Cent. FER 82-3

19DK FLASH SUBCOOLER ORIFICES

1.0 PURPOSE

To inform the field how to install ports in the 19DK vessel shell to allow access to the removable orifices, should the need arise.

2.0 MACHINES AFFECTED

All 19DK machines.

3.0 INFORMATION

The 19DK model line replaces the complete 19DH Series. The 19DK differs from that of the 19DH in that a flash subcooler section has been added in the condenser to improve efficiency. This flash subcooler contains four fixed and four removable orifices.

In the event a machine application or design duty is changed after the machine is manufactured, it may be necessary to change the orifice sizes.

Orifice plugging should not be a factor. There is a perforated plate upstream of the orifices with holes slightly smaller than the smallest orifice (5/16"). This plate runs the full length of the vessel and has a hole area several hundred times that of the orifices.

4.0 MATERIALS REQUIRED

Suggested tools and materials:

1 - 14-16 ga steel plate, 4" x 4" minimum.
4 - 6000 psi* pipe couplings (see Table 1) with plugs.
Chalk and a 90^{o} angle straightedge.
Hammer and prickpunch.
Machinist's steel tape (1/10" divisions).
1/2 hp electric drill (or equivalent).
Hole saw with limiting ring. (See Fig. 1.)
Grinder with 3" disk.
Oxy-acetylene rig with #1 tip and cutting torch.

* 6000 lb coupling is specified to minimize distortion during welding.

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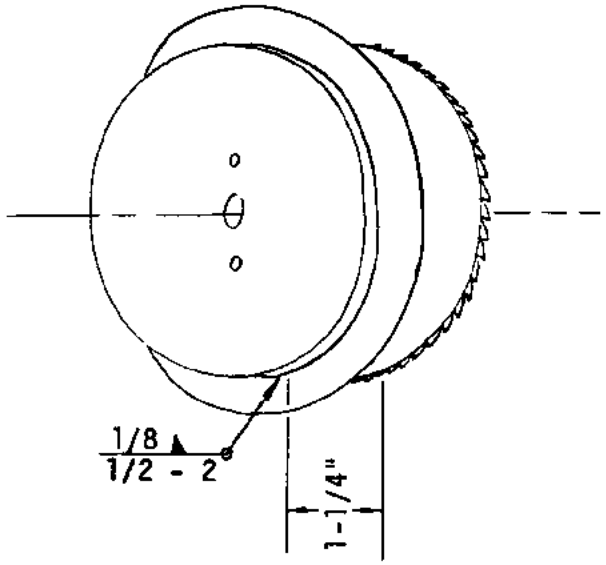
FILING INSTRUCTIONS: CENTRIFUGAL FIELD EXPERIENCE REPORTS MANUAL
TAB: Cooler-Condenser

4.0 MATERIALS REQUIRED (CONT.)

Table 1. Pipe Couplings (6000 psi)

Frame	Port Size	Orifice Size
21	1-1/4" Nom.	3/4" Nom.
31,41	1-1/2" Nom.	1-1/4" Nom.



*The limiting ring (OD = ID + 1") can be fabricated from a piece of 14-16 ga plate, using the hole saw to determine the inside diameter. The ring is then positioned at the specified dimension (Fig. 1) from the saw tooth face and brazed or skip welded in place.

Fig. 1. Hole Saw with Limiting Ring

CAUTION: It is absolutely essential that a limiting ring be installed on the hole saw to limit penetration to less than 1-1/4". If the hole saw penetrates 3/4 of its blade length, it will touch the nearest condenser tube.

5.0 PROCEDURES

Table 2 lists the layout dimensions for all machines. Figures 2 and 3 show the position and orientation of the hole centerlines referenced to the inside face of the motor end tube sheet and the upper face of the projecting condenser/evaporator partition plate. The first centerline mark will be a reference for all others; therefore, it is important that the prickpunch mark be accurate to ± .1".

Table 2. Unishell Layout Dimensions

Unishell Frame Size	A	B	C	D	E	Hole Saw Size
21 11-27	13.1"	26.0"	98.1"	124.1"	2.3"	2-5/8"
31 31-35	12.3"	25.0"	100.7"	125.7"	3.5"	3-1/8"
41 41-48	12.3"	25.0"	100.7"	125.7"	3.3"	3-1/8"

Grind a 1/16" bevel on the finished hole face and clean a one inch area around the hole before welding.

