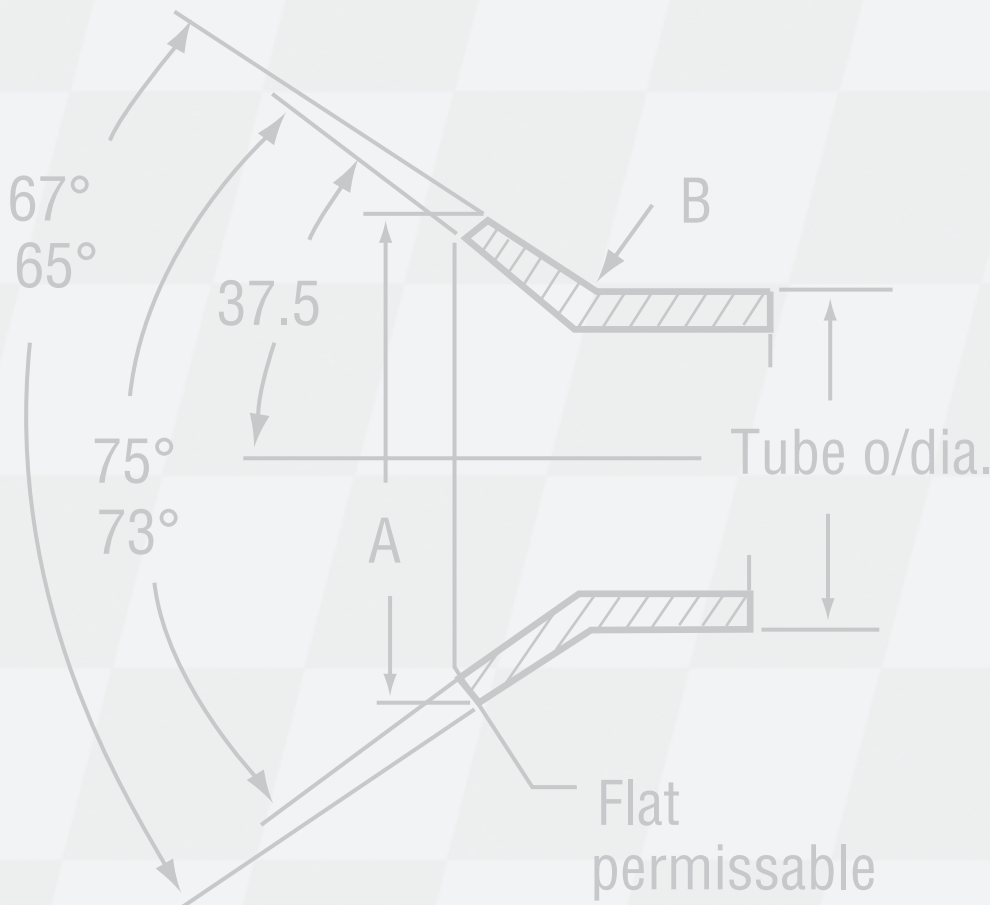
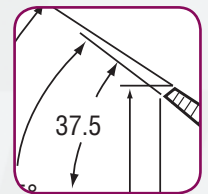
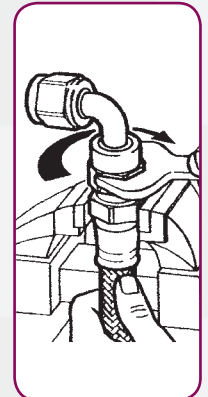
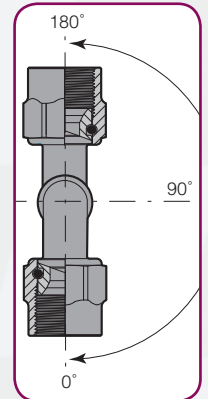




