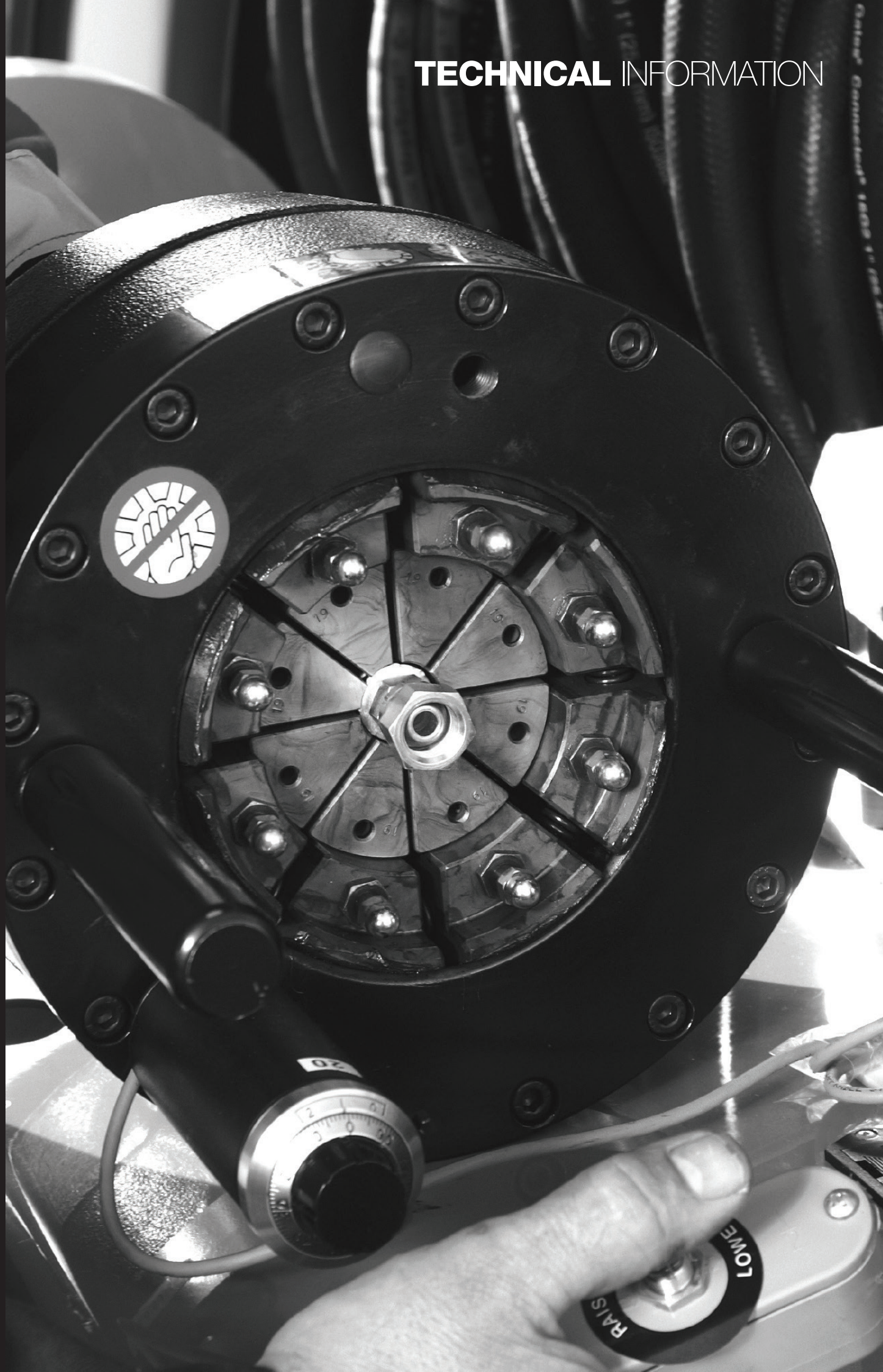


## **Minicheck And Test Fittings**

<b>Technical Information</b> .....	2
<b>Minicheck And Test Fittings</b> .....	21
A-TP - MALE BSPT X TEST POINT .....	23
B-C-FP - BSPP IN-LINE TEST POINT .....	23
B-C-TP - BSPP IN-LINE TEST POINT .....	24
BX-TP - MALE BSPP X TEST POINT .....	24
G-J-FP - JIC IN-LINE TEST POINT .....	25
N-TP - MALE UNO X TEST POINT .....	25
R-T-FP - ORFS IN-LINE TEST POINT .....	26
FX65 - DIRECT GAUGE ADAPTOR .....	27
FXTPK - DIRECT GAUGE ADAPTOR .....	27
GB - BSPT 63MM PRESSURE GAUGE .....	28
GBS - BSPP SPIGOT 63MM PRESSURE GAUGE .....	28
RTL - MINICHECK HOSE FOR TEST LEADS .....	29
SMC01 - BSPP FEMALE STRAIGHT .....	29
SMC02 - BSPP FEMALE STRAIGHT .....	29
SMC05 - JIC FEMALE STRAIGHT .....	30
SMC06 - BSP FEMALE STRAIGHT .....	30
SMC12 - BSPP MALE STRAIGHT .....	31
SMC16 - NPTF MALE STRAIGHT .....	31
SMC18 - JIC MALE STRAIGHT .....	31
SMC65 - METRIC FEMALE STRAIGHT .....	32



## GENERAL INFORMATION

An essential step in ensuring that a hydraulic system is safe and delivers optimum performance and service life is selecting the correct fluid conveying components.

Although a lot of the work undertaken in this industry is the replacement of existing components with a duplicate it is still good practice to check the product against the application especially if the service life of the product to be replaced was not acceptable or when fault finding on an existing system.

In some cases a problem with a hose assembly or other fluid conveying products can point to an underlying problem with the system itself or possibly the products have been incorrectly specified originally.

### INFORMATION - HOSE

#### HOSE SELECTION & SERVICE LIFE RECOMMENDATIONS

Hydraulic hose (and hose assemblies) have a finite life span that is dependent upon the actual operating conditions the assembly is subjected to. An effective way to remember hose selection criteria is to remember the word STAMPED. STAMPED is an acronym for the following:

**S = Size**  
**T = Temperature**  
**A = Application**  
**M = Medium or Media**  
**P = Pressure**  
**E = Ends**  
**D = Delivery**

**1. Size** - Hose Internal Diameter can be determined using the Nomographic Chart found in this section. The correct hose I.D. must be selected for the flow required. Too small an I.D. for a given volume will result in pressure drop, heat generation, fluid turbulence and possible internal tube damage. If in doubt, select the next size up.

**2. Temperature.** Hose selection is determined by two variables of temperature; the ambient (external) temperature and the fluid/material (internal) temperature. The hose should not be exposed to internal or external temperatures which exceed the manufacturer's stated maximum and minimum limits. Both continual and intermittent temperatures must be accommodated within the recommended limits. Extra care must be taken when specifying hoses that are routed near to (or terminate on) hot components such as engine manifolds.

**3. Application.** The determination of how the hydraulic hose or hose assembly will be used. Questions that may need to be answered to ensure correct hose selection could include: What is the suitable hose construction? What type of equipment is it used on? What are the end connections? Are there applicable Government or Industry standards to be satisfied? Questions that may need to be answered to ensure correct hose selection could include; What are the environmental conditions the hose will be used in? Does the hose require a special cover or armour? Are there unusual mechanical loads or excessive movement? What are the routing requirements? What are the required lengths and bend radius to satisfy those routing requirements? (Further data regarding Hose Installation Recommendation can be found in this section.)



**4. Medium** (or media, material) to be conveyed. Hose selection must ensure compatibility of the hose tube (liner) and outer cover with the oil, chemical or gas to be conveyed. A chemical resistance table to rubber compounds can be found in this section. Similar care to ensure compatibility should be taken when specifying end connections (hosetails and adaptors), especially those that contain o-rings.

