

Accessory Oil Cooler

INTRODUCTION

For oil cooler operation, there must be provision for routing the oil from the pump discharge thru the cooler to the bearing head feed. Depending on the compressor model, this is done by installing a setscrew, a sleeve or an internal plug in the pump end bearing head.

All 5F compressors require a special bearing head to utilize the accessory oil cooler. The compressor can be ordered with the special factory-installed bearing head (Table 1) or the special bearing head can be ordered thru Service Parts for modification of a standard compressor.

On all 5H compressors, the standard pump end bearing head must be modified using the components in the specified Oil Cooler Accessory Package.

Table 1 — Special Pump-End Bearing Heads*

COMPRESSOR	BEARING HEAD
5F20	5F20-677
5F30	5F30-677
5F40 5F60	5F40-677

*Standard bearing heads are used on 5H40 thru 5H126 compressors.

CHECK THE SHIPMENT

All Compressors — Check all items against the Oil Cooler Accessory Package parts list. If shipping damage is found, file a claim immediately with the shipping company. If any item is missing, report the shortage promptly to Carrier.

Special Order 5F Compressors — Remove the pump end cover to check the special bearing head. The special bearing head has a tapped hole for the socket head screw (Fig. 1). Do not reinstall the pump end cover until the setscrew is installed.

MODIFY THE PUMP END BEARING HEAD

The modification components are listed, with the Accessory Package number, in Fig. 1, 2 and 5. *The proper function of the oil cooler depends on the correct modification.* Follow the instructions carefully.

All 5F Compressors (Fig. 1) (Oil Cooler Accessory Package No. 5F20-B103) — With the special pump end bearing head installed and the pump end cover removed, insert the 7/16-in. setscrew (Item 15) in the tapped hole in the bearing head; replace the pump end cover.

5H40 Thru 5H86 Compressors (Fig. 2, 3, 4) (Oil Cooler Accessory Package No. 5H40-B283)

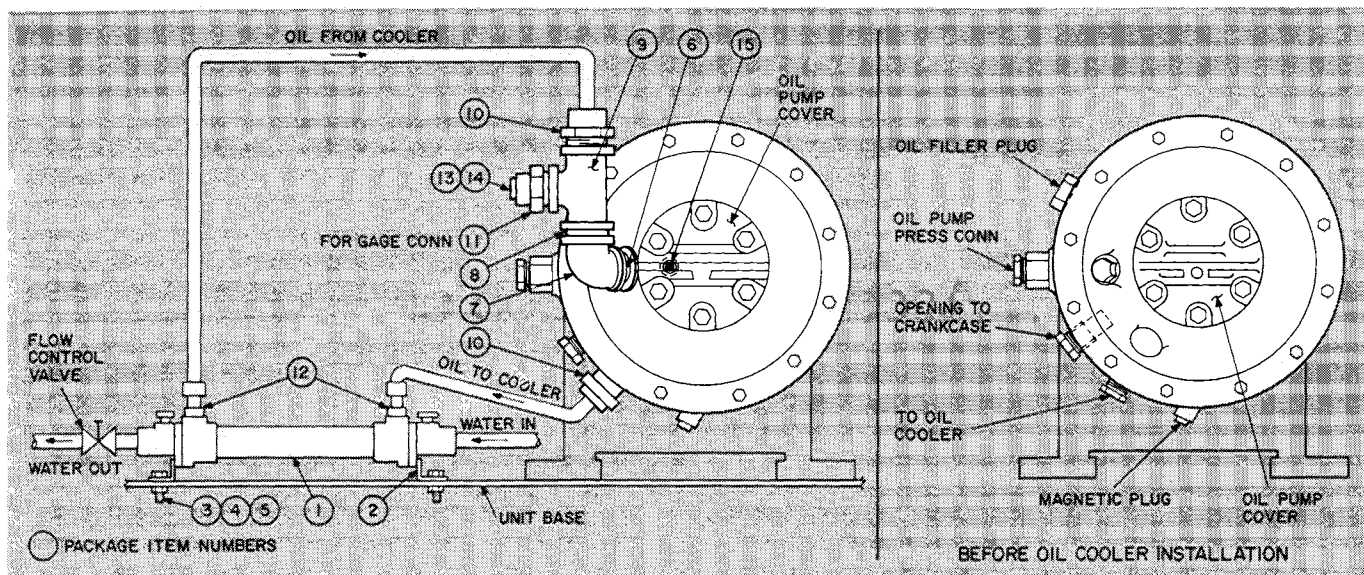
BEFORE COMPRESSOR SERIAL NO. M000264 (Fig. 3) — Remove the pump end bearing head. On the bearing side of the head, remove the outer plug and insert the 5/8-in. setscrew (Item 11). Replace the outer plug and reinstall the bearing head.

