EXAMPLES OF SEAL FAILURES AND THEIR CAUSES



| TYPE OF FAILURE | VISIBLE CONDITION | | PROBABLE CAUSE | POSSIBLE CURE | | |
|--------------------|---|--|--|--|--|--|
| HARDENING | Hardening of the dynamic face causing glazing and cracks | | Heat generated by high speed | Slow stroke speed Use alternative seal device | | |
| HAR! JENING | Hardening of the whole scal Loss of elasticity. | | High fluid temperature. Deterioration of fluid. Compatibility of scal to fluid | Lower oi-temperature. Renew Fluid Change to different seal compound | | |
| WEAR | Dynamic face is worn to glossy mirror-like finish | | Insufficient lubrication | Check of viscosity Use alternative seal device | | |
| | Wear on dynamic lip is egg-shaped | | Roc or piston bore not concentric | Hone to within seal specs Replace worn rod or cylinder tube | | |
| | Abnormal wear on one side of the dynamic lip | | Worn bearing or wear ring. Excessive lateral load | Replace bearings Increase bearing area | | |
| SCARRING | Cut or dent on the lip | | Storage on a nail or peg. Improper installation tool | Store flat in a plastic bag in a closed cardboard box Installation tools should not have sharp edges | | |
| | Scratches on the dynamic side | Company of the Compan | Scars on the rod or bore. Foreign material in fluid | Hone, polish, and de-burr metal parts Flush system | | |
| SWELLING | Materia soft and misshaped | | Absorption of fluid. Fluid and seal are incompatible. Water in system | Change seal compound or system fuid Hush system | | |
| DETERIORATION | Cracks and loss of clasticity. Material easily crumbles | | High fluid temperature. Exposure to ozone or sunlight | Lower oil temperature Store seals away from sunlight and are welding area. | | |
| GROOVING | Axia cuts on the dynamic side | | Metal chips or other foreign materral in system. Im- ploded air bubbles | Flush system Bleed air from system | | |
| EXTRUSION | Extruded material on dynamic side of heel | William . | Gap between mating surfaces too wide. Worn bearings Pressure extreme | Employ back-up ring. Replace bearings. Use alternative seal | | |
| | Extruded material on static side of sea | | Uneven support surface. Uncersize back-up ring | Machine surface. Correct back-up size | | |

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| TYPE OF FAILURE | VISIBLE CONDITION | PROBABLE CAUSE | POSSIBLE CURE | | | | | |
| | Chunks of material torn from dynamic side | Excessive back pressure | Check relief valves | | | | | |
| FRACTURING | Pressure side of seal burned and broken | Explosion of residua: air at high pressure. "Dieseling" | Check maximum pressure. Blood air from system | | | | | |
| FHACTORING | Long cracks in the "V" portion of the seal | Frequent high pressure shocks or spikes. Low temperature start-up | Use afternative style seal. Warm system before applying pressure | | | | | |
| | Broaking off of entire dynamic side | Deterioration of material and/or fluid | Use alternative material or scal. Flush system | | | | | |



For a professional analysis at SCS, Inc. of seal failure, send your damaged seals to our
Engineering Department.

1-877-905-SEAL (7325)

SEAL FAILURE INSPECTION

SEAL FAILURE INSPECTION CHECK LIST



When trying to determine the cause of a seal failure it is imperative that all aspects of the situation be investigated. Often, a seal failure points to another part of the hydraulic system that has failed or been compromised in some way. To help you determine where the potential cause of a failure lies, we have developed a seal failure check list. By filling in the necessary information you should be able to determine the cause of a failure and decide what mea-sures to take to assure future trouble free operation. If you have any questions regarding this form, please contact our sales staff at 1-877-905-SEAL (7325).

