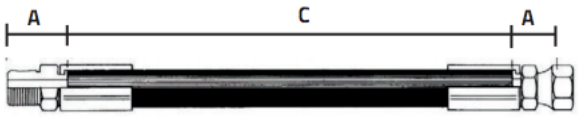
HOSE ASSEMBLY INSTRUCTIONS

CRIMPING METHOD

1) Calculate the length of the hose to be cut (C). The hose cut length for a hose assembly is calculated by subtracting the cut-off factor (distance from the bottom of the ferrule end of the fitting), denoted as A.



2) Cut the hose at right angles to the desired length using a specific disc cutter. Once the cut is done, make sure that there are no residues within the tube.

3) Ensure that the hose is cut squarely and clean the hose bore.

D) In certain situations, skiving may be required (= the process of removing the cover of the hose to allow the proper installation of crimped hose ends). Please ask for our crimping chart to check the length of the skiving suitable for the fitting used.

4) Insert the ferrule on the hose, insert the tang and -if necessary- lubricate with compatible hydraulic oil.

The 2piece crimped fitting consists of a a ferrule and a stem insert. it is essential to match the fitting with a compatible hose type.

5) The shoulder of the stem should make contact with ferrule, if you install an elbow make sure the angle is right.

6) Before carrying out the pressing, with the aid of a gauge, the internal diameter of the shank in the vicinity of the centerline should be measured.

7) Choose the most suitable dies to perform the pressing. Place the end of the tube between the punches ensuring that the positioning is such as to allow the pressing of the entire length of the busing. Press up to the dimension indicated in the crimping chart.

8) Check the internal diameter of the stem with go - no go gauge to ensure the compliance with the values given in the tables of collapse of pressing.

9) It is good practice to examine the assembly prior to delivery or use. The level of control must be in accordance with the quality plan.

<u>VISUAL AND DIMENSIONAL INSPECTION:</u>

A. Clean and flush to remove dust, chips, gum etc.

B. Apply caps to keep out contamination

C. Apply labels if required

Following the recommended practices for hose and fitting assembly and installation, you will achieve a longer service life and greater safety.

Satisfactory performance and appearance also depend upon proper hose installation.

Excessive length destroys the trim appearance of an installation and adds an unnecessary cost to the equipment. Hose assemblies of insufficient length to permit adequate flexing, expansion or contraction will cause poor power transmission and shorten the life of the hose.

CORRECT INSTALLATION

ABRASION

Run the hose in the installation, so that it avoids rubbing and abrasion. Clamps are often required to support long hose runs or to keep hose away from moving parts. Use clamps of the correct size; a larger clamp allows the hose to move and causes wear. **Fig. 1**

APPEARANCE

Rotate the hose directly by using 45° and/or 90° adapters and fittings. Avoid excessive hose length to improve appearance. **Fig. 2**

COLLAPSE

To avoid hose collapse and flow restriction, keep hose bend radius as large as possible. Refer to hose specification tables for minimum bend radius. **Fig. 2**

HIGH HEAT

High temperatures shorten the hose life, so make sure the hose is kept away from hot parts. If this is not possible, insulate the hose with a protective sleeving. **Fig. 3**

LENGTH CHANGE

When the hose installation is straight, allow enough slack in the hose line to prevent length changes that will occur when pressure is applied. **Fig. 4**

MOVEMENT / FLEXING

Adequate hose length is necessary to distribute movement on flexing applications and to avoid abrasion. **Fig. 5**

REDUCE CONNECTIONS

Reduce the number of pipe thread joints by using hydraulic adapters instead of pipe fittings. **Fig. 6**

STRAIN

Elbows and adapters should be used to relieve strain on the assembly, and to provide neater installations which will be more accessible for inspection and maintenance. **Fig. 7**

When the radius is below the required minimum, use an angl adapter to avoid sharp bends. **Fig. 8**

TWIST

Prevent twisting and distortion by bending the hose in the same plane as the motion of the port to which the hose is connected. **Fig. 9**

While installing the hose, make sure it is not twisted. Pressure applied to a twisted hose can result in hose failure or loosening of connections. **Fig. 10**