FROM COMPRESSOR SERIAL NO. M000264 (Fig. 4) — Use the standard pump end bearing head. Without removing the bearing head, remove the 3/8-in. pipe plug at the 10 o'clock position on the bearing head rim. Install the bearing head sleeve (Item 12, Fig. 2) in this tapped hole:

1. Position the sleeve at the entrance to the tapped hole, with the gap on the upper side and the tab end out.
2. Push sleeve into the hole until it bottoms. The sleeve can be removed by hooking a tool under the tab and pulling the sleeve out.

Leave the 3/8-in. pipe plug out as a fitting will go in this hole when installing the cooler.

5H120 and 5H126 Compressors (Fig. 5) (Oil Cooler Accessory Package No. 5H120-B283) — Remove the oil filter housing from the standard pump end bearing head. Apply a few drops of loctite, or other epoxy, to the threads of the headless plug (Item 11, Fig. 5) and insert into the 3/4-in. tapped hole in the filter mounting pad. Position the plug flush with the mounting surface. Reinstall the filter housing and filter, using gaskets provided (Items 9 and 10).



OIL COOLER ACCESSORY PACKAGE NO. 5F20-B103

ITEM	PART NO.	REQ	DESCRIPTION
1	KH51ZZ100	1	Oil Cooler
2	5H40-B243	2	Mounting Bracket
3	AC73AB197	4	Hex Head Bolt, 5/16-in. — 18 x 5/8-in. Lg
4	AU11AR201	4	Lock Washer, 5/16-in.
5	AT39AA201	4	Hex Nut, 5/16-in. — 18
6	CE01CA051	1	Nipple, 1/4-in. MPT x 7/8-in. Lg
7	CE06RA106	1	Elbow, 3/8-in. x 1/4-in. FPT
8	CE01CA102	1	Nipple, 3/8-in. MPT x 1-in. Lg
9	CE20RA102	1	Tee, 3/8-in. x 3/8-in. x 1/4-in. FPT
10	DD07DA101	2	Coupling, 3/8-in. MPT x 3/8-in. Fl
11	DD07UA051	1	Coupling, 1/4-in. MPT x 1/4-in. Fl
12	DD07DA208	2	Coupling, 1/2-in. MPT x 3/8-in. Fl
13	DD24FA051	1	Flare Gasket, 1/4-in.
14	DD19DA051	1	Flare Cap, 1/4-in.
15	AE11AR254	1	Screw, Socket Set, 7/16-in. — 14 x 3/8-in. Lg

NOTE: Oil and water lines to and from the cooler are field supplied.

Fig. 1 — 5F Compressors Oil Cooler Installation

INSTALL THE OIL COOLER

5F20 Thru 5F60 Compressors (Refer to Fig. 1)

MOUNT COOLER — Locate the cooler on the compressor unit frame or other surface free from vibration, as close to the pump end bearing head as possible.

1. Use mounting brackets (Item 2) as templates; mark and drill 4 holes in frame for 5/16-in. diam. mounting bolts (Item 3).
2. Attach mounting brackets to cooler ends using existing cooler head bolts. Position brackets so that the oil line connections are at the top.
3. Attach cooler to frame with bolts, nuts and washers provided (Item 3, 4, 5).

