Instructions
and
Parts Data
for the

HELIARC
Trade-Mark

HW-10
300-AMPERE
HAND-WELDING TORCH

Be Sure this Information Reaches the Operator. You Can Get Extra Copies Through Any LINDE Office.

Linde Instruction Literature
The HELIARC HW-10 Torch is designed for hand-welding. It can be used with high-frequency stabilized alternating current, or with straight-polarity direct current. Its current capacity is 300 amperes at a normal welding duty cycle. Tungsten electrodes from .040-in. to 1/8-in. diameter are accommodated in the rated current capacity. The torch is available with either a 12-1/2 ft. or 25-ft. length of cable-and-hose assembly.

Both metal nozzles and ceramic gas cups can be used with the HW-10. The metal nozzles are cooled through their screwed connection to a water-cooled jacket. The water jacket, torch body, and power cable are water-cooled by internal passages to eliminate cumbersome hose and fittings which interfere with maneuverability and visibility during welding. Because of this, the torch is lightweight and well balanced for convenient and easy handling. Water-cooling also protects essential parts from excessive heat, thereby giving the torch durability.

Another important feature is quick-release collets for gripping electrodes. These collets make changing or adjusting the electrode a simple operation. To adjust an electrode, the operator merely loosens the torch cap a quarter-turn, positions the electrode, and retightens the cap. This method of electrode adjustment is convenient and time saving, and does not require the use of any wrenches or special tools.

The torch body passages are accessible for cleaning by simply removing the water-jacket adaptor and collet body from the torch head, and disconnecting the handle and water hose.

I. SETTING UP THE HW-10 TORCH TO WELD

A. Equipment Needed

Check to be sure you have the following before setting up the equipment:

1. HELIARC HW-10 Torch which includes the necessary hose and power cable.

2. An electrode and collet of corresponding size. (See Table I for recommended electrode diameters for different welding current ranges.)

3. A metal nozzle or ceramic cup of the correct size for the welding current you intend to use. (See Table I for recommended nozzle and cup sizes for different welding currents.)

4. Fuse assembly, Part No. 56Y48, (optional) to prevent the torch from overheating if the water supply should fail. It is strongly recommended for use where the water flow fluctuates widely. If a fuse assembly is not used, a power cable adapter (Part No. 84284) is necessary for connecting the standard 3/0 welding cable to the water-cooled torch cable. One or the other of these accessories must be used to place the torch in operation.

5. Silicone Boot, Part No. 86214 (optional). When high-frequency current is used, either for starting or for arc stabilization, the Silicone Boot is slipped over the front end of the torch to prevent high-frequency leakage when the torch is brought close to a grounded metal surface while working in confined areas.


7. An OXWELD R-502 Argon Regulator and Flowmeter (Part No. 03X80). (An OXWELD L-23 flowmeter, together with any standard oxygen cylinder regulator, such as an OXWELD R-64, may be substituted for the R-502.)

8. An OXWELD V-30 Double shutoff Valve (Part No. 16X21).

9. A source of cooling water. (See Part II, Section A, for information on cooling water requirements.)

10. A drain for disposal of cooling water.

11. Additional hose assemblies.

(a) A 1/4-in. argon hose assembly of suitable length for connecting the regulator to the V-30 valve.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>10Y72</td>
<td>12-1/2-ft.</td>
</tr>
<tr>
<td>10Y68</td>
<td>25-ft.</td>
</tr>
</tbody>
</table>

(b) A 1/4-in. water hose assembly for connecting the V-30 valve to the water supply line. (A 1/4-in. pipe can be used if desired.)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>10Y93</td>
<td>12-1/2-ft.</td>
</tr>
<tr>
<td>10Y94</td>
<td>25-ft.</td>
</tr>
</tbody>
</table>

12. An OXWELD adaptor (Part No. 10230) for connecting the water inlet hose to the water supply line.

13. A source of electric power. (See Part I, Section C, for information on electric power requirements.)

14. A welding transformer and a high-frequency generator, if welding is with alternating current; a welding generator, if welding is with direct current.