Please Fill This Out Completely

| C. Speed: Inspect the app A. Amount of I B. Condition o | lication before seal reakage: | psi psi Leng removal: ⊐ Slight | _ | min: | : | °F °F | | °F |
|--|---|---|--|--|---|--|---------------------|--|
| Inspect the app A. Amount of I B. Condition o | max: Cycles/min: lication before seal reakage: f area: | psi beng removal: □ Slight | _ | max | : <u> </u> | °F | | |
| Inspect the app A. Amount of I B. Condition o | Cycles/min: lication before seal reakage: f area: | Leng removal: □ Slight | _ | | | | | |
| Inspect the app A. Amount of I B. Condition o | lication before seal reakage: | removal: Slight | _ | | | in Averag | | |
| A. Amount of I B. Condition o | eakage:f area: | □ Slight | Γ | | | | je speed: | |
| | urce: | - | 〔 wiper lip and bolt holes | | | • | ıt | Other |
| • | - | | C | ⊐ Cylinde | er dented | | ☐ Side loa | nding present |
| □ Eccentricity of rod and cylinder head ■ Bore: □ Bore diameter out of tolerance (check entire len □ Bore is out of round □ Eccentricity of piston head and cylinder bore C. Groove: □ Groove dimensions are out of tolerance □ Surface is dirty or rusted | | | | □ Surface finish (RMS) is too smooth or too rough □ Bore is scratched or scarred □ Surface finish (RMS) is too smooth or too rough □ Surface is nicked or scratched □ Surface finish (RMS) is too smooth or too rough | | | | |
| A. Describe | the failed seal | | | | | | | |
| | | | | | | | _ | |
| | | | Size: | | M | aterial: | Pr | ofile: |
| | on: 🛭 Dynamic: 🗀 | | □ Reciproc | cating | □ Os | scillating | | |
| i. Service | length until failure: | | Seal Catalog | pages 7 | & 8 | | | |
| | Inspect externa Collision that Remove seals a A. Shaft: B. Bore: C. Groove: D. Bearing sur Inspect the sea A. Describe i. Seal type Con ii. Operatio i. Service | Inspect external cylinder conditions. Collision that caused a pressure Remove seals and inspect internal. Red diameter out. Eccentricity of rod B. Bore: Bore diameter out. Bore is out of roun. Eccentricity of pist. C. Groove: Groove dimension. Surface is dirty or D. Bearing surfaces: q Improper. Inspect the seals for signs of failure. A. Describe the failed seal. i. Seal type: Piston Part Number: Companion parts: ii. Operation: Dynamic: Static: B. Describe the conditions of failure. | □ At gland □ Between Inspect external cylinder conditions: □ Collision that caused a pressure spike in cylinder Remove seals and inspect internal cylinder conditions A. Shaft: □ Rod diameter out of tolerance (chect □ Eccentricity of rod and cylinder head B. Bore: □ Bore diameter out of tolerance (chect □ Bore is out of round □ Eccentricity of piston head and cylinder head □ Surface is dirty or rusted D. Bearing surfaces: □ Improper support causing of the seals for signs of failure: A. Describe the failed seal □ Seal type: □ Piston □ Rod Part Number: □ Companion parts: □ Rotary □ Static: □ Radial B. Describe the conditions of failure □ Service length until failure: | □ At gland bolt holes □ Between piston and respect external cylinder conditions: □ Collision that caused a pressure spike in cylinder Remove seals and inspect internal cylinder conditions A. Shaft: □ Rod diameter out of tolerance (check entire leng □ Eccentricity of rod and cylinder head B. Bore: □ Bore diameter out of tolerance (check entire leng □ Bore is out of round □ Eccentricity of piston head and cylinder bore C. Groove: □ Groove dimensions are out of tolerance □ Surface is dirty or rusted D. Bearing surfaces: q Improper support causing eccentricity Inspect the seals for signs of failure: A. Describe the failed seal i. Seal type: □ Piston □ Rod □ Static Part Number: □ Size: □ Companion parts: ii. Operation: □ Dynamic: □ Rotary □ Reciproce □ Static: □ Radial □ Face B. Describe the conditions of failure i. Service length until failure: □ | □ At gland bolt holes □ Between piston and rod Inspect external cylinder conditions: □ Collision that caused a pressure spike in cylinder Remove seals and inspect internal cylinder conditions A. Shaft: □ Rod diameter out of tolerance (check entire length) □ Eccentricity of rod and cylinder head B. Bore: □ Bore diameter out of tolerance (check entire length) □ Bore is out of round □ Eccentricity of piston head and cylinder bore C. Groove: □ Groove dimensions are out of tolerance □ Surface is dirty or rusted D. Bearing surfaces: □ q Improper support causing eccentricity □ Abnormalise the seals for signs of failure: A. Describe the failed seal □ Seal type: □ Piston □ Rod □ Static □ Radial □ Face B. Describe the conditions of failure □ Service length until failure: □ Service length until failure: | At gland bolt holes Between piston and rod | At gland bolt holes | At gland bolt holes At gland OD Between piston and rod Across piston seal O Inspect external cylinder conditions: Collision that caused a pressure spike in cylinder Cylinder dented Side load Remove seals and inspect internal cylinder conditions A. Shaft: Rod diameter out of tolerance (check entire length) Rod is scratched or scarred Eccentricity of rod and cylinder head Surface finish (RMS) is too smooth B. Bore: Bore diameter out of tolerance (check entire length) Bore is scratched or scarred Bore is out of round Surface finish (RMS) is too smooth Eccentricity of piston head and cylinder bore C. Groove: Groove dimensions are out of tolerance Surface is nicked or scratched Surface is dirty or rusted Surface finish (RMS) is too smooth D. Bearing surfaces: q Improper support causing eccentricity Abnormal wear of wear ring and/or bearing surfaces Part Number: Size: Material: Pr Companion parts: ii. Operation: Dynamic: Rotary Reciprocating Oscillating Static: Radial Face B. Describe the conditions of failure i. Service length until failure: Size: S |