ASSEMBLE OIL RETURN CONNECTION

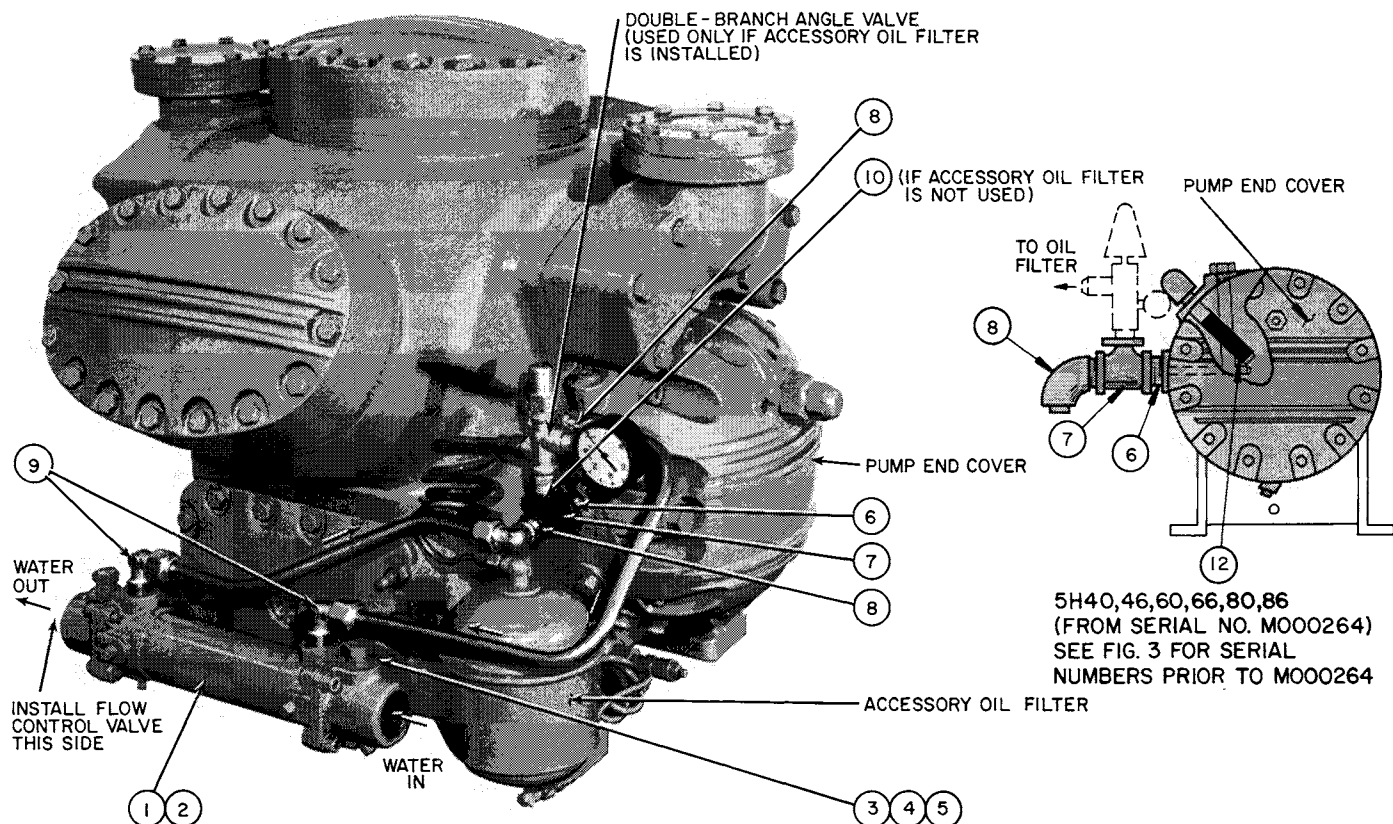
1. Remove 1/4-in. pipe plug from face of bearing head at 9 o'clock position, near oil pump cover. Insert 1/4-in. MPT x 7/8-in. Lg nipple (Item 6).

