Hydraulic & Offshore SUPPLIES

Hose Manufacturing Data

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R&G FLUID POWER GROUP

HOSE MANUFACTURING DATA

STORAGE

Detailed recommendations for storage of product are contained in BS 5244, 1986 (1991).
Tables 1, 2 and 3 of this document are produced with the kind permission of BSI.

Hose & Hose Assemblies Stored as Separate Items

Before fitting, all hose assemblies should be subjected to visual examination for evidence of deterioration.

The recommendation in Tables 1 and 2 apply to stored hoses and assemblies, depending on their age.

TABLE 1
TEST RECOMMENDATIONS FOR RUBBER HOSES

AGE	RECOMMENDATIONS
Up to 3 years	Use without further testing
3 to 5 years	Use after representative samples subjected to a proof pressure test
5 to 8 years	Use after representative samples subjected to proof, impulse and burst pressure tests, and cold bend and electrical tests
Over 8 years	Scrap

TABLE 2
TEST RECOMMENDATIONS FOR RUBBER HOSES ASSEMBLIES

AGE	RECOMMENDATIONS
Up to 3 years	Use without further testing
3 to 5 years	Use only after subjecting each assembly to a pressure test of 1.5 x design working pressure and representative samples to a burst pressure test
5 to 8 years	As for 3 to 5 years plus impulse pressure test and cold bend and electrical tests on representative samples
Over 8 years	Scrap

TABLE 3 TEST RECOMMENDATIONS FOR STORED EQUIPMENT	
AGE	**RECOMMENDATIONS**
Up to 3 years	Use without further testing
3 to 5 years	Use only after subjecting each assembly to a pressure test of 1.5 x design working pressure and representative samples to a burst pressure test
Over 5 years	Scrap

NOTE 1: It is important that hose assemblies fitted to stored equipment should be filled with the operating fluid with which they will be used on that equipment.

NOTE 2: It is highly recommended that hose assemblies fitted to stored equipment in conditions of extreme temperature, humidity or ozone concentration (strong sunlight) should be tested after 1 year according to the criteria stipulated for 3 to 5 year old assemblies.

TABLE 4 TEST RECOMMENDATIONS FOR THERMOPLASTIC HOSE	
AGE	**RECOMMENDATIONS**
Up to 5 years	Use without further testing
5 to 8 years	Use after representative samples subjected to proof pressure test
8 to 12 years	Use after representative samples subjected to proof, impulse and burst pressure tests, and cold bend and electrical tests
Over 12 years	Scrap

TABLE 5 TEST RECOMMENDATIONS FOR THERMOPLASTIC HOSE ASSEMBLIES	
AGE	**RECOMMENDATIONS**
Up to 5 years	Use without further testing
5 to 8 years	Use only after subjecting each assembly to a pressure test of 1.5 x design working pressure and representative samples to a burst pressure test
8 to 12 years	As for 3 to 5 years plus impulse pressure test and cold bend and electrical tests on representative samples.
Over 12 years	Scrap

ROUTING

In general, routing should be such that bends lower that minimum bend radius or tensile loading of the hose assemblies must be avoided. The minimum bend radius is measured to the inside of the bent hose and the length of the assembly should be such that there is a 25mm long straight portion of the hose at the inlet to each end fitting. Where abrasion of the product is likely, consideration should be given to extra protection. This can be provided in the form of steel or plastic spring guarding over the external surface of the hose preventing exposure to damage.

To this end, specific attention must be paid to the movement of the hose when operating between components of a hydraulic system which move relative to each other. It is advisable to ensure that hose is routed such that there is no bending of the hose within 25mm of the end fitting to which it is attached and that where possible, assemblies are not manufactured with swept elbows at either end. When deciding the routing of hose assemblies specific attention should also be paid to clipping and/or clamping hoses at appropriate points.

INSTALLATION

Before attempting to connect a hose assembly it is essential to ensure that the joining surfaces are completely free from foreign matter and from burrs, flash or fins. Damage to these surfaces, especially where metal to metal cone connections are concerned, may result in leakage. Also, hose assemblies should have been cleaned internally to avoid any contamination entering the system which may be residue of the hose assembly manufacture.