The orifice plugs have male pipe threads and a 1/2" square socket recess. To establish the best angle for tack welding the port (pipe coupling) into the hole, place a 1/2" socket extension through the port in the position required to remove the orifice plug. Make sure that both the inside and outside edges of the port are in contact with the socket extension held in the lowest possible position to insure proper centering of the port (see Fig. 4). Tack weld the port in place and check to see if the orifice plug can be removed easily. If this can be done without complication (i.e., universal adapter), finish welding, plug the port, and leak check.

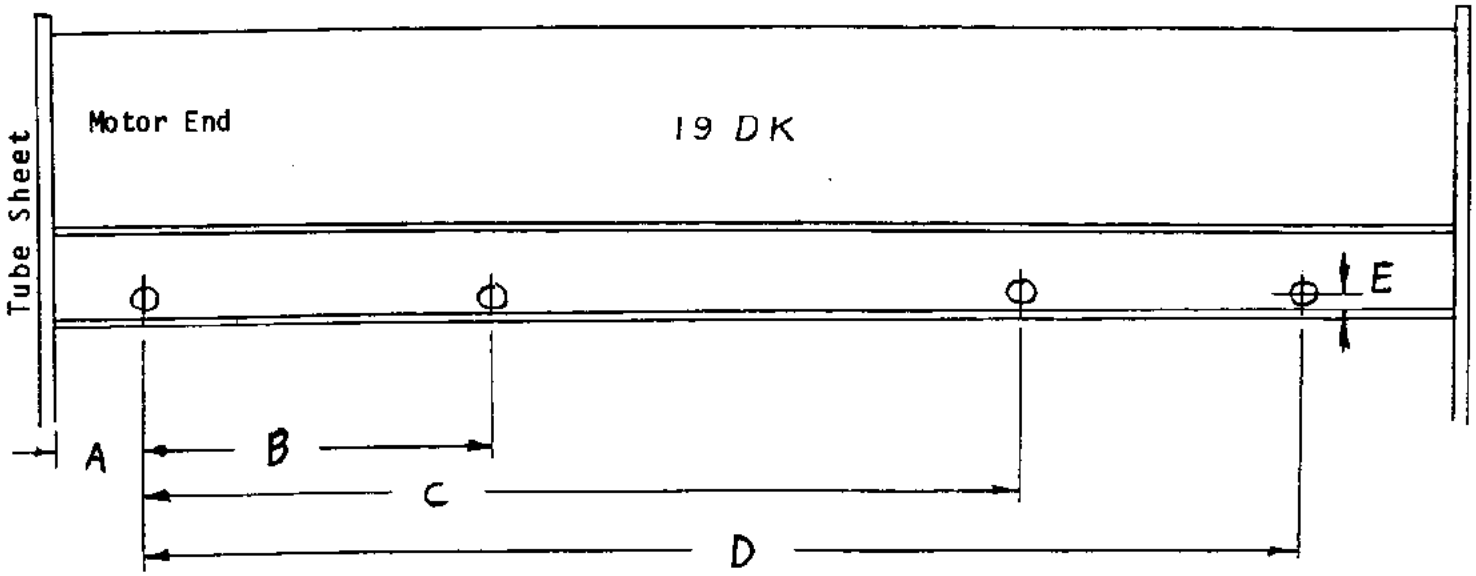


Fig. 2. Unishell Layout

5.0 PROCEDURE (CONT.)

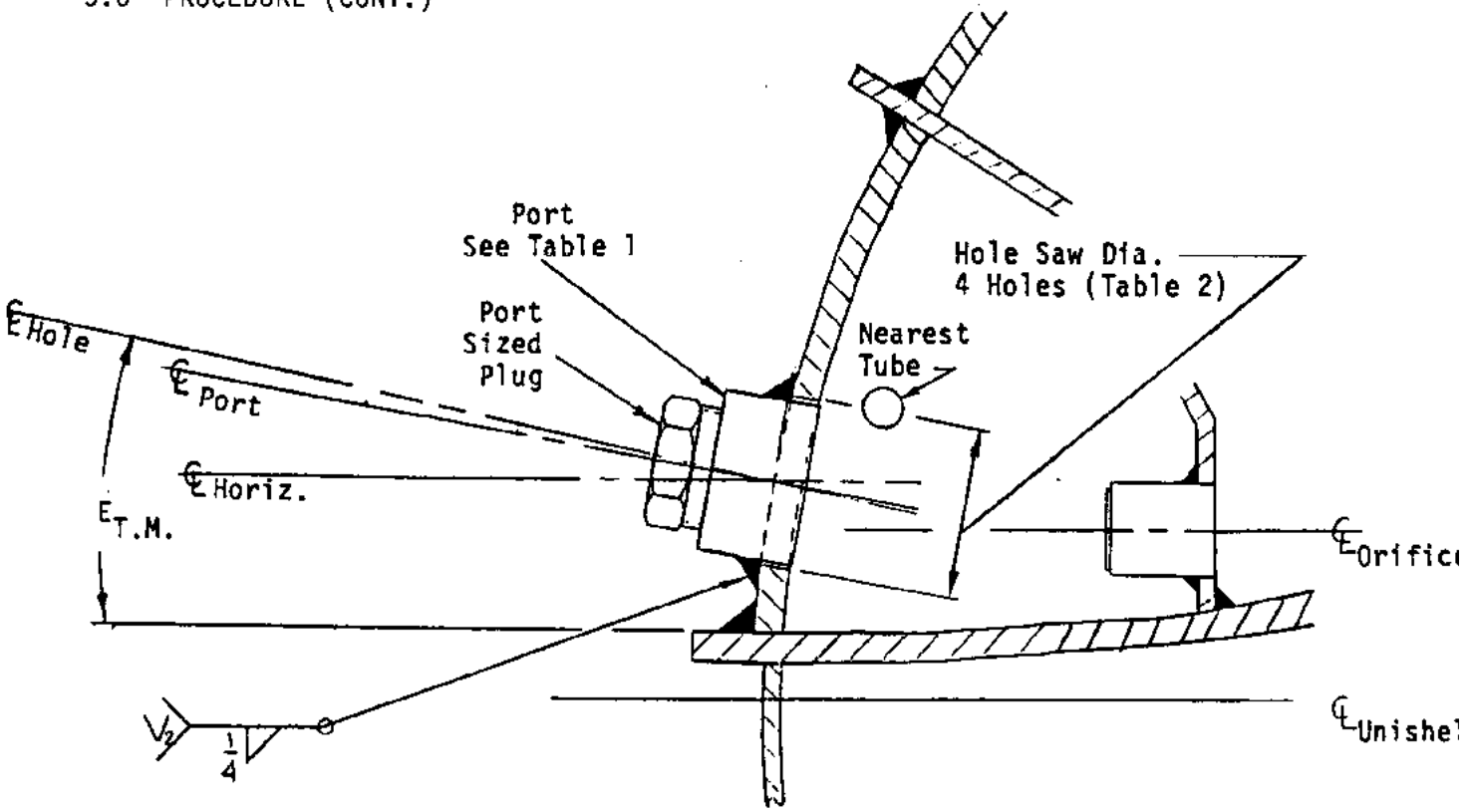


Fig. 3. Unishell Cross-Section

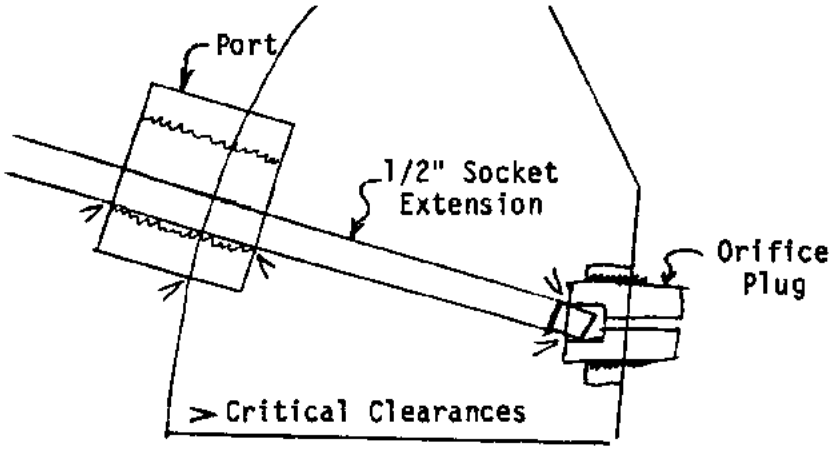


Fig. 4. Positioning Port