**5. Pressure.** The pressure in a hydraulic system should not exceed the stated hose working pressure at any time. System pressure spikes and surges must be considered and accommodated within the stated working pressure limits. Minimum burst pressures are reference pressures, and are intended for destructive testing and design purposes only.

**6. Ends.** The thread portions of the hose assembly must of course, be compatible with what it is connecting to. Different thread types have different working pressures, always insure that the threaded ends selected meet or exceed the designed working pressure. Check the technical section of this catalogue for pressure ratings. Also the chemical compatibility of the end fittings must be checked as per the hose. Ensure that the ends chosen are of the type matched to the hose.

**7. Delivery.** When a product is actually needed is important. A decision of what product is used can need to be altered by what is available when needed. Always specify up, not down to meet a timeline. A simple change of adaptor may be all that is needed to meet a requirement.

Exposure of hose or hose assemblies to operating conditions which exceed recommended or stated limits will significantly reduce the expected service life. If in doubt, over-specify hose assemblies to ensure as much safety margin on the recommended limits as possible.

**Notes;**

The potential service life of products can be significantly reduced if they are constantly operating at maximum limits.

Some areas of the selection process are interrelated however the key to correct product selection is the understanding of the application and what is required of the product.

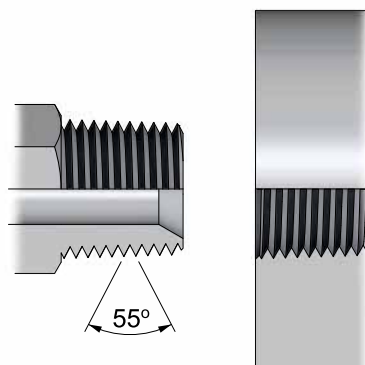
## B.S.P.T. - BRITISH STANDARD PIPE TAPER

**Taper:** 1 in 16 by diameter

**Thread Angle:** 55°

The BSPT (British Standard Pipe Taper) male is intended to mate with the BSPT female only. Although the taper male will screw into BSP Parallel fixed female sockets, this is not recommended practice where avoidable as a reliable seal cannot be guaranteed.

While many BSPT males are coned 30° and will mate with BSP Parallel swivel nut females, this is not recommended practice as the taper form can deform the parallel thread and reduce the integrity of the seal.



Thread Size & TPI	Male Thread O.D. BSPT*	Female Thread I.D. BSPT
1/8-28	9.7	8.5
1/4-19	13.1	11.4
3/8-19	16.6	14.9
1/2-14	20.9	18.6
5/8-14	22.9	20.6
3/4-14	26.4	24.1
1-11	33.2	30.2
1.1/4-11	41.9	38.9
1.1/2-11	47.8	44.8
2-11	59.6	56.6

\*Basic gauge plane diameter at basic gauge depth

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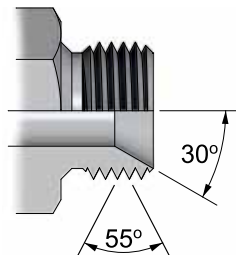
### B.S.P.P. - BRITISH STANDARD PIPE PARALLEL

**Thread Angle: 55°**

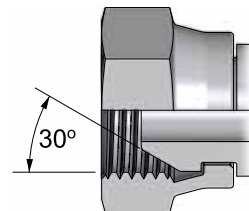
The British Standard Pipe Parallel (BSPP) male is typically coned 30° and will mate with either a BSPP swivel nut female or a BSPP female port.

BSPP female ports are normally spot faced, sealing is by either a soft metal washer, a bonded seal or a captive "O" ring.

In some cases, the port is chamfered to accept an "O" ring seal. (Similar to the U.N.O. style).

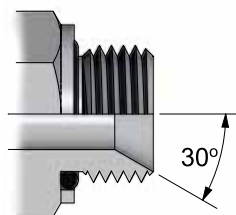


**BSPP male**



**BSPP swivel nut female**

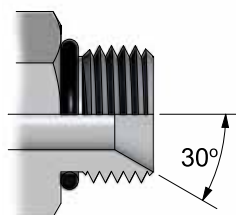
Thread Size & TPI	Male Thread O.D. BSPP	Female Thread I.D. BSPP	Torque Settings BSPP nuts
1/8-28	9.7	8.5	12 Nm
1/4-19	13.1	11.4	26 Nm
3/8-19	16.6	14.9	47 Nm
1/2-14	20.9	18.6	79 Nm
5/8-14	22.9	20.6	104 Nm
3/4-14	26.4	24.1	128 Nm
1-11	33.2	30.2	160 Nm
1.1/4-11	41.9	38.9	200 Nm
1.1/2-11	47.8	44.8	270 Nm
2-11	59.6	56.6	350 Nm



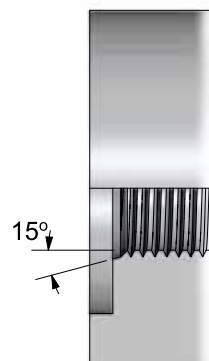
**BSPP male with captive o-ring seal**



**BSPP female port (spot-faced)**



**BSPP male with o-ring seal**



**BSPP female port (chamfered)**

**N.B. Torque values are nominal and supplied as a guide only.**

## N.P.T. - NATIONAL PIPE THREAD

**N.P.T.F.;** National Pipe Taper Fuel  
**N.P.S.M.;** National Pipe Straight Mechanical  
**N.P.S.F.;** National Pipe Straight Fuel

**Taper:** 1 in 16 by diameter.

**Thread Angle:** 60°

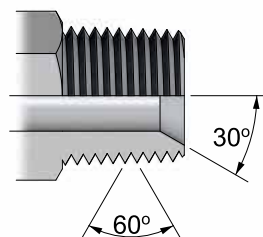
The National Pipe Taper Fuel (NPTF) male is coned 30° and will mate with the NPTF female port (taper), the National Pipe Straight Mechanical (NPSM) female (swivel nut female with 30° sealing cone), or the National Pipe Straight Fuel (NPSF) female port (parallel).

As NPTF is a “dryseal” thread, no sealing medium is required. However a sealing medium can be used to prevent thread galling.

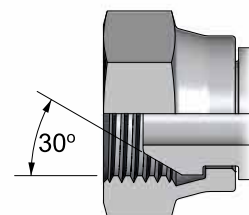
Thread Size & TPI	Male Thread O.D.	Female Thread I.D.	
	NPTF	NPTF	NPSF/SM
1/8-27	10.0	8.6	8.7
1/4-18	13.3	11.2	11.4
3/8-18	16.7	14.7	14.9
1/2-14	20.8	18.2	18.8
3/4-14	26.1	23.5	23.9
1-11.1/2	32.7	29.5	30.2
1.1/4-11.1/2	41.4	38.3	39.1
1.1/2-11.1/2	47.5	44.4	45
2-11.1/2	59.3	56.2	57



**NPTF female  
port (taper)**



**NPTF male  
(taper)**



**NPSM swivel  
nut female**



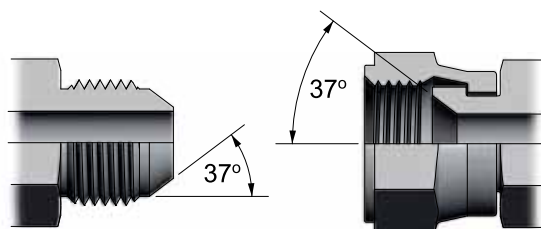
**NPSF female  
port (parallel)**

## J.I.C / U.N. O-RING THREAD

J.I.C. and U.N. "O"-Ring threads are both of the Unified National Form.

J.I.C. refers to the 37° flare type sealing face. The J.I.C. female is usually a swivel nut, but can also be a fixed socket (port) with a 37° sealing face in the base of the socket.

