Carrier Installation Instructions 5F,H

Carrier Corporation • Syracuse, N.Y. 13221

Water-Cooled Heads, Accessory Package

INTRODUCTION

This package contains the components required to convert from standard to water-cooled cylinder heads on 5F and 5H compressors.

On delivery, check the package contents against the parts list (Fig. 2 through 9). If any shipping damage is found, file a claim immediately with the shipping agent.

If any parts are missing, or are incorrect, contact your Carrier distributor.

Schematic piping for the 5F and 5H compressors is shown in Fig. 1.

Water-Cooled Heads — Usage

PACKAGE NUMBER	COMPRESSOR
5F20-172	5F20
5F30-172	5F30
5F40-172	5F40
5F60-172	5F60
5H40-507	5H40,46
5H60-507	5H60,66
5H80-507	5H80,86
5H120-507	5H120,126

INSTALLATION

Head Piping — Select from Fig. 2 through 9 the piping for the particular compressor. The components are listed with each piping layout.

→ **Cylinder Head and Cover Mounting**

CYLINDER HEAD

5F — All 3/8—16 cap screws; 30-35 lb-ft torque.
5H — All 7/16—14 cap screws; 55-60 lb-ft torque.

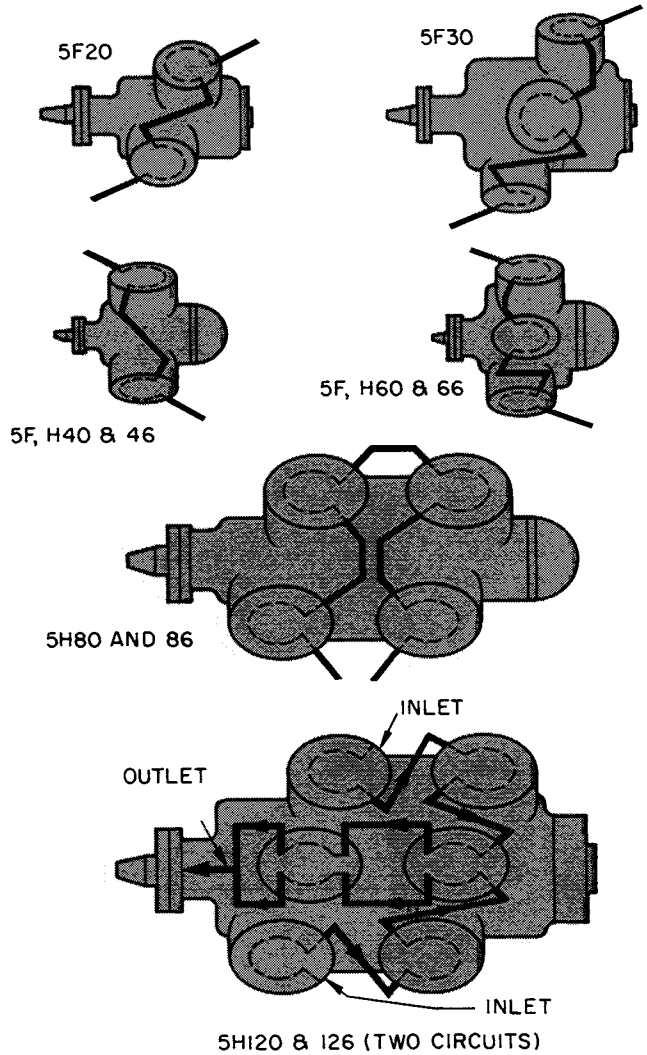
HEAD COVER

5F20,30: 3/8—16 cap screws; 30-35 lb-ft torque.
5F40,60: 5/16—18 cap screws; 20-25 lb-ft torque.
5H (all sizes): 3/8—16 cap screws; 30-35 lb-ft torque.

Special Procedure for 5H120,126 — Refer to Fig. 9. Follow tightening sequence shown; torque to 30-35 lb-ft, 1 through 14. Then repeat the sequence; again torque to 30-35 lb-ft.

Water Supply Lines — The head piping drawing for each compressor shows the locations of entering and leaving water connections, which are all 1/2-in.FPT.

All water supply lines and fittings are field supplied to complete the entering and leaving arrange-



NOTE: All 5F compressors and 5H40 through 86 compressors have one water circuit, for flow in either direction.

5H120,126 compressors have 2 circuits in parallel, as shown, with flow in one direction.

Fig. 1 — Schematic Piping for Water-Cooled Heads

ment for the particular requirements. If a water-cooled oil cooler is used, the oil cooler and water-cooled heads must be piped in series, with the oil cooler first. With this arrangement, a manually-operated flow-control valve should already be installed on the leaving side of the oil cooler. If the oil cooler specified by Carrier is used, the flow-control valve will probably be 3/4 in. or 1 in., depending on the compressor and the oil cooler used.