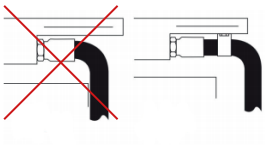


Fig. 1

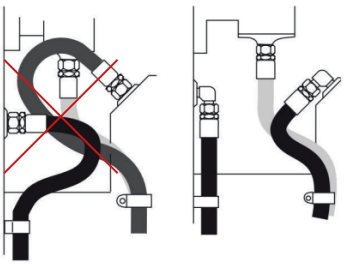


Fig. 2

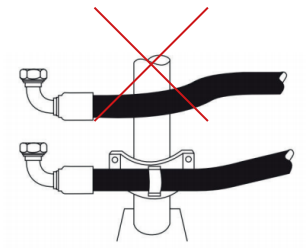


Fig. 3

Fig. 4

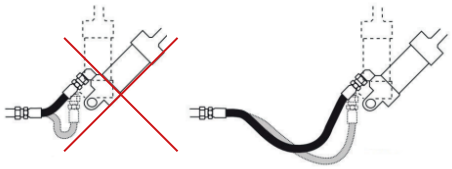


Fig. 5

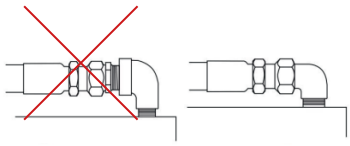


Fig. 6

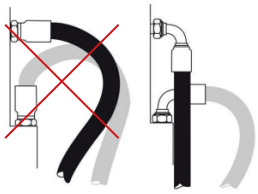


Fig. 7

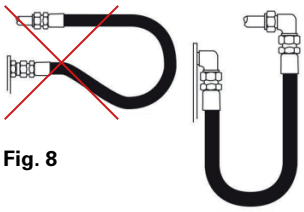


Fig. 8

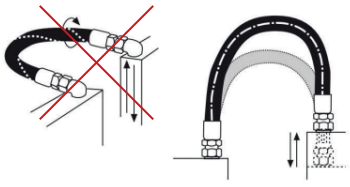


Fig. 9

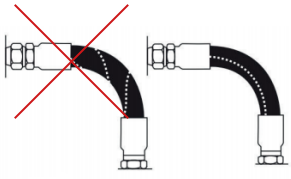


Fig. 10

a. Certain couplings require the use of an O-Ring. If it is missing, replace it if an O-Ring is used; check for damages caused during installation or possible material breakdown from heat or uid incompatibility.

b. Check the threads and/or seat angles on both mating surfaces for damage that may have occurred prior to or during installation. Any ding or burr may be a potential leak path.

c. If the coupling was misaligned during installation, threads may have been damaged. Replace and carefully install.

d. Over-torquing of a threaded connection can damage threads and mating seat angles. Over-torquing can also damage the staking area of the nut, causing cracking of either the nut or seat. Under-torquing does not allow proper sealing. The use of a torque wrench can alleviate such problems.

HOSE TWIST

Replace and reroute the hose to ensure that bending occurs only in one plane. The use of bent tube or block-style couplings and adapters may improve routing.

Also, when installing the assembly, hold the backup hex to prevent it from turning and applying a twist.

NOTES AND SUGGESTIONS

IMPORTANT NOTE FOR USERS

Hose assemblies require caution in use not only to provide long service life but also to guard against potentially dangerous failure.

Serious injury, death and destruction of property can result from the rupture of a hose assembly that is damaged, worn out, or which have been badly assembled or incorrectly installed. Users should follow good maintenance practices and establish a program of inspection, testing and replacement of hose assemblies before failure occurs, documenting the maintainance and taking into account factors including:

- severity of the application
- frequency of equipment use
- past performance of hose assemblies.

Only proper trained persons should inspect, test and service hose assemblies and this training should be upgraded regularly.

Users should carefully observe the precautions listed below and follow closely our recommendations for the selection of hose and couplings. Care should be taken not to go below the minimum bend radius listed for each hose size and type. Maximum operating pressure and temperature should not exceed the pressures listed.

In addition, instruction for assembling fittings to different hoses should be followed carefully to ensure the safe performance of the complete assembly.

Improved safety and longer service life will result by following the recommendations on hose assembly routing and installation.

SALIENT INFORMATION

Highly pressurized gas and/or oil escaping from a small pinhole can be almost invisible and, yet, exert extreme force capable of penetrating the skin and other body tissues, causing possible severe injury.

Hot fluids or chemicals can cause severe burns.

Pressurized fluids, if released uncontrolled, can exert a tremendous explosive force. Some fluids are highly flammable.

PRECAUTIONS

Always position a shield between you and any pressurized line when working nearby or shut the pressure off. Wear safety glasses. Do not use your hands to check for leaks.

Do not touch a pressurized hose assembly with any part of your body; if fluid punctures the skin, even if no pain is felt, a serious emergency exists: obtain medical assistance immediately, because the risks can result in the loss of the injured body part or even death.

Stay out of hazardous areas while testing hose assemblies under pressure. Use proper safety protections. If an injury or reaction occurs, get medical attention right away.