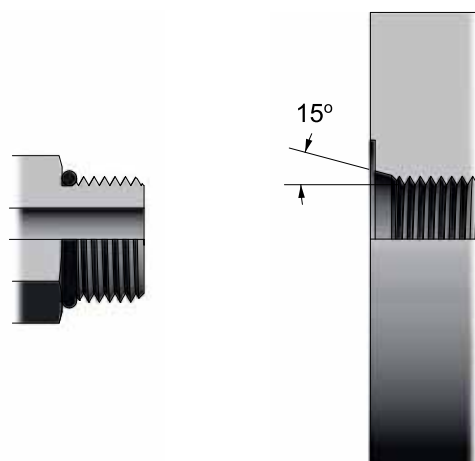
U.N. "O"-Ring refers to the thread type and "O"-Ring for sealing. The female U.N.O port has a chamfer to accept the o-ring.



**JIC male**

**JIC swivel nut female**

Thread Size & TPI	Female Thread I.D.	Tube O.D.	Torque Settings	
			JIC	UN"O"
7/16 x 20 UNF	9.8	1/4"	14 Nm	21 Nm
1/2 x 20 UNF	11.5	5/16"	19 Nm	25 Nm
9/16 x 18 UNF	13.0	3/8"	30 Nm	34 Nm
3/4 x 16 UNF	17.4	1/2"	50 Nm	72 Nm
7/8 x 14 UNF	20.3	5/8"	80 Nm	100 Nm
1 1/16 x 12 UN	24.8	3/4"	130 Nm	176 Nm
1 3/16 x 12 UN	28.2	7/8"	140 Nm	220 Nm
1 5/16 x 12 UN	31.2	1"	156 Nm	290 Nm
1 5/8 x 12 UN	39.2	1.1/4"	188 Nm	350 Nm
1 7/8 x 12 UN	45.5	1.1/2"	268 Nm	460 Nm
2 1/2 x 12 UN	61.5	2"	346 Nm	540 Nm



**UNO male**

**UNO female port (chamfered)**

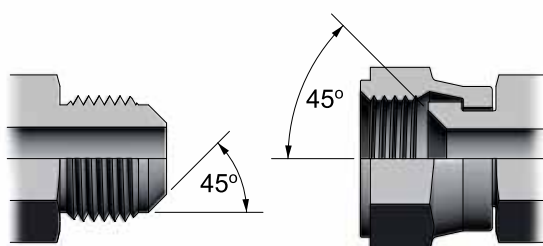
**N.B. Torque values are nominal and supplied as a guide only.**



### S.A.E. - SOCIETY OF AUTOMOTIVE ENGINEERS      O.R.F.S. - O-RING FACE SEAL

This system utilises the U.N. thread series and a 45° flare sealing face. Primarily used in the automotive and refrigeration industries.

This system uses an "O"-Ring for sealing. The "O"-Ring is housed in the face of the male and is compressed by the face of the female on connection. Connecting threads are U.N. form.

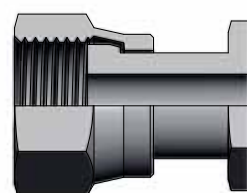


**SAE male**

**SAE swivel  
nut female**



**ORFS male**



**ORFS swivel  
nut female**

Thread Size & TPI	Tube O.D.	Female Thread I.D.
7/16-20	1/4"	9.8
1/2-20	5/16"	11.4
5/8-18	3/8"	14.3
11/16-16	7/16"	16
3/4-16	1/2"	17.5
7/8-14	5/8"	20.5
1.1/16-14	3/4"	24.8
1.1/4-12	7/8"	30.1
1.3/8-12	1"	33.2

Thread Size & TPI	Female Thread I.D.	Tube O.D.	"O"-ring size	Torque Settings *
9/16-18 UNF	12.8	1/4"	5/16x1/16	14-16 Nm
11/16-16 UN	16.0	3/8"	3/8x1/16	24-27 Nm
13/16-16 UN	19.1	1/2"	1/2x1/16	43-47 Nm
1-14 UN	23.5	5/8"	5/8x1/16	60-69 Nm
1.3/16-12UN	26.1	3/4"	3/4x1/16	90-95 Nm
1.7/16-12 UN	34.2	1"	15/16x1/16	125-135 Nm
1.11/16-12 UN	40.6	1.1/4"	1.3/16x1/16	170-190 Nm
2-12 UN	48.0	1.1/2"	1.1/2x1/16	200-225 Nm

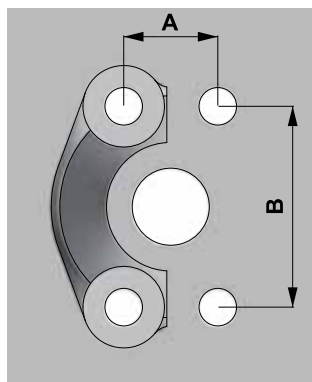
**N.B. Torque values are nominal and supplied as a guide only.**

## S.A.E. O-RING FLANGES (SAE - J518)

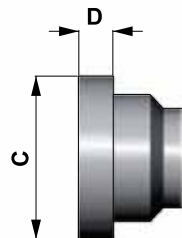
These connections utilise an “O”-Ring for sealing and are widely used for connecting to pump and motor parts as well as end terminations for pipe runs.

The “O”-Ring is housed in the flange head face and seals on a flat face female port, the flange is held in place by two clamp halves (or a one piece clamp) which are secured by four bolts.

SAE flanges are available in two pressure classes: **Standard Series, Code 61**, which goes to 5000 psi (dependent on size), and the **High Pressure Series, Code 62**, which is rated to 6000 psi for all sizes.



**SAE flange  
clamp / port  
bolt spacing**



**SAE flange  
head  
dimensions**

Nominal Flange Size	A (mm)		B (mm)		C (mm)		D (mm)	
	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62
<b>1/2</b>	17.48	18.24	38.1	40.49	30.18	31.75	6.75	7.75
<b>*5/8</b>	19.8	-	42.90	-	34.0	-	6.73	-
<b>3/4</b>	22.23	23.80	47.63	50.80	38.10	41.28	6.73	8.76
<b>1</b>	26.19	27.76	52.37	57.15	44.45	47.63	8.0	9.53
<b>1.1/4</b>	30.18	31.75	58.72	66.68	50.80	53.98	8.0	10.29
<b>1.1/2</b>	35.71	36.50	69.85	79.38	60.33	63.50	8.0	12.57
<b>2</b>	42.88	44.45	77.77	96.82	71.42	79.38	9.53	12.57

Nominal Flange Size	Pressure Rating		"O"-ring size		UNC Bolt size		Bolt torque	
	Code 61	Code 62	Code 61 and 62	AS568A number	Code 61	Code 62	Code 61	Code 62
<b>1/2</b>	5000 psi	6000 psi	3/4x1/8	210	5/16x1.1/4	5/16x1.1/4	20-25 Nm	20-25 Nm
<b>3/4</b>	5000 psi	6000 psi	1x1/8	214	3/8x1.1/4	3/8x1.1/2	28-40 Nm	34-45 Nm
<b>1</b>	5000 psi	6000 psi	1.5/16x1/8	219	3/8x1.1/4	7/16x1.3/4	37-48 Nm	56-68 Nm
<b>1.1/4</b>	4000 psi	6000 psi	1.1/2x1/8	222	7/16x1.1/2	1/2x1.3/4	48-62 Nm	85-102 Nm
<b>1.1/2</b>	3000 psi	6000 psi	1.7/8x1/8	225	1/2x1.1/2	5/8x2.1/4	62-79 Nm	158-181 Nm
<b>2</b>	3000 psi	6000 psi	2.1/4x1/8	228	1/2x1.1/2	3/4x2.3/4	73-90 Nm	271-294 Nm

*\*The 5/8\* size flange is not part of the SAE standard. It is included in the J.I.S. standards and is used by Komatsu and other O.E.M's.*

**N.B. Torque values are nominal and supplied as a guide only**

Caterpillar flanges used on XT3 hose are the same as the SAE Code 61, XT5 flanges have the same diameter as the SAE Code 62 but are thicker in the flange head.