15. Suitable lengths of 3/0 welding cable to connect the welding generator to the torch and to the work.

16. A clamp to ground the welding cable to the work.

17. A welder's helmet with the proper shade of glass for the welding current you intend to use.

<table>
<thead>
<tr>
<th>Glass No.</th>
<th>Welding Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Up to 30 amperes</td>
</tr>
<tr>
<td>8</td>
<td>30 to 75 amperes</td>
</tr>
<tr>
<td>10</td>
<td>75 to 200 amperes</td>
</tr>
<tr>
<td>12</td>
<td>200 to 250 amperes</td>
</tr>
</tbody>
</table>

The terms "Lincol," "Heliarc," and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.
FIG. 1 – Schematic Diagram of Water and Argon Connections for "Heliarc" HW-10 Torch

* For 12½ or 25 ft., respectively.

V-30 Double Shutoff Valve (16X21). If not used, connect water inlet hose assembly directly to water supply line, and argon inlet hose assembly to R-502 Regulator or equivalent.

Argon Hose Assembly, 12-1/2 ft. (10Y72) or 25 ft. (10Y68) to connect V-30 Valve to R-502 Regulator. Additional lengths may be added as needed using Argon Hose Coupling (6978) for each length added.

R-502 Argon Regulator with Flowmeter (03X90), L-23 Flowmeter with R-64 or other equivalent regulator may be substituted.

Water Inlet Hose Assembly * (54Y60 or 54Y62)

Argon Inlet Hose Assembly * (54Y61 or 55Y70)

HELIARC HW-10 Torch * (16X39 or 16X40)

Power Cable and Hose Assembly, * (54Y63 or 55Y72)

3/0 Welding Cable to Welding Generator.

Adaptor (10Z30)

Argon Cylinder

Water Supply Line

Water Hose Assembly, 12-1/2 ft. (10Y93) or 25 ft. (10Y94) (1/4-in. pipe may be used, if desired). Additional lengths may be added as needed, using water Hose Coupling (11Z15) for each length added.

Fuse Assembly (56Y48)

or

Power Cable Adaptor Assembly (84Z84)

Drain – if actual threaded connection between water outlet hose assembly and drain pipe is required, use Adaptor (10Z30).
FIG. 2 – Schematic Diagram for "Heliarc" A.C. Welding

FIG. 3 – Schematic Diagram for "Heliarc" D.C. Welding

NOTE 1: HEAVY LINES INDICATE CHANGES TO BE MADE IN GENERATOR CIRCUIT
NOTE 2: X INDICATES "BREAK CONNECTION HERE"
B. Hose Connections

Fig. 1 indicates the correct method of assembling the accessories used to supply argon and cooling water to the HW-10 Torch. Detailed instructions covering the mounting and use of each individual accessory are packed with the equipment.

C. Electrical Setup

1. POWER REQUIREMENTS

(a) For a.c. welding, a single-phase transformer requiring a 230- or 460-volt, alternating current supply, is generally used.

(b) For d.c. welding, a motor-generator unit powered by a 230- or 460-volt, 3-phase alternating current supply is generally used.

NOTE: Be sure to obtain manufacturer’s recommendations on power requirements for your transformer or generator.

2. SPECIAL CONTROL CIRCUITS Several special control circuits have been developed to automatically control various phases of the welding process. By use of these circuits, you can conserve argon and water, reduce radio interference when using high-frequency current, and provide greater convenience of operation. For specific details, call or write your nearest LINDE office. A booklet (Form 9067) giving descriptions of the circuits, and specifications for the equipment needed will be sent to you without charge upon request.

3. ELECTRICAL CONNECTIONS Before making any connections, refer to the schematic wiring diagram in Figures 2 and 3 for alternating current and direct current welding setups. Note that a foot switch is connected in an external circuit to interrupt welding current. Its use is recommended because it provides a convenient method of control. It also enables you to shut off welding current without removing the argon protection at the end of a seam, thus controlling crater cracking especially when welding high-temperature alloys. If you have an alternating current setup, radio interference caused by high-frequency current will be greatly reduced since no high-frequency current flows when the welding current is shut off. If no foot switch is used, the arc can be broken by lifting the torch from the work. However, this method of control is not as satisfactory for high-temperature alloys.

CONNECTIONS FOR A.C. WELDING (FIG. 2)

(a) Connect the fuse assembly or cable adaptor (1) to the “torch” terminal (2) of the high-frequency generator with a suitable length of 3/0 welding cable.

(b) Connect the workpiece (3) to the “work” terminal (4) of the high-frequency generator with a suitable length of 3/0 welding cable. Fasten the cable to a clean surface of the workpiece with a clamp. This will give you a good contact.

(c) Connect the input terminals (5) of the high-frequency generator to the output terminals (6) of the transformer secondary with suitable lengths of 3/0 cable.