PROBLEM	POSSIBLE CAUSE & MISAPPLICATION	SOLUTION
Hose bursts on outside of bend and is out of shape.	Hose bent too tight in routing. Reinforcement opened up too much on outside bend.	Increase hose length, also may be able to use different end fittings, i.e. swept 90 instead of straight.
Coupling blows off end when under pressure.	Incorrect coupling used. Couplings not crimped to correct swage dimension. Coupling not fully inserted. Hose not correct skived. Hose too short, twisted or bent too tight.	Check hose coupling compatibility, check swage information. Does routing cause excessive stress on assembly.
Hose liner swells or deteriorates, blocking fluid flow or leaking	Hose liner is not compatible with fluid. Temperature may be a factor.	Before making assembly, identify fluids and temperature in use. Check compatibility.
Wire reinforcement is rusty at site of hose burst.	Hose cover broken by cutting, abrasion, extreme temperatures, chemical attack, improper cover skiving, internal gas caused by blisters.	Use hose guard, nylon sleeve, anti-abrasive cover hose. Check temperature & fluid compatibility. Cover may require perforating.
NOTE: IN SOME INSTANCES, FAILURE MAY BE CAUSED BY PREVIOUS REPAIRS.		

FACTORS AFFECTING SERVICE LIFE

Main Causes

* Excessive Pressure
* Abuse
* End of Working

Contributory Factors

* Installation
* Below recommended minimum bend radius
* Twisting
* Pulling
* Temperature extremes
* Vibration
* Chemical attack
* High velocity oil erosion (hose tube)
* Ageing (ozone)
* Incorrect angle orientation

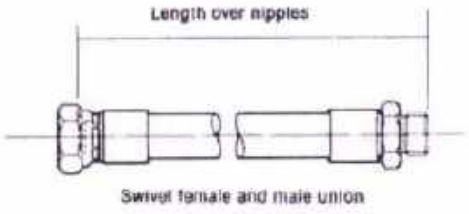
DO'S AND DON'TS TO PROLONG HOSE LIFE

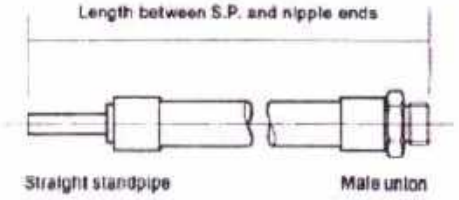
DO	Always use Hydraulic & Offshore Supplies fittings together with Hydraulic & Offshore Supplies approved hose.
DON'T	Ever mix and match hose and couplings from different sources. Make hose assemblies from Hydraulic & Offshore Supplies matched components to ensure compatibility and performance.
DON'T	Cut out a piece from an existing assembly to remove the "bad bit" and put a new coupling on. If a hose has failed it is likely that the reinforcement has passed its working life. First-aid repairs are potentially lethal and invalidate any manufacturer's guarantee.
DON'T	Alter the pressure relief valve in your hydraulic system without considering whether the increased pressure will exceed the recommended max working pressures of your hose assemblies. If it will, replace the hoses with more suitable assemblies.

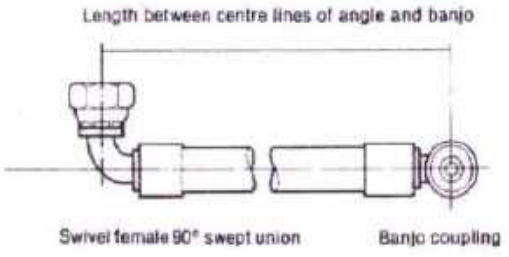
For most assemblies, the correct assembly length may be determined by direct measurement of the equipment or a drawing. Minimum bend radii as shown in the hose specification tables should be observed.
Assemblies are measured to the end of the seal.

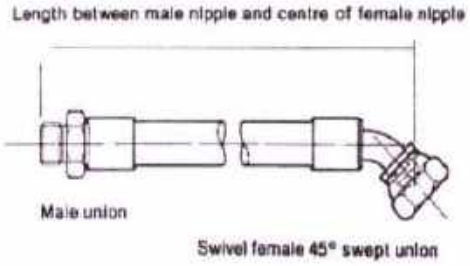
To determine the length of hose needed in making assemblies with permanent or reusable couplings, subtract Dimension "C" (Cut off factor) for each coupling from the required overall assembly length. Dimension "C" may be found in the coupling specification tables.