French Gaz (Poclain) flanges are completely different to, and will not interchange with the SAE flanges.

## J.I.S. - JAPANESE INDUSTRIAL STANDARDS

Japanese Industrial Standards (J.I.S.) incorporate B.S.P. and metric threads as well as flanges in their connection standards.

### Taper Threads:

Type R; BSPT Male (*Identical to BSP standard*)

### Parallel Threads:

Type G; BSPP Male (*Identical to BSP standard*)

Type C; BSPP Swivel Nut Female (*Identical to BSP standard - for thread data please refer to BSPP section*)

Type F; BSPP Swivel Nut Female, 30° Flare Seat

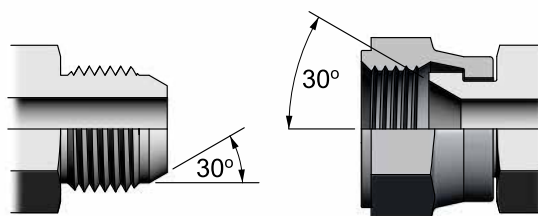
Type M; Metric, Male, 30° Cone

Type MF; Metric, Swivel Nut Female, 30° Flare Seat

### “O”-Ring Flanges:

Type I; Equivalent to Code 61 (*Identical to SAE standard*)

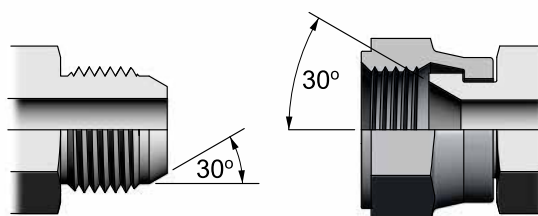
Type II; Equivalent to Code 62 (*Identical to SAE standard*)



**Type F JIS male**

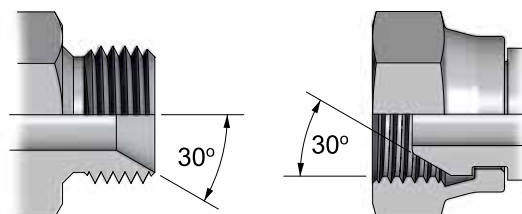
*For thread data please refer to BSPP section*

**Type F JIS swivel nut female**



**Type MF JIS male**

**Type MF JIS swivel nut female**



**Type M JIS male**

**Type M JIS swivel nut female**

THREAD SPECIFICATIONS			
Metric Threads (J.I.S)		Komatsu Threads (Metric)	
14-1.5*	12.5	14-1.5*	12.5
18-1.5*	16.5	18-1.5*	16.5
22-1.5*	20.5	22-1.5*	20.5
27-2.0	25	24-1.5	22.5
33-2.0	31	30-1.5	28.5
42-2.0	40	33-1.5	31.5
50-2.0	48	36-1.5	34.5
60-2.0	58	42-1.5	40.5

\* denotes interchange sizes between JIS and Komatsu.

## D.I.N. METRICS 24° CONE SYSTEM

The D.I.N. System allows for the connection of hose assemblies and tube in three main pressure series:

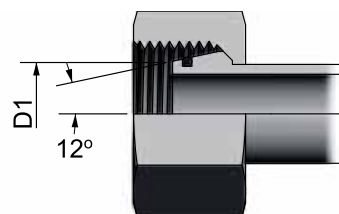
Series LL;	Extra Light, up to 100 bar
Series L;	Light up to 250 bar
Series S;	Heavy up to 640 bar

The pressure ranges are determined by the tube O.D. and the thread size e.g. a 12mm light coupling has an 18mm thread O.D. whereas a 12mm heavy coupling has a 20mm O.D. thread.

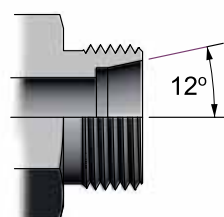
**N.B: Rated coupling pressures are subject to the design pressures of the tube or hose being used.**

Tubing is connected to the D.I.N. Male by the use of a cutting ring and nut. Hose assemblies can be connected by swivel nut females having either a spherical seal, 24° cone seal (can be fitted with "O"-Ring ), or a standpipe with cutting ring and nut. Hose can also be connected directly to tube by use of a hose tail with the D.I.N. Male form

The male form will accept all three female styles shown (right).



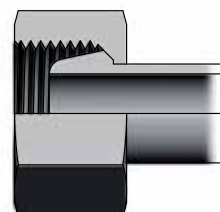
**DIN 24° cone female with o-ring**



**DIN 24° cone male**



**DIN cutting ring and nut on tube**



**DIN female swivel nut with spherical seat**

THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
<b>M12-1.5</b>	10.5	7.2	6
<b>M14-1.5</b>	12.5	9.2	8
<b>M16-1.5</b>	14.5	11.6	10
<b>M18-1.5</b>	16.5	13.8	12
<b>M22-1.5</b>	20.5	16.8	15
<b>M26-1.5</b>	24.5	19.8	18
<b>M30-2.0</b>	28	23.8	22
<b>M36-2.0</b>	34	29.8	28
<b>M45-2.0</b>	43	37.2	35
<b>M52-2.0</b>	50	44.2	42

THREAD SPECIFICATIONS HEAVY (S) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
<b>M14-1.5</b>	12.5	7.2	6
<b>M16-1.5</b>	14.5	9.2	8
<b>M18-1.5</b>	16.5	11.6	10
<b>M20-1.5</b>	18.5	13.8	12
<b>M22-1.5</b>	20.5	15.8	14
<b>M24-1.5</b>	22.5	17.8	16
<b>M30-2.0</b>	28	22	20
<b>M36-2.0</b>	34	27	25
<b>M42-2.0</b>	40	32	30
<b>M52-2.0</b>	50	40	38

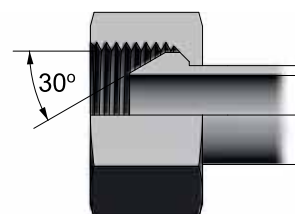
\* N.B. Diameter D1 is nominal and may vary between manufacturers.

## D.I.N. METRICS 60° CONE SYSTEM

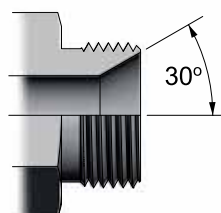
This series utilises a 60° cone seating angle and is used for the connection of hose assemblies and tube. It differs from the 24° series in that the threads are predominately 1.5mm pitch and there is no light or heavy pressure ranges.

The D.I.N. 60° male will accept the universal (spherical seat) female, a 60° coned female and tube fitted with a cutting ring and nut.

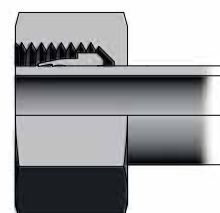
THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M10-1.0	9.0	5
M12-1.5	10.5	6
M14-1.5	12.5	8
M16-1.5	14.5	10
M18-1.5	16.5	12
M22-1.5	20.5	15
M26-1.5	24.5	18
M30-1.5	28.5	22
M38-1.5	36.5	28
M45-1.5	43.5	35
M52-2.0	56.5	42



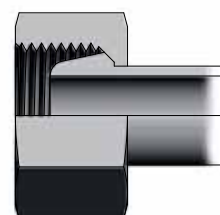
**DIN 60° cone female**



**DIN 60° cone male**



**DIN cutting ring and nut on tube**

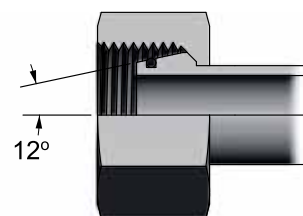


**DIN female swivel nut with spherical seat**



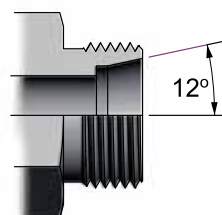
## I.S.O. METRICS (INTERNATIONAL STANDARDS ORGANISATION)

The I.S.O. series of couplings is similar to the D.I.N. light and heavy in function. The male has a 24° included angle sealing cone and a recessed counter bore for locating the tube when used in conjunction with a cutting ring and nut. The male will also accept a swivel nut female with either a cone or a spherical seal.