(d) Connect the input terminals (7) of the transformer primary to one set of terminals (8) of the main contactor. Then connect the other terminals (9) of the main contactor to the 230- or 460-volt main power supply (10). Be sure to select a conductor which will carry the maximum current you will use.

(e) Connect the high-frequency generator (11) to the lines (12) leading from the main contactor to the transformer primary. This connection is made so that power to the high-frequency generator is shut off when the main contactor is open.

(f) Connect one terminal (13) of the main contactor coil to one terminal (14) of the auxiliary contactor. Connect the remaining terminals (15) of the main contactor coil and the auxiliary contactor to opposite sides (16) of the 230- or 460-volt main power supply.

(g) Connect one terminal (17) of the auxiliary contactor coil to one terminal (18) of the foot switch. Connect the remaining terminals (19) of the auxiliary contactor coil and the foot switch to opposite sides (20) of the low voltage a.c. supply. (A control circuit supply of 6 to 24 volts is recommended for safety reasons.)

(h) Make a ground connection (21) from the “work” terminal (4) of the high-frequency generator. MAKE NO OTHER GROUND CONNECTION. Connect the case (22) of the high-frequency generator and the case (23) of the transformer to the “work” terminal (4) of the high-frequency generator.

CONNECTIONS FOR D.C. WELDING (FIG. 3)

(a) Connect a suitable length of 3/0 welding cable between the fuse assembly or cable adaptor (1) and the “negative” generator terminal (2) for straight-polarity welding. Connect the “positive” terminal (3) of the generator to the work (4). Use suitable lengths of 3/0 welding cable for these connections. Secure the ground connection to clean bright metal of the workpiece with a clamp for good contact.

(b) Make separate ground connections (5) to the work (4) and to the generator case (6).

(c) If you use a generator of the separately-excited type shown in Figure 3 you can shut off welding current remotely without lifting the torch from the work by means of a foot or hand switch which actuates a field relay. Parallel the field coil contacts with a 0.25 Mfd, 600-volt discharge condenser. For all other types of generators, obtain the manufacturer’s recommendations on installing a remote current shutoff. Connect one ter-
terminal (7) of the foot switch to one terminal (8) of the field relay coil. Connect the remaining terminals (9) of the switch and of the field relay coil to opposite sides (10) of the separate control circuit power supply.

(d) Connect the input terminals (11) of the motor side of the welding generator to the 230- or 460-volt alternating current main power supply (12).

D. Metal Nozzles, Ceramic Cups, and Electrode Collets

1. METAL NOZZLES AND CERAMIC CUPS. Five metal nozzles and five ceramic cups are available for use with the HW-10. Each nozzle or cup size is intended for use with a different welding current range. For the most effective argon protection, select the nozzle or cup size according to the recommendations in Table I.

2. ELECTRODE COLLETS. The electrode collets are designed for quick and simple adjustment of the electrode. They are available for four different electrode sizes (.040-in. to 1/8-in. diameter). Install the collet and electrode as follows:

(a) Remove the torch cap from the torch.

(b) Insert a collet for the electrode size you intend to use into the top of the torch head. Mate the tapered end of the collet with the tapered seat in the torch head.

(c) Insert an electrode of corresponding size into the top of the collet. Allow the electrode to protrude 1/8 to 3/16-in. beyond the end of the nozzle for butt welding, and 1/4 to 3/8-in. for fillet welding. Then screw the torch cap onto the torch head and tighten it to hold the electrode firmly.

E. Final Steps Before Welding

1. Check all argon and water connections for tightness. Turn on the cooling water supply, making certain that the flow is adequate. (See Part II, Section A below for recommended pressure, volume, and temperature.)

2. With the R-502 regulator flow-adjusting valve closed, open the argon cylinder valve.

3. Remove the torch from the V-30 valve arm; then turn the regulator flow-adjusting valve handle counter-clockwise to obtain the desired flow.

4. Set the welding generator or transformer for the desired welding current.

5. Close the foot or hand switch.

6. Draw a test arc on a heavy piece of scrap steel or copper. (Do not use a carbon pencil or carbon block for starting an arc.)

NOTE: When high-frequency current is used, either for starting or arc stabilization, Silicone Boot Part No. 84216 is slipped over the front end of the torch to prevent high-frequency leakage when the torch is brought close to a grounded metal surface while working in confined areas.