If no oil cooler is used, a field-supplied manually-operated control valve must be installed in the water supply line for the water-cooled heads.

Water Flow Regulation — If a water-cooled oil cooler is used, the water flow must be regulated to maintain a return oil temperature to the compressor of 100 F to 120 F. The temperature of the water entering the heads will then be between 100 F and 120 F. This should be satisfactory for maintaining a maximum temperature of 250 F at the discharge valves of the compressor.

To maintain the 100 F to 125 F return oil temperature, the minimum flow rate of water through the oil cooler, based on 80 F entering water, should be:

COMPRESSOR	GPM
5F (All)	2
5H (4, 6, 8 cyl)	4
5H (12 cyl)	5 - 6

If there is no water-cooled oil cooler, use the above flow rates as a guide and adjust the flow to obtain approximately 120 F water temperature leaving the cylinder heads.

The cooling water supply should be shut off when the compressor is not running to guard against refrigerant vapor condensing in the heads during the off cycle. A solenoid valve in the water supply line is recommended for this purpose, wired into the control circuit in parallel with the compressor contactor.

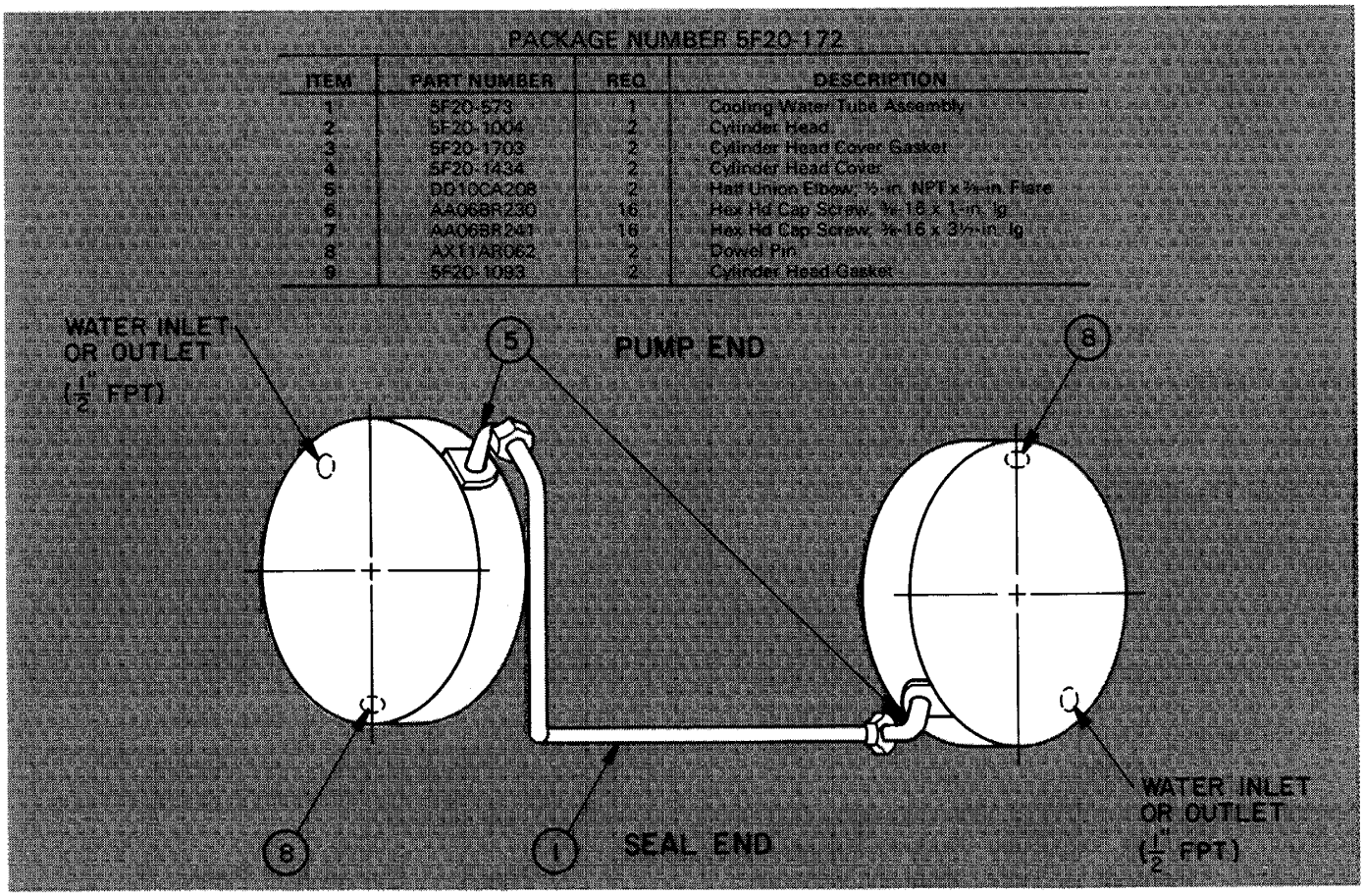


Fig. 2 — Head Piping; Compressor 5F20

PACKAGE NUMBER 5F30-172

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5F30-573	1	Cooling Water Tube Assembly
2	5F30-A302	1	Cooling Water Tube Assembly
3	5F20-1004	3	Cylinder Head
4	5F20-1703	3	Cylinder Head Cover Gasket
5	5F20-1434	3	Cylinder Head Cover
6	DD10CA208	2	Half Union Elbow; ½-in. NPT x ⅝-in. Flare
7	DD07DA208	2	Half Union Coupling; ½-in. NPT x ⅝-in. Flare
8	5F20-1093	3	Cylinder Head Gasket
9	AA06BR230	24	Hex Hd Cap Screw; ⅜-16 x 1-in. lg
10	AA06BR241	24	Hex Hd Cap Screw; ⅜-16 x 3½-in. lg
11	AX11AR062	3	Dowel Pin

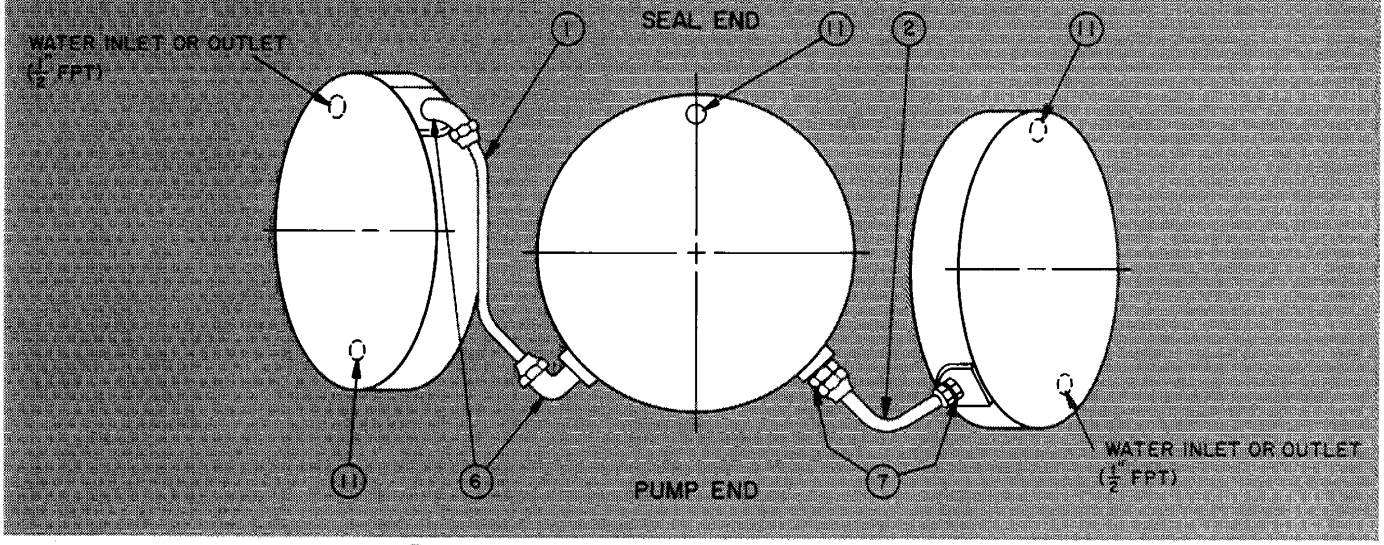


Fig. 3 — Head Piping; Compressor 5F30

PACKAGE NUMBER 5F40-172

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5F41-1004	2	Cylinder Head
2	5F41-1434	2	Cylinder Head Cover
3	5F41-1703	2	Cylinder Head Cover Gasket
4	AA06BR241	28	Hex Hd Cap Screw; ⅜-16 x 3½-in. lg
5	AA06BR200	28	Hex Hd Cap Screw; ⅜-16 x 1-in. lg
6	5F40-407	1	Cooling Water Tube Assembly
7	DD10CA302	1	Half Union Elbow; ½-in. NPT x ⅝-in. Flare
8	DD07DA302	1	Half Union Coupling; ½-in. NPT x ⅝-in. Flare
9	5F40-1093	2	Cylinder Head Gasket
10	AX11AR062	2	Dowel Pin