## Technical Information

### Technical Information Contents

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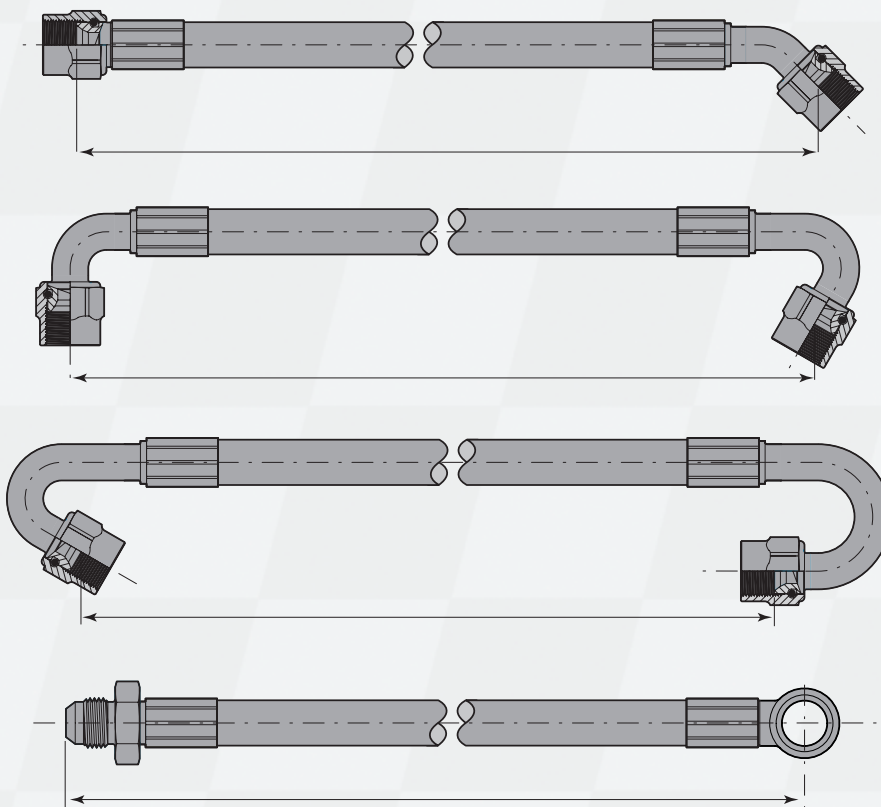
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## Hose Assembly Length and Orientation Measurement

When ordering factory made assemblies it is important to specify the length and fitting orientation in a consistent manner. The convention used by BMRS is that recognised internationally as the standard method.

### Assembly Length

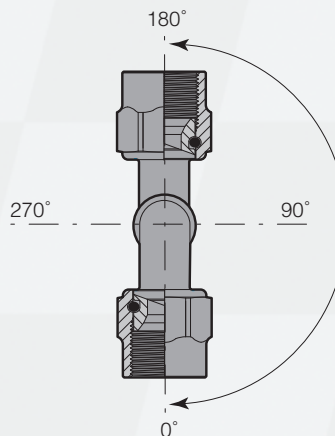
The diagrams below illustrate how to measure the overall length of the assembly with various styles and configurations of end fittings attached. Assembly lengths given to BMRS without further definition will be produced to this convention.



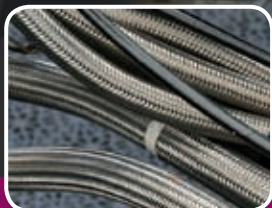
### Elbow Orientation

Where an assembly has an elbow or banjo fitting at both ends or a combination of elbows and banjos the angular orientation between the fittings must be stated. This is measured in degrees anticlockwise.

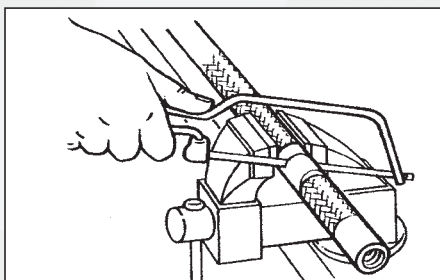
The angle is measured from the centre line of the nearest fitting when this fitting is positioned at 6 o'clock to the centre line of the other fitting.



Note: In this example the orientation is 180°.

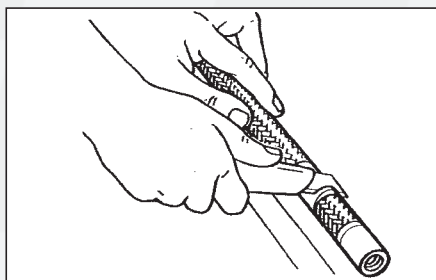


## Assembly Procedure ProGold AR Reusable Fittings



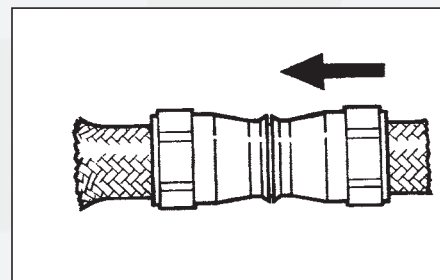
### Metallic braid:

To minimise braid flare wrap the area of the hose to be cut with masking tape. Cut the hose with a suitable fine toothed hack saw blade. remove the tape before next step.

