INSTRUCTIONS

AND PARTS LIST

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ROD FEEDER

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The Linde Air Products Company

Unit of Union Carbide and Carbon Corporation

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DIEC Offices in Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

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INTRODUCTION

The HELIARC Rod Feeder feeds straight lengths of welding rod into the welding zone at a constant, controlled rate: You can set the Rod Feeder to operate at the correct speed for the job being done, and the fly ball governor will hold it at this pre-determined value.

The Rod Feeder is generally used with the HELIARC FSH-1 500 Ampere Machine Welding Torch. It can also be used with the HELIARC HW-4 Hand Welding Torch.

The Rod Feeder and the Welding Torch are generally mounted on an OXWELD CM-37 Self-Propelled Carriage to make up a completely mechanical HELIARC welding outfit. The self-propelled carriage travels the entire assembly along the seam to be welded. The speed of carriage travel is adjustable over a wide range, and the correct adjustment for any set of welding conditions can easily be made merely by turning a dial. The CM-37 Carriage can be run on OXWELD machined track for perfect straight line welds, or the Rod Feeder can be mounted in a stationary mounting without the carriage and the work moved beneath it.

I. SETTING UP THE ROD FEEDER TO WELD

A. Equipment Needed

Check to be sure you have the following items of equipment on hand before you start to set up:

1. The Rod Feeder, Part No. D-217037 which includes:
   a. Motor and Switch Box Assembly, Part No. B-217039.
   c. Mounting Block, Part No. 34W05.
   e. Blowpipe Bracket Screw, Part No. 87A62.
   f. Rod Feed Support Bar, Part No. D-188606.
   g. Blowpipe Holder Assembly, Part No. 16V57.
   h. Spacer, Part No. D-218969.
   i. Long Screw, Symbol No. S-R-117-1.
   k. 3/4-in. diameter Feed Roller, Part No. 19W16, and 15/16-in. diameter Feed Roller, Part No. 19W22.

2. The HELIARC FSH-1 500-Ampere Machine Torch, complete. NOTE: This torch is available in three lengths; usually only the 13-in. torch (Part No. D-218820) is used with the Rod Feeder, although the 18-in. torch can be used if desired. If you are going to use the HW-4 torch, the Blowpipe Holder Post Assembly (Part No. 54Y35) must be ordered. The spacer and long screw are not used with the HW-4 torch.

3. The OXWELD CM-37 Carriage, Part No. 20X46.

4. OXWELD Machined Track, Part No. 37V15. This track is available in 6-ft. lengths. In some few cases, you may not need the extreme degree of accuracy of machined track, and a straight length of standard 10-in. I-beam can be substituted.

5. The OXWELD Vertical Slide and Turret Assembly, Part No. 20X74.

B. Steps In Setting Up The Rod Feeder

1. Assemble the Vertical Slide and Turret Assembly to the CM-37 Carriage. Figures 1 and 2 show the relative position of the Vertical Slide and Turret Assembly and the carriage.

2. Attach the Rod Feed Support Bar to the Vertical Slide and Turret Assembly with the blowpipe bracket screw. Make sure that the Rod Feed Support Bar is mounted in a horizontal position.

3. Attach the Vertical Slide Assembly to the Rod Feed Support Bar with the 5/16-in. 24 hex 5/8-in. square head bolts and washers supplied. These bolts are inserted through the back of the Support Bar and into the corresponding holes in the Vertical Slide Assembly.

4. Insert one end of the Mounting Block into the mounting hole in the Vertical Slide Assembly and attach with a 7/16-in.-20 hex nut and washer.

5. Insert the other end of the Mounting Block into the mounting hole in the Support Block of the Motor and Switch Box Assembly. Attach with the 7/16-in.-20 hex nut and washer. This nut should be tightened when the Rod Feeder has been finally positioned for welding.

6. Attach the Blowpipe Holder Assembly to the Rod Feed Support Bar with a 7/16-in.-20 x 4 square head bolt. Place the Spacer between the Blowpipe Holder and the Support Bar. Mount the Blowpipe
Fig. 1—Rod Feeder With "HELIARC" FSH-1 Machine Torch.
Holder so that the Holder is to the right of the bolt attaching it to the Rod Feed Support Bar and the holder is exactly vertical. See Figure 4 for the exact position of the Blowpipe Holder relative to the Support Bar.

7. Insert the HELIARC FSH-1 Machine Torch into the Blowpipe Holder until the rack engages with the wheel. Rack the torch down through the Blowpipe Holder until it projects about 9 or 10 inches below the bottom of the Blowpipe Holder.

8. Attach the correct water-cooled cup to the torch head. See the Torch Instruction Booklet. (Form No. 9022A) for directions on setting up and operating the torch.

9. Screw the Tube and Wire Guide Assembly into the bottom of the Motor and Switch Box Assembly. Select the tip corresponding in size to the diameter of filler rod used and screw the tip on to the Tube and Wire Guide Assembly.

