INSTRUCTIONS for OXWELD TRADE MARK C-57-R CUTTING TORCH

IMPORTANT
These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for oxy-fuel gas equipment, we urge you to read Linde's free booklet "Precautions and Safe Practices," Form 2035. The same information appears in the "Oxy-Acetylene Handbook" which may be purchased from any Linde Distributor. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these Instructions. If you do not fully understand these Instructions, contact your supplier for further information.

OPERATING INSTRUCTIONS

Connecting
1. Attach regulators to the oxygen and acetylene cylinders. Follow all instructions supplied with the regulators.

2. Attach oxygen and acetylene hose to the regulators and to the torch, after making sure all metal seating surfaces are clean. Tighten all connection nuts with a wrench.

3. Attach nozzle to torch head, and tighten connection nut with a wrench.

4. Check valve packing nuts for tightness.

Adjusting Gas Pressures
Low-Pressure Acetylene: Be sure the torch acetylene valve is closed. Open the supply valve.

Medium-Pressure Acetylene: Open the acetylene valve about one turn. Turn in the pressure-adjusting screw on the acetylene regulator until its delivery-pressure gauge registers 5 psig. Then immediately close the acetylene valve.

Oxygen: Open the cutting oxygen valve by depressing its valve lever fully. Turn in the pressure-adjusting screw on the oxygen regulator until its delivery-pressure gauge registers the desired pressure (see cutting chart on page 4). Then release the cutting oxygen lever.

NOTE: When gaugeless regulators are used, do not open torch valves. Merely turn in the pressure-adjusting screws to the desired pressures as indicated on the scales of regulator caps.

Testing for Leaks
Every cutting outfit should be thoroughly tested for leaks after it is first hooked up, and at regular intervals thereafter. After all connections have been made, make sure all valves on the torch handle are closed. Then turn in the regulator pressure-adjusting screws until the oxygen delivery-pressure gauge registers 60 psi and the acetylene delivery-pressure gauge registers 10 psi. Using OXWELD Leak Test Solution (P/N 8942-0023) or any other solution suitable for oxygen service, check for leaks at the cylinder valves, the cylinder-to-regulator connections, the regulator-to-hose connections, and the hose-to-torch connections. If bubbling at any point indicates leakage, tighten the connection. If this does not stop the leakage, close the appropriate cylinder valve, open the corresponding torch valve to remove all pressure from the line, and finally release the regulator pressure-adjusting screw by turning it counterclockwise. Then break the leaky connection, wipe metal seating surfaces with a clean, dry cloth, and examine them for nicks and scratches. Remake the connection(s) and retest. Do not try to light the torch until you are satisfied that all connections are gas-tight.
After lighting the torch and adjusting the flames, use leak test solution to check for leakage at all torch valves and at the nozzle nut.

**Lighting**

Open the preheat oxygen valve on the torch about two turns. Open the acetylene valve on the torch about two turns (1/8 turn if used with medium pressure acetylene), and light the gas at the nozzle with a friction lighter. DO NOT USE A MATCH. Then open the cutting oxygen valve and adjust the preheat flames to neutral by opening the preheat oxygen valve gradually. This will usually provide maximum preheat for the nozzle in use. If the flames burn away from the end of the nozzle, or if less preheat is desired, close the torch acetylene valve until the flame inner cones shorten noticeably, and then readjust the flames to neutral with the preheat oxygen valve. Be sure to keep the cutting oxygen valve open during any adjustment of the preheat flames.

**Shutting Off**

Release the cutting oxygen valve lever. Then close the acetylene valve, and finally the preheat oxygen valve.

**OPERATING PRECAUTIONS**

**Backfire:** Improper operation of the torch may cause the flames to go out with a loud ‘pop’. Such a backfire may be caused by contact of nozzle with the work, by spatter from the work, by the use of incorrect gas pressures, or by leakage at the cutting nozzle seats due to dirt or nicks on seats or to a loose nozzle nut.

