KEYSTONE LUBRICANTS

CONTROLS FOR KEYSTONE PETROLEUM BASED
HYDRAULIC *LUBRICANTS*

		Signals Caution	Recommend Oil Change	Note
VISCOSITY @ 40ºC or 100ºF, cSt:		+/- 10%	+/- 20%	1
VISCOSITY @ 100ºC or 210ºF, cSt:		+/- 5%	+/- 10%	1
ACID NUMBER (NEUT # OR TAN):		+ 0.75	+ 1.5	2
SOLIDS (SEDIMENT), %:		0.25	0.50	3
WATER, %:		0.5	1.0	4
WEAR METALS, PPM:	Iron:	100	400	5
	Copper:	40	120	6
	Tin:	5	15	7
	Lead:	10	25	7
	(Aluminum, Chromium, Nickel):	5	10	8
CONTAMINANTS-ABRASIVE:	Silicon:	10	25	9
ADDITIVES & CONTAMINANTS:	Zinc:	--	--	10
	Phosphorus:	--	--	10
	(Sodium, Calcium, Magnesium, Barium):	--	--	11

NOTES:

1. This test measures the flowability of oil at a given temperature. Too thin an oil will have a decreased load carrying ability and results in metal to metal contact. Too thick an oil will cause an increase in friction and improper cooling. Recommend change if out of AGMA, ISO, or SAE grade.
2. This test is useful in indicating relative changes that occur in an oil under oxidizing conditions. Change if above base lines.
3. Oil and/or air filter change might be sufficient.
4. Eliminating source of water might be sufficient.
5. Check for misalignment, vibration, or corrosion in rotors, vanes, pistons, and rods, housings and bores, gears and shafts, valves.
6. Indicates wear from bearings and bushings, swash plate cups, valves, some pistons, some pump cylinders, or oil cooler tubing.
7. Indicates wear from pump thrust plate, or bushings. Tin may also be present as a oil additive, usually in conjunction with lubricants containing molybdenum compounds.
8. Less usual wear metals; aluminum is often from some pump housings, chromium can be from rods and valves, and nickel can be from gears and shafts, and bearings.
9. Silicon is typically associated with dirt contamination. This contamination can result from any condition that allows dirt to enter a component oil system. Other sources of silicon include seals, oil and coolant additives, and greases.
10. Together zinc and phosphorus usually represent zinc dithiophosphate, an anti-wear, anti-oxidant lube additive, present in varying but near equal amounts depending on the type of lubricant. Zinc is also an alloy in brass and can also represent galvanize. Phosphorus alone is usually a lube additive.
11. Sodium is used as corrosion inhibitor in oils and coolant. Calcium and Magnesium are usually detergent/dispersant additives. Barium is used as a corrosion and rust inhibitor, or a detergent additive.

TOTAL

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