Aireng Pty Ltd

LUBRICATING OIL SYSTEM FLUSHING PROCEDURE

The lube oil console reservoirs have been cleaned and tested by the manufacturer prior to shipment. It is suggested, however, that the inspection doors be removed and the tank interior surfaces be thoroughly inspected and cleaned.

For the oil flushing operation to be accomplished properly within a reasonable time period, it is recommended that an outside flushing system be used as an alternative to the supplied lube system. Such outside systems typically have higher capacity tanks, pumps, filters, and heaters to increase flow rates and filter changes. This reduces required flushing time.

If the provided lube console is to be used for flushing the bearing supply and drain piping, several operational changes are required to increase oil flow and reduce flushing time. These will be addressed herein.

The best selection of piping material is stainless steel as it requires minimal flushing to obtain excellent results- When carbon steel pipe is used, it should be "pickled" prior to installation, and open ends capped to reduce oxidation. If this is not done the pipes internal surfaces will oxidize and acid flushing in place with an outside system will be required

Drain piping must have 1/2" slope per foot minimum. The vertical supply piping should be restricted to lube system pump capacity.

Connect the supply and drain piping bypassing the fan bearings or any other oil supplied device. Do not use small diameter piping as it restricts flow. Do not use soft flexible lines as these can blow off from elevated pressure and temperature. Temporary hard piping is recommended.

Cap or plug all vents.

Do not install metering devices (needle valves or orifices), flow gauges, or flow indicators as 'these restrict flow.

In systems were long piping runs are required to reach the inboard or outboard bearings, install an isolation valve near each bearing bypass connection, total of two (2). This allows oil to be circulated at higher flow rates to each loop and to bias flow to more restrictive pipe configurations.

If ''Y'' type strainer housings were not purchased by the customer, a mechanism for containing a return line filter must be provided. This is typically accomplished by constructing and installing a flanged spool piece just upstream of the lube console oil return port. All contaminants in the oil lines are therefore filtered before returning to the console. It is suggested that

this spool piece be fitted with a drain and shut off valve to facilitate return line oil removal in the event that the filter screen becomes plugged.

Filter screen/cloth size is forty (40) Micron for sleeve type bearings and ten (10) Micron for roller element type bearings. Coarser screening can be used for initial flushing periods if deemed necessary, however final system cleanliness evaluation must be made using forty (40) or ten (10) Micron screen or cloth depending on bearing type. Filter configuration can be flat plate or basket type provided any contaminants are clearly visible. Filter screening/baskets are not provided by Aireng

Fill lube console tank with flushing oil. This can be of a lower viscosity as compared to the required lubricating oil to enhance flow characteristics. Do not use acid in any solution.
Oil used specifically for flushing purposes must be removed from the tank and replaced with the proper grade lubricating oil. Any oil pumped into the lube tank must be filtered through a forty (40) micron screen

Energize immersion heaters and regulate oil temperature to 110 -120 Deg. F.

Configure the two pump/motors to run together to increase flow. Verify motor rotation.

Open shutoff valves to heat exchangers

Open all supply or isolation valves.

Adjust system relief valve for elevated flow and pressure.

Start both pumps and circulate oil. Adjust relief valve if necessary.

Hammer oil lines intermittently or attach vibrators to loosen particulate while flushing.

Check filter basket 1 to 2 hours after first start as the majority of loose contaminants will be dislodged in the initial oil surge. Clean filter and reinstall.

The lube console pressure filters must be monitored during the flushing operation. If they become plugged, cleaning or replacement is required. Aireng does not provide replacement filter elements with lube console units unless they have been specifically ordered by the customer.

Continue flushing for as long as necessary to remove all weld slag, scale, oxidation, dirt, metal cuttings, or any other particulate.

Acceptance criteria for oil system cleanliness is an eight (8) hour run through the forty (40) or ten (10) Micron screen/cloth (depending on bearing type) with zero particulate of any size present. This may- be verified by a particle count if the service is available. Particles larger than sleeve bearing oil film thickness, usually .001" 0.0015" must be minimal. Particles larger than roller

bearing operating clearances, 0.0005" max., must be minimal. After oil piping is acceptably clean, connect supply and return lines to fan bearings.

Use only one pump/motor to flush through the bearings to remove any soft particulate that will be present from the manual cleaning.
Install needle valves and flow indicators. Flow meters are not provided by Aireng however they are highly recommended to facilitate oil flow adjustment to the fan bearings.

Open all vents.

Adjust system relief valve to pressure setting that will provide specified oil flows to each bearing without flooding.

Circulate oil through bearings.

Acceptance criteria for flushing oil through the fan bearings is a four (4) hour run through the forty (40) or ten (10) micron screen/cloth (depending on bearing type) with zero particulate of any size present.

When flushing is complete remove return line screen. If flushing oil was used, remove from tank and refill with proper grade lubrication oil. It is suggested that the tank inspection doors be removed and the interior surfaces be inspected and cleaned. If the tank interior is inspected, it is suggested that the suction strainers be cleaned. If there are any questions or clarification is required, please contact Aireng.