0 | 25 | 30 | 3 | 5 |
| 1/2" | 0 | 30 | 35 | 3 | 5 |
| 3/4" | 1 | 30 | 35 | 3 | 5 |
| 1" | 2 | 35 | 40 | 3 | 7 |
| 2" | 3 | 40 | 45 | 4 | 8 |
| 3" | 4 | 40 | 50 | 5 | 11 |
| 4" | 5 | 45 | 55 | 6 | 13 |
| 5" | 5 | 45 | 55 | 6 | 13 |
| 6" | 6 | 45 | 55 | 8 | 14 |
| 8" | 6 | 45 | 55 | 8 | 14 |

Heating Nozzle Chart

| Tip Size | Acetylene Pressure Range | Oxygen Pressure Range | Acetylene Cubic Feet/Hour | | Oxygen Cubic Feet/Hour | |
|----------|--------------------------|-----------------------|---------------------------|------|------------------------|------|
| | P.S.I.G. | P.S.I.G. | Min. | Max. | Min. | Max. |
| 4 | 6-10 | 8-12 | 6 | 20 | 7 | 22 |
| 6 | 8-12 | 10-15 | 14 | 40 | 15 | 44 |
| 8 | 10-15 | 20-30 | 30 | 80 | 33 | 88 |
| 10 | 12-15 | 30-40 | 40 | 100 | 44 | 110 |

Note: Pressure settings are approximate for 25' hose length, an increase of about 1 psi per additional 25' is required.

Maintenance and Additional Products

General Maintenance

1. Prior to **EVERY** use, inspect hoses for damage.

Note: Never try to repair damaged gas hoses.
Damaged hoses should be replaced.

2. Prior to **EVERY** use, check all connections for leaks.
3. Clean splatter and slag off of the outside of welding and cutting tips as required.
4. Regularly clean tip holes with a welding tip cleaner (Hot Max P/N 22034 or 24175).

Note: Never use oil, grease, pipe dope or Teflon tape on any part of the HTK-MD equipment.

Notes:

Warranty

KDAR Company, and its affiliates, warrants that all torch kit components (except hoses) covered under this warranty are free from defects in material and workmanship for two years from the date of purchase. KDAR also warrants that all hose assemblies are free from defects in material and workmanship for 90 days from the date of purchase. This warranty is extended to the original purchaser who uses the product in a consumer application (personal, residential or household usage). All torch kits covered under this limited warranty which are used in commercial applications (i.e. income producing) are warranted to be free from defects in material and workmanship for 90 days from the date of original purchase. The products covered under this warranty are the VTK-HD-A, VTK-HD-B, VTK-MD, HTK-MD.

KDAR Company, and its affiliates, will repair or replace, at KDAR's sole discretion, parts found to be defective in material or workmanship within the warranty period. Warranty service will be scheduled according to the normal work flow and business hours of the service center doing the work as well as the availability of replacement parts. All decisions from KDAR Company regarding this limited warranty shall be final.

Original Purchaser's Responsibility:

1. Retain the original cash register receipt as proof of purchase.
2. Follow manual instructions regarding the care and operation of your welder.
3. If warranty work is required, **DO NOT RETURN THIS TORCH KIT TO THE RETAILER.** Contact KDAR Company for instructions. Visit www.hotmaxtorches.com or call KDAR Company M-F 8AM-5PM CST to locate the nearest Authorized Service Center.

Not Covered:

1. Transportation charges for sending or delivering the welder to the Authorized Service Center or returning the repaired or replacement welder back to the customer. These charges are the responsibility of the customer.
2. Damages caused by ordinary wear, abuse, rain, freeze damage, negligence, accident or failure to operate or maintain the torch kit in accordance with the instructions in the operator's manual supplied with the torch kit.
3. Damage caused by unauthorized repair or alterations.

Exclusions and Limitations:

KDAR Company makes no other warranty of any kind, express or implied. Implied warranties, including warranties of merchantability and of fitness for a particular purpose, are hereby disclaimed. The warranty service described above is the exclusive remedy under this warranty; liability for incidental and consequential damages is excluded to the extent permitted by law.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow a disclaimer of implied warranties, or the exclusion of incidental and consequential damages, so the above disclaimers and exclusions may not apply to you.

For warranty service or to obtain service parts or accessories:

Call: (314) 692-8555 M-F 8-5 PM, CST

Visit: www.hotmaxtorches.com

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