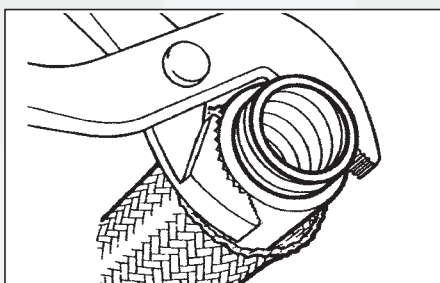


### Non-metallic braid:

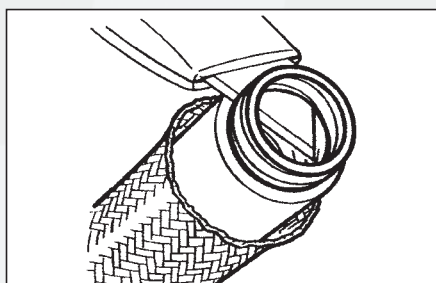
Wrap PTFE (teflon) thread tape on area to be cut. DO NOT use adhesive tape of any type. Cut the hose with a suitable sharp knife then carefully remove the tape.



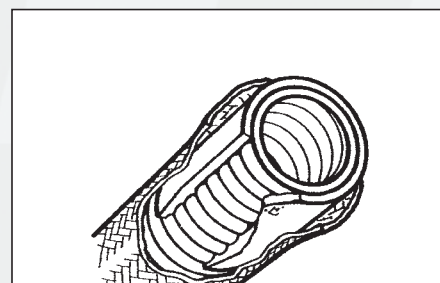
Braid tends to flare more at one end than the other. Assemble both sockets back to back from the less flared end.



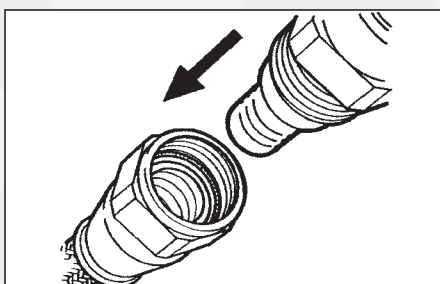
Screw the olive onto the hose until the hose protrudes through the olive. Don't cross thread or force the olive. Make sure the braid goes over the olive.



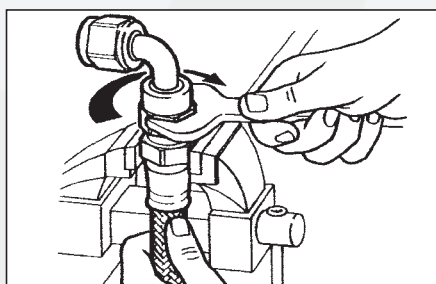
Trim the hose back to be flush or a maximum of 1mm proud of the olive.



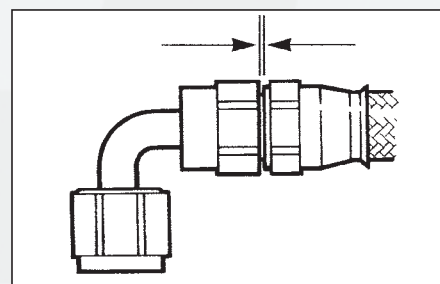
Ensure the hose is cut cleanly and square.



Pull the sockets up over the olives. Lubricate the fitting thread with a light oil. Insert the tail into the hose. Engage the fitting and socket threads. Screw together as far as possible by hand.



Lightly grip the socket in a set of vice jaws and fully tighten the fitting.



### Metallic braid:

Socket should be no more than 1mm away from the fitting face.

### Non-metallic braid:

Socket should be touching the fitting face.