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**TABLE I**

**ELECTRODE, NOZZLE AND CUP SIZES FOR DIFFERENT WELDING CURRENTS**

<table>
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<tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACHF**</td>
</tr>
<tr>
<td>0.020</td>
<td>-</td>
<td>-</td>
<td>5-15</td>
</tr>
<tr>
<td>† 0.040</td>
<td>4</td>
<td>4</td>
<td>10-60</td>
</tr>
<tr>
<td>† 1/16</td>
<td>4, 5</td>
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<td>50-100</td>
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<td>† 3/32</td>
<td>5, 6</td>
<td>6, 7</td>
<td>100-160</td>
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<tr>
<td>† 1/8</td>
<td>6, 7, 8</td>
<td>6, 7, 8</td>
<td>150-210</td>
</tr>
<tr>
<td>5/32</td>
<td>-</td>
<td>-</td>
<td>200-275</td>
</tr>
<tr>
<td>3/16</td>
<td>-</td>
<td>-</td>
<td>250-350</td>
</tr>
<tr>
<td>1/4</td>
<td>-</td>
<td>-</td>
<td>325-475</td>
</tr>
</tbody>
</table>

† Range of HW-10 Torch

* These figures are for pure tungsten electrodes. Add 50% to top limits for thoriated (1 or 2 per cent) tungsten electrodes.

** Maximum values for unbalanced wave transformers. Balanced wave reduces maximum by about 30 per cent.

*** Exceeds capacity of standard HELIARC torches.

**NOTE: All current values are metered readings. Transformers designed for metal-arc welding deliver about 15 per cent more current than shown on their scale readings.
II. GENERAL NOTES ON TORCH OPERATION

A. Cooling Water Requirements

1. USE CLEAN COOLING WATER. The cooling water that circulates through the torch body, water jacket, and cable and hose assembly should be clean and free from dirt or other solid material which might clog the water passages.

   If the torch becomes clogged, it can sometimes be flushed out by reversing the connections to reverse the water flow. CAUTION: BE SURE NOT TO WELD WITH WATER FLOW REVERSED. The water should cool the torch body and water jacket before it flows through the cable and hose assembly. If the water flow is reversed when a fuse assembly is used, (1) the inlet water will first cool the fuse and render it inoperative at the temperature for which it was designed, and (2) the temperature of the water flowing to the torch body is too high for effective protection of the torch.

   To prevent further clogging, install a strainer, such as the 1/4-in., type 340, semi-steel, 60-mesh brass screen available from Kiely and Mueller, Inc., 2013 43rd Street, North Bergen, N. J., or equivalent.

2. COOLING WATER INLET PRESSURE, VOLUME AND TEMPERATURE. The 300-ampere capacity rating of the torch is based on cooling water flow of one quart per minute at an inlet temperature of 60 deg. F., with 25 psi inlet pressure using 12-1/2 feet of hose and 35 psi inlet pressure using 25 feet of hose. Water pressures up to 50 psi at the inlet of the torch hose can be used. If the inlet water pressure exceeds 50 psi, a regulator should be installed to prevent damage to the plastic hose. A suitable regulator is the type 463, 1/4-in. water regulator available from Kiely and Mueller, Inc., 2013 43rd Street, North Bergen, N.J. (Any equivalent regulator can also be used.)

B. Leakage in the Torch Head

1. "O" ring 84W85 serves as a compression seal between the collet body and the argon gas chamber to prevent water leakage into the argon gas. If this "O" ring becomes damaged, nicked, or flattened, replace it with a new part.

2. "O" ring 85W51 serves as a radial seal between the water-jacket adaptor and the threaded section of the torch body (see Figs. 4 and 5) to prevent internal and external water leakage. External leakage will occur if the outer seal fails; internal leakage will occur if the inner seal fails. Failure of the inner seal may result in water finding its way between the insulation and the torch-body casting in the torch body. Such a leak may then by-pass the torch cap "O"-ring seal (85W50) and find its way into the argon "well" in the upper section of the torch body. External leakage would show up at the joint formed by the water-jacket adaptor and the torch-body insulation.

3. "O" ring 85W80 serves as a radial seal between the water jacket and the water-jacket adaptor, to prevent external water leakage. If this "O" ring becomes damaged, nicked, cracked or flattened, replace it with a new part.