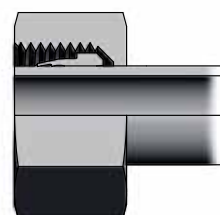


**ISO (24° cone)  
female with o-ring**

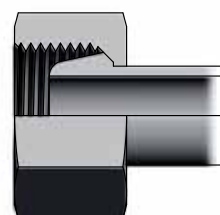
THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M12-1.0	11.0	6
M14-1.5*	12.5	8
M16-1.5*	14.5	10
M18-1.5*	16.5	12
M20-1.5	18.5	14
M22-1.5*	20.5	15
M24-1.5**	22.5	16
M27-1.5	25.5	18
M30-1.5	28.5	22
M33-1.5	31.5	25
M36-1.5	34.5	28
M39-1.5	37.5	30
M42-1.5	40.5	32
M45-1.5	43.5	35
M48-1.5	46.5	38
M52-1.5	50.5	40



**ISO (24° cone)  
male**



**ISO cutting ring and  
nut on tube**



**ISO female swivel  
nut with spherical  
seat**

\* Interchange with D.I.N. Light

\*\* Interchange with D.I.N. Heavy

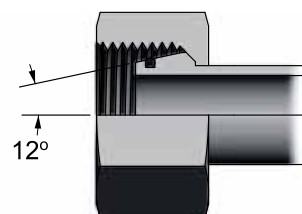
## FRENCH METRICS (GAZ & MILLIMETRIQUE SERIES)

The series are similar to the D.I.N. 24° type where the male has a 24° included angle sealing cone and a recessed counterbore for locating the tube.

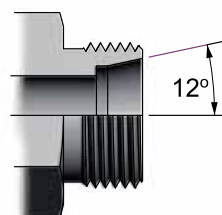
The male will accept a cutting ring and nut for use with tube or a swivel nut female with either a cone or spherical seal.

The Gaz and Millimetrique series are identical in all respects except for the O.D. of the tube:

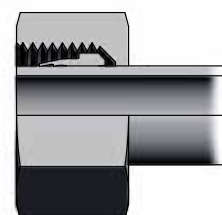
- Gaz series uses fractional number O.D. metric tubing.
- Millimetrique series uses whole number O.D. metric tubing.



**French 24° cone female with o-ring**

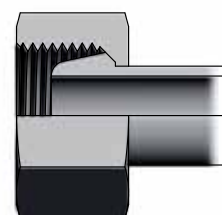


**French 24° cone male**



**Cutting ring and nut on tube**

THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter	
		GAZ	Millimetrique
<b>M12-1.0</b>	11.0	-	6
<b>M14-1.5</b>	12.5	-	8
<b>M16-1.5</b>	14.5	-	10
<b>M18-1.5</b>	16.5	-	12
<b>M20-1.5</b>	18.5	13.25	14
<b>M22-1.5</b>	20.5	-	15
<b>M24-1.5</b>	22.5	16.75	16
<b>M27-1.5</b>	25.5	-	18
<b>M30-1.5</b>	28.5	21.25	22
<b>M33-1.5</b>	31.5	-	25
<b>M36-1.5</b>	34.5	26.75	28
<b>M39-1.5</b>	37.5	-	30
<b>M42-1.5</b>	40.5	-	32
<b>M45-1.5</b>	43.5	33.5	35
<b>M48-1.5</b>	46.5	-	38
<b>M52-1.5</b>	50.5	42.25	40
<b>M54-2.0</b>	52.0	-	45
<b>M58-2.0</b>	56.0	48.25	-

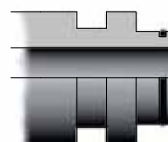


**French female swivel nut with spherical seat**

### STAPLE-LOK COUPLINGS

Originally designed in Germany for underground mining equipment, the Staple-lok requires no spanners for connection or disconnection. The male and female are pushed together and held with a retaining staple or "U" clip.

Sealing is achieved by the captive "O"-Ring located on the male spigot. The female can either be fixed or swivel type. The coupling is not designed to swivel under pressure.

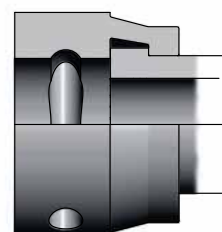


**Staple-lok male**



**Staple-lok fixed female**

Coupling Dash Size	Imperial Size	Male O.D.		Female I.D.	
		inch	mm	inch	mm
-4	1/4	0.58	14.8	.59	15.0
-6	3/8	0.78	19.8	.79	20.0
-8	1/2	0.94	23.9	.95	24.1
-12	3/4	1.13	28.8	1.14	29.0
-16	1	1.53	38.9	1.54	39.1
-20	1.1/4	1.80	45.7	1.81	46.0
-24	1.1/2	2.16	54.9	2.17	55.1
-32	2	2.52	64.0	2.53	64.3



**Staple-lok swivel female**

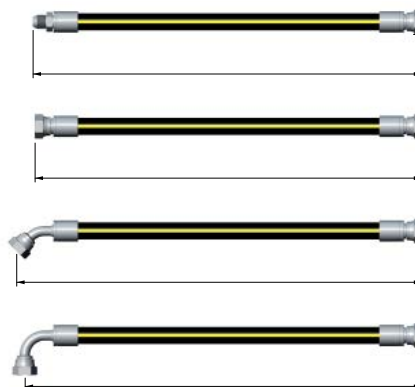


**Staple-lok staple**

## STRAIGHT HOSE ASSEMBLY LENGTH

Overall hose assembly lengths are determined by measuring the centreline length between the coupling end faces for straight couplings, or through the sealing face centreline for angled couplings (examples to right).

Sufficient length allowance should be made to compensate for hose contraction and expansion under operating procedures.



## BENT HOSE ASSEMBLY LENGTH

For installations that require a 180° bend in the hose assembly, the overall length can be calculated as follows:

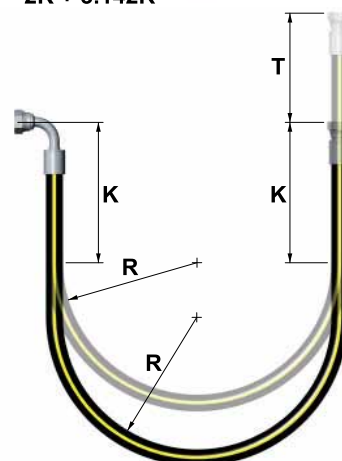
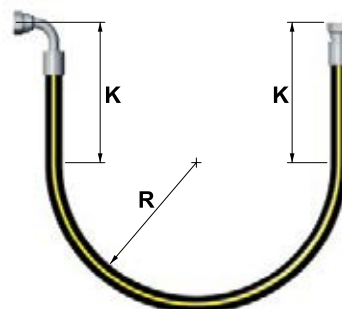
### Static Installations

To avoid localised concentration of bending strain on the hose couplings, a free distance (K) of hose should be designed into the length of each assembly. Distance "K" includes length of coupling and adaptor (if used). Dimension "R" should not be less than the manufacturer's recommended bend radius for the hose used. Refer to chart below for "K" dimensions of hoses with I.D. from 3/16" to 2".