**NEVER loosen fittings once assembled to achieve the desired orientation. ALWAYS use new olive when reusing an end fitting. IF IN DOUBT consult BMRS.**

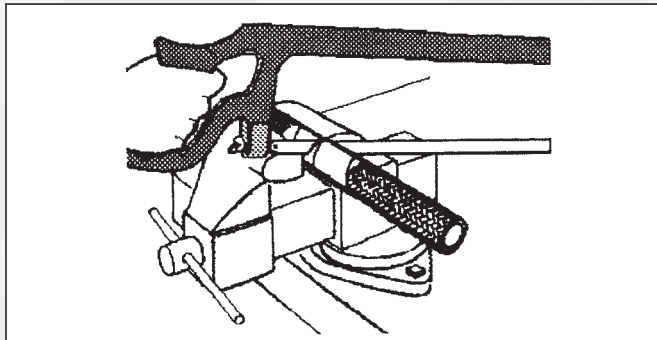
Clean the assembly fittings and proof pressure test the assembly to 1 1/2 times the system working pressure.



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## Assembly Procedure Smooth Bore PTFE Reusable Fittings

1. Having established the required length cut the hose with a suitable cut off wheel or fine toothed hack saw blade. To minimise braid flair wrap the area of the hose to be cut with masking tape.



2. Removed the masking tape and trim any loose braid wires. Remove burrs from inside diameter of the PTFE tube with a sharp knife. Clean the hose to ensure all loose particles and dirt removed from the bore.

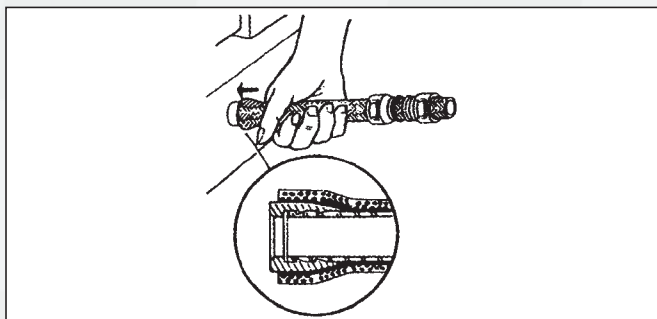
3. Braid tends to flair at one end more than the other, identify the end that has flared less and assemble two sockets back to back from this end.

4. Separate the braid from the innercore at each end using the appropriate tool. If the special tool is not available the braid may be loosened by working the hose over the fitting tail.

5. Push the olive over the end of the tube ensuring it goes under the braid wire.

Full assembly of the olive is best achieved by pushing it fully home against a flat surface such as the work bench or vice.

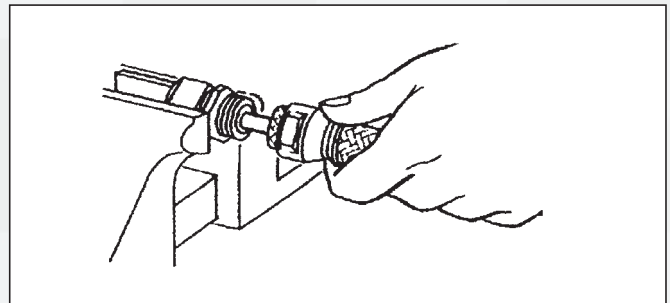
Visually check to ensure the innercore butts up to the shoulder inside the olive.



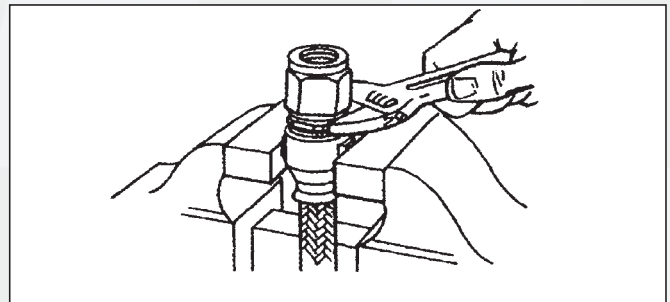
6. Lubricate the fitting and socket threads.

Hold the fitting hexagon in a set of vice jaws, push the hose over the tail using a twisting action until the olive is seated against the chamfer on the thread shoulder.

Push the socket forward and engage its thread on the fitting thread.



7. Using the appropriate size spanner tighten the two halves of the fitting together until there is a maximum gap of 0.75mm (0.031 inches) between the fitting hex and the socket.



