



SERVICE BULLETIN

Title: 19XR/XRT Familiarization

Number: C9638

Models Affected: 19XR/XRT

Date: 11/18/96

Purpose:

To point out the differences between the 19XL/XT and the 19XR/XRT and give information needed to service the XR/XRT.

File: Installation, Start-Up and Operation

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Background:

The 19XR/XRT are very similar in design to the 19XL/XT. It would not be false to say that if you have worked on the XL you can work on the XR. There are some differences that will be covered in an upcoming training program (slide and tape). Also, more information on the standard unit mounted starters will be included when the Start-Up, Operating and Maintenance Instructions are next revised.

Compressor Physical Differences:

The layout of the compressor is nearly identical to the 19XL the differences being these:

There are 4 frame sizes 19XR2,3,4 & 5, the largest of which, the 19XR5, is several times larger physically than the 19XL which is approximately the same size as the 19XR3.

The 19XR 3 & 4 are currently in production, the 5 will be next and the frame 2 is just starting the development phase.

New features are being developed that will appear first on the 19XR5, so do not consider this bulletin to be the final word in describing the 19XR/XRT product line.

SPACING THE IMPELLER requires a slightly different procedure than the 19XL. This will be covered in a separate bulletin, to be published shortly. The reason for a modification to the procedure is that the impeller vane contour does not follow the shroud contour exactly as it does on the 19XL. The initial production of the 19XR3 will use the 19XL procedure UNTIL an impeller is replaced. The replacement impeller will be the recontoured impeller. 19XR3 compressors as of

this writing are still using matching contour impellers. A SERIAL NUMBER CUTOFF will be provided in the BULLETIN describing the NEW IMPELLER SPACING PROCEDURE.

All 19XR4 compressors were built with the varying shroud contour and will be spaced using the modified procedure.

The compressor labyrinths are of a new design with much smaller “teeth” and a lot more of them. This design is both more effective and easier to manufacture.

The low speed shaft will no longer be held in place by the motor end bearing labyrinth as it was in the XL. This is important to remember when removing the bull gear and, or rigging the transmission assembly.

A similar change to the thrust assembly will allow the shaft to be removed from the transmission end of the high-speed assembly if the impeller has been removed. This does not complicate disassembly or reassembly but it does warrant some attention when handling the high speed. If you are used to handling the 19XL high speed you must remember not to hold the gear end of the high speed shaft without supporting the rest of the high speed assembly because the labyrinth that, in the 19XL, retained the assembly to the shaft is not there.

Motor Cooling:

MOTOR COOLING is supplied at two points on the motor. The supply that enters on the center of the motor end feeds the rotor and the internal passages in the rotor distribute the motor cooling refrigerant throughout the rotor and on to the stator. A second liquid spray enters the motor shell directly over the end turns on the inboard side of the motor. That's the end furthest from the rotor cooling feed.

There are no operating controls on the motor cooling system. Refrigerant feed is metered through an orifice at each inlet to the motor. The orifices are installed in the fittings where the refrigerant feed lines connect to the motor shell.

Oil System:

The OIL RESERVOIR in the 19XR/XRT is VENTED to the guide vane housing instead of to the suction. This makes the oil sump the lowest pressure point in the unit, which in turn, makes oil recovery easier. It also eliminates the solenoid valve assembly in the oil return system.

The OIL HEATER is 1800 watts as opposed to 1200 watts in the 19XL. They are not interchangeable with the 19XL heater. The heater is wired such that its two windings are in series for 230 volt operation and in parallel for 115 volt operation. This is common for heaters in general but is different from the 19XL.

Low load OIL RECOVERY is now a single method. The skimmer connection delivers oil and refrigerant foam to the guide vane housing where the refrigerant flashes off. An eductor moves the

oil that remains from the guide vane housing back to the oil sump.

Medium to high load oil recovery, does not utilize the skimmer line. As in the 19XL, oil coming into the compressor through the suction line follows the guide vane assembly wall and flows into the guide vane housing through a gap between the guide vane assembly and the inlet venturi. From here the oil return eductor moves the oil back to the sump.

Because the oil sump is no longer at the same pressure as the cooler, cooler pressure can no longer be used to calculate oil differential pressure. See “Oil Pressure Measurement” for a description of this new system.

Oil Pressure Measurement:

(If you have printed this bulletin from COIN, refer to Fig. 36 on page 61 of 19XR-1SS)

As cooler pressure is no longer common to sump pressure, a separate sump pressure transducer must be used together with the pump discharge transducer to determine differential oil pressure. This system has already been used on the 17EX machines.

Instead of using two separate transducer inputs to the PSIO and determining oil differential pressure internally, the transducers are compared externally and the signal entering the PSIO represents actual differential pressure.

The power supply board that produces the 5VDC required for the transducers has been redesigned to include a comparator circuit. The high and low side oil pressure transducers are connected to the appropriate terminals. The comparator subtracts the sump pressure from the pump discharge

pressure. The result is the differential pressure and that enters the PSIO at terminals J7-7&8. Since the two transducer outputs are combined into one signal, that signal, when the oil pump is not running, represents zero psid. All that is required to calibrate the oil pressure input is to ZERO the oil differential pressure point on the STATUS1 screen with the oil pump turned off. A span (high pressure point) calibration is not required.

Starters:

UNIT MOUNTED STARTERS on the 19XR/XRT and also on 19XL's shipped in Fall 1996 and later are of a new design.

The CUTLER-HAMMER WYE-DELTA STARTER utilizes a Westinghouse IQ1000II module to provide overload and phase unbalance protection. This module is covered in detail in bulletin C9632. An important feature to be aware of is that there is no separate current transformer and load resistor supplying a current signal to the SMM. The MOTOR CURRENT SIGNAL TO THE SMM comes from a 4-20mA signal from the IQ1000II. This current is directed through a 25 ohm resistor. The SMM reads the voltage drop across this resistor which is 0.5 VDC at FLA and 0.1 VDC at Zero motor amps.

Because the minimum voltage signal is 0.1, NOT Zero, the motor amps calibration on the LID has an additional step. With power to the controls, including the IQ1000II module and the motor NOT running, the motor amps point on the STATUS1 screen must be selected, and zeroed.

The calibration of running amps is done in the same manner as was done with the 19XL.

Only FLA and design volts normally need to be entered into the IQ1000II on the jobsite. All other values are entered when the starter is built. Some of the default values may have to be changed due to jobsite circumstances. For guidance, see bulletin C9632 and the IQ1000II Instruction Manual.

The BENSHAW UNIT MOUNTED SOLID STATE STARTER is a completely new design and is now equipped with a door mounted display/entry panel similar to the LID. As with the IQ1000II only FLA and design motor voltage must be entered on the jobsite. All other values will be entered when the starter is built.