General Guidelines for Using Rotary Joints Used with Thermal Oil

NOTE: Please follow your company's safety procedures whenever working on Kadant Johnson rotary joints and read all of the instructions completely before proceeding.

Please refer to the assembly drawings supplied with your Kadant Johnson rotary joint for part identification. Assembly drawings are available on request from Kadant Johnson. If you have any questions, please contact Kadant Johnson.

The SX® and EL™ rotary joints should be run dry for a few minutes at your company site before introducing thermal oil into the rotary joint. This can be accomplished by rotating the rotary joint for five minutes.

Rotary joints used with heat transfer oils require special attention during repair to ensure leak free operation.

Heat transfer oils tend to “coke” at high temperatures and deposit material which settles in the joint. Due to this, the joint should be disassembled and cleaned on a regular basis as noted in Table 1. Care must be exercised to prevent marring the sealing surfaces when cleaning. When ordering new replacement parts, always specify on your order “HOT OIL SERVICE” and indicate the maximum operating temperature.

Piping strains can force the joint out of alignment and result in leakage. Two pieces of flexible metal hose, installed perpendicular (90°) to each other, should be used at each inlet and outlet connection of the rotary joint. They should be properly supported so that piping loads are not applied directly to the joint. If a traveling loop is used, be sure to follow the recommendations of the hose manufacturer for length and proper installation, or contact Kadant Johnson.

PROCEDURES FOR STARTING NEW HOT OIL SYSTEMS

If the rotary joint begins leaking soon after its installation, disassemble and inspect the carbon seal rings for scratches or swirl marks on the flat or concave surface. These marks indicate particles are present in the oil and finer filtering mesh is required.

In order to ensure leak free service at start-up of new equipment, it is recommended that the circulating system be flushed and include a filter capable of retaining all metallic and nonmetallic foreign material that may be present in the system as they can damage the seal face.

A means of filtration should be installed before each rotary joint. The filter should remove particles 40 – 60 microns or smaller in size. Pressure gauges should be mounted up and down stream of the filter to monitor the condition of the filter element.

STEP 1.
It is highly recommended to keep the system clean. All piping should be thoroughly cleaned during construction. Cover all open piping stubs and other ports so that construction debris does not contaminate system. Make sure system is free of welding slag, metallic particles, and pipe sealers.

STEP 2.
Remove filter cartridges to accommodate the rinsing process.

STEP 3.
Bypass the rotary joint(s) so debris is not flushed into it.

STEP 4.
Flush roll(s) separately from rest of the system.

STEP 5.
Fill the system with a flushing solvent recommended by the manufacturer of the heat transfer fluid.

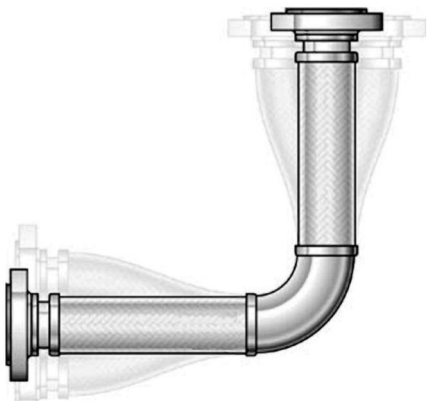
STEP 6.
Force the solvent through the system either by running the pump, by compressed air, or gravity flow. If possible, heat the flushing solvent. This will expand the piping allowing some additional debris left over from the welding to break free. Do not exceed the recommended temperature range of the flushing fluid.

STEP 7.
Continue to rinse the system until the flushing solvent is clean.

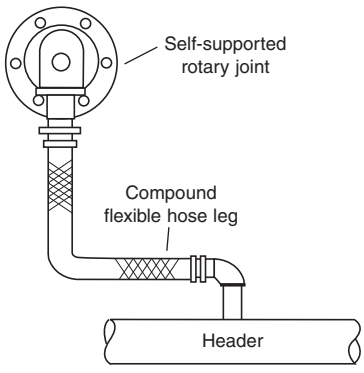
STEP 8.
Drain all the flushing solvent from the system.

STEP 9.
Install the system filter cartridges.

STEP 10.
Install the Kadant Johnson rotary joint(s).



Compound Hose



Flexible Metal Hose

STEP 11.
Fill system with the heat transfer fluid.

STEP 12.
Run system according to the manufacturer's recommendations.