8. Clean the assembly and proof pressure test it to twice the system operating pressure.

**9. NEVER loosen fittings once assembled to achieve the desired orientation.**

**ALWAYS use a new olive when reusing an end fitting.**

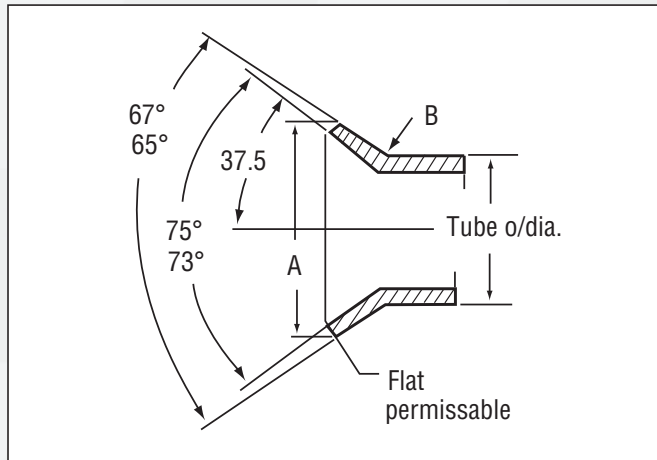


## Assembly Procedure Rigid Tube and Fittings

### Aluminium Flared Fittings

1. Cut the aluminium tube square and deburr the inside and outside diameters (not excessively).
2. Assemble fitting by sliding the sleeve and nut over the tubing.
3. Flare the tube with the appropriate proprietary flaring tool. After flaring, the tube end should conform to the figure and table below.

Tube size	A dia. max.	A dia. min.	B rad. nom.
-04	0.360	0.340	0.030
-06	0.490	0.460	0.040
-08	0.660	0.630	0.060
-10	0.790	0.760	0.060
-12	0.950	0.920	0.080
-16	1.200	1.170	0.090





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## Hose End Fitting – Torque Tightening Values

It is important not to over tighten hose fittings to their mating adaptors or housings. Over tightening causes permanent deformation of the fitting seat and will result in the mating adaptor sealing face being made concave, this will inhibit repeated reliable use of both the fitting and the adaptor.

### Torque values for JIC (AN) hose end fittings

Dash size	Thread size	Aluminium		Stainless steel	
		Pound / ins.	Newton / m.	Pound / ins.	Newton / m
-02	5/16 x 24	50-80	5.64-9.03	75-120	8.47-13.55
-03	3/8 x 24	70-105	7.90-11.86	95-140	10.73-15.81
-04	7/16 x 20	100-140	11.29-15.81	135-190	15.25-21.46
-05	1/2 x 20	130-180	14.68-20.33	170-240	19.20-27.11
-06	9/16 x 18	150-195	16.94-22.03	215-280	24.29-31.63
-08	3/4 x 16	270-350	30.50-39.54	470-550	53.08-62.14
-10	7/8 x 14	360-430	40.67-48.58	620-745	70.05-84.17
-12	1 1/16 x 12	460-550	51.97-62.14	855-1055	96.60-119.18
-16	1 5/16 x 12	700-840	79.08-94.90	1140-1370	128.80-154.78
-20	1 5/8 x 12	850-1020	96.03-115.24	1520-1825	171.73-206.19
-24	1 7/8 x 12	900-1080	101.68-122.02	1900-2280	214.67-257.60
-32	2 1/2 x 12	1800-2000	203.37-255.97	2660-2940	300.54-332.17

### Torque values for JIC (AN) flared ridge tube fittings

Dash size	Thread size	Aluminium		Stainless steel	
		Pound / ins.	Newton / m.	Pound / ins.	Newton / m
-02	5/16 x 24	22-30	2.48-3.39	35-50	3.95-5.65
-03	3/8 x 24	30-45	3.39-5.08	75-100	8.47-12.98
-04	7/16 x 20	40-60	4.52-6.78	115-150	12.99-16.95
-05	1/2 x 20	55-75	6.21-8.47	150-200	16.95-22.60
-06	9/16 x 18	75-115	8.47-12.99	250-300	28.25-33.90
-08	3/4 x 16	150-225	16.95-25.42	450-500	50.84-56.49
-10	7/8 x 14	200-315	22.60-35.59	650-700	73.44-79.09
-12	1 1/16 x 12	300-450	33.90-50.84	900-1000	101.7-113.0
-16	1 5/16 x 12	500-630	56.49-71.18	1200-1400	135.6-158.2
-20	1 5/8 x 12	600-810	67.79-91.52	1500-1800	169.5-203.4
-24	1 7/8 x 12	700-1000	79.09-113.0	1900-2200	214.7-248.6
-32	2 1/2 x 12	850-1300	96.04-146.9	2500-3000	282.5-338.9