2. Continue assembly as follows:

- a. Screw 3/8-in. x 1/4-in. FPT elbow (Item 7) onto nipple.
- b. Screw 3/8-in. MPT nipple (Item 8) into elbow.
- c. Screw 3/8-in. x 3/8-in. x 1/4-in. FPT tee (Item 9) onto nipple.
- d. Install a 3/8-in. MPT x 3/8-in. Fl coupling (Item 10) on tee (vertical opening).
- e. Install a 1/4-in. MPT x 1/4-in. Fl coupling (Item 11) on tee (horizontal opening).
- f. Install flare gasket and cap (Items 13 and 14) on Item 11.

INSTALL OIL LINE COUPLINGS

1. Remove 3/8-in. pipe plug at 7 o'clock position on bearing head rim and install a 3/8-in. MPT x 3/8-in. Fl coupling (Item 10).
2. Install a 1/2-in. MPT x 3/8-in. Fl coupling (Item 12) in each of the 2 oil ports on the cooler.



OIL COOLER ACCESSORY PACKAGE NO. 5H40-B283

ITEM	PART NO.	REQ	DESCRIPTION
1	KH51ZZ100	1	Oil Cooler
2	5H40-B243	2	Mounting Bracket
3	5H40-1781	4	Stud, 3/8-in. — 16 x 3 1/4-in. Lg
4	AU11AR241	4	Lock Washer, 3/8-in.
5	AT39AA241	4	Hex Nut, 3/8-in. — 16
6	CE01CA110	1	Nipple, 3/8-in. MPT x 2-in. Lg
7	CE20RA101	1	Tee, 3/8-in. x 3/8-in. x 3/8-in. FPT
8	DD10CA203	2	Elbow, 3/8-in. MPT x 1/2-in. FI
9	DD10CA201	2	Elbow, 1/2-in. MPT x 1/2-in. FI
10	CA63AA101	1	Hex Head Pipe Plug, 3/8-in.
11	AF19AR317*	1	Screw, Socket Set, 5/8-in. — 18 x 5/8-in. Lg
12	5H40-7252†	1	Sleeve, Bearing Head

*Before Compressor Serial No. M000264 (Fig. 3)

†From Compressor Serial No. M000264 (Fig. 4)

NOTE: Oil and water lines to and from the cooler are field supplied.

Fig. 2 — 5H40 thru 5H86 Compressors Oil Cooler Installation

INSTALL OIL LINE TUBING — Cut, bend and flare 3/8-in. copper tubing (field supplied) as required to connect oil cooler ports to compressor oil discharge and return connections. Install lines as shown in Fig. 1.

INSTALL WATER LINES ON COOLER (water lines are field supplied) — The IN and OUT water connections on the cooler are 1-in. FPT. *Attach a field-supplied flow-control valve on the leaving water side to maintain 100 F — 120 F oil return temperature* from oil cooler to compressor. Maximum working pressure for oil cooler water side and oil side is 150 psig. The estimated water flow rate for 5F compressors, based on 80 F entering water, is 2 gpm.

5H40 Thru 5H86 Compressors (Refer to Fig. 2)

MOUNT COOLER

1. Attach oil cooler mounting brackets (Item 2) to oil cooler, using existing cooler head bolts. Position brackets so that the cooler oil ports are at the top.
2. Mount cooler on the compressor hand hole cover as shown using studs, washers and nuts provided (Items 3, 4, 5).

INSTALL OIL DISCHARGE CONNECTION

Before Compressor Serial No. M000264 — With the pump end bearing head in place, remove the 3/8-in. pipe plug at the 10 o'clock position on the bearing head rim. Insert a 3/8-in. MPT x 1/2-in. FI

elbow (Item 8). Position the elbow to accept horizontal tubing, as shown.

From Compressor Serial No. M000264 – At the 10 o'clock position on the bearing head rim, where the sleeve (Item 12) was installed, insert a 3/8-in. MPT x 1/2-in. Fl elbow (Item 8). Position the elbow to accept horizontal tubing, as shown.