Hoses (and hose assemblies) have a limited life depending on the hose service conditions; subjecting hoses (and hose assemblies) to more severe conditions than the recommended limits (i.e. continuous use at maximum rated working pressure, maximum recommended operating temperature and minimum bend radius) will reduce service life.

ROUTING

Attention must be given to optimum routing to minimize the inherent problems.

Restrain, protect or guide hose with the help of clamps where necessary to minimize damages due to excessive flexing, whipping or contact with other moving parts or corrosives.

Determine hose lengths and configurations that will result in proper routing and protection from abrasion, snagging or kinking and provide leak resistant connections.

RADIATION

Radiation affects all materials used in hose assemblies. Since the long-term effects may be unknown, do not expose hose assemblies to atomic radiations.

MECHANICAL LOADS

External forces can significantly reduce hose life. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius and vibration. Use of swivel type fittings or adaptors may be required to ensure no twist is put into the hose. Unusual applications may require special testing prior to hose selection.

ABRASION

Hoses are designed with a reasonable level of abrasion resistance, but care must be taken to protect the hose from excessive abrasion which can result in erosion, snagging and cutting of the hose cover. Exposure of the reinforcement ill significantly accelerate hose failure.

SPECIFICATIONS AND STANDARDS

When selecting hose and fittings, government, industry and manufacturer's specifications must be reviewed as applicable.

STATIC-ELECTRIC DISCHARGE

Fluid passing through the hose can generate static electricity resulting in static electric discharge. This may create sparks that can puncture the hose. If this potential exists, select hose with sufficient conductivity to carry the static-electric charge to the ground.

MINIMUM BEND RADIUS

Installation of a hose at less than the minimum listed bend radius may significantly reduce the hose life. Particular attention must be given to avoid sharp bending at the hose/fitting juncture.

TWIST ANGLE AND ORIENTATION

Hose installations must be designed in order to avoid hose twisting.

SECUREMENT

In many applications, it may be necessary to restrain, protect or guide the hose to protect it from damage by unnecessary flexing, pressure surges and contact with other mechanical components. Care must be taken to ensure such restraints do not introduce additional stress or wear points.

PROPER CONNECTION OF PARTS

Proper physical installation of the hose requires a correctly installed port connection while ensuring that no twist or torque is transferred to the hose.

EXTERNAL DAMAGE

Proper installation is not complete without ensuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage or damage to sealing surfaces are corrected or eliminated.

UNINTENDED USES

Hose assemblies are primarily designed for the internal forces of the conducted gas and/or oil.

Do not pull hose or use it for purposes that may apply external forces for which the hose or fittings were not designed.

HOSE AND FITTING MAINTENANCE INSTRUCTIONS

Even with proper selection and installation, hose life may be significantly reduced without a continuing maintenance program. Frequency should be determined by the severity of the application and risk potential. A maintenance program must be established and followed to include the following as a minimum:

- visual inspection hose/fitting
- visual inspection all other

VISUAL INSPECTION HOSE/FITTING

Any ot the following conditions require immediate shut down and replacement of the hose assembly:

- Damaged, cut or abraded cover (any reinforcement exposed.
- Hard, stiff, heat cracked or charred hose.
- Cracked, damaged or badly corroded fittings.
- Leaks at the fitting or in the hose.
- Kinked, crushed, flattered or twisted hose.
- Blistered, soft, degraded or loose cover.

VISUAL INSPECTION ALL OTHER

The following items must be tightened, repaired or replaced as required: leaking port conditions, clamp, guards, shields, system fluid level, fluid type and any air entrapment.

Remove excess dirt.

PERIODIC INSPECTIONS

Periodic hose assembly inspections can prevent unwanted and unexpected assembly failures.

During normal operations, be aware of how the equipment sounds, feels etc. Be sure to check any noticeable abnormalities.

Hose inspection can vary by equipment type. Refer to your equipment manual and always follow the manufacturer's inspection recommendations.

If the recommendations are not available, use the following guidelines:

- Inspect stationary equipment every three months
- Inspect mobile equipment every 400 to 600 hours or every three months, whichever comes first.

Other factors that influence inspections include:

- Whether the equipment is critical to the operation
- Operating pressures and temperatures
- Difficult routing conditions
- Extreme environmental factors
- Accessibility of equipment

EQUIPMENT CHECKLIST

Here is a checklist to help keep your equipment running strong:

1. First, turn off and lock out the equipment's power
2. Place the equipment and components in a safe and / or neutral position
3. Remove access panels and inspect hose and fittings for damage or leaks
4. Repair or replace assemblies as needed
5. Inspect other hydraulic components
6. Reinstall access panels
7. Turn power back on
8. Pay attention to unusual noises, vibrations, etc.