

# Top 8 Reasons Hydraulic Hoses Fail

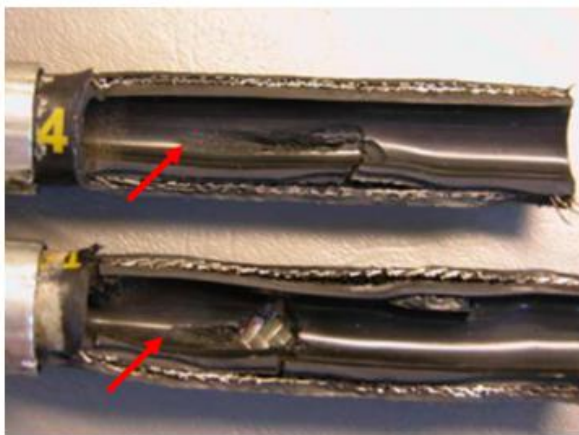
There are thousands of reasons a hydraulic hose can fail, but often, the most common failures could have been avoided with proper precautions. Below are eight of the most common reasons for hose failure and how to protect against them.

- Tube erosion
- Fluid compatibility
- Dry air / aged air
- Minimum bend radius
- Insertion depth
- Improper assembly
- Heat aged
- Abrasion

## 1. Tube erosion

Hydraulic hose tube erosion often causes external leakage. Tube erosion is usually caused by a concentrated high-velocity stream of fluid or by small particles in the fluid. The red arrows in the image point to the start of the erosion.

In order to avoid tube erosion, use Hose flow capacity nomogram to determine the proper hose size based on the recommended maximum velocities. Also, be sure that the hose assembly is not bent too tight for flow and that the fluid medium is not too abrasive for the inner tube of the hose. It is important to follow the maximum bend radius noted in the engineering specifications for each hose, as well as diameter, during the assembly process.



## 2. Fluid compatibility

System contamination and external leakage can be a direct result of fluid compatibility issues. Incompatible fluids will cause the inner tube of the hose assembly to deteriorate, swell, and delaminate. The inner tube can also partially wash out in some cases. The hose you order must be compatible with the fluid being conveyed.



## 3. Dry air / aged air

The inner tube of hoses can develop numerous tiny cracks due to aged or dry air. This type of failure is sometimes hard to spot because the hose will remain flexible, however there will be signs of external leakage. Typically, there are no signs of cracking on the hose under the fittings.

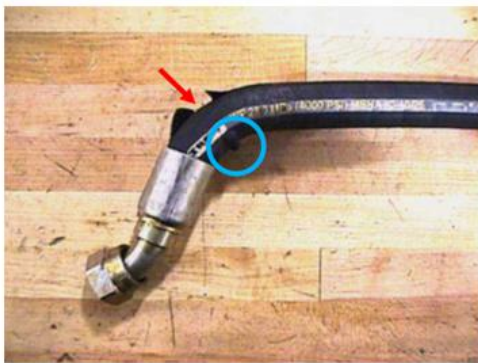
To avoid dry or aged air problems, confirm your hose is rated for extremely dry air. Hoses with inner tubes of PKR or EPDM rubber are preferred for these applications. If possible, raise the dew point of the air.



#### 4. Minimum bend radius

Hose assemblies can fail relatively quickly if the minimum bend radius is not met. In this image, it is obvious that the tube and cover physically ripped apart at the outside of the bend, noted by the red arrow. The blue circle indicates where the tube and cover are buckled at the inside of the bend.

In vacuum or suction applications, if the bend radius is exceeded, the hose may tend to be flat in the bend area. This will hinder or restrict flow. If the bend is severe enough, the hose may kink. To prevent minimum bend radius hose failures, double-check the recommended bend radius. Replace hose assemblies and change routing, length, or fittings to route the hose within the published minimum bend radius if they do not comply.



#### 5. Insertion depth

When a hose assembly is not properly assembled, it can create very dangerous situations. Fittings need to be pushed on completely to meet the recommended insertion depth. If the hose insertion depth is not met, fittings can blow off, leaving a failed hose assembly. The last grip in the fitting shell is essential to the holding strength.



## 6. Improper assembly

Contamination can cause several problems for a hydraulic hose assembly. When cutting a hose, metal particles and debris can settle inside the hose if not properly flushed. This abrasive debris left in the hose will contaminate the hydraulic system. It can also cause small fractures to develop on the inner tube of the hose assembly, resulting in leakage.

To prevent hose failures from contamination, the hose must be properly cleaned before inserting the fittings. The inner tube should be “squeaky-clean” before fittings are inserted. After the fittings are crimped, be sure to cap the ends in order to keep the hose clean and avoid recontamination during transport.



## 7. Heat aged

Hose failure can occur from overheating the hose assembly. Overheating will cause the hose to become very stiff. The inner tube will harden and begin to crack because the plasticizers in the elastomer will break down or harden under high temperatures. In some cases, the cover may show signs of being dried out. The hose assembly may remain in its installed shape after being removed from the application and if flexed, audible cracking can be heard.

In order to prevent overheated hydraulic hose assemblies, confirm hoses are rated for the temperatures required by your application. Also, reduce ambient temperatures or use heat guards and shields to protect the hose from nearby high-temperature areas.



## 8. Abrasion

Hydraulic hoses are put through rigorous applications every day, which eventually take their toll. If not inspected on a regular basis, abrasion can cause a hose assembly to burst and leak. Excessive rubbing of the hose against an external object or even another hose can wear away the cover and eventually the reinforcement layers.

The cover is meant to protect the hose, so signs of damage to the cover or reinforcement layers should warn you that something is wrong. Protective sleeving is available to better protect against abrasion.