**Flashback:** Under certain exceptional circumstances, the flame may not ‘pop’ out (backfire) but instead burn back inside the torch with a shrill hissing or squeal. This is called a ‘flashback’. A flashback should never occur if (1) the equipment is in good condition; (2) preheat ports on cutting nozzles or welding tips are cleaned frequently; and (3) operating pressures are correct. Should a flashback occur, IMMEDIATELY shut off the torch. Allow it to cool off for at least a minute. Then check your nozzle or tip, gas pressures, readjust regulators if necessary, and relight the torch. If flashback recurs, send the torch handle and welding head or cutting attachment to a Linde repair station or to your distributor for repair.

**MAINTENANCE INSTRUCTIONS**

For all repairs other than those covered below, send the apparatus to the nearest Linde Division apparatus repair station or to your UNION CARBIDE Welding Products distributor. Improperly repaired apparatus is hazardous. Parts shown in the illustration on page 3 require braze operation are provided for experienced and qualified persons engaged in the repair of this apparatus.

**Preheat Valves:** Leakage around either valve stem can usually be corrected by tightening the packing nut slightly. If this does not stop the leakage, replace the packing washer. (Since the original packing washer is not split, like replacement washer 77Z85, it must be pried out of the packing nut and cut off before the replacement washer can be installed.)

If either preheat valve fails to shut off completely, remove the valve stem assembly from the torch. With a clean cloth, wipe the ball in the end of the stem. Then reinstall valve stem assembly. If then the valve does not shut off completely, send the torch to a repair station for reseating of the body.

After installing a replacement packing washer, or a new valve stem assembly, tighten the packing nut until the valve stem can be turned only with great difficulty, and set the unit aside, for three or four hours at least, to set the packing. Then back off the packing nut until the valve stem turns readily.

**Cutting Valve Leakage:** If leakage develops around cutting valve stem, replace cutting valve packing bushing (57A18). If leakage develops in the cutting valve, replace cutting valve seat (3614).

**To replace packing bushing:**

1. Remove the (4) 6110-1851 screws from the handle. Slide the handle (24Y23) forward as far as possible.
2. Loosen the (2) 6130-7849 screws in the bracket (3619) and slide the bracket forward as far as possible.
3. Remove screw (35Z79) and pull out the valve stem (48Z14) from the gland (80Z87). (The valve packing bushing (57A18) will come out with the valve stem.)
4. Remove washer (45A34) and using soapy water (Ivory soap) moisten the valve stem, then remove the bushing, ferrule and washer.
5. Position the ferrule (73A93) in the packing bushing (57A18); moisten bushing and slip over the valve stem, Slip one washer (45A34) over the packing bushing.
6. Place washer (45A34) over the stem and slide stem into the gland (80Z87).
7. Slide the screw (35Z79) over the stem and screw it into the gland tight.
8. Set the bracket back to its normal position and tighten the (2) screws and setscrew.
9. Slide the handle back over the torch valve body, at the same time lining up the thumb piece with the cutting lever.
10. Replace the (4) 6110-1851 screws into the handle.

**To replace cutting valve seat:**

1. Loosen the oxygen connection locknut (4698) and remove the oxygen connection (4699). Tip the torch; the spring (3506) and seat (3614) will fall out from the body.
2. Slide the new seat into the body with the turned end first, slide the spring in after the seat, and assemble the oxygen connection tight, then tighten the locknut.

Cleaning the Injector:
1. Remove the mixing chamber plug (35Z60) and the injector locking ring (35Z59) from the mixer body (21Z74).
2. If gentle tapping of the mixer body does not cause the injector to fall out, screw a No. 10-32 machine screw into the end of the injector and pull it out.
3. Clean the recess in the mixer body with a clean cloth.
4. Clean the injector orifice with a No. 70 drill, wipe with a clean cloth.
5. Examine the injector carefully. If it is nicked or marred, on the seating surface, replace it with a new injector.
6. Insert the injector into the mixer body, and lock it securely in place with the locking ring.

7. Screw the mixer chamber plug into position and tighten to form a gas tight seat. (NOTE: Latest designed plug used 86W85 O-ring. (See parts illus.) Replace O-ring if necessary.

