YORK®

File in SRC Manual(s).

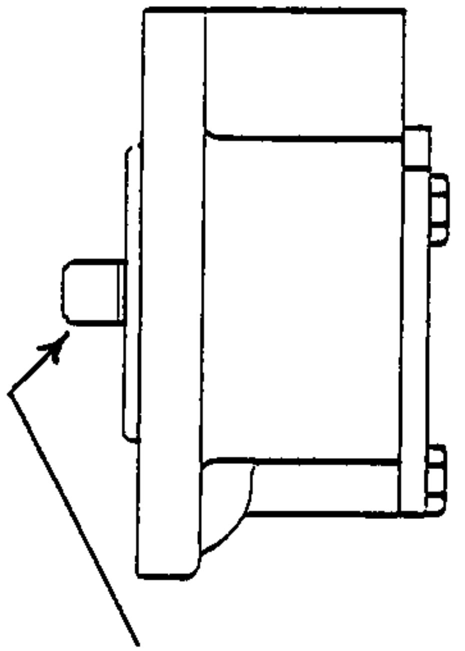
SERVICE BULLETIN

Supersedes: NOTHING	1093	Form 180.00-SB1
File with Form: 180.23-M1, 180.23-M2, 180.45-M1		

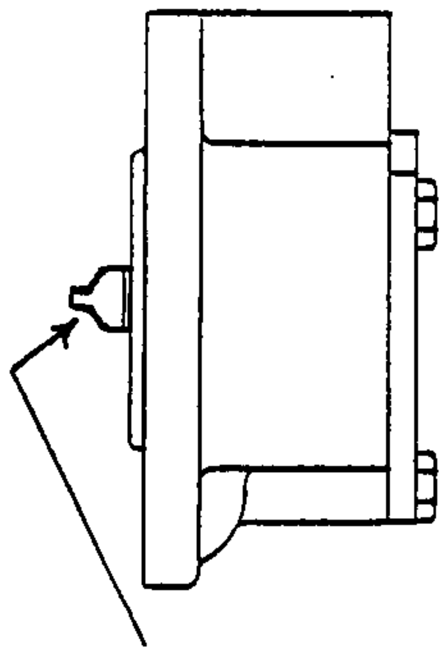
SUBJECT: "J" AND "Z" COMPRESSOR OIL PUMP FAILURES AND RETROFIT PROGRAM

A problem has been identified with "J" and "Z" compressor oil pumps manufactured by Tuthill. These oil pumps have been used on both "J" and "Z" compressors along with oil pumps manufactured by Concentric for approximately a year and a half.

The problem with the Tuthill pumps is that the drive shaft, which mates with the crankshaft of the compressor, is too soft and gradually wears over a period of time. When the drive shaft wears enough, it will no longer engage the crankshaft causing a loss in oil pressure which shuts the compressor down. Typically the pumps have been lasting approximately 4-14 months depending upon system operating conditions. An example of a good and a worn drive shaft is shown below:



GOOD SHAFT



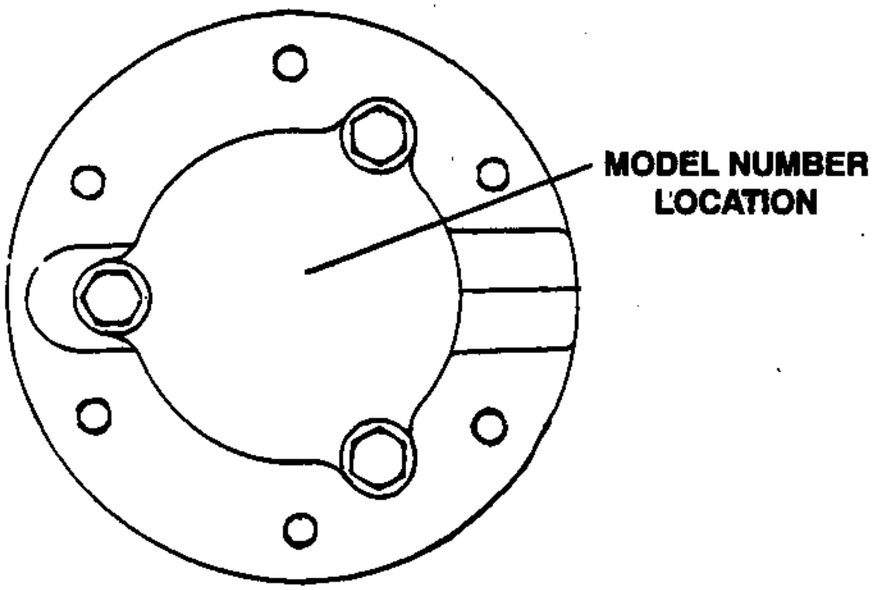
WORN SHAFT

NOTE: It may appear that the crankshaft is also worn. This is NOT the case. The conical shape to which the oil pump shaft wears is due to the center drilling in the end of the crankshaft that is necessary to machine the crankshaft. The crankshaft is much harder than the pump shaft and will not wear.

Concentric oil pumps are marked with the word "CONCENTRIC" and are easily recognizable. These pumps have been operating satisfactorily for many years, but are not currently supplied on production YORK Recip compressors. Concentric pumps may be used for replacements, if they are available from field stock. Tuthill pumps do not have the manufacturer's name on them and can be identified by the absence of the manufacturer's name. New Tuthill pumps with hardened shafts can be identified by an "H" at the end of the Model # that is stamped on the cover plate. Defective Tuthill oil pumps with the soft shaft can be identified by the absence of the "H". Shown below are typical model numbers of both good and bad Tuthill pumps along with the location of the model numbers:

90 GRC-9123 or 90 GRC-9124: DEFECTIVE SHAFTS! DO NOT USE!

90 GRC-9123H or 90 GRC-9124H: "H" = Hardened shaft oil pumps



The retrofit guidelines for replacing soft shaft Tuthill oil pumps are outlined below:

1. If an oil pump fails, install a Retrofit Kit or replace the oil pump on **ALL** the non "H" style Tuthill oil pumps on "J" or "Z" compressors at the jobsite.
2. If during recip. chiller maintenance for any reason or when someone is in the general area of a known recip. chiller started between Jan. 1992 and June 1994 (approx. anticipated latest start-up on chillers built until Oct. 1, 1993) with "J" or "Z" compressors, check for non "H" style Tuthill oil pumps and install retrofit kits or replace the pumps as required.
3. If maintenance is required on a chiller(s) in a remote or not easily accessible location or you are aware of such a chiller(s), contact the customer to determine the type of oil pump on each compressor at the site. Schedule a visit and install Retrofit Kits or replace the pumps.

We would suggest that each office order 6-10 of both "J" and "Z" Retrofit Kits (International) or 6-10 of both "J" and "Z" oil pumps (Domestic) to get started on the changeout. Domestic offices may also order kits, if pumps are not available. Supply them to the appropriate service mechanics who will most likely be going to the jobsites. It will save YORK a SUBSTANTIAL amount of money by doing as much of this work as possible without making return trips to the jobsites with parts. **NOTE:** The number of kits each office orders will vary substantially. Obviously, some areas have single jobsites with as many as 100 chillers. Order what you think you need and don't get greedy. If we run out of pumps or kits, everyone loses. Remember, you can always re-order with typical response time for parts from BALT PDC being virtually overnight.

Order the Retrofit Kits or replacement pumps and gaskets just as you would order any other part.

> **"J" Retrofit Kit part number is 664-48276-000 (Tuthill 90GRC 313 9123).**
>
> **"Z" Retrofit Kit part number is 665-25399-000 (Tuthill 90GRC 313 9124).**
>
> **Complete oil pump and gasket (Don't forget the gaskets!) part numbers are in the compressor parts manuals.**

IMPORTANT! If a complete oil pump is replaced, the defective pump must be immediately returned to YORK at the address shown below after the changeout is made. The defective pumps should be shipped no later than 72 hours after removal. Return of the pumps is necessary to assure we have enough replacement pumps to meet field and production demands. No exceptions will be given. We will rework the returned pumps and return them to service as replacements. "Domestic" oil pumps should be returned UPS SECOND DAY.

