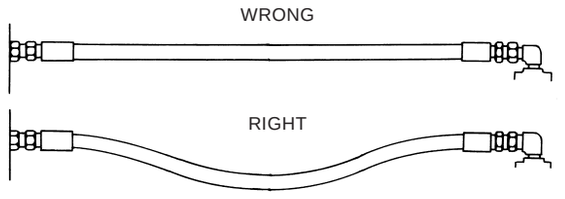
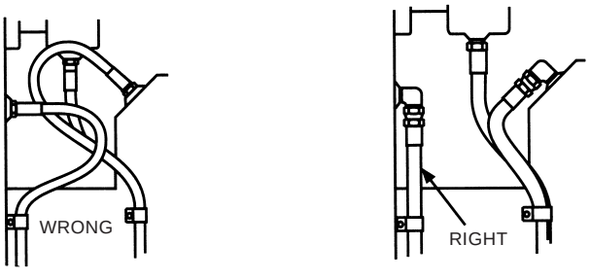
CORRECT ASSEMBLY INSTALLATION

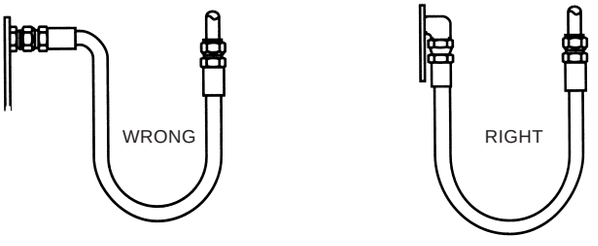
Satisfactory performance and appearance depend upon proper hose installation. Excessive length destroys the trim appearance of an installation and adds unnecessarily to the cost of the equipment. Hose assemblies of insufficient length to permit adequate flexing, expansion or contraction will cause poor power transmission and shorten the life of the hose.
The diagrams below offer suggestions for proper hose installations to obtain the maximum in performance and economy.



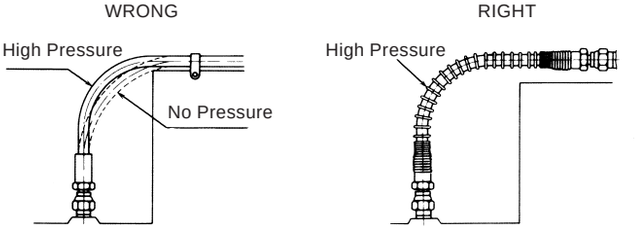
Since hose may change in length from +2% to -4% under the surge of high pressure, provide sufficient slack for expansion and contraction.



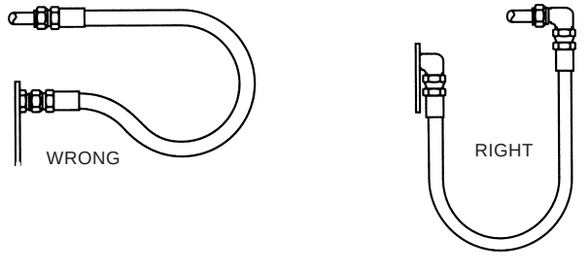
Obtain direct routing of hose through use of 45° and 90° adapters and fittings. Improve appearance by avoiding excessive hose length.



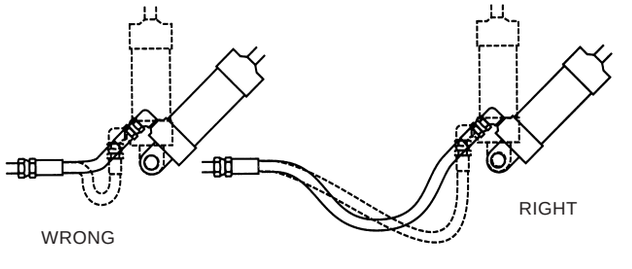
Avoid sharp twist or bend in hose by using proper angle adapters.



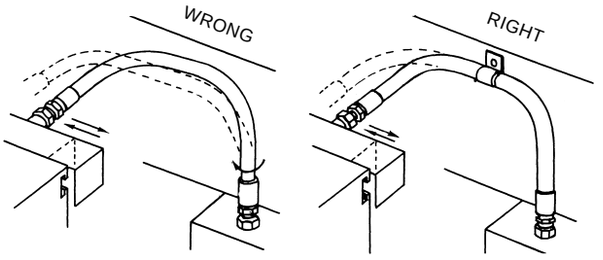
Due to changes in length when hose is pressurised, do not clamp at bends so curves absorb changes and protect the hose with a spring guard. Do not clamp high and low pressure lines together and protect the hose with a spring guard

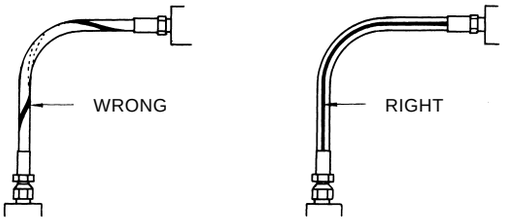


Where the radius falls below the required minimum, an angle adapter should be used as shown above to avoid sharp bends in hose.