Cleaning Cutting Nozzles: If the cutting nozzle does not produce straight, uniform flames, or if any of the nozzle orifices become clogged, clean them by hand with the correct size twist drills shown in the table on page 4, or with OXWELD tip cleaners. (The relationship between OXWELD tip cleaners and drill sizes is shown on the tip cleaner case.)

For longer life, nozzles should be cleaned periodically in a solution of OXWELD nozzle cleaning compound (Part No. 761F00) made up and used as directed on the jar in which it is packed.

**REPLACEMENT PARTS**

The drawing below shows all replacement parts available for the C-57-R cutting torch. To order, identify the required parts from the drawing and specify by part number and name.

* O-ring 86W85 cannot be used with the old hex-head 35Z60 plug. The latest plug with a screwdriver slot is supplied with the O-ring.

C-57-R Cutting Torch ........... Part No. 02X32
GENERAL NOTES:
1. Oxygen pressures listed in the tables are based on use of 50-ft. hose lengths.
2. If using medium-pressure acetylene, the operating acetylene pressure is 5 psig on all nozzles, except the 1565 Series, using 50-ft. hose lengths.
3. The tables show average values based on typical conditions. The type and quality of steel, its surface condition, the purity of oxygen, etc. will always have a bearing on the end results.

1565 Series Cutting Nozzles (Low Acetylene Consumption)

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Part No.</th>
<th>Steel Thickness, in.</th>
<th>Oxygen Pressure, psig</th>
<th>Acetylene Pressure, psig</th>
<th>Gas Consumption cu. ft./hr.</th>
<th>Cleaning Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Oxygen</td>
<td>Acetylene</td>
</tr>
<tr>
<td>1/8</td>
<td>639182</td>
<td>1/8</td>
<td>1.3</td>
<td>7.14</td>
<td>5.9</td>
<td>73</td>
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<tr>
<td>1/4</td>
<td>639263</td>
<td>1/4</td>
<td>1.4</td>
<td>7.14</td>
<td>5.9</td>
<td>69</td>
</tr>
<tr>
<td>1/2</td>
<td>639264</td>
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<td>2.0</td>
<td>8.6</td>
<td>8.12</td>
<td>70</td>
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<td>3/4</td>
<td>2.4</td>
<td>10.22</td>
<td>10.12</td>
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<tr>
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<td>1</td>
<td>2.4</td>
<td>15.30</td>
<td>15.20</td>
<td>65</td>
</tr>
</tbody>
</table>

1501 and 1502 Series General Purpose Cutting Nozzles

Minimum Hose Sizes: 1/4-in. oxygen - 1/4-in. acetylene (med. pressure) or 3/8-in. acetylene (low pressure) when using nozzles up through no. 8 size. 3/8-in. oxygen - 3/8-in. acetylene when using no. 10 & 12 nozzles.

† Higher oxygen pressure required when using low-pressure acetylene.

1511 Series Gouging Nozzles

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Oxygen Pressure, psig</th>
<th>Avg. Gouge Dimensions</th>
<th>Approx. Speed ft./min</th>
<th>Nozzle Cleaning Tools</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Width</td>
<td>Depth</td>
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<tr>
<td>13</td>
<td>15X14</td>
<td>65 75</td>
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<td>1.0 1.8</td>
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<tr>
<td>19</td>
<td>15X15</td>
<td>80 90</td>
<td>3/8</td>
<td>1/4 3/8 1/4</td>
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<tr>
<td>25</td>
<td>15X16</td>
<td>90 100</td>
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<td>1/4 7/16</td>
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1507 Series Rivet Washing Nozzles

<table>
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<th>Nozzle</th>
<th>Oxygen Pressure, psig</th>
<th>Cleaning Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Preheat</td>
</tr>
<tr>
<td>19</td>
<td>15Z20</td>
<td>80 90</td>
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<tr>
<td>19</td>
<td>66Z240</td>
<td>50 60</td>
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<tr>
<td>25</td>
<td>15Z237</td>
<td>80 90</td>
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* The cutting oxygen throat diameter is 0.055-in. on P/N 08Z90 and 0.125-in. on P/N 66Z40.