4. The insulator gasket seals the cooling water from the argon gas. Any leakage of water that can be noticed in the torch head is due to the failure of this gasket seal. Inspect the gasket for nicks, cracks or excessive distortion and replace with a new part, if necessary. Make certain the torch-head parts are reassembled as outlined in Section IV, page 9.

   NOTE: In order to protect the insulator gasket from rupturing, DO NOT tighten the Water Jacket excessively. A non-leaking seal can be obtained by moderate tightening of the Water Jacket.

5. "O" ring 85W50 serves as a radial seal between the torch cap and the torch body. It prevents external leakage of argon gas or aspiration of atmospheric air. Inspect this "O" ring for nicks, cracks or excessive wear and replace with a new part, if necessary.

   NOTE: Refer to the proper disassembly and assembly procedures outlined in Section IV, page 9.

C. Fuse Installation and Replacement

1. To install a fuse assembly, simply connect the power cable nut to the fuse assembly coupling. Then connect the standard 3/0 welding cable to the fuse assembly lug, and lead the water outlet hose to an open drain.

2. To insert a new fuse, proceed as follows:

   (a) Bend the fuse link to a 90-deg. angle about 1/4-in. from one end.

   (b) Insert the fuse link in one of the fuse-centering disks and place it into one end of the fuse body.

FIG. 4 - Exploded View of HW-10 Torch
(c) Replace the lock screw.

(d) Place the other fuse-centering disk at the opposite end of the body, taking care to insert the end of the fuse link through the slot in the disk. Then press the centering disk down into the groove in the fuse body.

(e) Bend the end of the fuse link against the disk and replace the lock screw, tightening it firmly.

(f) Replace the two large end nuts.

3. To replace or inspect a fuse, proceed as follows:
   (a) Remove the large nut and lock screw from each end.
   (b) If the fuse link is centered properly, a round impression from the lock screw should be visible.
   (c) If the fuse link has been caught in the lock screw threads, remove the centering disks and the fuse link. Then replace with a new fuse link, making sure that it is seated properly.
   (d) The fuse link (Part No. 94W30) is brass-plated for corrosion resistance. Its use is recommended when replacement becomes necessary. Standard 30-ampere 250-volt links may be used in an emergency but are not recommended for regular operation.

4. Two fuse links must be used to accommodate the 300-ampere capacity rating of the torch.

D. Torch Hose

1. Make certain that all argon hose connections and the gas-cup connections are gas-tight. If they are not, the argon may become diluted by air due to leakage, resulting in incomplete arc protection. The electrode should be silvery in color when it cools. A bluish color denotes air leakage. When welding aluminum, the presence of a dark gray deposit on or beside the weld, or a cloudy weld puddle also indicates air leakage.

2. Keep hose off hot metal. Plastic hose softens and begins to lose strength when heated to about 125 deg. F.

3. For instructions on hose repair and replacement, refer to page 8.

E. Do Not Let the Nozzle Touch the Work

If a nozzle touches the work, the arc may jump the gap from the electrode to the nozzle rather than to the work because of the conductivity of the hot gases. For this reason, hold the torch so that the nozzle does not touch at any point of the work.

F. Keep the Electrode Clean

1. If weld spatter sticks to the electrode, a black soot may appear when welding aluminum; or a reddish deposit may appear when you weld stainless steel. To clean the electrode, simply draw an arc for a few seconds on a heavy piece of scrap steel or copper (do not use a carbon block).

2. Should contamination of the electrode occur, due to contact with the weld puddle, shut off the power and remove the electrode from the torch. Break off a small piece from the end, and then replace the electrode. Always remove the electrode before breaking it off, to minimize waste of electrodes.

3. It is advisable to nick the electrode slightly with a grinding wheel at the point where the break is to be made. Then remove the contaminated end with pliers gripped close to the nick.

G. Conservation of Tungsten

Conserve tungsten electrodes wherever possible. Here's how:

1. Avoid contamination of electrodes caused by unnecessary contact with the workpiece.

2. Weld stub ends to make electrodes of usable length. Welding can be done with a HELIARC torch, using either DCSP or ACHF, currents from 30 to 100 amperes, argon flow of 13 to 17 cu. ft. per hr.

3. Don't scrap stub ends. The tungsten in them can be reclaimed for continued use in the defense effort.

III. SAFETY PRECAUTIONS

A. Use a standard welder's helmet with the proper shade of glass for the welding current to be used (see table on page 2).