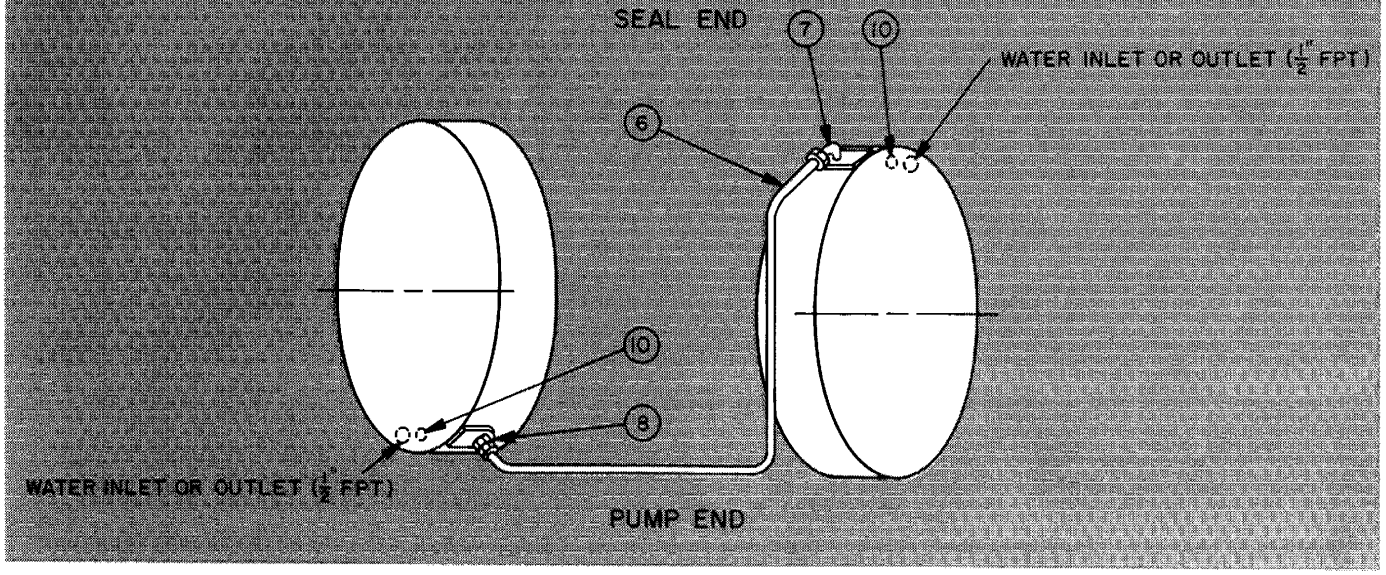


Fig. 4 — Head Piping; Compressor 5F40

PACKAGE NUMBER 5F60-172

ITEM	PART NUMBER	REQ.	DESCRIPTION
1	5F41-1004	3	Cylinder Head
2	5F41-1434	3	Cylinder Head Cover
3	5F41-1703	3	Cylinder Head Cover Gasket
4	5F61-573	1	Cooling Water Tube Assembly
5	5F61-583	1	Cooling Water Tube Assembly
6	DD10CA302	4	Half Union Elbow; ½-in. NPT x ⅜-in. Flare
7	5F40-1093	3	Cylinder Head Gasket
8	AA06BR241	42	Hex Hd Cap Screw; ⅜-16 x 3½-in. lg
9	AA06BR200	42	Hex Hd Cap Screw; ¼-18 x 1-in. lg
10	AX11AR062	3	Dowel Pin

