Hydraulic System Failure Checklist

Hydraulic systems can be very reliable and operate for many years without problems. Then suddenly you have a problem, and you wonder what the cause is. The checklist below may help you.

Common failure points

1. **Wear due to contamination** – this is still the top cause of failures and contamination can damage internal components causing premature wear.
2. **Leaks** – due to seal wear, fittings or hose damage.
3. **Hydraulic cylinders** – wear of seals and guide rings.
4. **Hydraulic cylinders** – damage to piston rods.
5. **High fluid temperature** – due to a lack of cooler maintenance.
6. **High fluid temperature** – due to pressure relief valve setting being too low, especially in pressure compensated pump circuits.
7. **High fluid temperature -** due to failure of temperature switch.
8. **Load hold valve leakage –** due to wear and contamination**.**
9. **Pump damage –** due to suction issues such as cavitation.
10. **Oil problems –** due to water from condensation.

Wear is natural in hydraulic systems, but wear can be accelerated with oil contamination.

There are some more failure points, but these above tend to be the main that I have seen.

What can you inspect?

How can you quickly understand the health of your hydraulic system?

- Regularly sample the oil and trend. Understand the target cleanliness code for your hydraulic system and what the oil sample report is telling you. Does your oil sample meet the target cleanliness code?
- Check for leaks on pipes fittings and hoses.
- Check for leaks on cylinders.
- Check pressures on main pressure gauges and trend.
- What is the oil temperature and has it increased since last month. Trend the oil temperature readings.

- Is the noise coming from the system the same as last month.

Simple Diagnostic Table

If you see the following issues, the causes detailed below may help you understand the problem with your hydraulic system.

Issue	Possible cause
Oil temperature is high	Check cooler is operating, is there a temperature difference between the inlet and outlet pipes?
Oil temperature is high	Check relief valve settings, is the return pipe from the relief valve hot?
Leak on cylinder rod seals	Seals damaged through wear or misuse.
Leak on cylinder rod seals	Chrome plating on cylinder rod is damaged.
System noisy	Check relief valve settings.
System noisy	Check pump suction hose for damage.
Pipe or hose leaks	Tighten connections, working safely.
Pipe or hose leaks	Change seals or replace hose.

Hydraulic System Health

If your hydraulic system looks like the picture below, then the health of the system will be low. You can see signs of leakage, pump and hoses are dirty, is the suction pipe seal doing its job?

To simply define the potential health of your hydraulic systems, follow the process detailed below:

1. Fluid sample taken and cleanliness meets an ISO 4406 code set by the maintenance team.
2. There are no leaks for pipes, fittings or manifolds.
3. Fluid temperature is normally around 40 to 50 °C, if it is higher then it is an issue.
4. Pressures checked and trended.
5. System has the same noise as when it was first commissioned.

Scoring –

Mark your system out of 4 for each of the above.

4 – Completely compliant

3 – Partially compliant

2 – Partially uncompliant

1 – Completely uncompliant

Add the scores together to determine the health of you hydraulic system, which is detailed below:

Score	Health
16-20	Your hydraulic system health is good.
11-15	The system health is okay, but some minor improvements are needed.
6-10	The hydraulic system needs some major attention to improve it health.
Below 5	The health is very poor and breakdowns are a possibility.