Hose I.D.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
K (mm)	110	130	130	160	180	210	210	260	260	260	310

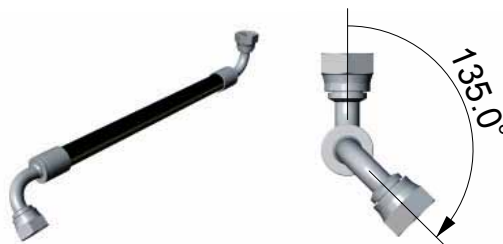
### Dynamic Installations

When a hose assembly is subjected to relative motion between the two end couplings, additional hose length is required to accommodate the travel distance. In the diagram (right) "T" represents the amount of travel.



### Off-Set Angle Measurement

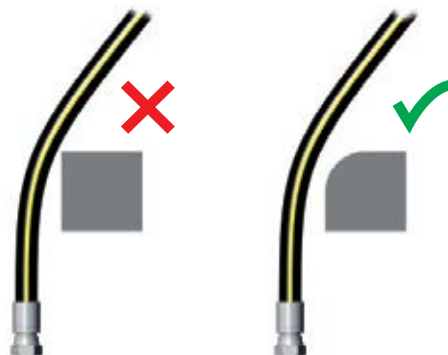
Place hose assembly in line of sight position with coupling furthest away facing upwards. Determine off-set angle by comparing relative position of closest coupling to the far coupling in a clockwise direction.



### 1. Hose Protection

Protect the hose cover from damage such as abrasion, erosion, snagging, and cutting. Where possible, route hose to reduce abrasion from hose rubbing other hose or objects that may abrade it (Fig. 1). Special abrasion-resistant hoses and hose guards are available for additional protection. Special consideration may also need to be given to hose assemblies near heat sources.

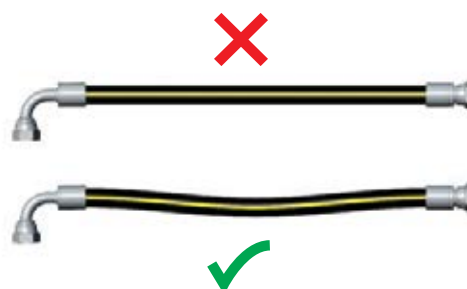
Fig. 1



### 2. Hose And Machine Tolerances

Avoid tension on hose assemblies and adaptors. Design hose to allow for changes in length due to machine motion and tolerances (Fig. 2). Failure to do so may result in seal or assembly failure.

Fig. 2



### 3. Torsional Twist

Do not transfer torque to hose while installing. This transfer of torque can result in torsional twist, which may result in premature hose assembly failure. Use swivel type couplings or adaptors for ease of alignment as needed to prevent twisting during installation. Use the brand lay-line as a guide to ensure the hose is not pre-loaded with torsional twist when installed (Fig. 3).

Fig. 3





#### 4. Minimum Bend Radius

The minimum bend radius for hose supplied by Hydraulink is detailed in this catalogue. Routing at less than minimum bend radius is not recommended and may reduce hose life.

Prevent sharp bending at the hose/fitting juncture (Fig. 4a). Unnecessary stress at this point may result in leaking, hose rupturing, or the hose assembly blowing apart.

Stress at this point can be minimised by ensuring adequate hose length (Fig. 4b), or by use of angled adaptors and couplings (Fig 4c).

Fig. 4a

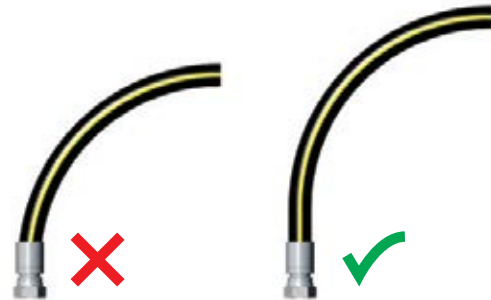


Fig. 4b

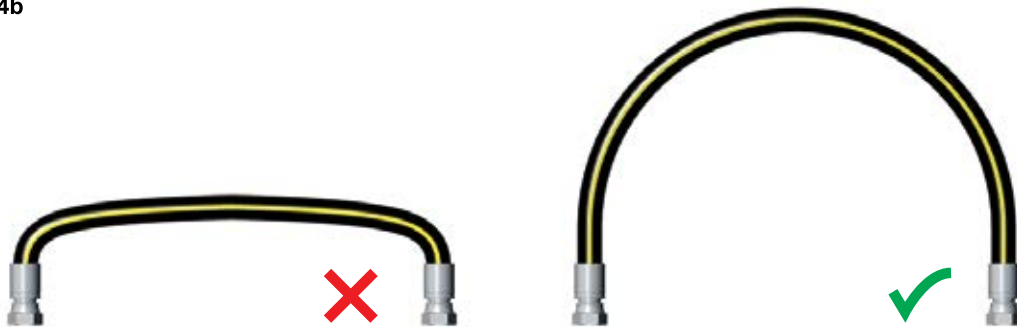


Fig. 4c



### 5. Hose Length Change

Hydraulic hose can expand longitudinally when pressurised, and this hose length change must be considered when specifying or installing hose assemblies (Fig. 5) When clamping hose lengths, always place clamps to avoid stressing the fitting end.

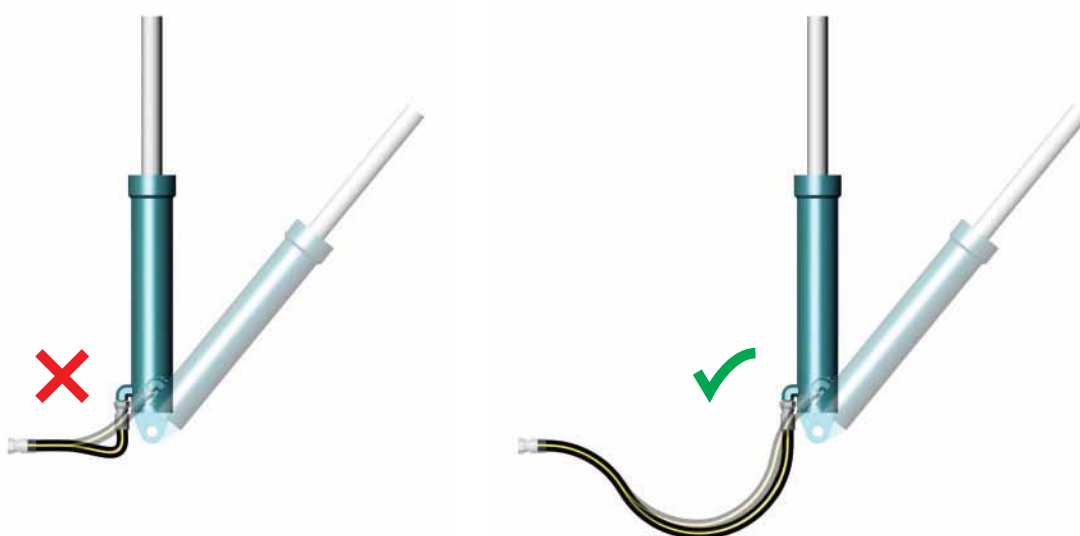
Fig. 5



### 6. Relative Movement

When specifying or installing hoses that have movement relative to each other, provide adequate hose length to absorb the required movement and prevent bends occurring that are smaller than the minimum bend radius (Fig. 6a).

Fig. 6a





## GENERAL INFORMATION

The Hydraulink Minicheck system is a complete range of miniature hose couplings, test-point adaptors, accessories and micro-bore hose. The system is specifically designed for checking hydraulic system pressures, fluid sampling lines, pilot lines, grease lines, air bleeding functions, pressure lines for transducers and switches.

Minicheck couplings and test-point adaptors are typically supplied in steel and finished with a silver trivalent chromium plating and clear sealant to further increase protection against corrosion. Couplings and adaptors are also available in AISI 316 stainless steel on request; please contact Hydraulink for more details.