10. Attach the two water hoses to the nipples at the rear of the Tube and Wire Guide Assembly. Attach one of these hoses to the source of cooling water, and attach the other to a suitable water disposal drain.

II. OPERATING INSTRUCTIONS

A. Inserting And Adjusting Filler Rod

1. Insert the end of the Filler Rod into the hole at the top of the Rod Feeder. Snap the Rod Lock down to disengage the jaws. Push the rod through the jaws and out through the Tube and Wire Guide Assembly.

2. When the rod projects about one inch beyond the tip of the Tube and Wire Guide Assembly, snap the Rod Lock back up to engage the jaws and hold the rod in position.

3. Through a combination of the adjustments described in Part D below, and illustrated in Figure 3, position the rod so that it strikes the work at an angle of 15 to 25 degrees from the horizontal. The tip of the rod should bear lightly against the work about one inch from the electrode.

B. Adjustments To Position The Rod Feeder And Torch

The following adjustments can be made to position the Rod Feeder and Torch for welding.

1. Vertical adjustment of both Rod Feeder and Torch. The Rod Feeder and Torch can be raised or lowered together a distance of 3 in. by turning the wheel on the Vertical Slide and Turret Assembly. This adjustment allows you to bring both Torch and Rod Feeder to the proper distance above the work at the same time.

2. Horizontal Adjustment of Both Rod Feeder and Torch. The Rod Feeder and Torch can be moved horizontally a distance of 5-1/2 in. at right angles to the weld by turning the Horizontal Adjustment Wheel on the Vertical Slide and Turret Assembly. This adjustment keeps the Torch and the Rod Feeder in line with the weld.

3. Vertical Adjustment of Rod Feeder Only. The Rod Feeder can be raised or lowered a distance of 3 in. independently of the Torch by turning the wheel on the Vertical Slide Assembly (not the Vertical Slide and Turret Assembly). This adjustment should keep the end of the filler rod at the forward edge of the weld puddle.

4. Vertical Adjustment of the Torch Only. The Torch can be raised or lowered independently of the Rod Feeder by turning the wheel of the Blowpipe Holder.

5. Swivel Adjustment of the Rod Feeder. The Rod Feeder can be swung closer to or farther away from the Torch, and the angle of rod feed adjusted, by loosening the nut which holds the Motor and Switch Box Assembly to the Mounting Block. The Rod Feeder can then be rotated about this point as a center until the desired position is reached, and the nut then retightened. The Rod Feeder will generally be swung so that the angle between the filler rod and the work is between 15 and 25 degrees.

6. Swivel Adjustment of the Tube and Wire Guide Assembly. The tube and Wire Guide Assembly can be swiveled in its mounting to give a combination of horizontal adjustment at right angles to the weld and a slight vertical adjustment. A handle at the top of the Tube and Wire Guide Assembly is used to make this adjustment. The upper end of the Tube and Wire Guide Assembly will thread into a bushing which is set in a split collar. The Tube and Wire Guide Assembly can be held in any set position by adjusting the tension on this split collar. Also, the bushing can be turned to adjust the position of the filler rod so that it is in the center of the front edge of the weld puddle.

C. Positioning The Work

1. Figure 3 shows the highest position above the top of the track, and the lowest position below the top of the track at which a weld can be made. Within these limits the work must be clamped or jiggled in position to maintain an accurate alignment while welding.

2. In general, a back-up bar beneath the work and
Fig. 3--Adjustments To Position The Rod Feeder And Torch.
two clamping bars on top of the work will maintain accurate alignment. The back-up bar should be slightly relieved, or channelled, to a depth of not more than 20 per cent of the thickness of the material being welded.

III. SPECIFICATIONS

A. Rod Feed Motor, Part No. 50V60

The Rod Feed Motor is a 115-volt, 60-cycle, single phase motor. The motor speed is controlled by an adjustable fly ball governor. The governor can be adjusted to obtain the speed of rod feed desired, and the speed will be held constant at this value. The Rod Feed Motor is attached to the electrical supply with an ordinary 3-conductor power cable. Attach to the 3-conductor power cable of the Rod Feed Motor the type of plug which matches your 110-volt AC outlet.

B. Feed Rollers

Two sets of Feed Rollers are supplied with the Rod Feeder. The 15/16-in. diameter feed rollers give a rod feed rate of from 6-1/2 to 45 inches per minute. The 3/4-in. diameter rollers give a rod feed rate of from 5-1/2 to 40 inches per minute. The rollers are interchangeable.