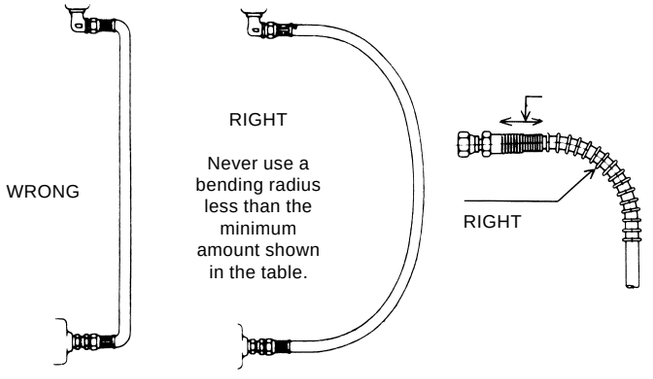


Adequate hose length is most important to distribute movement on flexing applications and to avoid abrasion.



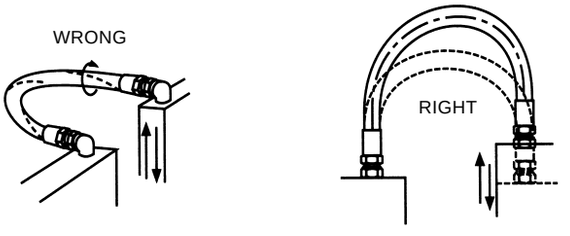


To avoid twisting in hose lines bent in two planes, clamp hose at change of plane, as shown.



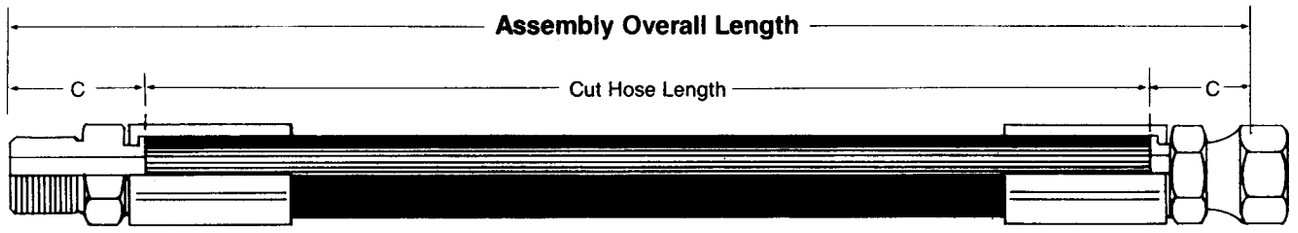
To prevent twisting and distortion, hose should be bent in the same plane as the motion of the boss to which the hose is connected.

Hose should not be twisted
Hose is weakened when installed in twisted position. Also pressure in twisted hose tends to loosen fitting connections. Design so that machine motion produces bending rather than twisting.



Never use a bending radius less than the minimum shown in the hose specification tables. Avoid sharp bend in hose to reduce collapsing of line and restriction of flow by using proper spring guard. Exceeding minimum bend radius will greatly reduce hose assembly life.

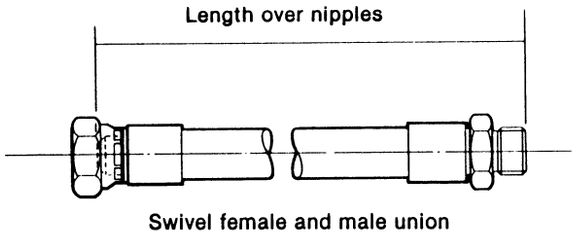
How To Determine Correct Assembly Length

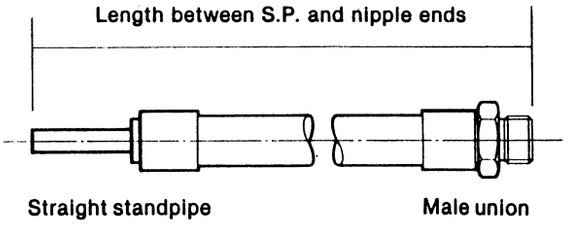


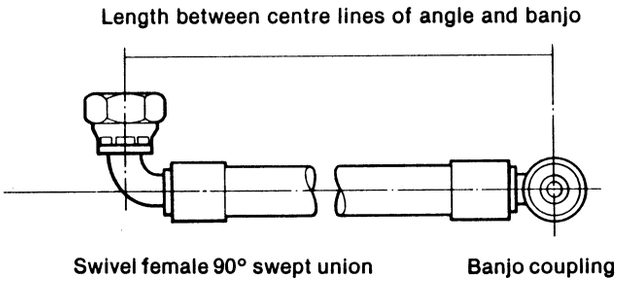
For most assemblies, the correct assembly length may be determined by direct measurement of the equipment or a drawing. Minimum bend radii as shown in the hose specification tables should be observed.
Assemblies are measured to the end of the seal.