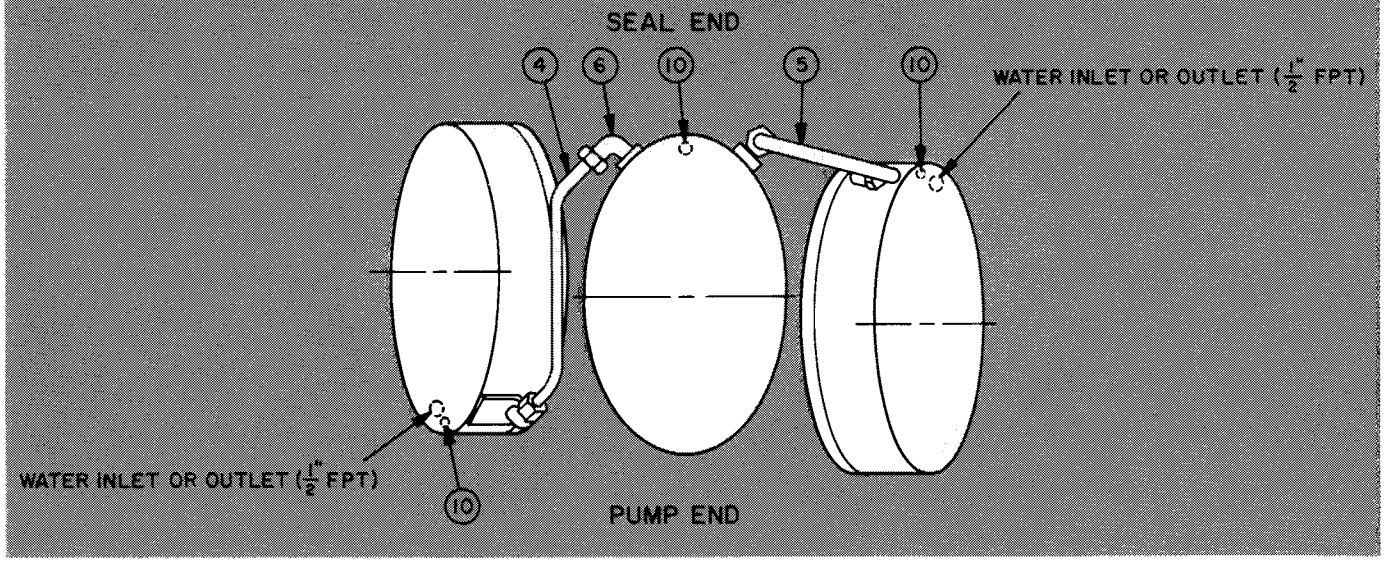


Fig. 5 — Head Piping; Compressor 5F60

PACKAGE NUMBER 5H40-507

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5H41-1019	2	Cylinder Head
2	5H61-1039	2	Cylinder Head Cover
3	5H41-1703	2	Cylinder Head Cover Gasket
4	5H40-1093	2	Cylinder Head Gasket
5	5H40-423	1	Cooling Water Tube Assembly
6	DD10CA302	1	Half Union Elbow; ½-in. NPT x ⅜-in. Flare
7	DD07DA302	1	Half Union Coupling; ½-in. NPT x ⅜-in. Flare
8	AA06BR232	32	Hex Hd Cap Screw; ⅜-16 x 1¼-in. lg
9	AA06BR274	32	Hex Hd Cap Screw; ⅞-14 x 4¼-in. lg