If oil pumps are rebuilt using the retrofit kit, no return is necessary and the old parts may be thrown away.

Return defective oil pumps to:

> **YORK INTERNATIONAL CORPORATION**
> 631 S. RICHLAND AVE., DOOR 70
> YORK, PA 17403
>
> ATT: Jim Tuthill

Place warranty charges on warranty paperwork used solely for the oil pump changeout. Do not put other charges on the warranty used for oil pump replacement. For convenience, a single warranty may be taken out for the specific jobsite, regardless of the number of chillers on the site. We would appreciate recording compressor model number, serial number, and date code on the warranty along with the required chiller model and serial numbers.

We regret the inconvenience this program has caused and appreciate the effort by everyone to make the retrofit a success.

Outlined below are instructions for installing the kits and replacing the pumps:

KIT INSTALLATION

1. Back seat the suction service valve which valves off the suction transducer and remove it. Connect a gauge block to measure suction pressure and front seat the valve a turn or two.
2. Valve off the liquid line and start the compressor to pump down the system. When the system is in a vacuum, stop the compressor and close the suction and discharge service valves. **NOTE:** It may take more than one start to pump the pressure low enough to reach a vacuum.
3. Remove the three oil pump hex bolts holding the cover plate on the oil pump. Remove the "O" ring and pump shaft/gear assembly. Be careful not to introduce any dirt into the pump.
4. Lightly oil the replacement shaft/gear assembly and insert it into the pump housing making sure the shaft tang is inserted into the crankshaft drive slot. Again, be careful not to introduce dirt.
5. Oil the new "O" ring lightly, assemble it into the pump housing and replace the cover plate with the new one stamped with an "H". Replace the three hex bolts torquing them to 10 ft. lbs.
6. Evacuate the compressor to about 500 microns through the gauge block.
7. Backseat the suction service valve, remove the gauge block and replace the transducer.
8. Place the suction and discharge service valves to the backseat position and then open them a turn or two toward the front seat position. Open the liquid line valve.
9. Clean the unpainted pump cover with sun spirits and spray paint it with Rust-Oleum 2179 black paint.
10. Return the system to operation.

COMPLETE PUMP REPLACEMENT

1. Backseat the suction service valve which valves off the suction transducer and remove it. Connect a gauge block to measure suction pressure and front seat the valve a turn or two.
2. Valve off the liquid line and start the compressor to pump down the system. When the system is in a vacuum, stop the compressor and close the suction and discharge service valves. **NOTE:** It may take more than one start to pump the pressure low enough to reach a vacuum.
3. Note the orientation of the pump by locating the notch on the pump housing. Remove the (6) hex bolts that bolt the pump to the bearing housing. **NOTE:** On "Z" compressors the tee should first be removed from the pump.
4. Remove the pump and gasket. Clean the gasket surface assuring no old gasket remains.

5. Lightly oil the new gasket and prime the new pump by adding oil into the pump ports and rotating the shaft.

6. Install the new primed pump and gasket making sure the tang of the shaft enters the crankshaft slot. Assure the notch on the pump housing is in the same position as the one that was removed.

7. Replace the hex bolts and torque them to the proper value:

   "J" Compressors: 112-120 inch lbs.

   "Z" Compressors: 19-22 ft. lbs.

8. Evacuate the compressor to about 500 microns through the gauge block.

9. Backseat the service valve, remove the gauge block and replace the transducer.

10. Place the suction and discharge service valves to the backseat position and then open them a turn or two toward the front seat position. Open the liquid line valve.

11. Clean the unpainted pump with sun spirits and spray paint it with Rust-Oleum 2179 black paint.

12. Return the system to operation.