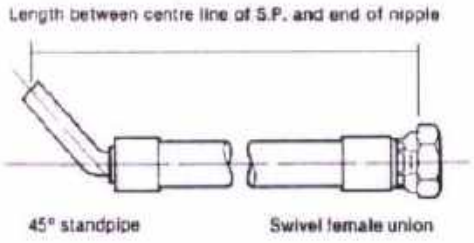
How To Measure Assemblies

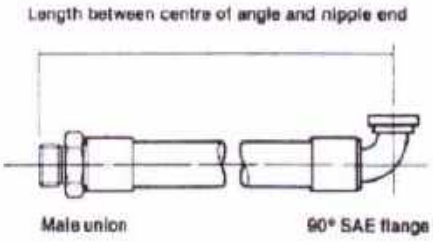




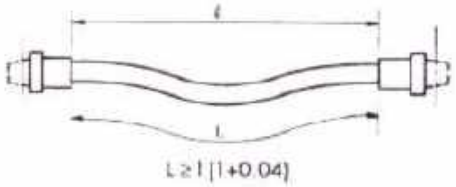




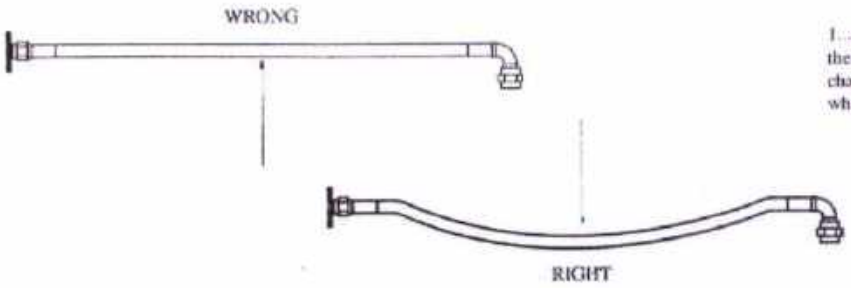




Remember that hydraulic hose under pressure will elongate up to 2% of its length or contract up to 4% depending on pressure, type and size. Sufficient allowance should be made to permit such changes in length.

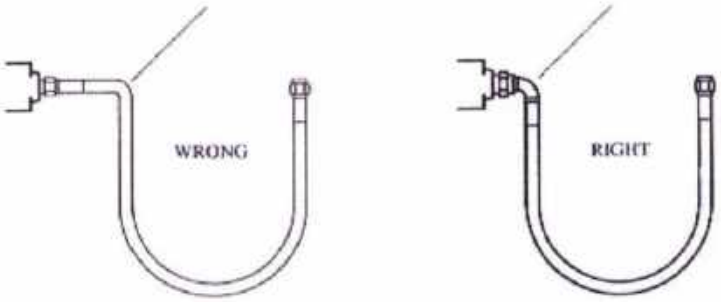


GUIDELINES FOR THE USE OF HYDRAULIC FLUID POWER HOSE & HOSE ASSEMBLIES

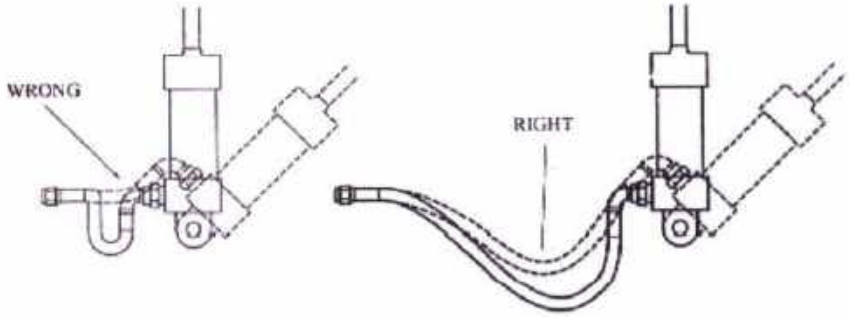


1...provide slack or bend in the hose line to provide for changes in length that will occur when pressure is applied.

2...observe linear stripe. The hose must not be twisted. High pressures applied to a twisted hose may cause failure or loosen the nut.

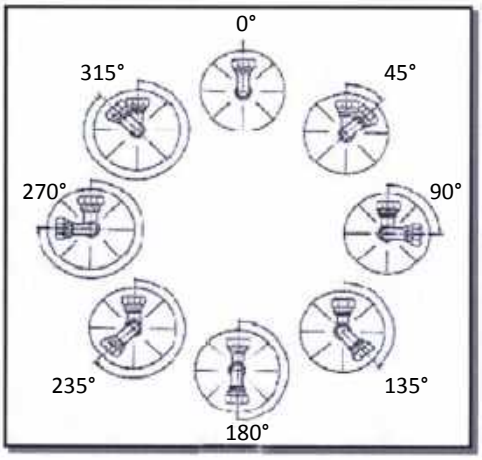


3...relieve sharp bends, avoid strain or hose collapse and make cleaner installations by using elbows or other adaptor fittings. Provide as large a bend radius as possible. Never use less than the recommended minimum bend radius specified for the hose.



4...provide additional bend radius when lines are subject to flexing and remember that the metal end fittings are not flexible. Place line support clamps so as not to restrict hose flexing.

ANGLE ORIENTATIONS



Refer to the following picture to define the correct fitting orientation.

Keep straight the further end and rotate clockwise the closest end of the requested angle.

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