UNITED TECHNOLOGIES CARRIER

SERVICE BULLETIN

Title: OIL FOAMING

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Models Affected: 17/19DK/DM/DR CENTRIFUGAL CHILLERS

PURPOSE

The purpose of this bulletin is to provide recommendations for corrective action when transmission oil foaming problems occur.

BACKGROUND

When excessive amounts of refrigerant are present in the lube oil of a centrifugal compressor, serious problems result. There are several ways that liquid refrigerant can enter the oil:

1 If the oil is not maintained at a temperature about 40 degrees or more above the refrigerant saturation temperature, excessive refrigerant will be absorbed into the oil. When a machine is shut down, the saturation temperature is close to ambient temperature. When a machine is operating, the saturation temperature is approximately the temperature of the refrigerant in the cooler.

2 If the sensor lead plug on a 31 size compressor pops out of the hole that secures it, refrigerant liquid can enter from the motor. On 11 and 21 size compressors, the plug is above the liquid level.

3 An improperly machined transmission flange or a lack of cast material in the flange area will allow leakage from motor to transmission.

4 A missing O-ring at the outboard bearing will create a leak path. It is also possible for improperly drilled or cored holes in the end bell area to cause a leak.

5 If the transmission is machined slightly over tolerance from front face to flange face, and the mating flange in the compressor base has a hole for the 17DK/DM/DR seal leakage return, a leak could result.

6 If the open drive transmission with a seal leakage return hole is used with a hermetic motor liquid refrigerant will pour into the motor.

MAIL KEYS: 2.33B, 2.33D, 2.40B, 2.45, and 2.53

FILE KEY Compressor-Motor Assembly

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DIAGNOSIS

A problem with refrigerant in the oil is evident in one or more of the following ways:

1 The chiller shuts down on low oil pressure during start, usually when the guide vanes start to open.

2 The oil temperature can not be maintained at 140 F when the compressor is running, even with the oil cooler turned off.

3 The oil pump cavitates and is noisy.

RECOMMENDATIONS

The following checks should be made and appropriate changes made:

1 Ensure that the oil temperature is maintained at least 40 F above ambient temperature when the compressor is shut off. Make sure that the oil heater thermostat is correctly set and that the heater is working.

2 Verify that the ramp loading rate is not too fast. A nominal rate of 2.25 deg F per minute is recommended, in some cases it might be necessary to use a lower rate.

3 Ensure that the motor temperature sensor plug is in place between the motor and transmission housings. Replace and secure this plug if necessary.

4 Check for the presence of an O-ring seal between the refrigerant feed nozzle ring in the motor and the motor outboard bearing.

5 Check for leaks between drilled and cored holes in the motor end bell for motor cooling refrigerant and lube oil.

6 Check for leakage between motor and transmission by pouring a quantity of R-11 into the motor and looking for leaks on the transmission side. If a leak is found, correct as follows:

Check the transmission bolted flange surface to ensure that it is flat and smooth

Check for clearance between the transmission flange and the compressor flange and, if necessary, add a thin gasket.

If the 17DK/DM/DR seal leakage hole in the compressor base flange is not plugged, plug it.

Check if the open drive transmission with the seal leakage hole is used on a hermetic compressor, and plug if necessary.