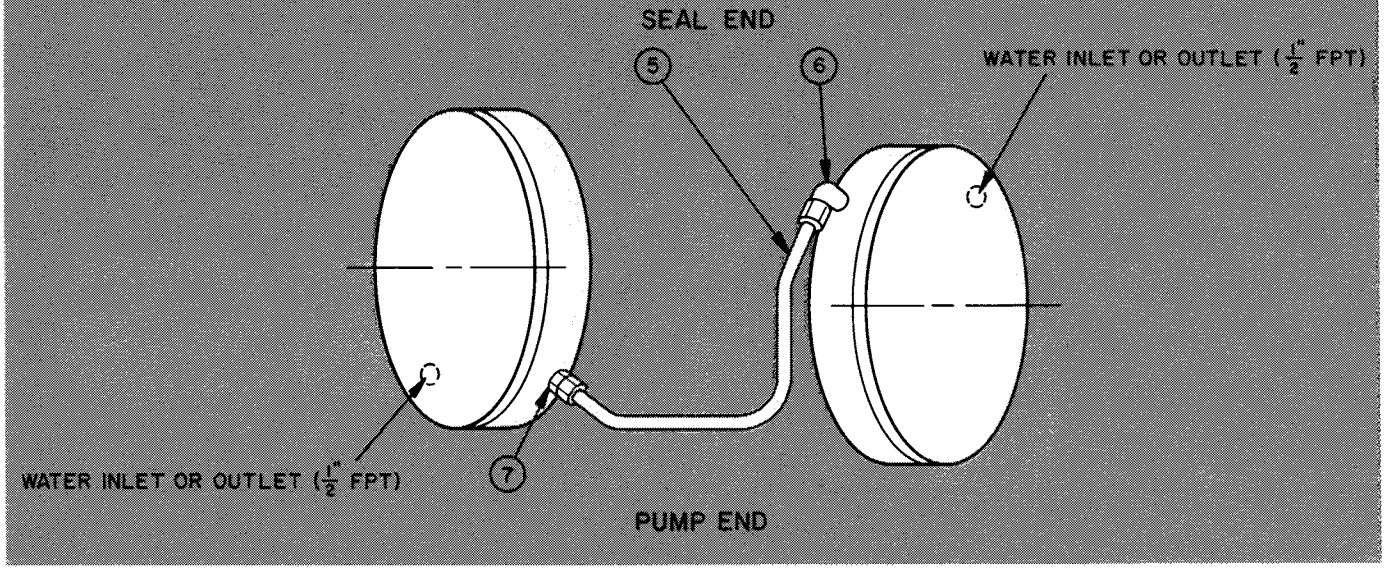


Fig. 6 — Head Piping; Compressor 5H40,46

PACKAGE NUMBER 5H60-507

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5H41-1019	3	Cylinder Head
2	5H61-1039	3	Cylinder Head Cover
3	5H41-1703	3	Cylinder Head Cover Gasket
4	5H40-1093	3	Cylinder Head Gasket
5	5H61-573	1	Cooling Water Tube Assembly
6	5F61-583	1	Cooling Water Tube Assembly
7	DD10CA302	4	Half Union Elbow; ½-in. NPT x ⅝-in. Flare
8	AA06BR232	48	Hex Hd Cap Screw; ⅜-16 x 1¼-in. lg
9	AA06BR274	48	Hex Hd Cap Screw; ⅜-14 x 4½-in. lg

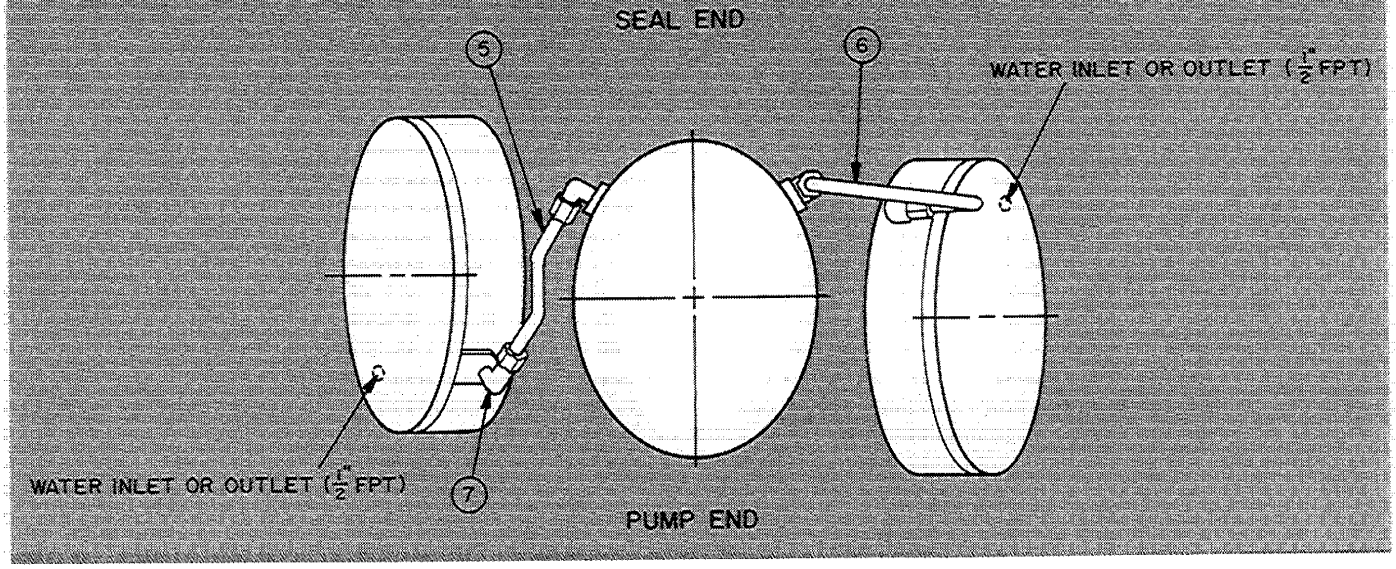


Fig. 7 — Head Piping; Compressor 5H60,66

PACKAGE NUMBER 5H80-507

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5H41-1019	4	Cylinder Head
2	5H61-1039	4	Cylinder Head Cover
3	5H41-1703	4	Cylinder Head Cover Gasket
4	5H80-423	1	Cooling Water Tube Assembly
5	5H80-443	1	Cooling Water Tube Assembly
6	5H81-583	1	Cooling Water Tube Assembly
7	DD07DA302	2	Half Union Coupling; ½-in. NPT x ⅝-in. Flare
8	DD10CA302	4	Half Union Elbow; ½-in. NPT x ⅝-in. Flare
9	AA06BR232	64	Hex Hd Cap Screw; ⅜-16 x 1¼-in. lg
10	AA06BR274	64	Hex Hd Cap Screw; ⅜-14 x 4½-in. lg
11	5H40-1093	4	Cylinder Head Gasket