ASSEMBLE OIL RETURN CONNECTION

1. Remove 3/8-in. pipe plug located at 9 o'clock position on bearing head rim. Insert 3/8-in. nipple (Item 6).
2. Screw the 3/8-in. x 3/8-in. x 3/8-in. FPT tee (Item 7) onto nipple (Item 6) with side opening vertically upward.
3. Screw a 3/8-in. MPT x 1/2-in. Fl elbow (Item 8) into end of tee. Position elbow to accept horizontal tubing as shown in Fig. 2.

4. If an accessory oil filter is to be used, as shown in Fig. 2, install the double-branch angle valve (supplied with the accessory oil filter package) in the side opening of the tee. If no oil filter is shipped with the compressor, insert 3/8-in. pipe plug (Item 10) in the side opening of the tee.

INSTALL OIL LINE CONNECTIONS ON COOLER – Insert a 1/2-in. MPT x 1/2-in. Fl elbow (Item 9) in each oil port on the cooler and position to accept tubing as shown.

INSTALL OIL LINE TUBING – Cut, bend and flare 1/2-in. copper tubing (field supplied) as required to connect oil cooler ports to compressor oil-discharge and oil-return connections. Install lines as shown.

INSTALL WATER LINES ON COOLER (water lines are field supplied) – The IN and OUT water connections on the oil cooler are 1-in. FPT. *Attach a field-supplied flow-control valve on the leaving water side of the cooler to maintain 100 F – 120 F oil return temperature from cooler to compressor.* Maximum working pressure for oil cooler water side and oil side is 150 psig. The estimated water flow rate for 5H40 thru 5H86 compressors, based on 80 F entering water temperature, is 4 gpm.

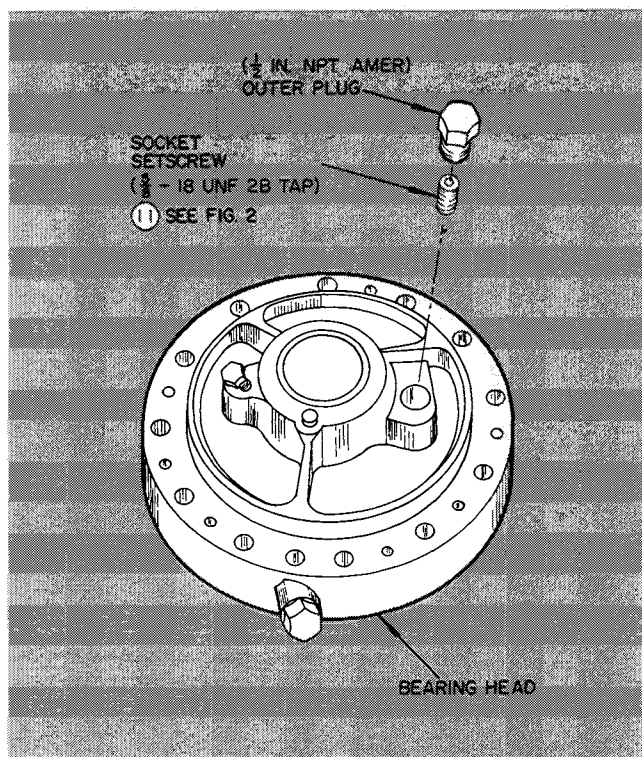


Fig. 3 – Internal Setscrew Installation (5H40 thru 5H86 Compressors Before Serial No. M000264)

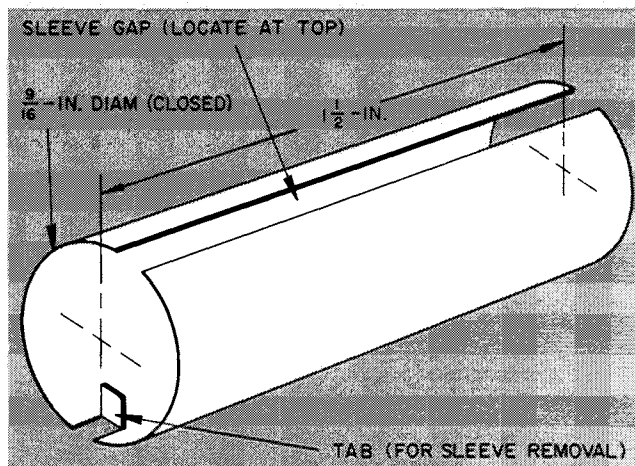


Fig. 4 – Bearing Head Sleeve (5H40 thru 5H86 Compressors From Serial No. M000264)