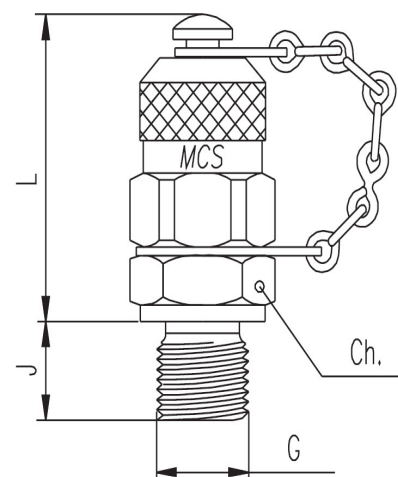
Our product range is constantly evolving and Hydraulink reserve the right to change technical specifications without notice

### TEST POINTS

#### A-TP

MALE BSPT X TEST POINT

BSPT MALE X M16-2.0 TEST POINT

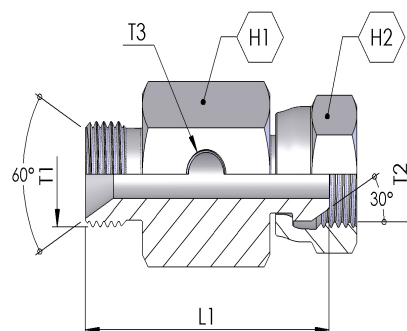


Part Number	BSPT Male Thread	Test point thread	L - mm	J - mm	Hex A/F (CH)	Working Pressure - bar
A-TP-02M16	1/8-28	M16-2	36	8	17	400
A-TP-04M16	1/4-19	M16-2	36	12	17	630

#### B-C-FP

BSPP IN-LINE TEST POINT

BSPP MALE X FEMALE W. BSPP PORT ON HEX



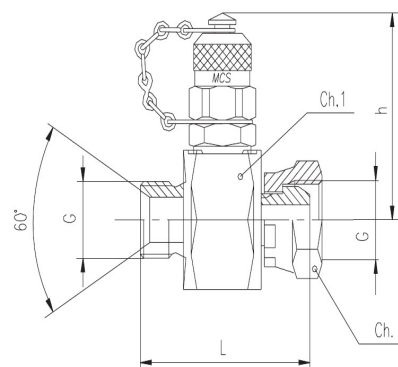
Part Number	BSPP Thread (T1)	BSPP Female Thread (T2)	L1 - mm	Hex A/F (H1)	Hex A/F (H2)	Working Pressure - bar
B-C-FP-040402	1/4-19	1/8-28	53	32	19	400
B-C-FP-060602	3/8-19	1/8-28	60	32	22	400
B-C-FP-080802	1/2-14	1/8-28	60	32	27	400
B-C-FP-121202	3/4-14	1/8-28	68	32	32	400
B-C-FP-161602	1-11	1/8-28	74	41	41	345



### B-C-TP

BSPP IN-LINE TEST POINT

BSPP MALE X FEMALE W. M16-2.0 TEST POINT ON BRANCH

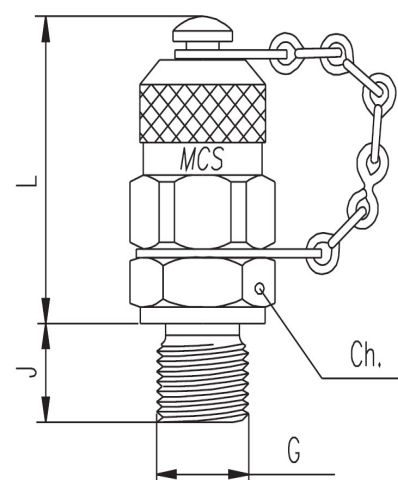


Part Number	BSPP Thread	Test point thread	L - mm	B - mm	Hex A/F (CH1)	Hex A/F (CH2)	Working Pressure - bar
B-C-TP-0404M16	1/4-19	M16-2	53	55	32	19	400
B-C-TP-0606M16	3/8-19	M16-2	60	55	32	22	400
B-C-TP-0808M16	1/2-14	M16-2	60	55	32	27	400
B-C-TP-1212M16	3/4-14	M16-2	68	55	32	32	400
B-C-TP-1616M16	1-11	M16-2	74	55	41	41	345

### BX-TP

MALE BSPP X TEST POINT

BSPP MALE X M16-2.0 TEST POINT

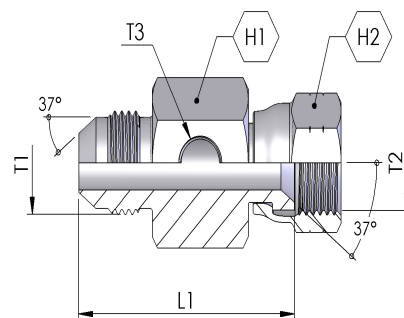


Part Number	BSPP Male Thread	Test point thread	L - mm	J - mm	Hex A/F (CH)	Working Pressure - bar
BX-TP-02M16	1/8-28	M16-2	38	8	17	400
BX-TP-04M16	1/4-19	M16-2	38	12	19	630

### G-J-FP

JIC IN-LINE TEST POINT

JIC MALE X FEMALE W. BSPP PORT ON HEX

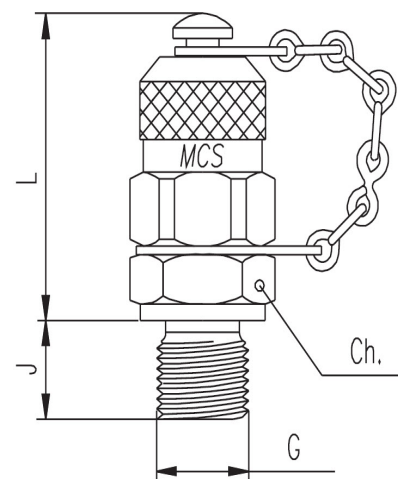


Part Number	JIC Thread (T1 & T2)	BSPP Female Thread (T3)	L1 - mm	Hex A/F (H1)	Hex A/F (H2)
G-J-FP-070702	7/16-20	1/8-28	45	27	14
G-J-FP-090902	9/16-18	1/8-28	46	27	19
G-J-FP-121202	3/4-16	1/8-28	49	27	22
G-J-FP-141402	7/8-14	1/8-28	52	32	27
G-J-FP-171702	1.1/16-12	1/8-28	57	32	32

### N-TP

MALE UNO X TEST POINT

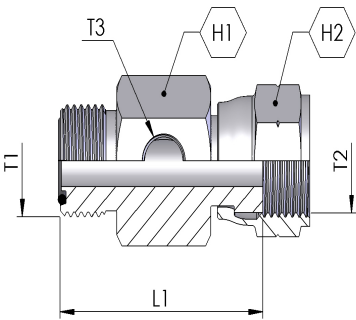
UNO MALE X M16-2.0 TEST POINT



Part Number	UNF Thread	Test point thread	L - mm	J - mm	Hex A/F (CH)	Working Pressure - bar
N-TP-07M16	7/16-20	M16-2	38	11	17	630

**R-T-FP**

ORFS IN-LINE TEST POINT  
ORFS MALE X FEMALE W. BSPP PORT ON HEX



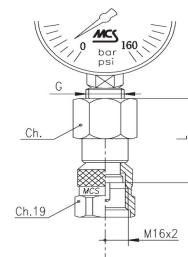
Part Number	ORFS Thread (T1 & T2)	BSPP Female Thread (T3)	L1 - mm	Hex A/F (H1)	Hex A/F (H2)
R-T-FP-090902	9/16-18	1/8-28	40	27	17
R-T-FP-111102	11/16-16	1/8-28	42	27	22
R-T-FP-131302	13/16-16	1/8-28	46	27	24
R-T-FP-161602	1-14	1/8-28	49	32	30
R-T-FP-191902	1.3/16-12	1/8-28	52	32	36