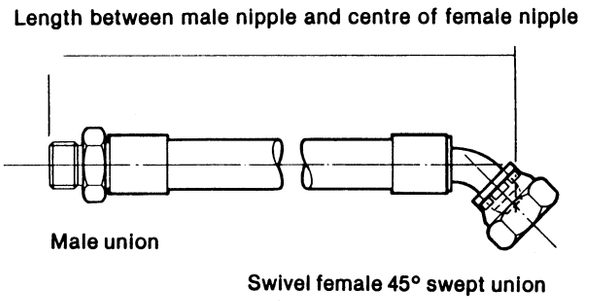
To determine the length of hose needed in making assemblies with permanent or reusable couplings, subtract Dimension "C" (Cut off factor) for each coupling from the required overall assembly length. Dimension "C" may be found in the coupling specification tables.

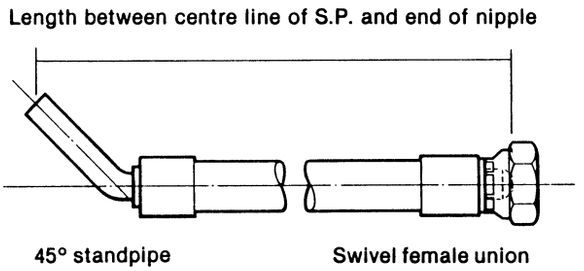
How To Measure Assemblies

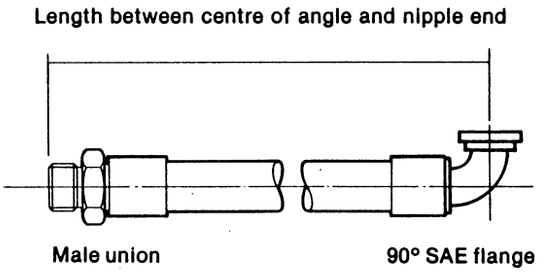




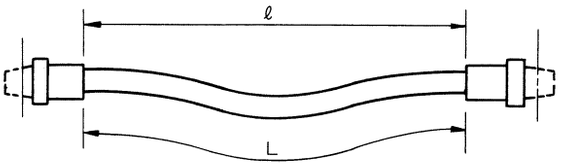








Remember that hydraulic hose under pressure will elongate up to 2% of its length or contract up to 4% depending on pressure, type and size. Sufficient allowance should be made to permit such changes in length.



$L \geq l\,(1+0.04)$

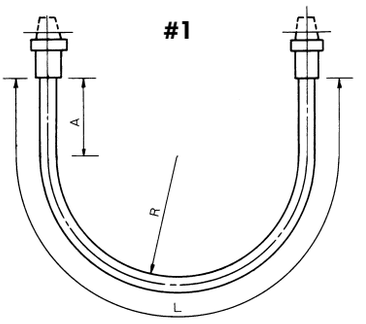
Occasionally an assembly will be required similar to the sketches to the right. The following equations are helpful in determining the correct length:

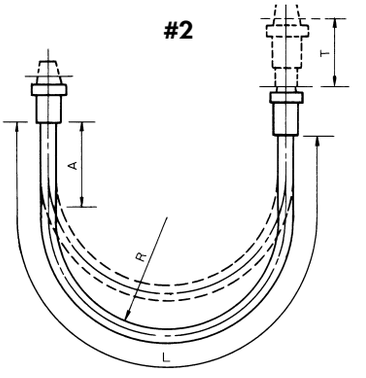
FOR 180° TURN APPLICATIONS

#1 L = 2A + π R

#2 L = 2A + π R + T

L = overall length of the hydraulic hose assembly, in mm or inches.
A = allowance for a minimum straight section of hydraulic hose at each end of the assembly, measured from the outer end of each coupling, in mm or inches. These two straight sections are necessary to prevent excessive stress concentrations directly back of the couplings. See table below.
R = bending radius of the hose, in mm or inches. See hose specifications tables.
T = amount of travel, in mm or inches.
Often right angle adapters provide a convenient means of avoiding too small a bend radius.





Hose	in	1/4	5/16	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
I.D.	mm	6.4	7.9	9.5	12.7	15.9	19	25	31.8	38.1	50.8
Min	in	5	5	5	6	6	7	8	9	10	11
"A"	mm	127	127	127	152	152	178	203	229	254	279

Length Tolerance for Hydraulic Hose Assemblies and Specified Hose Lengths

Length	Tolerance
For lengths from 0 up to and including 12" (305 mm)	±1/8" ± 3 mm
For lengths >12" (305 mm) £ 18" (457 mm)	±3/16" ± 5 mm
For lengths >18" (457 mm) £ 36" (914 mm)	±1/4" ± 6 mm
For lengths >36" (914 mm) £ 48" (1219 mm)	±3/8" ±10 mm
For lengths >48" (1219 mm) £ 72" (1830 mm)	±1/2" ±13 mm
For lengths >72" (1830 mm)	±1%
Elbow angle and angle of Orientation	Tolerance ±3

Angle Couplings

A - To measure angle of offset of a hose assembly, point one end of coupling "A" (the nearest) to a vertical position downward. The angle can then be measured from the centreline of this vertical coupling in an anticlockwise direction to the centreline of coupling "B" (the far coupling) (see illustration).

Relationships can then be expressed from 0° to 360°. If angle not given elbows are positioned at 0°.