5H120 and 5H126 Compressors (Refer to Fig. 5)

MOUNT COOLER

1. Attach oil cooler mounting brackets (Item 2) to cooler, using existing cooler head bolts. Position brackets so that the cooler oil ports are at the top.
2. Mount oil cooler on compressor hand hole cover, using studs, washers and nuts provided (Items 3, 4, 5).

→ **INSTALL OIL DISCHARGE CONNECTION** – Remove 1/2-in. pipe plug at 9 o'clock position on face of pump end bearing head and insert a 1/2-in. MPT x 1/2-in. Fl elbow (Item 6). Position to accept vertical tubing as shown.

INSTALL OIL RETURN CONNECTION – Remove 1/2-in. pipe plug at top of oil filter and insert a 1/2-in. MPT x 1/2-in. Fl elbow (Item 6). Do not tighten until tubing is installed.

INSTALL OIL LINE CONNECTIONSONCOOLER

1. Insert a 1-in. MPT x 3/4-in. FPT reducer (Item 7) in each of the 2 oil ports on cooler.
2. Insert a 3/4-in. MPT x 1/2-in. Fl elbow (Item 8) in each reducer. Position with the openings on the cooler centerline as shown.

INSTALL OIL LINE TUBING – Cut, bend and flare 1/2-in. copper tubing (field supplied) as required to connect oil cooler ports to compressor oil-discharge and oil-return connections. Install lines as shown.

INSTALL WATER LINES ON COOLER (water lines are field supplied) – The IN and OUT water connections on the oil cooler are 3/4-in. FPT. *Attach a field-supplied flow-control valve on the leaving water side to maintain 100 F – 120 F oil return temperature* from cooler to compressor. Maximum working pressure for oil cooler water side and oil side is 150 psig. The estimated water flow rate for 5H120 and 5H126 compressors, based on 80 F entering water temperature, is 5-6 gpm.

OPERATION

Adjust the water flow rate thru the cooler to maintain the temperature of oil returning to compressor at 100 F – 120 F (see Table 2).