IV. OPERATING DATA

Table I

<table>
<thead>
<tr>
<th>Plate Thick. in.</th>
<th>Welding Rate ipm</th>
<th>Welding Rod Diameter in.</th>
<th>Welding Rod Feed Rate ipm</th>
<th>Approx. Amperes DCSP</th>
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<tr>
<td>1/16</td>
<td>10</td>
<td>1/16</td>
<td>11.5</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>1/16</td>
<td>34.5</td>
<td>200</td>
</tr>
<tr>
<td>1/8</td>
<td>10</td>
<td>3/32</td>
<td>20.5</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>3/32</td>
<td>41.0</td>
<td>300</td>
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WELD REINFORCEMENT PROPORTIONS

![Diagram showing weld reinforcement proportions]
Replacement Parts List

FOR
"HELIARC" ROD FEEDER

PART NO. D-217037

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>B-217039</td>
<td>1</td>
<td>MOTOR AND SWITCH BOX ASSEMBLY,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes:</td>
</tr>
<tr>
<td>D-188423</td>
<td>1</td>
<td>504:1 Gear Reduction Unit Assembly</td>
</tr>
<tr>
<td>04V28 (modified)</td>
<td>1</td>
<td>Centrifugal Governor Assembly</td>
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<tr>
<td>50V60</td>
<td>1</td>
<td>155-Volt Standard Motor Assembly</td>
</tr>
<tr>
<td>C-188280</td>
<td>1</td>
<td>Vertical Slide Assembly</td>
</tr>
<tr>
<td>D-188806</td>
<td>1</td>
<td>Rod Feed Support Bar</td>
</tr>
<tr>
<td>D-188598</td>
<td>1</td>
<td>Wire Guide Tip for 1/16-in. Rod</td>
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<tr>
<td>D-188648</td>
<td>1</td>
<td>Wire Guide Tip for 3/32-in. Rod</td>
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<tr>
<td>D-188649</td>
<td>1</td>
<td>Wire Guide Tip for 1/8-in. Rod</td>
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<tr>
<td>D-218643</td>
<td>1</td>
<td>Tube and Wire Guide Assembly</td>
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<tr>
<td>D-218969</td>
<td>1</td>
<td>Spacer</td>
</tr>
<tr>
<td>87A62</td>
<td>1</td>
<td>Blowpipe Bracket Screw</td>
</tr>
<tr>
<td>18V57</td>
<td>1</td>
<td>Blowpipe Holder Assembly</td>
</tr>
<tr>
<td>19W16</td>
<td>1</td>
<td>3/4-in. dia. Feed Roller</td>
</tr>
<tr>
<td>19W17</td>
<td>1</td>
<td>Feed Roller Steel Washer</td>
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<td>19W18</td>
<td>2</td>
<td>Feed Roller Insulating Washer</td>
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<td>19W21</td>
<td>1</td>
<td>Feed Roller Insulating Bushing</td>
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<td>19W22</td>
<td>1</td>
<td>15/16-in. dia. Feed Roller</td>
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<td>34W05</td>
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<td>Mounting Block</td>
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HARDWARE (Supplied)

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<tr>
<td>B-S-H-47</td>
<td>4</td>
<td>5/16-in. - 24 x 5/8-in. Square Head Bolt</td>
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<tr>
<td>D-187978</td>
<td>1</td>
<td>Washer</td>
</tr>
<tr>
<td>D-188640</td>
<td>3</td>
<td>Washer</td>
</tr>
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<td>M-7</td>
<td>1</td>
<td>SAE Steel Washer, 1/4-in.</td>
</tr>
<tr>
<td>N-H-20</td>
<td>2</td>
<td>7/16-in. - 20 Hex Steel Nut</td>
</tr>
<tr>
<td>S-D-PK-U-9</td>
<td>4</td>
<td>No. 2 x 1/4-in. Drive Screw</td>
</tr>
<tr>
<td>S-H-117-1</td>
<td>1</td>
<td>7/16-in. - 20 x 2-5/8 in. long Hex Head Steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cap Screw</td>
</tr>
<tr>
<td>W-L-4</td>
<td>4</td>
<td>5/16 x 1/8 x 1/16-in. Steel Lockerwasher</td>
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RECOMMENDED ACCESSORY ITEMS (Not Supplied)

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<tr>
<td>20X46</td>
<td>1</td>
<td>CM-37 Carriage (Note: A detailed Instruction</td>
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<td></td>
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<td>Booklet and Parts List is supplied with the</td>
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<td></td>
<td></td>
<td>CM-37 Carriage)</td>
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<tr>
<td>20X74</td>
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<td>Vertical Slide and Turret Assembly</td>
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ACCESSORIES FOR USE WITH HW-4 TORCH

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<tr>
<td>BSH-113</td>
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<td>7/16-in. - 20 x 1-1/4 in. Long Square Head Steel</td>
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<td></td>
<td></td>
<td>Bolt (Used in place of S-H-117-1)</td>
</tr>
<tr>
<td>54Y35</td>
<td>1</td>
<td>Blowpipe Holder Post Assembly</td>
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