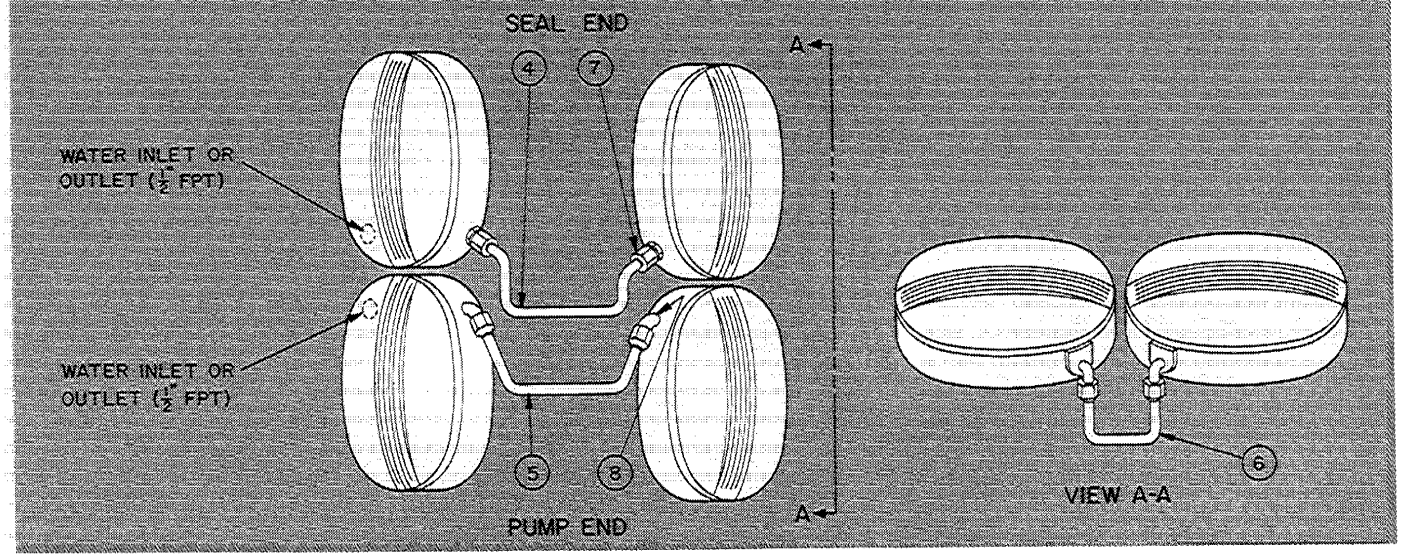


Fig. 8 — Head Piping; Compressor 5H80,86

PACKAGE NUMBER 5H120-507

ITEM	PART NUMBER	REQ	DESCRIPTION
1	5H41-1019	4	Cylinder Head (Side)
2	5H121-1019	2	Cylinder Head (Center)
3	5H61-1039	4	Cylinder Head Cover (Side)
4	5H121-1434	1	Cylinder Head Cover (Center)
5	5H121-1424	1	Cylinder Head Cover (Center)
6	5H121-1044	1	Cylinder Head Cover (Center)
7	5H121-1054	1	Cylinder Head Cover (Center)
8	5H121-367	1	Cooling Water Tube Assembly
9	5H121-573	1	Cooling Water Tube Assembly
10	5H121-377	2	Cooling Water Tube Assembly
11	5H121-387	1	Cooling Water Tube Assembly
12	5H121-583	1	Cooling Water Tube Assembly
13	5H41-1703	4	Cylinder Head Cover Gasket (Side)
14	5H121-1703	4	Cylinder Head Cover Gasket (Center)
15	5H40-1093	6	Cylinder Head Gasket
16	AA06BR232	72	Hex Hd Cap Screw; ⅜-16 x 1¼-in. lg (Side Cylinder Head Cover)
17	AA06BR274	64	Hex Hd Cap Screw; ⅞-14 x 4¼-in. lg (Side Cylinder Head)
18	AA06BR977	32	Hex Hd Cap Screw; ⅞-14 x 5⅛-in. lg (Center Cylinder Head)
19	AA06BR233	56	Hex Hd Cap Screw; ⅜-16 x 1½-in. lg (Center Cylinder Head Cover)
20	DD10CA302	12	Half Union Elbow; ½-in. NPT x ⅝-in. Flare
21	5H120-497	1	Water Outlet Manifold Assembly
22	5H120-4472	2	Discharge Manifold Gasket
23	5H80-1632	1	Discharge Valve Gasket
24	7K4-4522	3	Relief Valve Gasket
25	DD10CA203	2	Half Union Elbow; ⅜-in. NPT x ½-in. Flare
26	5H120-5952	1	Flange (Spacer)
27	AA06BR295	2	Hex Hd Cap Screw; ½-13 x 2-in. lg
28	AU51YA009	2	Cap Screw Gasket; ½-in.