STEP 13.
Check system for leaks and repair as necessary.

It is very important to maintain a clean system. The major cause of premature rotary joint failure is debris in the system. If an older system is being used, it is important to keep the piping, rolls, and rotary joints clean while service is being performed. Adequate filters must be installed in all systems.

CARBON SEAL RING REPLACEMENT

Kadant Johnson recommends replacing the nipple, wear plate, seal ring, guides, and spring when rebuilding the joint. When ordering replacement parts, they must be specified for hot oil service. They will be factory lapped and no further lapping will be required.

When field repair is being performed, thoroughly clean all components. Replace any damaged or worn parts.

Since the carbon seal ring is being used to seal a very low viscosity fluid, the seal ring, nipple, and wear plate must be properly lapped using the following guidelines.

To lap the spherical surface, mount the steel nipple tube in a lathe with its spherical collar facing toward the tailstock end of the machine. Apply a light coating of 250 to 350 grit lapping compound to the spherical surface (Figure 1). Rotating the tube at 50–100 RPM, hold the carbon seal ring against the rotating collar (Figure 2). Since the carbon will tend to dry out the lapping compound, thin the compound with mineral spirits or use water if it is a water-based lapping compound. The lapped surfaces will develop a dull matte finish when sufficiently lapped. The surface finish should be 20 Ra or less. Clean all lapping compound from sealing surfaces.

Using a lapping plate, lap the flat surface of the seal ring (Figure 3) and wear plate (Figure 4). These surfaces should be flat to three light bands or less with a polished appearance. The surface finish on both the wear plate and the seal ring needs to be 20 Ra or less.

If metal wear surfaces are scratched, pitted, or otherwise damaged, Kadant Johnson recommends replacement of the damaged parts. CAUTION: Do not attempt to machine the surfaces, as it may change the safe working pressure rating of the product.

Recommended Cleaning and Inspection Schedule

Operating Temperature Hot Oil	Months
100° – 300°F (38° – 149°C)	12
301° – 450°F (150° – 232°C)	6
451° – 650°F (233° – 343°C)	3

Table 1

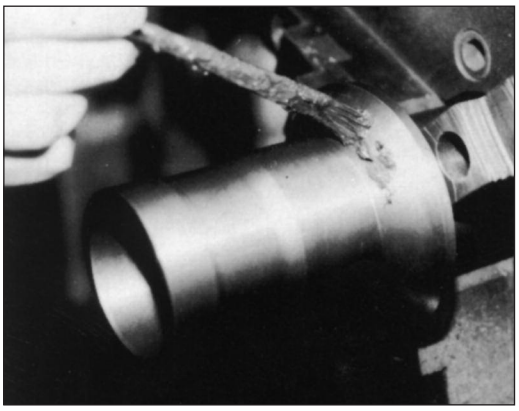


Figure 1

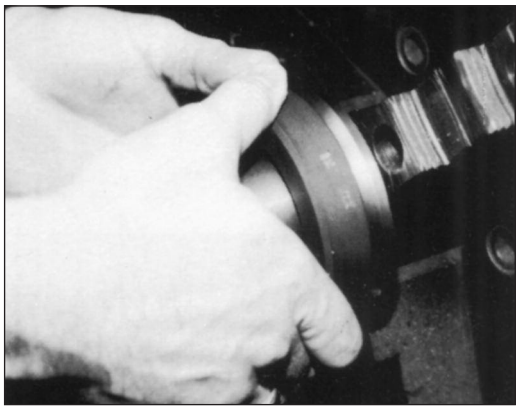


Figure 2

Figure 3

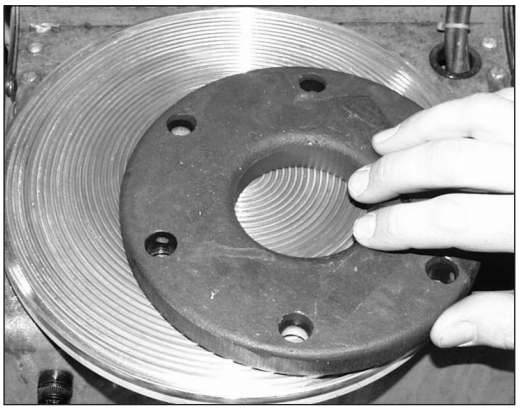


Figure 4