INSTRUCTIONS for OXWELD

C-57-R CUTTING TORCH

Cutting Range using acetylene ........................................ 1/8" - 12" (3 - 300 mm)
Cutting Range using other fuel gases ................................ 1/8" - 4" (3 - 100 mm)
Cutting Nozzles ..................................................................... 1500 series
Torch-Hose Connections ...................................................... ORS-B-size (41/64" - 18 fem.)
Torch Overall Length .......................................................... .21-in. (532 mm)
Weight .................................................................................. 4-lbs. (1.8 kg)

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.

OPERATION INSTRUCTIONS

CONNECTING
1. Attach regulators to the oxygen and fuel gas cylinders. Follow all instructions supplied with the regulators.
2. Attach oxygen and fuel gas hoses 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 Fuel Gas: Be sure the torch fuel gas valve is closed. Open the supply valve.

Medium-Pressure Fuel Gas: Open the fuel gas valve about one turn. Turn in the pressure-adjusting screw on the fuel gas regulator until its delivery-pressure gauge registers the desired pressure (see cutting chart on pg. 4). Then immediately close the fuel gas 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 fuel gas delivery-pressure gauge registers 10 psi. Using Leak Test Solution suitable for oxygen service, such as P/N 998771 (8 oz. container), 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 AND FLAME ADJUSTMENT**

1. Open the preheat oxygen valve on the torch about two turns.
2. Open the fuel gas valve on the torch about 1/8 turn (about two turns if using low pressure fuel gas) and light the gas at the nozzle with a friction lighter. DO NOT USE A MATCH. Use of a match could seriously burn your hand.
3. If using acetylene, open the fuel gas valve until preheat flames leave the end of the nozzle and then close just enough to return the flames to the nozzle. Depress lever to open cutting oxygen valve and then readjust preheat flame to neutral by opening preheat oxygen valve gradually.

If using FG-2 or other fuel gases but acetylene, open fuel gas valve until flame just starts to leave the end of the nozzle and then open the preheat oxygen valve until the flames are at their shortest length. Depress the cutting oxygen valve lever and then readjust the preheat flames to the shortest length by opening the preheat oxygen valve gradually.

The above procedure usually provides adequate preheat for the nozzle in use. If desiring to change the preheat flames, always hold the cutting oxygen valve open while readjusting the preheat oxygen and fuel gas valves.

**SHUTTING OFF**

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

If operations are to be stopped for a half-hour or more, all pressure should be released from the torch, hoses, and regulators by doing the following:

1. Close each cylinder or station valve.
2. Open torch valves.
3. After relieving the gases, back out the pressure-adjusting screw of each regulator and close the torch valves.

**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 with the nozzle in use when the flashback occurred 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 that require brazing 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 four screws from the handle. Slide the handle (24Y23) forward as far as possible.
2. Loosen the two 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 leak test solution 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. Reassemble the four 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 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 locking ring.
7. Replace O-ring if necessary, and then install the mixer chamber plug. Tighten plug firmly with a screwdriver.

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 listed in the tables on page 4, or with OXEWELD tip cleaners. (The relationship between OXEWELD tip cleaners and drill sizes is shown on the tip cleaner case.)

For longer life, nozzles should be cleaned periodically in a solution of OXEWELD 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 86W51 cannot be used with the old hex-head 35Z60 plug. The latest plug with a screwdriver slot is supplied with the O-ring.
GENERAL NOTES:

1. Pressures given are measured at the torch; therefore, pressure drop through hose should be considered when setting pressure at the regulator. Generally, 1/4-in. hoses up to 25-ft. long are adequate for cutting steel up to 4-in. thick. If longer hoses are required and if cutting thicker steel, 3/8-in. hoses should be used. If using low-pressure fuel gas, 3/8-in. fuel gas hose should be used for all cutting operations.

2. 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.

NOTE: If using the C-57-R for fuel gases other than acetylene, see your Linde representative.

### Acetylene Cutting Nozzles

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Steel Thickness, in.</th>
<th>Gas Pressure, psig</th>
<th>Gas Consumption, ft³/hr</th>
<th>Cleaning Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Oxygen</td>
<td>Acetylene</td>
<td>Preheat</td>
</tr>
<tr>
<td>1505 Series (Low Acetylene Consumption)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/8</td>
<td>639182 1/8</td>
<td>40</td>
<td>5 - 7</td>
<td>78</td>
</tr>
<tr>
<td>1/4</td>
<td>639263 1/4</td>
<td>30 - 40</td>
<td>5 - 9</td>
<td>69</td>
</tr>
<tr>
<td>1/2</td>
<td>639264 1/2</td>
<td>55 - 65</td>
<td>73</td>
<td>65</td>
</tr>
<tr>
<td>3/4</td>
<td>639265 3/4</td>
<td>60 - 70</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>1</td>
<td>639266 1</td>
<td>85 - 95</td>
<td>61</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>639267 2</td>
<td>155 - 165</td>
<td>70</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>639268 3</td>
<td>215 - 230</td>
<td>69</td>
<td>47</td>
</tr>
<tr>
<td>4</td>
<td>639269 4</td>
<td>340 - 360</td>
<td>69</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>998742 6</td>
<td>35 - 45</td>
<td>57</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>998743 10</td>
<td>40 - 65</td>
<td>56</td>
<td>31</td>
</tr>
</tbody>
</table>

1502 Series (Medium Preheat)

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Steel Thickness, in.</th>
<th>Gas Pressure, psig</th>
<th>Gas Consumption, ft³/hr</th>
<th>Cleaning Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>08267 1/4</td>
<td>20 - 25</td>
<td>85 - 75</td>
<td>69</td>
</tr>
<tr>
<td>4</td>
<td>15Z17 1/2</td>
<td>30 - 35</td>
<td>85 - 75</td>
<td>69</td>
</tr>
<tr>
<td>6</td>
<td>15Z18 3/4</td>
<td>39 - 40</td>
<td>120 - 135</td>
<td>65</td>
</tr>
<tr>
<td>8</td>
<td>15Z19 3/4</td>
<td>39 - 40</td>
<td>120 - 135</td>
<td>65</td>
</tr>
<tr>
<td>10</td>
<td>15Z20 6</td>
<td>35 - 45</td>
<td>395 - 460</td>
<td>57</td>
</tr>
<tr>
<td>12</td>
<td>15Z21 6</td>
<td>45 - 55</td>
<td>630 - 710</td>
<td>57</td>
</tr>
</tbody>
</table>

*Not recommended for 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>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Part No.</td>
<td>Width</td>
<td>Depth</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>15X14</td>
<td>65 - 75</td>
<td>5/16</td>
<td>1.0 - 1.8</td>
</tr>
<tr>
<td>19</td>
<td>15X15</td>
<td>80 - 90</td>
<td>3/8</td>
<td>1.6 - 2.2</td>
</tr>
<tr>
<td>25</td>
<td>15X16</td>
<td>90 - 100</td>
<td>1/2</td>
<td>1.9 - 2.8</td>
</tr>
</tbody>
</table>

### 1507 Series Rivet Washing Nozzles

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Oxygen Pressure, psig</th>
<th>Cleaning Drill Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Part No.</td>
<td>Preheat</td>
</tr>
<tr>
<td>19*</td>
<td>08290</td>
<td>62</td>
</tr>
<tr>
<td>19*</td>
<td>66240</td>
<td>62</td>
</tr>
<tr>
<td>25</td>
<td>15Z237</td>
<td>62</td>
</tr>
</tbody>
</table>

*The cutting oxygen throat diameter is 0.055-in. on P/N 08290 and 0.125-in. on P/N 66240.