B. Wear suitable clothing to protect exposed skin from arc burns.

C. Be sure to shut off power before adjusting or replacing electrodes.

D. When welding copper indoors, provide good ventilation or use a respirator.

E. If you use chlorinated solvents for degreasing or cleaning the workpiece, do not weld near degreasing tanks.

F. Shield your welding station to prevent the exposure of neighboring workers to ultraviolet radiation.
IV. DISASSEMBLY
(Refer to Figures 4 and 5)

1. Unscrew the torch cap (56Y44) to inspect the "O" ring (85W50).
2. Remove the electrode and collet.
3. Unscrew the cup or nozzle from the water jacket (56Y59).
4. Hold the water-jacket adaptor (84Z65) with a strap wrench to keep it from turning, and unscrew the water jacket (56Y59) to inspect the insulator gasket (84Z68) and "O" ring (85W80).
5. Using a 5/16-in. Allen wrench, turn the nut (84Z66) counter-clockwise until it unscrews from the torch body.
6. Pull the collet body (84Z65) out from the front end of the torch body. Inspect the collet body and the "O" ring (84W85). This "O" ring should be replaced each time the collet body is removed from the torch body for examination or replacement.
7. Unscrew the water-jacket adaptor (84Z63) from the torch body to inspect the "O" ring (85W51). Replace if defective.
8. To reassemble, follow the preceding steps in reverse order. The nut (84Z66), which locks the "O" ring 84W85, should not be screwed all the way down until the front subassembly parts are installed and the water jacket (56Y59) is brought up snug by hand tightening. Then tighten the nut against the "O" ring with a minimum of force and retighten the water jacket just enough to maintain a seal at the insulator gasket. (Moisten the upper end of the collet body before screwing it into the torch body to assist its passage through the "O" ring.)

The shoulder of the collet body should fit tightly against the lower end of the torch body to assure good electrical contact. Make certain that the water jacket is sufficiently tightened for a leakproof connection.

HOSE REPAIR AND REPLACEMENT

Power Cable-and-Hose Assembly
If the power cable-and-hose assembly becomes damaged, we recommend that you purchase a new assembly, or send the damaged cable-and-hose assembly over to your nearest LINDE repair station for possible repair. DO NOT TRY TO REPAIR IT YOURSELF. The connection fittings at each end of the assembly are crimped to the cable and insulator hose by special crimping tools at the factory to obtain a strong and completely water-tight joint. A satisfactory repair job cannot be done without these tools.

Argon and Water Hose Assemblies
If an argon or water hose assembly becomes damaged, we recommend that you purchase a new hose assembly or send the damaged hose assembly to the nearest LINDE repair station for possible repair. DO NOT ATTEMPT PERMANENT REPAIRS YOURSELF. As with the power cable-and-hose assembly, the connection fittings are crimped on at the factory by special crimping tools to assure a leakproof connection. A completely satisfactory job cannot be done without these tools. Improper repair of an argon hose connection, for example, could cause argon dilution, resulting in incomplete arc protection and consequent unsatisfactory welds. If you must continue to use the torch until new or properly-repaired plastic hose can be installed, temporary repairs can be made as follows:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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<th>Nut</th>
<th>Nipple</th>
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<td>76Z04</td>
<td>3382</td>
<td>03288</td>
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<tr>
<td></td>
<td>(Inlet End)</td>
<td></td>
<td>36Z40</td>
<td>03272</td>
</tr>
<tr>
<td>54Y61</td>
<td>Argon Inlet (Torcl End)</td>
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<td></td>
<td>(Inlet End)</td>
<td></td>
<td>3380</td>
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<td>54Y78</td>
<td>Water Outlet</td>
<td>76Z10</td>
<td>36Z40</td>
<td>32A12</td>
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</tbody>
</table>
FIG. 5 — Type HW-10 "Heliarc" Water-Cooled Welding Torch < 16X39 (12½ Ft.) < 16X40 (25 Ft.)