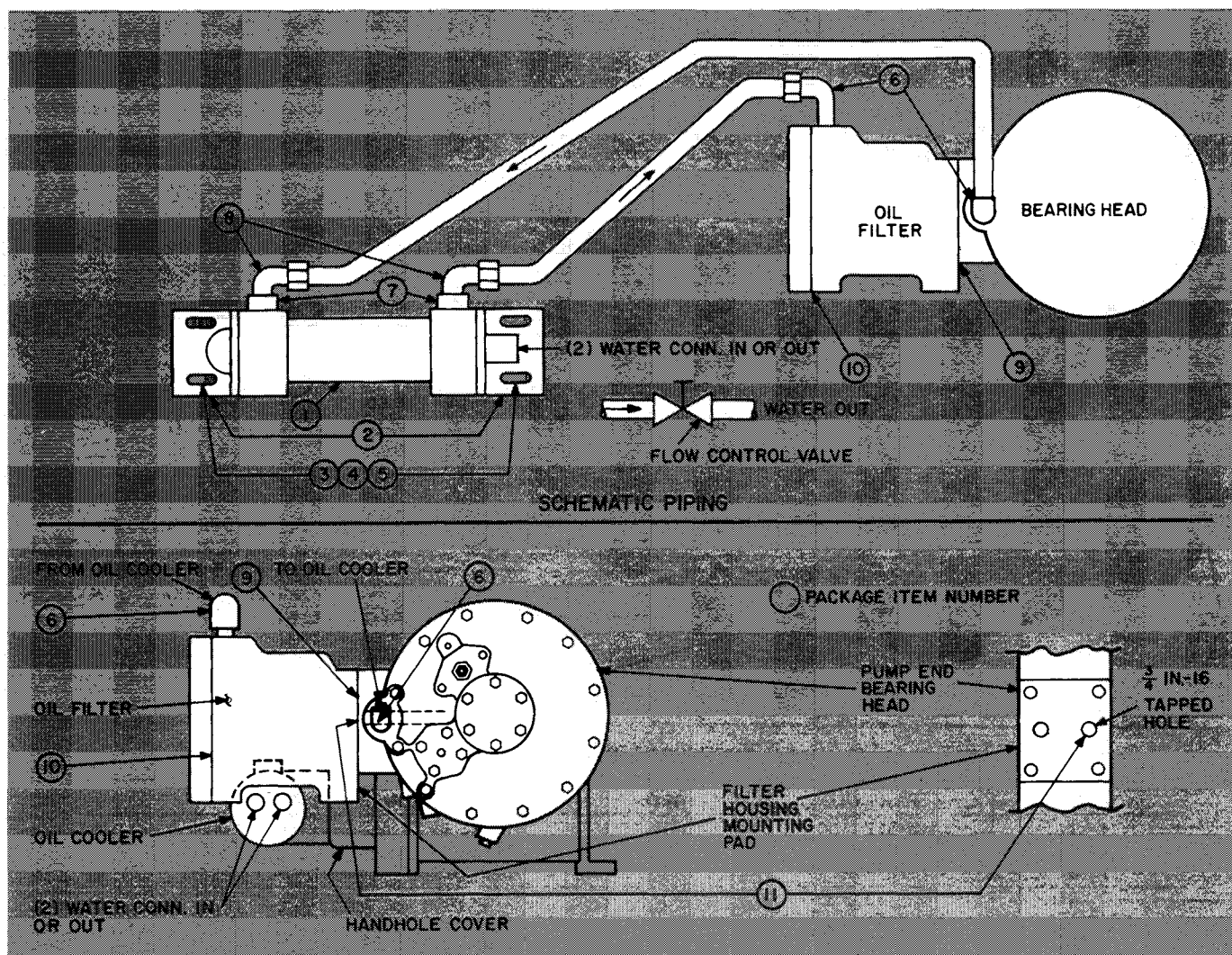
Oil breakdown and shaft seal leakage can occur as a result of high oil temperature. Keep crankcase temperature below 140 F and shaft seal temperature below 170 F (measured at surface of seal housing).

Table 2 – Estimated Water Flow Rates*

COMPRESSOR	GPM†
5F	2
5H (4, 6 and 8 Cylinders)	4
5H (12 Cylinders)	5-6

*To maintain 100 F - 120 F return oil temperature.

†Flow rate based on 80 F entering water.



OIL COOLER ACCESSORY PACKAGE NO. 5H120-B283

ITEM	PART NO.	REQ	DESCRIPTION
1	KH51ZZ180	1	Oil Cooler
2	5H40-B253	2	Mounting Bracket
3	5H40-1781	4	Stud, 3/8-in. — 16 x 3 1/4-in. Lg
4	AU11AR241	4	Lock Washer, 3/8-in.
5	AT39AA-241	4	Hex Nut, 3/8-in. — 16
6	DD10CA201	2	Elbow, 1/2-in. MPT x 1/2-in. FI
7	CA53RA252	2	Reducer, 1-in. MPT x 3/4-in. FPT
8	DD10CA403	2	Elbow, 3/4-in. MPT x 1/2-in. FI
9	5H120-4482	1	Gasket, Oil Filter Housing
10	5H120-4492	1	Gasket, Oil Filter Cover
11	5H81-2171	1	Headless Plug, 3/4-in. — 16

NOTE: Oil and water lines to and from the cooler are field supplied.

→ Fig. 5 — 5H120, 126 Compressors Oil Cooler Installation

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.