


















# Seal Failure Causes

Examples of seal failures & their causes.

TYPE OF FAILURE	VISIBLE CONDITION	PROBABLE CAUSE	POSSIBLE CURE
Hardening	 <p>Hardening of the dynamic face has caused glazing and cracks.</p>	Heat generated by high speed.	Slow stoke speed or use an alternative seal device.
	 <p>Hardening of the whole seal. Loss of elasticity.</p>	<p>High fluid temperature.</p> <p>Deterioration of fluid.</p> <p>Compatibility of the seal to the fluid.</p>	<p>Lower the oil temperature.</p> <p>Renew fluid.</p> <p>Change to a different seal compound.</p>
Wear	 <p>Dynamic face is worn to a glossy mirror-like finish.</p>	Insufficient lubrication.	Check oil viscosity or use an alternative seal device.
	<p>Wear on dynamic lip of seal is egg-shaped.</p>	Rod or piston bore is not concentric	Hone to within seal specifications or replace the worn rod or cylinder tube.
	 <p>Signs of abnormal wear on one side of the dynamic lip.</p>	Worn bearing or wear ring. Excessive lateral load.	Replace bearings. Increase bearing area.

Scarring	 <p>Cut or dent on the lip.</p>	<p>Storage on a nail or peg.</p> <p>Improper installation tool.</p>	<p>Store flat in a plastic bag in a closed cardboard box.</p> <p>Installation tools should not have sharp edges.</p>
	 <p>Scratched on the dynamic side.</p>	<p>Scars on the rod or bore or foreign material in fluid.</p>	<p>Hone, polish and deburr metal parts or flush the system.</p>
Swelling	 <p>Material is soft and misshaped.</p>	<p>Absorption of fluid.</p> <p>Fluid and seal are incompatible.</p> <p>Water in the system.</p>	<p>Change the seal compound or system fluid.</p> <p>Or flush the system.</p>
Deterioration	 <p>Cracks and loss of elasticity. Material easily crumbles.</p>	<p>High fluid temperature.</p> <p>Exposure to ozone or sunlight.</p>	<p>Lower oil temperature.</p> <p>Store seals away from sunlight and arc welding area.</p>
Grooving	 <p>Axial cuts on the dynamic side.</p>	<p>Metal chips or other foreign material in system.</p> <p>Imploding air bubbles.</p>	<p>Flush System.</p> <p>Bleed air from the system.</p>
Extrusion	 <p>Extruded material on the dynamic side of heel.</p>	<p>Gap between mating surfaces is too wide.</p> <p>Worn bearings.</p> <p>Pressure extreme.</p>	<p>Employ a back ring.</p> <p>Replace the bearings.</p> <p>Use an alternative seal.</p>

Extrusion	 <p>Extruded material on the static side of the seal.</p>	<p>Uneven support surface.</p> <p>Undersized back-up ring.</p>	<p>Machine surface.</p> <p>Correct back up size.</p>
Fracturing	 <p>Chunks of material torn from the dynamic side.</p>	<p>Excessive back pressure.</p>	<p>Check relief valves.</p>
	 <p>Pressure side of seal burned and broken.</p>	<p>Explosion of residual air at high pressure. 'Dieseling'</p>	<p>Check maximum pressure</p> <p>Bleed air from system.</p>
	 <p>Long cracks in the "V" portion of the seal.</p>	<p>Frequent high pressure shocks or spikes.</p> <p>Low temperature start-up.</p>	<p>Use alternative style seal.</p> <p>Warm system before applying pressure.</p>
	 <p>Entire dynamic side breaking off.</p>	<p>Deterioration of material and/or fluid.</p>	<p>Use alternative material or seal.</p> <p>Flush system.</p>