Replacement Parts List

FOR
HW-10 "HELIARC" HAND-WELDING TORCH

PART NO. | PART NO. | DESCRIPTION
--- | --- | ---
84W85 | 56Y59 | "O" Ring Water Jacket
85W80 | 84Z53 | "O" Ring Handle
85W51 | 84Z63 | "O" Ring Water Jacket Adaptor
54Y60 | 84Z65 | Water Inlet Hose Assembly (12-1/2 ft.) Collet Body
54Y61 | 84Z66 | Argon Inlet Hose Assembly (12-1/2 ft.) Nut
54Y62 | 84Z67 | Water Inlet Hose Assembly (25 ft.) Washer
54Y63 | 84Z68 | Cable and Hose Assembly (12-1/2 ft.) Insulator Gasket
55Y70 | 60Y04 | Argon Inlet Hose Assembly (25 ft.) Enlarged Part Supplied
55Y72 | | Cable and Hose Assembly (25 ft.)
56Y44 | | Torch Cap (Long) Includes:
85W50 | 60Y04 | "O" Ring Collet Body Wrench
56Y47 | | Spare Parts Supplied
79240 | 84W85 | Inlet Connection (2 Used)
79263 | 85W80 | "O" Ring
| 85W51 | "O" Ring
| 84Z88 | Insulator Gasket
FIG. 6 – Fuse and Hose Assembly, Part No. 56Y48

ACCESSORIES
(These parts must be purchased separately.)

Part No. Description

56Y48 Fuse and Hose Assembly (Fig. 6) Includes:

54Y25 Fuse Assembly Includes:
84W30 Fuse Link (4 Supplied)
75291 Fuse Body
75292 Fuse Disk (2 Used)
75297 Locking Screw (2 Used)
75298 Coupling (2 Used)
54Y77 Cable and Body Assembly Includes:
84W83 Lug
54Y27 Body
76225 Cable
54Y78 Water Outlet Hose Assembly
76Z12 Fuse Casing
84Z84 Power Cable Adaptor
84Z16 Silicone Boot

ELECTRODE COLLETS

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>84Z59</td>
<td>.040-in. Collet</td>
</tr>
<tr>
<td>84Z60</td>
<td>1/16-in. Collet</td>
</tr>
<tr>
<td>84Z61</td>
<td>3/32-in. Collet</td>
</tr>
<tr>
<td>84Z62</td>
<td>1/8-in. Collet</td>
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</tbody>
</table>

NOZZLES AND CUPS

<table>
<thead>
<tr>
<th>Nozzles</th>
<th>Ceramic Cups</th>
</tr>
</thead>
<tbody>
<tr>
<td>94Z54 No. 4 Nozzle</td>
<td>35207 No. 4 Ceramic Cup</td>
</tr>
<tr>
<td>84Z55 No. 5 Nozzle</td>
<td>35208 No. 5 Ceramic Cup</td>
</tr>
<tr>
<td>84Z56 No. 6 Nozzle</td>
<td>35209 No. 6 Ceramic Cup</td>
</tr>
<tr>
<td>84Z57 No. 7 Nozzle</td>
<td>35210 No. 7 Ceramic Cup</td>
</tr>
<tr>
<td>84Z58 No. 8 Nozzle</td>
<td>35211 No. 8 Ceramic Cup</td>
</tr>
<tr>
<td>D285081</td>
<td>No. 4 Long Ceramic Cup</td>
</tr>
<tr>
<td>D279257</td>
<td>No. 6 Long Ceramic Cup</td>
</tr>
<tr>
<td>D279256</td>
<td>No. 8 Long Ceramic Cup</td>
</tr>
</tbody>
</table>

ELECTRODES

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Pure Tungsten 7 inches long</th>
<th>1% Thoriated Tungsten 7 inches long</th>
<th>2% Thoriated Tungsten 7 inches long</th>
</tr>
</thead>
<tbody>
<tr>
<td>.040 in.</td>
<td>79215</td>
<td>79216</td>
<td>84222</td>
</tr>
<tr>
<td>1/16 in.</td>
<td>78251</td>
<td>78247</td>
<td>84233</td>
</tr>
<tr>
<td>3/32 in.</td>
<td>76257</td>
<td>---</td>
<td>84224</td>
</tr>
<tr>
<td>1/8 in.</td>
<td>76252</td>
<td>---</td>
<td>84225</td>
</tr>
</tbody>
</table>

*When 3-inch electrodes are used, a short torch cap, Part No. 56Y45, is also required.*
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LINDE Oxygen, Nitrogen, Argon, Neon, Helium, Krypton, Xenon, Hydrogen
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Manifolds, Regulators and Valves
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PREST-O-LITE Air-Acetylene Apparatus and Small Tanks
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Oxygen Therapy Regulators
Oxygen Therapy Manifolds and Valves

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Synthetic Calcium- and Cadmium Tungstates
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Memphis 2, Tenn.
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Tulsa 3, Okla.
614 National Bank of Tulsa Bldg.

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