### GAUGE ADAPTORS

#### FX65

DIRECT GAUGE ADAPTOR

BSPP GAUGE SOCKET X M16-2.0 SWIVEL FEMALE

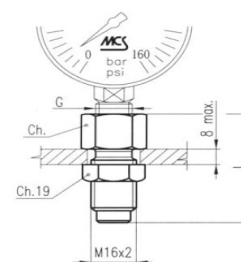


Part Number	BSPP Female Thread (A)	Test point thread (B)	L1 - mm	Hex A/F (CH1)	Hex A/F (CH2)	Working Pressure - bar
FX65-04M16	1/4-19	M16-2	34	19	19	630

#### FXTPK

DIRECT GAUGE ADAPTOR

GAUGE BULKHEAD ADAPTOR TO M16-2.0 MALE



Part Number	BSPP Female Thread (A)	Metric Male Thread	L (mm)	Hex A/F - CH (mm)	Working Pressure - bar
FXTPK-04M16	ISO228-G 1/4	M16-2	50	19	630

### PRESSURE GAUGES

#### GB

BSPT 63MM PRESSURE GAUGE  
BOTTOM ENTRY GAUGE WITH 63mm FACE



Part Number	BSPT Male (A)	Body O.D - mm	Face O.D - mm	O.A - mm	Depth - mm	Pressure range - psi	Pressure range - bar
GB-0300	1/4-19	63	69	86.2	31	0-300	0-20
GB-0600	1/4-19	63	69	86.2	31	0-600	0-40
GB-0850	1/4-19	63	69	86.2	31	0-850	0-60
GB-1450	1/4-19	63	69	86.2	31	0-1450	0-100
GB-3600	1/4-19	63	69	86.2	31	0-3600	0-250
GB-5800	1/4-19	63	69	86.2	31	0-5800	0-400

#### GBS

BSPP SPIGOT 63MM PRESSURE GAUGE  
BOTTOM ENTRY GAUGE WITH 63mm FACE



Part Number	BSPP Male (A)	Body O.D - mm	Face O.D - mm	O.A - mm	Depth - mm	Pressure range - psi	Pressure range - bar
GBS-0160	1/4-19	63	69	86.2	31	0-160	0-10
GBS-0300	1/4-19	63	69	86.2	31	0-300	0-16
GBS-0600	1/4-19	63	69	86.2	31	0-600	0-25
GBS-0850	1/4-19	63	69	86.2	31	0-850	0-60
GBS-1450	1/4-19	63	69	86.2	31	0-1450	0-100
GBS-3600	1/4-19	63	69	86.2	31	0-3600	0-250
GBS-5800	1/4-19	63	69	86.2	31	0-5800	0-400



### MINICHECK

#### RTL

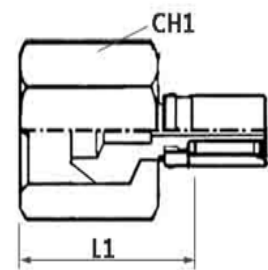
MINICHECK HOSE FOR TEST LEADS  
KEVLAR / FIBRE BRAID REINFORCED HOSE



Part Number	Internal dimension - mm	External dimension - mm	Working pressure - psi	Working pressure - bar	Burst pressure - psi	Burst pressure - bar	Weight per metre - g
RTL-M2	2 +/-0.1	5 +/-0.1	9135	630	27550	1900	18

#### SMC01

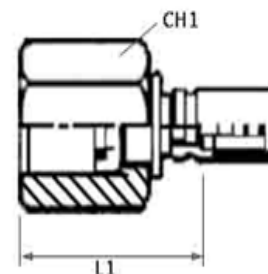
BSPP FEMALE STRAIGHT  
BSPP SWIVEL NUT FEMALE WITH 60° CONE



Part Number	BSPP Female Thread	Hose I.D - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC01-04M2	1/4-19	2	DN2	17	18	630

#### SMC02

BSPP FEMALE STRAIGHT  
BSPP FEMALE SWIVEL FLAT FACE WITH O-RING

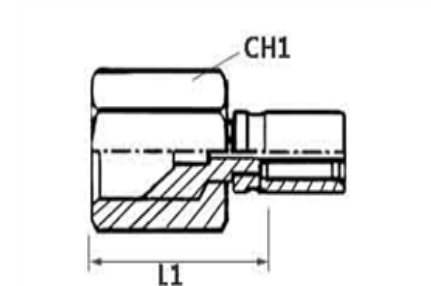


Part Number	BSPP Female Thread	Hose I.D - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC02-04M2	1/4-19	2	DN2	17	15	630

### SMC05

JIC FEMALE STRAIGHT

JIC FEMALE SWIVEL WITH 37° CONE

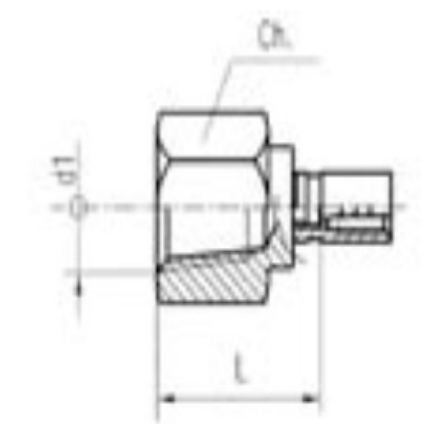


Part Number	JIC Female Thread	Hose I.D - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC05-07M2	7/16-20	2	DN2	14	15	450
SMC05-09M2	9/16-18	2	DN2	19	18	350

### SMC06

BSP FEMALE STRAIGHT

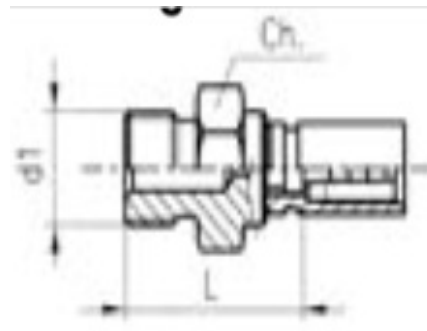
BSPT FIXED FEMALE SOCKET



Part Number	BSPT Female Thread	Hose I.D - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC06-04M2	1/4-19	2	DN2	19	23	630

### SMC12

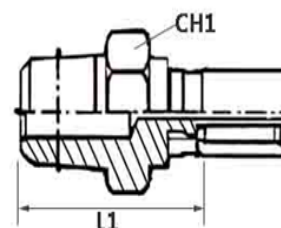
BSPP MALE STRAIGHT  
BSPP FIXED MALE



Part Number	BSPP Male Thread	Hose I.D. - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC12-04M2	1/4-19	2	DN2	19	24.5	400

### SMC16

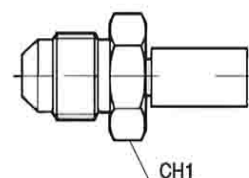
NPTF MALE STRAIGHT  
NPTF FIXED MALE



Part Number	NPTF Male Thread	Hose I.D. - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC16-02M2	1/8-27	2	DN2	13	21	400

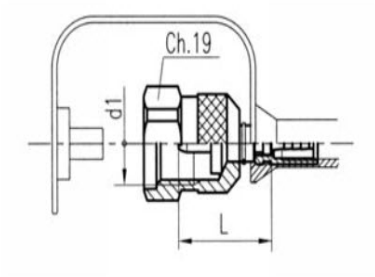
### SMC18

JIC MALE STRAIGHT  
JIC MALE SWIVEL WITH 37° CONE



Part Number	JIC Male Thread	Hose I.D. - mm	DIN	Hex A/F (CH1)	Cutoff mm (L1)	Max working Pressure - bar
SMC18-09M2	9/16-18	2	DN2	19	18	350

SMC65  
METRIC FEMALE STRAIGHT  
METRIC FEMALE SWIVEL TEST SPIGOT



Part Number	Metric Male Thread	Hose I.D - mm	DIN	Hex A/F (CH19)	Cutoff mm (L1)	Max working Pressure - bar
SMC65-M16M2	M16 - 2	2	DN2	19	24	630