

- 1) **Mis-application** - Perhaps the greatest cause of failure is using a hose, fitting, or clamp in an application that it is not designed for.
- 2) **Kinking at or near the fittings** - Once the barb of the fitting cuts into the tube of the hose, the product being conveyed can escape into the reinforcement and eventually lead to bubbling or blistering of the cover within several feet of the end.
- 3) **Temperature Exposure** - As temperature increases pressure ratings decrease. Excessive hot or cold temperatures will lead to discoloration, cracking, or hardness - as well the build up of static electricity if hose wire has not been ground properly.
- 4) **Surging or excessive working pressure** - Usually a large burst with torn reinforcement, typically along the outside of a bend.
- 5) **External damage to hose carcass** - Kinks, crushed sections, and cover damage which exposes reinforcement will eventually break down the reinforcement and lead to a hose failure.
- 6) **Exceeding the minimum bend radius** - Kinking, crushing, or forcing a hose to bend beyond its minimum bend radius (measured from the inside edge of the hose, not the centerline). This is commonly seen on high pressure hoses or vacuum hoses.
- 7) **Defective hose or improperly installed or selected clamp** - Failure from a defective hose will typically occur in the first few hours of service, such as pin holes, blow-outs, or tube and cover separation. Improperly installed or selected clamps can result in the coupling ejecting from the end of the hose. Always confirm the manufacturer recommendations based on STAMPED information.
- 8) **Tube or cover not compatible with fluids or environment** - Usually results in discoloration, swelling, sponginess, or the breakdown of the hose carcass. For material handling hoses, always rotate to ensure even wear of the hose tube.
- 9) **Old age** - Hose is not 'pipe', it is a flexible component that will degrade over time. Shelf or service life will range from 1 to 20+ years, depending on its composition, application, and environment. Older hoses become discoloured, stiff, or burst at low pressures.
- 10) **Incorrect hose length** - Too short of a length does not allow the hose to expand/contract due to changes in pressure or temperature and causes excessive stress on the fittings or hose reinforcement.
- 11) **Twisting hose during installation or service** - Twisting a hose rather than naturally bending the hose will reduce life. It is estimated a 7% twist when installing a hose in a permanent application can reduce hose life by 90%.
- 12) **Poor workmanship** - Hose and fittings are made of a unique blend of different materials with complex manufacturing methods - human error, inconsistent machinery, or poor product quality or raw materials can result in defects or variances greater than allowable tolerances. As for failure at the end fitting, ends blowing off assemblies can be a result of sub-standard coupling procedures or due to the "mixing-and-matching" of incompatible hose, couplings, or clamps.
- 13) **Contaminated media being transferred** - Foreign particles or residue in the fluid or air can flow through the tube and break it down or wear it out prematurely. Always clean hoses prior to installing in field to ensure there is no cross-contamination.

### HOW TO MEASURE "OVERALL LENGTH" (OAL)

When assembling a hose, it is important to note when the "overall length" (OAL) is critical. In most industrial applications (such as water or general purpose) the OAL is not critical, but in many hydraulic applications the OAL can be critical due to space restrictions. The OAL of a hose assembly can be determined by measuring a hose assembly from end-to-end. The following illustrates how to correctly measure specific end configurations (hose should NOT be taut when installed):

- Male threaded ends are measured from the end of their threads (refer to figure AC.1)
- Female threaded ends and Flanged ends are measured from their sealing surface (refer to figure AC.2 & AC.3)
- Angled ends are measured from the center of their sealing surface (refer to figure AC.3 & AC.4)

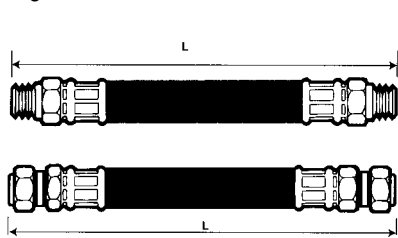


Figure AC.1

Figure AC.2

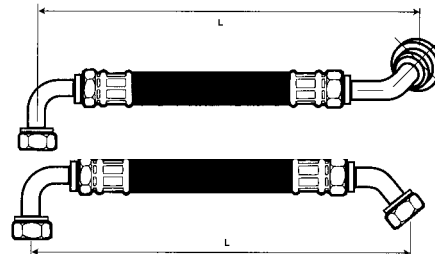


Figure AC.3

Figure AC.4

### HOW TO DETERMINE 'OFFSET ANGLES'

There are two ways to determine the orientation of offset angles:

- 1) **Far End Reference - Measured Clockwise:** Using the furthest end as a base reference the angular displacement is measured clockwise to the center line of the far end (refer to figure AC.5).
- 2) **Near End Reference - Measured Counter-Clockwise:** Using the nearest end as a base reference the angular displacement is measured counter-clockwise to the center line of the far end (refer to figure AC.6).

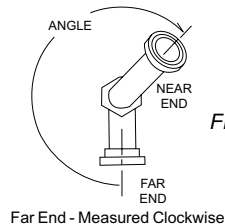


Figure AC.5

Far End - Measured Clockwise

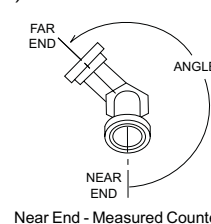


Figure AC.6

Near End - Measured Counter Clockwise

**NEW '09**