### Torque values for male swivel 'O' ring boss fittings and adaptors

Dash size	Thread size	Aluminium and stainless steel	
		Pound / ins.	Newton / m.
-02	5/16 x 24	22-24	2.48-2.71
-03	3/8 x 24	28-32	3.16-3.62
-04	7/16 x 20	38-42	4.29-4.74
-05	1/2 x 20	58-63	6.55-7.00
-06	9/16 x 18	70-80	7.91-9.04
-08	3/4 x 16	145-155	16.38-17.51
-10	7/8 x 14	190-210	21.47-23.73
-12	1 1/16 x 12	285-315	32.20-35.59
-16	1 5/16 x 12	475-525	53.67-59.32
-20	1 5/8 x 12	570-630	64.40-71.18
-24	1 7/8 x 12	570-630	64.40-71.18
-32	2 1/2 x 12	570-630	64.50-71.18

### Torque values for Flareless hose end fittings

Dash size	Thread size	Aluminium	
		Pound / ins.	Newton / m.
-20	1 9/16 x 12	495 - 550	56 - 62
-24	1 13/16 x 12	600 - 660	68 - 74
-28	2 1/8 x 12	730 - 790	83 - 89
-32	2 3/8 x 12	830 - 890	94 - 100

Fitting mating faces and threads should be lubricated prior to assembly. Generally the system working fluid (engine oil, hydraulic fluid etc.) is used. If another lubricant is used ensure it is compatible with the working fluid and system. Dry assembly should be avoided if at all possible.



## Fitting Thread Sizes

Nom. Tube size ins	AN Dash size	JIC, AN Thread size	NPT Thread size	BSP Thread size
1/8	-02	5/16 x 24	1/8 x 27	1/8 x 28
3/16	-03	3/8 x 24		
1/4	-04	7/16 x 20	1/4 x 18	1/4 x 19
5/16	-05	1/2 x 20		
3/8	-06	9/16 x 18	3/8 x 18	3/8 x 19
1/2	-08	3/4 x 16	1/2 x 14	1/2 x 14
5/8	-10	7/8 x 14		5/8 x 14
3/4	-12	1 1/16 x 12	3/4 x 14	3/4 x 14
1	-16	1 5/16 x 12	1 x 11.5	1 x 11
1 1/4	-20	1 5/8 x 12	1 1/4 x 11.5	1 1/4 x 11
1 1/2	-24	1 7/8 x 12	1 1/2 x 11.5	1 1/2 x 11
2	-32	2 1/2 x 12	2 x 11.5	2 x 11



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## 'O' Ring Material – Selection Guide

The appropriate selection of 'O' Ring material is important. Failure to select the correct material may lead to a shortened service life or, in an extreme case, seal failure.

The following table is offered as a guide only, the information is not intended to be comprehensive. Operating conditions, temperature and fluid combinations should be taken into account when selecting the material. For specific application advice please consult the factory.

'O' Ring material code	'O' Ring material	Temperature range	Application	
			Recommended for	NOT recommended for
'N'	Nitrile (Buna N)	- 40°C to + 135°C	Mineral based hydraulic oils & greases Engine oils SAE 10 to 50 & multigrades Pneumatics Cold water Silicone oils & greases Ethylene glycol based fluids (anti-freeze) Di-ester based lubricants Gasoline Nitrous oxide	Brake Fluid Phosphate ester hydraulic fluids Ketones (acetone)
'V'	Fluorocarbon	- 25°C to + 250°C	Mineral based hydraulic oils & greases Engine oils SAE 10 to 50 & multigrades Pneumatics Di-ester based lubricants Phosphate ester hydraulic fluids Silicate ester base lubricants Silicone oils & greases Gasoline Aviation fuels High temperature air	Brake Fluid Ketones (acetone)
'EP'	Ethylene Propylene	- 54°C to + 135°C	Brake fluid Water (hot & cold) Phosphate ester hydraulic fluids Methanol Nitromethane Nitrous oxide Ketones (acetone)	Petroleum oils Di-ester base lubricants