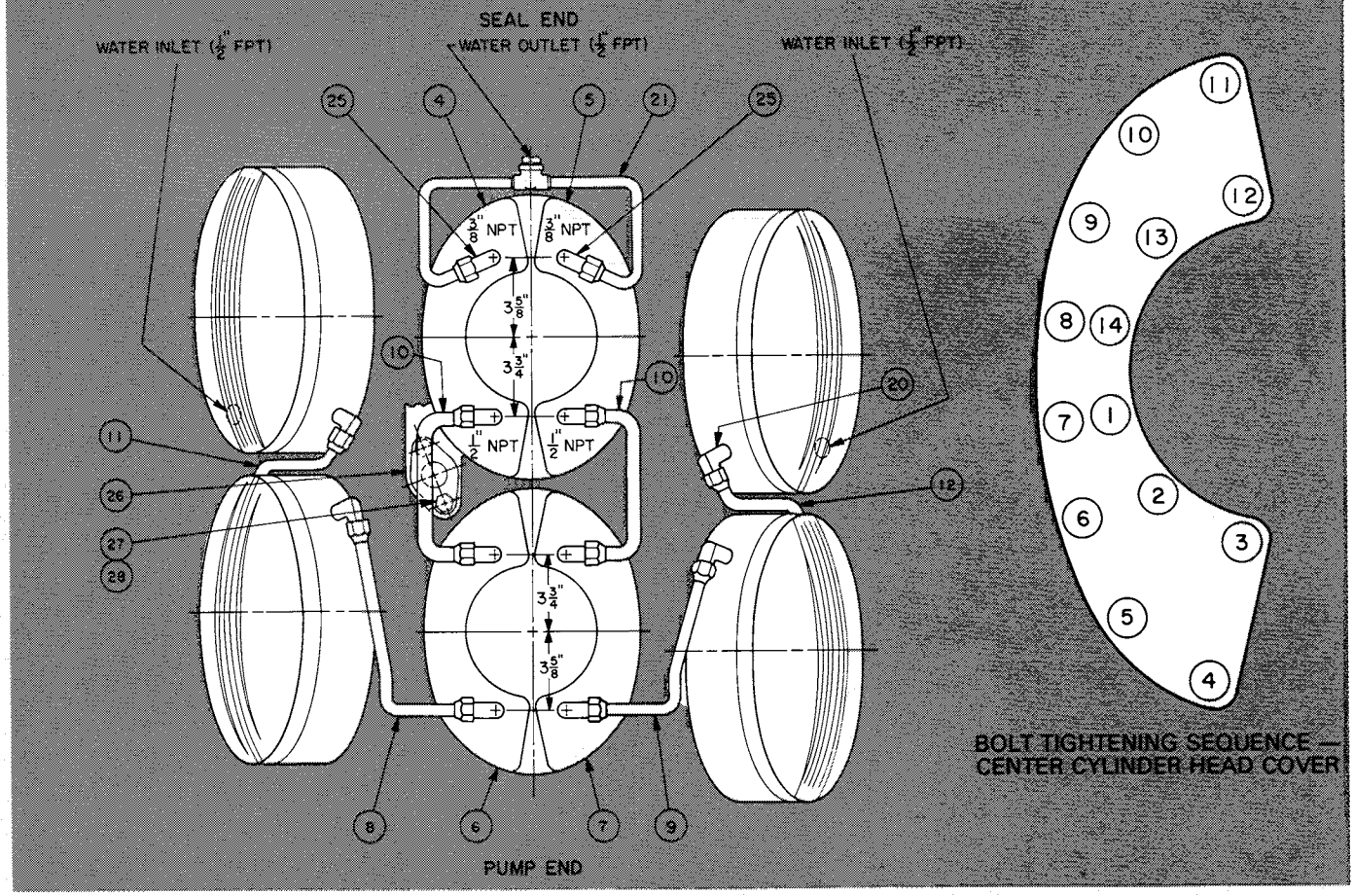


Fig. 9 — Head Piping; Compressor 5H120,126

Book	2	4
Tab	2a	3a

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